

NENA NG9-1-1 STANDARDS OVERVIEW

NENA is the standards making body for NG9-1-1 and produces both standards (STA) and information documents (INF) as best practice documents. There are numerous standards that are relevant to NG9-1-1, but only a handful are relevant to GIS data. These include:

STANDARDS

13 Standard for NG9-1-1 [NENA-STA-010.2-2016]

- Provides the requirements and technical architecture for NG9-1-1 systems including concepts, terminology and functional elements.
- Expands on the functional elements that consume GIS such as the Location Validation Function (LVF), Emergency Call Routing Function (ECRF) and Spatial Interface (SI).

United States Civic Location Data Exchange Format (CLDXF) Standard [NENA-STA-004.1.1-2014]

- Defines data elements needed for address data exchange across national boundaries.
- Provides means for PSAPs to exchange 9-1-1 call location information.
- Illustrates examples of address parsing.

NG9-1-1 GIS Data Model [NENA-STA-006.1-2018]

- Defines the GIS data model to support location validation and call routing.
- Includes standards for GIS data layers used in PSAP and response agency mapping applications.

NG9-1-1 Data Management Requirements [NENA-REQ-002.1-2016]

- Defines discrepancy and performance reports associated with NG9-1-1.
- Provides 9-1-1 Authorities, vendors, Communication Service Providers (CSP), and other interested parties with guidelines for communicating issues or status of various elements within the system.
- Details the generation of discrepancy reports around GIS provisioned to LVFs and ECRFs. Provisioning and Maintenance of GIS data to ECRF and LVFs [NENA-STA-005.1-2017]
- Defines roles and responsibilities of those using and provisioning ECRF/LVF services.
- Outlines ECRF/LVF performance and implementation considerations.

BEST PRACTICES

Development of Site/Structure Address Point GIS Data for 9-1-1 [NENA-INF-014.1-2015]

- Guides the development of address point GIS data.
- Provides numerous address point placement methodologies.

Location Validation Function Consistency [NENA-INF-027.1-2018]

- Builds upon the specifications provided in NENA STA 010 related to the Location Validation Function (LVF) and the Location to Service Translation (LoST) protocol.
- Outlines recommendations that LVF stakeholders, including operators, implementers, Geographic Information System (GIS) personnel and LVF clients can follow to help ensure responses to LoST queries to different LVFs are consistent.
- Provides recommendations for LVF client systems as to how the recommendations for the responses can be utilized and provides operational guidance to the stakeholders listed above.

DATAMARK IS INVOLVED WITH DRAFTING THE FOLLOWING:

Data Stewardship for NG9-1-1 Best Practices

- Expands on NC9-1-1 standards documents with guidance for the creation and maintenance of GIS data.
- Includes GIS coordination recommendations and best practices for data exchange between 9-1-1 authorities, QA/QC, and GIS data maintenance and stewardship.

NG9-1-1 GIS Data Transition Information Document

- Acknowledges that there are many starting points and methods to creating and/or transitioning existing GIS data for NC9-1-1.
- Provides guidance to 9-1-1 Authorities, Addressing Authorities and GIS Data Providers on important concepts when beginning, executing and maintaining GIS data for NC9-1-1.

NG9-1-1 GIS Data Template

- Provides a geodatabase template that is strictly adherent to NC9-1-1 GIS Data Model [NENA- STA-006.1-2018].
- Offers a starting point geodatabase for the thoughtful interpretation that each GIS Data Provider must make of the NC9-1-1 GIS Data Model [NENA-STA-006.1-2018].

NG9-1-1 GIS DATA CRITERIA

Feature	Req?	Rule
Road Centerlines	Yes	<ul style="list-style-type: none"> • Edge-matched with neighboring jurisdictions (snap points recommended). • Must be split and edge-matched at the PSAP boundary (even with multiple PSAPs in your jurisdiction). • No gaps, overlaps or redundant centerlines.
Site/Structure Address Points	Yes	<ul style="list-style-type: none"> • Structure-based, including sub-address information where available and relevant. • Layer is required, but completeness of the data is not currently a requirement.
Public Safety Answering Point (PSAP) Boundary <i>(routes call to in 9-1-1 center)</i>	Yes	<p>a. Any primary PSAP will need footprints of each neighboring primary PSAP.</p> <ul style="list-style-type: none"> • Special cases include federal lands or military bases. • If a landline 9-1-1 call can be routed to a PSAP, that PSAP boundary needs to be represented. • No gaps, overlaps or redundant polygons.
Emergency Service Boundaries	Yes	<p>a. Separate layers for the following services:</p> <ul style="list-style-type: none"> • Law Enforcement • Fire • Emergency Medical Service (EMS) <p>b. Cannot use ESZ layer (single layer).</p> <p>c. No gaps or overlaps</p>
Provisioning Boundary <i>(Area of GIS data provisioning responsibility)</i>	Yes	<p>a. 9-1-1 Authority only includes data within boundary.</p> <p>b. 9-1-1 Authority is responsible for data in the entire extent of the boundary.</p> <p>c. No gaps or overlaps.</p>

DEFINITIONS

- ALI** (**Automatic Location Identification**) Call location data associate with the ANI that is displayed to the call taker when answering 9-1-1 calls
- ANI** (**Automatic Number Identification**) 10-digit telephone number associated with a device used to call 9-1-1
- AVL** (**Automatic Vehicle Location**) A means for determining the geographic location of a vehicle and transmitting this information to a point where it can be used
- CAD** (**Computer Aided Dispatch**) Computer system that aids PSAP telecommunicators by automating selected dispatching and record keeping activities
- ECRF** (**Emergency Call Routing Function**) Functional element in ESInet and LoST protocol server where 9-1-1 calls are routed toward the appropriate PSAP using spatial operations.
- ESB** (**Emergency Service Boundary**) Geographic area representing the dispatch responsibility emergency service agency
- ESN** (**Emergency Service Number**) 3-5 digit number assigned to each record of the MSAG which represents a ESZ and facilitates the dispatching of the proper emergency service agencies
- ESInets** (**Emergency Services Internet Protocol Networks**) End state for the IP-based networks that support Public Safety operations by enabling the sharing of emergency data between PSAPs
- ESZ** (**Emergency Service Zone**) Geographic area representing a unique combination of emergency service agencies within a 9-1-1 governing authority's jurisdiction
- ESRP** (**Emergency Services Routing Proxy**) ESInet component which is a SIP proxy server that selects the next hop routing within the ESInet based on location and policy
- LIS** (**Location Information Server**) Repository of mappings between calling device reference values, like an IP address, and geographic location values
- LNG** (**Legacy Network Gateway**) Function element that provides an interface between a non-IP originating network and a NG9-1-1 system
- LPG** (**Legacy PSAP Gateway**) Signaling and media interconnection point between an ESInet and a legacy PSAP
- LoST** (**Location to Service Translation**) Protocol that takes location information and Service URN to return URI
- LSRG** (**Legacy Selective Router Gateway**) Interface that allows calls to be routed or transferred between legacy and NG9-1-1 networks
- LVF** (**Location Validation Function**) Functional element in an ESInet that is a LoST protocol server where civic location information is validated against the authoritative GIS database information. Requires road center-lines and address points
- MSAG** (**Master Street Address Guide**) Database of street names, house number ranges and associated communities defining ESZs and their associated ESNs to enable call routing
- PRF** (**Policy Routing Function**) Functional component of ESRP that determines the next hop in the SIP signaling path using policy
- Provisioning Boundary** Geographic area of GIS data in which a 9-1-1 authority is responsible to maintain
- PSAP** (**Public Safety Answering Point**) Entity responsible for receiving 9-1-1 calls and processing those calls according to a specific operational policy
- QA/QC** (**Quality Assurance/Quality Control**) QA is the maintenance of data at a required level of quality through each step or process of preparation. QC is the system of maintaining standards during the development of data
- SI** (**Spatial Interface**) Software that allows for the QA/QC of GIS data
- URI** (**Uniform Resource Identifier**) Predictable formatting of text used to identify a resource on a network
- URN** (**Uniform Resource Name**) Location independent identifiers that are designed to be unique and persistent over extended periods of time
- VoIP** (**Voice over Internet Protocol**) Technology that permits the delivery of real-time multimedia sessions, like voice calls, over IP networks

WHEN SECONDS MATTER TO YOU, DATA MATTERS TO US.

WHO IS DATAMARK?

DATAMARK is the go-to authority on GIS data needs for public safety, addressing authorities, PSAPs and GIS analysts. Our team works with clients to solve complex public safety needs, from data quality checks to addressing workflows in order to support the requirements of any NG9-1-1 system.



*Aligns with
NENA Stan-
dards*



*GIS Strategic
Planning*



*Boundary
Facilitation*



*GIS Data
Creation &
Remediation*



*Custom GIS
Consulting*



*GIS Data
Maintenance
& Software*

MEET THE TEAM

The DATAMARK team brings over 25 years of experience and subject matter expertise in the GIS data needs for E9-1-1, NG9-1-1, application development, database creation and maintenance, public safety, and the definition of technical best practices specific to supporting the data needs of PSAPs.



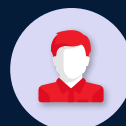
*State-Level
GIS Officials*



*PSAP
Directors*



GIS Directors



*Project
Managers*



*9-1-1
Professionals*



*Public Safety
GIS Experts*