Federal Highway Administration: Pavement/Bridge Condition (PM2) Target Reaffirmation or Revisions

Presented by:
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Streamlined Project Delivery & Data Management

North Central Texas Council of Governments (NCTCOG)
November 2020 – Virtual Public Meeting
# NCTCOG Performance Measurement Activities

## FAST Act – Performance Measures and Target Setting

<table>
<thead>
<tr>
<th>Complete</th>
<th>Rulemaking</th>
<th>Number of Measures</th>
<th>DOT/Provider Target Setting Deadline</th>
<th>MPO Target Setting Deadline</th>
<th>Reporting Period</th>
<th>Reporting Schedule</th>
</tr>
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<tbody>
<tr>
<td>✗</td>
<td>Safety (PM1)</td>
<td>5</td>
<td>8/31/2020</td>
<td>2/27/2021</td>
<td>Annually</td>
<td>Annually</td>
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<tr>
<td>✗</td>
<td>Pavement/Bridge Condition (PM2)</td>
<td>6</td>
<td>10/01/2020</td>
<td>3/30/2021</td>
<td>Four-Year Performance Periods (starting 2018-2022)</td>
<td>Biennially (beginning, middle, &amp; end of performance periods)</td>
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<tr>
<td>✓</td>
<td>System Performance (PM3)</td>
<td>7</td>
<td>10/01/2020</td>
<td>10/01/2020</td>
<td>Four-Year Performance Periods (starting 2018-2022)</td>
<td>Biennially (beginning, middle, &amp; end of performance periods)</td>
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<tr>
<td>✗</td>
<td>Public Transportation Safety Plan (PTASP)</td>
<td>7</td>
<td>12/31/2020</td>
<td>6/29/2021</td>
<td>Annually</td>
<td>Annually</td>
</tr>
<tr>
<td>✗</td>
<td>Transit Asset Management (TAM)</td>
<td>4</td>
<td>1/01/2021</td>
<td>6/30/2021</td>
<td>Annually</td>
<td>Annually</td>
</tr>
</tbody>
</table>
NCTCOG Performance Measurement Activities (cont.)
PM2 (Pavement/Bridge Condition) Performance Period Schedule

First Performance Period began
November 8, 2018: RTC affirms TxDOT statewide PM2 targets for 2020 and 2022

Mid-Performance Period Report due October 1, 2020
If TxDOT adjusts PM2 statewide targets (2022), MPOs have 180 days to either reaffirm support for adjusted targets, or set new regional targets

First Performance Period ends
Second Performance Period begins
MPOs adopt new targets (statewide or regional) for 2024 and 2026
In accordance with 23 CFR Part 490, pavement/bridge conditions are reported for National Highway System (NHS) facilities.

State DOTs are required to establish PM2 targets representing the full NHS extent, regardless of ownership.

Total NHS (NCTCOG) = 12,448 lane-miles
- Interstate Highways = 3,215 lane-miles (25.8%)
- Non-Interstate Freeways = 1,667 lane-miles (13.4%)
- On-System Arterials = 3,769 lane-miles (30.3%)
- Off-System Toll Roads (NTTA) = 838 lane-miles (6.7%)
- Off-System Arterials = 2,959 lane-miles (23.8%)

NHS comprises 14.1% of region’s total roadway lane-miles (2018), but accommodate 63.2% of total vehicle-miles of travel (VMT).

30 local entities own NHS off-system arterials.
## PM2 Pavement Analysis – Statewide vs. Regional Data

### Breakdown of Good Condition Targets

<table>
<thead>
<tr>
<th>NHS ROADWAY CATEGORIES</th>
<th>DESIRED IMPROVEMENT TREND</th>
<th>2018 BASELINE</th>
<th>2020 CONDITION (NEW)</th>
<th>2022 TARGET (ORIGINAL)</th>
<th>2022 TARGET (UPDATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State of Texas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good Pavement Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate National Highway System (NHS)</td>
<td>↑</td>
<td>66.8%</td>
<td>66.6%</td>
<td>66.4%</td>
<td>66.5%</td>
</tr>
<tr>
<td>Non-Interstate National Highway System (NHS)</td>
<td>↑</td>
<td>54.4%</td>
<td>55.2%</td>
<td>52.3%</td>
<td>54.1%</td>
</tr>
<tr>
<td><strong>North Central Texas (NCTCOG) Region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good Pavement Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate NHS (TxDOT)</td>
<td>↑</td>
<td>50.1%</td>
<td>34.9%</td>
<td>52.7%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Non-Interstate NHS: On-System Freeways (TxDOT)</td>
<td>↑</td>
<td>48.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Interstate NHS: On-System Arterials (TxDOT)</td>
<td>↑</td>
<td>26.9%</td>
<td>43.3%</td>
<td>36.2%</td>
<td>50.9%</td>
</tr>
<tr>
<td>Non-Interstate NHS: Off-System Toll Roads (NTTA)</td>
<td>↑</td>
<td>47.6%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Interstate NHS: Off-System Arterials (Local)</td>
<td>↑</td>
<td>1.1%</td>
<td></td>
<td></td>
<td>1.0%</td>
</tr>
</tbody>
</table>

1. Highway Performance Monitoring System (HPMS) data; new regional target estimates based on 3-year (2017-19) HPMS moving average (assumes IRI ratings only for non-Interstate NHS; assumes IRI, cracking, rutting, & faulting metrics for Interstate NHS).
2. TxDOT Pavement Management Information System (PMIS) data where indicated; estimation/reporting of original NCTCOG regional target based on 5-year (2013-17) moving average for all non-Interstate NHS roadways combined (good condition only).
3. Indicated figures/target estimates based on TxDOT HPMS/PMIS data, not on NTTA's Condition Rating System (CRS) which addresses surface condition, IRI, rutting, faulting, & pavement type. In 2018 & 2020, CRS good condition ratings were 93.4% & 91.4%, respectively.
### Breakdown of Poor Condition Targets

**State of Texas**

<table>
<thead>
<tr>
<th>NHS ROADWAY CATEGORIES</th>
<th>DESIRED IMPROVEMENT TREND</th>
<th>2018 BASELINE</th>
<th>2020 CONDITION (NEW)</th>
<th>2022 TARGET (ORIGINAL)</th>
<th>2022 TARGET (UPDATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Pavement Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate National Highway System (NHS)</td>
<td>✅ 0.3%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.2%</td>
<td></td>
</tr>
<tr>
<td>Non-Interstate National Highway System (NHS)</td>
<td>✅ 13.8%</td>
<td>14.2%</td>
<td>14.3%</td>
<td>14.2%</td>
<td></td>
</tr>
</tbody>
</table>

**North Central Texas (NCTCOG) Region**

<table>
<thead>
<tr>
<th>Poor Pavement Condition</th>
<th>DESIRED IMPROVEMENT TREND</th>
<th>2018 BASELINE</th>
<th>2020 CONDITION (NEW)</th>
<th>2022 TARGET (ORIGINAL)</th>
<th>2022 TARGET (UPDATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate NHS (TxDOT)</td>
<td>➕ 5.8%</td>
<td>0.7%</td>
<td>8.0%</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>Non-Interstate NHS: On-System Freeways (TxDOT)</td>
<td>➕ 6.8%</td>
<td>6.8%</td>
<td>8.9%</td>
<td>7.2%</td>
<td></td>
</tr>
<tr>
<td>Non-Interstate NHS: On-System Arterials (TxDOT)</td>
<td>➕ 18.5%</td>
<td>20.4%</td>
<td>18.4%</td>
<td>22.1%</td>
<td></td>
</tr>
<tr>
<td>Non-Interstate NHS: Off-System Toll Roads (NTTA)</td>
<td>➕ 8.4%</td>
<td>3.2%</td>
<td>9.3%</td>
<td>2.8%</td>
<td></td>
</tr>
<tr>
<td>Non-Interstate NHS: Off-System Arterials (Local)</td>
<td>➕ 73.7%</td>
<td>74.3%</td>
<td>69.8%</td>
<td>74.1%</td>
<td></td>
</tr>
</tbody>
</table>

1. Highway Performance Monitoring System (HPMS) data; new regional target estimates based on 3-year (2017-19) HPMS moving average (assumes IRI ratings only for non-Interstate NHS; assumes IRI, cracking, rutting, & faulting metrics for Interstate NHS).
2. TxDOT Pavement Management Information System (PMIS) data where indicated; estimation/reporting of original regional targets in 2018 based on 5-year (2013-17) moving average (poor condition only).
3. Indicated figures/target estimates based on TxDOT HPMS/PMIS data, not on NTTA’s Condition Rating System (CRS) which addresses surface condition, IRI, rutting, faulting, & pavement type. In both 2018 & 2020, CRS poor condition rating was 0.0%.
Considerations for Pavement Target Decision-Making

Current Regional Transportation Council (RTC) Action

- **NCTCOG supported TxDOT statewide 2022 “Good Condition” NHS pavement targets**
- Analysis of TxDOT data for NCTCOG region indicated general compatibility across all NHS roadway categories

- **NCTCOG supported TxDOT statewide 2022 “Poor Condition” NHS pavement targets**
- Collaboration to plan/program projects contributing toward accomplishment of pavement goals also included the following action:
  - NCTCOG will work with local governments to expedite improvements for NHS Off-System Arterials in “Poor Condition”
## PM2 Bridge Analysis – Statewide vs. Regional Data

### Breakdown of Good/Poor Condition Targets

<table>
<thead>
<tr>
<th>NHS ROADWAY CATEGORIES</th>
<th>DESIRED IMPROVEMENT TREND</th>
<th>2018 BASELINE</th>
<th>2020 CONDITION (NEW)</th>
<th>2022 TARGET (ORIGINAL)</th>
<th>2022 TARGET (UPDATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State of Texas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good Bridge Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All NHS Facilities</td>
<td>50.7%</td>
<td>50.7%</td>
<td>50.4%</td>
<td>50.4%</td>
<td></td>
</tr>
<tr>
<td>Poor Bridge Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All NHS Facilities</td>
<td>0.9%</td>
<td>1.3%</td>
<td>0.8%</td>
<td>1.5%</td>
<td></td>
</tr>
<tr>
<td><strong>North Central Texas (NCTCOG) Region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good Bridge Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All NHS Facilities</td>
<td>55.3%</td>
<td>56.0%</td>
<td>58.4%</td>
<td>57.9%</td>
<td></td>
</tr>
<tr>
<td>Poor Bridge Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All NHS Facilities</td>
<td>1.9%</td>
<td>2.3%</td>
<td>1.5%</td>
<td>2.0%</td>
<td></td>
</tr>
</tbody>
</table>

1. All percentages based on total deck area.
2. Estimation/reporting of original regional targets in 2018 based on 6-year (2012-18) linear trend analysis; condition data reported in 2-year increments.
3. Estimation/reporting of new regional targets based on 8-year (2012-20) linear trend analysis; condition data reported in 2-year increments.
**PM2 Bridge Analysis – Statewide vs. Regional Data**

**Extent of Regional “Poor”/”Near-Poor” Condition NHS Bridges**

<table>
<thead>
<tr>
<th>NCTCOG Region – Bridge Performance Status</th>
<th>2018</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Poor Condition” NHS Bridges</td>
<td>14</td>
<td>34</td>
</tr>
<tr>
<td>Funded – 2018 (UTP –or– TIP/STIP)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Repeat Listings</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Funded – 2020 (UTP –or– TIP/STIP)</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Not Addressed (&lt; 10 Years)</td>
<td>2</td>
<td>9</td>
</tr>
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</table>

1. UTP = Unified Transportation Program (TxDOT); TIP/STIP = (Statewide) Transportation Improvement Program

**NCTCOG Region – “Poor Condition” Bridges Not Addressed (2020)**

<table>
<thead>
<tr>
<th>FACILITY CARRIED</th>
<th>FEATURE(S) CROSSED</th>
<th>COUNTY</th>
<th>NHS CATEGORY</th>
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<tbody>
<tr>
<td>IH 20 EB Connector D</td>
<td>IH 20/US 175 Interchange</td>
<td>Dallas</td>
<td>Interstate</td>
</tr>
<tr>
<td>IH 20 WB Connector C</td>
<td>IH 20/US 175 Interchange</td>
<td>Dallas</td>
<td>Interstate</td>
</tr>
<tr>
<td>Belt Line Rd</td>
<td>Goff Branch</td>
<td>Dallas</td>
<td>Off-System Arterial</td>
</tr>
<tr>
<td>Belt Line Rd</td>
<td>Keller Branch</td>
<td>Dallas</td>
<td>Off-System Arterial</td>
</tr>
<tr>
<td>US 67 EB</td>
<td>Ward Branch</td>
<td>Ellis</td>
<td>Non-IH Freeway</td>
</tr>
<tr>
<td>US 80 EB</td>
<td>Buffalo Creek Relief</td>
<td>Kaufman</td>
<td>Non-IH Freeway</td>
</tr>
<tr>
<td>US 80 WB</td>
<td>Buffalo Creek Relief</td>
<td>Kaufman</td>
<td>Non-IH Freeway</td>
</tr>
<tr>
<td>US 80 EB</td>
<td>Bachelor Creek</td>
<td>Kaufman</td>
<td>Non-IH Freeway</td>
</tr>
<tr>
<td>SH 121 WB</td>
<td>IH 35W SB</td>
<td>Tarrant</td>
<td>Non-IH Freeway</td>
</tr>
</tbody>
</table>
Considerations for Bridge Target Decision-Making
Current Regional Transportation Council (RTC) Action

- NCTCOG supported TxDOT statewide 2022 “Good Condition” NHS bridge targets
- Analysis of TxDOT data for NCTCOG region indicated general compatibility across all NHS roadway categories

- NCTCOG supported TxDOT statewide 2022 “Poor Condition” NHS bridge targets
- Collaboration to plan/program projects contributing toward accomplishment of bridge goals also included the following actions:
  - NCTCOG will work with TxDOT and local governments to expedite improvements for NHS Bridges in “Poor Condition”
Considerations for PM2 Target Decision-Making (cont.)

Other Issues/Actions Learned Since 2018

Influence of NHS off-system facilities:
- NCTCOG region has 47.8% of the total extent of NHS off-system facilities in Texas
- Nationwide, Texas ranks 3rd in off-system NHS mileage, but 15th in percentage of total NHS mileage (California ranks 1st by far in both categories)

In 2018, all Texas MPOs agreed to support TxDOT’s statewide PM2 targets, and it is unknown if any nationwide set their own targets due to the following:
- First performance period (2018-22)
- Changing non-Interstate NHS pavement metric
- DOT/MPO/Local coordination and data sharing
- Challenges to directly link planning, performance, and programming both within and across agencies
- DOT/Local maintenance funds rarely flow to MPOs
- Few dedicated revenue sources
### PM2 Target Reaffirmation or Revisions

#### Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 1, 2020</td>
<td>TxDOT Submits Mid Performance Period (MPP) Progress Report to FHWA (adjustments to 5 out of 6 PM2 targets restarts 180-day MPO review)</td>
</tr>
<tr>
<td>October 23, 2020</td>
<td>STTC Information</td>
</tr>
<tr>
<td>November 9, 2020</td>
<td>Online Public Input Opportunity (comment period ends December 8, 2020)</td>
</tr>
<tr>
<td>November 12, 2020</td>
<td>RTC Information</td>
</tr>
<tr>
<td>December 4, 2020</td>
<td>STTC Action</td>
</tr>
<tr>
<td>December 10, 2020</td>
<td>RTC Action</td>
</tr>
<tr>
<td>March 30, 2021</td>
<td>Deadline for MPOs to Report to State DOTs Whether They Will Either:</td>
</tr>
<tr>
<td></td>
<td>(i.) Agree to plan/program projects contributing to adjusted State targets; or,</td>
</tr>
<tr>
<td></td>
<td>(ii.) Commit to new quantifiable targets for the Metropolitan Planning Area (MPA)</td>
</tr>
</tbody>
</table>
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November 9, 2020 North Central Texas Council of Governments (NCTCOG)  
November 2020 – Virtual Public Meeting
HPMS vs. PMIS

- Highway Performance Monitoring System (HPMS) is a national-level information system with data on the extent, condition, performance, use, and operation of the nation’s highways (ride and distresses reported on one lane per roadway).
- Pavement Management Information System (PMIS) is TxDOT’s automated system for storing, retrieving, analyzing, and reporting pavement condition (ride and distresses recorded on one lane per direction).
- Project-specific pavement management plans by each TxDOT district conducted via PMIS, not HPMS.
- Data segment length = 1/10 mile.

International Roughness Index (IRI) and full distresses (cracking, rutting, and faulting) used as performance measures for Interstate NHS.

IRI only used for non-Interstate NHS during first Performance Period (2018-22).

PM2 Pavement Metric Thresholds

<table>
<thead>
<tr>
<th>RATING</th>
<th>GOOD</th>
<th>FAIR</th>
<th>POOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRI (inches/mile)</td>
<td>&lt; 95</td>
<td>95 – 170</td>
<td>&gt; 170</td>
</tr>
<tr>
<td>PSR* (0.0 – 5.0 value)</td>
<td>≥ 4.0</td>
<td>2.0 – 4.0</td>
<td>&lt; 2.0</td>
</tr>
<tr>
<td>Cracking** (%)</td>
<td>&lt; 5</td>
<td>CRCP: 5 – 10</td>
<td>JPCP/JRCP: 5 – 15</td>
</tr>
<tr>
<td>Rutting (inches)</td>
<td>&lt; 0.20</td>
<td>0.20 – 0.40</td>
<td>&gt; 0.40</td>
</tr>
<tr>
<td>Faulting (inches)</td>
<td>&lt; 0.10</td>
<td>0.10 – 0.15</td>
<td>&gt; 0.15</td>
</tr>
</tbody>
</table>

* Present Serviceability Rating (PSR) may be used only on routes with posted speed limit < 40 MPH.

** Continuously Reinforced Concrete Pavement (CRCP); Jointed Plain Concrete Pavement (JPCP); Jointed Reinforced Concrete Pavement (JRCP).
Appendix: PM2 Analysis – Statewide vs. Regional Data (cont.)

Bridge Data Considerations

- Bridges are defined as **structurally deficient** with any component condition rating ≤ 4
- Applicable bridges:
  - Bridges carrying NHS facilities
  - Bridges carrying entrance/exit ramps (including direct connectors) and cross-streets connecting to NHS facilities
- State DOTs must submit their most current National Bridge Inventory (NBI) data on NHS bridges no later than March 15th of each year
- PM2 bridge data distributed to MPOs every two years for determination of progress in achieving adopted performance targets and identifying potential adjustments (optional)

### Bridge Deck

- GOOD: ≥ 7
- FAIR: 5 or 6
- POOR: ≤ 4

### Superstructure

- GOOD: ≥ 7
- FAIR: 5 or 6
- POOR: ≤ 4

### Substructure

- GOOD: ≥ 7
- FAIR: 5 or 6
- POOR: ≤ 4

### Culvert

- GOOD: ≥ 7
- FAIR: 5 or 6
- POOR: ≤ 4

* National Bridge Inventory (NBI)