



ILLINOIS  
**GIS**  
ASSOCIATION



# NG911 in Illinois

# Emergency Telephone System Act Legislative Mandate

Build a Statewide, state of the art system for all 9-1-1 Authorities.

- Every 9-1-1 system in Illinois shall provide Next Generation 9-1-1 service by:

**July 1, 2020**

# Consultant Recommendations

GIS is a foundational data element for the overall operation of a NG9-1-1 solution.

- The transition from legacy databases to geo-spatial data used to route and process a 9-1-1 call in an NG9-1-1 environment is required.

# Consultant Recommendations

Establish a statewide geographic information system (GIS) initiative to provide definitive guidance on:

- System Requirements
- Frequency of Data Updates
- Data Quality Standards for public safety use in NG9-1-1

Develop a statewide system and place the receipt and management of GIS data of the initial areas on the NG Core Service provider to speed up the deployment.



# Geographic Information System/Mapping

- In the current 9-1-1 PSAP environment, GIS data is used for mapping a caller's location and supporting dispatch functions.
- Eighty-four percent of the PSAPs use this data within their CAD system, CPE, or both to support their operation.
- With the introduction of the NG9-1-1 environment, GIS takes on the additional role of supporting call routing functions.
- The Department's role is to implement a program to ensure gaps, overlaps, and quality metrics are met for a statewide data set.

# Enhanced 911 Vs. Next Generation 911

- E-911:
  - Handled at the PSAP, by their chosen 911 CAD solution
  - Calls are mapped based on the Master Street Address Guide (MSAG)
    - Address Range, Street Name, City
  - Response Jurisdiction assigned by Emergency Service **Zone's** within the MSAG

# Enhanced 911 Vs. Next Generation 911

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# Enhanced 911 Vs. Next Generation 911 - Cont.

- NG-911:
  - Calls are mapped by coordinates or address.
  - Routed to the PSAP based on submitted PSAP boundaries.
  - Response Jurisdiction is assigned by Emergency Service **Boundaries.**
- Boundary Vs. Zone
  - Boundaries are managed as independent layers in GIS (Police, Fire, EMS).
  - Zones are the same boundaries merged and given an ID.



# Functional Data Element

- GIS is a functional data element for the overall operation of a NG9-1-1 solution, and requires an appropriate level of leadership attention.
- Today GIS data is managed either directly by PSAPs or through local agency or 3<sup>rd</sup> party resources.
- Maintenance will remain with the local agency and will be submitted to the State through an online Portal.

# Training and Certification

- Training Plan
  - GIS and NG911 Orientation
  - GIS data maintenance and data submission
  - Responsibilities of Local Data Stewards
- Delivery Format
  - A mixture of live classes and webinars

# Local Data Stewards

- The person responsible for assuring maintenance is performed on the GIS data.
- Every 9-1-1 authority must designate a Local Data Steward.
- Must be a staff person for the City, County, or intergovernmental cooperative.
- May also serve as the Data Maintainer.
- Responsible for maintaining current contact information in the Portal.

# Local Data Steward Certification

- Obtained by attending the GIS Program Policy and Procedure Training.
- Renewed annually by in-person or online renewal course.

# Data Maintainers

- Primary person/group who will perform the actual maintenance
- Must acquire and maintain Certification
  - Obtained by attending the GIS Program Data Standards and Maintenance Training.
  - In-person attendance is required for initial certification.
  - Renewed annually in-person or online through the NG911 Project Portal.



# Vendors as Data Maintainers

- This is Allowed.
- Data Steward defines their role in the NG911 Project Portal.
- Must obtain Data Maintainer Certification and follow the same guidelines.

# Authoritative Data

- The Authoritative Boundary layer produced by each data steward represents the area for which all of the data submitted by that data steward is authorized.
- The features of remaining data layers shall only be accepted from the data steward within that Authoritative Boundary.
- All features intended for submission must be inside that boundary.

# GIS Technology Platform

- ESRI or ESRI-based solutions account for over 60% of the GIS platforms used in Illinois.
- The Illinois NG911 Portal will adhere to current data format standards.
  - A Geodatabase will be the primary data format
  - Shapefiles will be allowed for Non-ESRI platforms

# Reciprocal Data Licensing Agreement

- A Memorandum of Understanding will be enacted with each agency.
- GIS data collected in the GIS Master Repository may be used by:
  - 911 Authorities
  - State, County and Local governmental agencies
- Cannot be released or sold to non-governmental organizations.

# Data Management

- The transition to NG9-1-1 assumes that:
  - PSAPs are likely starting with an environment consisting of traditional E9-1-1 components such as :
    - An ALI system
    - Selective Router(s)
    - A Database Management System
    - A Tabular MSAG
    - A legacy 9-1-1 Network



# Data Management

- It also assumes that:
  - PSAPs have developed a set of GIS data to a level of accuracy that approximates the contents of the tabular MSAG.
  - PSAPs and/or 9-1-1 Authorities that are using GIS have previously performed preliminary reconciliation between their GIS data and their MSAG.

# Data Management

- This is essential to provision the NG9-1-1 GIS based Location Validation Function (LVF) and Emergency Call Routing Function (ECRF).
- If this is not the case, the preparatory work for PSAPs and/or 9-1-1 Authorities to implement NG9-1-1 services will be substantially lengthened as the technology is dependent upon the minimum foundational GIS elements.

# Standards

- Compliance with standards are critical for planning and implementation. Statewide data standardization improves PSAP operations. The use of different formats will lead to call routing failures.
- Currently 76% of the PSAPs self-report compliance with standards. While overall this percentage is high, efforts need to be taken to verify data independently to ensure an appropriate baseline from which to build upon.

# Published GIS Data Standards

- NENA
  - NENA-STA-06 Standard for the NG9-1-1 GIS Data Model
  - NENA 02-014 v1 GIS Data Collection and Maintenance
  - NENA 71-001 v1 NG9-1-1 Additional Data
  - NENA 71-501 v1 Synchronizing GIS Databases with MSAG and ALI
  - NENA Standards for the Provisioning and Maintenance of GIS data to ECRF/LVF
  - NENA 08-003 v1 Detailed Functional and Interface Standards for the NENA i3 Solution
- USPS Publication 28
- Federal Geographic Data Committee (FGDC) Metadata

# NENA GIS Data Model Standards

- NENA STA-06 defines the GIS data layers in a NG911 System that support:
  - Location Validation
  - Geospatial Call Routing
  - Dispatch Routing
  - Public Safety Mapping Applications



# NENA GIS Data Model Standards

- Defines 3 categories for GIS Data
  - Required
    - System cannot function without
  - Strongly Recommended
    - Can function, but may struggle without
  - Recommended
    - Provides additional assistance in finding a location or reference points

# Required

- Public Safety Answering Point (PSAP) Boundaries
- Emergency Service Zone Boundaries
  - Police, Fire, EMS
  - Provisioning Boundary
    - Response Agreements  
(intersections at jurisdiction boundaries)
- Road Centerline with Address Ranges
- Address Points

# Strongly Recommended

- Additional Emergency Service Boundaries
    - Animal Control
    - Park Police
  - County Boundaries
  - Emergency Service Zones to support initial conversion
  - Municipal Boundary Layer – Unincorporated areas defined by mailing names
  - Neighborhood Community Boundaries
  - Parcel
  - State Boundaries
- ## Tables
- Street Name Alias Table
  - Landmark Name Alias Table

# Recommended (Reference)

- Airports and Runways
- Bridges
- Building Footprints
- Cell Towers
- Flood Plains
- Hydrants
- Mile Markers
- Park Boundaries
- Railroads
- Rivers, lakes, creeks, ponds
- Wind Towers
- Water Mains
- Zip Codes

# GIS Routing and Data

- The NENA standards for GIS Data accuracy recommend a minimum of 98% accuracy from a GIS centerline or an address point file.
- The GIS datasets in NG9-1-1 will now be used to validate telephone subscriber addresses before a 9-1-1 call is placed and will also be used to route live 9-1-1 calls to the proper PSAP at the time of the call.



# GIS Routing and Data

- With GIS functioning as the foundation of the NG9-1-1 system, the importance of data accuracy cannot be overstated. The process of building, collecting, cleaning and maintaining a GIS database is complicated and labor intensive.
- The QA/QC aspect of GIS maintenance is also crucial but often missed or rarely performed.
- Those responsible for GIS accuracy must ensure that protocols and practices are in place for handling specific updates.

# Quality Assurance and Quality Control

- Attribute Data Quality
  - Data submitted must fit within the defined database design
  - Values must be consistent with the domain (pre-defined list)
- Topological Relationships
  - All boundaries must be coincident and align with adjacent Emergency Service Boundaries.
    - No Gaps, Slivers or Overlaps are allowed.
    - Address points are placed on the building or property access location.
    - Centerlines must be snapped and connected.
- Metadata
- All rules are defined in the Illinois NG911 Data Standards document.

# Your Next Steps

- Review NENA-STA-6 - Standard for the NG9-1-1 GIS Data Model
- Review/update/prepare boundary layers. Polygon boundaries are the key component.
- Coordinate with surrounding jurisdictions in that effort
- Assess your data against the Data Management slides
- Gather and maintain GIS data to support your jurisdiction

# Your Next Steps

- Do so in conformance with the standards
- If you currently use a 3<sup>rd</sup> party to maintain your data:
  - Review your Agreement
  - Know what your rights to the data are
- Third Party Options to improve/manage your data
  - There are several Vendors that specialize in GIS Data for NG911, University GIS Departments, Consortiums

# Department's Next Steps

- Prepare a Readiness Checklist
- Finalize and distribute Schema
- Standup State Portal
- Development of the Training and Certification Program

# Documents

[NG911 GIS Governance Policy](#)

[NG911 GIS Data Standards](#)

Available on the Administrator's Website

Found Under 9-1-1 Information/Next Generation 9-1-1  
Project

<https://www2.illinois.gov/sites/statewide911/Pages/default.aspx>



# Standards & Policy Committee

- Cindy Barbera-Brelle – Illinois State Police
- William Barrett – Marion, IL
- Eric Creighton – ILGISA President
- Mike DiGiannantonio – DuPage County ETSB
- Mary Elliot – DuPage County
- Brandon Lacey – McLean County
- Phil McCarty – Jacksonville, IL
- Keith Nightlinger – City of St. Charles, IL
- Chad Sperry – Western Illinois University
- Eric Venden – Village of Gurnee, IL
- Mark Yacucci – Illinois State Geological Survey

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