California Road Sharing (CaRS)

Road to Governed California Centerlines

California's road system is managed by various authoritative roads data management government agencies. These include the Caltrans State Department of Transportation (DOT), 58 counties and 482 municipalities using multiple data systems.

Vision: The **California Road Sharing (CaRS) Program** will establish the **Road to Governed California Centerlines.** Road data modeling, management and exchange practices will be coordinated across Caltrans, Cal OES and Local agencies. A Statewide Roads Data, Applications and Technology Architecture will be created for management of road centerline geometry and road information. Pilot projects will be done with stakeholders in California and workshops will be held as part of the ongoing FHWA-led AEGIST program involving 18 States, in the U.S. to gather information for successful deployment of an integrated and federated data management system with data modeling, governance, sharing and QA/QC rules..
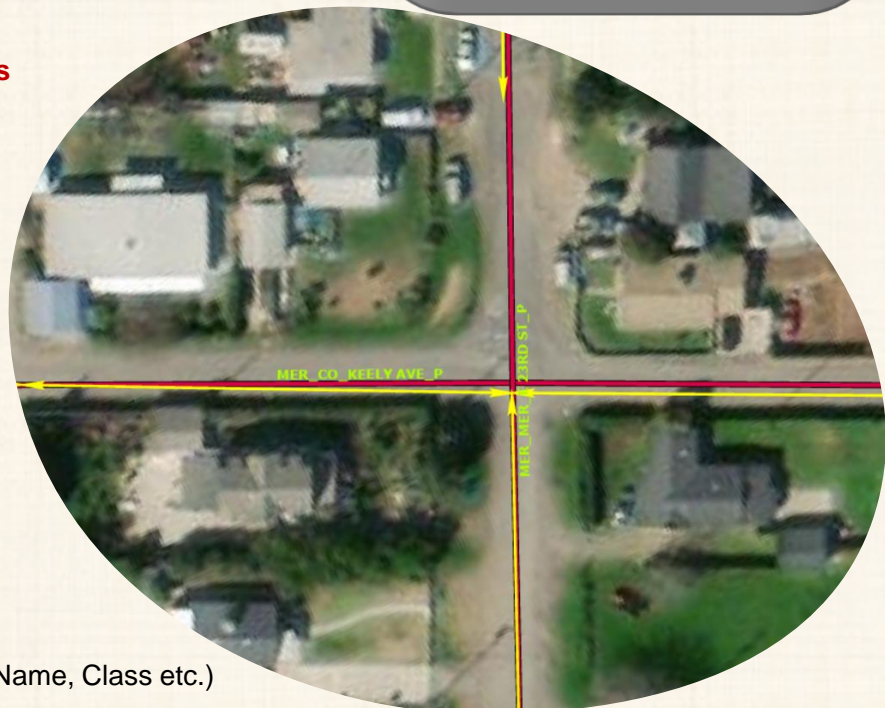
Benefits to Stakeholders

- Public safety enhancement through data-driven emergency management, preparedness and incident response
- Transportation planning, traffic studies, safety assessments and geo-locating address information (geocoding)
- Linear referencing of infrastructure asset inventory and condition assessment data in Asset Management Systems
- Capital and Maintenance project work data management (linear/spatial referencing)
- Topologically connected routable network development for map-based vehicle routing and analysis of driving directions, distances, roadway mileage.
- Deployment of Statewide Roads Data Governance Framework through establishment of National standards-based roads data modeling and QA/QC rules across government agencies
- Development of Digital Twin and AI/ML Applications for Infrastructure Management, CV/AV & Unmanned Aerial Systems

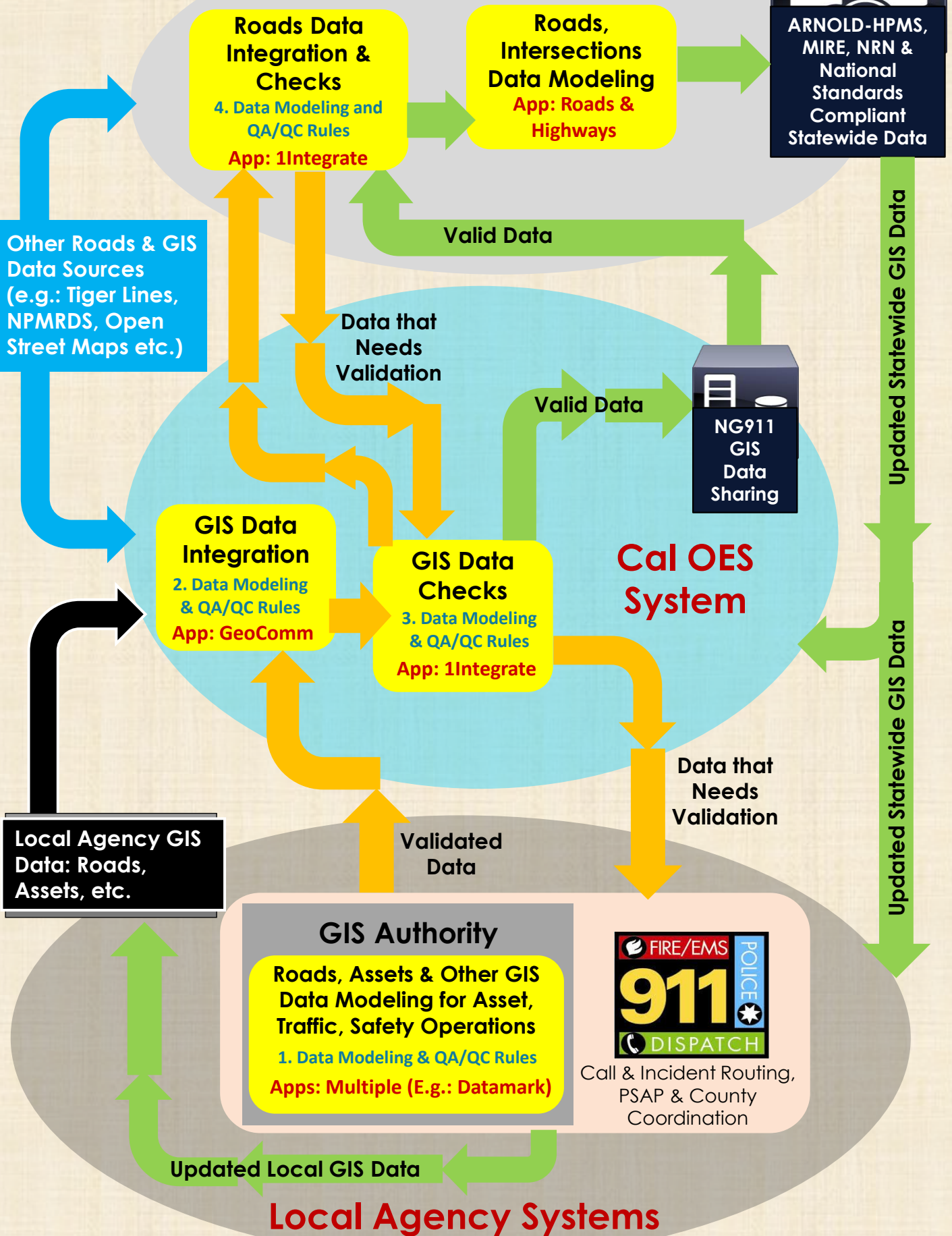### Roads Data Modeling & QA/QC Rules

- Null and Multi-Part Geometry
- Duplicate Vertices
- Centerline Alignment
- Digitization Direction
- Centerline Accuracy, Source
- Self-Intersecting Geometry
- Start/End Nodes Alignment
- Overshoots/Undershoots
- Kickbacks
- Bifurcations
- Turn Lanes & Ramps Centerlines
- Emergency Crossovers
- Railroad Crossings
- Administrative Boundary Junctions
- Overlap/Concurrent Roads
- Dual-Geometry (Divided/Undivided)
- Roundabouts & Traffic Circles
- Road Identification Information (ID, Name, Class etc.)

PROGRAM GOALS

- ✓ Create a governed state-wide road centerline dataset to meet ARNOLD and NG911 roads data requirements

- ✓ Provide mutual benefits to State and Local jurisdictions, especially the business users involved in highway project planning, survey, design, construction, safety, traffic and asset management operations

- ✓ Coordinate roadway cartographic and data model recommendations

- ✓ Support Transportation for the Nation (TFTN), which promotes a publically available, high quality road centerline that is coordinated across all levels of government

- ✓ Building Information Modeling (BIM) for Roads and Assets using Standards for supporting AI/ML Applications, CV/AV and UAS.

Envisioned Data Flow

Caltrans System

Roads Data Integration & Checks
4. Data Modeling and QA/QC Rules
App: 1Integrate

Roads, Intersections Data Modeling
App: Roads & Highways

ARNOLD-HPMS, MIRE, NRN & National Standards Compliant Statewide Data

Other Roads & GIS Data Sources (e.g.: Tiger Lines, NPMRDS, Open Street Maps etc.)

Valid Data

Data that Needs Validation

Valid Data

NG911 GIS Data Sharing

Cal OES System

GIS Data Integration
2. Data Modeling & QA/QC Rules
App: GeoComm

GIS Data Checks
3. Data Modeling & QA/QC Rules
App: 1Integrate

Updated Statewide GIS Data

Updated Statewide GIS Data

Local Agency GIS Data: Roads, Assets, etc.

Data that Needs Validation

Validated Data

GIS Authority
Roads, Assets & Other GIS Data Modeling for Asset, Traffic, Safety Operations
1. Data Modeling & QA/QC Rules
Apps: Multiple (E.g.: Datamark)

FIRE/EMS 911 POLICE DISPATCH
Call & Incident Routing, PSAP & County Coordination

Updated Local GIS Data

Local Agency Systems