DATA: FROM COLLECTION TO SHARING

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Transportation Planning & Programming Division (TPP)
Overview

1. Why is data important?
   - Data principles & Push for Quality Data

2. How do we maintain data?
   - Implement standards
   - Data sources, partners

3. Some data collection & sharing projects
   - GRID
   - County Road Inventory
   - Guardrail End Treatment
   - Project Tracker
   - Google Imagery Service - TNRIS
   - ArcGIS Online/Open Data Portal
   - DUSA
Goals: Quality, Completeness, Timeliness, Consistency

- GIS/Spatial Data
  - Tied to a point on the earth

- Metadata is *crucial*
  - Source & Format
  - Creation Date/Date Last Modified
  - Projection information (how Earth’s geoid is measured and then converted to a flat 2D plane)
  - Accuracy & scale

- Data Dictionary
  - Explanation of all the data items, attributes
Push for Quality Data

- The value of any decision is based on the quality/correctness of data
  - Texas-sized transportation decisions based on data
- Answer questions internal to TxDOT & externally
  - Confidence in answers
- Era of digital data ‘literacy’
  - Keeping up with a data literate world
- Increasingly federally/state mandated reporting requirements
  - Esp. HPMS (Highway Performance Monitoring System) report incl. Performance Measures
- Public Safety
  - Find where risks are greatest and minimize them
Some of What We, Data Management, Do

- Deliver the HPMS Submittal & Certified Mileage to FHWA each year
- Maintain Functional Classification of Roadways
- Roadway Inventory Maintenance (Geospatial and Attribute Data)
- Support the planning process
- General GIS Support
- Help with Project Tracking & Mapping (Project Tracker)
- Coordinate GIS data sharing with TxDOT Divisions, Districts & other agencies
- Coordinate with Counties for the County Road Inventory
- Produce mapping products, such as:
  - Departmental Map, Railroad Map, Statewide Planning Map, Other Custom Maps
- Etc.
Why It’s Important

- Roadway Funding is determined by the Mileage Certification
- Keeping up with Roadway Inventory changes
  - *Build that solid foundation*
- GIS supports Mileage Certification and all stages of roadway development life cycle including Planning, Construction, Maintenance
- Assist employees with GIS issues & provide GIS leadership
- Provide GIS data for TxDOT enterprise applications (Statewide Planning Map, Comanche, Tarhe, etc.)
- Share GIS data with TxDOT Divisions, Districts, other agencies, and the public
In Case You Needed a Reminder...

2015 Certified Mileage

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Our public road mileage makes up roughly 8% of the total public road mileage in the U.S.
Some of our Data Sources/Data Partners

- COG (Council of Government)
- MPO (Metropolitan Planning Organizations)
- RMA (Regional Mobility Authority)
- County, City
- E-911 (Emergency Management Districts)
- Other State Agencies
- Aerial Imagery
  - Partnership with TNRIS & Google for Imagery
- You!...?

The Wider GIS Community

- Passionate about spatial data
- Already existing solutions
Implementing Data Standards

Standards are important for consistency and usability

I. Examine already established standards by reputable institutions
II. Assess our data needs & formulate guidelines accordingly
III. Publish those guidelines
IV. Publicize those guidelines (*challenging with current infrastructure*)
V. Make updates as needed (*Ongoing process*)

The hardest part? Getting people to follow the guidelines every time.
Scripting is ESSENTIAL for large data projects

- Initial data processing time cut-down
- Creating Routes
- QA/QC
- Makes huge tasks faster and cleaner

Launch yourself

TxDOT Data Model

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DATA COLLECTION & SHARING EFFORTS
- Web-based, spatial application.
  - Latitude, Longitude based
    - Other LRM (Linear Referencing Methods) treated as ‘assets’
- Replaced TRM and RI as the roadway inventory for Texas.
- Launched in August 2015.
- Brings the road map and road data into one geospatial format.
- ‘Open Source’ in a way...
  - Allows SMEs (District Personnel, Data Management Employees) to directly edit roadway assets
- In it’s infancy... yet at a glance...
County Road Inventory Updates Application

- County Road Inventory was launched in 2015
- **Functions within the Feature Service:**
  - Access to mark up existing roadway attributes
  - Draw new alignments
- We Have Options!
  - Snail mail **OR** Online CRI App
- Higher % county response thanks to CRI
Guard Rail End Treatment (GET) Project

- Statewide Effort to collect all On-System GETs
  - All TxDOT Districts & Maintenance Offices
- Web App for use by Maintenance Personnel
- 1 month collection time
  - Over 150,000 GETs collected
  - Power of modern spatial data collection technology
Project Tracker

- Public Web App for increased project transparency
- Mandated by the Texas Legislature with Senate Bill 1420
- Funded and unfunded projects included
- Many TxDOT sources updated DAILY except for Financials which are monthly
  - Design and Construction Information System (DCIS)
  - Primavera (P6)
  - SiteManager
  - PeopleSoft
  - ArcGIS Online (AGO)

- TxDOT.gov
  - Searchable
Project Tracker

- Ability to export project data
  - PDF
  - XLSX
  - XML

- Search and filter
  - Project ID (CSJ)
  - County
  - TxDOT District
  - State House District
  - State Senate District
  - US House District
Google Imagery Service

- **Background**
  - TNRIS, TxDOT and many other state agencies contracted with Google to provide up-to-date imagery as a service

- **Benefits**
  - Yearly Imagery Buy Ups
  - High resolution
  - Widely accessible
  - Cost effective
  - Available to any government agency
  - Safety
    - Verify your assets from the seat of your office chair
Google Imagery Service

■ Limitations
  – Blend of imagery from multiple years
    • Seams can be more pronounced, since the seasons vary (leaf on or leaf off)
  – Contract may not be renewed in the future
  – Not intended as a CAD service (there are workarounds)

■ Non-Government Use
  – Consultants may use for length of contract with agency
  – Must request link through sponsor agency

■ More Information - TNRIS
  – https://tnris.org/texas-google-imagery/
Open Data Portal *a preview*
Open Data Portal *a preview* – What is it?

- Provides an avenue for other divisions and the public to explore TxDOT’s data catalog
- Data available to be downloaded in multiple formats
- Great benefit
  - Reduce data requests and centralize publicly available data
    - GIS oriented but you can publish and share over 60 formats including: SHP, FGDB, CSV, XLS, PDF, CAD, JSON, LYR, KML, and much more.
- Open Data webpage is a portal to organization’s ArcServer and ArcGIS Online REST Services ---

**Try me >>** [www.txdot.gov/opendata](http://www.txdot.gov/opendata)
DUSA (Data Updates and Sharing Application) - a preview

Data Updates & Sharing Application

Sign-In

Choose an Inventory to Update

Choose Your Organization

Access Code

Sign In

Need Help?
DUSA a preview

Web Portal

• Web application for markup & data submittal
• Unified place for data collection & sharing

Current Status

• Set up for county & local streets currently, in testing

Long-term Goal

• Centralized location of all data updates to our inventory
In Conclusion

This was just...

Questions? We work with some very smart individuals!

CONTACT US – TPP-GIS@txdot.gov
THANKS, DILIGENT DATA MANAGEMENT EMPLOYEES!

AND THANK YOU, AUDIENCE!

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