MDOT Transportation Asset Management System (TAMS)

2017 MAASTO Conference
July 27th, 2017
Cleveland, Ohio

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MDOT Operations Field Services
Asset Lifecycle

Conceived in Planning/Design
Born in Construction
Cared for During Maintenance & Operations
End of Life
Reincarnation By Planning/Design

Transportation Asset Management System
Capture Data During Normal Business
“TAM Systems are the vendor tools that will be utilized by combining spatial information (across multiple linear referencing systems (LRS) with business intelligence to achieve the objectives of Enterprise Asset Management. TAM Systems also integrate information from other MDOT data systems and applications”
Awarded Contract to Data Transfer Solutions, LLC
July 13, 2015 (DTMB: 071B5500115)

Contract is for 7 years with options for 5 additional years.

Key Components:
- Road Network Management (linear referencing)
- Asset Inventory Management
- Maintenance Management
- Future Integration Capability
• Project Management: Department Technology Management and Budget (DTMB) *(Michigan IT agency)*

• MDOT Business Owners:
  • Bureau of Field Services
  • Bureau of Development
  • Bureau of Transportation Planning

• Subject Matter Experts:
  • Asset experts
  • Data system experts

• End Users
  • Central Office *(statewide)*
  • Regions/TSCs *(Maintenance, Design, Construction)*
  • MDOT Garages
  • Contract Agencies & private contractors

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**Project Execution**
• Maintenance Management System (MMS)  
  - Asset functions (RAI, Signs, Culverts, Guardrail)
  - Linear referencing functionality (PR, CS, Route)
    - ESRI Roads & Highways
    - Straight Line Diagram tool
• Data Interfaces (1-way communication)
  - Global, MIDB, PDRP, M5, Stores, MIBridge, SDE
• Support PBM functions.
  - HPMS reporting

GIS Centered Functions

Phase 1 Priorities
• Service Request & Work Order Functions
  • Plan/track/report activities
    • Locations
    • Costs
    • Quantities
  • Supervisors can schedule work and resources
  • Reporting capability
  • Integrate w/ existing MDOT systems
  • Budget planning and Asset Association
<table>
<thead>
<tr>
<th>Vendor Tools</th>
<th>Spatial Asset Info</th>
<th>Data/System Integrations</th>
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</thead>
<tbody>
<tr>
<td>Vueworks</td>
<td>Culverts (1-10’)</td>
<td>MiBridge (bridge system)</td>
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<tr>
<td>Mobilevue</td>
<td>Guardrail</td>
<td>MIDB (employee data)</td>
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<td>Road Analyzer</td>
<td>Cable Barrier</td>
<td>PDRP (insurance claims)</td>
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<td>ESRI Roads and Highways tools</td>
<td>Signs (5 classes)</td>
<td>M5 Fleet Focus (fleet)</td>
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<td>Transcend Productivity tools</td>
<td>Road Asset inventory (8 classes)</td>
<td>FIN MSTAR (materials)</td>
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<td>Bridges</td>
<td>GIS SDE (asset data)</td>
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<td><em>Pump Stations (in the works)</em></td>
<td>Global (address info)</td>
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<td>MiLogin (single sign on)</td>
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### Guardrail Attribute Data

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<th>Route</th>
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<th>Guardrail Run</th>
<th>Guardrail Type</th>
<th>Post Type</th>
<th>Approach</th>
<th>Departure</th>
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TAMS Data Flow:

MDOT Photolog

Road Analyzer

ESRI R&H

GIS SDE

Asset SMEs

Vueworks

MDOT Data Systems

System SMEs

- Data Stewards

- LRS data
- HPMS data

- Asset Attributes

- Asset Condition

- Work Order data
- Asset Condition data

- SLD Viewer

- View/Filter/Report data
- Maintain Management System
- Sign Management system

TAMS Data Flow:
Each Asset or System:
• Coordinate Data Needs for Various Stakeholders
• Communicate Business Rules
• Quality Assurance of Data
• Identify and Resolve Data Issues
• Manage Integrity of Data

Each Asset:
• Coordinate a Team
• Create & Maintain Collection Guides
• Determine Necessary Spatial Quality
• Determine Condition Rating Method

Each Data System:
Facilitate Data Sharing Between Systems
• Other than Roads and Bridges, our GIS asset inventories are sporadic or not current.
• Each Asset type requires a Data Collection and Condition Assessment guide.
• Current large scale collection efforts/plans:
  • Extraction of Guardrail and Sign data from photolog imagery
  • Contractor “Boots on the Ground” collection of Culvert (1’-10’) data (5 counties)
  • Looking into mobile LiDAR technology and costs
• Service Request & Work Order Functions
  • Plan/track/report activities
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To document/process potential work needs in Vueworks Service Request.

Vueworks Service Request
Activity Name: Tree Removal

Description: Removal of trees (except stumps) including cleanup and ensuring that the remaining stump is not hazardous to vehicles that leave the roadway. This includes all trees 8" DBH (diameter breast high) and larger. The use of a bucket truck may be required. **Note:** All related stump chipping should be reported to activity 1.

Instructions:
1. Review.
2. Do.
3. Rem.
4. Use ropes as necessary to lower large limbs.
5. Attach a line to ensure proper direction of fall if necessary.
6. Cut and fell the tree.

Vueworks Work Order
Direct Force Pilot:
- Since August 2016
- Four Direct Garages
- Approx 350 Work Orders
- Working off DTMB test environment (DEV)
- Limited use of MobileVue, SR, and reports so far.
Near Term items for TAMS project:
• “Go live” (production server) roll out November 2017 (target)
• Vendor Train-the-Trainer for maintenance September
• Ipads for maintenance users (outside of project)
• Final load of existing asset data
• Incorporate MiLogin single sign on
• Configuration of signs inventory/project module
• Configuration of pump Station module

Long Term:
• Add additional asset types, data systems, and asset management tools
• Improve asset inventories (photolog extraction, LiDAR, etc)
• Incorporate Construction data into asset inventories
• Implement comprehensive Data Governance, global asset management, and new business practices to MDOT (cultural Change)
1. Enterprise Asset Management is a “major effort” and requires a lot of groups to implement.
2. It is important to have your IT Area involved, but their pace might not match yours.
3. Issues with Contract Procurement.
4. There will be unexpected items and obstacles to overcome.
5. With numerous stakeholders communication is key, along with managing expectations.
6. A project of this magnitude requires multiple people fully dedicated to the project.
7. Data Governance is imperative.
8. Cultural Changes to how we do business.
THANKS!

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