Workflow for Publishing LRS Based Road Network Data

Yueming Wu, Ph.D., GISP
GIS Manager
West Virginia Department of Transportation
Agenda

- Introduction
- Workflow for Publishing LRS Data
- Lessons Learned
- Near Future Plan
- Qs & As
Introduction

- GIS Strategic & Business Plan in 2011
- Years Long Ambitious Project - Develop an Enterprise LRS
- Multiple Phases
  - Road Network Data Conflation
  - R&H Implementation
  - Data Cleanup
  - Enterprise LRS Go Live
Road Network Data Conflation

- **Challenges**
  - Multiple Sources (WVDOT, E911, Non-State Public Road, Google Map, Microsoft Bing Map, etc.)
  - Various Data Schemas

- **Output**
  - A Single Dataset of All Public Roads
  - Completed in 2014
Roads & Highways Implementation

- Prototyping → Staging → Production
- In Production in 2016
- R&H 10.3.1 → R&H 10.4.1 → R&H 10.5.1
- LRS Editing Only
LRS Data Cleanup

- **Challenges**
  - Two Networks (LRMs) + Concurrency
  - 10,000+ Data Issues
  - Changing Deadline from West Virginia ERP (wvOASIS)

- **Resources**
  - R&H + Workflow Manager + Data Reviewer
  - 5 FTEs + Temps + Consultants

- **Milestone:** 09/15/2017
- About 500 Data Issues Left
Enterprise LRS Go Live

- What is an enterprise LRS?
- Who are the prospective LRS users?
- How can the LRS users consume the same LRS?
What Is An Enterprise LRS?

Why LRS?
Your budget depends on it!

HPMS Requires It!
Work Order Management
One Authoritative Data Source
Bring your enterprise data into a single linear network to work more effectively!

Simplified Reporting
Cost Reductions!

Organization wide data sharing

(Adrian Litton, 2015)
Who Are the LRS Users?

- FHWA - HPMS Reporting
- Business Systems
  - AgileAssets System
  - Deighton dTIMS
  - Transmetric Traffic Server
  - Bentley InspecTech
  - Etc.
- Databases
  - Road Inventory Log
  - Crash Database
  - Etc.
- Applications & Products
  - Official Highway Maps
  - Web Applications
  - Etc.
- Public
- Etc.
Data Format for Consumption

- System Integration
  - File GeoDatabase
  - Web Services
- Data Exchange
  - Feature Classes
  - Shapefiles
How Can the LRS Users Consume the Same LRS?
How Can the LRS Users Consume the Same LRS?

- **Facts**
  - All consumers should use the same authoritative LRS.
  - Automatic consumption is impossible.
  - The GIS program is responsible for most LRS based products & applications.

- **Business Rules**
  - LRS editing and LRS consumption should be separated.
  - LRS is published regularly in various formats.
  - All consumers should use the published LRS.
  - All consumers should know what changes have been made to LRS since the last release.
Workflow for Publishing LRS Data

- Business Rules Based Workflow
- Run 8 Steps with Specific Jobs Included
  - A job is to update web services/web apps/highway maps/etc.
  - Jobs are chained together and executed step by step.
  - Jobs at the same step can be run in parallel.
- Run Semi-Automatically
- Run Once a Quarter
  - First run was started 10/2017 and finished 01/2018.
  - Second run was started 02/2018 and is ongoing.
Workflow for Publishing LRS Data

Last Update: 2/15/2018

Differences Published --- JA
Workflow for Publishing LRS Data   (Last Update: 02/23/2018)

0. Release date determined

1. Default version of RIL_LRS finalized --- CM

2. Export Network GP tool run & results analyzed --- CM

2. RIL_LRS_STG updated --- Script/RJ

2. RIL_LRS_PUB updated --- Script/RJ

3. RIL_LRS_STAGE updated --- Script/MB

4. GeoRIL archived & reproduced --- Script/MB

3. Web services on RIL_LRS_PUB verified --- JA/New GIS PAN2

4. Road Analyzer verified --- AF

4. Other web apps ([for example, Geometry & Measures]) verified --- PD, SA & JA/New GIS PAN2

3. Meta data verified & updated --- RJ

3. Shapefiles_for_UTM verified & updated --- RJ

4. Changes generated --- Script/RJ

3. Dominant_Routes & Lane_Info_RH produced --- Script/RJ

4. Differences for Dominant_Routes since the last update generated --- Script/RJ

5. Differences published --- JA

5. Milepoint diagrams updated --- EP

4. GTI_PUB_UTM updated --- Script/RJ

5. GTI_PUB_WM updated --- Script/RJ

6. Web services on GTI_PUB_WM verified --- JA/New GIS PAN2

7. Web apps on GTI_PUB_WM verified --- PD, SA & JA/New GIS PAN2

5. GTI_PUB_UTM replicated at district level --- Script/RJ

5. Basemap & basemap web service verified --- JA/New GIS PAN2

6. Basemap verified at district level --- JA/New GIS PAN2

5. Other web services on GTI_PUB_UTM verified -- JA/New GIS PAN2

6. Web apps on GTI_PUB_UTM verified --- PD, SA & JA/New GIS PAN2

5. Transportation GIS data published -- Script/RJ

5. GTI_Mapping_Projects archived & reproduced -- Script/RJ

6. Official highway maps updated -- KE & SE

7. Official highway maps published -- KE, SE, & SA

8. GTI/GIS homepage updated -- SA & YW
Lessons Learned

- Keep Stakeholders on the Same Page
- Treat Jobs/Staff Differently --- Bottleneck Jobs
- Automate as Much as Possible
- Be Adaptable
- Be Service Oriented
Near Future Plan

- Leverage ESRI Workflow Manager
- Keep Improving the Workflow
- Automate More
- Improve Bottleneck Jobs
- Finish Correcting Remaining Data Issues
- Improve Archiving and Backing up
- What else?