Transit Asset Management (TAM)

Condition Assessment & Guideway Performance Restriction Guidebooks

July/August 2016

Presenter: Maggie Schilling
Agenda

- Webinar Purpose & NTD Data Requirements
- Facility Condition Assessment Guidebook
- Guideway Performance Restriction Calculation Guidebook
Webinar Purpose

• Introduce **FTA Facility Condition Assessment & Guideway Performance Restriction Calculation Guidebooks**
• Solicit & receive comments on Guidebooks to ensure direction is helpful and comprehensive
• Provide proposal for calculating performance measures for facilities & infrastructure
NTD Data Requirements: Facility & Infrastructure Condition

• MAP-21 created **new** requirement that facility & infrastructure conditions data be added to the National Transit Database (NTD) to:
  - Support requirements for Transit Asset Management (TAM) plans
  - Calculate State of Good Repair (SGR)-related measures

• Agencies must only conduct & report **condition assessments** for transit assets for which they have direct capital responsibility
Guidebooks: Table of Contents

- Background, scope, & purpose
- Reporting procedures, data requirements, & definitions
- Procedures for calculating condition assessments & guideway performance restrictions
- Appendices, glossary, references, & sample forms
Classes of Facilities

• Administrative
• Maintenance
• Passenger
• Parking
Facility Details – Administrative & Maintenance

**Administrative Facility**
Offices for management/supporting activities for transit operations

**Maintenance Facility**

General Purpose
- Garage or building for routine maintenance/repairs

Heavy Maintenance
- Garage or building for engine/other major unit rebuilds

**Agencies must report:**
- Maintenance facilities by ownership
- General purpose facilities by size
### Passenger & Parking Facilities*

- Rail passenger facilities
- Light rail, cable car, & streetcar passenger facilities that have platforms & serve track in a separate ROW
- Motorbus, rapid bus, commuter bus, & trolley bus passenger facilities in a separate ROW that have an enclosed structure for passengers
- Transportation, transit or transfer centers, park-&-ride facilities, & transit malls if they have an enclosed structure for passengers

*Collectively called “passenger facilities”*
Steps to Conducting & Reporting a Facility Condition Assessment

1. Define Facility Components
2. Establish Condition Assessment Language
3. Conduct the Assessment
4. Calculate Overall Condition
5. Document and Report
Pre-Condition Assessment Data Gathering Recommendations

Inspectors should gather & review the following:

- Agency inspection & maintenance procedures/schedules
- Inspection schedule/alignment with reporting schedule
- Data needs
- Warranty status & age of components
- Other background information
FTA Transit Economic Requirements Model (TERM) Scores

An asset is in **SGR** if it has a rating over 3 on the TERM scale.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Excellent</td>
<td>New asset; no visible defects</td>
</tr>
<tr>
<td>4</td>
<td>Good</td>
<td>Some slightly defective/deteriorated component(s)</td>
</tr>
<tr>
<td>3</td>
<td>Adequate</td>
<td>Some moderately defective/deteriorated component(s)</td>
</tr>
<tr>
<td>2</td>
<td>Marginal</td>
<td>Increasing # of defective/deteriorated component(s) &amp; maintenance needs</td>
</tr>
<tr>
<td>1</td>
<td>Poor</td>
<td>In need of immediate repair or replacement; may have critically damaged component(s)</td>
</tr>
</tbody>
</table>
Components, by Facility Type

**Administrative or Maintenance**
- Substructure
- Shell
- Interiors
- Elevators and Escalators
- Plumbing
- HVAC
- Fire Protection
- Electrical
- Equipment
- Site

**Passenger**
- Substructure
- Shell
- Interiors
- Elevators and Escalators
- Plumbing
- HVAC
- Fire Protection
- Electrical
- Fare Collection
- Site
Sub-Component Examples

Component: Substructure (admin/maintenance or passenger facility)
- Sub-components
  - Foundations: walls, columns, pilings, etc.
  - Basement: materials, insulation, slab, floor underpinnings

Component: Site (admin/maintenance or passenger facility)
- Sub-components
  - Roadways and associated signage, markings, & equipment
  - Site utilities, etc.

Component: Equipment (admin/maintenance facility)
- Sub-components
  - Equipment related to the function of the facility, including maintenance or vehicle service equipment
  - Includes only items valued above $10,000 & related to facility function
### Conducting a Component Condition Assessment: HVAC Systems

**Component ratings should be based on rating descriptions in the Facility Condition Assessment Guidebook**

<table>
<thead>
<tr>
<th>Component</th>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. HVAC</td>
<td>5: Excellent</td>
<td>New construction, no visible defects or damage. Meets efficiency and capacity goals and maintains desired temperature and air quality throughout the facility.</td>
</tr>
<tr>
<td></td>
<td>4: Good</td>
<td>Minor improvements needed, may be slightly outdated and less efficient and consistent. Minor deterioration or defect with no functional impact typically addressed through routine maintenance.</td>
</tr>
<tr>
<td></td>
<td>3: Adequate</td>
<td>Repairs are needed; some deterioration exists, and maintenance needs are significant. With these, the system meets needs. Still within its useful life.</td>
</tr>
<tr>
<td></td>
<td>2: Marginal</td>
<td>System has exceeded its useful life; fails to meet standards or needs. Components need extensive repair at a minimum. Currently does not appear to be any safety issue.</td>
</tr>
<tr>
<td></td>
<td>1: Poor</td>
<td>System is well past its useful life and has critical defects affecting function; its issues are beyond repair and warrant detailed review.</td>
</tr>
</tbody>
</table>
Condition Rating Aggregation Approaches

Once you determine condition ratings for individual facility components, you must **aggregate results** to determine the condition of the facility. **There are three approaches:**

- Approach #1: Weighted Average Condition
- Approach #2: Median Value
- Approach #3: Other
**Sample Administrative/Maintenance Facility Condition Assessment Form**

### 4.3 Sample Administrative/Maintenance Facility Condition Assessment Form

<table>
<thead>
<tr>
<th>ID</th>
<th>Component</th>
<th>Asset Quantity</th>
<th>Unit of Measure</th>
<th>Percent of Asset Quantity by Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Roof</td>
<td></td>
<td></td>
<td>5 Excellent</td>
</tr>
<tr>
<td>B</td>
<td>Shell</td>
<td></td>
<td></td>
<td>4 Good</td>
</tr>
<tr>
<td>C</td>
<td>Interior</td>
<td></td>
<td></td>
<td>3 Adequate</td>
</tr>
<tr>
<td>D</td>
<td>Conveyance</td>
<td></td>
<td></td>
<td>2 Marginal</td>
</tr>
<tr>
<td>E</td>
<td>Plumbing</td>
<td></td>
<td></td>
<td>1 Poor</td>
</tr>
<tr>
<td>F</td>
<td>HVAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Fire Protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Electrical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Site</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
References for Facility Condition Assessments

Agenda

1. Webinar Purpose & NTD Data Requirements
2. Facility Condition Assessment Guidebook
3. Guideway Performance Restriction Calculation Guidebook
Reporting Procedures

**Applicability:** Agencies operating rail fixed guideway

- Submit both monthly & annual reports

**Primary measure:** Average length of fixed guideway directional route mileage (DRM) under performance restriction
Data Requirements

- Fixed Guideway
- Directional Route Miles
- Fixed Guideway Directional Route Miles
- Design Speed
- Performance Restriction
Fixed Guideway (FG) Definition

- Fixed Guideway is a public transportation facility
  - Using and occupying a separate right-of-way for the exclusive use of public transportation;
  - Using rail;
  - Using a fixed catenary system;
  - For a passenger ferry system
  - For a bus rapid transit system

Icons: The Noun Project, Arthur Shlain
Directional Route Miles (DRM) Definition

- Total mileage in each direction that public transportation vehicles travel during revenue service
  - Specified for each combination of mode & service with fixed guideway
Fixed Guideway Directional Route Miles (FG DRM) Definition

Mileage in each direction that public transportation vehicles travel in revenue service on a fixed guideway.
Design Speed Definition

- Maximum allowable speed at the time of the FG segment’s opening
  - Determining design speed can be tricky
  - Maximum historically scheduled speed may be used when determination is not practical
Performance Restriction Definition

• When the maximum speed of vehicles on a FG segment is below the segment’s design speed
• Calculated at 9:00am local time on the first Wednesday of each month
Performance Restriction Calculation

1. List Fixed Guideway Segments and Total Length by Month
2. Identify Potential Performance Restrictions
3. Itemize Actual Performance Restrictions
4. Calculate Performance Restriction Length by Month
5. Calculate Annual Average Performance Restriction
6. Document and Report
List fixed guideway segments for each combination of mode and type of service.

<table>
<thead>
<tr>
<th>Segment ID</th>
<th>Description</th>
<th>From</th>
<th>To</th>
<th>DRM</th>
<th>Design Speed (MPH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Track 1 West Station</td>
<td>0.00</td>
<td>0.10</td>
<td>0.10</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Track 1 West-Park</td>
<td>0.10</td>
<td>2.90</td>
<td>2.80</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>Track 1 Park Station</td>
<td>2.90</td>
<td>3.10</td>
<td>0.20</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Track 1 Park-East Station</td>
<td>3.10</td>
<td>7.90</td>
<td>4.80</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>Track 1 East Station</td>
<td>7.90</td>
<td>8.00</td>
<td>0.10</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Track 2 West Station</td>
<td>0.00</td>
<td>0.10</td>
<td>0.10</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Track 2 West-Park</td>
<td>0.10</td>
<td>2.90</td>
<td>2.80</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>Track 2 Park Station</td>
<td>2.90</td>
<td>3.10</td>
<td>0.20</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>Track 2 Park-East Station</td>
<td>3.10</td>
<td>7.90</td>
<td>4.80</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>Track 2 East Station</td>
<td>7.90</td>
<td>8.00</td>
<td>0.10</td>
<td>10</td>
</tr>
</tbody>
</table>
2: Identify Potential Restrictions

- List all potential performance restrictions
- Suggest the collection of additional data beyond the minimum requirement

<table>
<thead>
<tr>
<th>Performance Restriction Cause</th>
<th>From</th>
<th>To</th>
<th>Tracks</th>
<th>Performance Restriction Cause</th>
<th>Max Speed Under Performance Restriction (MPH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary speed restriction due to rail defects</td>
<td>0.00</td>
<td>0.35</td>
<td>1, 2</td>
<td>Temporary speed restriction due to rail defects</td>
<td>10 mph</td>
</tr>
<tr>
<td>ROW maintenance</td>
<td>2.75</td>
<td>2.90</td>
<td>1</td>
<td>ROW maintenance</td>
<td>20 mph</td>
</tr>
<tr>
<td>Temporary speed restriction due to improper elevation</td>
<td>4.00</td>
<td>5.08</td>
<td>2</td>
<td>Temporary speed restriction due to improper elevation</td>
<td>20 mph</td>
</tr>
<tr>
<td>East Station Improvement Project</td>
<td>7.67</td>
<td>8.00</td>
<td>1, 2</td>
<td>East Station Improvement Project</td>
<td>10 mph</td>
</tr>
</tbody>
</table>
3: Itemize Actual Restrictions

<table>
<thead>
<tr>
<th>Segment ID</th>
<th>Description</th>
<th>From</th>
<th>To</th>
<th>DRM</th>
<th>Design Speed (MPH)</th>
<th>Performance Restriction (Y/N)</th>
<th>Performance Restriction Cause</th>
<th>Speed Restriction (MPH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Track 1 West Station</td>
<td>0.00</td>
<td>0.10</td>
<td>0.10</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Track 1 West-Park A</td>
<td>0.10</td>
<td>0.35</td>
<td>0.25</td>
<td>40</td>
<td>Y</td>
<td>Temporary speed restriction due to rail defects</td>
<td>10</td>
</tr>
<tr>
<td>2.2</td>
<td>Track 1 West-Park B</td>
<td>0.35</td>
<td>2.75</td>
<td>2.40</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Track 1 West-Park C</td>
<td>2.75</td>
<td>2.90</td>
<td>0.15</td>
<td>40</td>
<td>Y</td>
<td>ROW maintenance</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Track 1 Park Station</td>
<td>2.90</td>
<td>3.10</td>
<td>0.20</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Track 1 Park-East Station A</td>
<td>3.10</td>
<td>7.67</td>
<td>4.57</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>Track 1 Park-East Station B</td>
<td>7.67</td>
<td>7.90</td>
<td>0.23</td>
<td>40</td>
<td>Y</td>
<td>East Station Improvement Project</td>
<td>10</td>
</tr>
</tbody>
</table>
## 4: Calculate Restriction Length by Month

<table>
<thead>
<tr>
<th>Segment ID</th>
<th>Description</th>
<th>From</th>
<th>To</th>
<th>DRM</th>
<th>Performance Restriction Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Track 1 West-Park A</td>
<td>0.10</td>
<td>0.35</td>
<td>0.25</td>
<td>Temporary speed restriction due to rail defects</td>
</tr>
<tr>
<td>2.3</td>
<td>Track 1 West-Park C</td>
<td>2.75</td>
<td>2.90</td>
<td>0.15</td>
<td>ROW maintenance</td>
</tr>
<tr>
<td>4.2</td>
<td>Track 1 Park-East Station B</td>
<td>7.67</td>
<td>7.90</td>
<td>0.23</td>
<td>East Station Improvement Project</td>
</tr>
<tr>
<td>7.1</td>
<td>Track 2 West-Park A</td>
<td>0.10</td>
<td>0.35</td>
<td>0.25</td>
<td>Temporary speed restriction due to rail defects</td>
</tr>
<tr>
<td>9.2</td>
<td>Track 2 Park-East Station B</td>
<td>4.00</td>
<td>5.08</td>
<td>1.08</td>
<td>Temporary speed restriction due to improper elevation</td>
</tr>
<tr>
<td>9.4</td>
<td>Track 2 Park-East Station D</td>
<td>7.67</td>
<td>7.90</td>
<td>0.23</td>
<td>East Station Improvement Project</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2.19</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 5: Calculate Annual Average Length

<table>
<thead>
<tr>
<th>Restriction Causes (Examples)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>YTD AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>0.15</td>
<td>2.05</td>
<td>2.45</td>
<td>1.78</td>
<td>1.50</td>
<td>0.57</td>
<td>1.50</td>
<td>1.05</td>
<td>1.25</td>
<td>0.40</td>
<td>0.15</td>
<td>0.15</td>
<td>1.08</td>
</tr>
<tr>
<td>Rail Defect</td>
<td>0.50</td>
<td>0.15</td>
<td>0.91</td>
<td>0.91</td>
<td>0.25</td>
<td>0.44</td>
<td>0.25</td>
<td>0.44</td>
<td>0.15</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.49</td>
</tr>
<tr>
<td>Signal, Controls Issue</td>
<td>0.00</td>
<td>0.50</td>
<td>0.53</td>
<td>0.53</td>
<td>0.11</td>
<td>0.11</td>
<td>0.00</td>
<td>0.20</td>
<td>0.20</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.23</td>
</tr>
<tr>
<td>Bridge Conditions</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
<td>0.02</td>
<td>0.10</td>
<td>0.10</td>
<td>0.00</td>
<td>0.00</td>
<td>0.14</td>
</tr>
<tr>
<td>Track Geometry</td>
<td>1.08</td>
<td>0.25</td>
<td>0.00</td>
<td>0.00</td>
<td>0.75</td>
<td>0.70</td>
<td>0.75</td>
<td>0.75</td>
<td>0.25</td>
<td>0.08</td>
<td>0.08</td>
<td>0.08</td>
<td>0.39</td>
</tr>
<tr>
<td>Construction</td>
<td>0.46</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.20</td>
<td>1.20</td>
<td>3.00</td>
<td>2.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.46</td>
<td>0.46</td>
<td>0.69</td>
</tr>
<tr>
<td>Other</td>
<td>0.00</td>
<td>0.31</td>
<td>0.31</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.08</td>
</tr>
<tr>
<td><strong>TOTAL Under Performance Restriction (miles)</strong></td>
<td>2.19</td>
<td>3.26</td>
<td>4.20</td>
<td>3.53</td>
<td>2.94</td>
<td>3.38</td>
<td>4.45</td>
<td>5.55</td>
<td>4.66</td>
<td>1.10</td>
<td>0.83</td>
<td>1.19</td>
<td>3.11</td>
</tr>
</tbody>
</table>
Guidance on Special Cases

- Establishing Design Speed
- Identifying When Performance Restrictions Occur
- Measuring the Length of a Performance Restriction
Glossary and Sample Forms

Appendices to the guidebook include:

• Glossary of terms based on FTA’s NTD Glossary
• Sample Performance Restriction Calculation Form, used in examples throughout the guidebook
Guidebooks – How to Provide Official Feedback

- https://federalregister.gov/a/2016-17076
- Federal Register Docket FTA-2016-0030
- Comments due by 9/26/2016