



***Cal* OES**

GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

NG 9-1-1 Data Integration and Workflow

Esri User Conference 2021





Agenda

- Geospatial Data and NG 9-1-1
- 9-1-1 Call routing
- The 9-1-1 GIS workflow
- Data Sources and Data Integration
- Data Sharing and Next Steps



Geospatial Data and NG 9-1-1

Vision: Make the transition to NG 9-1-1 and improve the routing accuracy of 9-1-1 calls and deliver increased location accuracy to the PSAP

- What others say: “We must have a 100% NENA compliant GIS data set before they make the transition to NG 9-1-1”
- Why are they saying this?
 - GIS data is needed to route 9-1-1 calls in an NG 9-1-1 environment
 - GIS data is used to dispatch first responders to the scene of the emergency
 - GIS data is used by Call Processing Equipment (CPE) and Computer Aided Dispatch (CAD)
- Reality Check
 - Most CPE and CAD solutions in California could not import a standardized GIS dataset
 - Developing a standardized GIS dataset that meets 100% of the needs will take years to develop
 - GIS data is needed to route 9-1-1 calls in an NG 9-1-1 environment is the first step
- How can we support the vision and improve call routing that is used with the legacy 9-1-1 system?



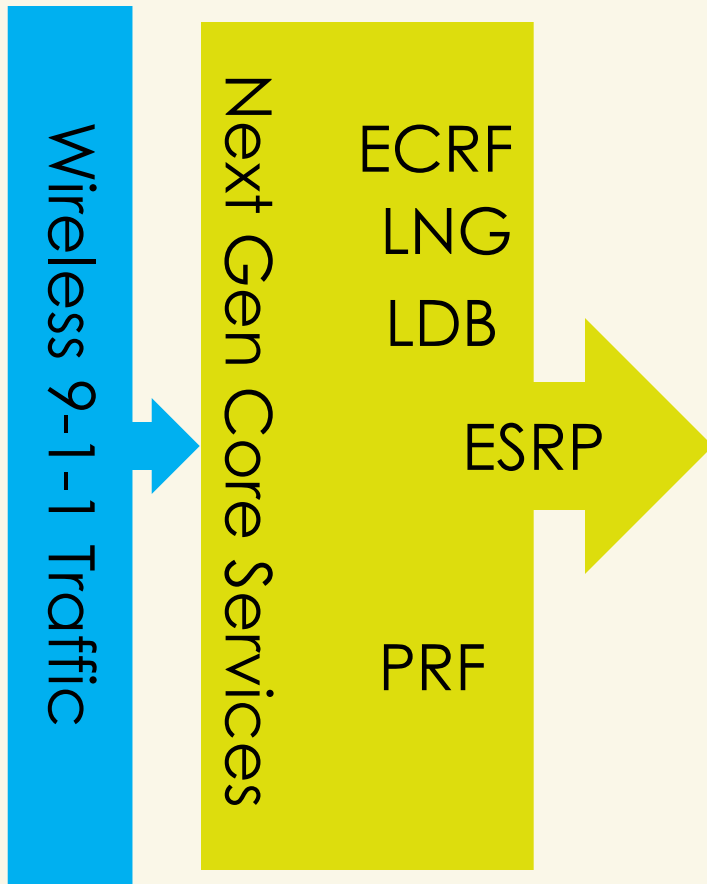
Making the Transition to NG 9-1-1: What is really needed?

- 9-1-1 today uses a tabular dataset (like an Excel file)
- Cal OES must transition the tabular dataset into a geo-encoded dataset used to route 9-1-1 calls
- This process requires:
 - Master Street Address Guide (MSAG)
 - Automatic Number Information / Automatic Location Information (ANI/ALI)
 - PSAP boundary files – These are not legal or city/county boundaries
 - Road centerline data
 - Software to convert the existing data
 - NG 9-1-1 service providers who can route 9-1-1 calls using this data



9-1-1 traffic routing with NG 9-1-1

Definitions



ESRP - Emergency Services Routing Proxy essentially replaces the selective routers in NG 9-1-1.

ECRF - Emergency Call Routing Function is the functional element where caller location and routing information for that call is stored (think GIS)

LDB - Location Data Base server retains all of the current information, functionality, and interfaces of today's ALI and can utilize the new protocols required in an NG 9-1-1 deployment

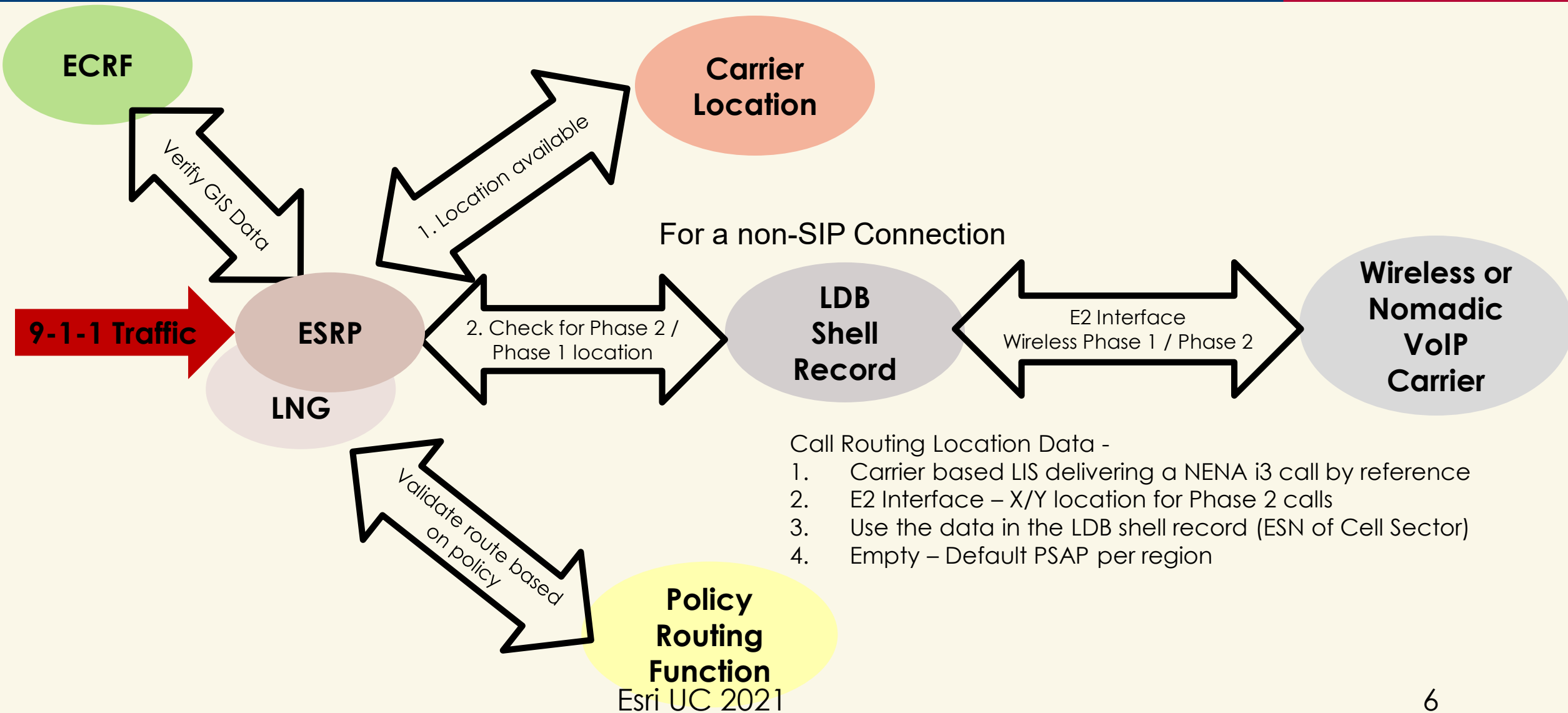
LIS - Location Information Server is used in conjunction with the LDB

LNG - Legacy Network Gateway - performs specific interworking functions to support ingress of non-i3 calls into the i3 network

PRF - The Policy Routing Function is where default, alternate, contingent, and emergency routes are located. The PRF is the specific functionality regarding 9-1-1 traffic routes



9-1-1 traffic routing with NG 9-1-1 (Wireless and Nomadic VoIP)





Other Terms – to complicate the process

- E2 Interface – This interface is used by wireless and nomadic VoIP to send location updates to the ANI/ALI database
- SOI – Service Order Interface – This is used by wireline and nonnomadic VoIP to update the location in the ANI/ALI database
- NG 9-1-1 must support these functions until carriers provide a true SIP interface and deliver location with the call



Files and data sets needed for the transition

- Master Street Address Guide (MSAG) - A database of street names and house number ranges within their associated communities defining Emergency Service Zones (ESZs) and their associated Emergency Service Numbers (ESNs) to enable proper routing of 9-1-1 calls.
- ESN - 3-5 digit number that represents an ESZ. It is stored in the MSAG and is returned from an ALI query. The Administrative ESN facilitates dispatching of the proper emergency service agency(ies). An Administrative ESN is assigned to each MSAG range to associate the physical addresses to an ESZ. Also known as the 3-5 position Emergency Service Number (ESN) used by a selective router to selectively route a 9-1-1 call and for switch-based selective transfer features.

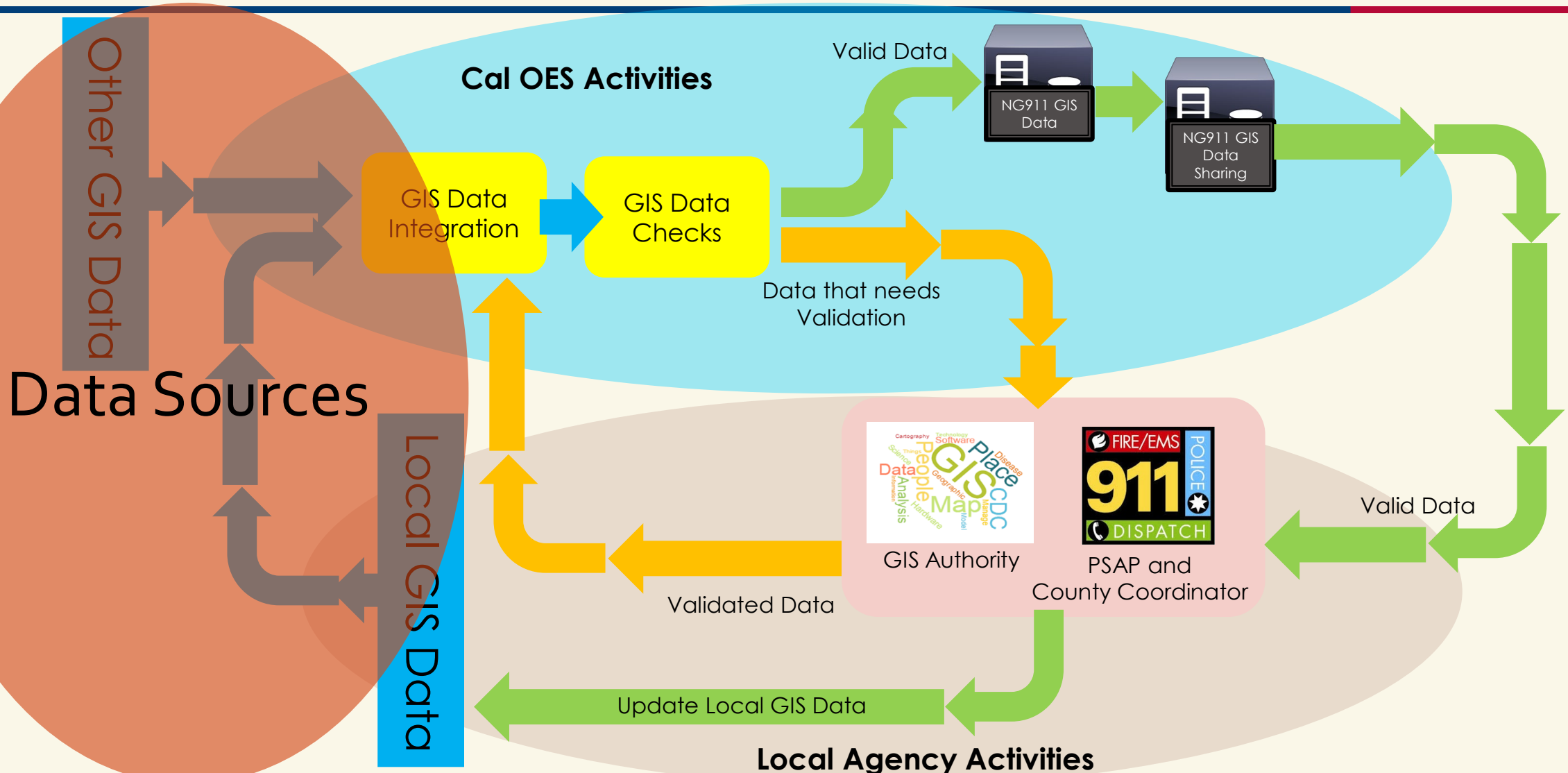


Files and data sets needed for the transition (continued)

- Automatic Location Information (ALI) - The automatic display at the PSAP of the caller's telephone number, the address/location of the telephone and supplementary emergency services information of the location from which a call originates.
- PSAP Boundary - A polygon in a GIS system, SIF, ECRF or other ESInet element that indicates the area a particular agency or element serves. These are not legal or city/county boundaries.
- Road Centerlines (Required) and Address Points (Recommended) – The conversion process from legacy 9-1-1 routing to NG9-1-1 routing requires one form of civic location GIS data set. Address point data and road centerlines help facilitate the process.
- Data provided by local agencies is not directly used to route 9-1-1 calls



NG 9-1-1 GIS Workflow – Data Sources



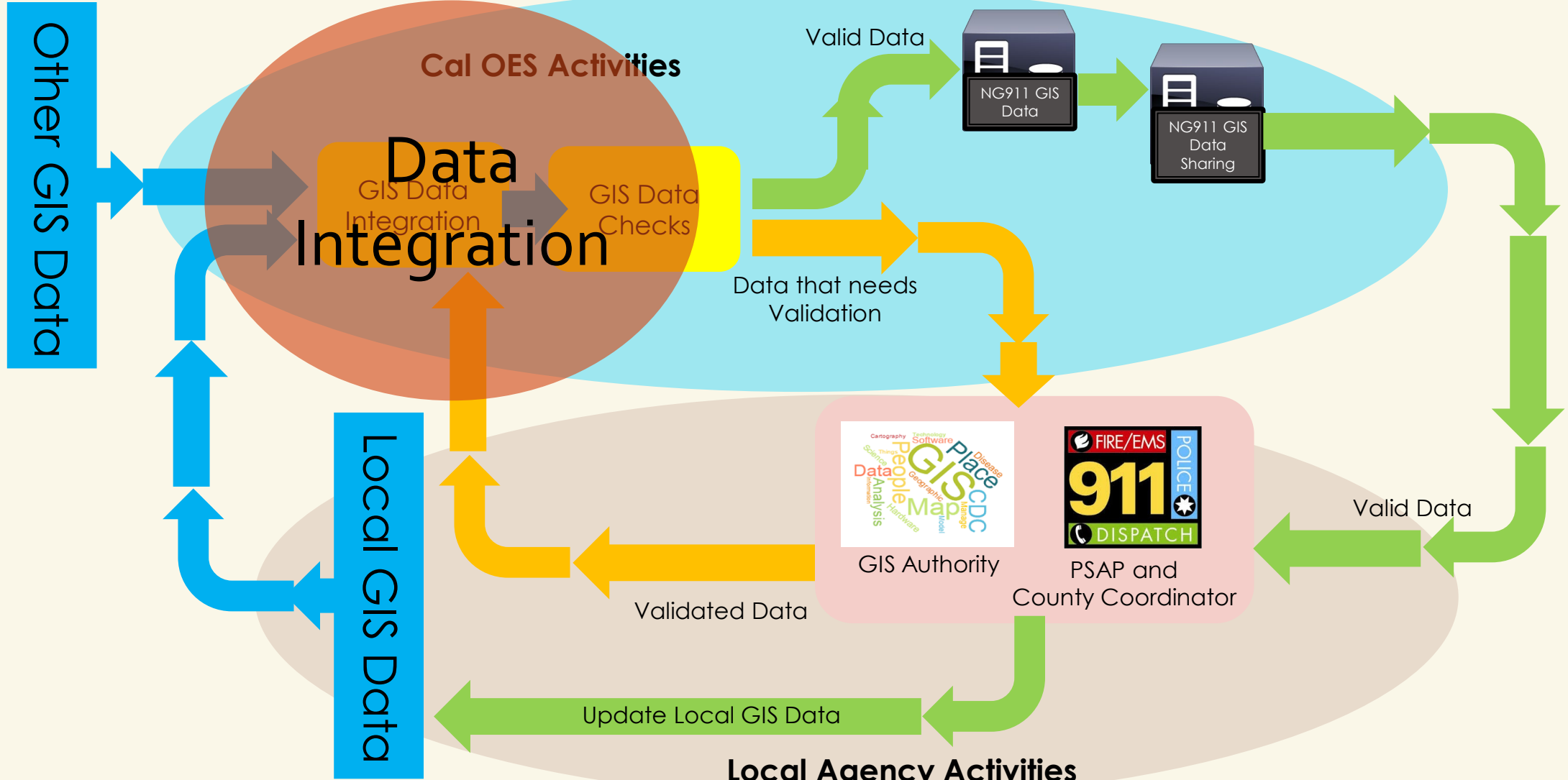


Data Sources

- Local Data Sources
 - Road Centerlines and address points
 - PSAP Boundaries
 - Locally managed GIS data that can be used to improve 9-1-1 call routing data
 - Each local data source typically supports a different process
- Other Data Sources
 - Tiger data used to supplement road centerlines and address points
 - CalTRANS / DOT data
 - Other state data – CHP, CalFIRE
 - Data needed to support data integration with other systems



NG 9-1-1 GIS Workflow: Data Integration



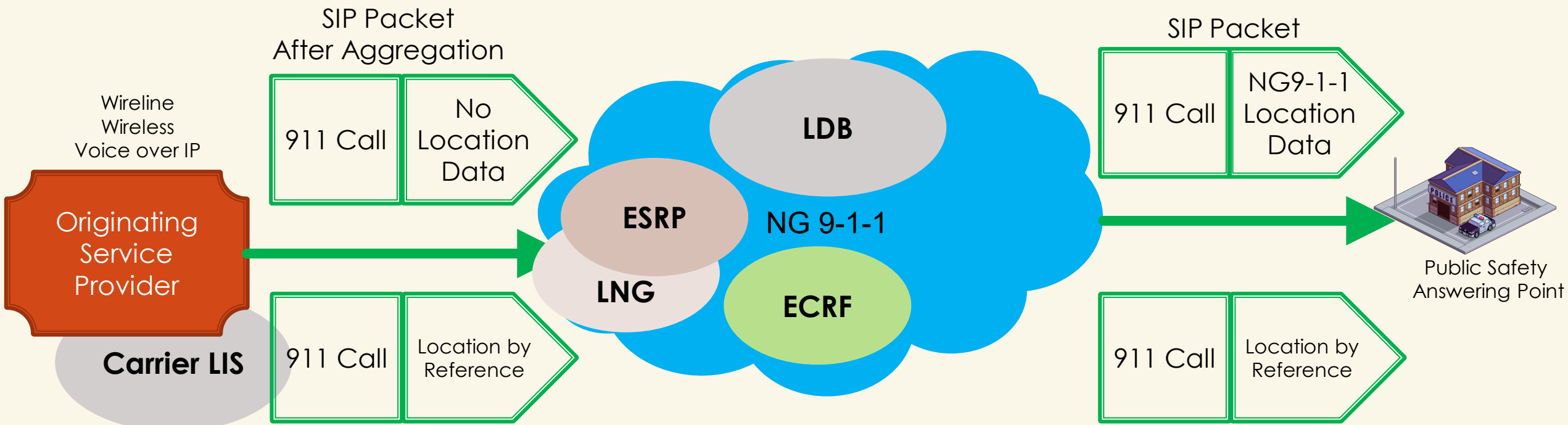


Data Integration

- Cal OES defined a standard format / process to submit GIS data
 - Process had to be altered to meet capabilities of the local agency
 - Some have a robust local capability, others have limited to no GIS staff
 - Gaps can be supported using combination of staff and software
 - Software can be used to identify errors and suggest updates
- Creating relationships and collaboration to support data integration
- Barriers –
 - Common standard for road center lines – Divided highways for example
 - Common standard for location within a plot for the address point
 - Determining critical errors that impact call routing
 - Providing feedback to agencies submitting data
 - Accommodate input of various data sources and formats
 - Aligning state funding process with local funding process

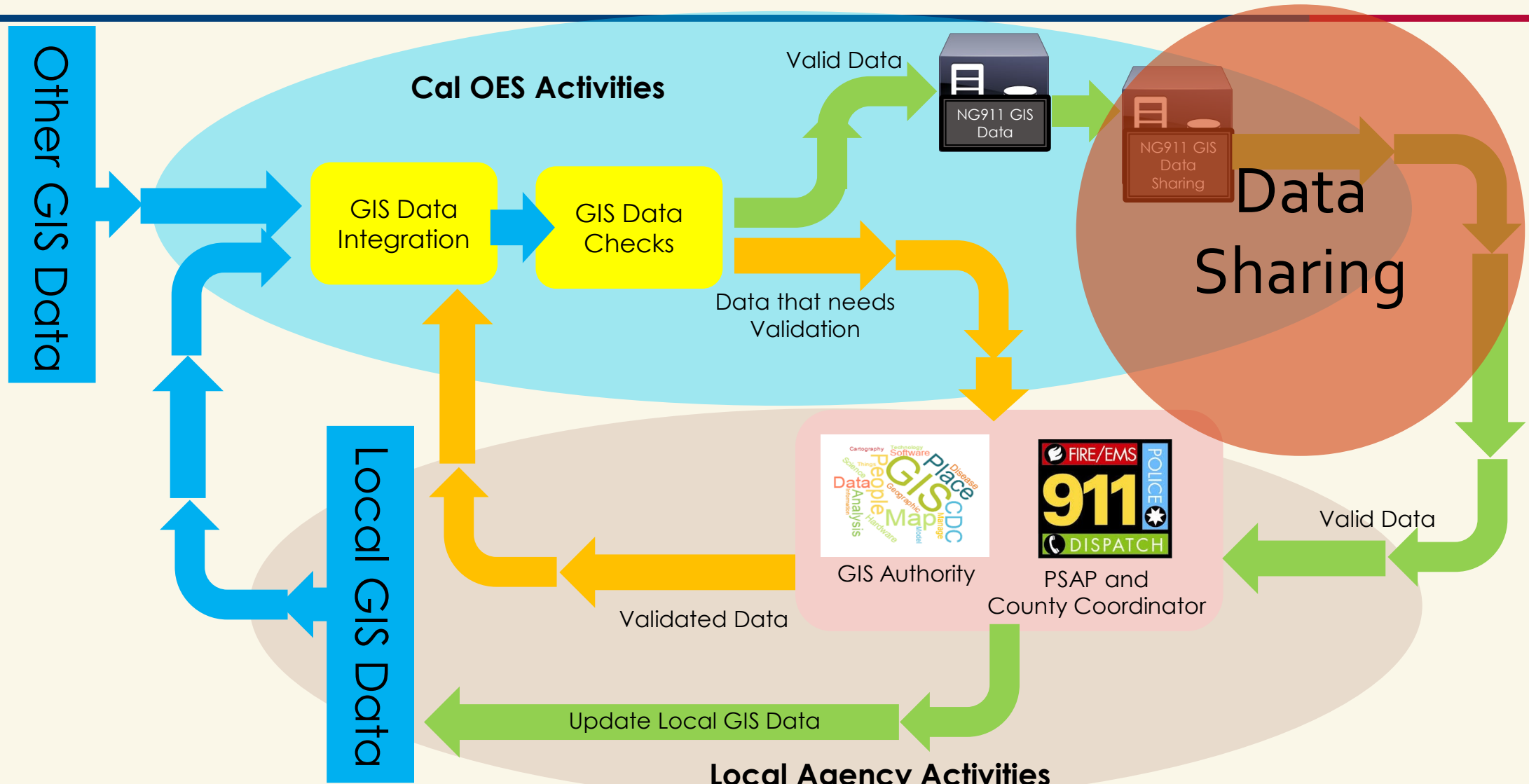


How NG9-1-1 uses updated location dataset





NG 9-1-1 GIS Workflow: Data Sharing





Data Sharing

- The NG 9-1-1 GIS dataset has been developed
- Working with Esri and NG 9-1-1 vendors to implement a data sharing process
- Data must be public before sharing
- Provides the ability for local agencies to use the data to update local GIS data
- Facilitates data integration with other agencies
- When will NG 9-1-1 be live in California?



Making GIS a reality for NG 9-1-1

- The work, strategies and implementation described in this presentation would not be possible without the 9-1-1 GIS Unit. Thank you for what you are doing!
 - Natasha Potter 9-1-1 GIS Unit Supervisor
 - Amanda Kabisch-Herzog 9-1-1 GIS DATA Analyst
 - Sam Sedgwick 9-1-1 GIS DATA Analyst
 - Nicole Philips 9-1-1 GIS Systems Analyst



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Follow and Further Discussion

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