Technology Efforts Related to Asset Management Integration

Presented to the Institute of Navigation GNSS 2011 Conference
By Laura Wipper, Asset Management Integration Manager
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Short History

- Previous focus of Asset Management predominantly:
  - Pavements and bridges
  - Safety and congestion

- Location methods:
  - Local landmarks and odometers
  - Linear referencing system
  - Routes and mile post markers
About Five Years Ago

- ODOT efforts building for more robust Asset Management
  - Steering committees in place
  - Strategic and implementation plans
  - Pilot project
2006 Pilot Revealed

- ODOT had a significant lack of reliable transportation infrastructure data
- Staff collected a lot of data, but typically for single use
- New thinking and approach could re-invent these processes
Search for Best Practices

- Research
- Trying it ourselves via 2006 pilot
- Web-based tool for accessible, integrated data
- New programs use data for decisions
The “Elephant” – one bite at a time

Get to "Green"
Staged process to build capacity
Working across and down based on resources and priority
### Progress!

<table>
<thead>
<tr>
<th>Asset</th>
<th>Statewide data available in 2005?</th>
<th>Statewide data available now?</th>
<th>Included in 1R Roadside Inventory</th>
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<tbody>
<tr>
<td>Bridges</td>
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<tr>
<td>Tunnels</td>
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<tr>
<td>ITS</td>
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<tr>
<td>Pavement</td>
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<td>Right of Way</td>
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<td>Signs</td>
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<tr>
<td>Traffic Barriers</td>
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<tr>
<td>Sidewalks</td>
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<td>ADA Ramps</td>
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<td>Culverts 6ft and over</td>
<td>NBI</td>
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<td>Tri-color only</td>
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<tr>
<td>Unstable Slopes</td>
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<td>in progress</td>
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<tr>
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<td>Storm Water Facilities</td>
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<td>Illumination</td>
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</table>
Location, Location, Location

- Management of transportation infrastructure beyond pavements and bridges requires:
  - Reliable locations for reliable integration
  - Degree of reliability is next question
Governance Structure

- Highway Leadership
  - RE: Policies

- Transportation Community of Interest
  - RE: Systems

- TDD Administrator
  - State Maintenance Engineer
  - Chief Engineer

- Asset Mgmt Steering
  - RE: Plans, Priorities

- Asset Data Mgmt
  - RE: Standards
Some Things We’re Doing/Trying

- FACS-STIP Tool (2009)
- Mobile GPS Applications (2010)
- earthmine Pilot (2010)
- Field Data Collection Unit Pilot (2011)
- Custom-built Field Data Collection Application (June 2011)
- Purchase of Mobile Scanner (June 2011)
Reports Generated Use the Following Criteria:

- Start Milepoint: 0.76
- End Milepoint: 11.28
- Highway Name: ALBANY-CORVALLIS (031)
- Highway Suffix: 00
- Roadway Number: 1
- Buffer Distance: 0.1
- Asset Filter Type: All Assets

### Traffic-AADT (aadt_state)

Records Returned: 25

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<th>End Milepoint</th>
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1 2 3
Data Available

**Data2Go Tool**
- ADA Ramps
- Approaches
- Auto Traffic Recorder Sites
- Bike Facilities
- Bridges
- Culverts
- Fish Passage
- ITS Sites
- Pavement
- Place to Record Special Problems
- Retaining Walls
- Safety (Crashes, SPIS, SIP)
- Sidewalks
- Traffic (Volume - Posted Speed)
- Traffic Barriers
- Traffic Signals
- Traffic Support (Signs)
- Tunnels
- Unstable Slopes
- Weight in Motion Sites

**Map Tool**
- Aggregate Sites
- Bridge and Culvert Locations
- Bridge, Pavement, and Safety Project Lists
- Counties and Cities
- Crash Rates
- Number of Lanes, Right & Left Shoulder
- Pavement Conditions
- PLSS (Township/Range/Section)
- Regions and Districts
- Signed Routes & Road Networks
- SIP 2005-2007
- STIP 2008-2011
- Traffic Flow
- Traffic Projections
Mobile GPS Field Applications

- Asset Data Management Committee
  - Determined ArcPad to be the ODOT application platform of choice
    - Field Applications
    - Draft Applications
Signs Juno Pilot

Working with sign maintenance staff:
• Building on efforts for consistent statewide enterprise sign data to
  – Test utility of a more affordable mobile GPS unit while:
    • Adhering to ODOT approved standards, procedures, and equipment
    • Allowing collection of reliable, cost effective, accurate data
      – Custom data entry forms streamline field data collection
      – Building capacity to automate data updates
    • Manual entry right now
earthmine Pilot

- Kick off September 2010
- Mobile Interactive Mapping System
- Scope of project approximately 100 centerline miles
- Able to “tag” assets
earthmine Assets Tagged

- ADA Ramps
- Approaches
- Bike Facilities
- Illumination Installation
- Retaining Walls
- Roadbed Centerline
- Roadbed Edge of Pavement
- Sidewalks
- Traffic Signal Installation
- Sign Installation
- Special Problems
- Traffic Barriers
- Traffic Structures
- Roadbed Fog Line
New, Robust Asset Database with Field Data Collection Unit

- Exor-Bentley product offers:
  - Robust options to house infrastructure data
  - Use of linear referencing methods (LRM) and coordinates
  - Field Data Collection Unit option
  - Pilot failed
Custom-Built GPS Data Tool
RAZ Mobile Mapper

• Provide more current information to highway maintenance crews than available in hardcopy publications
• Create compact portable version of current data normally accessed within office enterprise environment
• Provide complete spatial awareness through live GPS connection
Custom-Built GPS Data Tool
RAZ Mobile Mapper

• Connect to GPS
• Three visual components similar to existing hardcopy products
  – Cartographic display
  – Road Inventory as straightline chart
  – Maintenance guidelines as Restricted Activity zones (RAZ)
• Meets regulators requirements to support threatened and endangered species protection while performing routine road maintenance
Custom-Built GPS Data Tool
RAZ Mobile Mapper
Custom-Built GPS Data Tool
RAZ Mobile Mapper
Mobile Scanner

• Surveyor safety and efficiency justified purchase
• Bonus potential is use for asset data collection
  – Questions:
    • Data alignment, storage and management?
    • Best practice vs. data “overkill?”
    • Best set of tools – what is the right tool for the job?
Conclusion

• A lot of transportation infrastructure asset data related technology is being used at ODOT
  – FACS-STIP Tool
  – GIS
  – Mobile GPS

but...
The Question for ODOT is....

- **What is the right mix of tools that substantially – and efficiently - meets most needs and supports our movement toward reliable enterprise data?**

...the answers are still to be revealed
Contact Information

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