## AgileAssets Enterprise Platform Suite

### Executive Series
- Portfolio Analyst™
- AgileAssets Summit™

### Analyst Series
- Bridge Analyst™
- Pavement Analyst™
- Safety Analyst™

### Manager Series
- Bridge Inspector™
- Facilities Manager™
- Fleet & Equip. Manager™

- Maintenance Manager™
- Right-of-Way Manager™
- Sign Manager™
- Signal and ITS Manager™

### Foundation
- AgileAssets API
- LRS Gateway
- GIS
- Configuration

- System Administration
- Security
- Asset Database
- Dashboards

### 3rd Party System Integration
- Data Warehousing
- Purchasing Systems
- Materials Mgmt Systems
- ERP Systems
- Financial Systems
- LRS/GIS Systems
- Legacy Systems
Presenter and Audience

Look what I have created!

Just show the summary slide!
Element Data Collection

Years of CoRe Element Data Collection + Reconfigured Element Language = BMS Good?

NBE
BME
ADE

BMS
Different Processes, Similar Goals

**DOT 1**
- A → B
- Maintain Condition: ✔
- Ensure Safety: ✔
- Increase Lifespan: ✔
- Collect Data: ✔
- Report Information: ✔

**DOT 2**
- A → B
- Maintain Condition: ✔
- Ensure Safety: ✔
- Increase Lifespan: ✔
- Collect Data: ✔
- Report Information: ✔

**DOT 3**
- A → B
- Maintain Condition: ✔
- Ensure Safety: ✔
- Increase Lifespan: ✔
- Collect Data: ✔
- Report Information: ✔
Bridge Analyst™ Basic Processes

**INPUTS**
- Inventory & Condition Data

**ANALYSIS**
- Deterioration & Improvement Models
- Condition Indices
- Decision Trees

**OPTIMIZATION**
- Treatment & Strategy
- Integer Optimization Analysis

**OUTPUTS**
- Optimal Work Plan
- Projected Condition, Budgets, etc.
Bridge Analyst™ Basic Processes

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## AASHTO Elements & Deterioration Models

### BME
- Approach Slabs
- Joints
- Wearing Surfaces & Protective Systems

### NBE
- Bearings
- Railings
- Culverts
- Decks & Slabs
- Superstructure
- Substructure

### ADE
- Agency Developed (Custom)
AASHTO Elements & Deterioration Models

### BME
- Approach Slabs
- Joints
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### NBE
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- Agency Developed (Custom)
<table>
<thead>
<tr>
<th>Model</th>
<th>Years in Condition State 1</th>
<th>Years in Condition State 2</th>
<th>Years in Condition State 3</th>
<th>Shape Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>320-P/S Concrete Approach Slab</td>
<td>30</td>
<td>22</td>
<td>12</td>
<td>1</td>
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<tr>
<td>320-P/S Concrete Approach Slab with 510-Wearing Surfaces (320)</td>
<td>33</td>
<td>24</td>
<td>13</td>
<td>1</td>
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<tr>
<td>320-P/S Concrete Approach Slab with 520-Concrete Reinforcing Steel Protective Coating (320)</td>
<td>33</td>
<td>24</td>
<td>13</td>
<td>1</td>
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<tr>
<td>320-P/S Concrete Approach Slab with 521-Concrete Protective Coating (320)</td>
<td>33</td>
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<td>13</td>
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### Element Probability Models

<table>
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<th>Model</th>
<th>Years in Condition State 1</th>
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<td>1</td>
</tr>
</tbody>
</table>

### Element Health Index

![Health Index Graph]

### Condition States Over Time

![Condition States Over Time Graph]
INPUTS

Bridge Inventory & Condition Data

Element Health Index

Condition States Over Time

AGILE ASSETS
Decision Trees

- Element and Component Level Trees
- Treatment Improvement Models
- Good Treatment Cost Data
Decision Trees

- NBI 58 Deck Index<3.01
  - NBI 58 Deck Index<4.01
    - DC - Deck Rehabilitation - Deck Overlay (Hydro Demo) (condition 5)
  - 3.01<=NBI 58 Deck Index<4.01
    - DC - Minor Patching, Crack Sealing (condition 5)
  - 4.01<=NBI 58 Deck Index<5.01
    - DC - Minor Patching, Crack Sealing (condition 5)
  - 5.01<=NBI 58 Deck Index<6.01
    - DC - Minor Patching, Crack Sealing (condition 6)
  - NBI 58 Deck Index>=6.01
    - DC - Deck Sealers/Joints (conditions 6-7)

203D - Type Bridge - Deck:
O. Concrete
Decision Trees

NBI 59 Superstructure Index < 4.02

NBI 60 Substructure Index < 4.02
- Structure Replacement

NBI 60 Substructure Index ≥ 4.02
- DC - Deck Rehabilitation - Deck Overlay (Hydro Demo) (condition 5)

NBI 59 Superstructure Index ≥ 4.02
- DC - Deck Rehabilitation - Deck Overlay (Hydro Demo) (condition 5)
Decision Trees

INPUTS

Bridge Inventory & Condition Data

203D – Type Bridge - Deck: O. Concrete

NBI 58 Deck Index<3.01

Select one

Select Treatment: DC - Minor Patching, Crack Sealing

- DC - Deck Rehabilitation - Deck Overlay (Hydro Demo) (conditions 6-7)
- DC - Deck Sealers Joints (conditions 6-7)
- DC - Minor Patching, Crack Sealing (condition 5)
- DC - Minor Patching, Crack Sealing (condition 6)
- DC - Minor Patching, Crack Sealing (condition 6)
- Deck NBI Preservation
- Deck Preservation
- Deck Rehabilitation
- Deck Rehabilitation - COTS Treatment

OK Cancel
Multi-Constraint Optimization Analysis

Deficient Bridges

10%

NHS vs. Non-NHS

$$\text{Pres}

$$\text{Rehab}

$$\text{Replace}

Analysis and Optimization
Analysis and Optimization

Multi-Constraint Optimization Analysis

Optimized Work Plan
Map-Based Analysis Reporting
Map-Based Analysis Reporting
Map-Based Analysis Reporting
Map-Based Analysis Reporting
Map-Based Analysis Reporting
Map-Based Analysis Reporting
BMS / Maintenance Integration

Recommended Work

BMS Work Plan

MMS Work Activities

Scheduled & Completed Work
## BMS / Maintenance Integration

### Screenshot of the BMS/Maintenance Integration Interface

- **Navigation Menu**: Bridge Analyst > Setup > Analysis Setup > BMS Treatment
- **Actions**
  - Treatment: CONC - Deck Preservation (HMWM)
  - Activity: M152 - BRIDGE DECK REPAIR (Square Yard)
- **Analysis Setup**
  - Analysis Constraints Subdivisions
  - BMS Treatment / MMS Activities Mapping

### Table Example

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Activity</th>
<th>Comments</th>
<th>Att.</th>
<th>User Update</th>
<th>Date Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONC - Deck Preservation (HMWM)</td>
<td>M152 - BRIDGE DECK REPAIR (Square Yard)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUPERST - PPC - Replace Affected Members (cond 3)</td>
<td>M151 - BRIDGE SUPERSTRUCTURE REPAIR (Man Hour)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>DC - Deck Sealers/ Joints (cond 5-7)</td>
<td>M152 - BRIDGE DECK REPAIR (Square Yard)</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>SUBST-CONCPILE - Seal Cracks (cond 8-6)</td>
<td>M151 - BRIDGE SUPERSTRUCTURE REPAIR (Man Hour)</td>
<td></td>
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<tr>
<td>SUPERST - ST - Spot Clean and Paint (cond 5)</td>
<td>M152 - BRIDGE DECK REPAIR (Square Yard)</td>
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<tr>
<td>DS - Local Repairs, Reweld, Replace Sections (cond 5)</td>
<td>M152 - BRIDGE DECK REPAIR (Square Yard)</td>
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<td></td>
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</tr>
<tr>
<td>DT - Relin/Tighten Boards, Replace Boards and Nails (cond 5)</td>
<td>M152 - BRIDGE DECK REPAIR (Square Yard)</td>
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</tr>
<tr>
<td>SUPERST - RCONC - Crack Sealing (cond 8-7)</td>
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<tr>
<td>SUBST-ST - Repair Affected Member (cond 5)</td>
<td>M154 - BRIDGE SUBSTRUCTURE REPAIR (Man Hour)</td>
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</tbody>
</table>

**Attributes**
- **Att.**: PASCAL
- **User Update**: Various dates from 3/10/2017 to 3/17/2017
- **Date Update**: 3/17/2017
BMS / Maintenance Integration
BMS / Maintenance Integration

MMS

Bridge Work

Very Nice!

Bridge Management
Summary

- AASHTO bridge & tunnel elements
- User-editable deterioration/improvement models & decision trees
- FHWA submittals (NBI and NBEs) can be produced in the interface
- Multi-constraint optimization
- Integration with maintenance completes the bridge planning / work execution loop

Finally!
Thank You!

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512.531.5027