The Importance of GIS Data In The Next Generation

Diana Gijselaers - Solutions Engineer – GIS
Matt Florio – Regional Account Manager

January 23, 2014
TOPICS COVERED

- GIS & 9-1-1 Today
- GIS & NG9-1-1 Basics
- GIS & NG9-1-1 Checklists
- GIS & 9-1-1 Tomorrow
GIS & 9-1-1 Today
HOW IS GIS USED IN 9-1-1 TODAY?

- Confirming/validating emergency caller’s location
- Display emergency callers location on a map
- Provide vehicular routing
9-1-1, What’s the location of your emergency?

Centerlines + Address Points
LANDLINE LOCATION....LOCATION.....LOCATION

9-1-1, What’s the location of your emergency?

+ Parcels & Building Footprints

+ Neighborhood labels
LANDLINE LOCATION….LOCATION…..LOCATION

9-1-1, What’s the location of your emergency?

+ Aerials

Pictometry
WIRELESS – ADDRESSED LOCATION LOCATION...PERCEPTION...KNOWLEDGE

9-1-1, what is the location of your emergency?

Centerlines

+ Address Points
911, what is the location of your emergency?

+ Parcels

+ Building Footprints
9-1-1, what is the location of your emergency?

Phase II: 29.6496, -82.3469

+ Aerials

Pictometry
GIS & NG9-1-1 Basics
HOW IS GIS USED IN NG9-1-1?

- Location Validation
- Call Routing
- Confirming/validating emergency caller’s location
- Display emergency caller’s location on a map
- Provide vehicular routing
HOW IS GIS USED IN NG9-1-1?

- Uses Geospatial routing to connect an emergency caller with a PSAP
ESINET COMPONENTS & GIS

- Location Information Server (LIS)
- Location Validation Function (LVF)
- Emergency Services Routing Proxy (ESRP)
- Emergency Call Routing Function (ECRF)
- GIS Data Provisioning
- Border Control Function (BCF)
- Service Provider
- PSAP
- Mapping
- 9-1-1 Authority
Is this a valid location in GIS?

**LIS**
- Calling devices query the LIS
- Civic addresses are validated prior to being stored in the LIS by the LVF – validated against the GIS
- Returns a Pidf-LO (Presence Information Data Format – Location Object) – can be a civic address or a geo-coordinate

**LVF**
- Pre-validation, validates before loading to the LIS
- Similar to MSAG, verifies that the civic location matches a known address in the 9-1-1 Authorities service area
- Able to validate an address, not just address range

**9-1-1 Authority**

**GiS Data Provisioning**

**LGIS**

**LIS**

**LVF**

**ECRF**

**GIS Data Provisioning**

**9-1-1 Authority**
Where do I route the call?

Route to PSAP A

9-1-1 Authority

PSAP

Emergency Services Routing Proxy (ESRP)

Emergency Call Routing Function (ECRF)

Location Validation Function (LVF)

GIS Data Provisioning

Emergency Services Routing Proxy (ESRP)

ESRP

• Call routing engine
• Closest thing to a selective router in NG9-1-1
• Uses the ECRF (GIS) to choose how to route a 9-1-1 call

ECRF

• Provides GIS based Next Generation call routing
• Replaces legacy selective router databases
• Allows for alternate dynamic call routing

Where do I route the call?
NG 9-1-1 AND GIS

9-1-1 Authorities will be responsible for provisioning GIS data for NG 9-1-1

- Three required GIS datasets
  1. Authoritative Boundary - PSAP
  2. Emergency Services Boundary - Law, Fire, Medical
  3. Street Centerline
GENERAL NG9-1-1 CHECKLIST

People:

Identify

- GIS resources – may be in-house or contracted
- Point of Contact for Public Safety/ 9-1-1 GIS
- Addressing Authorities
- MSAG/ALI Authority
- Authorities for defining
  - PSAP boundaries
  - Law Enforcement boundaries
  - Fire boundaries
  - EMS boundaries
GENERAL NG9-1-1 CHECKLIST

Data:

- Inventory existing GIS data
  - Datasets required for NG9-1-1
    - Authoritative Boundary
    - Emergency Services Boundary
    - Street Centerlines
    - Address Points are strongly recommended
- Acquire current MSAG and ALI databases
- Conduct a Suitability Analysis
  - Does existing data meet requirements for NG9-1-1?
GENERAL NG9-1-1 CHECKLIST

Procedures:

- Address Assignment
- Street Centerline Mapping
- Field data collection
- PSAP Boundary determination and updates
- Service Boundary determination and updates
- Data QA/QC
- Data Maintenance
- Coordinating data and information between departments
SERVICE BOUNDARY CHECKLIST

- Identify authorities for defining PSAP boundaries
- Identify authorities for defining Law Enforcement boundaries
- Identify authorities for defining Fire Jurisdiction boundaries
- Identify authorities for defining EMS boundaries
- Determine if boundaries will be maintained as separate GIS files for each type, or consolidated into a single file
- Identify responsible party/parties for updating and maintaining files in GIS
- Create and define a set of agreed upon boundaries in GIS
- Check topology. Ensure there are no gaps or overlaps
- Consult NENA documentation to ensure all required attributes are being maintained in GIS data. **NG9-1-1 GIS Data Model is currently in Committee review**
- Create/Ensure there are procedures for updating and maintaining file
- Create/Ensure there are QA/QC procedures to ensure topology, and completeness and accuracy of GIS data
- Ensure there are resources in place to maintain GIS data in concordance with NG9-1-1 standards
- Coordinate and share data – Work with neighbors
STREET CENTERLINE CHECKLIST

- Identify Department or individual responsible for maintaining the MSAG
- Identify Department or individual responsible for maintaining GIS Street Centerlines
- Address/Understand how well the MSAG matches real world street names and ranges. Is it complete? Is it accurate?
- Address/Understand how well GIS Street Centerlines match real world street names and ranges. Is it complete? Is it accurate?
- Validate and Synchronize MSAG & GIS – See NENA Information Document 71-501
  - Data Preparation
  - Data Standardization
  - Initial Corrections to the Databases
  - Synchronization
  - Discrepancy Reports
  - Discrepancy Corrections
  - Maintenance

NENA recommends a minimum match rate of 98% between GIS and MSAG be set prior to using GIS data for geospatial routing. GIS data should match as well as possible real world streets in your community, not just the MSAG which could be incomplete or inaccurate. Knowing and understanding the quality of both the current GIS data and MSAG are critical to ensuring corrections are made to best reflect on the ground status of streets in the community. Field verification of centerline data should be considered. Validation and Synchronization Tools and Reports are available from multiple vendors.
STREET CENTERLINE CHECKLIST

- Consult NENA documentation to ensure all required attributes are being maintained in GIS data. **NG9-1-1 GIS Data Model is currently in Committee review**

- Create/Ensure there are procedures for updating and maintaining GIS centerline file.

- Create/Ensure there are procedures for continuing validation and synchronization of GIS and MSAG.

- Create/Ensure there are QA/QC procedures to ensure completeness and accuracy of GIS data.

- Ensure there are resources in place to maintain GIS data in concordance with NG9-1-1 standards.

- Coordinate and share data.
  - Work with neighbors to create an authoritative layer of snap points for edge matching of streets and boundaries.
GIS & 911 Tomorrow
HOW IS GIS USED IN NG9-1-1?

- Location Validation
- Call Routing
- Confirming/validating emergency caller’s location
- Display emergency callers location on a map
- Provide vehicular routing
HOW IS GIS USED IN NG9-1-1?

- Uses Geospatial routing to connect an emergency caller with a PSAP
ESINET COMPONENTS & GIS

Service Provider

Location Information Server (LIS)

Border Control Function (BCF)

Location Validation Function (LVF)

Emergency Services Routing Function (ECRF)

Emergency Services Routing Proxy (ESRP)

9-1-1 Authority

GIS Data Provisioning

PSAP

Mapping

Copyright © 2013 Cassidian Communications, Inc. All rights reserved.
BENEFITS OF NG9-1-1 CALL ROUTING

- Enables on the fly call routing changes that take effect within minutes
- Allows 9-1-1 calls to routed based on location to a specific PSAP or call queue
- Allows call validation to an address point, not just a street based address range