Meeting Federal Reporting Requirements with Roads and Highways

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Presentation

- Overview of Reporting Requirements
- Changes in WV data architecture and model
- Reporting challenges
- Data challenges
- Tools and methods for reporting assistance
- Remaining challenges
Highway Performance Monitoring System (HPMS)
- 2014 HPMS Field Manual updates
- 2010 Reassessment - 2013 impacts

Fundamental Data Elements (FDE)
- Portion of Model Inventory of Roadway Elements (MIRE)
- Primarily intersections and ramps – others already in HPMS

MAP-21 Legislation
- Include all local roads in Federal reporting (ARNOLD/TFTN)
- Performance measures (HSIP, NHPP, Asset Mgmt, NFN, CMAQ, etc.)
- Changes still coming...
• WVDOT Requirements
  • Internal safety group pushing for all MIRE attributes
  • Asset Management effort supporting a portion MIRE attributes. Need to integrate with Roads and Highways.
  • Interface to Deighton dTIMS data.
  • Interface to Transmetric traffic data.
  • Certified mileage for State of West Virginia.
  • Existing legacy systems with specific data format needs.
• LRS and road inventory maintenance are currently in independent data systems and merged for analysis and reporting...moving to Esri R&H.

• External use of LRS for the WV Enterprise Resource Planning (ERP) project - wvOASIS.
  • AgileAssets for asset management
  • Assets maintained outside of core WVDOT GIS group

• Leveraging a County and Statewide route designation for all centerlines. Statewide LRM primary LRM of Asset Management project.
Changes in WV Data Modeling

- Normalized data/table structures.
  - Fewer attributes per table
  - Many more tables
- More lookup/domain tables to help with data quality.
- Fewer “keys” between multiple tables.
  - Depend more on spatial and linear relationships
  - Less confusion for data users/maintainers
- Migration pains from ArcGIS > Rome > R&H 10.2
• New specifications for data elements.
  • FDE data elements
  • MIRE elements for safety
• Tools not readily available for reporting.
• New data model allowing for the MIRE attributes, but need to define data reports/views.exports to leverage the data.
• Bringing multiple business units’ data together to facilitate reporting and analysis.
Data Challenges

- Not all needed data exists in the DOT.
- Much larger quantity and scope of data.
- Normalized data is easier to maintain, but more challenging to combine for reporting.
- DOT, MIRE, and HPMS data elements not all the same definition.
  - Functional class
  - Shoulder definitions
  - Surface types
  - and many more...
Meeting the Challenges

- Defining a scalable and extendable data model for new data as it comes available.
- Adjusting the data model to accommodate the added attribution.
- Defining good solid data and system architectures for the larger data quantities.
Meeting the Challenges

- Locating or developing tools to facilitate the reporting of the data.
- Integrate reporting tools with the data environment.
- Identifying methods for deriving values from existing attributes and GIS (e.g. intersections).
Tools for Reporting

- Dynamic segmentation tools – provide more robust dyn seg query tools.
Tools for Reporting

• Statistical segmentation tools – generate “predominant” and “weighted average” values during dynamic segmentation.

• Route dominance tools – support database level reporting of shared route ownership and concurrent route names.

• Automated intersection data model population for FDE requirements.
  • Intersection leg configurations
  • Interchange contents (roads and intersections)
Publish views and “materialized views” for data analysis and reporting.

Leverage data temporality in R&H to assist with integrating appropriate data.

Leverage R&H REST services for syncing external business data with the LRS.
- AgileAssets – LRS Export and Relocate Event services
- Deighton dTIMS – Relocate Event services
- Transmetric Traffic Server – Relocate Event services
Ongoing Challenges

• Aligning the DOT, HPMS, MIRE data definitions...or not.
  • Carry multiple fields for the different needs?
  • Determine if DOT fields can be deprecated over time.
  • Accommodating changes from Federal mandates.

• Aligning the needs of the ERP and Federal report requirements.

• Changing Federal requirements.

• Staffing and skills.
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Questions??