NEXTGEN 911 AND GIS

Edward Reuter, IN 911 Board Executive Director
Aaron Shaw, IPSC GIS Administrator

Agenda

- Introductions
- Background
- Governance
- Goals of NG 9-1-1
- Role of GIS in NG 9-1-1
- Support Relationships
- Road Forward
  - Baseline
  - Strategy
    - Objectives
    - Timeline

Introductions

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Background

- Different types of 911 Technology

Basic 911
- Originated in 1968
- Caller provides address verbally to 911 operator
- No Phone Number or Address is displayed to 911 Operator
- Voice Calls are routed by ??? To Dispatch

Enhanced 911 (E911)
- Calls sent to PSAP with callers name and phone # displayed
- ALI database determines routing based on address of caller
- MSAG database provides specific address to be displayed
- Mandated in 1999
- Calls are routed based on address analysis to appropriate emergency dispatch

Wireless E911
- Calls routed based on cell tower location
- Location of handset transmits more accurate latitude and longitude during call
- Calls are routed based on cell tower or antenna being used for call to appropriate emergency dispatch

VoIP 911
- Calls sent to emergency dispatch with caller's name and phone number displayed to 911 Operator
- VoIP Position Center analyses latitude and longitude of address to determine routing to correct emergency dispatch
- MSAG database is only used for display purposes, not routing determination
- Mandated by FCC in 2005 for Interconnected VoIP providers
- Calls originate as VoIP and routed to appropriate emergency dispatch

Next Generation 911 (NG911)
- Calls sent to emergency dispatch entirely over IP bypassing PSTN
- Location determined & transmitted at the time of call
- Uses PIDF-LO (Presence Information Data Format-Location Object), a standard that's used to represent an address/location in XML format.
- All-VoIP connection enables photos, video, and text messaging

Indiana: 9-1-1 Perspective

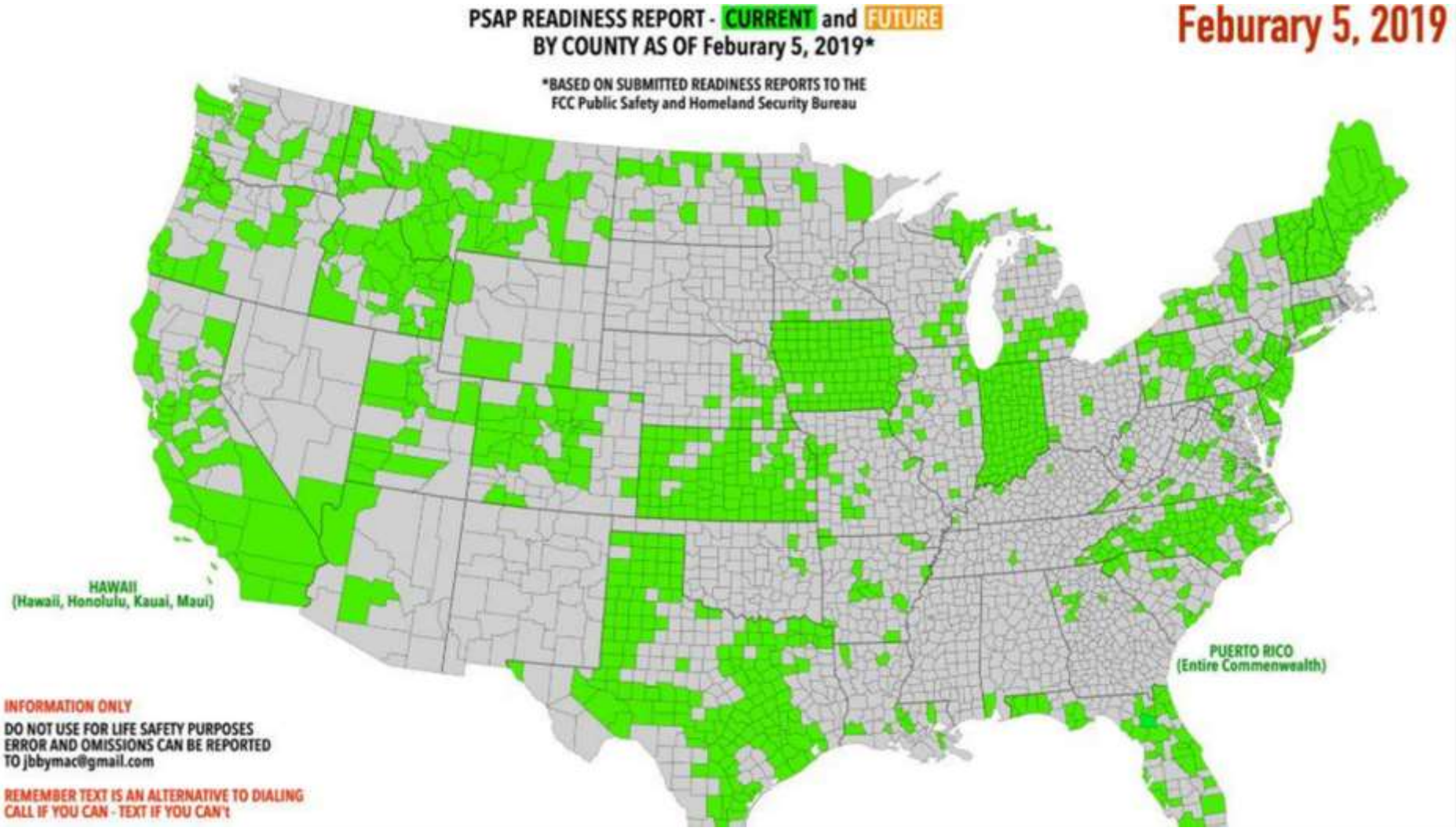
- March 1, 1968 - First 911 call in Indiana to Huntington County.
- 1998 - First Phase I wireless 911 call.
- 2001- Lake County 2nd county in nation to receive wireless 911 calls.
- 2019
  - 122 PSAPs
    - 91 County PSAPs
    - 25 Secondary PSAPs
    - 6 ISP Regional Dispatch Centers
  - CAD Software
    - Caliber
    - Motorola
    - New World (Tyler)
    - Spillman
    - Other

Text to 911

- The Board pays **$740,000** annually for Text to 911 Services for 92 counties.
- Indiana leads the nation in the use of this system.
- **215,784** text sessions 2018
  - 13,070- text sessions **to** 911
  - 202,714- text sessions **from** 911

IN911 Statewide 911 Board

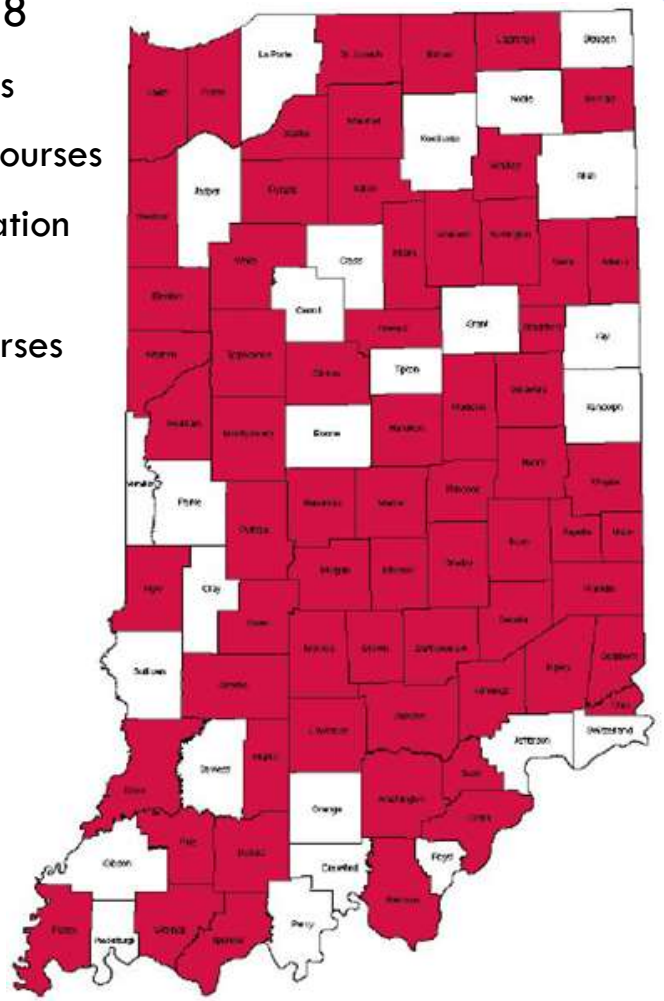
Text to 911


PSAP READINESS REPORT - CURRENT and FUTURE
BY COUNTY AS OF Feburary 5, 2019*
Feburary 5, 2019
*BASED ON SUBMITTED READINESS REPORTS TO THE
FCC Public Safety and Homeland Security Bureau
HAWAII
(Hawaii, Honolulu, Kauai, Maui)
PUERTO RICO
(Entire Commenwealth)
INFORMATION ONLY
DO NOT USE FOR LIFE SAFETY PURPOSES
ERROR AND OMISSIONS CAN BE REPORTED
TO jbbymac@gmail.com
REMEMBER TEXT IS AN ALTERNATIVE TO DIALING
CALL IF YOU CAN - TEXT IF YOU CAN'T

Training?

- Introduced in January of 2015 and effective July 1, 2015, the objective of IC 22-14-2-6 was to provide fire fighting and emergency services with cost effective, volunteer training opportunities.
- The Statewide Board approved the recommended minimum training guidelines for telecommunicators in December of 2017.
  - The Statewide 911 Board has earmarked $1.5M in funds to provide certified basic training for telecommunicators in Indiana.

- Since January 2018
  - Certified Courses
  - Recertification Courses
  - Continuing Education Courses
  - Supervisory Courses
  - CTO Courses
  - CMCP Course



MEVO/Disaster Recovery Services

- The MEVO system provides a backup 911 call delivery.
- The Board pays approximately **$224,000** each year for MEVO services.

What is Next Generation 911?

- A system comprised of hardware, software, data and operational policies and procedures briefly described to:
  - Provide standardized interfaces from call and message services
  - Process all types of emergency calls including non-voice (multi-media) messages
  - Acquire and integrate additional data useful to call routing and handling
  - Deliver the calls/messages and data to the appropriate PSAPs and other appropriate emergency entities
  - Support data and communications needs for coordinated incident response and management
  - Provide a secure environment for emergency communications

https://cdn.ymaws.com/www.nena.org/resource/resmgr/ng9-1-1_project/whatisng911.pdf

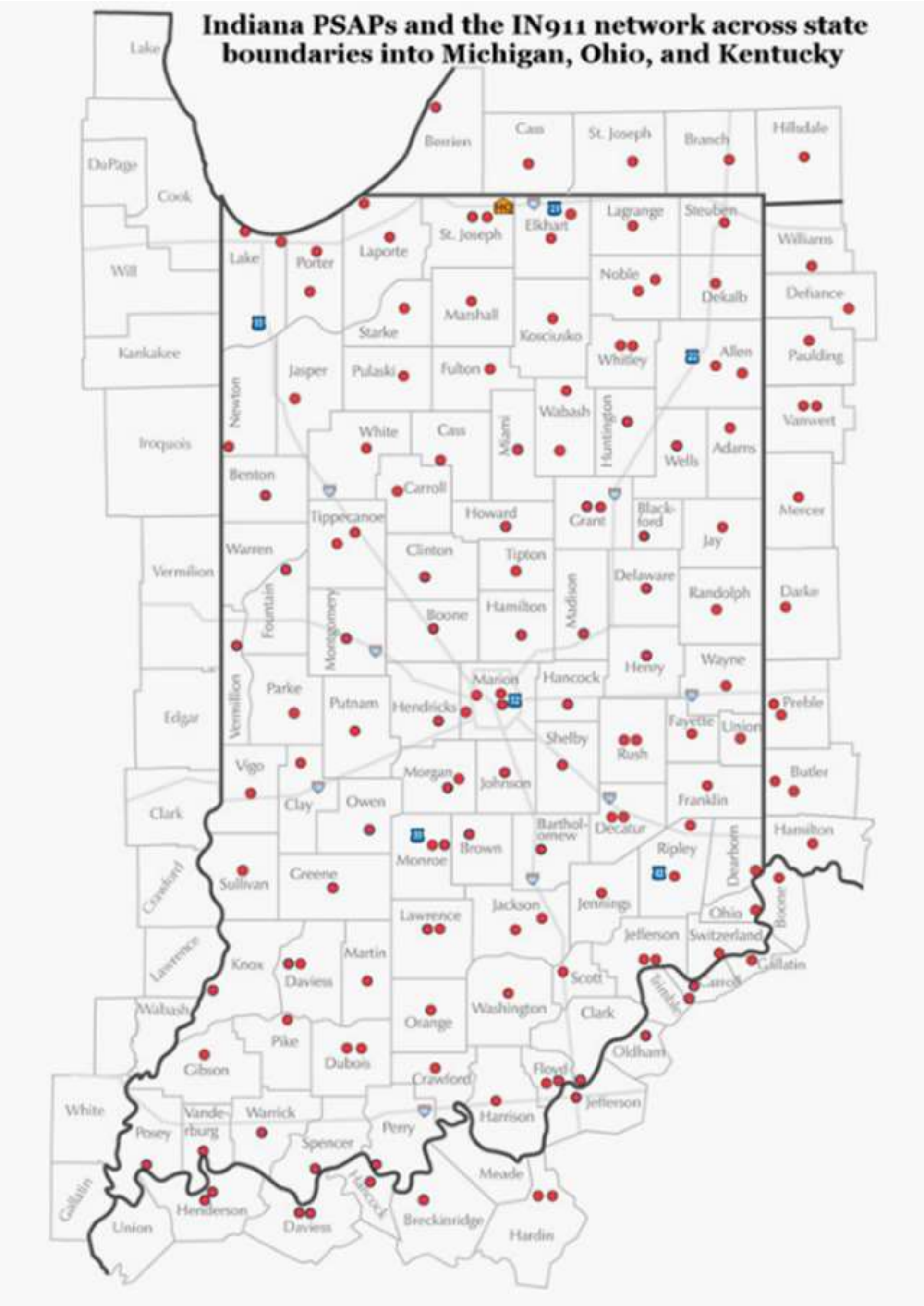
Building Block of NG9-1-1

- ESI Net: Emergency Services IP Network
  - broadband technology capable of carrying voice and large amounts of data using Internet Protocols and standards.
  - Hierarchical (network of networks) in a tiered design approach to support local, regional, state and national emergency management authorities.

Building Block of NG9-1-1

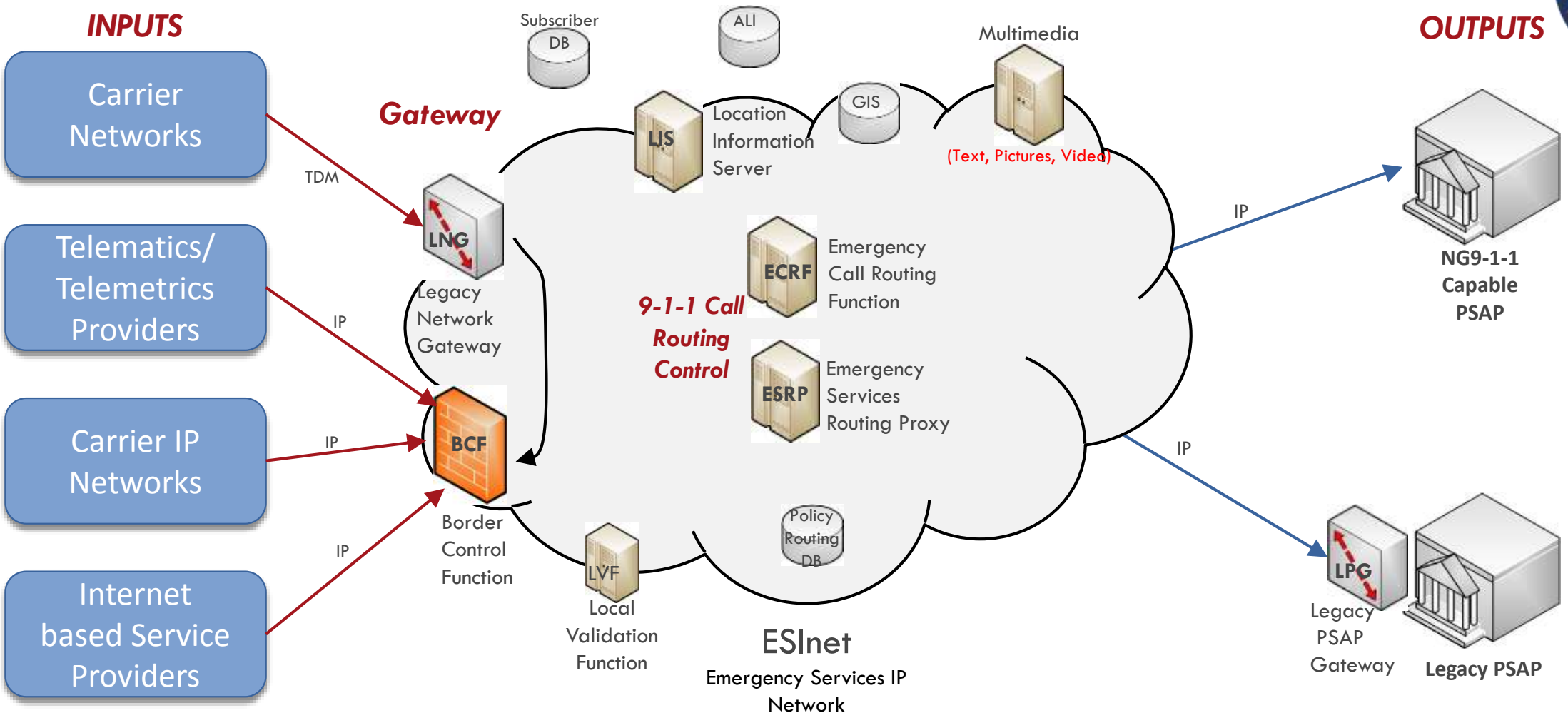
- Since 2005 Indiana- single redundant ESInet statewide network
- Serving 122 PSAPs.
- By 2020 will have two redundant ESInet statewide networks for NG911.
- Annual cost for the statewide deployments is **$17.5 million**.

ESInet

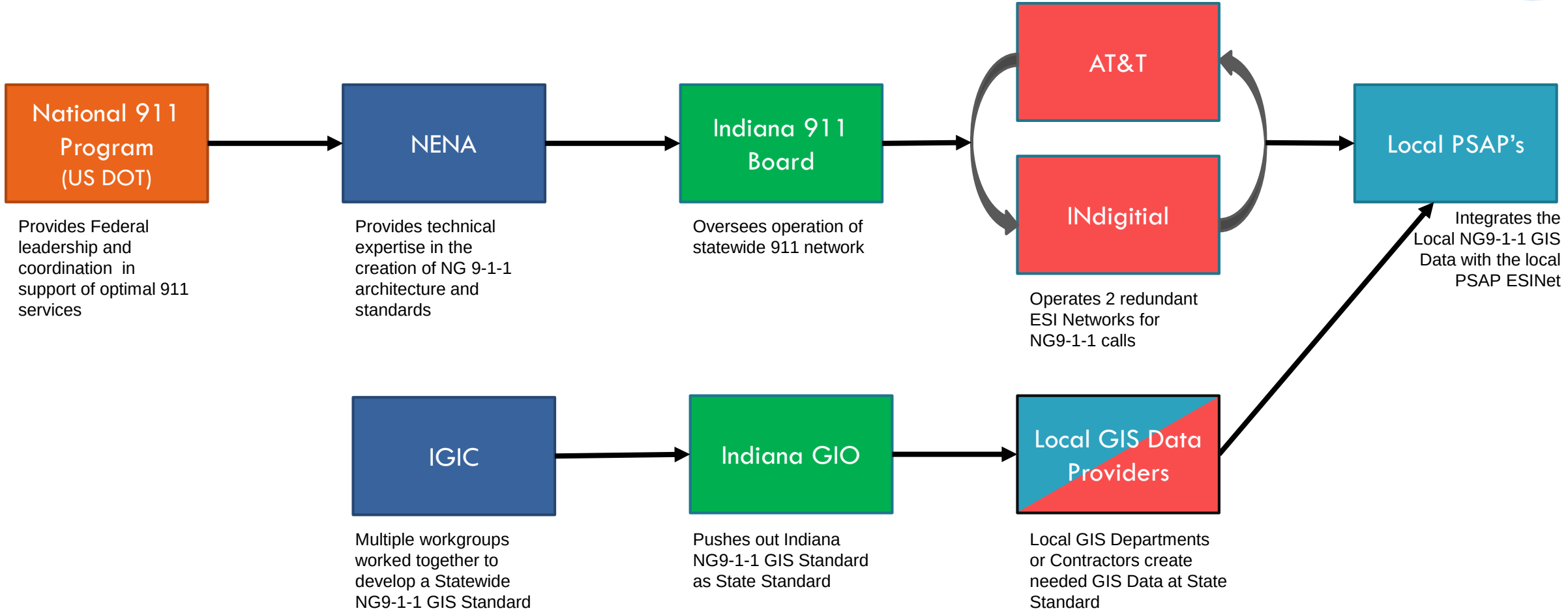


Indiana PSAPs and the IN911 network across state boundaries into Michigan, Ohio, and Kentucky
Lake
DuPage
Cook
Will
Kankakee
Iroquois
Vermilion
Edgar
Clark
Crawford
Lawrence
Wabash
White
Gallatin
Union
Berrien
Cass
St. Joseph
Branch
Hillsdale
Williams
Defiance
Paulding
Vanwert
Mercer
Darke
Preble
Butler
Hamilton
Boone
Gallatin
Lake
Porter
Laporte
St. Joseph
Elkhart
Lagrange
Steuben
Noble
Dekalb
Starke
Marshall
Kosciusko
Whitley
Allen
Jasper
Pulaski
Fulton
Newton
White
Cass
Miami
Wabash
Huntington
Wells
Adams
Benton
Carroll
Howard
Grant
Black-ford
Jay
Tippecanoe
Warren
Clinton
Tipton
Delaware
Randolph
Fountain
Montgomery
Boone
Hamilton
Madison
Henry
Wayne
Vermillion
Parke
Putnam
Hendricks
Marion
Hancock
Fayette
Union
Rush
Shelby
Vigo
Clay
Owen
Morgan
Johnson
Franklin
Bartholomew
Decatur
Monroe
Brown
Ripley
Dearborn
Sullivan
Greene
Jackson
Jennings
Ohio
Switzerland
Lawrence
Jefferson
Knox
Daviess
Martin
Scott
Carroll
Trimble
Washington
Clark
Orange
Oldham
Pike
Dubois
Gibson
Crawford
Floyd
Jefferson
Vanderburg
Warrick
Harrison
Posey
Spencer
Perry
Meade
Henderson
Hancock
Daviess
Breckinridge
Hardin

NG 9-1-1System (Simplified diagram)



Governance of NG 9-1-1

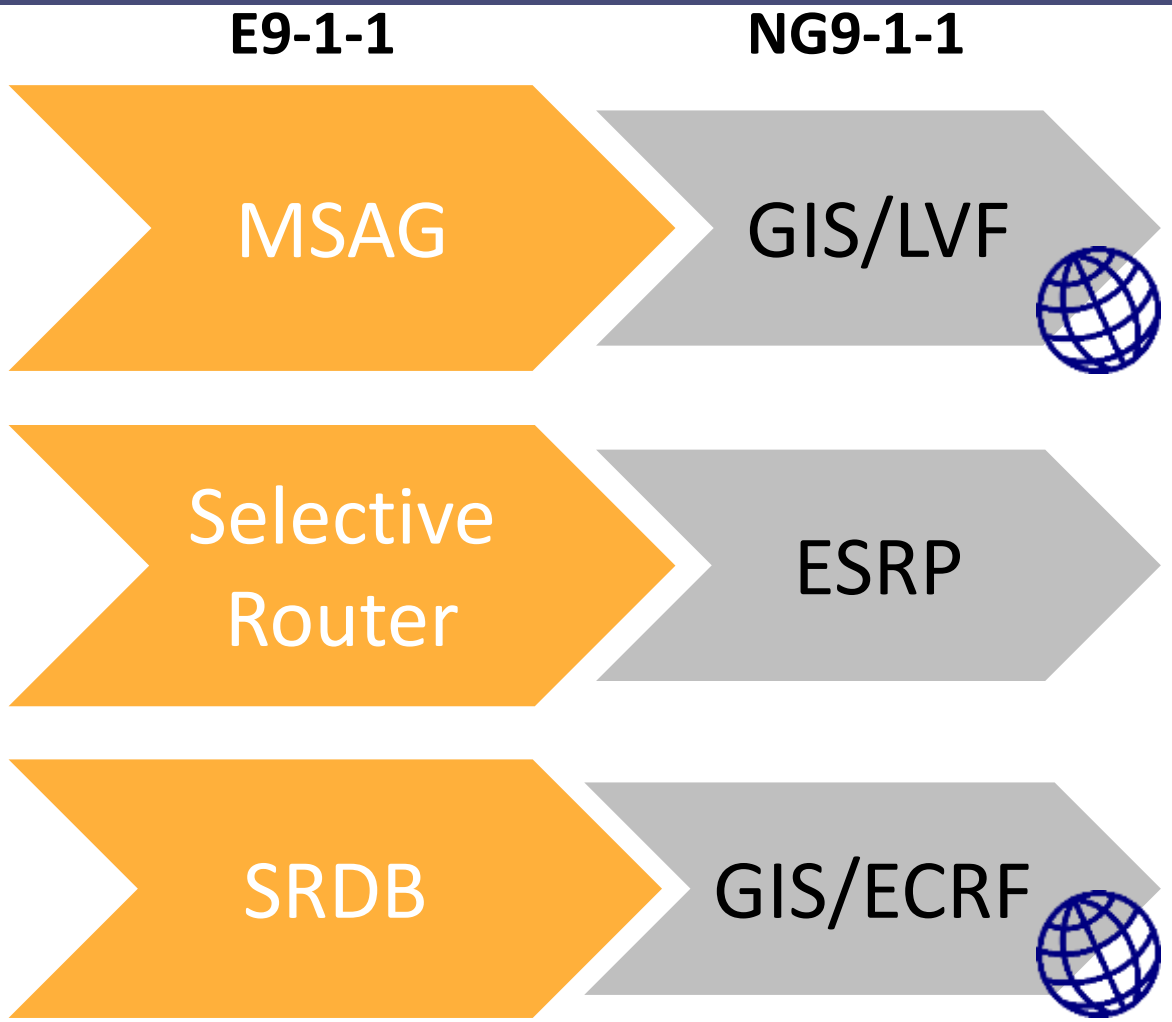


Goals of NG 9-1-1

Indiana Goals

- Build out of NG9-1-1Core
  - AT&T core locations at Indianapolis, Crown Point and Louisville, KY-complete
  - INdigital network-complete (Ft. Wayne and Indianapolis)
- Text-to-911implemented
- Adequate funding for PSAPs
- NG9-1-1 System interconnectivity and interoperability with FirstNet
- Telecommunicators provided with adequate tools and training

Goals of NG 9-1-1



Role of GIS IN NG9-1-1

- **GIS: Geographic Information Systems**
  - What is it?: A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. (Esri)
  - What does it do?:
    - Store, reference, combine, and analyze multiple layers
    - Allows you query based on geographic location
    - Allows for visualization of data

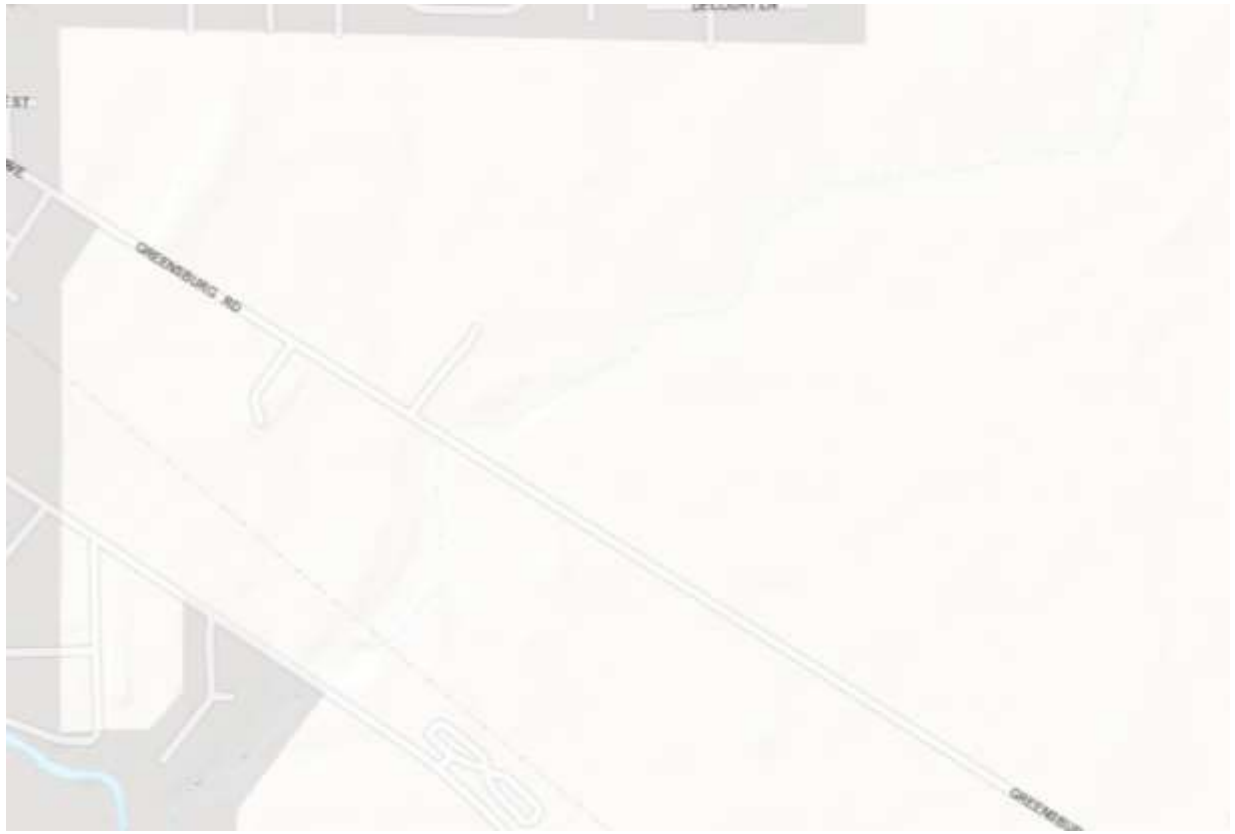
Role of GIS IN NG9-1-1 (Cont.)

- **GIS: Geographic Information Systems**
  - Why?: Map Display
    - Confirms/validating emergency callers location
    - Vehicle Routing
    - Display callers location

Role of GIS IN NG9-1-1 (Cont.)

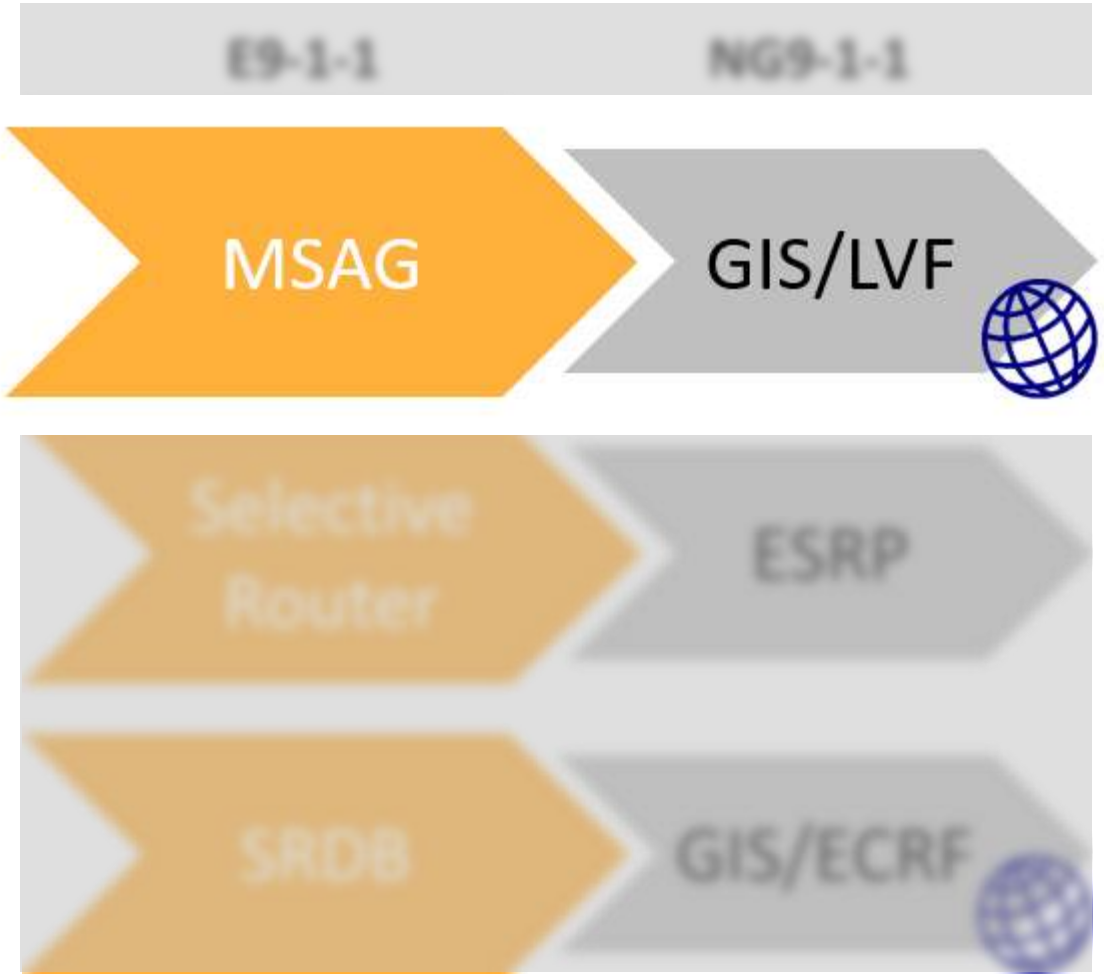
- **GIS: Geographic Information Systems**
  - Why Maps?
    - High Stress environment of the PSAP
      - Information Overload
      - Multi-tasking
      - Decreased Productivity
      - Impaired Decision Making
    - Good Maps lead to:
      - Improved decision making
      - Increased ability to understand complex data and spatial relationships

Role of GIS IN NG9-1-1 (Cont.)



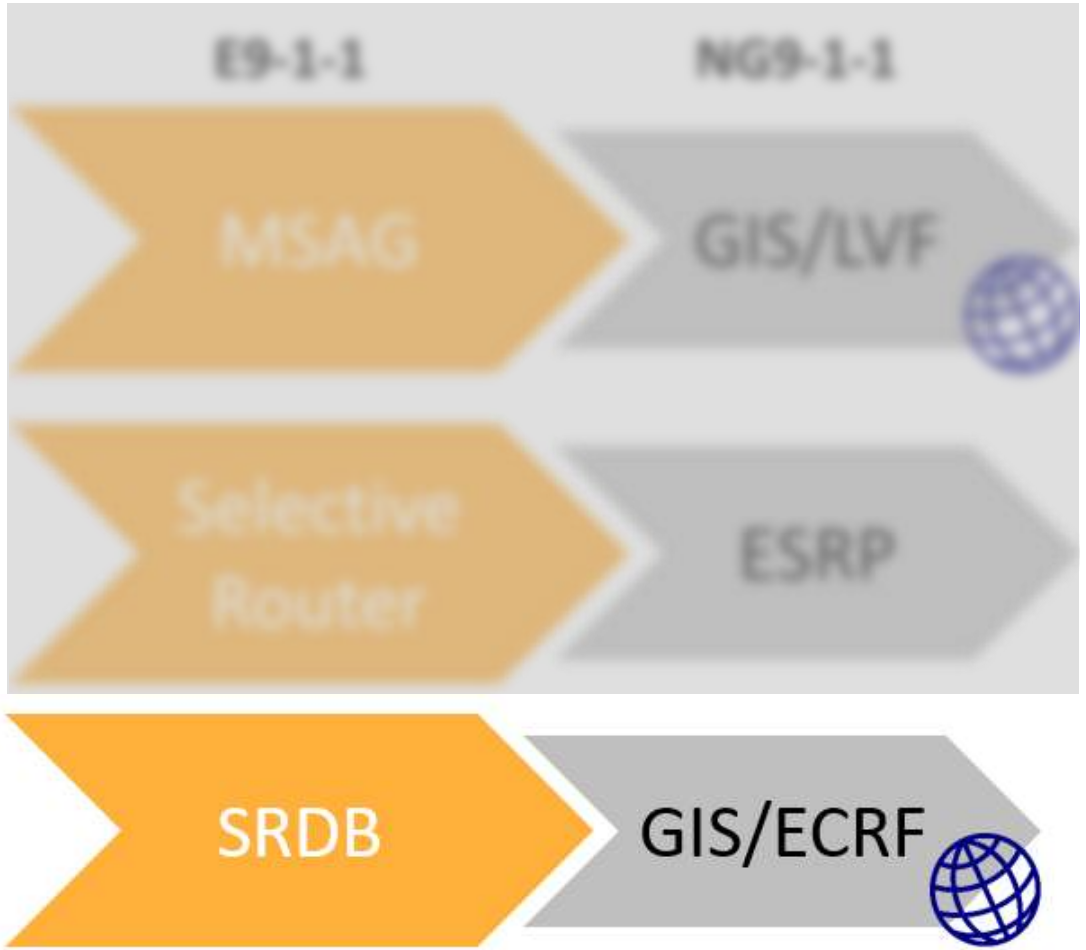
How is GIS Used?

- Instead of tabular MSAG data, GIS is used for Location Validation



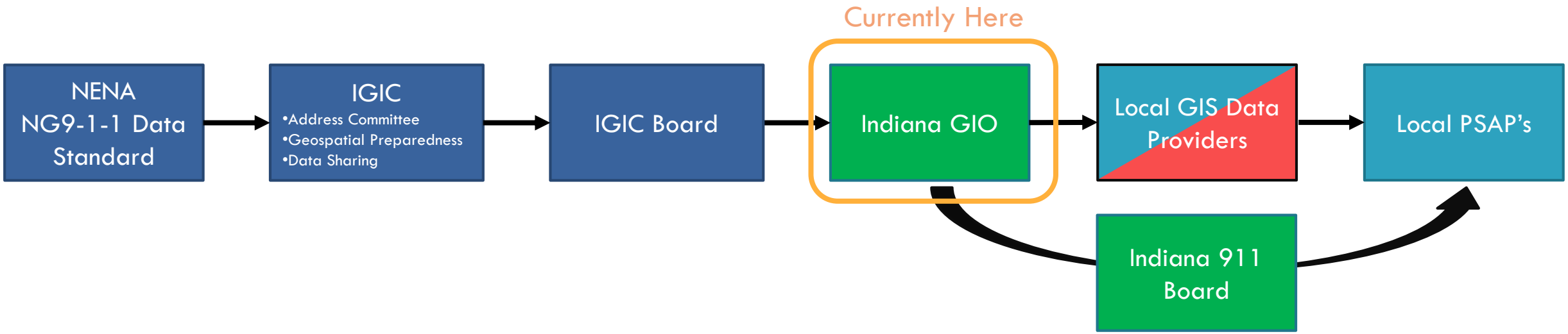
How is GIS Used?

- Instead of Selective Routing Database which is the table that contains telephone number to ESN relationship the GIS



GIS Data Standards

- NENA developed a NG9-1-1 GIS Data Model
- Indiana developing/developed an Indiana NG9-1-1 Data model.



What is the Indiana GIS Data Standards

- Required Data Layers
  - Road Centerlines
  - Site/Structure Address Points
  - Emergency Service Boundaries
  - PSAP Boundary
  - Provisioning/Jurisdictional Boundary
  - Street Name Alias Table
- Strongly Recommended
  - County Boundary
  - Incorporated Municipal Boundary
  - Landmark Name Alias Table
  - Mile Marker Location
  - Neighborhood Community Boundary
  - Unincorporated Community Boundary
- Recommended
  - Cell Site Location
  - Hydrology Line
  - Hydrology Polygon
  - Railroad Centerlines

Support Relationships

- Indiana 911 Board
- INdigital
- FirstNet
- AT&T
- Corporate GIS providers
- Local Government GIS
- PSAP's

Road Forward

- Baseline
- State GIO Data harvest