Mapping the Road Network

Statewide Roadway Data Modeling: Colorado Case Study

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State of Colorado

"Unified Roadway Layer Needs Assessment"

by

Colorado Department of Transportation

GIS Data Management Section

in collaboration with

Governor's Office of Information Technology

Project Objectives

- Support multiple statewide use cases
- Leverage mission output as input to a unified data set
  - Identify opportunities to collaborate
  - Reduce redundant efforts
- Develop a logical data model for roadway unification
- Recommend governance and stewardship for developing and maintaining a unified data set

…building upon CDOT's existing data collection processes and tools

that meet

FHWA Highway Performance Monitoring System (HPMS) and Colorado Highway Use Tax Fund (HUTF) reporting requirements

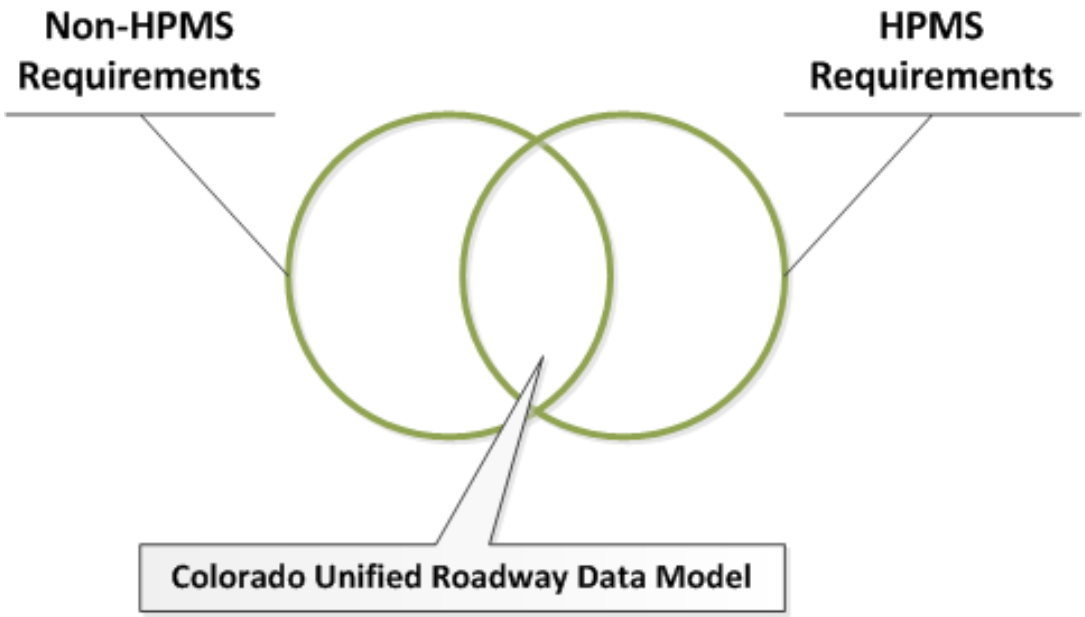
…while recognizing the need to serve roadway safety goals (e.g. National Highway Safety Administration performance requirements)

and emerging

US DOT Transportation for the Nation (TFTN) requirements

AppGeo

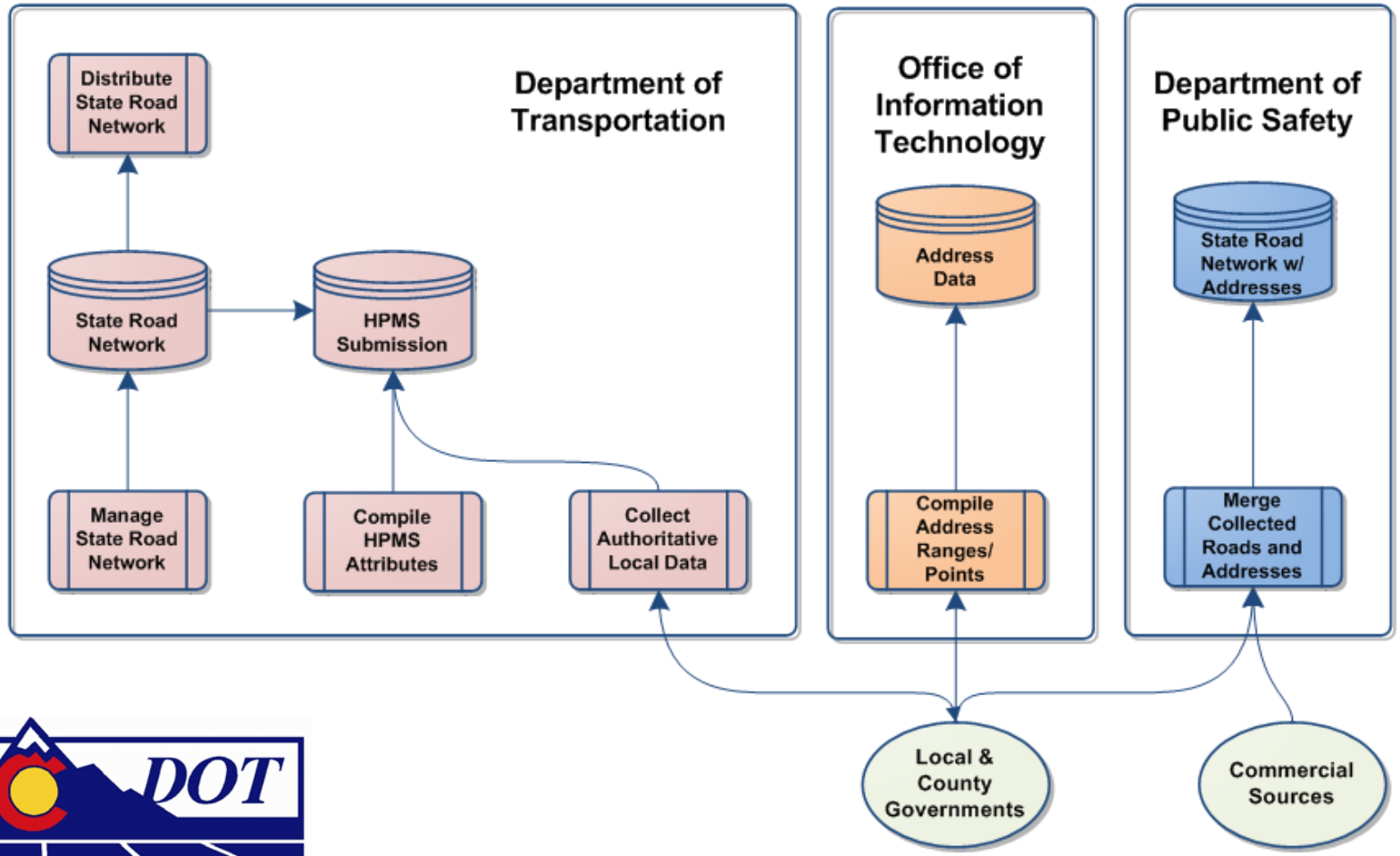
Unified Roadway Data Model



Key Stakeholders

- Colorado Department of Transportation
- Colorado Department of Public Safety (State Patrol and Dept. of Emergency Management)
- Colorado Department of Natural Resources (and Div. of Wildlife)
- Governor's Office of Information Technology

Current Roadway Data Flows



Functional Use Cases

1. Basemap Creation and Simple Cartography
2. Spatial Analysis
3. Linear Referencing
4. Addressing and Geolocation
5. Routing and Response

Used to design the logical data model

1. Basemap Creation and Simple Cartography

Activities Supported:

- Desktop map creation
- Online map viewers
- Basemap data services

2. Spatial Analysis

Activities Supported:

- Roadway length measurements
- Buffering
- Jurisdiction/zone identification and assignment
- Planning and permitting

3. Linear Referencing

Activities Supported:

- HPMS Reporting
- Point and line event creation
- Non-engineering construction and maintenance
- Local use

4. Addressing and Geolocation

Activities Supported:

- Geolocation via:
  - Address
  - Intersection offset
  - Mile marker offset

5. Routing and Response

Activities Supported:

- Emergency and non-emergency routing to one or more destinations
- Oversize/Overweight permitting

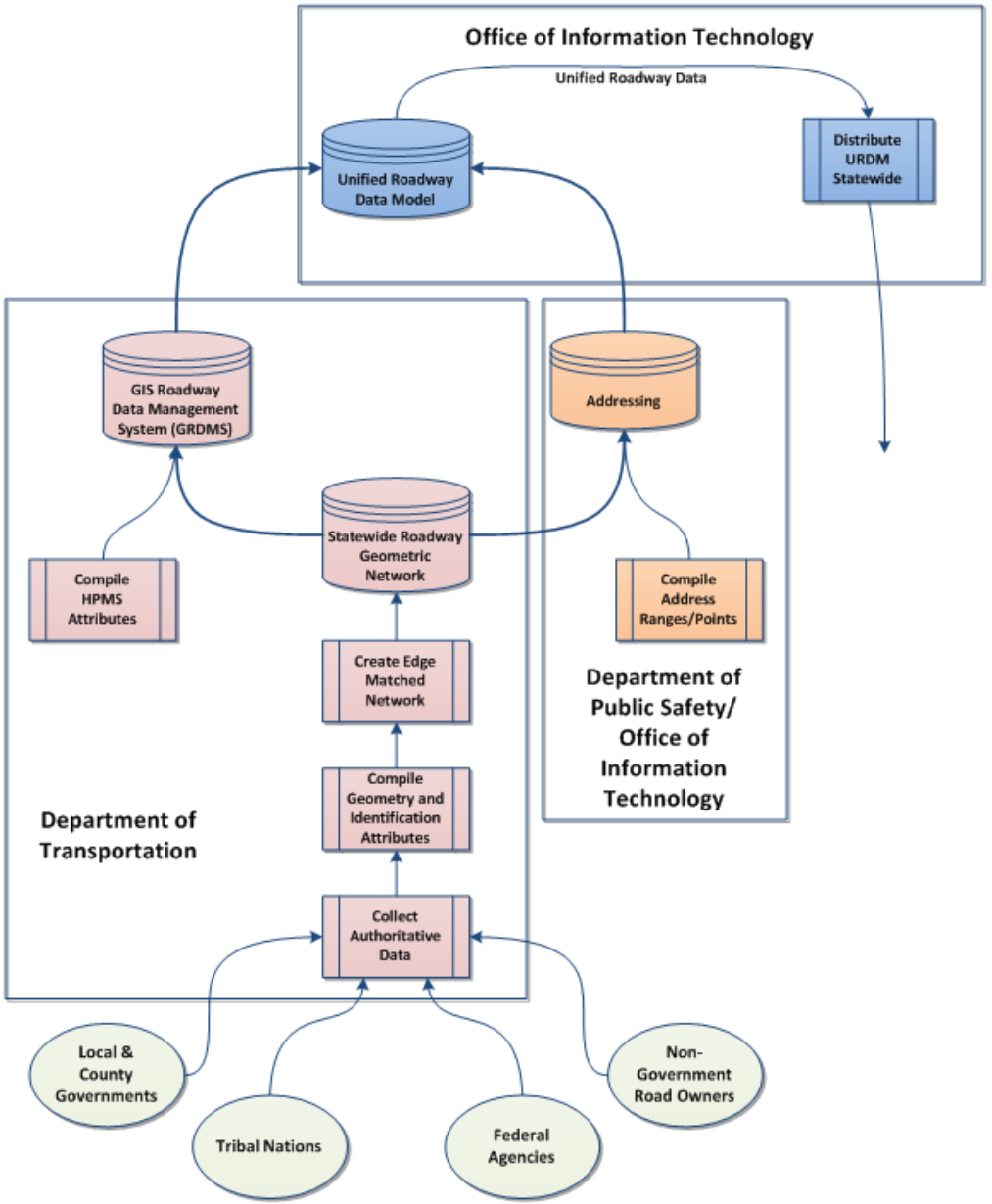
Recommended Process Steps for Roadway Data Unification: 1-3

1. Roadway data is collected by CDOT from **authoritative sources** within local jurisdictions across the state, leveraging CDOT processes and tools
2. For roadway data not currently collected by CDOT, or not supplied by local jurisdictions, the state will conduct a messaging campaign, coordinated by OIT, to encourage **submittal of all roads** through the CDOT processes
3. In addition to meeting state Highway User Tax Fund (HUTF) and FHWA HPMS reporting requirements, **CDOT will provide roadway data to OIT** for integration into the URDM

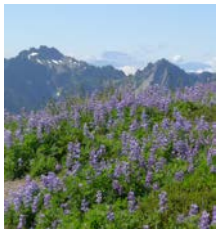
Recommended Process Steps for Roadway Data Unification: 4-6

4. OIT will undertake QA/QC and other **value-added processing** and data integration, such as adding addressing information, and disseminate the statewide unified roadway data to users
5. OIT and other state users will provide **feedback to CDOT on noted errors and omissions** in the data collected from local jurisdictions
6. OIT will **provide the statewide unified roadway dataset back to the local jurisdictions**, as well as feedback on the local jurisdiction's own data

Future Roadway Data Flows



Summary



- **Getting all roads is important for multiple reasons**
  - HPMS reporting and Transportation for the Nation (TFTN)
  - Improved safety analysis and infrastructure improvements
  - Many other state and local needs besides transportation
- **Leveraging existing CDOT processes is advantageous**
  - The “supply-chain” is largely built and in practice
  - There is a clear *quid pro quo* between CDOT and local government data authorities
  - Relationships with the Governor’s OIT are established for collaborating on statewide initiatives such as the URDM

Who is AppGeo?

- Founded in 1991 in Boston, Massachusetts
- National footprint, with more than 650 projects in 36 states, DC, and USVI
- Primary focus: State and Local government projects and customers
- GIS-T Gold Sponsor -- see us in Booth #17

Acknowledgements

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