Ongoing Maintenance Workshop

Kansas NG9-1-1 GIS Program

Ongoing Maintenance Training

- Primer on NG9-1-1
- Overview of the Kansas NG9-1-1 GIS Program
- Kansas NG9-1-1 GIS Data Model
  - The Authoritative Boundary
  - Address Points
  - Road Centerlines
  - Road Alias Table
  - Emergency Service Boundaries
  - Emergency Service Zones
  - County and Municipal Boundaries
  - Common Questions and Problem Areas
- Data Maintenance Strategies and Techniques

Why are we here?

Because NG9-1-1 requires GIS Data that is both accurate and current in order to function.

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

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

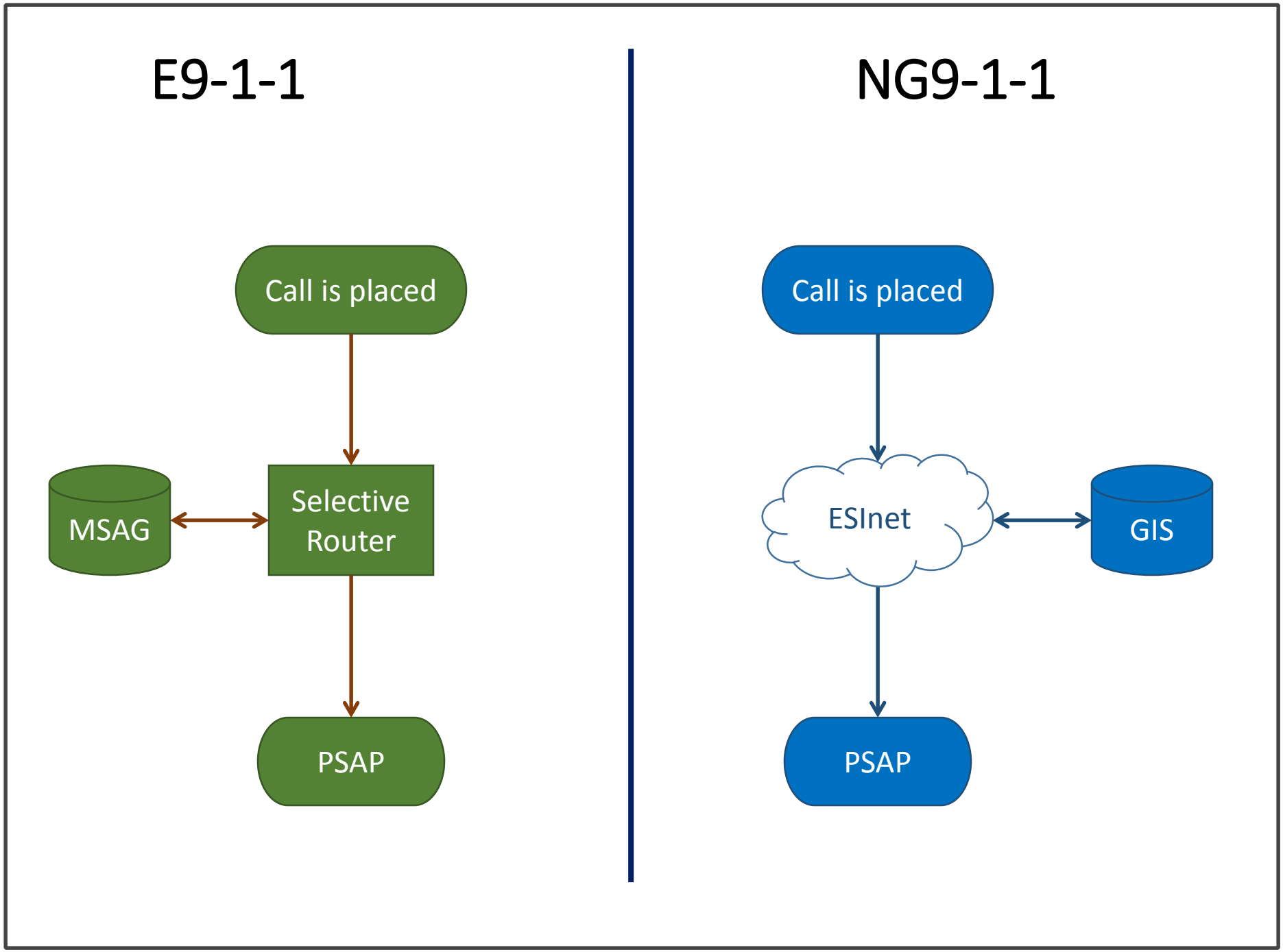
The Big Difference

The MSAG

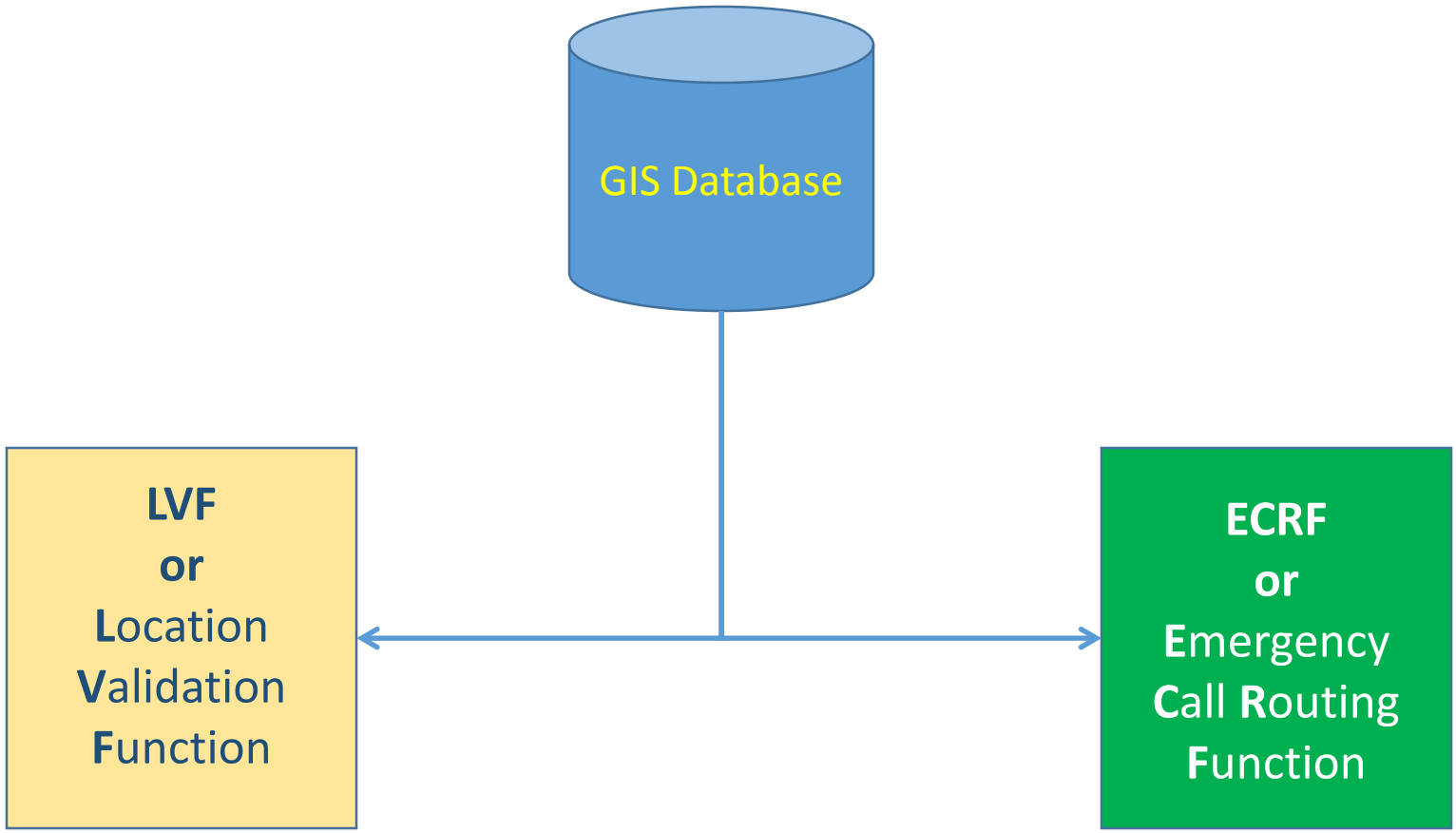
is replaced by

The GIS Database

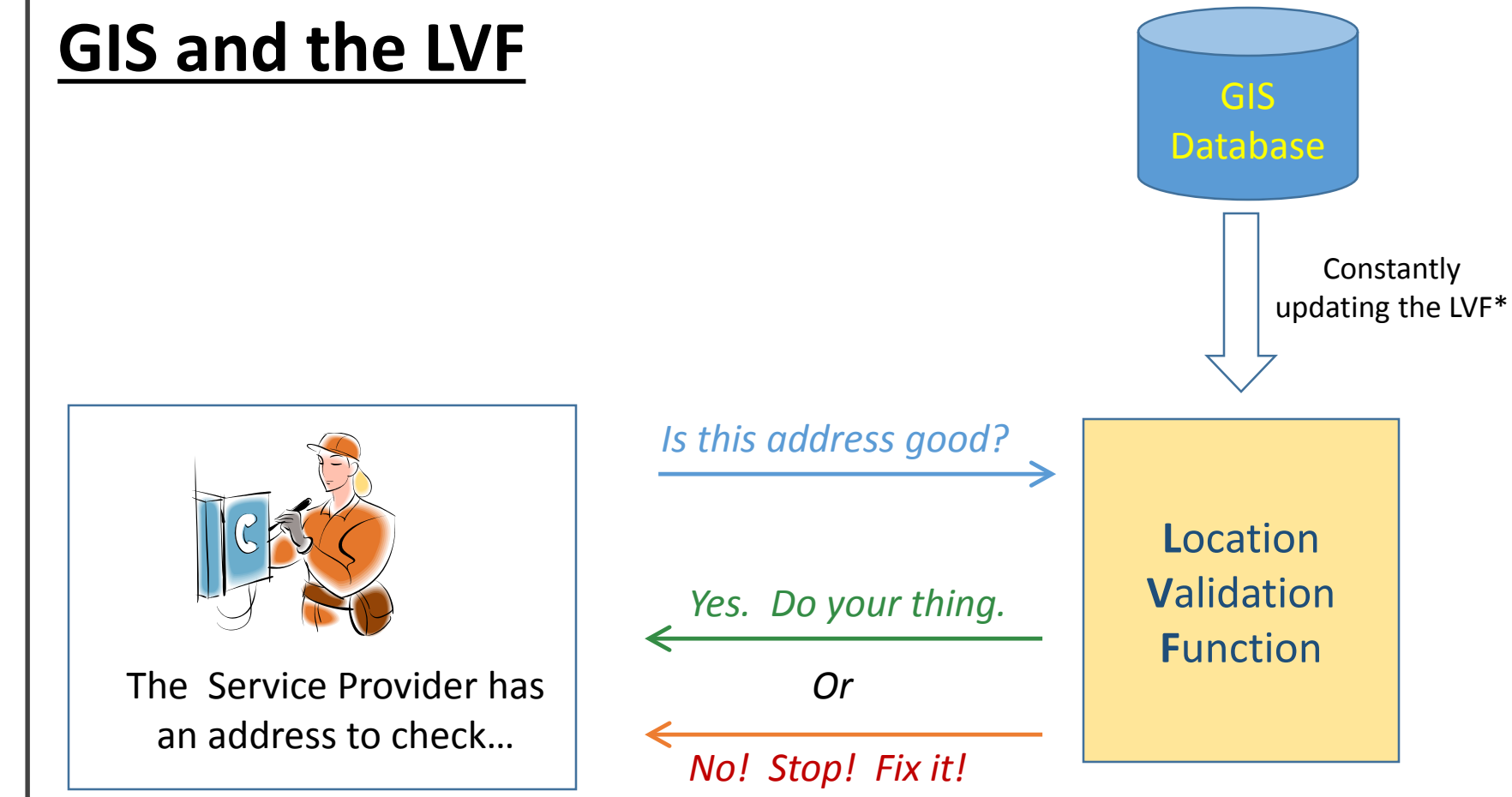
NG9-1-1 Primer


E9-1-1
Call is placed
MSAG
Selective Router
PSAP
NG9-1-1
Call is placed
ESInet
GIS
PSAP

The Role of GIS in NG9-1-1



GIS and the LVF



A Next-Gen 9-1-1 Call

Someone dials 911

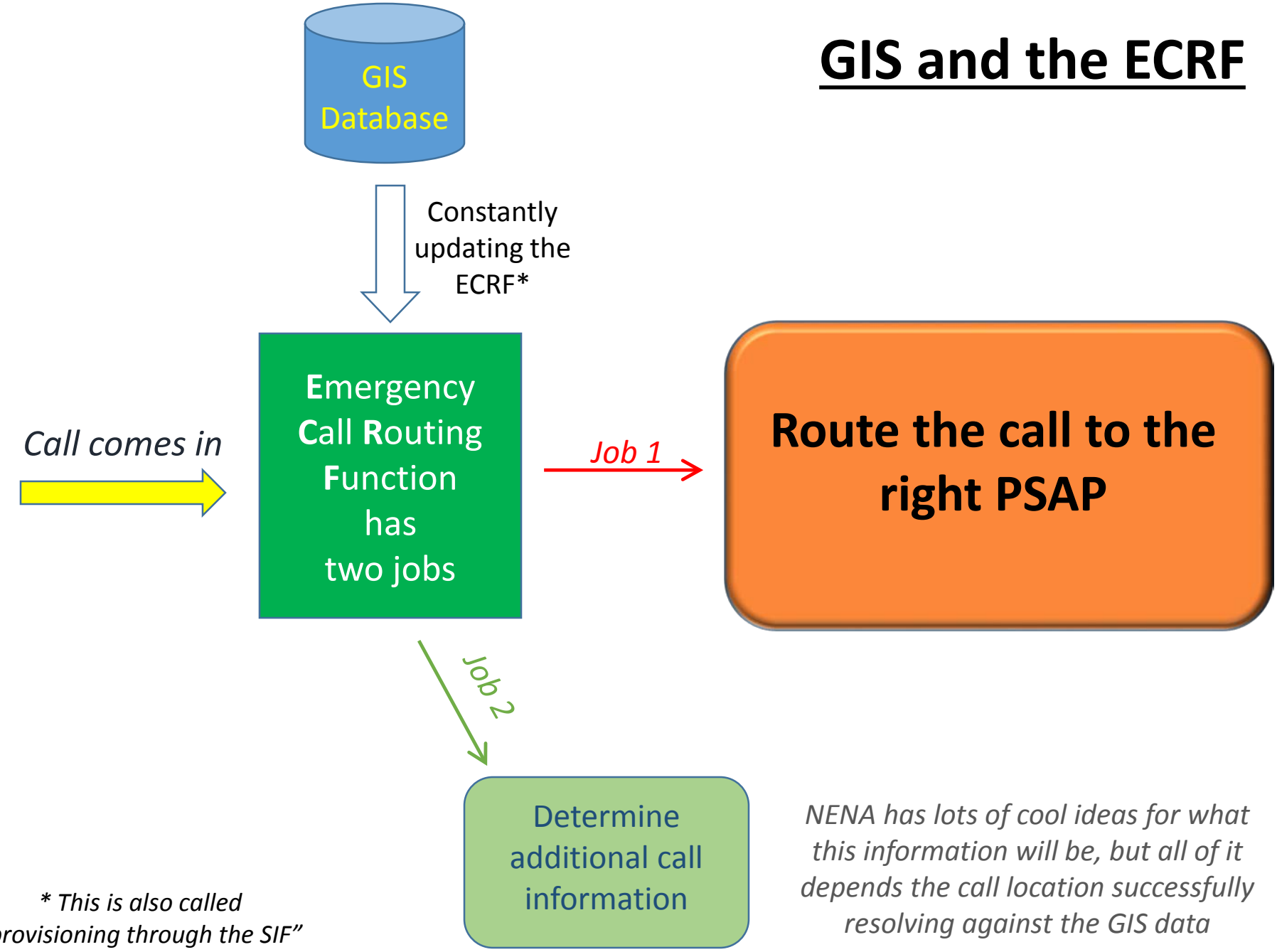
ESInet

ECRF

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

PSAP

GIS and the ECRF



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

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

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

Kansas NG9-1-1 GIS Program

Kansas NG9-1-1 GIS Program Goals

1. Create a shared GIS database for all counties that meets national NG9-1-1 standards.

2. Keep it up to date

911 Council GIS Subcommittee

- Recommends GIS data standards and protocols for use by PSAPs, telecomm carriers, and GIS service providers
- Oversees RFP's issued on behalf of the Council and recommends selection of vendors and services
- Provides oversight of GIS service contracts approved by the Council
- Coordinates work of GIS providers with PSAPs and other stakeholders
- Coordinates state level NG911 database administration with database administrator and NG911 stakeholders

GIS Subcommittee

Chairman Ken Nelson
Randall White, CC
Scott Ekberg, CC

Eileen Battles, DASC
Eamonn Coveney, Ellis
Kyle Gonterwitz, KDOT
Saralyn Hayes, MARC
Sherry Massey, Dickinson
John Rogers, Sedgwick
Keith Shaw, Johnson
Mark Whelan, Johnson

GIS Subcommittee Activities

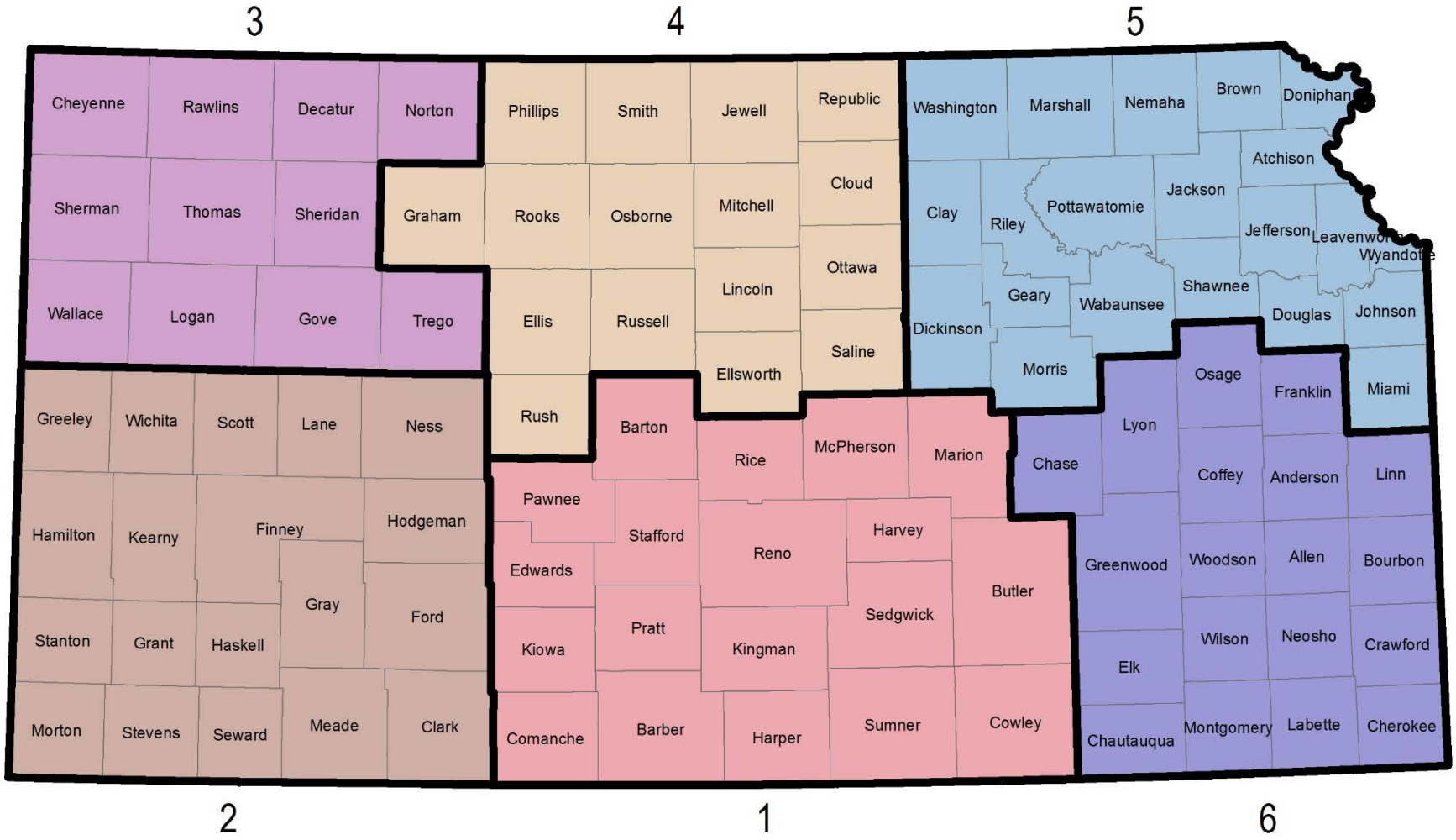
- Work with selected vendors on the GIS Data Gap Analysis & Remediation
- Develop *Kansas NG9-1-1 GIS Data Model* to support Project B remediation activities and ongoing maintenance activities
- Document business needs and RFP specifications for statewide imagery
- Develop and recommend aggregation & maintenance strategies for statewide master repository
- Coordinate with technical committee and others to develop a training to support the operation/maintenance of NG9-1-1 GIS components
- Develop GIS-related portions of the 911 Council's *Governance Policy*

GIS Enhancement Project

Three phase project with the modest goal of making sure that all PSAPs in Kansas have current, accurate GIS data that meets NG9-1-1 standards

- Project A – Gap Analysis
  - Existing data is evaluated
- Project B – Data Remediation
  - Data is brought up to date and in line with standards
- Project C – Quality Assurance
  - Remediated data is re-evaluated to confirm that it meets standards

Kansas NG9-1-1 GIS Project Regions



Data Aggregation

- What is it?
  - Pulling all the data into a single database with reasonable alignment between counties
- How are we going to do it?
  - We're working on that one
- What's the plan for now?
  - Pilot project to determine what the challenges might be
  - Evaluate options after the pilot is finished

Ongoing Maintenance

The Goal:

To make sure the Master GIS Repository

stays accurate and current

Ongoing Maintenance – The CC's Role

- Aggregating, storing and serving out the data
- Providing training in the policies and procedures surrounding the Master GIS Repository
- Providing training on meeting the GIS data standards
- Monitoring and maintaining NG9-1-1 GIS data standards as well as the policies and procedures of the GIS Program
- Providing outreach to help educate local officials on the importance and details of the program
- Communicating about everything

Ongoing Maintenance – Data Stewards

- Submitting changes in their NG9-1-1 GIS data to keep the Master GIS Repository continually updated
- Adhering to the policies and procedures of the GIS Program
- Communicating any concerns or suggestions about the GIS Program
- Keeping contact information up-to-date

Kansas NG9-1-1 GIS Data Model

Authoritative Data Only

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

General Attribute Standards

- Every attribute is listed as Mandatory, Conditional or Optional
- 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

Data Storage Formats

- Maintaining the topology and adhering to the domains are the keys to selecting a storage format
- Allowable formats for the submission of updates have not been determined

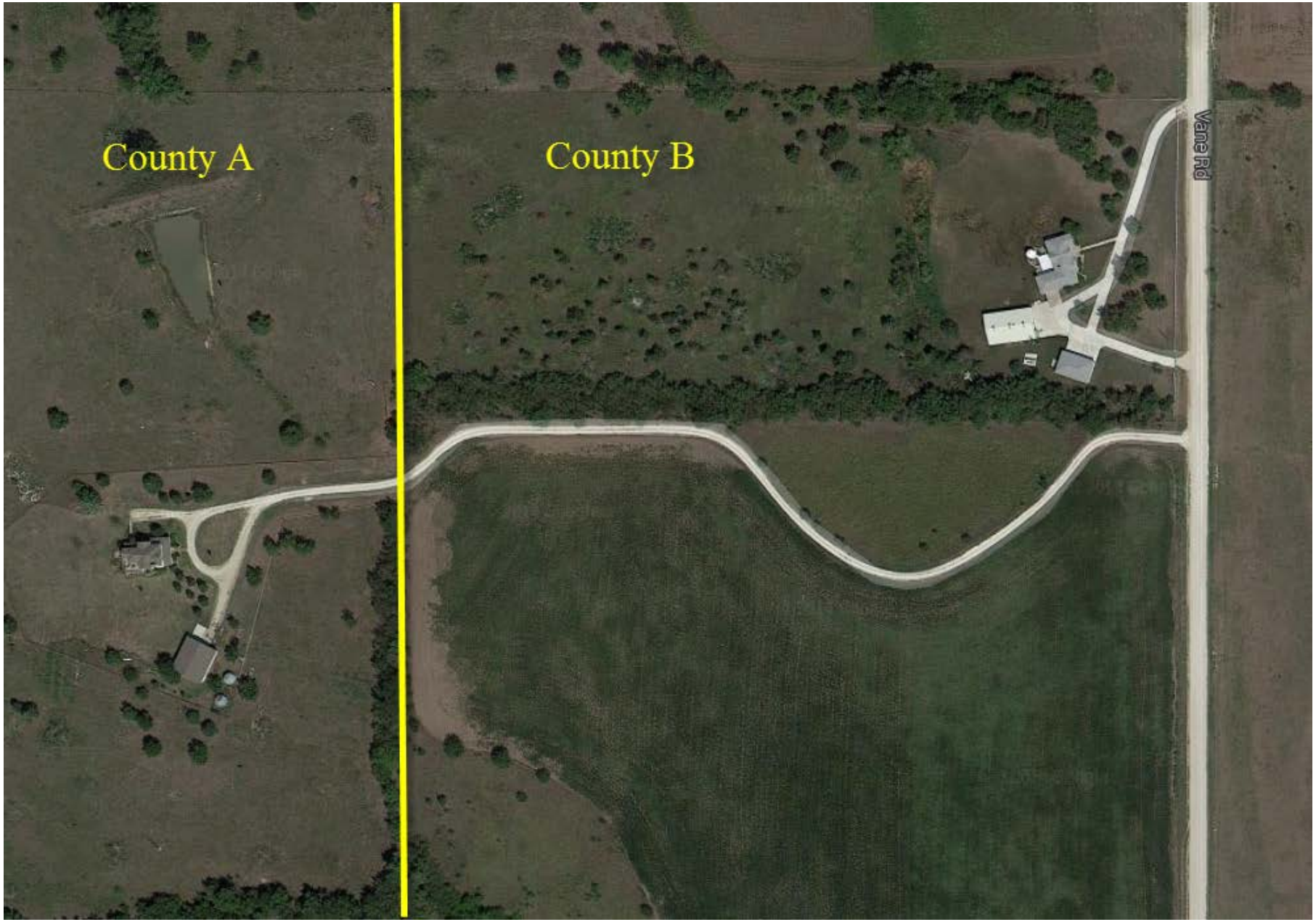
The GIS Subcommittee recommends using the Kansas NG9-1-1 Template Geodatabases in the Esri file geodatabase or SDE geodatabase format maintained with an ArcGIS Desktop Standard or Advanced license

Authoritative Boundaries

- Polygons that represent the geographic area for which the data is authoritative
- Usually a county boundary or a city limit boundary, but not always

Address Points

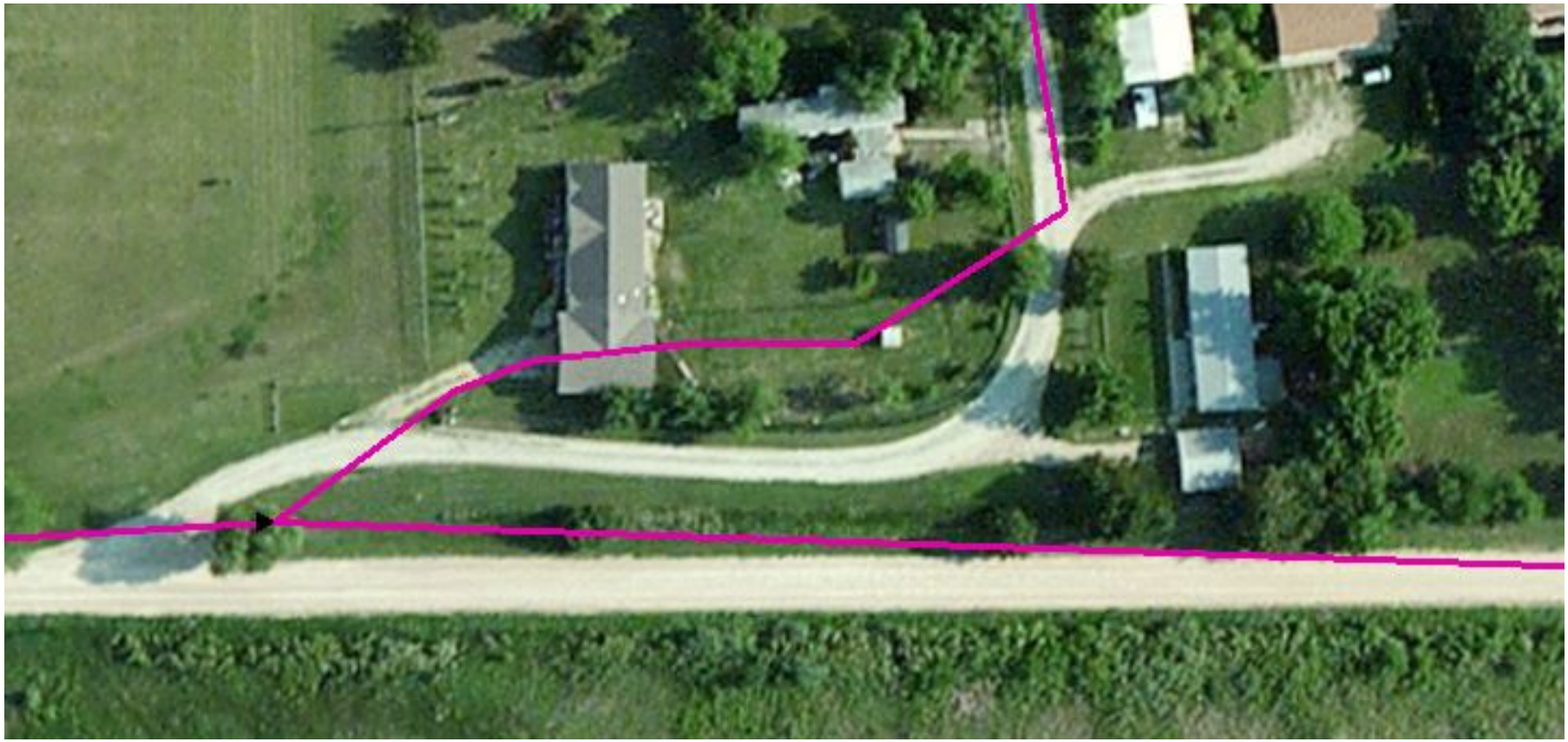
- All structures and sites with an assigned street address
- One point per occupancy (apartment, lot, store, camp site, etc)
- Points must be on the structure or site they represent , but remember to keep call routing in mind


County A
County B
Vane Rd

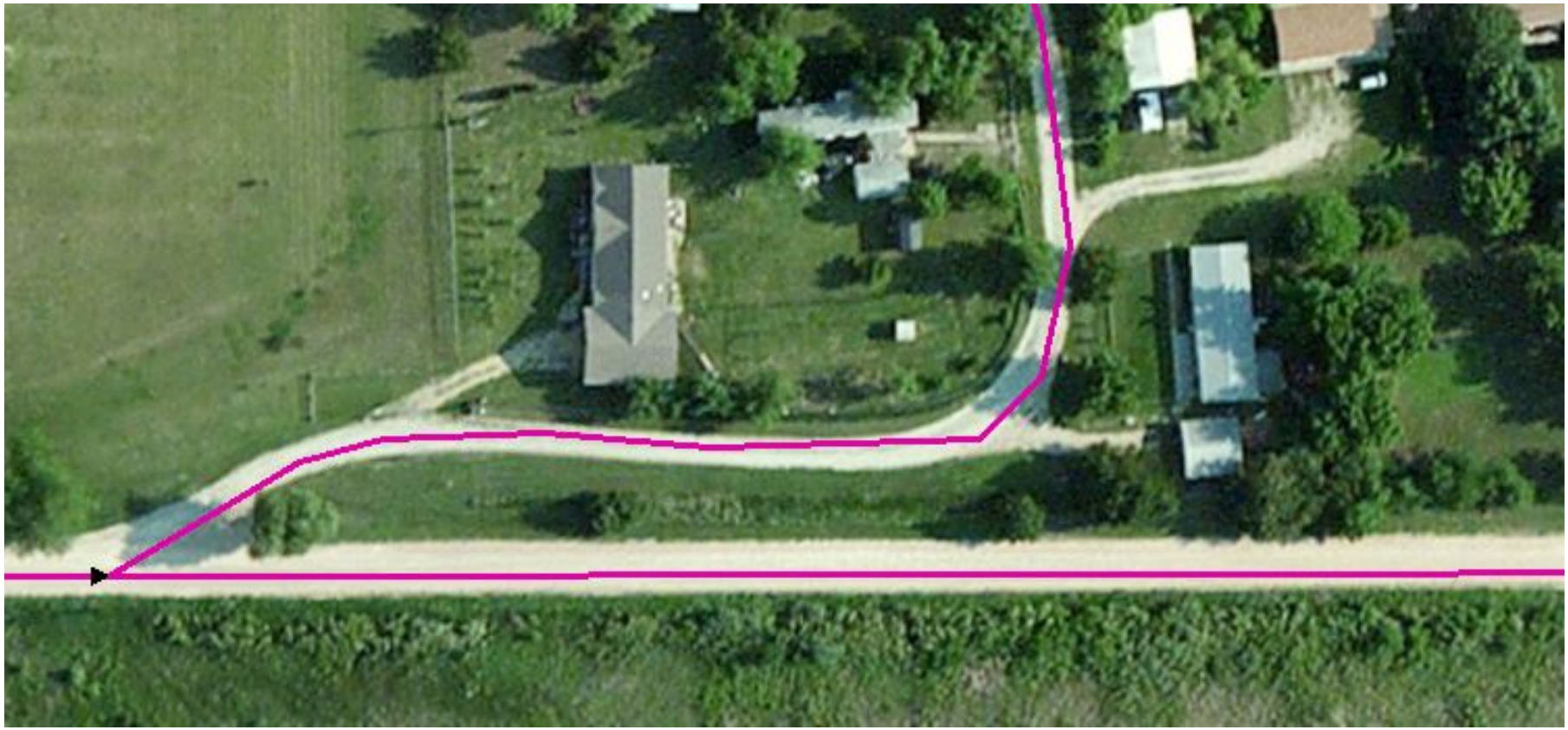
Road Centerlines - Geometry

- 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 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

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

Common Questions and Problem Areas

Address Points

- When the address point and the centerline don’t match
- When there is no structure
- When you know there are multiple units but you don’t know the unit numbers/letters/etc.

Road Centerlines: Left, Right and Center

- Left and Right attributes do not mean to left and right of the centerline. They mean left and right of the road right of way.

- ESN_C is only used if the actual right of way is in a different ESN than the land outside the road right of way, and then only if you want or need to use it.

Boundaries

- Border Roads
  - Segments that should be in your Authoritative Boundary but aren't
  - All those other county attributes
- Cities that are in two or more counties
- Fun with Fire District Boundaries
  - Response Districts vs. Taxing Districts
  - One area, two fire departments or one fire department, two counties
  - Does the fire district boundary follow the section line or the road centerline?

Data Maintenance

Strategies and Techniques

1. Use the Template Geodatabases

- NG9-1-1 has a lot of requirements
- The templates provide a common language
- Remediated data is most likely already in that format
- Support is available (tools, training, etc.)
- You can export the data in different formats to accommodate other applications

2. Customize the Domains

- Remove irrelevant items
- Change the Coded Value descriptions to suit your taste
- Set Split and Merge policies

3. Set Defaults

- Set default values inside Domains
- Control default values with Feature Templates

4. Get Comfortable with the Topology

- Understand the Rules
- Use the Error Inspector - Make it your friend
- Find tools to help
  - Tracing features
  - Showing vertices with ET GeoTools (http://www.ian-ko.com/)

5. Convert data when and how you need it

- Feature Class to Feature Class tool
- Use the Expression option to select specific records or a specific Subtype
- Use the Field Map to set things up just how you need it
  - Add and delete fields
  - Change names
  - Change order
  - Create concatenated fields
  - Create statistical fields

5. Convert data, part 2

- Once you have the export working the way you want, make a model out of it
- Keep a toolbox in your geodatabase to store the models

- If you need them done regularly and feel comfortable with Python and Windows Scheduled tasks, you can even set them up to run automatically

Wrap Up

- Ongoing Maintenance is necessary to NG9-1-1
- Ongoing Maintenance is supported by the Kansas 9-1-1 Coordinating Council, but fueled by you
- Document your boundary changes
- Keep your contact information up to date
- If you need help or just want a second opinion, we are here
- This class will be offered again regularly

Important Websites

DASC NG9-1-1 Page

http://www.kansasgis.org/

Kansas 911 Coordinating Council GIS Page

http://www.kansas911.org/

Thank you

GIS Subcommittee

Kansas 911 Coordinating Council