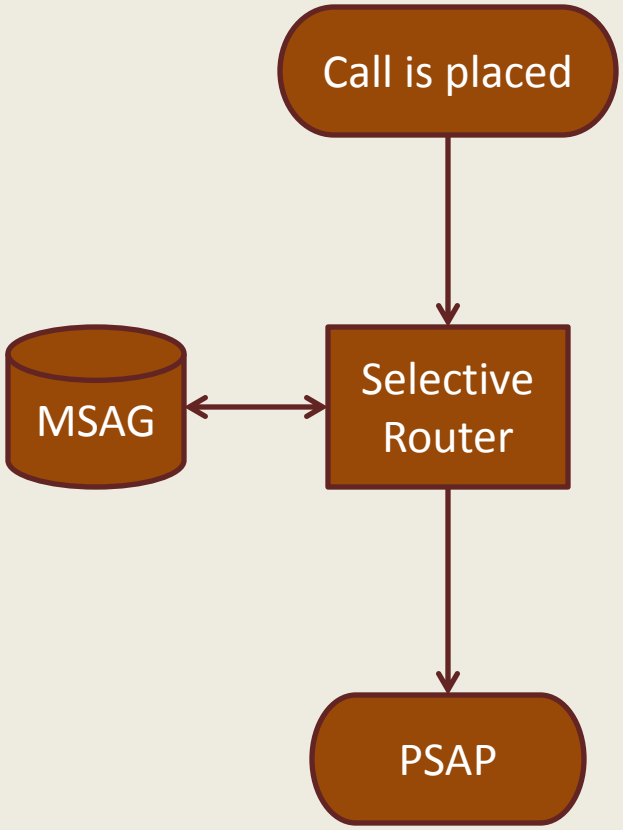
Kansas NG9-1-1 GIS Data Model

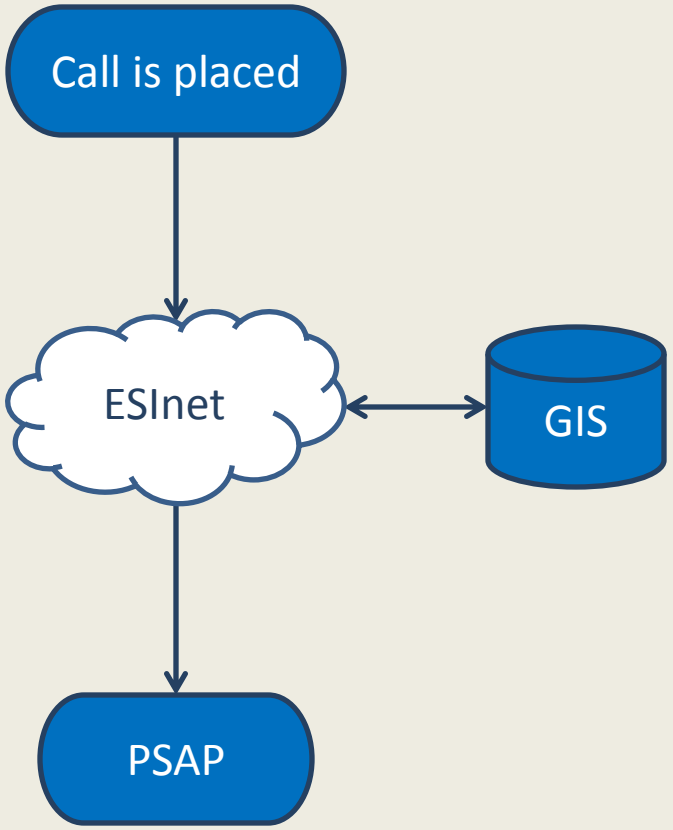
Model Standards and Data Remediation Workshop

NG9-1-1 Primer

E9-1-1


Call is placed
MSAG
Selective Router
PSAP

NG9-1-1


Call is placed
ESInet
GIS
PSAP

What's Driving NG9-1-1

- **Newer Technologies/Services**
  - Text, Image, Video, Telematics, Sensors, Subscriber Info
- **Improve Survivability**
  - Network Resilience, Virtual PSAPs
- **Improve Interoperability and Information Sharing**
- **Need to "Mainstream" 9-1-1 Technology**

How NG9-1-1 is Different

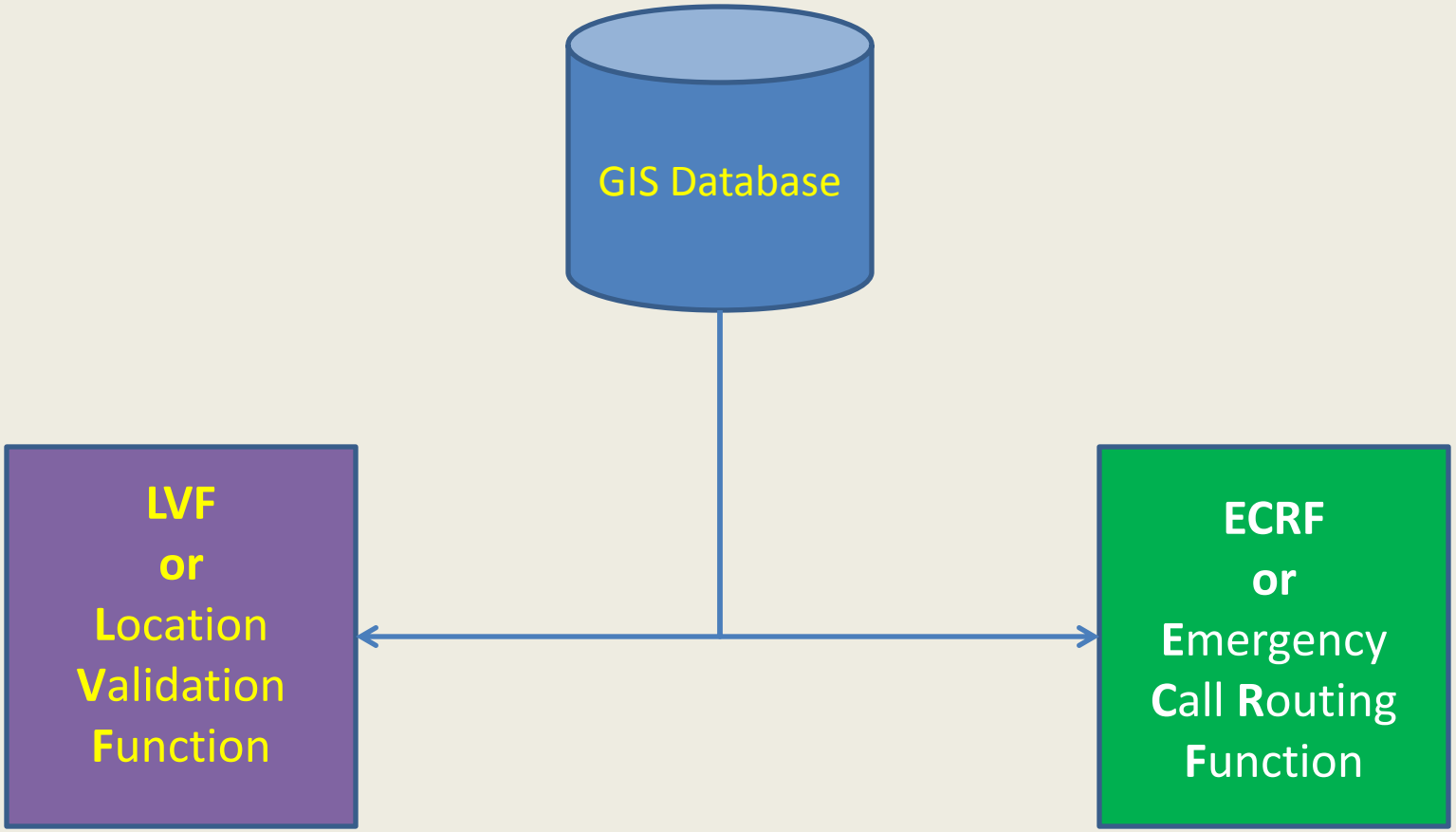
- **Technology:**
  - -Packet Based vs Circuit Switched

- **Functions:**
  - -Replicates E9-1-1 capabilities
  - -Adds new capabilities
  - -GIS vs Tabular MSAG

- **No longer a 'local' service:**
  - -Interoperability at county, region, state and national levels

NENA THE 9·1·1 ASSOCIATION

The Role of GIS in NG9-1-1



GIS and the LVF

GIS Database

Constantly updating the LVF*

The Service Provider has an address to check…

Is this address good?

Yes. Do your thing.

Or

No! Stop! Fix it!

Location
Validation
Function

…before installing a land line

…before accepting a VOIP location

…while testing existing records to be sure they are still good

** This is also called "provisioning through the SIF"*

A Next-Gen 9-1-1 Call

Someone dials 911

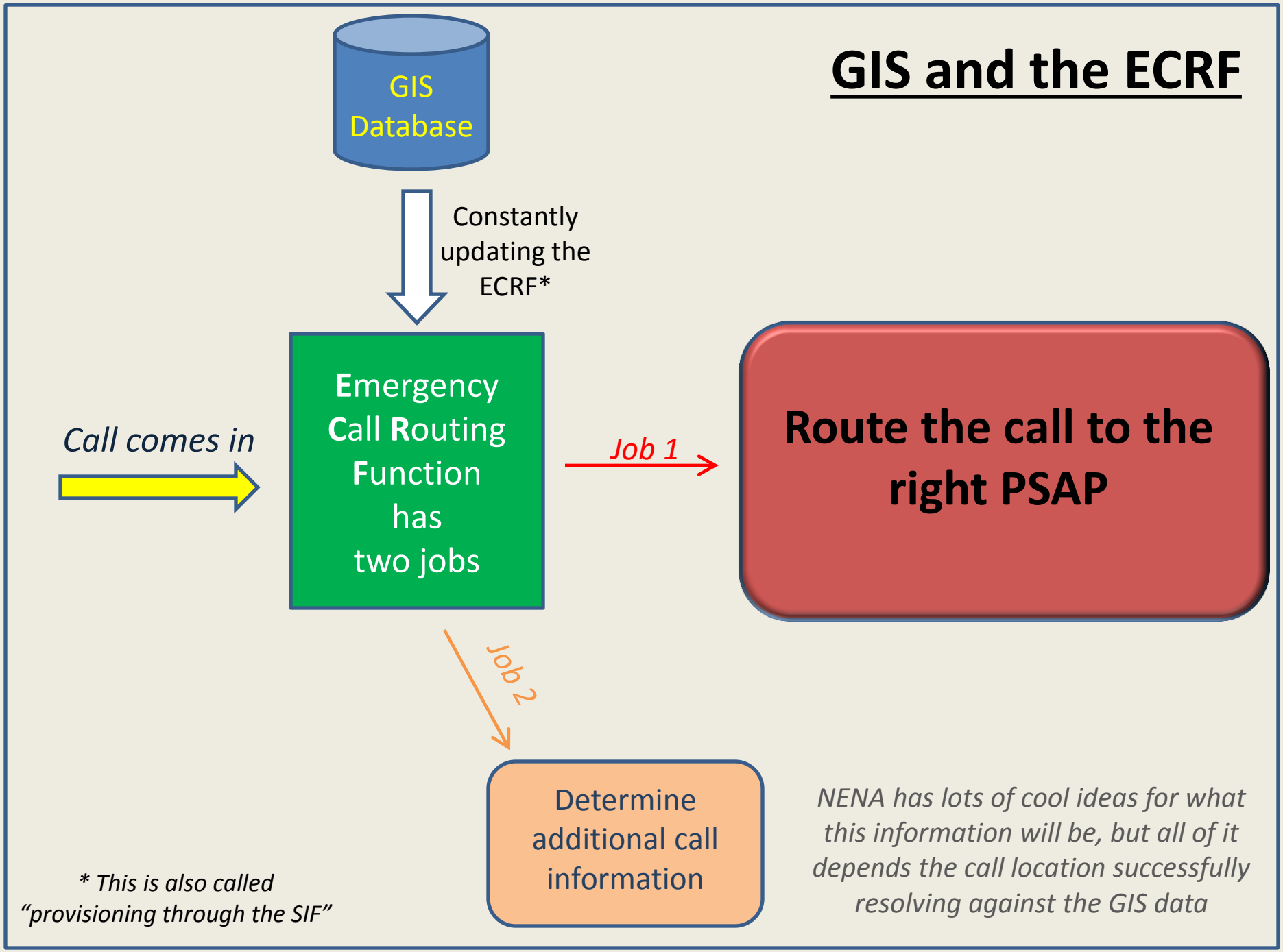
ESInet

ECRF

Lots of things happen in here. Fortunately, we only have to know about this one.

PSAP

GIS and the ECRF



NENA has lots of cool ideas for what this information will be, but all of it depends the call location successfully resolving against the GIS data

** This is also called "provisioning through the SIF"*

The ability to route emergency calls will depend on standardized GIS data that is both current and accurate

Kansas NG9-1-1 GIS Data Model

Document Conventions

- Requirements vs. Recommendations
  - "Shall" and "Must"
  - "Recommended" and "Preferred"
- Data stewards = Whomever is responsible for maintaining the data
- Data aggregation and the data aggregator

Authoritative Data Only

All features submitted by the data steward must be inside their authoritative boundary polygon(s)

General Attribute Standards

- The attribute type must match with the type in the standard
  - A = Alphanumeric = Text field
  - D = Date and time = Date field
  - N = Numeric = Integer field
  - ND = Numeric, Decimal = Decimal field
- Every attribute is listed as Mandatory, Conditional or Optional

General Attribute Standards, cont.

- Everything in the table must be there, and the fields should be in the same order
- If field names are different than in the standard, metadata must show how the fields map to the standard
- Every record must have a persistent unique identifier within the local data (not the ObjectID)
- If there is a domain, it represents the only valid values for the attribute

Road Centerlines - Geometry

- All public and addressed private roads
- Segments must be broken at:
  - Every intersection with another segment
  - Every State, County, Municipal, ESB and ESZ boundary
  - Any change in road name
  - Any change in surface type, if used
- Required to be on the road surface in aerial photography. Recommended within 10’ of the center.
- Line direction moves from low to high address

Fails to Meet Standard

Meets Minimum Standard

Meets Recommended Standard

Road segments created during grant-funded remediation must meet this standard.

Road Centerlines – Document Review

Attributes

Special cases in geometry

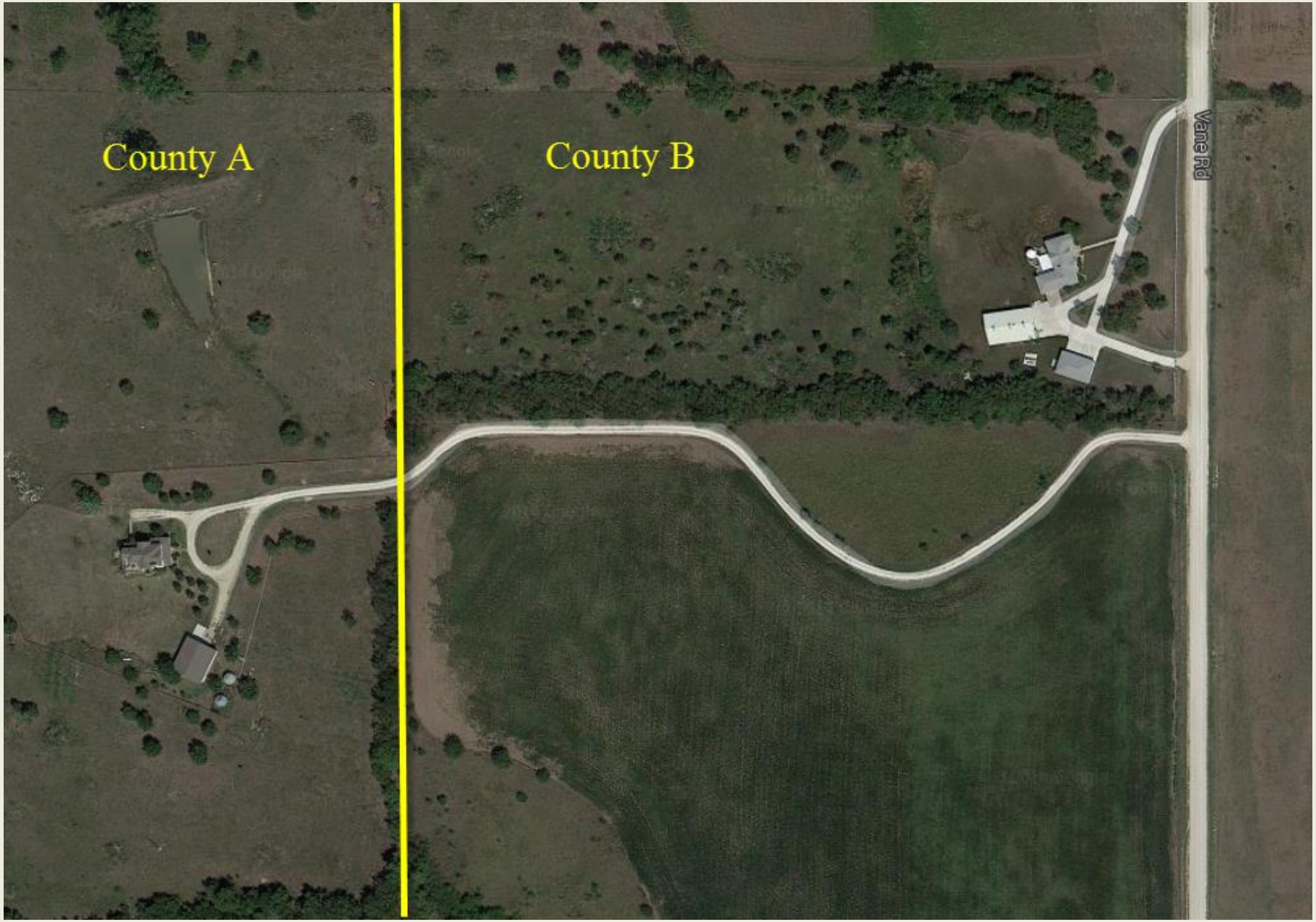
Summary of standards

Road Alias Table

- The Name field [RD] in the Road Centerline data must be the name used by the local addressing authority, even if that is not the most common name for a segment
- All State and Federal Highway designations must be in the table
- Any other common or uncommon name for the road segment may be in the table

Address Points

- All structures and sites with an assigned street address
- One point per occupancy (apartment, lot, store, camp site, etc)
- Points must be on the structure or site they represent , but remember to keep call routing in mind


County A
County B
Vane Rd

Authoritative Boundaries

- Polygons that represent the geographic area for which the data is authoritative
- Usually a county boundary or a city limit boundary

ESBs and ESZs

- Emergency Service Boundary
  - Polygon representing service areas for emergency service agencies.
  - PSAP, Law enforcement, Fire and EMS at a minimum, but could also include others like First Responders, Rescue, Special Tactical Units
- Emergency Service Zone
  - The area related to a particular ESN or Emergency Service Number
  - Should be the geometric union of law enforcement, fire and EMS service polygons

ESBs and ESZs: Why we need both

- The ESN and ESZ will eventually be obsolete, but they are very important today
- ESBs can represent more emergency service agencies and NG9-1-1 will be able to relay that information to call-takers

Topology for ESBs and ESZs

- Each Emergency Service Boundary layer must fill the Authoritative Boundary polygons completely with no gaps and no overlaps
- If a combined ESB layer is used, the PSAP, LAW, FIRE and EMS fields must be complete for every feature
- The Emergency Service Zone layer must fill the Authoritative Boundary polygons completely with no gaps and no overlaps

MSAG Remediation

- The Gap Analysis includes a comparison between the road centerline file and the MSAG for the jurisdiction
- Remediation vendors will produce a specially formatted spreadsheet with the changes that need to be made in the MSAG
- It will be the responsibility of the local MSAG Coordinator to get the changes into the MSAG*

Working with the Telephone Co's

- AT&T
  - MSAG Edits
    - AT&T will directly enter complex edits, but Counties will need to enter the simple edits via the web interface
  - Providing Customized Training
  - TN Corrections can be submitted via email
- CenturyLink
  - If a county has 25 or fewer edits, they'll need to use the web interface to submit them
  - Counties with more than 25 edits will be able to submit changes via the spreadsheet.

Grant-funded Remediation

- Phase 1: Road Centerlines, Road Alias Table, Address Points, Authoritative Boundaries, Emergency Service Boundaries, Emergency Service Zones
- Phase 2: Cell Sites and Sectors, Emergency Service Agency Locations, Municipality Boundaries, Municipality Divisions, Neighborhoods, Counties and States

What will grant money pay for in Phase 1?

- Correcting all Phase 1 data layers for proper placement, topology and attribution
- Creating the features needed to complete the Phase 1 data layers
- MSAG Change Reports

What can get created with funding?

- Road Centerlines
  - Public Roads
  - Addressed Private Roads
- Road Alias Table
  - Highways
  - Anything provided by the PSAP
- Address Points
  - The “primary” point for any addressed structure or site
- ABs, ESBs, ESNs
  - Any needed feature

What will not be funded?

- CAMA correction
- Centerlines for driveways and other private roads that are not addressed
- Features outside the Authoritative Boundary polygons
- Travel or research time for populating attributes or records considered optional
- Entry of the MSAG changes into the telephone company system

Important Websites

DASC NG9-1-1 Page

http://www.kansasgis.org/initiatives/NG911/index.cfm

Kansas 911 Coordinating Council GIS Page

http://www.kansas911.org/108/Geographic-Information-Services

Thank you

GIS Subcommittee

Kansas 911 Coordinating Council