AASHTOWare Bridge Update

Todd Thompson, Chair
Eric Christie, Vice-Chair
Spokane, WA
Agenda

• Bridge Rating and Design Update
• Modernization Update
• Task Force Members
• Bridge Management Update
AASHTOWare Bridge Rating

Current Participation (FY 2017 ending June 30)

<table>
<thead>
<tr>
<th>City/County/Territory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoenix, AZ</td>
</tr>
<tr>
<td>Puerto Rico</td>
</tr>
<tr>
<td>Maricopa, AZ</td>
</tr>
<tr>
<td>Cincinnati, OH</td>
</tr>
<tr>
<td>Army Corps of Engr.</td>
</tr>
<tr>
<td>NJ Turnpike</td>
</tr>
<tr>
<td>Columbus, OH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manitoba, Canada</td>
</tr>
</tbody>
</table>

Map Key

<table>
<thead>
<tr>
<th>Licensee</th>
<th>Non-Licensee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensee</td>
<td></td>
</tr>
</tbody>
</table>

Consultant Licenses = 568
Agency Licenses = 41
Current Participation (FY 2017 ending June 30)

City/County/Territory
- Cincinnati, OH

Country
- Manitoba, Canada

Map Key
- Consultant Licenses = 35
- Agency Licenses = 17
- Non-Licensee
- Licensee
Releases since last year

• 6.8.1 – October 2016
  • Load Rating Tool
  • Bridge Copy/Delete/Replace utility
  • Regression Comparison Tool
Rating Tool – Phase 1

• Highlights of the tool:
  
  o Very fast computation of rating factors using precomputed data and hardware improvements
  
  o The Tool can be used by permitting systems using a REST API or the Analysis API
  
  o BrR within the application can use the tool to compute ratings for a list of bridges and vehicles
Rating Tool – Phase 1

• Highlights of the tool (continued):
  
  o LFR capability
  
  o Steel and concrete multi-girder straight superstructures
  
  o LRFR, floor systems, concrete multi-cell boxes, culverts and trusses in subsequent phases
  
  o Rating results exactly match the BrR results (i.e. no approximations or simplifications)
  
  o Customizable configuration options and pass conditions
Rating Tool – Phase 1

BrDR UI

Yes: Bridge has Pre Comp Data
- Rating Tool

No: BrDR

3rd Party Permit Routing System

Yes: Bridge has Pre Comp Data
- Rating Tool

No: BrDR
Generate pre-computed data:

- Analysis Type: Line Girder
- Rating Method: LFD

- Points of Interest:
  - Overwrite bridge points of interest
  - Generate at tenth points
  - Generate at section change points
  - Generate at user-defined points

- Concrete Member:
  - Generate at tenth points except supports
  - Generate at support points
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points

- Override existing precomputed data
- Stop on first error

[Save as System Defaults] [Generate]
Rating Tool – Phase 1

Maintain pre-computed data:

<table>
<thead>
<tr>
<th>BID</th>
<th>Bridge ID</th>
<th>NBI Structure ID</th>
<th>Date Generated</th>
<th>Generated By</th>
<th>Bridge ID</th>
<th>NBI Structure ID</th>
<th>Date Last Modified</th>
<th>Last Modified By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TrainingBridge1</td>
<td>TrainingBridge1</td>
<td>05/25/17</td>
<td>Bridge Bridge</td>
<td>TrainingB</td>
<td>TrainingBridge1</td>
<td>10/12/09</td>
<td>BrR BrR</td>
</tr>
<tr>
<td>10</td>
<td>Example7</td>
<td>Example7</td>
<td>05/25/17</td>
<td>Bridge Bridge</td>
<td>Example7</td>
<td>Example7</td>
<td>10/12/09</td>
<td>BrR BrR</td>
</tr>
<tr>
<td>11</td>
<td>RCTrainingBridge1</td>
<td>RCTrainBridge1</td>
<td>05/25/17</td>
<td>Bridge Bridge</td>
<td>RCTrainin</td>
<td>RCTrainBridge1</td>
<td>10/12/09</td>
<td>BrR BrR</td>
</tr>
</tbody>
</table>

Select All | Select Outdated | Select Not Found | Clear Selected | Update Selected | Delete Selected | Close

[Image of table interface]
Perform the analysis:

![Rating Tool - Phase 1](image)
Rating Tool – Phase 1

Review the rating results:

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Rating Level</th>
<th>BID</th>
<th>Bridge ID</th>
<th>Route Number</th>
<th>Code</th>
<th>Description</th>
<th>Inventory Rating Factor</th>
<th>Operating Rating Factor</th>
<th>Controlling Impact</th>
<th>Pass Conditions</th>
<th>Analysis Warnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 3</td>
<td>Inventory</td>
<td>1</td>
<td>TrainingBridge1</td>
<td>0051</td>
<td>1</td>
<td>Pass, no restrictions</td>
<td>1.320</td>
<td>2.284</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td>Inventory</td>
<td>10</td>
<td>Example7</td>
<td>-1</td>
<td>X</td>
<td>Denied</td>
<td>0.881</td>
<td>1.471</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td>Inventory</td>
<td>10</td>
<td>Example7</td>
<td>-1</td>
<td>2</td>
<td>Pass with conditions</td>
<td>1.063</td>
<td>1.775</td>
<td>0.000</td>
<td>10 - Truck speed restriction to 5 mph</td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td>Inventory</td>
<td>11</td>
<td>RCTrainingBridge1</td>
<td>-1</td>
<td>1</td>
<td>Pass, no restrictions</td>
<td>1.286</td>
<td>2.148</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Bridge Copy/Delete/Replace Utility

Standalone utility that enables a user to do the following activities:

1. Copy bridge definitions from one database to another database

2. Delete bridge definitions from one database

3. Replace a bridge definition in one database with a bridge definition from another database
## Bridge Copy/Delete/Replace Utility

### BrDR Data Source 1 (6.8.2 (Build 2002))

<table>
<thead>
<tr>
<th>BID</th>
<th>Bridge ID</th>
<th>Bridge Name</th>
<th>NBI Structure ID</th>
<th>Deleted</th>
<th>Checked C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TrainingBridge1</td>
<td>Training Bridge 1</td>
<td>TrainingBridge1</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TrainingBridge2</td>
<td>Training Bridge 2</td>
<td>TrainingBridge2</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TrainingBridge3</td>
<td>Training Bridge 3</td>
<td>TrainingBridge3</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge1</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge2</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge3</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge4</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge5</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge6</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Example7</td>
<td>Example 7</td>
<td>Example7</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

### BrDR Data Source 2 (6.8.2 (Build 2002))

<table>
<thead>
<tr>
<th>BID</th>
<th>Bridge ID</th>
<th>Bridge Name</th>
<th>NBI Structure ID</th>
<th>Deleted</th>
<th>Checked C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TrainingBridge1</td>
<td>Training Bridge 1</td>
<td>TrainingBridge1</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TrainingBridge2</td>
<td>Training Bridge 2</td>
<td>TrainingBridge2</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TrainingBridge3</td>
<td>Training Bridge 3</td>
<td>TrainingBridge3</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge1</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge2</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge3</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge4</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge5</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>PCITrainingBridge</td>
<td>PCI Training Bridge</td>
<td>PCITrainBridge6</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

- Include Bridges in Deleted Bridges Folder
- Copy to Right >>
- << Copy to Left
- Replace Right >>
- << Replace Left
- Delete Right >
- < Delete Left
Regression Comparison Tool

- New tool to assist with regression testing of BrDR

*Regression testing* is a form of testing that verifies that the work performed to add new features and capabilities did not break or inappropriately alter the existing code causing incorrect results or behavior.

- A large part of the testing of the modernized analysis module will be regression testing

- Based on NCHRP Report 485 – Bridge Software – Validation Guidelines and Examples
Regression Comparison Tool
The Task Force has invited two representatives from T18 and T19 to attend two Task Force meeting each year.
Upcoming Release

• 6.8.2 – June 2017
  • Numerous Maintenance Issues
  • Updates for the latest AASHTO specifications
  • Legacy software
Specification Updates

- Updates for the latest AASHTO specifications
  - LRFD 8th Edition
  - MBE 3rd Edition
Modernization Update

Modernization began in July 2016

• User Interface Design and Development
  o Identified windows to be redesigned based on comments from the users
  o 90% of the windows will retain the Legacy look and behavior
Modernization Update

• User Interface Design and Development (continued)

  o Prepared mockups of windows for approval by the Modernization Technical Advisory Group and Task Force:
    ➢ Detailed mockups of windows to be redesigned
    ➢ Summary mockups of the windows that will not be redesigned
Modernization Update

- Example of a redesigned Bridge Explorer

Modernized

Different appearance, same functionality
Modernization Update

• Example of the Library - Legacy
Modernization Update

- Example of the Library - Modernized
Modernization Update

- Example of the Library - Modernized
Modernization Update

- Example – Structure Definition

Legacy

Modernized

Same appearance and functionality
Modernization Update

- Example – Structure Definition

Modernized  →  Legacy

Same appearance and functionality
Modernization Update

• Analysis Module Development
  
  o Based on the pattern established for the P/S Design Tool released with 6.8.0
  
  o Initial development focused on implementing LRFR and spec-checking (LRFD) for P/S I multi-girder systems
  
  o Currently work has progressed to include reinforced concrete and steel multi-girder systems, concrete multi-celled boxes and substructures
Modernization Update

Timeline:

• Phase 1 – Modernize the analytical modules
  ➢ Release June 2018 (includes Legacy maintenance release)

• Phase 2 – Modernize the user interface and the rest of the system
  ➢ Release June 2019 (includes last Legacy maintenance release)

• Phase 3 – Implement selected user-requested enhancements
  ➢ Release June 2020
Modernization Update

Timeline:

• Phase 1 – Modernize the analytical modules
  - Release June 2018 (version 6.8.3)
  - Includes Legacy maintenance release
  - Existing user interface with the modernized analysis engine
  - Both the modernized engine and the legacy engine will be available for use

(At this point, since no enhancements have been implemented, the analysis results of the modernized engine should closely match the legacy engine analysis results)
Modernization Update

Timeline:

• Phase 2 – Modernize the user interface and the rest of the system
  ➢ Release June 2019
  ➢ Includes last Legacy maintenance release 6.8.4
  ➢ The modernized user interface and the modernized engine – i.e. the fully modernized system – version 7.0
Modernization Update

Timeline:

• Phase 3 – Implement selected user-requested enhancements
  ➢ Release June 2020 (version 7.1)
  ➢ The fully modernized system with selected user-requested enhancements
<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td>Todd Thompson</td>
<td>South Dakota</td>
</tr>
<tr>
<td>Vice Chair</td>
<td>Eric Christie</td>
<td>Alabama</td>
</tr>
<tr>
<td>Member – BrM</td>
<td>Bruce Novakovich</td>
<td>Oregon</td>
</tr>
<tr>
<td>Member – BrM</td>
<td>Thomas Martin</td>
<td>Minnesota</td>
</tr>
<tr>
<td>Member – BrM</td>
<td>Mark Faulhaber</td>
<td>Kentucky</td>
</tr>
<tr>
<td>Member – BrM</td>
<td>Beckie Curtis</td>
<td>Michigan</td>
</tr>
<tr>
<td>FHWA Liaison – BrM</td>
<td>Derek Constable</td>
<td>FHWA</td>
</tr>
<tr>
<td>Member – BrR</td>
<td>Joshua Dietsche</td>
<td>Wisconsin</td>
</tr>
<tr>
<td>Member – BrD</td>
<td>Jeff Olsen</td>
<td>Montana</td>
</tr>
<tr>
<td>Member – BrD</td>
<td>Dean Teal</td>
<td>Kansas</td>
</tr>
<tr>
<td>Member – BrR</td>
<td>Amjad Waheed</td>
<td>Ohio</td>
</tr>
<tr>
<td>FHWA Liaison – BrDR</td>
<td>Tom Saad</td>
<td>FHWA</td>
</tr>
</tbody>
</table>
User Group Training Meetings

- **Bridge Design and Rating**
  - RADBUG
  - August 15-16, 2017
  - Kansas City, KS

- **Bridge Management**
  - BrMUG
  - September 12-13, 2017
  - Alexandria, VA
AASHTOWare Bridge Management Update
County/City | State
---|---
Los Angeles Co | CA
City of Phoenix | AZ
Penn. Turnpike | PA
Richmond Metro Auth | VA

40 State Departments of Transportation +
Manitoba, District of Columbia & Puerto Rico

Map Key
- Non-Licensee
- Licensee

AASHTOWare Bridge Management
www.AASHTOWareBridge.com
Bridge Management 5.2 Stages

- Inspection
- Bridge Groups, Risk, Utility Functions
- Deterioration Modeling, Preservation Action, and Projects
- Enhanced Deterioration Modeling, Enhanced Project/Program Planning, and Administration Features

5.1.2
5.1.3
5.2.1
5.2.2
5.2.3
Bridge Management 5.2.3

• Released in December 2016
• Fully supporting the FHWA Identified Rule Making
• Key Features
  • Capability to perform life cycle cost analysis
  • Capability to perform network level analysis
  • Tracking and reporting of FHWA's 23 metrics
  • Dashboards for easy data visualization and tracking performance measures
  • Enhanced User Help System
  • Tunnels module to record and track National Tunnel Inventory data as required by FHWA
Bridge Management 5.2.3 Release 3

• Released March 2017
• Key Updates
  • Tunnel Defects expanded to better align with the Specifications for the National Tunnel Inventory
  • Rating Factor of 9 is correctly exported to the NBI file
  • USERINSP is now copied over when creating a new inspection
  • Various other minor enhancements and bug fixes
## Programs > Performance Measures

### Select Performance Measures

<table>
<thead>
<tr>
<th>Performance Measures</th>
<th>Best Value</th>
<th>Worst Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility (Scour - Bentley Test)</td>
<td>100.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Health Index</td>
<td>100.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Pct. Good/Fair (Surface-Based)</td>
<td>100.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

### Performance Constraints by Segment

<table>
<thead>
<tr>
<th>Segment</th>
<th>Utility (Scour - Bentley Test)</th>
<th>Health Index</th>
<th>Pct. Good/Fair (Surface-Based)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division 1, 1 On the NHS</td>
<td>Min: [ ] Target: [ ]</td>
<td>Min: 50</td>
<td>Target: 80</td>
</tr>
<tr>
<td>Division 3, 1 On the NHS</td>
<td>Min: [ ] Target: [ ]</td>
<td>Min: 50</td>
<td>Target: 75</td>
</tr>
<tr>
<td>Division 1, 0 Not on NHS</td>
<td>Min: [ ] Target: [ ]</td>
<td>Min: 50</td>
<td>Target: 80</td>
</tr>
<tr>
<td>Division 10, 1 On the NHS</td>
<td>Min: [ ] Target: [ ]</td>
<td>Min: 50</td>
<td>Target: 75</td>
</tr>
<tr>
<td>Division 3, 0 Not on NHS</td>
<td>Min: [ ] Target: [ ]</td>
<td>Min: 50</td>
<td>Target: 80</td>
</tr>
<tr>
<td>Division 10, 0 Not on NHS</td>
<td>Min: [ ] Target: [ ]</td>
<td>Min: 50</td>
<td>Target: 75</td>
</tr>
</tbody>
</table>
Program Optimization

![Program Planning Interface](image)

### Programs > Program Planning

#### Optimize Program
- **Optimization Method:** Maximize Utility
- **Keep assigned projects:** No
- **Run on all scenarios:** No

#### Assigned Projects
- **Segment:** All
- **Year:** All

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Category</th>
<th>Automatic</th>
<th>Cost</th>
<th>Utility</th>
<th>Utility Benefit</th>
<th>Benefit/Cost ($)</th>
<th>Cost ($k) / Benefit</th>
<th>Year</th>
<th>Frozen</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>019674 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$56,510</td>
<td>92.96</td>
<td>1.62</td>
<td>0.0287</td>
<td>$34.88</td>
<td>2019</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>018762 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$143,840</td>
<td>83.75</td>
<td>3.07</td>
<td>0.0213</td>
<td>$46.85</td>
<td>2020</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>018423 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$98,495</td>
<td>90.74</td>
<td>3.01</td>
<td>0.0306</td>
<td>$32.72</td>
<td>2017</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>018405 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$77,600</td>
<td>90.16</td>
<td>2.25</td>
<td>0.029</td>
<td>$34.49</td>
<td>2018</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>018122 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$56,845</td>
<td>90.26</td>
<td>1.42</td>
<td>0.025</td>
<td>$40.03</td>
<td>2019</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>018121 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$52,945</td>
<td>92.46</td>
<td>1.60</td>
<td>0.0307</td>
<td>$32.53</td>
<td>2017</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>017944 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$57,960</td>
<td>92.07</td>
<td>1.63</td>
<td>0.0281</td>
<td>$35.56</td>
<td>2019</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>017636 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$62,060</td>
<td>91.43</td>
<td>1.42</td>
<td>0.0229</td>
<td>$43.70</td>
<td>2019</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>016624 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$51,650</td>
<td>96.7</td>
<td>1.43</td>
<td>0.0277</td>
<td>$36.12</td>
<td>2019</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>016031 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$57,725</td>
<td>91.55</td>
<td>1.43</td>
<td>0.0248</td>
<td>$40.37</td>
<td>2019</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>015815 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$113,915</td>
<td>85.91</td>
<td>2.67</td>
<td>0.0254</td>
<td>$42.66</td>
<td>2019</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>015497 (Rehab Culvert)</td>
<td>None</td>
<td>Yes</td>
<td>$95,538</td>
<td>69.2</td>
<td>7.53</td>
<td>0.0768</td>
<td>$12.69</td>
<td>2016</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>014125 (Rehab Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$80,902</td>
<td>78.77</td>
<td>1.82</td>
<td>0.0299</td>
<td>$33.46</td>
<td>2017</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>014062 (Rehab Culvert)</td>
<td>None</td>
<td>Yes</td>
<td>$60,011</td>
<td>71.95</td>
<td>3.56</td>
<td>0.0593</td>
<td>$16.86</td>
<td>2016</td>
<td>No</td>
<td>Proposed</td>
</tr>
<tr>
<td>014025 (Preserve Deck)</td>
<td>None</td>
<td>Yes</td>
<td>$62,900</td>
<td>88.7</td>
<td>1.64</td>
<td>0.0261</td>
<td>$38.35</td>
<td>2020</td>
<td>No</td>
<td>Proposed</td>
</tr>
</tbody>
</table>
Program Optimization

Future Performance by Segment

Performance: Avg. Health Inde: Year: 2017

District 1, On System
District 1, Off System
District 3, On System
District 3, Off System
District 10, On System
District 10, Off System

Avg. Health Index

Current Target Final

AASHTOWare Bridge Management
www.AASHTOWareBridge.com
Program Optimization

District 5: 200
District 4: 200
District 3: 200
District 2: 200
District 1: 200
District 5: 250
District 4: 250
District 3: 500
District 2: 500
District 1: 500
District 5: 1000
District 4: 500
District 3: 1000
District 2: 1000
District 1: 1500

Good
Fair
Bad
Bridge Management 5.3

- Anticipated Release Summer 2017
- Key Features
  - Element Condition Grid Re-Do
  - New Load Rating Module
  - New Cross Section Module
  - Migration from Cassini to IIS Express (Workstation)
  - Enhanced Rule Builder for Network Policies
  - Updates to Handling of Default Data
  - Error Check Prescript
  - Miscellaneous Small Enhancements/Bug Fixes
Load Rating Module
Cross Section Module

Streambed Cross Sections

Scour Items
- Station EG: 0
- Elev EG: 0
- Offset Remark: FROM C/L
- Water Surface: 36.5088

Line Settings
- Name: Streambed Cross-Section
- Color: Red
- Show In Legend: Yes
- Visible: Yes

Details
<table>
<thead>
<tr>
<th>Station</th>
<th>Sdng/Elev</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>201.70001</td>
</tr>
<tr>
<td></td>
<td>0 + 5</td>
<td>201.7001</td>
</tr>
<tr>
<td></td>
<td>0 + 59</td>
<td>245.7999</td>
</tr>
<tr>
<td></td>
<td>0 + 63</td>
<td>242.2001</td>
</tr>
<tr>
<td></td>
<td>1 + 0</td>
<td>225</td>
</tr>
<tr>
<td></td>
<td>1 + 20</td>
<td>216.2001</td>
</tr>
<tr>
<td></td>
<td>1 + 38</td>
<td>213.0001</td>
</tr>
<tr>
<td></td>
<td>1 + 50</td>
<td>207.9999</td>
</tr>
<tr>
<td></td>
<td>1 + 58</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>1 + 80</td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>2 + 3</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td>2 + 21</td>
<td>127</td>
</tr>
</tbody>
</table>
Cross Section Module

### Structure Detail

- **Scour Items**
  - Highwater Elev: 0
  - Upstream Side: Left
  - Station EO: 0 → 0 = 0 → 36.5092
  - Station Direction: Increasing
  - Downstream Side: Right
  - Highwater Year: 0 (INVALID YEAR VALUE)
  - Data Source: PLANS

- **Line Settings**
  - Name: Structure Details
  - Style: Solid
  - Color: Green
  - Show in Legend: Yes
  - Visible

### Details

<table>
<thead>
<tr>
<th>Station</th>
<th>Ref Car/Rail</th>
<th>Dock</th>
<th>Bot FTG</th>
<th>Crit Pier Scour Depth</th>
<th>Pile Tip</th>
<th>FTG</th>
<th>Super Thick</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 + 0</td>
<td>257.0013</td>
<td></td>
<td>267.0013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 + 58.993</td>
<td>256.9193</td>
<td>266.5193</td>
<td>196.2795</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 + 59.101</td>
<td>256.9193</td>
<td>266.9193</td>
<td>196.2795</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 + 7.7913</td>
<td>256.7815</td>
<td>266.7815</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 + 95</td>
<td>256.6404</td>
<td></td>
<td>266.6404</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 + 12.5987</td>
<td>256.4993</td>
<td>266.4993</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 + 31.0017</td>
<td>256.3615</td>
<td>266.3615</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 + 48.993</td>
<td>256.2106</td>
<td></td>
<td>266.2106</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 + 67.0913</td>
<td>256.0597</td>
<td>266.0597</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 + 85</td>
<td>255.9686</td>
<td></td>
<td>265.9686</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 + 2.9093</td>
<td>255.7612</td>
<td>265.7612</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 + 2.9087</td>
<td>255.7612</td>
<td>265.7612</td>
<td>110.0514</td>
<td>80.1214</td>
<td>No Footing</td>
<td></td>
<td>12.001</td>
<td>E-3</td>
</tr>
</tbody>
</table>
Cross Section Module
Cross Section Module
Questions?
Thank you