Iowa Homeland Security and Emergency Management Department

Next Generation 9-1-1 GIS Standards

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1.0 Executive Summary

As an integral part of the NG9-1-1 call process, Geographic Information Systems (GIS) map data is leveraged to route 9-1-1 calls to the correct Public Safety Answering Point (PSAP), to display a caller's location in tactical PSAP mapping systems, and to provide valuable life-saving information to emergency response personnel. Before a county or city's GIS data can take on these critical roles in the State of Iowa's Next Generation (NG) 9-1-1 system, certain elements must first be considered. What existing GIS data can be used? Does existing GIS data meet minimum accuracy requirements for NG9-1-1? What standard schema should be followed?

The GIS data created following the standards outlined in this document will serve the purpose of validating civic address locations, defining PSAP and Emergency Services boundaries for the routing and transfer of 9-1-1 calls, and defining the authoritative data sources at the local, regional, and State level. The resulting GIS data can then be coalesced and provisioned into the State of Iowa's NG9-1-1 system.

This standards document was a collaborative effort between the Iowa NG9-1-1 Advisory Committee, the Iowa Homeland Security and Emergency Management Department (HSEMD), and GeoComm, Inc. and will provide a solid foundation for NG9-1-1 GIS dataset development in the State of Iowa. At its core, this document follows the NENA Standard for NG9-1-1 GIS Data Model (NENA-STA-006.2a), and as such, may be amended in the future as the standard is updated by NENA.

1.1 Purpose

These standards will define a common data model and set minimum accuracy benchmarks to be attained before local data is integrated into a statewide NG9-1-1 GIS dataset. Existing and emerging industry standards at the national level were considered in the development of NG9-1-1 standards for the State of Iowa. The result is an authoritative document that can be used by local jurisdictions as a guide in updating their GIS data to meet NG9-1-1 standards.

Essentially, there are two types of GIS data that are required in the Emergency Call Routing Function (ECRF) and Location Validation Function (LVF) functional elements of a NG9-1-1 system, and they are emergency service area boundaries, and address location data. The layers and schema are subject to change based on functionality criteria of the ECRF and LVF elements. Additionally, this standard does not conform to the requirements of any specific vendor systems for CAD, CPE, and dispatch mapping applications. Any refinement required from an operational standpoint will need to be considered and a subsequent version of the standards published to meet those requirements.

The schema contained in these standards was developed to accommodate all address elements in the Presence Information Data Format – Location Object (PIDF-LO) as outlined in NENA 08-003 Detailed Functional and Interface Specification for the NENA i3 Solution and are subject to

change based on Emergency Services Routing Proxy (ESRP) requirements for the State of Iowa's NG9-1-1 system.

2.0 Background Terminology

The following terms are a subset of the terms defined in NENA 08-003 Detailed Functional and Interface Specification for the NENA i3 Solution. They serve to lay the base terminology incorporated into the GIS attribute definitions in subsequent sections of these standards.

TERM	DEFINITION
9-1-1 Authority	The local agency responsible for overall operation of, and data for the 9-1-1 system.
Agency Identifier	A domain name for an agency used as a globally unique identifier.
ALI (Automatic Location Identification)	The automatic display at the PSAP of the caller's telephone number, the address/location of the telephone, and supplementary emergency services information of the location from which a call originates.
CLDXF (Civic Location Data Exchange Format)	A United States profile of PIDF-LO that defines a set of standard data elements that describe detailed street address information.
Data Domain	An enumerated listing or range of valid values that may be used as an attribute. If no Data Domain is provided, then any value that meets the format criteria may be used.
Data Layer	Geospatial features and feature attributes maintained in a GIS database that represent a common data theme. Feature data represent geographic entities as points, lines, and polygons. Data layer may also be referred to as a "layer" (example the streets layer).
Data Model	A set of standardized design specifications for objects in a GIS database or other database. A data model defines the data layers, data features, data fields and attributes, and other defining requirements of a database for use in an application.
ECRF (Emergency Call Routing Function)	A functional element in NGCS (Next Generation Core Services) which is a Location-to-Service Translation (LoST) protocol server where location information (either civic address or geo-coordinates) and a Service URN serve as input to a mapping function that returns a URI used to route an emergency call toward the appropriate PSAP for the caller's location or towards a responder agency. **Related Terms:** ***External ECRF*** An ECRF instance that resides outside of an ESInet instance. ***Internal ECRF*** An ECRF instance that resides within and is only accessible from an ESInet instance.

TERM	DEFINITION
ESInet (Emergency Services IP Network)	A managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core services can be deployed, including, but not restricted to, those necessary for providing NG9-1-1 services. ESInets may be constructed from a mix of dedicated and shared facilities. ESInets may be interconnected at local, regional, state, federal, national and international levels to form an IP-based inter-network (network of networks). The term ESInet designates the network, not the services that ride on the network. See NG9-1-1 Core Services.
Geocoding	Interpolation-based computational techniques to derive estimates of geographic locations.
Geospatial Call Routing	The use of ECRF (Emergency Call Routing Function) and GIS (Geographic Information System) data to route an emergency call to the appropriate PSAP or emergency service provider based on the civic location or geographic coordinates provided with the call.
GIS (Geographic Information System)	A system for capturing, storing, displaying, analyzing, and managing data and associated attributes which are spatially referenced.
GIS Attribute	Tabular information about features contained in GIS data.
LVF (Location Validation Function)	A functional element in an NGCS that is a LoST protocol server where civic location information is validated against the authoritative GIS database information. A civic address is considered valid if it can be located within the database uniquely, is suitable to provide an accurate route for an emergency call, and adequate and specific enough to direct responders to the right location.
MCS (MSAG Conversion Service)	A web service providing conversion between PIDF-LO (Presence Information Data Format – Location Object) and MSAG (Master Street Address Guide) data.
Metadata	A record of information, usually presented as an eXtensible Markup Language (XML) document, which captures the basic characteristics of a data or information resource. Metadata records include core library catalog elements such as Title, Abstract, and Publication Data; geographic elements such as Geographic Extent and Projection Information; and database elements such as attribute label definitions and attribute domain values.
MSAG (Master Street Address Guide)	A database of street names and house number ranges within their associated communities defining Emergency Service Zones (ESZs) and their associated Emergency Service Numbers (ESNs) to enable proper routing of 9-1-1 calls.

TERM	DEFINITION
NENA (National Emergency Number Association)	NENA is the National Emergency Number Association, also referred to as The 9-1-1 Association, which is fully dedicated to the continued improvement and modernization of the 9-1-1 emergency communication system. NENA's approach includes research, standards development, training, education, certification, outreach, and advocacy through communication with stakeholders. As an ANSI-accredited Standards Developer, NENA works with 9-1-1 professionals, public policy leaders, emergency services and telecommunications industry partners, like-minded public safety associations, and more. Current NENA activities center on awareness, documentation, and implementation for Next Generation 9-1-1 (NG9-1-1) and international three-digit emergency communication systems. NENA's worldwide members join with the emergency response community in striving to protect human life, preserve property, and maintain the security of all communities. www.nena.org
NGCS (Next Generation 9-1-1 Core Services)	The set of services needed to process a 9-1-1 call on an ESInet. It includes, but is not limited to, the ESRP, ECRF, LVF, BCF, Bridge, Policy Store, Logging Services, and typical IP services such as DNS and DHCP. The term NG9-1-1 Core Services includes the services and not the network on which they operate. See Emergency Services IP Network.
NGUID (NENA Globally Unique ID)	A globally unique ID generated and maintained within a GIS database as defined by NENA-STA-006. Each NGUID must be unique.
PIDF-LO (Presence Information Data Format – Location Object)	Provides a flexible and versatile means to represent location information in a SIP header using an XML schema.

TERM	DEFINITION
PSAP (Public Safety Answering Point)	A physical or virtual entity where 9-1-1 calls are delivered by the 9-1-1 Service Provider. Primary PSAP: A PSAP to which 9-1-1 calls are routed directly from the 9-1-1 Control Office. Secondary PSAP: A PSAP to which 9-1-1 calls are transferred from a Primary PSAP. Alternate PSAP: A PSAP designated to receive calls when the primary PSAP is unable to do so. Consolidated PSAP: A facility where multiple Public Safety Agencies choose to operate as a single 9-1-1 entity. Legacy PSAP: A PSAP that cannot process calls received via i3-defined call interfaces (IP-based calls) and still requires the use of CAMA or ISDN trunk technology for delivery of 9-1-1 emergency calls. Serving PSAP: The PSAP to which a call would normally be routed. NG9-1-1 PSAP: This term is used to denote a PSAP capable of processing calls and accessing data services as defined in NENA's i3 specification, NENA-STA-010, and referred to therein as an "i3 PSAP." Virtual PSAP: An operational model directly enabled through NG9-1-1 features and/or network hosted PSAP equipment in which telecommunicators are geographically dispersed, rather than working from the same physical location. Remote access to the PSAP applications by the dispersed telecommunicators requires the appropriate network connections, security, and work station equipment at the remote location. The virtual work place may be a logical combination of physical PSAPs, or an alternate work environment such as a satellite facility, or any combination of the above. Workers are connected and interoperate via IP connectivity.
SI (Spatial Interface)	A standardized data replication interface between the GIS and the functional elements that consume GIS data, such as the ECRF, LVF, Map Database Services, etc.
Spatial data	Information stored as coordinates and topology that identifies the geographic location of features and boundaries on Earth. **Also known as:** *Geospatial Data* *Geographic Information*

TERM	DEFINITION
URI (Uniform Resource Identifier)	A URI is an identifier consisting of a sequence of characters matching the syntax rule that is named <URI> in RFC 3986. It enables uniform identification of resources via a set of naming schemes. A URI can be further classified as a locator, a name, or both. The term "Uniform Resource Locator" (URL) refers to the subset of URIs that, in addition to identifying a resource, provides a means of locating the resource by describing its primary access mechanism (e.g., its network "location"). The term "Uniform Resource Name" (URN) has been used historically to refer to both URIs under the "urn" scheme [RFC2141], which are required to remain globally unique and persistent even when the resource ceases to exist or becomes unavailable, and to any other URI with the properties of a name. An example of a URI that is neither a URL nor a URN is sip:psap@example.com.
URN (Uniform Resource Name)	A type of URI. Uniform Resource Names (URNs) are intended to serve as persistent, location-independent, resource identifiers and are designed to make it easy to map other namespaces (which share the properties of URNs) into URN-space. An example of a URN is urn:service.sos. **External References:** **RFC 8141, Uniform Resource Names (URNs)**
USPS (United States Postal Service)	An independent agency of the United States government responsible for providing mail service in the United States.

3.0 Layer and Attribute Definitions

3.1 GIS Layer Categories

The categories defining GIS layer requirements in a NG9-1-1 system in this document fit into two categories, Required and Strongly Recommended. These categories are defined below.

Required
MUST be available for NGCS to process a 9-1-1 call on an ESInet, in particular the ECRF and LVF, and for functionality of the SI. The layers below are the minimum layers required to serve those purposes.
Note: Local layer names do not need to conform to the layer names below. The state's QC/aggregation tool will transform to the layer names during aggregation.

LAYER NAME	RESPONSIBLE PARTY
RoadCenterLine	Local Jurisdiction
SiteStructureAddressPoint	Local Jurisdiction
PsapPolygon	Local Jurisdiction; maintained at the state level to ensure alignment
FirePolygon	Local Jurisdiction
PolicePolygon	Local Jurisdiction

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EmsPolygon	Local Jurisdiction
ProvisioningPolygon	State Level

To further refine the required GIS data, and provide even more accurate location validation and call routing, the following layers can be provisioned to the ECRF and LVF.

LAYER NAME	RESPONSIBLE PARTY
StreetNameAliasTable	Local Jurisdiction
A1Polygon (*State Boundary*)	State Level
A2Polygon (*County Boundaries*)	State Level
A3Polygon (*Incorporated Municipal Boundaries*)	Local Jurisdiction

3.2 GIS Attribute Categories

In the GIS data layers, fields include a specification of when they may appear in a record. The database systems that are used to store a GIS typically can only support a specification of whether a field is required to be present, or it is optional. The "Required" column in Sections 5.0 and 6.0 provides this specification. Three values may occur in this column.

- "Yes" means the data element is required to be present in all records. It will appear as required in the database schema.
- "No" means the data field is optional in all records. It will not appear as required in the database schema.
- "Conditional" means the data element is conditional. This value alerts the reader that a business rule is specified that controls the presence of a value in the data field. It will not appear as required in the database schema. The prevailing business rule for all conditional attributes is that if an attribute value exists (e.g., if a Street Name Pre Directional such as "West" is part of the valid street name), it MUST be provided. If no value exists for the attribute (e.g., there is no Street Name Pre Directional as part of the valid street name), the data field is left unpopulated. All attributes that are governed by CLDXF PIDF-LO structure MUST follow the business rules identified in the CLDXF Standard, NENA-STA-004. If no business rule is identified, the prevailing rule will apply.

Locally maintained GIS data layers are REQUIRED to include all data fields specified as "Yes" within this GIS Data Model but are NOT REQUIRED to include data fields that are not specified as "Yes" if no data exists to be populated within the data fields. If there are no records in the entire database for a specific non-required data field, then the data field itself is NOT REQUIRED. Local policy may dictate that all data fields be included in the structure regardless of whether data exists.

3.3 GIS Attribute Types

The "Type" column, found in Sections 5.0 and 6.0, indicate the type of data used with the data field and attributes.

- P – Printable UTF-8 characters that display recognizable glyphs when printed, plus the space character, (U+0020). This explicitly supports accented characters and does not permit other blank characters such as a non-breaking space or control characters such as carriage return, line feed, and escape. Indigenous characters are expressly allowed. It is up to the agency to verify with their 9-1-1 system vendor(s) that their systems support characters or pictographic glyphs for all of the indigenous languages within their service area, or for a service area from which they receive diverted or transferred emergency calls.
- U – A Uniform Resource Identifier (URI) as described in Section 7.9, Abbreviations, Terms, and Definitions in the NENA NG9-1-1 GIS Data Model (NENA-STA-006.2a) and defined in RFC 3986, and also conforming to any rules specific to the scheme (e.g. sip:, https:, etc.) of the chosen URI.
- D – Date and Time may be stored in the local database date/time format with the proviso that local time zone MUST be recorded, and time MUST be recorded to a precision of at least 1 second and MAY be recorded to a precision of 0.1 second. If the local database date/time format does not meet these specifications, the database SHOULD record the local date/time format in a string conforming to W3C dateTime format as described in XML Schema Part 2: Datatypes Second Edition.
- F – Floating (numbers that have a decimal place). There is no defined field length of a floating number; it is system dependent. Note that the decimal separator in other languages is a comma or space.
- N – Non-negative integer

3.4 Case Sensitivity

All systems compliant with this standard that receive, and store data must preserve case. Fields using a domain of values must adhere to the casing rules of that domain. Legacy fields specified in this standard namely, "Legacy Street Name," "Legacy Street Name Post Directional," "Legacy Street Name Pre Directional," "Legacy Street Name Type," and "MSAG Community Name" (including left and right siblings), MUST be all uppercase. For all other fields that are not governed by domains, values SHOULD be provided using mixed casing (i.e., combination of uppercase and lowercase letters such as in "MacDonald", "LaCrosse", "O'Reilly", "deHavilland", "Avenue of the Americas", "Bras d'Or") as deemed correct by the authoritative source.

3.5 NENA Globally UniqueIDs (NGUID)

NGUID is REQUIRED for all GIS data elements. NGUIDs shall be generated and maintained within a GIS database by concatenating "urn:emergency:uid:gis:[Layer Indicator]:[Local Unique ID]:[Agency Identifier]" where the elements are defined as:

- **urn:emergency:uid:gis** – standardized unique prefix that defines this class of IDs associated with GIS data.

- **Layer Indicator** – the shorter name for the GIS data layer the feature is associated with as defined by the GIS Data Layers Registry in NENA-STA-010. See Appendix B in this document for Layer Indicator values.
- **Local Unique ID** – a GIS Data Provider generated "locally assigned ID," which can be numeric and/or text. This local ID MUST be unique within the GIS Data Provider's dataset for all features associated with a specific Agency Identifier.
- **Agency Identifier** – a fully qualified domain name (FQDN) representing the GIS Data Provider, which is an "Agency." Agency and Agency Identifier are as defined in NENA-STA-010. The domain name is obtained from any Domain Name System (DNS) registrar. See Appendix C in this document for Agency Identifier values.

Each NGUID MUST be unique as an aggregated NGUID following the structure described in this section.

The combination of the Local Unique ID with the rest of the values that construct the NGUID, provides a unique NGUID when multiple GIS Data Provider submissions are aggregated. The NGUID SHOULD be stable for as long as possible, so that it supports the reporting and resolution of errors from a quality control process, including the discrepancy reporting. The consistency of the ID between submissions also assists with managing downstream data sets.

Note: The state's QC/aggregation tool can populate the NGUID, if requested. The only requirement is that the local entity provide the Local Unique ID within the NGUID field so that the URN, layer indicator and agency identifier can be concatenated.

Example NGUIDs:
urn:emergency:uid:gis:RCL:{AD873541-F41C-409E-A0BE-1B0C583902A4}:carroll-county-comm.state.ia.us

URN	urn:emergency:uid:gis
Layer Indicator	RCL
Local Agency ID	{AD873541-F41C-409E-A0BE-1B0C583902A4}
Agency Identifier	carroll-county-comm.state.ia.us

urn:emergency:uid:gis:Psap:1234:boone-county-comm.state.ia.us

URN	urn:emergency:uid:gis
Layer Indicator	Psap
Local Agency ID	1234
Agency Identifier	boone-county-comm.state.ia.us

3.6 Agency ID and Discrepancy Agency ID Values

The values for Agency ID and Discrepancy Agency ID within the NG9-1-1 system will be populated to the state's GIS Data Service Provider. The values utilized will follow the URIs provided by the state's NGCS. The values for each entity can be found in Appendix C.

4.0 Spatial Requirements

4.1 Data Format

GIS data can be represented in a growing number of different GIS data file formats. In some cases, a GIS data file format can also be "versioned" which can create problems even when an entity believes it is fully-equipped to read a particular format from another entity. Due in part to the dynamic nature of GIS data file formats and in part to the variety of formats that an entity may or may not be in a position to support with their chosen GIS, this standard currently places no requirement on the GIS data file format to use for information exchange. This standard does however place requirements on the field names used, the properties of each field, and specific guidance on the attribution to be placed within the fields of an entity's chosen GIS data file format.

In many cases, when an entity is exchanging GIS data with a vendor, the vendor's requirements will drive the use of a particular GIS data file format. When exchanging GIS data between entities, it is expected that the entities will coordinate to ensure the receiving entity can read the GIS data file format provided. What should be consistent with GIS data exchange in an NG9-1-1 environment, regardless of the GIS data file format used for the exchange, are the naming conventions of each field in each layer, as well as the accompanying properties of each field described within this standard. This should be true whether the exchange is between a public safety entity and its vendor(s) or between one or more public safety entities and/or authoritative GIS sources. It is anticipated that by ensuring consistency at the field level, entities will be able to share information with any other public safety entity using a mutually-agreed-upon GIS data file format and that the information received will not be misinterpreted, or perceived as malformed by the recipient, in that exchange.

4.2 Coordinate Reference System and Datum

While local GIS data may be kept in any projection desired, prior to loading the data into the Emergency Call Routing Function (ECRF) or the Location Validation Function (LVF) the data MUST be in the following spatial reference:

- Coordinate Reference System and Datum – Use of the World Geodetic System of 1984 (WGS84) [6] is required for GIS information within the ECRF/LVF. All geodetic data in i3 uses WGS84 as referenced in NENA-STA-010 [1].
- Geodetic parameters for WGS84 are specified by the European Petroleum Survey Group (EPSG) for both 2-dimensional and 3-dimensional geometries.
    - For 2-dimensional geometries the geodetic parameters are required to follow EPSG::4326.
    - For 3-dimensional geometries the geodetic parameters are required to follow EPSG::4979.

Note: WGS84 (GPS) elevation is measured as height above the ellipsoid, which varies significantly from height above the geoid (approximately Mean Sea Level).

Recognizing that conversion always introduces some error, it is recommended that NG9-1-1 systems use WGS84 natively. As an example, if one is using GIS software and the North American Datum (NAD) of 1983, the NAD 1983 to WGS84 transformation SHALL be used. Regardless of the projection used by the native data, any re-projection to WGS84 will require transformation steps. These transformation steps will minimize error and reduce or eliminate the chance of creating unnecessary overlaps and gaps. The transformation steps will vary depending on your native projection and the GIS software used for data development and maintenance. Advice from a geodesist, registered surveyor, or your Spatial Interface (SI) provider is recommended for minimization of transformation errors.

Projection and transformation process information for each GIS data layer MUST be included in the metadata.

5.0 Required Layer Category

5.1 Road Centerline

Roads data is maintained as a line layer for representing the centerline of a real world roadway. This dataset is referred to as the RoadCenterLine layer in the GIS Data Layers Registry in NENA-STA-010 and in NENA documents going forward. GIS road centerline arc-node topology is associated with attribute data containing information on street names, address ranges, jurisdictional boundaries, and other attributes.

Road Centerline Creation
Road centerlines represent all public and addressed private streets. Road names must conform to the legal names as assigned by the local addressing authority. All centerline attributes should be accurate, complete, and standardized to the format in this document. All abbreviations of Street Prefixes and Suffixes should be incorporated according to NENA Standards. Road centerlines must match the ALI data to a 98% or higher rate, and all related NENA standards shall be met or exceeded.

Road centerlines are drawn in segments. Segments shall be broken and snapped to the endpoint of the adjoining segments in the following circumstances:
- At State, County, Incorporated Municipality, Service and ESZ boundaries
- At any change in the primary road name
- Data stewards may include any additional breaks in the segments that they require, as long as each segment is snapped to the endpoint of the adjoining segments and attributes are properly populated.

Placement of centerlines shall fall within the visible boundary of the road surface in the best available orthoimagery. It is recommended they fall with 10' of the center of the visible road

surface in the best available orthoimagery.

Fails to meet standard   *Meets standard*

Meets recommendation

Centerlines and Range Placement
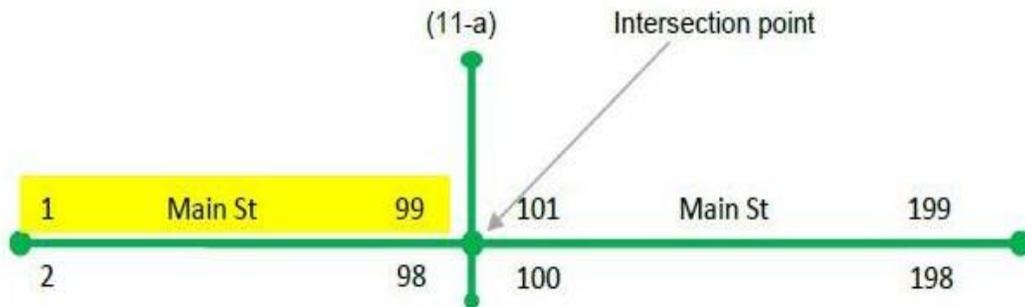
(11-a) The highlighted range above represents the odd addresses between 1 and 99 for Main St. The address range should be numbered Low address to High address, following the direction of the centerline. Any necessary deviations should be documented.
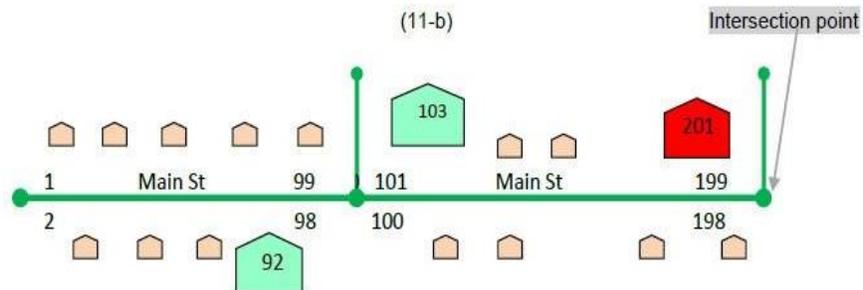
(11-b) All address point addresses along a section of centerline should fall within the range of that particular centerline segment. The address point for 201 Main St. is not included in the range, the point should be verified and either centerline range or address point location should be modified.
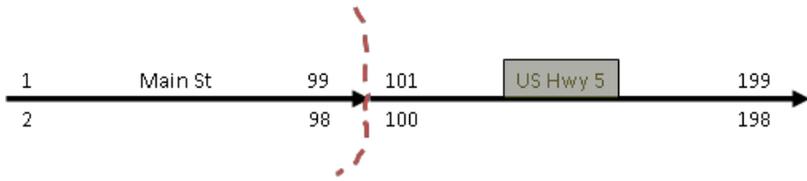
(11-c)

(11-c) - Street names can change. Main St is located inside the city limits, but when it leaves the city, the name changes to US Hwy 5. The address range data may change with the new name, but not always.

One-Way Streets

Follow the center of the lane or lanes with a single line segment. As a general best practice, the segment should be drawn in the direction of increasing address with the lower range at the start point (left from/right from) and the higher range at the end point (left to/right to) and not the direction of travel. It is important to note that the One-Way directional attributes (FT, TF, B) indicating the direction of travel is interpreted based on digitized direction of the segment, if not populated. If digitized direction is change to meet requirements, the optional attribute, One-Way, must be populated.

Turning Lanes

Follow the center of the turning lane, when there are no physical or legal barriers between lanes, one line segment is sufficient.
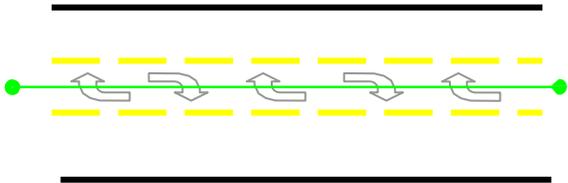
Bi-Directional Traffic Lanes

Two lanes on one side of the divider, three lanes on the other side results in one centerline coinciding with the central painted line on one side, and one centerline in the middle lane on the opposite side of the barrier. Only one side of each centerline shall be addressed for this type of road.
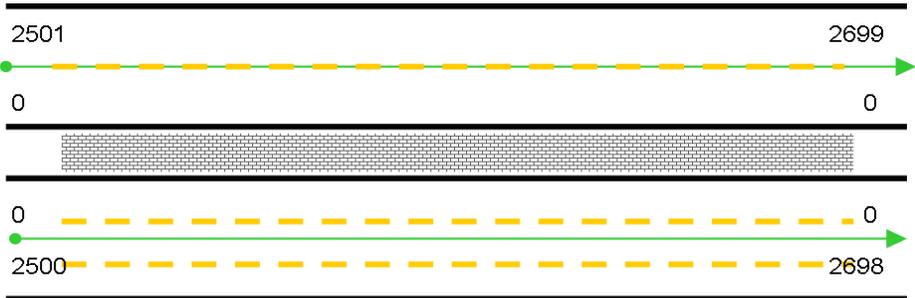
Dual Carriageway
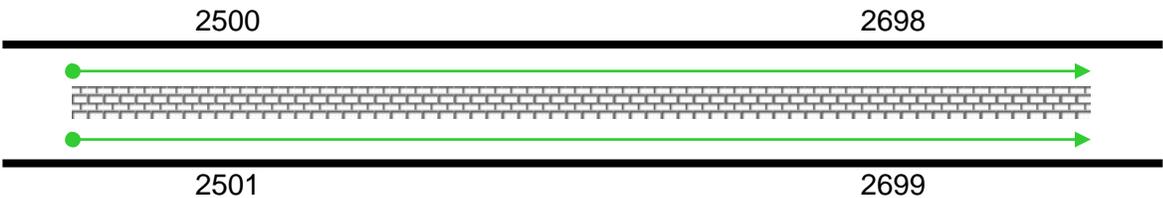
This is an example of a Dual Carriageway. Only one side of the centerline shall be addressed for this type of road centerline.

Road shall be represented as dual carriageways if the median meets both the type and length specifications below:

Median Type: Any physical barrier and any painted barrier greater than 4' wide.

Median Length: Divides the road for 1/10th of one mile or more in urban areas and 3/10th of one mile or more in rural areas.

For a road that divides temporarily to go around small reserves or other small obstructions, as in the example image below, a single centerline can be used.

Cul-De-Sac

Cul-de-sac roads shall be represented by a single line extended to the center or edge of the pavement as shown below. If the drive lane circles a small reserve or other central obstruction, the line can follow the center of the drive lane at the GIS data provider's discretion.
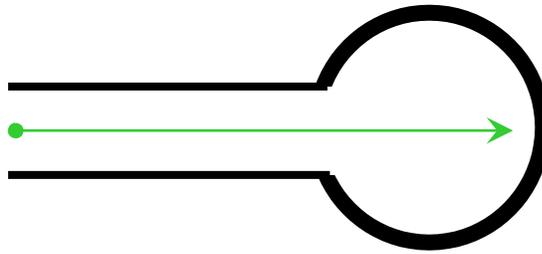
Address Ranges Along Jurisdictional Boundaries

When a road segment forms the boundary between PSAP service areas, the data steward shall include only those address ranges for which they are responsible. For example, if a road forms part of the boundary between two counties. County A assigns addresses along the west side of the road, and County B assigns addresses along the east side. County A data MUST contain zeros for the address ranges on the east side, and County B data MUST contain zeros for the address ranges on the west side.

Border Roads

Roads that form the border between Provisioning Boundaries such as counties will be present in the data of more than one agency. Each agency is responsible for the attributes on the side of the line segment associated with addresses in their jurisdiction. Values for attributes on the side of the line segment associated with addresses that are not in their jurisdiction will be dropped in aggregation however the ranges on the non-authoritative side MUST be 0, 0.

In the example below, the left side attributes are the responsibility of County A and the right side attributes are the responsibility of County B.
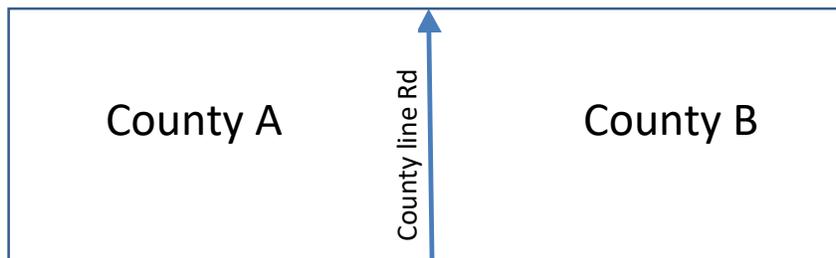
Unnamed Streets

All unnamed centerlines MUST have the Street Name field and ranges (0,0) populated.

Descriptions for each field in the NG9-1-1 data model can be found in [Appendix A](#).

RoadCenterLine Layer				
Descriptive Name	Field Name	Required	Type	Field Width
Discrepancy Agency ID	DiscrpAgID	Yes	P	100
	Auto populated through the state's QC/aggregation platform			
Date Update	LastUpdated	Yes	D	
Effective Date	Effective	No	D	
Expiration Date	Expire	No	D	
NENA Globally Unique ID	NGUID	Yes	P	254
	Locally assigned number is the only information required at local level; the state's QC/aggregation platform <u>can</u> add the URN, Layer and Discrepancy Agency ID			
Country Left	Country_L	Yes	P	2
	Can be auto populated through the state's QC/aggregation platform			
Country Right	Country_R	Yes	P	2
	Can be auto populated through the state's QC/aggregation platform			
State Left (A1)	State_L	Yes	P	2
State Right (A1)	State_R	Yes	P	2
County Left (A2)	County_L	Yes	P	40
County Right (A2)	County_R	Yes	P	40
Incorporated Municipality Left (A3)	IncMuni_L	Yes	E	100
Incorporated Municipality Right (A3)	IncMuni_R	Yes	E	100
Unincorporated Community Left (A4)	UnincComm_L	No	E	100
Unincorporated Community Right (A4)	UnincComm_R	No	E	100
Neighborhood Community Left (A5)	NbrhdCom_L	No	E	100
Neighborhood Community Right (A5)	NbrhdCom_R	No	E	100
Left Address Number Prefix	AdRngPre_L	Conditional	P	15
Right Address Number Prefix	AdRngPre_R	Conditional	P	15
Left From Address	FromAddr_L	Yes	N	6
Left To Address	ToAddr_L	Yes	N	6
Right From Address	FromAddr_R	Yes	N	6
Right To Address	ToAddr_R	Yes	N	6
Parity Left	Parity_L	Yes	P	1
Parity Right	Parity_R	Yes	P	1
Postal Community Name Left	PostComm_L	Conditional	P	40
Postal Community Name Right	PostComm_R	Conditional	P	40
Postal Code Left	PostCode_L	Conditional	P	7
Postal Code Right	PostCode_R	Conditional	P	7
ESN Left*	ESN_L	Yes	P	5
ESN Right*	ESN_R	Yes	P	5
MSAG Community Name Left*	MSAGComm_L	Yes	P	30
MSAG Community Name Right*	MSAGComm_R	Yes	P	30
Street Name Pre Modifier	StN_PreMod	Conditional	E	15
Street Name Pre Directional	StN_PreDir	Conditional	P	10
Street Name Pre Type	StN_PreTyp	Conditional	E	50
Street Name Type Separator	StN_PreSep	Conditional	E	20
Street Name	StreetName	Yes	E	254
Street Name Post Type	StN_PosType	Conditional	E	50

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RoadCenterLine Layer				
Descriptive Name	Field Name	Required	Type	Field Width
Street Name Post Directional	StN_PosDir	Conditional	P	10
Street Name Post Modifier	StN_PosMod	Conditional	P	25
Speed Limit	SpeedLimit	No	N	3
One-Way	OneWay	No	P	2
Road Class	RoadClass	No	A	24
Legacy Street Name Pre Directional*	LSt_PreDir	Yes	P	2
Legacy Street Name*	LSt_Name	Yes	P	75
Legacy Street Name Type*	LSt_Type	Yes	P	4
Legacy Street Name Post Directional*	LSt_PosDir	Yes	P	2
Validation Left	Valid_L	No	P	1
Validation Right	Valid_R	No	P	1
QA/QC Exception Code	GC_Exception	Conditional	P	75
County Identifier Left**	CountyID_L	Yes		
County Identifier Right**	CountyID_R	Yes		
EMS Display Name Left**	EMS_L	Yes		
EMS Display Name Right**	EMS_R	Yes		
Fire Display Name Left**	FIRE_L	Yes		
Fire Display Name Right**	FIRE_R	Yes		
Law Display Name Left**	LAW_L	Yes		
Law Display Name Right**	LAW_R	Yes		
PSAP Display Name Left**	PSAP_Name_L	Yes		
PSAP Display Name Right**	PSAP_Name _R	Yes		
PSAP URI Left**	PSAPURI_L	Yes		
PSAP URI Right**	PSAPURI_R	Yes		

*Used in legacy systems and is not used in a full NG9-1-1 implementation.
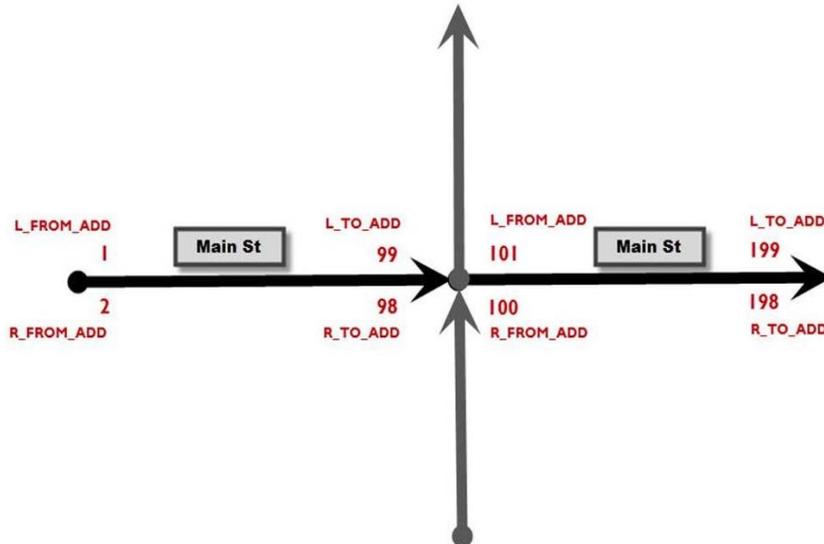** Required for the State of Iowa's ALI 6.0 file; auto populated through the state's QC/aggregation platform

Figure 1: This graphic depicts the explanation of "From" and "To" address ranges described in the attribute descriptions above for L_FROM_ADD, L_TO_ADD, R_FROM_ADD, and R_TO_ADD.

5.2 Site/Structure Address Points

Site/Structure Addresses data is maintained as a point layer for representing the location of a site, a structure, or access to a site or structure. This dataset is referred to as the SiteStructureAddressPoint layer in the GIS Data Layers Registry in NENA-STA-010 and in NENA documents going forward. Site/Structure Address data can also represent landmarks. While SiteStructureAddressPoint is a required layer, there is no requirement for the completeness of this data. It is understood that it will take time and resources to fully develop complete and accurate Site/Structure Addresses data.

Site/Structure Addresses data can be used to locate sites that otherwise may not geocode correctly using the road centerline data. It can also be used to locate areas of unusual addressing (i.e., odd addresses on even side of the road centerlines and vice versa), and other areas where the data is available. Some addressable locations may be problematic near boundaries.

The Address Number, Street Name, and place name attributes (e.g., Incorporated Municipality, Unincorporated Community, Neighborhood Community) in the SiteStructureAddressPoint layer SHOULD be consistent with the address number range, street name, and left/right place name attribute combinations found in the RoadCenterLine layer.

While there may be address data available, it may not be in the standardized format of this structure. GIS data providers should be working toward developing and maintaining the site structure point data described in this Standard.

See Section 9.1 for the link to the NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1.

Placement Properties

Address points represent all structures and sites with a unique assigned street address. There should not be any duplicate address points. There should be a point on every addressable single-unit building, on living unit/occupancy of every multi-unit building or complex, and a point for every telephone service address in the TN listing.

For some structures and sites, an access point is not always obvious. Long driveways in rural areas are an example of this. It is recommended that GIS Data Provider maintain subordinate points for those access locations, if possible, and these points should have the appropriate exception code to remove from the data set before aggregation to the NG9-1-1 statewide GIS data set.

Primary Point Placement

The primary address point should be placed on the primary structure or site, if no structure exists. This is a requirement for point placement, not address assignment. It is common for a

rural address to be assigned based on the location of the driveway where it joins the road, which is appropriate. However, it is recommended that the address point shall be placed on the structure itself.

Multiple Address Structures

Buildings or complexes with a street address and individual units bearing unit identifiers (apartment numbers, building numbers, etc.), should, when possible, have an address point for each unit. Address points for individual units should be placed on the structure, in the appropriate location of the unit within the building. When there are units in similar locations on multiple stories, it is recommended that the points for each unit shall be placed near the others but not stacked on top of them at the same coordinate.

Point placement on Duplex
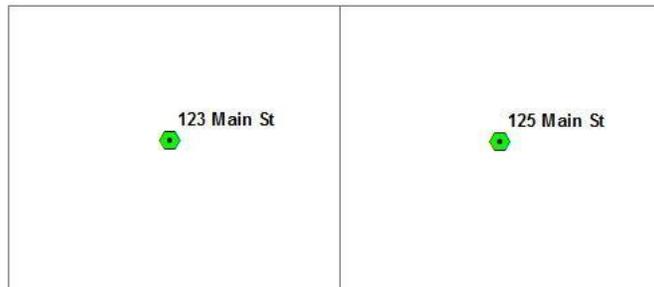
Point placement on single story with multiple units (ex. Apartment numbers 101-104)
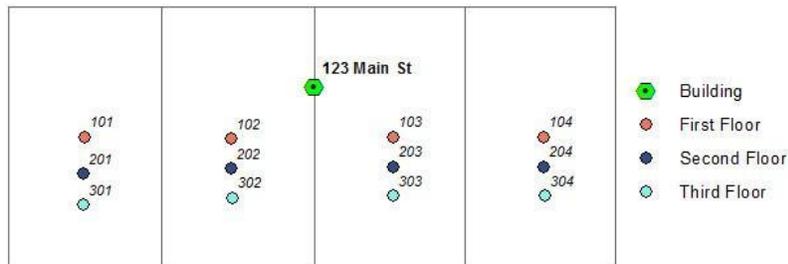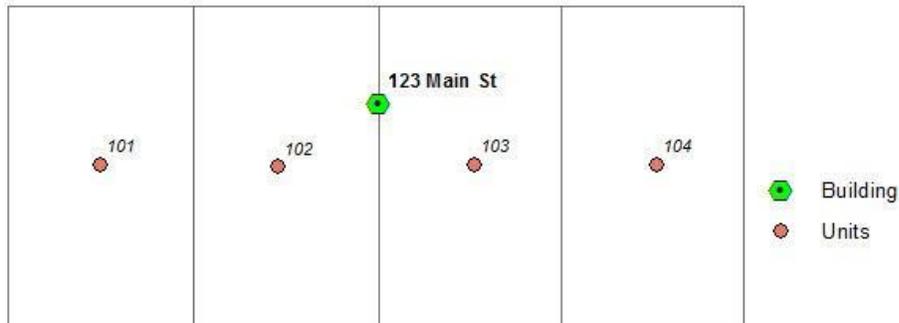
Address Point Requirements Summary

Address points should be continually updated and meet or exceed the NENA standards. Each address point should represent a unique address and represent all 9-1-1 addressable structures.

Descriptions for each field in the NG9-1-1 data model can be found in Appendix A.

SiteStructureAddressPoint Layer				
Descriptive Name	Field Name	Required	Type	Field Width
Discrepancy Agency ID	DiscrpAgID	Yes	P	100
	Auto populated through the state's QC/aggregation platform			
Date Update	DateUpdate	Yes	D	
Effective Date	Effective	No	D	
Expiration Date	Expire	No	D	
NENA Globally Unique ID	NGUID	Yes	P	254
	Locally assigned number is the only information required at local level; the state's QC/aggregation platform can add the URN, Layer and Discrepancy Agency ID			
Country	Country	Yes	P	2
	Can be auto populated through the state's QC/aggregation platform			
State (A1)	State	Yes	P	2
County (A2)	County	Yes	P	40
Additional Data URI	AddDataURI	Conditional	U	254
Incorporated Municipality (A3)	Inc_Muni	Yes	P	100
Unincorporated Community (A4)	Uninc_Comm	No	P	100
Neighborhood Community (A5)	Nbrhd_Comm	No	P	100
Address Number Prefix	AddNum_Pre	Conditional	P	15
Address Number	Add_Number	Conditional	N	6
Address Number Suffix	AddNum_Suf	Conditional	P	15
Street Number Pre Modifier	StN_PreMod	Conditional	P	15
Street Number Pre Directional	StN_PreDir	Conditional	P	10
Street Number Pre Type	StN_PreTyp	Conditional	P	50
Street Number Pre Type Separator	StN_PreSep	Conditional	P	20
Street Name	StreetName	Conditional	P	254
Street Name Post Type	StN_PosType	Conditional	P	50
Street Name Post Directional	StN_PosDir	Conditional	P	10
Street Name Post Modifier	StN_PosMod	Conditional	P	25
ESN*	ESN	Yes	P	5
MSAG Community Name*	MSAG_Comm	Yes	P	30
Postal Community Name	Post_Comm	Conditional	P	40
Postal Code	Post_Code	Conditional	P	7
Zip Plus 4	Post_Code4	No	P	4
Building	Building	No	P	75
Floor	Floor	No	P	75
Unit	Unit	No	P	75
Room	Room	No	P	75
Seat	Seat	No	P	75
Additional Location Information	Addtl_Loc	No	P	225
Complete Landmark Name	LandmkName	Conditional	P	150

SiteStructureAddressPoint Layer				
Descriptive Name	Field Name	Required	Type	Field Width
Mile Post	Mile_Post	Conditional	P	150
Place Type	Place_Type	No	P	50
Longitude	Long	No	F	
Latitude	Lat	No	F	
Elevation	Elev	No	N	6
Legacy Street Name Pre Directional*	LSt_PreDir	Yes	P	2
Legacy Street Name*	LSt_Name	Yes	P	75
Legacy Street Name Type*	LSt_Type	Yes	P	4
Legacy Street Name Post Directional*	LSt_PosDir	Yes	P	2
QA/QC Exception Code	GC_Exception	Conditional	P	75
County Identifier**	CountyID	Yes		
EMS Display Name**	EMS	Yes		
Fire Display Name**	FIRE	Yes		
Law Display Name**	LAW	Yes		
PSAP Display Name**	PSAP_Name	Yes		
PSAP URI**	PSAPURI	Yes		

 *Used in legacy systems and is not used in a full NG9-1-1 implementation.
** Required for the State of Iowa's ALI 6.0 file; auto populated through the state's QC/aggregation platform

5.3 Service Boundaries

Service Boundaries data is maintained as polygon layers for representing the geographic area for the providers of response services. These layers are collectively referred to as the service boundary layers in NENA documents or individually as the PsapPolygon layer, PolicePolygon layer, FirePolygon layer, and EmsPolygon layer in the GIS Data Layers Registry in NENA-STA-010 and in NENA documents going forward. All other service boundary layers (e.g., CoastGuardPolygon, PoisonControlPolygon) would follow the naming conventions found in NENA-STA-010 GIS Data Layers Registry.

Within the i3 architecture, all service boundary layers follow the same data structure. GIS Data Providers MAY locally maintain these layers as separate or combined.

5.3.1 Primary PSAP Services

In an NG9-1-1 deployment, the initial routing of a 9-1-1 call cannot happen without Primary PSAP boundaries. It is the most critical layer and MUST be provided. Its data structure is the same as all service boundary layers defined in this section. All polygons in this layer MUST have a Service URN of urn:service:sos.

The PsapPolygon layer may have one or many PSAP Boundaries contained in the layer. Each PSAP Boundary defines the geographic area of a PSAP that has primary responsibilities for an emergency request. This layer is used by the ECRF to perform a geographic query to determine the PSAP to which an emergency request is routed. An emergency request is routed using the NG9-1-1 Core Services based upon the geographic location of the request, provided by either a civic address, geographic coordinate, or geodetic shapes as defined in NENA-STA-010.

5.3.2 Primary Emergency Services

In an NG9-1-1 deployment, the selective transfer of 9-1-1 calls and Emergency Incident Data Objects (EIDOs) to another PSAP or downstream agency uses service boundary layers, all with the same data structure.

The following layers (formerly known as Emergency Service Boundaries), which may be maintained as separate or combined, are the next highest priority for NG9-1-1 deployment. Primary Emergency Services MUST include the following:

● Police
● Fire
● Emergency Services

Each of these layers is used by the ECRF to perform a geographic query to determine which agencies are responsible for providing service to a location in the event a selective transfer is desired, or to direct an EIDO to an agency for dispatch, or to display the responsible agencies at the PSAP. In addition, service boundary layers are used by PSAPs to identify the appropriate entities/first responders to be dispatched. Each layer representing a primary emergency service may contain one or more polygon boundaries that define the primary emergency services for that geographic area.

*Note: The service boundary layers described here are intended to represent the entirety of the service boundary of the agencies. In many agencies, the service boundary is broken into smaller areas served by a station/beat/platoon, with the service area of the agency being the union of the smaller areas. The layer can contain a polygon set (more than one polygon), which is intended to cover holes, and disconnected areas of service, which does occur. Because a polygon set is allowed, if this layer had the smaller polygons and if all of them have the same Service URI and Service URN (but not necessarily the same Display Name, for example), it would work correctly. It has the downside of increasing work on the ECRF since it has more polygons to consider. The SI Operator can advise whether small polygons can be accommodated in any given implementation. A future edition of this document will address this issue and specifically handle station/beat/platoon service areas directly.

Service Boundary Layers				
Descriptive Name	Field Name	Required	Type	Width
Discrepancy Agency ID	DiscrpAgID	Yes	P	100
	Auto populated through the state's QC/aggregation platform			
Date Update	DateUpdate	Yes	D	
Effective Date	Effective	No	D	
Expiration Date	Expire	No	D	
NENA Globally Unique ID	NGUID	Yes	P	254
	Locally assigned number is the only information required at local level; the state's QC/aggregation platform can add the URN, Layer and Discrepancy Agency ID			
Country	Country	No	P	2

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Service Boundary Layers				
Descriptive Name	Field Name	Required	Type	Width
Can be auto populated through the state's QC/aggregation platform				
State (A1)	State	No	P	2
Agency Identifier	Agency_ID	Yes	P	100
Service URI	ServiceURI	Yes	U	254
Auto populated through the state's QC/aggregation platform *except* for data sets with multiple PSAP boundaries				
Service URN	ServiceURN	Yes	P	55
Auto populated through the state's QC/aggregation platform				
Service Number	ServiceNum	No	P	15
Agency vCard URI	AVcard_URI	Yes	U	254
Display Name	DsplayName	Yes	P	60
QA/QC Exception Code	GC_Exception	Conditional	P	75

5.5 Provisioning Boundary

Provisioning Boundaries data is maintained as a polygon layer for representing the area of GIS data provisioning responsibility, with no unintentional gaps or overlaps. This dataset is commonly referred to as the ProvisioningPolygon layer in the GIS Data Layers Registry in NENA-STA-010 and in NENA documents going forward. The Provisioning Boundary MUST align with data from all adjoining GIS Data Providers.

A Provisioning Boundary can take on a variety of shapes; for example, it may represent the extent of a city, the extent of a county, a region with multiple cities and counties, or possibly the extent of all areas served by a particular PSAP.

When provisioning data for an ECRF and LVF through the SI, a GIS Data Provider MUST only include GIS data within their Provisioning Boundary and MUST ensure the data includes coverage for the entire extent of their Provisioning Boundary. The Spatial Interface Operator will utilize the ProvisioningPolygon layer to ensure that these requirements are met.

Note: The 9-1-1 Authority is ultimately responsible for the GIS data within the area they provide service for.

ProvisioningPolygon Layer				
Descriptive Name	Field Name	Required	Type	Width
Discrepancy Agency ID	DiscrpAgID	Yes	P	100
Auto populated through the state's QC/aggregation platform				
Date Update	DateUpdate	Yes	D	
Effective Date	Effective	No	D	
Expire	Expiration Date	No	D	
NENA Globally Unique ID	NGUID	Yes	P	254
Locally assigned number is the only information required at local level; the state's QC/aggregation platform can add the URN, Layer and Discrepancy Agency ID				
QA/QC Exception Code	GC_Exception	Conditional	P	75

6.0 Strongly Recommended Layer Category

6.1 Administrative Units (A1-A3)

In prior versions of this document, and in common use, we have layers named "State," "County," and "Incorporated Municipality." As use of this document expands beyond the typical US experience, these terms are evolving to the PIDF-LO A1, A2, A3 names, respectively. Territories, indigenous person managed lands, and military installations, even with a few alternative names, does not cover the wide variety of nomenclature for these levels. The PIDF-LO names were created by an international standards organization (IETF) which covers a much wider variation but using the A1 for what was "State/Province," A2 for what was "County or equivalent," and A3 for what was "Incorporated Municipality" is seen as a better choice.

6.1.1 State (A1)

States (A1) data is maintained as a polygon layer for representing the geographic area of a state, province, or other top-level subdivision of the larger country corresponding to PIDF-LO element A1. This dataset is referred to as the A1Polygon layer in the GIS Data Layers Registry in NENA-STA-010 and in NENA documents going forward. At the time of publication, the Stats polygon is not utilized for NG9-1-1 and when needed will be provided by the State of Iowa.

A1Polygon Layer				
Descriptive Name	Field Name	Required	Type	Field Width
Discrepancy Agency ID	DiscrpAgID	Yes	P	100
	Auto populated through GIS Data Hub			
Date Update	DateUpdate	Yes	D	
Effective Date	Effective	No	D	
Expiration Date	Expire	No	D	
NENA Globally Unique ID	NGUID	Yes	P	254
	Locally assigned number is the only information required at local level; the state's QC/aggregation platform <u>can</u> add the URN, Layer and Discrepancy Agency ID			
Country	Country	Yes	P	2
	Can be auto populated through GIS Data Hub			
State (A1)	State	Yes	P	2
QA/QC Exception Code	GC_Exception	Conditional	A	75

6.1.2 Counties (A2)

County (A2) polygons are not required to be submitted to the state's QC/aggregation tool.
Counties (A2) data is maintained as a polygon layer for representing the geographic area of a county, parish, province, or other subdivision of the larger country corresponding to PIDF-LO element A2. This dataset is referred to as the A2Polygon layer in the GIS Data Layers Registry in NENA-STA-010 and in NENA documents going forward. This layer may be useful for addressing and emergency response.

A2Polygon Layer				
Descriptive Name	Field Name	Required	Type	Field Width
Discrepancy Agency ID	DiscrpAgID	Yes	P	100
	Auto populated through the state's QC/aggregation platform			
Date Updated	DateUpdate	Yes	D	
Effective Date	Effective	No	D	
Expire Date	Expiration	No	D	
NENA Globally Unique ID	NGUID	Yes	P	254
	Locally assigned number is the only information required at local level; the state's QC/aggregation platform can add the URN, Layer and Discrepancy Agency ID			
Country	Country	Yes	P	2
	Can be auto populated through the state's QC/aggregation platform			
State (A1)	State	Yes	P	2
County (A2)	County	Yes	P	75
QA/QC Exception Code	GC_Exception	Conditional	P	75

6.1.3 Incorporated Municipalities (A3)

Incorporated Municipalities (A3) polygons are not required to be submitted to the state's QC/aggregation tool.

Incorporated Municipalities (A3) data is maintained as a polygon layer for representing the geographic area of a city, town, village, or other subdivision of the larger country corresponding to PIDF-LO element A3. This dataset is referred to as the A3Polygon layer in the GIS Data Layers Registry in NENA-STA-010 and in NENA documents going forward. This layer may be useful for addressing and emergency response.

A3Polygon Layer				
Descriptive Name	Field Name	Required	Type	Field Width
Discrepancy Agency ID	DiscrpAgID	Yes	P	100
	Auto populated through the state's QC/aggregation platform			
Date Updated	DateUpdate	Yes	D	
Effective Date	Effective	No	D	
Expiration Date	Expire	No	D	
NENA Globally Unique ID	NGUID	Yes	P	254
	Locally assigned number is the only information required at local level; the state's QC/aggregation platform can add the URN, Layer and Discrepancy Agency ID			
Country	Country	Yes	P	2
	Can be auto populated through the state's QC/aggregation platform			
State (A1)	State	Yes	P	2
County (A2)	County	Yes	P	100
Incorporated Municipality (A3)	Inc_Muni	Yes	P	100
QA/QC Exception Code	GC_Exception	Conditional	P	75

7.0 Synchronization and Accuracy Standards

7.1 Synchronization Standards

In NG9-1-1 systems, the RoadCenterLine layer in GIS is what will absorb the content and purpose currently served by the MSAG in E9-1-1 systems for civic address location validation. The process of translating location information and a service URN request into a routing URI takes place via a Location to Service Translation (LoST) Protocol. According to the NENA informational document (71-501), a minimum 98% synchronization rate between MSAG, ALI, and GIS data is recommended before GIS data is considered viable for use in a LoST protocol. The State of Iowa has transitioned to a GIS derived MSAG where the legacy MSAG has been replaced by the tabular data from the RoadCenterLine and SiteStructureAddressPoint layers. For this reason, the State of Iowa has made the decision that the more important synchronization of ALI to RoadCenterLine at or above 98% be the benchmark for NG9-1-1 as long as the GIS derived MSAG is utilized.

7.2 Accuracy Standards

Improving the synchronization as recommended in 8.1 will also serve the purpose of improving the overall accuracy of the GIS layers. Because the purpose of this document is to provide recommendations for GIS data for use in ECRF and LVF functional elements, the accuracy standards will focus only on those required layers that will be provisioned into the ECRF and LVF.

- RoadCenterLines
  - Must contain all information currently maintained in the MSAG in line with all mandatory attributes defined in the schema above
  - Must be broken at all PSAP and Emergency Services boundaries to accommodate proper left/right attribution
  - Must contain populated fully spelled out street name fields
- SiteStructureAddressPoints
  - Must contain all information currently maintained in the MSAG in line with all mandatory attributes defined in the schema above
  - Must contain populated fully spelled out street name fields
- PSAP Boundaries
  - Must represent geographic extent and proper boundaries for all PSAPs within the provisioning boundary
  - Must not contain any overlaps or gaps among polygons
  - Must be attributed as outlined in schema above
- Service Boundaries
  - Must represent geographic extent and proper boundaries for all Emergency Services with the provisioning boundary
  - Must not contain any overlaps or gaps among polygons
  - Must be attributed as outlined in schema above
- Provisioning Boundary

- o Must represent the geographic extent of the source agency providing GIS data for inclusion in statewide layers utilized in the NG9-1-1 system
- o Must be attributed as outlined in schema above

8.0 QA/QC Errors and Feature Level Exceptions

During the QA/QC process implemented by the State of Iowa topological and attribute level quality control checks are conducted at the feature level. As the checks are completed and errors are identified, error codes are populated within the GC_Exception field of each data layer. Each error should be reviewed by the GIS Data Provider to correct all errors identified. Exceptions, covered in the following section, can be made at the feature level using the same codes as identified during QA/QC and listed below.

At the time of publication, the only exception code that is available to use is 999 (remove feature for the NG9-1-1 dataset). Additional codes, as listed below, will be available soon within the state's QC/aggregation tool.

Road Centerline Exception Codes (not currently in used at time of publication)

Exception Code	QC Check	Discrepancy Description
003	GEN_Complex_Geometry	RCL: Complex Geometry
102	RCL_Parsing	RCL: Separated Street name fields do not match combined street field
104	RCL_Range_Parity	RCL: Range parity issue with mix of odd and even values on a side
105	RCL_Range_FROM_Higher	RCL: FROM range higher than TO range
106	RCL_ Direction_Check	RCL: Has Incorrect Direction
107	RCL_ Oneway_Check	RCL: Has Incorrect One-way Value
111	RCL_ Zero_Range_Value	RCL: Has Zero In Range Value
112	RCL_ StackedSegments	RCL: Has Stacked Segments
200	RCL_Topology_Snapping	RCL: Segment is not snapped to adjacent segments
201	RCL_Topology_BND	RCL: Segment is not broken at or following one or more boundaries
202	RCL_Segment_Length	RCL: Segment length is too short
203	RCL_Topology_Dangle	RCL: Segment ends in dangling node
701, 702	RCL_RangeToZero	RCL: Roads Need Zero Ranges

Site/Structure Address Point Exception Codes (not currently in used at time of publication)

Exception Code	QC Check	Discrepancy Description
003	GEN_Complex_Geometry	SSAP: Complex Geometry
302	SSAP_Parsing	SSAP: Separated house number and street name fields do not match combined address field
304	SSAP_RCL_Range_Compare	SSAP: Street name in SSAP does not match street name in RCL layer or address does not fit in the range on a side of a road
400	SSAP_RCL_Segment_Compare	SSAP: Address spatially located on the wrong block/segment in RCL layer
401	SSAP_RCL_Parity_Compare	SSAP: Address spatially located on the wrong side of the segment in RCL layer

| 402 | SSAP_Duplicate | SSAP: Address occurs more than once in SSAP layer[1] |
| 703 | SSAP_Remove | SSAP: SSAP Address Duplicates with 703 Code |

Boundary Exception Codes (not currently in used at time of publication)
(PSAP, Services, Provisioning, State, County, Incorporated Municipality)

Exception Code	QC Check	Discrepancy Description
003	GEN_Complex_Geometry	BND: Complex Geometry
003	GEN_MultiPart_Geometry	BND: MultiPart Geometry

8.1 Feature Level Exceptions

Exceptions are flags at the feature level that notify QA/QC checks to omit the feature from specific checks. Features may have multiple exceptions. Caution should be used when setting exceptions for each feature within a GIS data set and should only be used when there is a viable exception that will cause known errors during the QA/QC process. Example exceptions for each data layer included in this standard can be found below.

Road Centerline Exception Examples
- Roads are outside the PSAPs boundary but are necessary for visualization within the PSAPs dispatch software and should not be a part of the statewide GIS database. (Code: 999)
- Roads have known, unchangeable parity conflicts. (Code: 104)
- Driveways are included in the road centerline layer but should not be included in the statewide GIS database (Code: 999)
- Road endpoints are within 15ft of another road that do not connect in the real world (Code: 203)

Site/Structure Address Point Exception Examples
- Address points are mile post markers and are necessary for visualization within the PSAP and should be excluded from the statewide GIS database. (Code: 999)
  - Note: Mile post markers are allowed within the address point data layer however the mile post number (e.g., 1.2, 56.4, etc.) must be attributed under the Mile_Post field and not within the Add_Number as the address number field can only contain whole numbers.
- Address points have known, unchangeable addressing conflicts. (Code: 304, 400, 401)
- Points with no addresses have been included for reference and should not be included in the statewide GIS database (Code: 999)

Boundary Exception Examples
(PSAP, Services, Provisioning, State, County, Incorporated Municipalities)
- Boundary data for a surrounding jurisdiction should not be included in the statewide GIS database. (Code: 999)

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[1] The duplicate address check is accomplished through a concatenation of the following SSAP fields: TRIM([AddNum_Pre] & [Add_Number] & [AddNum_Suf] & [StN_PreMod] & [StN_PreDir] & [StN_PreTyp] & [StN_PreSep] & [StreetName] & [StN_PosTyp] & [StN_PosDir] & [StN_PosMod] & [ESN] & [MSAGComm] & [Post_Comm] & [Building] & [Floor] & [Unit] & [Room] & [Seat] & [Addtl_Loc]).

9.0 Conclusion

There are many considerations and variables in developing a statewide GIS dataset for NG9-1-1. Without the proper groundwork, it can be a formidable task. These standards are meant to lay that groundwork and provide guidance for local entities as they approach the task of bringing source GIS data up to the necessary standards for inclusion in statewide layers to be provisioned into the ECRF and LVF functional elements of Iowa's NG9-1-1 system.

9.1 Reference Material and Recommended Reading

- National Emergency Number Association. "NENA Standard Data Formats for 9-1-1 Data Exchange & GIS Mapping." NENA STA-015.010-2018, August 12, 2018. Posted at: https://www.nena.org/page/DataFormats
- National Emergency Number Association. "Detailed Functional and Interface Standards for the NENA i3 Solution, NENA-STA-010.3-2021, October 7, 2021. Posted at: https://www.nena.org/?page=i3_Stage3
- National Emergency Number Association. "NENA Information Document for Synchronizing Databases with MSAG & ALI." NENA 71-501, Version 1, May 16,2009. Posted at: https://www.nena.org/page/synch_gis_msag_ali
- National Emergency Number Association. "NENA Standard for NG9-1-1 GIS Data Model." NENA-STA-006.2a-2022, September 23, 2022. Posted at: https://www.nena.org/?page=NG911GISDataModel
- National Emergency Number Association. "NENA Standards for the Provisioning and Maintenance of GIS data to ECRF and LVFs." NENA-STA-005.1.2-2022, July 19, 2022. Posted at: https://www.nena.org/?page=ProvGISECRFLVF
- National Emergency Number Association. "NENA Next Generation 9-1-1 (NG9-1-1) United States Civic Location Data Exchange Format (CLDXF) Standard." NENA-STA-004, March 23, 2014. Posted at: https://www.nena.org/page/NG911CLDXF
- Kansas NG9-1-1 GIS Data Model, version 2.2, GIS Subcommittee on behalf of the Kansas 911 Coordinating Council, April 6, 2018. https://portal.kansas911.org/portal_doc.cfm?kid=1582
- National Emergency Number Association. "NENA Knowledge Base Glossary." Posted at: https://kb.nena.org/wiki/Category:Glossary
- National Emergency Number Association. "NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1." NENA-INF-014.1-2015, September 18, 2015. Posted at: https://www.nena.org/?SSAP
- World Wide Web Consortium. "XML Schema Part 2: Datatypes Second Edition." October 28, 2004. Posted at: https://www.w3.org/TR/xmlschema-2
- National Emergency Number Association. "NENA E9-1-1 Wireless Maintenance Call Routing & Testing Validation Standard." NENA 57-002, Version 1, June 9, 2007, and "Appendix A – Wireless Call Routing and Testing Validation Worksheet (TVW)." Posted at https://www.nena.org/page/WirelessRoutingTest
- U.S. Postal Service (USPS). "Postal Addressing Standards." Publication 28, November 2022. Posted at: https://pe.usps.com/text/pub28/welcome.htm
- Further references on NG9-1-1 http://www.nena.org/?NG911_Project

Appendix A | NG9-1-1 Data Model Field Descriptions

Additional Data URI
Description: URI(s) for additional data associated with the address point. This attribute is contained in the SiteStructureAddressPoint layer and will define the Service URI of additional information about a location, including building information (blueprints, contact info, floor plans, etc.).
Domain: List of one or more URIs
Example: https://addl68603.example.com

Additional Location Information
Description: A part of a sub-address that is not a Building, Floor, Unit, Room, or Seat.
Domain: None
Example: Pediatric Wing; Loading Dock; Concourse B; Gate B27; Corridor 5

Address Number
Description: The numeric identifier of a location along a thoroughfare or within a defined community.
Domain: Whole numbers from 0 to 999999
Example: "1600" in "1600 Pennsylvania Avenue"
Note: The Address Number MUST be a whole number. This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Address Number Prefix
Description: An extension of the Address Number that precedes it and further identifies a location along a thoroughfare or within a defined area.
Domain: None
Example: "75-" in "75-6214 Kailua Place"; "3W2N-" in "3W2N-4551"
Note: The Address Number Prefix contains any alphanumeric characters, punctuation, and spaces preceding the Address Number. This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Address Number Suffix
Description: An extension of the Address number that follows it and further identifies a location along a thoroughfare or within a defined area.
Domain: None
Example: "B" in "223B Jay Avenue"; "½" in 119½ Elm Street"
Note: This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Agency Identifier
Description: A Domain Name System (DNS) domain name which is used to uniquely identify an agency. An agency is represented by a fully qualified domain name as defined in NENA-STA-010. In order to correlate actions across a wide range of calls and incidents, each agency MUST use one domain name consistently. Any domain name in the public DNS is acceptable so long as each distinct agency uses a different domain name. This ensures that each agency identifier is globally unique.
Domain: Fully qualified domain name
Example: clinton-county-comm.state.ia.us; dsm.city/departments/police-division/
Note: The Agency Identifier is a field in service boundary layers which identifies the agency the boundary defines. It is also used in the Emergency Incident Data Object, the Service/Agency Locator, and MUST be used in constructing NGUIDs.
For the State of Iowa, the Agency Identifier may be the DNS portion of the Service URI as provided by the NGCS if the specific agency does not have an existing DNS. See Appendix C for each PSAP's Agency Identifier.

Agency vCard URI
Description: A vCard is a file format standard for electronic business cards. The Agency vCard URI is the internet address of a JavaScript Object Notation (JSON) data structure which contains contact information (Name of Agency, Contact phone numbers, etc.) in the form of a jCard (RFC 7095). The vCard URI is used in the service boundary layers to provide contact information for that agency. The Agency Locator (see NENA-STA-010) provides the URIs for Agencies listed in it.
Domain: None
Example: https://vcard.psap. clinton-county-comm.state.ia.us; https://jcard.dsm.city/police
Note: This field will be considered for deletion in a future version of this document to align with future changes in NENA-STA-010.
For the State of Iowa, the Agency vCard URI is not populated and treated as Required, No.

Alias Street Name
Description: An alias street name associated with the road centerline segment in the RoadCenterLine layer. The alias street name does not include any street types, directionals, or modifiers. If an alias street name is used in the StreetNameAliasTable this field MUST be populated.
Domain: None
Example: "Scenic" in the Alias Street Name "Scenic Boulevard"

Alias Street Name Post Directional
Description: A word following the Street Name element that indicates the direction taken by the road from an arbitrary starting point or line, or the sector where it is located.
Domain: North; South; East; West; Northeast; Northwest; Southeast; Southwest; or equivalent words in other languages.
Example: "West" in the Alias Street Name "Foley Street West"

Alias Street Name Post Modifier
Description: A word or phrase that follows and modifies the Alias Street Name element, but is separated from it by an Alias Street Name Post Type or an Alias Street Name Post Directional or both.
Domain: None
Example: "Bypass" in the Alias Street Name "Loop 601 North Bypass"
Access, Alternate, Business, Connector, Extended, Extension, Loop, Overpass, Private, Public, Ramp, Scenic, Spur, Underpass

Alias Street Name Post Type
Description: A word or phrase that follows the Alias Street Name element and identifies a type of thoroughfare in a complete alias street name.
Domain: Restricted to values found in the "NENA Registry of Street Name Pre Types and Street Name Post Types" or combinations thereof at:
http://technet.nena.org/nrs/registry/StreetNamePreTypesAndStreetNamePostTypes. xml
Example: "Avenue" in the Alias Street Name "Fashion Avenue"

Alias Street Name Pre Directional
Description: A word preceding the Alias Street Name element that indicates the direction taken by the road from an arbitrary starting point or line, or the sector where it is located.
Domain: North; South; East; West; Northeast; Northwest; Southeast; Southwest; or equivalent words in other languages.
Example: "North" in the Alias Street Name "North Commerce Street"

Alias Street Name Pre Modifier
Description: A word or phrase that precedes and modifies the Alias Street Name element but is separated from it by an Alias Street Name Pre Type or an Alias Street Name Pre Directional or both.
Domain: None
Example: "Alternate" in the Alias Street Name "Alternate Route 8"
Access, Business, Bypass, Connector, Extended, Extension, Loop, Old, Overpass, Private, Public, Ramp, Scenic, Spur, Underpass.

Alias Street Name Pre Type
Description: A word or phrase that precedes the Alias Street Name element and identifies a type of thoroughfare in a complete street name.
Domain: Restricted to values found in the "NENA Registry of Street Name Pre Types and Street Name Post Types" or combinations thereof at:
http://technet.nena.org/nrs/registry/StreetNamePreTypesAndStreetNamePostTypes.xml
Example: "Avenue" in the Alias Street Name "Avenue C";
                     "County Road" in the Alias Street Name "County Road 12";
                     "Avenue" in the Alias Street Name "Avenue of the Americas"

Alias Street Name Pre Type Separator
Description: A preposition or prepositional phrase between the Alias Street Name Pre Type and the Alias Street Name. This element is defined in the CLDXF Standard, NENA-STA-004, as a US specific extension of PIDF-LO per RFC 6848.
Domain: Restricted to values found in the "NENA Registry of Street Name Pre Type Separators" at:
http://technet.nena.org/nrs/registry/StreetNamePreTypeSeparators.xml
Example: "in the" in the Alias Street Name "Circle in the Woods"

Building
Description: One among a group of buildings that have the same address number and complete street name.
Domain: None
Example: Building A; Building 4

Complete Landmark Name

Description: The name by which a prominent site/structure is publicly known.
Domain: None
Example: Veterans Sports Complex, Walsh Hall, Woolfe Avenue Court Apartments, Zion Lutheran Church
Note: Landmarks may or may not be associated with a civic address. There are two landmark name elements: Landmark Name Part and Complete Landmark Name. Within a record, Landmark Name Part MAY occur multiple times, while Complete Landmark Name MAY occur only once. When a landmark is denoted by multiple names in a series (such as "University of South Florida" and "Sun Dome," an arena on the university campus), the Landmark Name Part element holds the separate individual names, and the Complete Landmark Name holds the complete combination. The Landmark Name Part element also allows specification of the order in which the separate names SHOULD be combined into the complete name. This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Country / Country Left / Country Right

Description: The name of a country represented by its two-letter ISO 3166-1 English country alpha-2 code elements in UPPER CASE letters.
Domain: Restricted to the two-letter designations provided in ISO 3166-1.
Example: "US" for the United States of America

County (A2) / County Left (A2) / County Right (A2)

Description: The name of a County or County-equivalent where the address is located. A county (or its equivalent) is the primary legal division of a state or territory.
Domain: Restricted to the names of counties and county equivalents. For the US, a complete list is maintained by the US Census Bureau as ANSI INCITS 31:2009 (Formerly FIPS 6-4) and the Domain is restricted to the exact listed values as published in ANSI INCITS 31:2009, including casing and use of abbreviations.
Example: Allamakee County, Poweshiek County, Washington County
Note: The following clarifications are provided directly from the CLDXF Standard, NENA-STA-004:
- The county name or county equivalent name indicates location, not jurisdiction. Many counties include federal, state, tribal, and other lands within which county government powers, including powers to name roads and assign address numbers, may be limited or superseded by other government bodies. Indicating who has what jurisdiction at a given address is well beyond the scope or intent of this standard.
- FIPS Codes have been superseded, renamed, and updated by the InterNational Committee for Information Technology Standards (INCITS) and can be found at: https://www.census.gov/library/reference/code-lists/ansi.html.

Date Updated

Description: The date and time that the record was created or last modified. This value MUST be populated upon modifications to attributes, geometry, or both.
Domain: Date and Time may be stored in the local database date/time format with the proviso that local time zone MUST be recorded and time MUST be recorded to a precision of at least 1 second and MAY be recorded to a precision of 0.1 second. If the local database date/time format does not meet these specifications, the database SHOULD record both the local date/time format and a string conforming to W3C dateTime format as described in XML Schema Part 2: Datatypes Second Edition.
Example: (of a W3C dateTime with optional precision of .1 second) 2017-12-21T17:58.03.1-05:00 (representing a record updated on December 21, 2017 at 5:58 and 3.1 seconds PM US Eastern Standard Time); 2017-07-11T08:31:15.2-04:00 (representing a record updated on July 11, 2017 at 8:31 and 15.2 seconds AM US Eastern Daylight Time)

Discrepancy Agency ID
Description: Agency that receives a Discrepancy Report (DR), should a discrepancy be discovered, and will take responsibility for ensuring discrepancy resolution. This may or may not be the same as the 9-1-1 Authority. This MUST be represented by a domain name that is an Agency Identifier as defined in the NENA Master Glossary of 9-1-1 Terminology, NENA-ADM-000.
Domain: None
Example: dickinson-county-sheriffs-office.state.ia.us; webster-county-telecommunications.state.ia.us
For the State of Iowa, the Discrepancy Agency ID is the DNS portion of the Service URI as provided by the NGCS. See Appendix C for each PSAP's Discrepancy Agency ID.

Display Name
Description: A description or "name" of the service provider that offers services within the area of a Service Boundary. This value MUST be suitable for display.
Domain: None
Example: Eitzen Fire Department, Manning Rescue, Sumner Police Department

Effective Date
Description: The date and time that the record is scheduled to take effect.
Domain: Date and Time may be stored in the local database date/time format with the proviso that local time zone MUST be recorded and time MUST be recorded to a precision of at least 1 second and MAY be recorded to a precision of 0.1 second. If the local database date/time format does not meet these specifications, the database SHOULD record both the local date/time format and a string conforming to W3C dateTime format as described in XML Schema Part 2: Datatypes Second Edition.
Example: (of a W3C dateTime with optional precision of .1 second) 2017-02-18T02:30:00.1-05:00 (representing a record that will become active on February 18, 2017 at 2:30 and 0.1 seconds AM US Eastern Standard Time); 2017-10-09T13:01:35.2-04:00 (representing a record that will become active on October 9, 2017 at 1:01 and 35.2 seconds PM US Eastern Daylight Time)
Note: This field is used when time and date of a change is known. For example, the time and date an annexation takes effect.

Elevation
Description: The elevation, given in meters above a reference surface defined by the coordinate system, associated with the site/structure address.
Domain: Restricted to whole numbers.
Example: "68" representing the elevation (in meters) associated with the address "123 Main Street, Suite 401"
Note: WGS84 (GPS) elevation is measured as height above the ellipsoid, which varies significantly from height above the geoid (approximately Mean Sea Level).

ESN / ESN Left / ESN Right
Description: A 3-5 character numeric string that represents one or more Emergency Service Zones (ESZ).
Domain: Characters from 000 to 99999
Example: 4662; 7; 1674
Note: An ESZ is not necessarily the same as a Service Boundary as outlined in this document. ESN is used for routing in Legacy Systems. This field may also provide backward compatibility with legacy map displays and Computer Aided Dispatch (CAD) systems.

Expiration Date
Description: The date and time when the information in the record is no longer considered valid.
Domain: Date and Time may be stored in the local database date/time format with the proviso that local time zone MUST be recorded and time MUST be recorded to a precision of at least 1 second and MAY be recorded to a precision of 0.1 second. If the local database date/time format does not meet these specifications, the database SHOULD record both the local date/time format and a string conforming to W3C dateTime format as described in XML Schema Part 2: Datatypes Second Edition.
Example: (of a W3C dateTime with optional precision of .1 second) 2017-02-18T02:30:00.1-05:00 (representing a record that will expire and no longer be valid on February 18, 2017 at 2:30 and 0.1 seconds AM US Eastern Standard Time); 2017-10-09T13:01:35.2-04:00 (representing a record that will expire and no longer be valid on October 9, 2017 at 1:01 and 35.2 seconds PM US Eastern Daylight Time)
Note: This field is used when the time and date of a change is known. For example, the time and date an annexation takes effect and the previous boundary is retired.

Floor
Description: A floor, story, or level within a building.
Domain: None
Example: Floor 5; 5th Floor; Mezzanine

Incorporated Municipality / Incorporated Municipality Left / Incorporated Municipality Right
Description: The name of the Incorporated Municipality or other general-purpose local governmental unit (if any) where the address is located.
Domain: None; however, use "Unincorporated" if the address is not within an incorporated local government.
Example: Des Moines; Ottumwa; Waterloo; Unincorporated

Latitude
Description: The angular distance of a location north or south of the equator as defined by the coordinate system, expressed in decimal degrees.
Domain: +90 degrees to -90 degrees
Example: 41.500378

Left Address Number Prefix
Description: An extension of the Address Number that precedes it and further identifies a location along a thoroughfare or within a defined area, on the Left side of the road segment relative to the FROM Node. It contains any alphanumeric characters, punctuation, and spaces preceding the Left FROM Address and Left TO Address.
Domain: None
Example: "101-" in "101-123 Grid Drive"
                 "N" in "N46999 Holden Road"
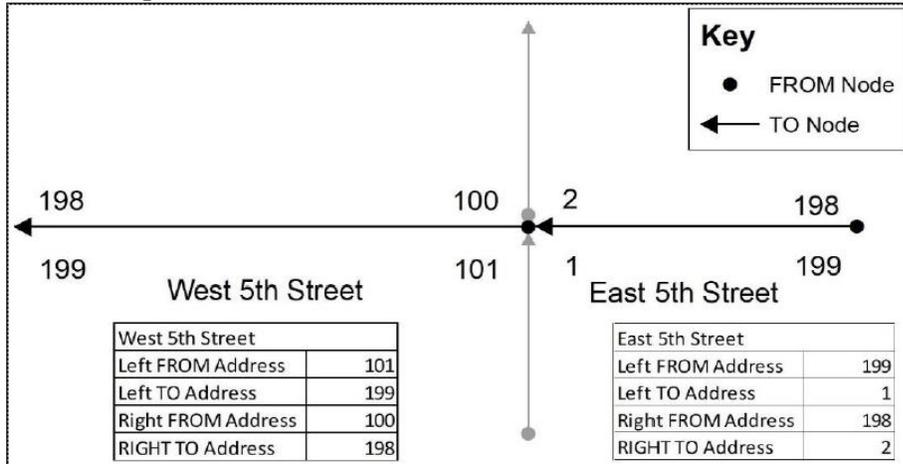   "0" in "012 Portland D"

Left FROM Address
Description: In the RoadCenterLine layer, each feature has a begin point and an endpoint. The FROM Node is the begin point while the TO Node is the endpoint. Each has a left side and a right side relative to a begin node and an end node. The Left FROM address is the address number on the Left side of the road segment relative to the FROM Node.
Domain: Whole numbers from 0 to 999999
Example: See Figure below
Note: This address can be higher than the Left TO Address

Left TO Address
Description: In the RoadCenterLine layer, each feature has a begin point and an endpoint. The FROM Node is the begin point while the TO Node is the endpoint. Each has a left side and a right side relative to a begin node and an end node. The Left TO address is the address number on the Left side of the road segment relative to the TO Node.
Domain: Whole numbers from 0 to 999999
Example: See Figure above
Note: This address can be lower than the Left FROM Address.

Legacy Street Name
Description: The street name as it currently exists in the MSAG. Ideally this is the name as assigned by the local addressing authority. However, it is imperative that the content of the "Legacy Street Name" field in the GIS data and the content of the "Street Name" field in the MSAG are identical. If there are discrepancies, one of these two databases (GIS and/or MSAG) MUST be updated to match the other.
Domain: None
Example: "STATE" in "STATE ST"; "ELMWOOD" in "N ELMWOOD AVE"
Note: This field is included in the GIS Data Model primarily for use with the MCS. Attributes in this field MUST match the corresponding field in the MSAG to ensure civic locations are accurately converted and stored as PIDF-LO for use in NG9-1-1 systems. This field may also provide backward compatibility with legacy map displays and Computer Aided Dispatch (CAD) systems.

Legacy Street Name Post Directional
Description: The trailing street direction suffix as it currently exists in the MSAG. Ideally this is the street name post directional as assigned by the local addressing authority. However, it is imperative that the content of the "Legacy Street Name Post Directional" field in the GIS data and the "Post Directional" field in the MSAG are identical. If there are discrepancies, one of these two databases (GIS and/or MSAG) MUST be updated to match the other.
Domain: N; S; E; W; NE; NW; SE; SW; or equivalent abbreviations in other languages.
Example: "E" in "CHURCH ST E"
Note: This field is included in the GIS Data Model primarily for use with the MCS. Attributes in this field MUST match the corresponding field in the MSAG to ensure civic locations are accurately converted and stored as PIDF-LO for use in NG9-1-1 systems. This field may also provide backward compatibility with legacy map displays and Computer Aided Dispatch (CAD) systems.

Legacy Street Name Pre Directional
Description: The leading street direction prefix as it currently exists in the MSAG. Ideally this is the street name pre directional as assigned by the local addressing authority. However, it is imperative that the "Legacy Street Name Pre Directional" field in the GIS data and the "Prefix Directional" field in the MSAG are identical. If there are discrepancies, one of these two databases (GIS and/or MSAG) MUST be updated to match the other.
Domain: N; S; E; W; NE; NW; SE; SW; or equivalent abbreviations in other languages.
Example: "S" in "S PINE AVE"
Note: This field is included in the GIS Data Model primarily for use with the MCS. Attributes in this field MUST match the corresponding field in the MSAG to ensure civic locations are accurately converted and stored as PIDF-LO for use in NG9-1-1 systems. This field may also provide backward compatibility with legacy map displays and Computer Aided Dispatch (CAD) systems.

Legacy Street Name Type
Description: The valid street abbreviation as it currently exists in the MSAG. Ideally this is the street name type as assigned by the local addressing authority. However, it is imperative that the "Legacy Street Name Type" in the GIS data and the "Street Suffix" field in the MSAG are identical. If there are discrepancies, one of these two databases (GIS and/or MSAG) MUST be updated to match the other.
Domain: None
Example: "ST" for "STREET";
                 "BLVD" for "BOULEVARD";
                 "AVE" for "AVENUE"
                 "TRCE" for "TRACE"
Note: This field is included in the GIS Data Model primarily for use with the MCS. Attributes in this field MUST match the corresponding field in the MSAG to ensure civic locations are accurately converted and stored as PIDF-LO for use in NG9-1-1 systems. This field may also provide backward compatibility with legacy map displays and Computer Aided Dispatch (CAD) systems.

Longitude
Description: The angular distance of a location east or west of the prime meridian of the coordinate system, expressed in decimal degrees.
Domain: -180 degrees to +180 degrees
Example: -94.644943

Milepost
Description: A distance traveled along a route such as a road or highway, typically indicated by a milepost sign. There is typically a post or other marker indicating the distance in miles/kilometers from or to a given point.
Domain: None
Example: Milepost 13; Mile Marker 327.5; Station 101 North
Note: Milepost numbers, which may or may not be an actual milepost distance, are useful for specifying locations along interstate highways, recreational trails, navigable waterways and other unaddressed routes, as well as stretches of county, state, federal, and other routes where distance measurements are posted. Milepost numbers are a numeric measurement from a beginning point and MAY be used in place of, or in addition to, Address Numbers. This element is a conditional element. Including it as a conditional field within the SiteStructureAddressPoint layer allows for another means of location verification, particularly at the PSAP level. Including the field allows for matching an Address, assigned by an Addressing Authority using the local addressing interval, to the Mile Marker. It should be noted that Mile Markers may not be placed at the exact mile intervals, due to post placement issues such as underground rock ledges or bridges. Tying an Address to the Mile Marker reduces potential ambiguity about location. For more details, please see the CLDXF Standard, NENA-STA-004.

MSAG Community Name / MSAG Community Name Left / MSAG Community Name Right
Description: The Community name associated with an address as given in the MSAG and may or may not be the same as the Community Name used by the postal service.
Domain: None
Example: ADEL; LANSING; POSTVILLE; RICHLAND TWP
Note: Used in Legacy Systems and is not used in a full NG9-1-1 implementation.

Neighborhood Community / Neighborhood Community Left / Neighborhood Community Right
Description: The name of an unincorporated neighborhood, subdivision, or area, either within an incorporated municipality or in an unincorporated portion of a county or both, where the address is located.
Domain: None
Example: Copperfield; University Heights; Shady Oaks Mobile Home Park
Note: Neighborhood communities are only used when they are known and have a clearly defined boundary. Neighborhood communities are usually not used for addressing purposes, but are often used as differentiators within an area that have the same or similar sounding street names.

NENA Globally Unique ID
Description: The NENA Globally Unique ID (Primary Key) for each record in a GIS data layer. Each record in the GIS data layer MUST have a globally unique ID. When coalescing data from other local 9-1-1 Authorities into the ECRF and LVF, this unique ID MUST continue to have only one occurrence. Additional detail on how to construct the NGUID can be found in section 3.5 NENA Globally Unique IDs (NGUID).
Domain: None
Example:
- urn:emergency:uid:gis:SSAP:3458:grundy-county-sheriffs-office.state.ia.us
- urn:emergency:uid:gis:RCL:987364:lucas-county-sheriffs-office.state.ia.us
- urn:emergency:uid:gis:Psap:84274599:sac-county-sheriffs-office.state.ia.us
- urn:emergency:uid:gis:Pol:3184974-8:washington-county-911.state.ia.us
- urn:emergency:uid:gis:Fire:{123e4567-e89b-12d3-a456-426652340000}:descom.state.ia.us
- urn:emergency:uid:gis:Ems:6ee38f8e-20e4-4e5e-aa37-a22b7a42d9b4:maquoketa-police-department.state.ia.us

One-Way
Description: The direction of traffic movement along a road in relation to the FROM node and TO node of the line segment representing the road in the GIS data. The one-way field has three possible designations: B (Both), FT (From-To), and TF (To-From).
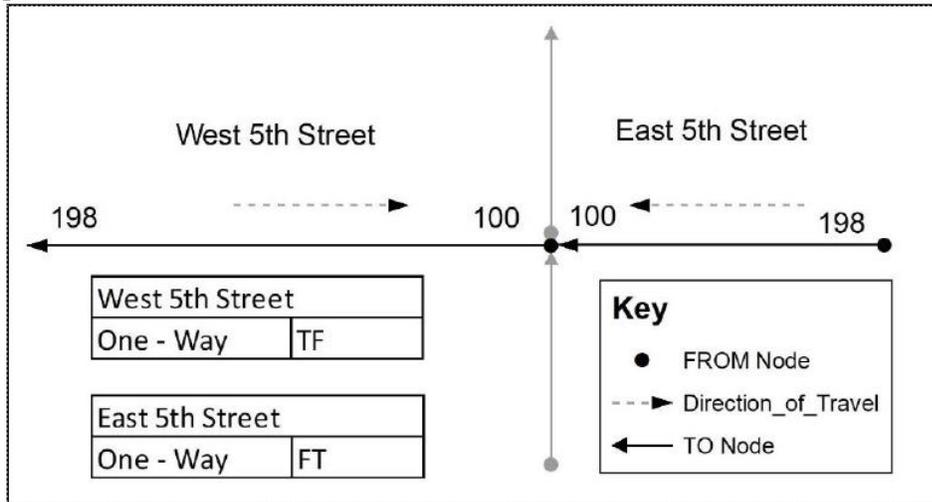B – Travel in both directions allowed
FT – One-way traveling from the FROM node to the TO node
TF – One way traveling from the TO node to the FROM node
Domain: B; FT; TF
Example: See Figure below

Parity Left / Parity Right
Description: The even or odd property of the address number range on the Left side of the road segment relative to the FROM Node.
Domain: O=Odd; E=Even; B=Both; Z=Address Range 0-0
Example: O; E; B; Z

Place Type
Description: The type of feature identified by the address.
Domain: The Registry of Location Types proposed in RFC 4589 (https://tools.ietf.org/rfc/rfc4589.txt) is: https://www.iana.org/assignments/location-type-registry/location-type-registry.xml. A new value in the registry may be added by sending an email to iana@iana.org. Indicate you want to add a new value to the Location Types Registry as defined in Section 5.1 of RFC 4589.
Example: airport; bank; cafe; club; office; hotel

Placement Method
Description: The methodology used for placement of the address point
Domain: Restricted to values found in the "NENA Site/Structure Address Point Placement Method Registry" at: http://technet.nena.org/nrs/registry/SiteStructureAddressPointPlacementMethod.xml
Example: Structure; Site; Parcel; Geocoding; PropertyAccess; Unknown

Postal Code / Postal Code Left / Postal Code Right
Description: A system of 5-digit (US) or 7-character codes (Canada) that identify the individual USPS or Canadian Post Office or metropolitan area delivery station associated with an address.
Domain: The domain of values comes from the USPS City State Product, which is a comprehensive list of Postal Codes with corresponding USPS city and county names.
Example: 50457 (Postal Code in Meservey, IA)
Note: Postal Codes in the US are the same as ZIP Codes. The USPS considers ZIP Codes to be delivery routes instead of areas. There may be differences between this depiction and actual ZIP Code mailing address. When Postal Code is used, it only includes the ZIP Code portion in the US and not the ZIP Plus 4 portion of a ZIP Code. The Canadian Postal Code is a uniformly structured, alphanumeric code in the form "ANA NAN" where "A" represents an alphabetic character and "N" represents a numeric character. It is made up of two 3-character segments, "forward sortation area" and "local delivery unit," separated by a space for a total of 7 characters in length. However, the USPS City State Product only contains city and community names and their associated ZIP Codes. To perform complete 5-digit ZIP coding of address files, City State Product must be used in conjunction with Five-Digit ZIP Product, ZIP + 4® Product, or Carrier Route Product.

Postal Code Extension
Description: The addition of the Postal Code Extension refines the mail delivery point down to a specific block or building, and may prove useful to validate locations. Postal Code Extensions change more often than US Postal Codes, and this additional data field should make maintaining these optional codes easier. Domain: Defined by the USPS
Example: "9865" in "50644-9865" (the Postal Code Extension for Independence, IA)

Postal Community Name / Postal Community Name Left / Postal Community Name Right
Description: A city name for the Postal Code of an address.
Domain: Restricted to city names given in the USPS City State Product for a given ZIP Code. The USPS City State Product is a comprehensive list of ZIP Codes with corresponding USPS city and county names.
Example: Fort Dodge, Ida Grove, Spencer
Note: The Postal Community Name is the name assigned to the post office that delivers mail to a given address, and may differ from the 9-1-1 city or community location. Only the "preferred" Postal Community Name as defined by the USPS City State Product is allowed. The Postal Community Name is also defined in the USPS ZIP Code lookup at https://tools.usps.com/go/ZipLookupAction_input. However, the USPS City State Product only contains city and community names and their associated ZIP Codes. To perform complete 5-digit ZIP coding of address files, the USPS City State Product must be used in conjunction with Five-Digit ZIP Product, ZIP + 4® Product, or Carrier Route Product. The USPS Postal City name is the "preferred" name assigned to the post office from which the USPS delivers mail to the address, and may differ from the 9-1-1 city or community name.

Right Address Number Prefix
Description: An extension of the Address Number that precedes it and further identifies a location along a thoroughfare or within a defined area, on the Right side of the road segment relative to the FROM Node. It contains any alphanumeric characters, punctuation, and spaces preceding the Right FROM Address and Right TO Address.
Domain: None
Example: "2N3W-" in "2N3W-124 Township Drive"; "S" in "S877 Highway 88"
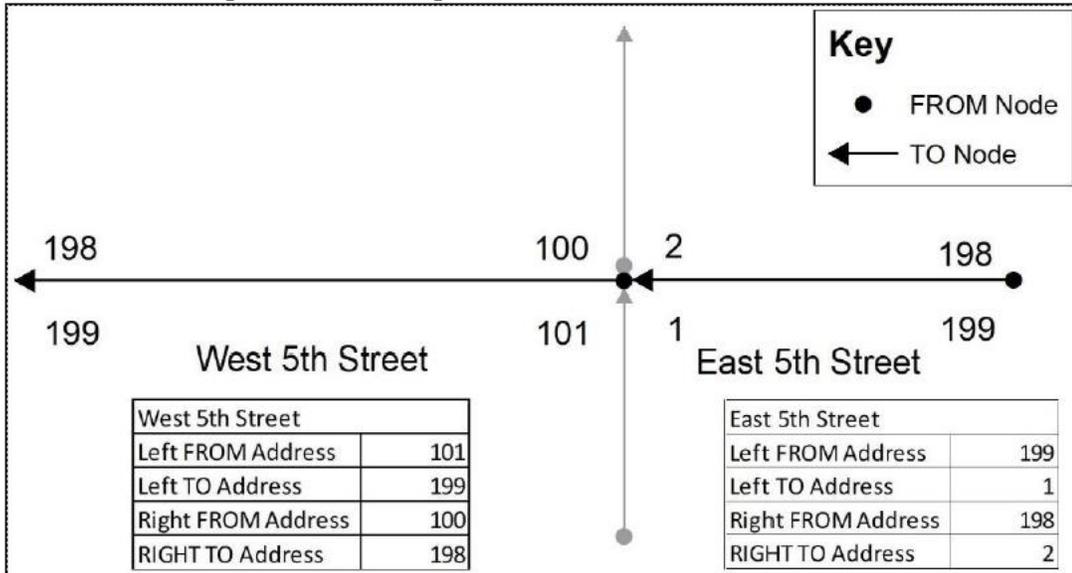
Right FROM Address
Description: In the RoadCenterLine layer, each feature has a begin point and an endpoint. The FROM Node is the begin point while the TO node is the endpoint. Each has a left side and a right side relative to a begin node and an end node. The Right FROM address number is the address number on the Right side of the road segment relative to the FROM Node.
Domain: Whole numbers from 0 to 999999
Example: See Figure below
Note: This address can be higher than the Right TO Address.

Right TO Address
Description: In the RoadCenterLine layer, each feature has a begin point and an endpoint. The FROM Node is the begin point while the TO node is the endpoint. Each has a left side and a right side relative to a begin node and an end node. The Right TO address number is the address number on the Right side of the road segment relative to the TO Node.
Domain: Whole numbers from 0 to 999999
Example: See Figure above
Note: This address can be lower than the Right FROM Address.

Road Centerline NENA Globally Unique ID (Foreign Key)
Description: The Road Centerline NENA Globally Unique ID (RCL_NGUID) is used in the StreetNameAliasTable as a foreign key relationship between the StreetNameAliasTable and the RoadCenterLine layer. A foreign key acts as a cross-reference between RCL_NGUID field in the StreetNameAliasTable because it references the NGUID field primary key in the RoadCenterLine layer, thereby establishing a link between them. A RoadCenterLine record may have zero to many (0:M) StreetNameAliasTable records. Without this relationship, it would not be possible to identify any street name aliases of a road centerline. The values in the RCL_NGUID field MUST exist in the values of the NGUID field in the RoadCenterLine layer.
Domain: None
Example: "urn:emergency:uid:gis:RCL:1:AC911.tx.us" value in the RoadCenterLine layer NGUID would appear in all related alias records in the RCL_NGUID field of the StreetNameAliasTable.

Road Class

Description: The general description of the type of road. The Road Classifications used in this document are derived from the US Census MAF/TIGER Feature Classification Codes (MTFCC), which is an update to the now deprecated Census Feature Class Codes (CFCC).
Domain: Primary; Secondary; Local; Ramp; Service Drive; Vehicular Trail; Walkway/Pedestrian Trail; Stairway; Alley; Private; Parking Lot; Bike Path or Trail; Bridle Path; Other
Example: Ramp
Note: The Road Class is completely spelled out in the attribute fields. Road Classification is based on the Census road classification found in the MAF/TIGER Feature Class Code (MTFCC) Definitions [18]. The values are taken from the S series information in this document which provided the classification scheme for surface roads and can be found at: https://www2.census.gov/geo/pdfs/reference/mtfccs2019.pdf

- Primary roads are generally divided, limited-access highways within the interstate highway system or under state management, and are distinguished by the presence of interchanges. These highways are accessible by ramps and may include some toll highways.
- Secondary roads are main arteries, usually in the US Highway, State Highway, or County Highway system. These roads have one or more lanes of traffic in each direction, may or may not be divided, and usually have at-grade intersections with many other roads and driveways.
- Local roads are generally a paved non-arterial street, road, or byway that usually has a single lane of traffic in each direction. Roads in this classification include neighborhood, rural roads, and city streets.
- Ramp designates a road that allows controlled access from adjacent roads onto a limited access highway, often in the form of a cloverleaf interchange. Ramps typically do not have address ranges.
- Service Drive provides access to structures along the highway, usually parallel to a limited access highway. If these roads are named and addressed, they may be considered local roads.
- Vehicular Trail (4WD, snowmobile) is an unpaved trail or path where a
- four-wheel-drive vehicle, snowmobile, or similar vehicle is required.
- Walkway/Pedestrian Trail is a path that is used for walking, being either too narrow for or legally restricted from vehicular traffic.
- Stairway is a pedestrian passageway from one level to another by a series of steps.
- Alley is generally a service road that does not generally have associated addressed structures and is usually unnamed. It is located at the rear of buildings and properties.
- Private (service vehicles, logging, oil fields, ranches, etc.) is a road within private property that is privately maintained for service, extractive, or other purposes. These roads are often unnamed.
- Parking Lot is the main travel route for vehicles through a paved parking area.
- Bike Path or Trail is a path that is used for manual or small, motorized bicycles, being either too narrow for or legally restricted from vehicular traffic.
- Bridle Path is a path that is used for horses, being either too narrow for or legally restricted from vehicular traffic.
- Other is any road or path type that does not fit into the above categories.

Room

Description: A single room within a building.
Domain: None
Example: Room 137; Lobby

Seat
Description: A place where a person might sit within a building. Domain: None
Example: Cubicle 5A; 5A; Desk 11; 1
Note: From the CLDXF Standard, NENA-STA-004:
- The Seat element "designates a place where a person might sit, such as a seat in a stadium or theater, or a cubicle in an open-plan office or a booth in a trade show" (IETF RFC 4776, section 3.4).
- Subaddress elements typically include both a "type" word (such as "seat" or "desk") and an identifier (a specific name or number). Include both the type word, the identifier in this element, and any separating characters or spaces.
- The type word may precede or follow the identifier ("Registration Desk" vs. "Desk 17"). Either order is acceptable; local usage should be followed. In some cases, no type word is used.

Service Number
Description: The numbers that would be dialed on a 12-digit keypad to reach the service appropriate for the location. This is not the same as an Emergency Service Number (ESN) in Legacy E9-1-1 systems. This field is used for all service boundary layers including PsapPolygon, PolicePolygon, FirePolygon, EmsPolygon, and others such as PoisonControlPolygon. Within North America, the Service Number for most services is 9-1-1; however, there may be service boundaries that have a different number that may be associated with them such as Poison Control. Additionally, in some countries, different numbers may be used for Police, Fire, and EMS – this field would be used to denote those numbers.
Domain: A dialable number or dial string
Example: 911; 18002221222

Service URI
Description: URI for call routing. This attribute is contained in the service boundary layers and will define the Service URI of the service. The URI is usually a Session Initiation Protocol (e.g., SIP or SIPs) URI that defines the route to reach the service.
Domain: Registered domain name
Example: sip:911@greene-county-sheriffs-office.state.ia.us
                sip:911@jefferson-county-law-center.state.ia.us

Service URN
Description: The URN used to select the service for which a route is desired. The ECRF is queried with a location and a Service URN that returns the Service URI.
Domain: RFC 5031 defines the Service URN; NENA-STA-010 defines the domain of allowable values. PSAP boundaries SHOULD only contain features with Service URN values of "urn:emergency:service:sos.psap." Values to be used for service boundaries for other responding agencies are found in the IANA urn:emergency:service:responder registry.
Example: urn:service:sos
                urn:service:sos.police
                urn:service:sos.fire
                urn:service:sos.ambulance

NOTE: Iowa's Service URNs are set by the NGCS and does not follow RFC 5031.

Speed Limit
Description: Posted Speed Limit in MPH.
Domain: Whole numbers from 1 to 999
Example: 35; 55; 70

State (A1) / State Left (A1) / State Right (A1)
Description: The name of a state or state equivalent, represented by the two-letter UPPER CASE abbreviation given in USPS Publication 28, Appendix B. A state is a primary governmental division of the United States.
Domain: ISO 3166-2 includes the same abbreviations as USPS Publication 28, Appendix B, with the exception of the additional one for the nine minor uninhabited islands owned by the US. These abbreviations are also freely available at https://www.census.gov/library/reference/code-lists/ansi/ansi-codes-for-states.html
Example: IA, MO, WI

Street Name
Description: The official name of the road, usually defined by the lowest jurisdictional authority (e.g., city). The street name does not include any street types, directionals, or modifiers.
Domain: None
Example: "Fifth" in "Fifth Avenue"
Note: This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Street Name Post Directional
Description: A word following the Street Name element that indicates the direction taken by the road from an arbitrary starting point or line, or the sector where it is located.
Domain: North; South; East; West; Northeast; Northwest; Southeast; Southwest; or equivalent words in other languages.
Example: "North" in "Elm Avenue North"
Note: This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Street Name Post Modifier
Description: A word or phrase that follows and modifies the Street Name element, but is separated from it by a Street Name Post Type or a Street Name Post Directional or both.
Domain: None
Example: "Number 5" in "Fire Road Number 5";
              "Extension" in "Main Street North Extension"
Note: This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.
Access, Alternate, Business, Connector, Extended, Extension, Loop, Overpass, Private, Public, Ramp, Scenic, Spur, Underpass

Street Name Post Type
Description: A word or phrase that follows the Street Name element and identifies a type of thoroughfare in a complete street name.
Domain: Restricted to values found in the "NENA Registry of Street Name Pre Types and Street Name Post Types" or combinations thereof at:
http://technet.nena.org/nrs/registry/StreetNamePreTypesAndStreetNamePostTypes. xml
Example: "Parkway" in "Ocean Parkway
Note: This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Street Name Pre Directional

Description: A word preceding the Street Name element that indicates the direction taken by the road from an arbitrary starting point or line, or the sector where it is located.
Domain: North; South; East; West; Northeast; Northwest; Southeast; Southwest; or equivalent words in other languages.
Example: "South" in "South Congress Avenue"
Note: This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Street Name Pre Modifier

Description: A word or phrase that precedes and modifies the Street Name element but is separated from it by a Street Name Pre Type or a Street Name Pre Directional or both.
Domain: None
Example: "Alternate" in "Alternate Route 8";
             "Old" in "Old North Church Street"
Note: This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Street Name Pre Type

Description: A word or phrase that precedes the Street Name element and identifies a type of thoroughfare in a complete street name.
Domain: Restricted to values found in the "NENA Registry of Street Name Pre Types and Street Name Post Types" or combinations thereof at:
http://technet.nena.org/nrs/registry/StreetNamePreTypesAndStreetNamePostTypes. xml
Example: "Avenue" in "Avenue C";
             "United States Highway" in "United States Highway 65";
             "County Road" in "County Road W66";
             "Interstate" in "Interstate 35"
Note: Occasionally two or more type words occur together before the Street Name element (e.g., Bypass Highway 22). All of the words are placed in the Street Name Pre Type, unless the local address authority has included any of them in Street Name element. If the two type words are not part of the Street Name element and are not separated from each other by a directional word or other word, they are all placed in the Street Name Pre Type. This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Street Name Pre Type Separator

Description: A preposition or prepositional phrase between the Street Name Pre Type and the Street Name. This element is defined in the CLDXF Standard, NENA-STA-004 [4], as a US specific extension of PIDF-LO per RFC 6848.
Domain: Restricted to values found in the "NENA Registry of Street Name Pre Type Separators" at:
http://technet.nena.org/nrs/registry/StreetNamePreTypeSeparators.xml
Example: "of the" in "Avenue of the Saints"
Note: This element is a conditional element. For more details, please see the CLDXF Standard, NENA-STA-004.

Unincorporated Community / Unincorporated Community Left / Unincorporated Community Right
Description: The name of an Unincorporated Community, either within an incorporated municipality or in an unincorporated portion of a county, or both, where the address is located.
Domain: None
Example: Rudd Twp; Diamond Township; Yarmouth
Note: An Unincorporated Community typically is a region of land that is not governed by its own local municipal corporation.

Unit
Description: A group or suite of rooms within a building that are under common ownership or tenancy, typically having a common primary entrance.
Domain: None
Example: Apartment C2; Penthouse; Suite 710

Validation Left
Description: Indicates if the address range on the left side of the road segment, relative to the FROM node, should be used for civic location validation. A value of "Y" MAY be entered if any Address Number within the address range on the left side of the road segment should be considered by the LVF to be valid. A value of "N" MAY be entered if the Address Number should only be validated using the SiteStructureAddressPoint layer. If not present, a value of "Y" is assumed.
Domain: Y; N
Example: Y; N
Note: This field does not affect routing of emergency calls, nor display of GIS data. It controls how the LVF determines its response when an address does not match an address point but is within a valid range of a Road Centerline.

Validation Right
Description: Indicates if the address range on the right side of the road segment, relative to the FROM node, should be used for civic location validation. A value of "Y" MAY be entered if any Address Number within the address range on the right side of the road segment should be considered by the LVF to be valid. A value of "N" MAY be entered if the Address Number should only be validated using the SiteStructureAddressPoint layer. If not present, a value of "Y" is assumed.
Domain: Y; N
Example: Y; N
Note: This field does not affect routing of emergency calls, nor display of GIS data. It controls how the LVF determines its response when an address does not match an address point but is within a valid range of a Road Centerline.

Appendix B | NGUID Layer Indicator List

Name	Layer Indicator
RoadCenterLine	RCL
SiteStructureAddressPoint	SSAP
ProvisioningPolygon	Prov
PsapPolygon	Psap
PolicePolygon	Pol
FirePolygon	Fire
EmsPolygon	Ems
A1Polygon	A1
A2Polygon	A2
A3Polygon	A3

Appendix C | NGUID Agency Identifier List

Adair County (SCI)	adair-county-sheriffs-office.state.ia.us
Adams County (SCI)	adams-county-sheriffs-office.state.ia.us
Allamakee County	allamakee-county-sheriffs-office.state.ia.us
Appanoose County	appanoose-county-sheriff.state.ia.us
Audubon County	audubon-county-911-comm.state.ia.us
Benton County	benton-county-sheriffs-office.state.ia.us
Black Hawk County	black-hawk-consol-comm-center.state.ia.us
Boone County	boone-county-comm.state.ia.us
Bremer County	bremer-county-waverly-law-center.state.ia.us
Buchanan County	buchanan-county-sheriff.state.ia.us
Buena Vista County	buena-vista-county-911-comm-center.state.ia.us
Butler County	butler-county-sheriffs-office.state.ia.us
Calhoun County	calhoun-county-sheriffs-office.state.ia.us
Carroll County	carroll-county-comm.state.ia.us
Cass County	cass-county-public-safety-comm-center.state.ia.us
Cedar County	cedar-county-sheriffs-office.state.ia.us
Cerro Gordo County	cerro-gordo-county-sheriff.state.ia.us
Cherokee County	cherokee-county-sheriff.state.ia.us
Chickasaw	chickasaw-county.state.ia.us
Clarke County (SCI)	clarke-county-sheriffs-office.state.ia.us
Clay County	clay-county.state.ia.us
Clay County	clayton-county-sheriffs-office.state.ia.us
Clinton County	clinton-county-comm.state.ia.us
Crawford County	crawford-county-comm-center.state.ia.us
Dallas County	dallas-county-sheriff-comm.state.ia.us
Davis County	davis-county-law-center.state.ia.us
Decatur County	decatur-county-sheriffs-office.state.ia.us
Delaware County	delaware-county-comm-center.state.ia.us
Des Moines County	descom.state.ia.us
Dickinson County	dickinson-county-sheriffs-office.state.ia.us
Dubuque County	dubuque-county-comm-center.state.ia.us
Emmet County	emmet-county-e911.state.ia.us
Fayette County	fayette-county-sheriffs-office.state.ia.us
Floyd County	floyd-county-communications-center.state.ia.us
Franklin County	franklin-county-emc.state.ia.us
Fremont County	fremont-county-sheriffs-office.state.ia.us
Greene County	greene-county-sheriffs-office.state.ia.us
Grundy County	grundy-county-sheriffs-office.state.ia.us
Guthrie County (SCI)	guthrie-county-sheriffs-office.state.ia.us
Hamilton County	hamilton-county-sheriffs-office.state.ia.us
Hancock County	hancock-sheriffs-office.state.ia.us
Hardin County	hardin-county-sheriff.state.ia.us
Harrison County	harrison-county-communications.state.ia.us
Henry County	henry-county-sheriffs-office.state.ia.us
Howard County	howard-county-sheriff-office.state.ia.us
Humboldt County	humboldt-county-law-enforcement-center.state.ia.us

Ida County	ida-county-sheriffs-office.state.ia.us
Iowa County	iowa-county-sheriffs-office.state.ia.us
Jackson County (Maquoketa Police Department)	maquoketa-police-department.state.ia.us
Jasper County	jasper-county-sheriffs-office.state.ia.us
Jefferson County	jefferson-county-law-center.state.ia.us
Johnson County	johnson-co-jec-services-asso.state.ia.us
Jones County	jones-county-sheriff.state.ia.us
Keokuk County	keokuk-county-sheriffs-office.state.ia.us
Kossuth County (Algona Police Department)	algona-police-department.state.ia.us
Lee County	lee-county-psap-leecomm.state.ia.us
Linn County	linn-county-sheriffs-office.state.ia.us
Louisa County	louisa-county-sheriffs-office.state.ia.us
Lucas County	lucas-county-sheriffs-office.state.ia.us
Lyon County	lyon-county-sheriff.state.ia.us
Madison County (SCI)	madison-county-sheriffs-office.state.ia.us
Mahaska County	mahaska-county-911-center.state.ia.us
Marion County	marion-county-sheriffs-office.state.ia.us
Marshall County (Marshalltown Police Department)	marshalltown-police-department.state.ia.us
Mills County	mills-county-comm-center.state.ia.us
Mitchell County	mitchell-county-comm-center.state.ia.us
Monona County	monona-county-sheriffs-office.state.ia.us
Monroe County	monroe-county-sheriff-office.state.ia.us
Montgomery County	montgomery-county-sheriffs-office.state.ia.us
Muscatine County (MUSCOM)	muscom.state.ia.us
O'Brien County	obrien-county-sheriff.state.ia.us
Osceola County	osceola-county-sheriffs-office.state.ia.us
Page County	page-county-comm-center.state.ia.us
Palo Alto County	palo-alto-comm-center.state.ia.us
Plymouth County	plymouth-county-sheriff-office.state.ia.us
Pocahontas County	pocahontas-sheriffs-office.state.ia.us
Polk County	polk-county-sheriffs-office.state.ia.us
Pottawattamie County	pottawattamie-co-law-enforcement-911.state.ia.us
Poweshiek County	poweshiek-county.state.ia.us
Ringgold County	ringgold-county-sheriff-office.state.ia.us
Sac County	sac-county-sheriffs-office.state.ia.us
Scott County	scott-emergency-comm-center-secc.state.ia.us
Shelby County	shelby-county-comm.state.ia.us
Sioux County	sioux-county-sheriffs-office.state.ia.us
Story County	story-county-sheriffs-office.state.ia.us
Tama County	tama-county-911-comm-center.state.ia.us
Taylor County (SCI)	taylor-county-sheriffs-office.state.ia.us
Union County (SCI)	union-county-sheriffs-office.state.ia.us
Van Buren County	van-buren-county.state.ia.us
Wapello County (Ottumwa Police Department)	ottumwa-police-department.state.ia.us

Warren County	warren-county-sheriffs-office.state.ia.us
Washington County	washington-county-911.state.ia.us
Wayne County	wayne-county.state.ia.us
Webster County	webster-county-telecommunications.state.ia.us
Winnebago County	winnebago-county-comm.state.ia.us
Woodbury County	woodbury-county-comm.state.ia.us
Worth County	worth-county-sheriffs-office.state.ia.us
Wright County	wright-county-comm.state.ia.us
Winneshiek County (Decorah Police Department)	decorah-police-department.state.ia.us
Wright County	wright-county-comm.state.ia.us