Wisconsin NG9-1-1 GIS Data Standard & Best Practices

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Developed in collaboration with the Wisconsin Land Information Association

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1 Introduction

In 2020, the Wisconsin Department of Military Affairs' (DMA) Office of Emergency Communications (OEC), in collaboration with the 9-1-1 Subcommittee and the State Interoperability Council, continued efforts to prepare the State of Wisconsin for the implementation of Next Generation 9-1-1 (NG9-1-1). This standard and best practices document is the result of one such effort that focused on GIS data preparation for NG9-1-1. Changes to this Standard occur on a regular basis and a Change Log can be found in Appendix A.

1.1 Background

Accurate and complete GIS data is critical to the operation of an NG9-1-1 system. Locally developed GIS data will be used for routing 9-1-1 calls to the appropriate Public Safety Answering Point (PSAP) and to support the dispatch of emergency services providers. This requires the GIS data to be standardized for use in NG9-1-1.

The majority of authoritative GIS data in Wisconsin is created at the county or local level to meet local government needs, including 9-1-1 purposes. In 2017, the Wisconsin Land Information Association (WLIA) began discussing the need for statewide GIS data standards for data exchange and aggregation purposes. They began developing statewide Street Centerline and Address Point standards the following year, with an eye towards their potential use for NG9-1-1 and supporting a Wisconsin NG9-1-1 GIS data schema. Their work on developing these standards invoked valuable conversations among the Wisconsin geospatial community about NG9-1-1 GIS data needs in Wisconsin.

In 2020, the 9-1-1 Subcommittee updated the 2017 Wisconsin Statewide NG9-1-1 Plan [1], adding GIS as one of their nine primary goals: *Implement Geographic Information Systems (GIS) in support of statewide NG9-1-1*. The 2019 update of the State Interoperability Council's Wisconsin Emergency Communication Strategy report [2] also identified GIS in their goals for advancing NG9-1-1: *Identify and promote minimum data standards and integrity for 9-1-1 and GIS integration*. To successfully implement these goals, the 9-1-1 Subcommittee and the Wisconsin DMA partnered with WLIA's NG9-1-1 Task Force to develop this standard.

1.2 Purpose of the Wisconsin NG9-1-1 GIS Data Standard

The purpose of the Wisconsin NG9-1-1 GIS Data Standard is to establish a uniform, common data model for the required NG9-1-1 GIS layers in the State of Wisconsin. The National Emergency Number Association (NENA) sets standards for implementing and managing 911 systems, including the data used in public safety systems to support emergency response, particularly as it relates to NG9-1-1. NENA has identified the following GIS data layers as required for NG9-1-1 call routing and dispatching emergency services:

- Road Centerlines
- Site/Structure Address Points
- PSAP Boundaries
- Service Boundaries (law enforcement, fire/rescue, emergency medical services)
- Provisioning Boundaries

Data maintained locally in the Wisconsin Land Information Association (WLIA) Street Centerline Data Standard [3] or the WLIA Address Point Data Standard [4] contains many of the same data fields as this standard. Most fields in the WLIA Standards can be directly crosswalked into the Wisconsin NG9-1-1 GIS Data Standard. See Section 8, Schema Crosswalk Tables, for more detailed information for cross walking WLIA Street Centerline and WLIA Address Point data into this standard.

This document also provides recommendations and best practices for creating and maintaining the Road Centerline and Site/Structure Address Point GIS data layers to meet Wisconsin's NG9-1-1 GIS data requirements and quality control processes for all of the required NG9-1-1 GIS data layers.

1.3 Applicability

The standard is not intended to replace any data producer's local schema, internal data capture, or storage specifications. Rather, it is the required GIS data standard for use in NG9-1-1 functional elements and core services such as:

- **Location Validation Function (LVF)** to determine if a civic location is valid for call routing and dispatch before a 911 call is ever made,
- **Emergency Call Routing Function (ECRF)** to identify the location of a 911 call and then perform a geographic query to determine the appropriate PSAP to route the call to,
- **MSAG Conversion Service (MCS)** to create an MSAG record from an NG9-1-1 PIDF-LO record for backwards compatibility or to create a PIDF-LO record from an MSAG record for use in NG9-1-1,
- **Geocode Service (GCS)** to provide geocoding and reverse-geocoding services,
- **Mapping Data Service (MDS)** to display a map to the telecommunicator showing the location of an out-of-area call.

GIS data to be used in NG9-1-1 must be in this format. Some data producers may find benefits from storing their data in this structure, such as reducing incompatibilities and inconsistencies when sharing data or eliminating the need for ETL (Extract, Transform, Load) processes when providing data for NG9-1-1 purposes. However, some may choose to continue storing their data in a structure that fits their local needs.

1.4 Sources of this Standard

The Wisconsin NG9-1-1 GIS Data Standard is built upon the NENA Standard for NG9-1-1 GIS Data Model [5] and includes all required GIS data layers and their elements. This standard also incorporates some elements and data domains from the WLIA Street Centerline Data Standard [3] and the WLIA Address Point Data Standard [4]. The WLIA Standards, developed in conjunction with the Wisconsin geospatial community and the WLIA Technical Committee, provided an initial baseline standard for Street Centerline and Address Point GIS data layers that would support a Wisconsin NG9-1-1 GIS data schema.

2 Compliance Notes

The NENA Standard for NG9-1-1 GIS Data Model [5] identifies the GIS data layers necessary for NG9-1-1 and defines their required data schema and associated fields. This Wisconsin NG9-1-1 GIS Data Standard is fully compliant with the NENA Standard and includes the required Road Centerline, Site/Structure Address Point, PSAP Boundary, Emergency Service Boundary, and Provisioning Boundary GIS data layers. All fields listed in the NENA standard for these layers are included in this document as well as a few additional fields specific to the State of Wisconsin's needs. All fields listed in this standard must be included in the GIS data layers, even if data does not exist for a field or a field is classified as Optional.

2.1 Spatial Reference

Local GIS data shall be maintained in any datum and coordinate system desired. Final GIS data must be transformed into the World Geodetic System of 1984 (WGS 1984) prior to its use in a NGCS and the conversion will be completed through the WI NG911 GIS Data Management process. All GIS data in i3 must be in this WGS84 format to support interoperability between all systems and all sites across the US, as referenced in NENA STA 010

- Geodetic parameters for WGS84 are specified by the European Petroleum Survey Group (EPSG) as follows:
    - 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

2.2 Title Case

The standard requires that field values use title case format with the exception of the Country and State fields, which must be in uppercase. Legacy Street Name fields should preserve the case of existing data. It is understood that some end users may need the uppercase format for some applications. However, there are several methods that allow end users to convert the data to uppercase for a desired purpose. Having the data in a title case format makes it much easier to automatically convert the data if needed.

2.3 Abbreviations

NENA NG9-1-1 standards require field values to be fully spelled out to remove confusion and ambiguity. This is important when dealing with street names where abbreviations could have multiple interpretations (e.g., "W Charles Tr" could be West Charles Trail, West Charles Trace, William Charles Trail, William Charles Trace, etc.). It is understood that abbreviations can be widely used for a number of applications and some fields may need to be maintained locally in abbreviated form. The use of non-USPS abbreviations are allowed within the Legacy Street Name Type field to match the existing MSAG and ALI values (e.g., AV, TR, LA, etc.). PSAPs should strive to update the MSAG and ALI for USPS standard types as time allows. The goal in the State of Wisconsin is to follow the USPS abbreviations for the Legacy Street Name Pre Directional, Legacy Street Name Type and Legacy Street Name Post Directional; base street name should not be abbreviated. If only abbreviations are maintained locally data must be converted into the fully spelled out values before use in NG9-1-1.

The use of abbreviations in the NG9-1-1 GIS data should not be confused with what telecommunicators see on their screens or what they need to type into their systems. Consult with the NG9-1-1 Core Services Provider regarding the software translation capabilities of the data input interfaces used by the telecommunicators.

2.4 NENA Globally Unique IDs (NGUID)

In this version of the Wisconsin NG9-1-1 GIS Data Standard, the format of the NENA Globally Unique ID (NGUID) has changed. The changes make the form of these IDs match other similar IDs in i3. Like the changes in i3, this change lets a user see what kind of data the ID is from (GIS data), what layer it is from, and which organization created the data. Conversion from the Wisconsin NG9-1-1 GIS Data Standard version 1 format is straightforward: a layer-sensitive string precedes the existing data and the "@" sign is replaced with a colon. The new format allows a host name containing the agency identifier to be used after the final colon, although just the agency identifier is acceptable.

A 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-010.3e-2021 [16]. See section 2.4.1 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. ***It is not recommended to use the ObjectID as the Local Unique ID as the ObjectID can be changed by the software.***
- 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-010.3e-2021 [16]. The domain name is obtained from any Domain Name System (DNS) registrar.

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.

Example NGUIDs:

urn:emergency:uid:gis:RCL:{AD873541-F41C-409E-A0BE-1B0C583902A4}:co.polk.wi.us

URN	**urn:emergency:uid:gis**
Layer Indicator	**RCL**
Local Unique ID	**{AD873541-F41C-409E-A0BE-1B0C583902A4}**
Agency Identifier	**co.polk.wi.us**

urn:emergency:uid:gis:SSAP:100373182:waukeshacounty.gov

URN	**urn:emergency:uid:gis**
Layer Indicator	**SSAP**
Local Unique ID	**100373182**
Agency Identifier	**waukeshacounty.gov**

urn:emergency:uid:gis:Ems:55025{AD873541-F41C-409E-A0BE-1B0C583902A4}:countyofdane.com

URN	**urn:emergency:uid:gis**
Layer Indicator	**Ems**
Local Unique ID	**55025{AD873541-F41C-409E-A0BE-1B0C583902A4}**
Agency Identifier	**countyofdane.com**

The Local Unique ID above contains the two-digit state code (55) followed by the three-digit county code (025) prior to the unique number of the feature.

2.4.1 Layer Indicators

Name	Layer Indicator
RoadCenterLine	RCL
SiteStructureAddressPoint	SSAP
PsapPolygon	Psap
PolicePolygon	Pol
FirePolygon	Fire
EmsPolygon	Ems
ProvisioningPolygon	Prov
StreetNameAliasTable	StrNA

2.5 Field Type

For simplicity, this standard identifies five field types (Text, Date, Short, Long, Float) that equate to the following NENA-defined field types:

P [Text] **–** 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 [Text] – A Uniform Resource Identifier (URI) as described in Section 16, Terminology, and defined in RFC 3986 [7], and also conforming to any rules specific to the scheme (e.g., sip:, https:, etc.) of the chosen URI. Consult with the NG9-1-1 Core Services Provider for requirements.

D [Date] – Date and time. Information for a record represented as local time with offset from Coordinated Universal Time (UTC) as defined by the W3C "dateTime" datatype described in XML Schema Part 2: Datatypes Second Edition [8]. Since many GIS applications cannot currently utilize this format, local data may store the date and time in the local database date/time format but time must include seconds and may be recorded to 0.1 seconds. Local data stored in a local database date/time format will be converted to the NENA-required format prior to use in NG9-1-1.

N [Short, Long] **–** Non-negative Integer, consisting of whole numbers only.

F [Float] **–** Floating (numbers that have a decimal place). There is no defined field length of a floating number; it is system dependent. These shall be double-precision fields.

2.6 Field Width

This is the maximum number of characters a field may contain. Field width represents guidelines for interoperability. Local implementations MAY use smaller maximum widths, but their emergency call processing systems MUST be capable of managing the listed widths when handling out-of-area calls. A GIS system that allows longer widths must be used with great care as those attributes which exceed these widths may be truncated.

2.7 Inclusion

Inclusion refers to the requirement for a field to be populated in a dataset to comply with the standard. Data 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 provides this specification. Three values may occur in this column:

> **Yes:** The data element is required to be present in all records. It will appear as required in the database schema.
>
> **Conditional:** The data field 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-004.1.1-2014 [17]. If no business rule is identified, the prevailing rule will apply.
>
> **No:** The data field is optional in a record. It will not appear as required in the database schema.

2.8 Domains

A domain defines the set of all valid values that are allowed in a data field. If the domain defines no values, then any value that matches the field type and description may be populated in the data field. This standard identifies a number of required domain tables (shown in italics in the Summary Tables below), some currently maintained by organizations within Wisconsin and others limited to values identified in external sources such as NENA and USPS.

If a local value exists but is not included in an identified domain, and has a business purpose for NG9-1-1 GIS, submit the value with supporting documentation to the 9-1-1 Subcommittee via email at interop@widma.gov for consideration of inclusion. The 9-1-1 Subcommittee will work with the appropriate organization to add the local values that meet the criteria for inclusion in the domains.

3 RoadCenterLine (Road Centerline) - Summary Table

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
3.1 Identification Elements							
3.1.1	NENA Globally Unique ID	NGUID	TEXT	254	**Yes**		NENA
3.2 Relate Elements							
3.3 Address Elements							
3.3.1	Left Address Number Prefix	AdNumPre_L	TEXT	15	Conditional		NENA, WLIA
3.3.2	Left FROM Address	FromAddr_L	LONG	6	**Yes**	Whole numbers from 0 to 999999	NENA, WLIA
3.3.3	Left TO Address	ToAddr_L	LONG	6	**Yes**	Whole numbers from 0 to 999999	NENA, WLIA
3.3.4	Right Address Number Prefix	AdNumPre_R	TEXT	15	Conditional		NENA, WLIA
3.3.5	Right FROM Address	FromAddr_R	LONG	6	**Yes**	Whole numbers from 0 to 999999	NENA, WLIA
3.3.6	Right TO Address	ToAddr_R	LONG	6	**Yes**	Whole numbers from 0 to 999999	NENA, WLIA
3.3.7	Street Name Pre Modifier	St_PreMod	TEXT	15	Conditional		NENA, WLIA
3.3.8	Street Name Pre Directional	St_PreDir	TEXT	10	Conditional	WLIA *DirectionDomain*	NENA, WLIA
3.3.9	Street Name Pre Type	St_PreType	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry*	NENA, WLIA
3.3.10	Street Name Pre Type Separator	St_PreSep	TEXT	20	Conditional	NENA *Street Name Pre Type Separators Registry*	NENA, WLIA
3.3.11	Street Name	St_Name	TEXT	254	**Yes**		NENA, WLIA
3.3.12	Street Name Post Type	St_PosTyp	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry*	NENA, WLIA
3.3.13	Street Name Post Directional	St_PosDir	TEXT	10	Conditional	WLIA *DirectionDomain*	NENA, WLIA
3.3.14	Street Name Post Modifier	St_PosMod	TEXT	25	Conditional		NENA, WLIA
3.3.15	Full Street Name	FullStNm	TEXT	254	**Yes**		WLIA
3.3.16	Abbreviated Full Street Name	abFullStNm	TEXT	175	No		WLIA
3.3.17	Legacy Street Name Pre Directional	LSt_PreDir	TEXT	2	Conditional	WLIA *abvDirectionDomain*	NENA

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
3.3.18	Legacy Street Name	LSt_Name	TEXT	75	Conditional		NENA
3.3.19	Legacy Street Name Type	LSt_Type	TEXT	4	Conditional	PSAP MSAG; USPS Publication 28, Appendix C1	NENA
3.3.20	Legacy Street Name Post Directional	LSt_PosDir	TEXT	2	Conditional	WLIA *abvDirectionDomain*	NENA
3.3.21	Postal Code Left	PostCode_L	TEXT	7	No	USPS City State File Product	USPS, NENA, WLIA
3.3.22	Postal Code Right	PostCode_R	TEXT	7	No	USPS City State File Product	USPS, NENA, WLIA
3.3.23	Postal Community Name Left	PostComm_L	TEXT	40	No	USPS City State File Product	USPS, NENA, WLIA
3.3.24	Postal Community Name Right	PostComm_R	TEXT	40	No	USPS City State File Product	USPS, NENA, WLIA
3.4 Area Elements							
3.4.1	Country Left	Country_L	TEXT	2	**Yes**	ISO 3166-1 alpha-2 codes	NENA
3.4.2	Country Right	Country_R	TEXT	2	**Yes**	ISO 3166-1 alpha-2 codes	NENA
3.4.3	State Left (A1)	State_L	TEXT	2	**Yes**	WLIA *FIPSStateDomain*	US Census, NENA, WLIA
3.4.4	State Right (A1)	State_R	TEXT	2	**Yes**	WLIA *FIPSStateDomain*	US Census, NENA, WLIA
3.4.5	County Left (A2)	County_L	TEXT	100	**Yes**	*NG911CountyDomain*	US Census, NENA, WLIA
3.4.6	County Right (A2)	County_R	TEXT	100	**Yes**	*NG911CountyDomain*	US Census, NENA, WLIA
3.4.7	Incorporated Municipality Left (A3)	IncMuni_L	TEXT	100	**Yes**	WLIA *FIPSMunicipalityDomain*	NENA, WLIA
3.4.8	Incorporated Municipality Right (A3)	IncMuni_R	TEXT	100	**Yes**	WLIA *FIPSMunicipalityDomain*	NENA, WLIA
3.4.9	Unincorporated Community Left (A4)	UnincCom_L	TEXT	100	No		NENA
3.4.10	Unincorporated Community Right (A4)	UnincCom_R	TEXT	100	No		NENA
3.4.11	Neighborhood Community Left (A5)	NbrhdCom_L	TEXT	100	No		NENA
3.4.12	Neighborhood Community Right (A5)	NbrhdCom_R	TEXT	100	No		NENA
3.4.13	Additional Code Left	AddCode_L	TEXT	6	No		NENA
3.4.14	Additional Code Right	AddCode_R	TEXT	6	No		NENA
3.5 Functional Elements							
3.5.1	One-Way	OneWay	TEXT	2	No	WLIA *OneWayDomain*	NENA, WLIA
3.5.2	Speed Limit	SpeedLimit	SHORT	3	No	WLIA *SpeedLimitDomain*	NENA, WLIA
3.5.3	Road Class	RoadClass	TEXT	24	No		NENA, WLIA
3.5.4	From Elevation	FrElev	SHORT		**Yes**	WLIA *ElevationDomain*	WLIA
3.5.5	To Elevation	ToElev	SHORT		**Yes**	WLIA *ElevationDomain*	WLIA
3.5.4 Management Elements							
3.6.1	Date Updated	DateUpdate	DATE		**Yes**		NENA
3.6.2	Effective Date	Effective	DATE		No		NENA
3.6.3	Expiration Date	Expire	DATE		No		NENA
3.7 9-1-1 Elements							
3.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	100	**Yes**		NENA
3.7.2	Parity Left	Parity_L	TEXT	1	**Yes**	O, E, B, Z	NENA
3.7.3	Parity Right	Parity_R	TEXT	1	**Yes**	O, E, B, Z	NENA

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
3.7.4	ESN Left	ESN_L	TEXT	5	Conditional	Characters from 000 to 99999	NENA
3.7.5	ESN Right	ESN_R	TEXT	5	Conditional	Characters from 000 to 99999	NENA
3.7.6	MSAG Community Name Left	MSAGComm_L	TEXT	30	Conditional		NENA
3.7.7	MSAG Community Name Right	MSAGComm_R	TEXT	30	Conditional		NENA
3.7.8	Validation Left	Valid_L	TEXT	1	No	WLIA *YesNoDomain*	NENA
3.7.9	Validation Right	Valid_R	TEXT	1	No	WLIA *YesNoDomain*	NENA
3.7.10	Exception	Exception	TEXT	75	Conditional		GMSP, NGCS

RoadCenterLine (Road Centerline) - Data Element Details

3.1 Identification Elements

3.1.1 NENA Globally Unique ID

Database Field Name	NGUID		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	urn:emergency:uid:gis:RCL:47824393:co.polk.wi.us, urn:emergency:uid:gis:RCL:587392034:waukeshacounty.gov, urn:emergency:uid:gis:RCL:90a942e1bc7f4g1h94c5acaadv24r89h:countyofdane.com		
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 2.4 NENA Globally Unique IDs (NGUID).		

3.2 Relate Elements

Not applicable.

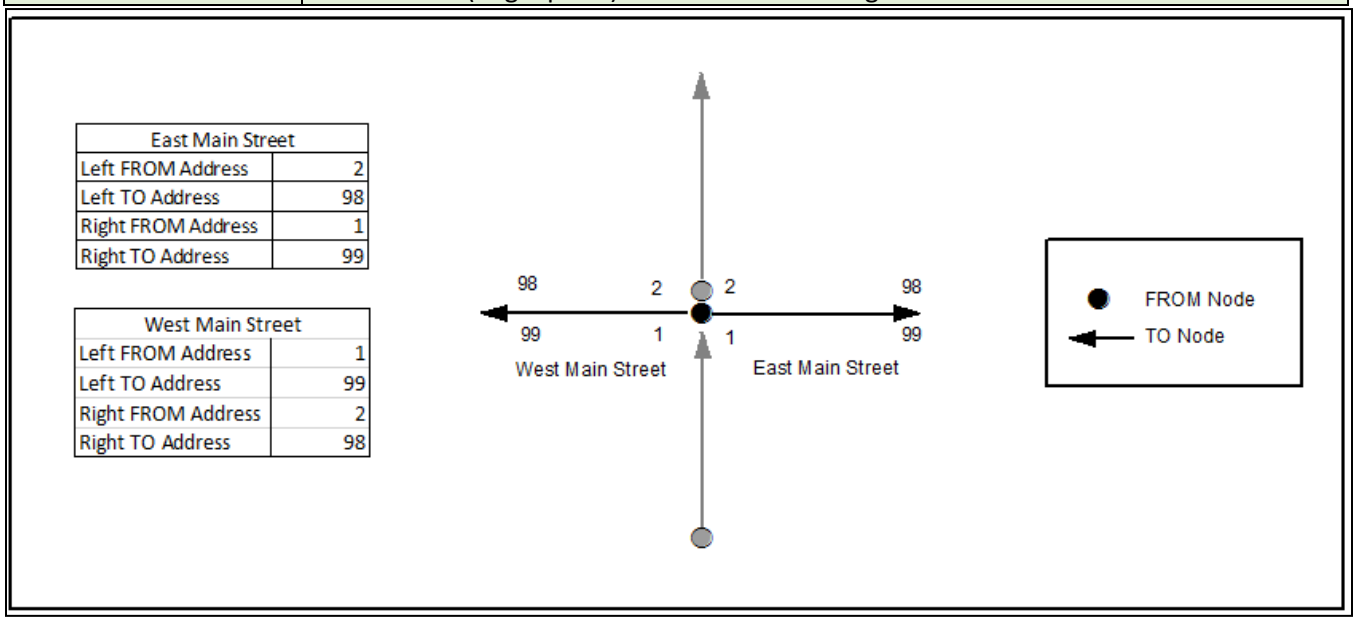
3.3 Address Elements

3.3.1 Left Address Number Prefix

Database Field Name	AdNumPre_L		
Data Type	TEXT	Inclusion	Conditional
Width	15	Domain	
Examples	N123, W123, N, W, S123W		
Description	An extension of the Left FROM Address or Left TO Address on the left side of the road segment consisting of the non-integer portion of the identifier for a parcel, house, building or other feature which precedes the address number, as defined by the official Addressing Authority for the given jurisdiction. Used commonly in Wisconsin to include the directional to an address number (e.g., **N**2554 Johnson Street). Also used in a few counties where grid address numbers exist to include the locally-defined grid cell reference. In Wisconsin, this is typically only the two directionals and the number between them (e.g., **W180N**8085 Town Hall Road).		

3.3.2 Left FROM Address

Database Field Name	FromAddr_L		
Data Type	LONG	Inclusion	**Yes**
Width	6	Domain	Whole numbers from 0 to 999999
Examples	123		
Description	The beginning value of the address range on the left side of the road segment at the FROM node (begin point). This value can be higher than the Left TO Address.		



Example of Left FROM, Left TO, Right FROM, and Right TO Addresses

3.3.3 Left TO Address

Database Field Name	ToAddr_L		
Data Type	LONG	Inclusion	**Yes**
Width	6	Domain	Whole numbers from 0 to 999999
Examples	123		
Description	The ending value of the address range on the left side of the road segment at the TO node (endpoint). This value can be lower than the Left FROM Address.		

3.3.4 Right Address Number Prefix

Database Field Name	AdNumPre_R		
Data Type	TEXT	Inclusion	Conditional
Width	15	Domain	
Examples	N123, W123, N, W, S123W		
Description	An extension of the Right FROM Address or Right TO Address on the right side of the road segment, consisting of the non-integer portion of the identifier for a parcel, house, building or other feature which precedes the address number, as defined by the official Addressing Authority for the given jurisdiction. Used commonly in Wisconsin to include the directional to an address number (e.g., **N**2554 Johnson Street). Also used in a few counties where grid address numbers exist to include the locally-defined grid cell reference. In Wisconsin, this is typically only the two directionals and the number between them (e.g., **W180N**8085 Town Hall Road).		

3.3.5 Right FROM Address

Database Field Name	FromAddr_R		
Data Type	LONG	Inclusion	**Yes**
Width	6	Domain	Whole numbers from 0 to 999999
Examples	123		
Description	The beginning value of the address range on the right side of the road segment at the FROM node (begin point). This value can be higher than the Right TO Address.		

3.3.6 Right TO Address

Database Field Name	ToAddr_R		
Data Type	LONG	Inclusion	**Yes**
Width	6	Domain	Whole numbers from 0 to 999999
Examples	123		
Description	The ending value of the address range on the right side of the road segment at the TO node (endpoint). This value can be lower than the Right FROM Address.		

3.3.7 Street Name Pre Modifier

Database Field Name	St_PreMod		
Data Type	TEXT	Inclusion	Conditional
Width	15	Domain	
Examples	**Old** North County Highway 12		
Description	A word or phrase that precedes all other Street Name elements and is separated from the Street Name element by a Street Name Pre Directional and/or a Street Name Pre Type element. Not commonly used and use should be minimized.		

3.3.8 Street Name Pre Directional

Database Field Name	St_PreDir		
Data Type	TEXT	Inclusion	Conditional
Width	10	Domain	*WLIA DirectionDomain*
Examples	**East** Main Street, Old **North** County Highway 12		
Description	A word or phrase preceding the Street Name element that indicates the direction taken by the road from an arbitrary starting point or the sector where it is located.		

3.3.9 Street Name Pre Type

Database Field Name	St_PreType		
Data Type	TEXT	Inclusion	Conditional
Width	50	Domain	*NENA Street Name Pre Types and Street Name Post Types Registry*
Examples	**Avenue** A, Old North **County Highway** 12, **United States Highway** 151, **State Highway** 46, **Interstate** 90		
Description	A word or phrase that precedes the Street Name element and identifies the type of thoroughfare in the Full Street Name.		

3.3.10 Street Name Pre Type Separator

Database Field Name	St_PreSep		
Data Type	TEXT	Inclusion	Conditional
Width	20	Domain	*NENA Street Name Pre Type Separators Registry*
Examples	Avenue **of the** Arts, Avenue **of** Champions		
Description	A preposition or prepositional phrase between the Street Name Pre Type and the Street Name element.		

3.3.11 Street Name

Database Field Name	St_Name		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	**Jones** Road, County Highway **KP**, Avenue of the **Arts**, Avenue **C**, **Azure** Court South		
Description	The official name of the road as defined by the official Street Naming Authority for the given jurisdiction. The Street Name element does not include a street type, directional, or modifier unless assigned as such by the official Street Naming Authority.		

3.3.12 Street Name Post Type

Database Field Name	St_PosTyp		
Data Type	TEXT	Inclusion	Conditional
Width	50	Domain	*NENA Street Name Pre Types and Street Name Post Types Registry*
Examples	Jones **Road**, Azure **Court** South		
Description	A word or phrase that follows the Street Name element and identifies the type of thoroughfare in the Full Street Name.		

3.3.13 Street Name Post Directional

Database Field Name	St_PosDir		
Data Type	TEXT	Inclusion	Conditional
Width	10	Domain	*WLIA DirectionDomain*
Examples	Azure Court **South**, 10th Avenue **West**		
Description	A word or phrase following the Street Name element that indicates the direction taken by the road from an arbitrary starting point or the sector where it is located.		

3.3.14 Street Name Post Modifier

Database Field Name	St_PosMod		
Data Type	TEXT	Inclusion	Conditional
Width	25	Domain	
Examples	Bermuda Boulevard **Lower**, Lake Road **Fire Road 8**, Stoughton Road **Frontage Road**, Interstate 90 **westbound**		
Description	A word or phrase that follows all other Street Name elements and is separated from the Street Name element by a Street Name Post Directional and/or Street Name Post Type element. Not commonly used and use should be minimized.		

3.3.15 Full Street Name

Database Field Name	FullStNm		
Data Type	TEXT	Inclusion	**Yes**
Width	245	Domain	
Examples	Old North County Highway 12, Azure Court South, Lake Road Fire Road 8		
Description	The Street Name with all Pre/Post Modifiers, Pre/Post Directionals, Pre Type Separator, and Pre/Post Types concatenated: St_PreMod + St_PreDir + St_PreTyp + St_PreSep + St_Name + St_PosTyp + St_PosDir + St_PosMod		

3.3.16 Abbreviated Full Street Name

Database Field Name	abFullStNm		
Data Type	TEXT	Inclusion	No
Width	175	Domain	
Examples	Old N CTH 12, Azure Ct S, Lake Rd Fire Rd 8		
Description	The Full Street Name with abbreviations (where appropriate) used for the Pre/Post Modifiers, Pre/Post Types, and Pre/Post Directionals. This field is equivalent to the abFullStNm field in the WLIA Standard.		

3.3.17 Legacy Street Name Pre Directional

Database Field Name	LSt_PreDir		
Data Type	TEXT	Inclusion	Conditional
Width	2	Domain	*WLIA abvDirectionDomain*
Examples	**E** MAIN ST, **S** ELMWOOD DR		
Description	The street direction prefix as it appears in the MSAG, as assigned by the official Street Naming Authority. Casing should reflect what appears in the MSAG data.		

3.3.18 Legacy Street Name

Database Field Name	LSt_Name		
Data Type	TEXT	Inclusion	Conditional
Width	75	Domain	
Examples	E **MAIN** ST, S **ELMWOOD** DR, **I 90**, **CTH U**, **10TH** AVE W, **AZURE** CT S		
Description	The street name field as it appears in the MSAG, as assigned by the official Street Naming Authority. Casing should reflect what appears in the MSAG data.		

3.3.19 Legacy Street Name Type

Database Field Name	LSt_Type		
Data Type	TEXT	Inclusion	Conditional
Width	4	Domain	PSAP MSAG; USPS Publication 28, Appendix C1 [9]
Examples	E MAIN **ST**, S ELMWOOD **DR**, 10TH **AVE** W, AZURE **CT** S		
Description	The valid street type abbreviation as it appears in the MSAG, as assigned by the official Street Naming Authority. Casing should reflect what appears in the MSAG data.		

3.3.20 Legacy Street Name Post Directional

Database Field Name	LSt_PosDir		
Data Type	TEXT	Inclusion	Conditional
Width	2	Domain	*WLIA abvDirectionDomain*
Examples	10TH AVE **W**, AZURE CT **S**		
Description	The street direction suffix as it appears in the MSAG, as assigned by the official Street Naming Authority. Casing should reflect what appears in the MSAG data.		

3.3.21 Postal Code Left

Database Field Name	PostCode_L		
Data Type	TEXT	Inclusion	No
Width	7	Domain	USPS City State File Product [10]
Examples	53527		
Description	The 5-digit code on the left side of the road segment that identifies the individual US Post Office or metropolitan area delivery station associated with the addresses on that side of the road.		

3.3.22 Postal Code Right

Database Field Name	PostCode_R		
Data Type	TEXT	Inclusion	No
Width	7	Domain	USPS City State File Product [10]
Examples	53527		
Description	The 5-digit code on the right side of the road segment that identifies the individual US Post Office or metropolitan area delivery station associated with the addresses on that side of the road.		

3.3.23 Postal Community Name Left

Database Field Name	PostComm_L		
Data Type	TEXT	Inclusion	No
Width	40	Domain	USPS City State File Product [10]
Examples	Cottage Grove, Eau Claire, Minocqua, Harshaw		
Description	The name on the left side of the road segment recognized by the USPS as valid for the ZIP Code of the addresses on that side of the road.		

3.3.24 Postal Community Name Right

Database Field Name	PostComm_R		
Data Type	TEXT	Inclusion	No
Width	40	Domain	USPS City State File Product [10]
Examples	Cottage Grove, Eau Claire, Minocqua, Harshaw		
Description	The name on the right side of the road segment recognized by the USPS as valid for the ZIP Code of the addresses on that side of the road.		

3.4 Area Elements

3.4.1 Country Left

Database Field Name	Country_L		
Data Type	TEXT	Inclusion	**Yes**
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-1 alpha-2 codes
Examples	US, CA		
Description	The two-letter abbreviation of the Country on the left side of the road segment where the address is located. Must be in uppercase.		

3.4.2 Country Right

Database Field Name	Country_R		
Data Type	TEXT	Inclusion	**Yes**
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-1 alpha-2 codes
Examples	US, CA		
Description	The two-letter abbreviation of the Country on the right side of the road segment where the address is located. Must be in uppercase.		

3.4.3 State Left (A1)

Database Field Name	State_L		
Data Type	TEXT	Inclusion	**Yes**
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-2 *WLIA FIPSStateDomain*
Examples	WI, IL, MN, MI		
Description	The two-letter abbreviation of the State on the left side of the road segment where the address is located. Must be in uppercase.		

3.4.4 State Right (A1)

Database Field Name	State_R		
Data Type	TEXT	Inclusion	**Yes**
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-2 *WLIA FIPSStateDomain*
Examples	WI, IL, MN, MI		
Description	The two-letter abbreviation of the State on the right side of the road segment where the address is located. Must be in uppercase.		

3.4.5 County Left (A2)

Database Field Name	County_L		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	Restricted to the values in ANSI INCITS 31:2009, including casing and abbreviations [11] *NG911CountyDomain*
Examples	La Crosse County, Racine County		
Description	The name of the County on the left side of the road segment where the address is located.		

3.4.6 County Right (A2)

Database Field Name	County_R		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	Restricted to the values in ANSI INCITS 31:2009, including casing and abbreviations [11] *NG911CountyDomain*
Examples	La Crosse County, Racine County		
Description	The name of the County on the right side of the road segment where the address is located.		

3.4.7 Incorporated Municipality Left (A3)

Database Field Name	IncMuni_L		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	*WLIA FIPSMunicipalityDomain*
Examples	Town of Cottage Grove, City of Green Bay, Village of North Hudson		
Description	The name of the Incorporated Municipality on the left side of the road segment where the address is located, including the incorporated municipality type.		

3.4.8 Incorporated Municipality Right (A3)

Database Field Name	IncMuni_R		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	*WLIA FIPSMunicipalityDomain*
Examples	Town of Cottage Grove, City of Green Bay, Village of North Hudson		
Description	The name of the Incorporated Municipality on the right side of the road segment where the address is located, including the incorporated municipality type.		

3.4.9 Unincorporated Community Left (A4)

Database Field Name	UnincCom_L		
Data Type	TEXT	Inclusion	No
Width	100	Domain	
Examples	Minocqua, Houlton, Gotham, Pray		
Description	The name of the Unincorporated Community on the left side of the road segment where the address is located.		

3.4.10 Unincorporated Community Right (A4)

Database Field Name	UnincCom_R		
Data Type	TEXT	Inclusion	No
Width	100	Domain	
Examples	Minocqua, Houlton, Gotham, Pray		
Description	The name of the Unincorporated Community on the right side of the road segment where the address is located.		

3.4.11 Neighborhood Community Left (A5)

Database Field Name	NbrhdCom_L		
Data Type	TEXT	Inclusion	No
Width	100	Domain	
Examples	Third Ward, Bassett, Greenbush		
Description	The name of an unincorporated neighborhood, subdivision, or area within an incorporated municipality on the left side of the road segment where the address point is located. Neighborhood communities are only used when they are known and have a clearly defined boundary.		

3.4.12 Neighborhood Community Right (A5)

Database Field Name	NbrhdCom_R		
Data Type	TEXT	Inclusion	No
Width	100	Domain	
Examples	Third Ward, Bassett, Greenbush		
Description	The name of an unincorporated neighborhood, subdivision, or area within an incorporated municipality on the right side of the road segment where the address point is located. Neighborhood communities are only used when they are known and have a clearly defined boundary.		

3.4.13 Additional Code Left

Database Field Name	AddCode_L		
Data Type	TEXT	Inclusion	No
Width	6	Domain	
Examples			
Description	**Note:** Since this field is not applicable in the US, it will not be populated in WI GIS data layers. A Standard Geographical Classification code used in Canada that specifies a geographic area and is used to differentiate two municipalities with the same name in a province that does not have counties.		

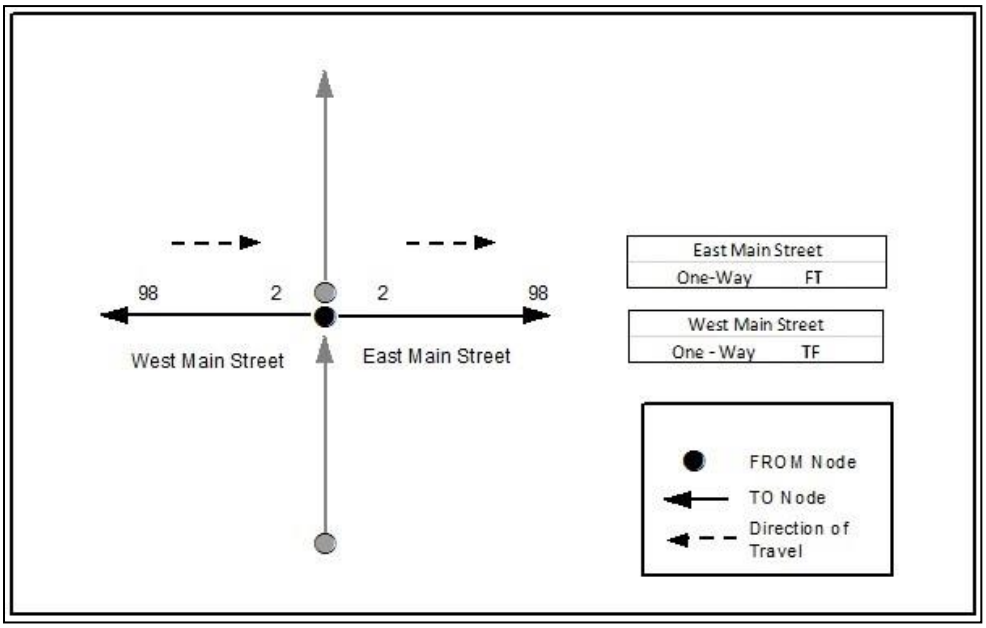
3.4.14 Additional Code Right

Database Field Name	AddCode_R		
Data Type	TEXT	Inclusion	No
Width	6	Domain	
Examples			
Description	**Note:** Since this field is not applicable in the US, it will not be populated in WI GIS data layers. A Standard Geographical Classification code used in Canada that specifies a geographic area and is used to differentiate two municipalities with the same name in a province that does not have counties.		

3.5 Functional Elements

3.5.1 One-Way

Database Field Name	OneWay		
Data Type	TEXT	Inclusion	No
Width	2	Domain	B, TF, FT
Examples	B, FT, TF		
Description	The direction of traffic movement along a road in relation to the FROM node and TO node of the road segment where: B (Travel allowed in both directions) FT (One-way, travel from FROM node to TO node) TF (One-way, travel from TO node to FROM node)		



Example of OneWay attribution

3.5.2 Speed Limit

Database Field Name	SpeedLimit		
Data Type	SHORT	Inclusion	No
Width	3	Domain	*WLIA SpeedLimitDomain*
Examples	10, 25, 30, 55, 65		
Description	The posted predominate speed limit of the road segment.		

3.5.3 Road Class

Database Field Name	RoadClass		
Data Type	TEXT	Inclusion	No
Width	24	Domain	Primary, Secondary, Local, Ramp, Service Drive, Vehicular Trail, Walkway/Pedestrian Trail, Stairway, Alley, Private, Parking Lot, Bike Path or Trail, Bridle Path, Other
Examples	Primary, Secondary, Local, Ramp, Alley, Private, Trail		
Description	The general description of the type of road. These values are based on road classification definitions from the Census MAF/TIGER Feature Class Codes (MTFCC) at https://www.census.gov/library/reference/code-lists/mt-feature-class-codes.html. • *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.		

3.5.4 From Elevation

Database Field Name	FrElev		
Data Type	SHORT	Inclusion	No
Width		Domain	*WLIA ElevationDomain*
Examples	0, 1, 2		
Description	Identifies the From routing for intersections and overpasses. Base elevation = 0.		

3.5.5 To Elevation

Database Field Name	ToElev		
Data Type	SHORT	Inclusion	No
Width		Domain	*WLIA ElevationDomain*
Examples	0, 1, 2		
Description	Identifies the To routing for intersections and overpasses. Base elevation = 0.		

3.6 Management Elements

3.6.1 Date Updated

Database Field Name	DateUpdate		
Data Type	DATE	Inclusion	**Yes**
Width		Domain	
Examples	2020-01-28T15:47.09.3-06:00 (representing a record updated on January 28, 2020 at 3:47 and 9.3 seconds PM US Central Standard Time, with a precision of .1 second); 2020-07-16T08:31:15.2-05:00 (representing a record updated on July 16, 2020 at 8:31 and 15.2 seconds AM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record was created or last modified.		

3.6.2 Effective Date

Database Field Name	Effective		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will become active on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will become active on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record is scheduled to take effect (e.g., the date and time an annexation takes effect and a copy of the road centerlines within the annexed area that have had their Incorporated Municipality, ESN, and MSAG Community Name fields populated with the new values are recognized for use in the NG9-1-1 system).		

3.6.3 Expiration Date

Database Field Name	Expire		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will expire and no longer be valid on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will expire and no longer be valid on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time when the information in the record is no longer considered valid (e.g., the date and time an annexation takes effect and the road centerlines within the annexed area that have their Incorporated Municipality, ESN, and MSAG Community Name fields populated with the former values are no longer recognized for use in the NG9-1-1 system).		

3.7 9-1-1 Elements

3.7.1 Discrepancy Agency ID

Database Field Name	DiscrpAgID		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	
Examples	co.polk.wi.us, waukeshacounty.gov, countyofdane.com		
Description	Agency that receives a Discrepancy Report (DR), should a discrepancy in the GIS data 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-000.23-2020 [21].		

3.7.2 Parity Left

Database Field Name	Parity_L		
Data Type	TEXT	Inclusion	**Yes**
Width	1	Domain	O, E, B, Z
Examples	O, E, B, Z		
Description	The even or odd property of the address number range on the left side of the road segment relative to the FROM Node where: O (only Odd addresses in the address range) E (only Even addresses in the address range) B (Both Even and Odd addresses in the address range) Z (Address Range is 0-0)		

3.7.3 Parity Right

Database Field Name	Parity_R		
Data Type	TEXT	Inclusion	**Yes**
Width	1	Domain	O, E, B, Z
Examples	O, E, B, Z		
Description	The even or odd property of the address number range on the right side of the road segment relative to the FROM Node where: O (only Odd addresses in the address range) E (only Even addresses in the address range) B (Both Even and Odd addresses in the address range) Z (Address Range is 0-0)		

3.7.4 ESN Left

Database Field Name	ESN_L		
Data Type	TEXT	Inclusion	Conditional
Width	5	Domain	Characters from 000 to 99999
Examples	35, 810, 7115		
Description	A 3-5 character alphanumeric string that represents the Emergency Service Zone (ESZ) on the left side of the road segment relative to the FROM Node. ESZ is used for 10-digit routing in Legacy Systems and is not used in a full NG9-1-1 implementation.		

3.7.5 ESN Right

Database Field Name	ESN_R		
Data Type	TEXT	Inclusion	Conditional
Width	5	Domain	Characters from 000 to 99999
Examples	35, 810, 7115		
Description	A 3-5 character alphanumeric string that represents the Emergency Service Zone (ESZ) on the right side of the road segment relative to the FROM Node. ESZ is used for 10-digit routing in Legacy Systems and is not used in a full NG9-1-1 implementation.		

3.7.6 MSAG Community Name Left

Database Field Name	MSAGComm_L		
Data Type	TEXT	Inclusion	Conditional
Width	30	Domain	
Examples	MADISON, MAYVILLE, REDGRANITE		
Description	The Community name on the left side of the road segment relative to the FROM Node, as it appears in the MSAG. This may or may not be the same as the Postal Community Name used by the US Postal Service.		

3.7.7 MSAG Community Name Right

Database Field Name	MSAGComm_R		
Data Type	TEXT	Inclusion	Conditional
Width	30	Domain	
Examples	MADISON, MAYVILLE, REDGRANITE		
Description	The Community name on the right side of the road segment relative to the FROM Node, as it appears in the MSAG. This may or may not be the same as the Postal Community Name used by the US Postal Service.		

3.7.8 Validation Left

Database Field Name	Valid_L		
Data Type	TEXT	Inclusion	No
Width	1	Domain	*WLIA YesNoDomain*
Examples	Y, N		
Description	Indicates if the address range on the left side of the road segment should be used for civic location validation. A value of "Y" means the Road Centerline layer can be used for address validation and therefore 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" means the Road Centerline layer should not be used for validation and an Address Number within the address range on the left side of the road segment should only be validated using the Site/Structure Address Point layer. If no values are populated, a value of "Y" is assumed.		

3.7.9 Validation Right

Database Field Name	Valid_R		
Data Type	TEXT	Inclusion	No
Width	1	Domain	*WLIA YesNoDomain*
Examples	Y, N		
Description	Indicates if the address range on the right side of the road segment should be used for civic location validation. A value of "Y" means the Road Centerline layer can be used for address validation and therefore 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" means the Road Centerline layer should not be used for validation and an Address Number within the address range on the right side of the road segment should only be validated using the Site/Structure Address Point layer. If no values are populated, a value of "Y" is assumed.		

3.7.10 Exception

Database Field Name	Exception		
Data Type	TEXT	Inclusion	Conditional
Width	75	Domain	*GMS, NGCS*
Examples	999, 401, OAB		
Description	Indicates if the segment is an exception. 999 is a global exception code that will remove the feature from being provisioned to the NG9-1-1 Core Service providers system.		

4 SiteStructureAddressPoint (Site/Structure Address Point) - Summary Table

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
4.1 Identification Elements							
4.1.1	NENA Globally Unique ID	NGUID	TEXT	254	**Yes**		NENA
4.2 Relate Elements							
4.2.1	Road Centerline NENA Globally Unique ID (Foreign Key)	RCL_NGUID	TEXT	254	Conditional		WLIA
4.3 Address Elements							
4.3.1	Address Number Prefix	AddNum_Pre	TEXT	15	Conditional		NENA, WLIA
4.3.2	Address Number	Add_Number	LONG	6	Conditional	Whole numbers from 0 to 999999	NENA, WLIA
4.3.3	Address Number Suffix	AddNum_Suf	TEXT	15	Conditional		NENA, WLIA
4.3.4	Complete Landmark Name	LandmkName	TEXT	150	Conditional		NENA
4.3.5	Mile Post	MilePost	TEXT	150	Conditional		NENA
4.3.6	Building	Building	TEXT	75	No		NENA, WLIA
4.3.7	Floor	Floor	TEXT	75	No		NENA, WLIA
4.3.8	Unit Pre Type	Unit_PreType	TEXT	75	No		NENA, WLIA
4.3.9	Unit Value	Unit_Value	TEXT	75	No		NENA, WLIA
4.3.10	Room	Room	TEXT	75	No		NENA, WLIA
4.3.11	Seat	Seat	TEXT	75	No		NENA, WLIA
4.3.12	Additional Location Information	Addtl_Loc	TEXT	225	No		NENA, WLIA
4.3.13	Street Name Pre Modifier	St_PreMod	TEXT	15	Conditional		NENA, WLIA
4.3.14	Street Name Pre Directional	St_PreDir	TEXT	10	Conditional	WLIA *DirectionDomain*	NENA, WLIA
4.3.15	Street Name Pre Type	St_PreTyp	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry*	NENA, WLIA
4.3.16	Street Name Pre Type Separator	St_PreSep	TEXT	20	Conditional	NENA *Street Name Pre Type Separators Registry*	NENA, WLIA
4.3.17	Street Name	St_Name	TEXT	254	Conditional		NENA, WLIA
4.3.18	Street Name Post Type	St_PosTyp	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry*	NENA, WLIA
4.3.19	Street Name Post Directional	St_PosDir	TEXT	10	Conditional	WLIA *DirectionDomain*	NENA, WLIA
4.3.20	Street Name Post Modifier	St_PosMod	TEXT	25	Conditional		NENA, WLIA
4.3.21	Full Street Name	FullStNm	TEXT	245	**Yes**		WLIA
4.3.22	Abbreviated Full Street Name	abFullStNm	TEXT	175	No		WLIA
4.3.23	Legacy Street Name Pre Directional	LSt_PreDir	TEXT	2	Conditional	WLIA *abvDirectionDomain*	NENA
4.3.24	Legacy Street Name	LSt_Name	TEXT	75	Conditional		NENA
4.3.25	Legacy Street Name Type	LSt_Type	TEXT	4	Conditional	PSAP MSAG; USPS Publication 28, Appendix C1	NENA
4.3.26	Legacy Street Name Post Directional	LSt_PosDir	TEXT	2	Conditional	WLIA *abvDirectionDomain*	NENA
4.3.27	Postal Code	Post_Code	TEXT	7	No	USPS City State File Product	USPS, NENA, WLIA

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
4.3.28	ZIP Plus 4	Post_Code4	TEXT	4	No	USPS City State File Product	USPS, NENA
4.3.29	Postal Community Name	Post_Comm	TEXT	40	No	USPS City State File Product	USPS, NENA, WLIA
4.4 Area Elements							
4.4.1	Country	Country	TEXT	2	**Yes**		NENA
4.4.2	State (A1)	State	TEXT	2	**Yes**	WLIA *FIPSStateDomain*	US Census, NENA, WLIA
4.4.3	County (A2)	County	TEXT	100	**Yes**	*NG911CountyDomain*	US Census, NENA, WLIA
4.4.4	Incorporated Municipality (A3)	Inc_Muni	TEXT	100	**Yes**	WLIA *FIPSMunicipalityDomain*	US Census, NENA, WLIA
4.4.5	Unincorporated Community (A4)	Uninc_Comm	TEXT	100	No		NENA
4.4.6	Neighborhood Community (A5)	Nbrhd_Comm	TEXT	100	No		NENA
4.4.7	Additional Code	AddCode	TEXT	6	No		NENA
4.5 Functional Elements							
4.5.1	Placement Method	Placement	TEXT	25	No	NENA *Site/Structure Address Point Placement Method Registry*	NENA, WLIA
4.5.2	Place Type	Place_Type	TEXT	50	No		NENA
4.5.3	Additional Data URI	AddDataURI	TEXT	254	Conditional		NENA
4.5.4	*Structure*	Structure	TEXT	3	Conditional	WLIA *YesNoDomain*	WLIA
4.6 Management Elements							
4.6.1	Date Updated	DateUpdate	DATE		**Yes**		NENA
4.6.2	Effective Date	Effective	DATE		No		NENA
4.6.3	Expiration Date	Expire	DATE		No		NENA
4.7 9-1-1 Elements							
4.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	100	**Yes**		NENA
4.7.2	ESN	ESN	TEXT	5	Conditional	Characters from 000 to 99999	NENA
4.7.3	MSAG Community Name	MSAGComm	TEXT	30	Conditional		NENA
4.7.4	Latitude	Lat	FLOAT		No		NENA
4.7.5	Longitude	Long	FLOAT		No		NENA
4.7.6	Elevation	Elev	LONG	6	No		NENA
4.7.7	Exception	Exception	TEXT	75	Conditional		GMS, NGCS

SiteStructureAddressPoint (Site/Structure Address Point) - Data Element Details

4.1 Identification Elements

4.1.1 NENA Globally Unique ID

Database Field Name	NGUID		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	urn:emergency:uid:gis:SSAP:17342239:co.polk.wi.us, urn:emergency:uid:gis:SSAP:100373182:waukeshacounty.gov, urn:emergency:uid:gis:SSAP:44f161f2jk7f4g1v45b1hgaw71av189c:countyofdane.com		
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 details on how to construct the NGUID can be found in section 2.4 NENA Globally Unique IDs (NGUID). The locally assigned unique ID may be the SAP_ExtID (WLIA Standard), an autogenerated unique ID, or a manually generated unique ID.		

4.2 Relate Elements

4.2.1 Road Centerline NENA Globally Unique ID (Foreign Key)

Database Field Name	RCL_NGUID		
Data Type	TEXT	Inclusion	Conditional
Width	254	Domain	
Examples	urn:emergency:uid:gis:RCL:47824393:co.polk.wi.us, urn:emergency:uid:gis:RCL:587392034:waukeshacounty.gov, urn:emergency:uid:gis:RCL:90a942e1bc7f4g1h94c5acaadv24r89h:countyofdane.com		
Description	The Road Centerline NENA Globally Unique ID (RCL_NGUID) is used in the StreetNameAliasTable and SiteStructureAddressPoint as a foreign key relationship between the StreetNameAliasTable and the RoadCenterLine layer or the SiteStructureAddressPoint and the RoadCenterLine layer. A foreign key acts as a cross-reference between RCL_NGUID field in the StreetNameAliasTable and SiteStructureAddressPoint 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 and SiteStructureAddressPoint features. 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.		

4.3 Address Elements

4.3.1 Address Number Prefix

Database Field Name	AddNum_Pre		
Data Type	TEXT	Inclusion	Conditional
Width	15	Domain	
Examples	N123, W123, N, W, S123W		
Description	The non-integer portion of the identifier for a parcel, house, building or other feature which precedes the address number, as defined by the official Addressing Authority for the given jurisdiction. Used commonly in Wisconsin to include the directional to an address number (e.g., **N**2554 Johnson Street). Also used in a few counties where grid address numbers exist to include the locally-defined grid cell reference. In Wisconsin, this is typically only the two directionals and the number between them (e.g., **W180N**8085 Town Hall Road).		

4.3.2 Address Number

Database Field Name	Add_Number		
Data Type	LONG	Inclusion	Conditional
Width	6	Domain	Whole numbers from 0 to 999999
Examples	123, 10546		
Description	The numeric identifier for a parcel, house, building or other feature, as defined by the official Addressing Authority for a given jurisdiction.		

4.3.3 Address Number Suffix

Database Field Name	AddNum_Suf		
Data Type	TEXT	Inclusion	Conditional
Width	15	Domain	
Examples	A, 1/2		
Description	The non-integer portion of the identifier for a parcel, house, building or other feature which follows the address number, as defined by the official Addressing Authority for a given jurisdiction. Not commonly used and use should be minimized. Not to be confused with Unit divisions within a building.		

4.3.4 Complete Landmark Name

Database Field Name	LandmkName		
Data Type	TEXT	Inclusion	Conditional
Width	150	Domain	
Examples	Lambeau Field, Camp Randall Stadium, Devil's Lake, Gibraltar Rock, Pop's Cave, Grand Dad's Bluff		
Description	The name by which a prominent site or structure is publicly known and which may or may not be associated with a civic address. **Note:** This element may be impacted by a potential future change in NENA Standards. See Section 9 for more information.		

4.3.5 Mile Post

Database Field Name	MilePost		
Data Type	TEXT	Inclusion	Conditional
Width	150	Domain	
Examples	Mile Marker 284.8, MIN10		
Description	A measured distance travelled along a road, highway, trail, navigable waterway, or other unaddressed route, from a given point, that is typically posted with a milepost sign, a mile marker sign, or other marker. Mile Post numbers may be used in place of, or in addition to, Address Numbers.		

4.3.6 Building

Database Field Name	Building		
Data Type	TEXT	Inclusion	No
Width	75	Domain	
Examples	Building 1, Building 2, Tower A, Tower B		
Description	The type (e.g., Building, Tower) and identifier (e.g., 2, B) for a building among a group of buildings that have the same Address Number and Full Street Name. **Note:** This element may be impacted by a potential future change in NENA Standards. See Section 9 for more information.		

4.3.7 Floor

Database Field Name	Floor		
Data Type	TEXT	Inclusion	No
Width	75	Domain	
Examples	Floor 4, First Floor, 11, Mezzanine		
Description	The floor, story, or level within a building.		

4.3.8 Unit Pre Type

Database Field Name	Unit_PreType		
Data Type	TEXT	Inclusion	No
Width	75	Domain	
Examples	Suite, Apartment, Unit		
Description	Part of the complete unit identifier that precedes the Unit Value and indicates the kind of unit.		

4.3.9 Unit Value

Database Field Name	Unit_Value		
Data Type	TEXT	Inclusion	No
Width	75	Domain	
Examples	2102, 3C, 12, Penthouse		
Description	Part of the complete unit identifier that uniquely identifies a particular unit.		

4.3.10 Room

Database Field Name	Room		
Data Type	TEXT	Inclusion	No
Width	75	Domain	
Examples	Room 101A, 1202, E, Capitol Ballroom		
Description	The name or identifier of a single room within a building.		

4.3.11 Seat

Database Field Name	Seat		
Data Type	TEXT	Inclusion	No
Width	75	Domain	
Examples	1, 2, A, B, Registration Desk, Cubicle D6		
Description	An individual seat location.		

4.3.12 Additional Location Information

Database Field Name	Addtl_Loc		
Data Type	TEXT	Inclusion	No
Width	225	Domain	
Examples	Concourse B; Gate C14; Loading Dock 2B, Stairwell D		
Description	The type and identifier for a part of a subaddress that is not a Building, Floor, Unit, Room, or Seat.		

4.3.13 Street Name Pre Modifier

Database Field Name	St_PreMod		
Data Type	TEXT	Inclusion	Conditional
Width	15	Domain	
Examples	**Old** North County Highway 12		
Description	A word or phrase that precedes all other Street Name elements and is separated from the Street Name element by a Street Name Pre Directional and/or a Street Name Pre Type element. Not commonly used and use should be minimized.		

4.3.14 Street Name Pre Directional

Database Field Name	St_PreDir		
Data Type	TEXT	Inclusion	Conditional
Width	10	Domain	*WLIA DirectionDomain*
Examples	**East** Main Street, Old **North** County Highway 12		
Description	A word or phrase preceding the Street Name element that indicates the direction taken by the road from an arbitrary starting point or the sector where it is located.		

4.3.15 Street Name Pre Type

Database Field Name	St_PreTyp		
Data Type	TEXT	Inclusion	Conditional
Width	50	Domain	*NENA Street Name Pre Types and Street Name Post Types Registry*
Examples	**Avenue** A, Old North **County Highway** 12, **United States Highway** 151, **State Highway** 46, **Interstate** 90		
Description	A word or phrase that precedes the Street Name element and identifies the type of thoroughfare in the Full Street Name.		

4.3.16 Street Name Pre Type Separator

Database Field Name	St_PreSep		
Data Type	TEXT	Inclusion	Conditional
Width	20	Domain	*NENA Street Name Pre Type Separators Registry*
Examples	Avenue **of the** Arts, Avenue **of** Champions		
Description	A preposition or prepositional phrase between the Street Name Pre Type and the Street Name element.		

4.3.17 Street Name

Database Field Name	St_Name		
Data Type	TEXT	Inclusion	Conditional
Width	254	Domain	
Examples	**Jones** Road, County Highway **KP**, Avenue of the **Arts**, Avenue **C**, **Azure** Court South		
Description	The official name of the road as defined by the official Street Naming Authority for the given jurisdiction. The Street Name element does not include a street type, directional, or modifier unless assigned as such by the official Street Naming Authority.		

4.3.18 Street Name Post Type

Database Field Name	St_PosTyp		
Data Type	TEXT	Inclusion	Conditional
Width	50	Domain	*NENA Street Name Pre Types and Street Name Post Types Registry*
Examples	Jones **Road**, Azure **Court** South		
Description	A word or phrase that follows the Street Name element and identifies the type of thoroughfare in the Full Street Name.		

4.3.19 Street Name Post Directional

Database Field Name	St_PosDir		
Data Type	TEXT	Inclusion	Conditional
Width	10	Domain	*WLIA DirectionDomain*
Examples	Azure Court **South**, 10th Avenue **West**		
Description	A word or phrase following the Street Name element that indicates the direction taken by the road from an arbitrary starting point or the sector where it is located.		

4.3.20 Street Name Post Modifier

Database Field Name	St_PosMod		
Data Type	TEXT	Inclusion	Conditional
Width	25	Domain	
Examples	Bermuda Boulevard **Lower**, Lake Road **Fire Road 8**, Stoughton Road **Frontage Road**, Interstate 90 **westbound**		
Description	A word or phrase that follows all other Street Name elements and is separated from the Street Name element by a Street Name Post Directional and/or Street Name Post Type element. Not commonly used and use should be minimized.		

4.3.21 Full Street Name

Database Field Name	FullStNm		
Data Type	TEXT	Inclusion	**Yes**
Width	245	Domain	
Examples	Old North County Highway 12, Azure Court South, Lake Road Fire Road 8		
Description	The Street Name with all Pre/Post Modifiers, Pre/Post Directionals, Pre Type Separator, and Pre/Post Types concatenated: St_PreMod + St_PreDir + St_PreTyp + St_PreSep + St_Name + St_PosTyp + St_PosDir + St_PosMod		

4.3.22 Abbreviated Full Street Name

Database Field Name	abFullStNm		
Data Type	TEXT	Inclusion	No
Width	175	Domain	
Examples	Old N CTH 12, Azure Ct S, Lake Rd Fire Rd 8		
Description	The Full Street Name with abbreviations (where appropriate) used for the Pre/Post Modifiers, Pre/Post Types, and Pre/Post Directionals. This field is equivalent to the abFullStNm field in the WLIA Standard.		

4.3.23 Legacy Street Name Pre Directional

Database Field Name	LSt_PreDir		
Data Type	TEXT	Inclusion	Conditional
Width	2	Domain	*WLIA abvDirectionDomain*
Examples	**E** MAIN ST, **S** ELMWOOD DR		
Description	The street direction prefix as it appears in the MSAG, as assigned by the official Street Naming Authority. Casing should reflect what appears in the MSAG data.		

4.3.24 Legacy Street Name

Database Field Name	LSt_Name		
Data Type	TEXT	Inclusion	Conditional
Width	75	Domain	
Examples	E **MAIN** ST, S **ELMWOOD** DR, **I 90**, **CTH U**, **10TH** AVE W, **AZURE** CT S		
Description	The street name field as it appears in the MSAG, as assigned by the official Street Naming Authority. Casing should reflect what appears in the MSAG data.		

4.3.25 Legacy Street Name Type

Database Field Name	LSt_Type		
Data Type	TEXT	Inclusion	Conditional
Width	4	Domain	PSAP MSAG; USPS Publication 28, Appendix C1 [9]
Examples	E MAIN **ST**, S ELMWOOD **DR**, 10TH **AVE** W, AZURE **CT** S		
Description	The valid street type abbreviation as it appears in the MSAG, as assigned by the official Street Naming Authority. Casing should reflect what appears in the MSAG data.		

4.3.26 Legacy Street Name Post Directional

Database Field Name	LSt_PosDir		
Data Type	TEXT	Inclusion	Conditional
Width	2	Domain	*WLIA abvDirectionDomain*
Examples	10TH AVE **W**, AZURE CT **S**		
Description	The street direction suffix as it appears in the MSAG, as assigned by the official Street Naming Authority. Casing should reflect what appears in the MSAG data.		

4.3.27 Postal Code

Database Field Name	Post_Code		
Data Type	TEXT	Inclusion	No
Width	7	Domain	USPS City State File Product [10]
Examples	53527, 54703		
Description	The 5-digit code that identifies the individual US Post Office or metropolitan area delivery station associated with an address.		

4.3.28 ZIP Plus 4

Database Field Name	Post_Code4		
Data Type	TEXT	Inclusion	No
Width	4	Domain	USPS City State File Product [10]
Examples	9675, 2871		
Description	A system of 4-digit codes that are used after the 5-digit Postal Code to specify a range of USPS delivery addresses.		

4.3.29 Postal Community Name

Database Field Name	Post_Comm		
Data Type	TEXT	Inclusion	No
Width	40	Domain	USPS City State File Product [10]
Examples	Cottage Grove, Eau Claire		
Description	The municipal name recognized by the USPS as valid for the ZIP Code of an address.		

4.4 Area Elements

4.4.1 Country

Database Field Name	Country		
Data Type	TEXT	Inclusion	**Yes**
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-1 alpha-2 codes
Examples	US, CA		
Description	The two-letter abbreviation of the Country where the address is located. Must be in uppercase.		

4.4.2 State (A1)

Database Field Name	State		
Data Type	TEXT	Inclusion	**Yes**
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-2 *WLIA FIPSStateDomain*
Examples	WI, IL, MN, MI		
Description	The two-letter abbreviation of the State where the address is located. Must be in uppercase.		

4.4.3 County (A2)

Database Field Name	County		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	Restricted to the values in ANSI INCITS 31:2009, including casing and abbreviations [11] *NG911CountyDomain*
Examples	La Crosse County, Racine County		
Description	The name of the County where the address is located.		

4.4.4 Incorporated Municipality (A3)

Database Field Name	Inc_Muni		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	*WLIA FIPSMunicipalityDomain*
Examples	Town of Cottage Grove, City of Green Bay, Village of North Hudson		
Description	The name of the Incorporated Municipality where the address is located, including the incorporated municipality type.		

4.4.5 Unincorporated Community (A4)

Database Field Name	Uninc_Comm		
Data Type	TEXT	Inclusion	No
Width	100	Domain	
Examples	Minocqua, Houlton, Gotham, Pray		
Description	The name of the Unincorporated Community where the address is located.		

4.4.6 Neighborhood Community (A5)

Database Field Name	Nbrhd_Comm		
Data Type	TEXT	Inclusion	No
Width	100	Domain	
Examples	Third Ward, Bassett, Greenbush		
Description	The name of an unincorporated neighborhood, subdivision, or area within an incorporated municipality where the address is located. Neighborhood communities are only used when they are known and have a clearly defined boundary.		

4.4.7 Additional Code

Database Field Name	AddCode		
Data Type	TEXT	Inclusion	No
Width	6	Domain	
Examples			
Description	**Note:** Since this field is not applicable in the US, it will not be populated in WI GIS data layers. A Standard Geographical Classification code used in Canada that specifies a geographic area and is used to differentiate two municipalities with the same name in a province that does not have counties.		

4.5 Functional Elements

4.5.1 Placement Method

Database Field Name	Placement		
Data Type	TEXT	Inclusion	No
Width	25	Domain	*NENA Site/Structure Address Point Placement Method Registry*
Examples	Geocoding, Parcel, PropertyAccess, Site, Structure, Unknown		
Description	The methodology used for placement of the address point.		

4.5.2 Place Type

Database Field Name	Place_Type		
Data Type	TEXT	Inclusion	No
Width	50	Domain	Restricted to the values in RFC 4589 [12]
Examples	Airport, bank, hotel, office, residence, stadium, store		
Description	The type of feature identified by the address.		

4.5.3 Additional Data URI

Database Field Name	AddDataURI		
Data Type	TEXT	Inclusion	Conditional
Width	254	Domain	
Examples	https://addtl12345.example.com		
Description	A Uniform Resource Identifier (URI) that defines the Service URI for accessing additional data and information associated with the address location, including building information (e.g., blueprints, contact info, floor plans).		

4.5.4 Structure

Database Field Name	Structure		
Data Type	TEXT	Inclusion	Conditional
Width	3	Domain	*WLIA YesNoDomain*
Examples	Yes, No		
Description	Indicates if the address point is associated with a structure.		

4.6 Management Elements

4.6.1 Date Updated

Database Field Name	DateUpdate		
Data Type	DATE	Inclusion	**Yes**
Width		Domain	
Examples	2020-01-28T15:47.09.3-06:00 (representing a record updated on January 28, 2020 at 3:47 and 9.3 seconds PM US Central Standard Time, with a precision of .1 second); 2020-07-16T08:31:15.2-05:00 (representing a record updated on July 16, 2020 at 8:31 and 15.2 seconds AM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record was created or last modified.		

4.6.2 Effective Date

Database Field Name	Effective		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will become active on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will become active on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record is scheduled to take effect (e.g., the date and time an annexation takes effect and a copy of the Site/Structure Address Points within the annexed area that have had their Incorporated Municipality, ESN, and MSAG Community Name fields populated with the new values are recognized for use in the NG9 1 1 system).		

4.6.3 Expiration Date

Database Field Name	Expire		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will expire and no longer be valid on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will expire and no longer be valid on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time when the information in the record is no longer considered valid (e.g., the date and time an annexation takes effect and the Site/Structure Address Points within the annexed area that have their Incorporated Municipality, ESN, and MSAG Community Name fields populated with the former values are no longer recognized for use in the NG9-1-1 system).		

4.7 9-1-1 Elements

4.7.1 Discrepancy Agency ID

Database Field Name	DiscrpAgID		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	
Examples	co.polk.wi.us, waukeshacounty.gov, countyofdane.com		
Description	Agency that receives a Discrepancy Report (DR), should a discrepancy in the GIS data 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-000.23.2020 [21].		

4.7.2 ESN

Database Field Name	ESN		
Data Type	TEXT	Inclusion	Conditional
Width	5	Domain	Characters from 000 to 99999
Examples	35, 810, 7115		
Description	A 3 to 5 character alphanumeric string that represents the Emergency Service Zone (ESZ) where the address is located.		

4.7.3 MSAG Community Name

Database Field Name	MSAGComm		
Data Type	TEXT	Inclusion	Conditional
Width	30	Domain	
Examples	MADISON, MAYVILLE, REDGRANITE		
Description	The Community name where the address is located, as it appears in the MSAG. This may or may not be the same as the Postal Community Name used by the US Postal Service.		

4.7.4 Latitude

Database Field Name	Lat		
Data Type	LONG	Inclusion	No
Width		Domain	+90 degrees to -90 degrees
Examples	43.075450		
Description	The angular distance of the address point location north or south of the equator as defined by the coordinate system, expressed in decimal degrees.		

4.7.5 Longitude

Database Field Name	Long		
Data Type	LONG	Inclusion	No
Width		Domain	-180 degrees to +180 degrees
Examples	-89.385161		
Description	The angular distance of the address point location east or west of the prime meridian of the coordinate system, expressed in decimal degrees.		

4.7.6 Elevation

Database Field Name	Elev		
Data Type	LONG	Inclusion	No
Width	6	Domain	Whole numbers from 0 to 999999
Examples	68, 136		
Description	The WGS84 (GPS) elevation, given in meters above the ellipsoid, associated with the address.		

4.7.7 Exception

Database Field Name	Exception		
Data Type	TEXT	Inclusion	Conditional
Width	75	Domain	*GMS, NGCS*
Examples	999, 401, OAB		
Description	Indicates if the segment is an exception. 999 is a global exception code that will remove the feature from being provisioned to the NG9-1-1 Core Service providers system.		

5 PsapPolygon (PSAP Boundary) - Summary Table

This layer represents the geographic extent of each PSAP's primary call-taking responsibility.

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
5.1 Identification Elements							
5.1.1	NENA Globally Unique ID	NGUID	TEXT	254	**Yes**		NENA
5.2 Relate Elements							
5.3 Address Elements							
5.4 Area Elements							
5.4.1	Country	Country	TEXT	2	No		NENA
5.4.2	State (A1)	State	TEXT	2	No	WLIA *FIPSStateDomain*	US Census, NENA
5.5 Functional Elements							
5.5.1	Agency Identifier	Agency_ID	TEXT	100	**Yes**		NENA
5.5.2	Service URI	ServiceURI	TEXT	254	**Yes**		NENA
5.5.3	Service URN	ServiceURN	TEXT	55	**Yes**	NENA *urn:emergency:service:sos Registry*	NENA
5.5.4	Service Number	ServiceNum	TEXT	15	No		NENA
5.5.5	Agency vCard URI	AVcard_URI	TEXT	254	No		NENA
5.5.6	Display Name	DsplayName	TEXT	60	**Yes**		NENA
5.6 Management Elements							
5.6.1	Date Updated	DateUpdate	DATE		**Yes**		NENA
5.6.2	Effective Date	Effective	DATE		No		NENA
5.6.3	Expiration Date	Expire	DATE		No		NENA
5.7 9-1-1 Elements							
5.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	100	**Yes**		NENA
5.7.2	Exception	Exception	TEXT	75	Conditional		

PsapPolygon (PSAP Boundary) - Data Element Details

5.1 Identification Elements

5.1.1 NENA Globally Unique ID

Database Field Name	NGUID		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	urn:emergency:uid:gis:Psap:57311256:co.polk.wi.us, urn:emergency:uid:gis:Psap:410371581:waukeshacounty.gov, urn:emergency:uid:gis:Psap:45a133f2jm7f2g5n41b1hjpw18ay583t:countyofdane.com		
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 2.4 NENA Globally Unique IDs (NGUID).		

5.2 Relate Elements

Not applicable.

5.3 Address Elements

Not applicable.

5.4 Area Elements

5.4.1 Country

Database Field Name	Country		
Data Type	TEXT	Inclusion	No
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-1 alpha-2 codes
Examples	US, CA		
Description	The two-letter abbreviation of the Country where the polygon is located. Must be in uppercase.		

5.4.2 State (A1)

Database Field Name	State		
Data Type	TEXT	Inclusion	No
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-2 *WLIA FIPSStateDomain*
Examples	WI, IL, MN, MI		
Description	The two-letter abbreviation of the State where the address is located. Must be in uppercase.		

5.5 Functional Elements

5.5.1 Agency ID

Database Field Name	Agency_ID		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	Must be a registered domain name
Examples	co.polk.wi.us, waukeshacounty.gov, countyofdane.com		
Description	A Domain Name System (DNS) registered domain name which is used to uniquely identify an agency. An agency is represented by a domain name as defined in Internet Engineering Task Force (IETF) RFC 1034 [6]. Each agency MUST use one domain name consistently in order to correlate actions across a wide range of calls and incidents. Any domain name in the public DNS is acceptable so long as each distinct agency uses a different domain name to ensure that each agency ID is globally unique.		

5.5.2 Service URI

Database Field Name	ServiceURI		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	Must be a registered domain name
Examples	sips:sos@psap.columbus.oh.us; tel:+16145551212		
Description	The Uniform Resource Identifier (URI) used for call routing that defines the URI of the specific service. The URI is usually a Session Initiation Protocol (SIP or SIPs) URI but may be a telephone number (e.g., tel) URI that defines the route to reach the service. Internet Engineering Task Force (IETF) RFC 1035 [13] defines the process to register a domain name		

5.5.3 Service URN

Database Field Name	ServiceURN		
Data Type	TEXT	Inclusion	**Yes**
Width	55	Domain	*NENA urn:emergency:service:responder Registry*
Examples	urn:emergency:service:sos.psap; urn: emergency:service:responder.police; urn: emergency:service:responder.fire; urn: emergency:service:responder.ems		
Description	The Uniform Resource Name (URN) used to select the service for which a route is desired. The ECRF is queried with a location and a Service URN, and then returns the Service URI. NOTE: Spatial Interface providers may auto populate the Service URN based on their system requirements.		

5.5.4 Service Number

Database Field Name	ServiceNum		
Data Type	TEXT	Inclusion	No
Width	15	Domain	A dialable number or dial string
Examples	911, 18002221212		
Description	The numbers that would be dialed on a 12 digit keypad to reach the emergency 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 Emergency Boundaries including PSAP; Law; Fire; EMS; and others such as Poison Control. Within the United States the Service Number for most emergency services is 9-1-1, however, there may be Emergency Service boundaries that have a different number that may be associated with them such as Poison Control.		

5.5.5 Agency vCard URI

Database Field Name	AVcard_URI		
Data Type	TEXT	Inclusion	No
Width	254	Domain	
Examples	https://vcard.psap.allegheny.pa.us; https://vcard.houstontx.gov/fire		
Description	**Note:** This field will be considered for deletion in a future version of this document to align with future changes in the NENA NG911 GIS Data Model. 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 each agency. The Service/Agency Locator (see NENA STA-010.3e-2021 [16]) will provide these URIs for agencies listed within it. NOTE: Spatial Interface providers may auto populate the Agency vCard URI based on their system requirements.		

5.5.6 Display Name

Database Field Name	DsplayName		
Data Type	TEXT	Inclusion	**Yes**
Width	60	Domain	
Examples	New York Police Department, Med Life Ambulance Services, Houston FD		
Description	A name or description of the entity offering emergency services within a PSAP or Emergency Service Boundary. This value must be suitable for display.		

5.6 Management Elements

5.6.1 Date Updated

Database Field Name	DateUpdate		
Data Type	DATE	Inclusion	**Yes**
Width		Domain	
Examples	2020-01-28T15:47.09.3-06:00 (representing a record updated on January 28, 2020 at 3:47 and 9.3 seconds PM US Central Standard Time, with a precision of .1 second); 2020-07-16T08:31:15.2-05:00 (representing a record updated on July 16, 2020 at 8:31 and 15.2 seconds AM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record was created or last modified.		

5.6.2 Effective Date

Database Field Name	Effective		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will become active on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will become active on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record is scheduled to take effect (e.g., the date and time an annexation takes effect and the new PSAP Boundary is recognized for use in the NG9-1-1 system).		

5.6.3 Expiration Date

Database Field Name	Expire		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will expire and no longer be valid on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will expire and no longer be valid on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time when the information in the record is no longer considered valid (e.g., the date and time an annexation takes effect and the former PSAP Boundary is no longer recognized for use in the NG9-1-1 system).		

5.7 9-1-1 Elements

5.7.1 Discrepancy Agency ID

Database Field Name	DiscrpAgID		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	
Examples	co.polk.wi.us, waukeshacounty.gov, countyofdane.com		
Description	Agency that receives a Discrepancy Report (DR), should a discrepancy be discovered in the GIS data, 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-000.23-2020 [21].		

5.7.2 Exception

Database Field Name	Exception		
Data Type	TEXT	Inclusion	Conditional
Width	75	Domain	*GMS, NGCS*
Examples	999, 401, OAB		
Description	Indicates if the segment is an exception. 999 is a global exception code that will remove the feature from being provisioned to the NG9-1-1 Core Service providers system.		

6 FirePolygon, PolicePolygon, EmsPolygon (Emergency Service Boundary) - Summary Table

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 Medical 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.

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
6.1 Identification Elements							
6.1.1	NENA Globally Unique ID	NGUID	TEXT	254	**Yes**		NENA
6.2 Relate Elements							
6.3 Address Elements							
6.4 Area Elements							
6.4.1	Country	Country	TEXT	2	No		NENA
6.4.2	State (A1)	State	TEXT	2	No	WLIA *FIPSStateDomain*	US Census, NENA
6.5 Functional Elements							
6.5.1	Agency ID	Agency_ID	TEXT	100	**Yes**		NENA
6.5.2	Service URI	ServiceURI	TEXT	254	**Yes**		NENA
6.5.3	Service URN	ServiceURN	TEXT	55	**Yes**	NENA *urn:emergency:service:sos Registry*	NENA
6.5.4	Service Number	ServiceNum	TEXT	15	No		NENA
6.5.5	Agency vCard URI	AVcard_URI	TEXT	254	No		NENA
6.5.6	Display Name	DsplayName	TEXT	60	**Yes**		NENA
6.6 Management Elements							
6.6.1	Date Updated	DateUpdate	DATE		**Yes**		NENA
6.6.2	Effective Date	Effective	DATE		No		NENA
6.6.3	Expiration Date	Expire	DATE		No		NENA
6.7 9-1-1 Elements							
6.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	100	**Yes**		NENA
6.7.2	Exception	Exception	TEXT	75	Conditional		

FirePolygon, PolicePolygon, EmsPolygon (Emergency Service Boundary) - Data Element Details

6.1 Identification Elements

6.1.1 NENA Globally Unique ID

Database Field Name	NGUID		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	urn:emergency:uid:gis:Pol:71378233:co.polk.wi.us, urn:emergency:uid:gis:Fire:617271786:waukeshacounty.gov, urn:emergency:uid:gis:Ems:54a513f2kk7g5h7n41b0hxwa81jw531c:countyofdane.com		
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 2.4 NENA Globally Unique IDs (NGUID).		

6.2 Relate Elements

Not applicable.

6.3 Address Elements

Not applicable.

6.4 Area Elements

6.4.1 Country

Database Field Name	Country		
Data Type	TEXT	Inclusion	No
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-1 alpha-2 codes
Examples	US, CA		
Description	The two-letter abbreviation of the Country where the polygon is located. Must be in uppercase.		

6.4.2 State (A1)

Database Field Name	State		
Data Type	TEXT	Inclusion	No
Width	2	Domain	Restricted to the two-letter codes in ISO 3166-2 *WLIA FIPSStateDomain*
Examples	WI, IL, MN, MI		
Description	The two letter abbreviation of the State where the polygon is located. Must be in uppercase.		

6.5 Functional Elements

6.5.1 Agency ID

Database Field Name	Agency_ID		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	Must be a registered domain name
Examples	co.polk.wi.us, waukeshacounty.gov, countyofdane.com		
Description	A Domain Name System (DNS) registered domain name which is used to uniquely identify an agency. An agency is represented by a domain name as defined in Internet Engineering Task Force (IETF) RFC 1034 [15]. Each agency MUST use one domain name consistently in order to correlate actions across a wide range of calls and incidents. Any domain name in the public DNS is acceptable so long as each distinct agency uses a different domain name to ensure that each agency ID is globally unique.		

6.5.2 Service URI

Database Field Name	ServiceURI		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	Must be a registered domain name
Examples	sips:sos@psap.columbus.oh.us; tel:+16145551212		
Description	The Uniform Resource Identifier (URI) used for call routing that defines the URI of the specific service. The URI is usually a Session Initiation Protocol (SIP or SIPs) URI but may be a telephone number (e.g., tel) URI that defines the route to reach the service. Internet Engineering Task Force (IETF) RFC 1035 [13] defines the process to register a domain name		

6.5.3 Service URN

Database Field Name	ServiceURN		
Data Type	TEXT	Inclusion	**Yes**
Width	55	Domain	*NENA urn:emergency:service:responder Registry*
Examples	urn:emergency:service:sos.psap; urn: emergency:service:responder.police; urn: emergency:service:responder.fire; urn: emergency:service:responder.ems		
Description	The Uniform Resource Name (URN) used to select the service for which a route is desired. The ECRF is queried with a location and a Service URN, and then returns the Service URI. NOTE: Spatial Interface providers may auto populate the Service URN based on their system requirements.		

6.5.4 Service Number

Database Field Name	ServiceNum		
Data Type	TEXT	Inclusion	No
Width	15	Domain	A dialable number or dial string
Examples	911, 18002221212		
Description	The numbers that would be dialed on a 12 digit keypad to reach the emergency 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 Emergency Boundaries including PSAP; Law; Fire; EMS; and others such as Poison Control. Within the United States the Service Number for most emergency services is 9-1-1, however, there may be Emergency Service boundaries that have a different number that may be associated with them such as Poison Control.		

6.5.5 Agency vCard URI

Database Field Name	AVcard_URI		
Data Type	TEXT	Inclusion	No
Width	254	Domain	
Examples	https://vcard.psap.allegheny.pa.us; https://vcard.houstontx.gov/fire		
Description	**Note:** This field will be considered for deletion in a future version of this document to align with future changes in the NENA NG911 GIS Data Model. 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) [14]. The vCard URI is used in the service boundary layers to provide contact information for each agency. The Service/Agency Locator (see NENA STA-010.3e-2021 [16]) will provide these URIs for agencies listed within it. NOTE: Spatial Interface providers may auto populate the Agency vCard URI based on their system requirements.		

6.5.6 Display Name

Database Field Name	DsplayName		
Data Type	TEXT	Inclusion	**Yes**
Width	60	Domain	
Examples	New York Police Department, Med Life Ambulance Services, Houston FD		
Description	A name or description of the entity offering emergency services within a PSAP or Emergency Service Boundary. This value must be suitable for display.		

6.6 Management Elements

6.6.1 Date Updated

Database Field Name	DateUpdate		
Data Type	DATE	Inclusion	**Yes**
Width		Domain	
Examples	2020-01-28T15:47.09.3-06:00 (representing a record updated on January 28, 2020 at 3:47 and 9.3 seconds PM US Central Standard Time, with a precision of .1 second); 2020-07-16T08:31:15.2-05:00 (representing a record updated on July 16, 2020 at 8:31 and 15.2 seconds AM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record was created or last modified.		

6.6.2 Effective Date

Database Field Name	Effective		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will become active on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will become active on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record is scheduled to take effect (e.g., the date and time an annexation takes effect and the new Emergency Service Boundary is recognized for use in the NG9-1-1 system).		

6.6.3 Expiration Date

Database Field Name	Expire		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will expire and no longer be valid on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will expire and no longer be valid on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time when the information in the record is no longer considered valid (e.g., the date and time an annexation takes effect and the former Emergency Service Boundary is no longer recognized for use in the NG9-1-1 system).		

6.7 9-1-1 Elements

6.7.1 Discrepancy Agency ID

Database Field Name	DiscrpAgID		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	
Examples	co.polk.wi.us, waukeshacounty.gov, countyofdane.com		
Description	Agency that receives a Discrepancy Report (DR), should a discrepancy be discovered in the GIS data, 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-000.23-2020 [21].		

6.7.2 Exception

Database Field Name	Exception		
Data Type	TEXT	Inclusion	Conditional
Width	75	Domain	*GMS, NGCS*
Examples	999, 401, OAB		
Description	Indicates if the segment is an exception. 999 is a global exception code that will remove the feature from being provisioned to the NG9-1-1 Core Service providers system.		

7 ProvisioningPolygon (Provisioning Boundary) - Summary Table

This layer represents the coverage area for which GIS data providers are responsible for submitting GIS data for NG9-1-1. The data provided must cover the entire extent of the coverage area that defines their geographic area of responsibility but data must not extend beyond the identified coverage area.

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
7.1 Identification Elements							
7.1.1	NENA Globally Unique ID	NGUID	TEXT	254	**Yes**		NENA
7.2 Relate Elements							
7.3 Address Elements							
7.4 Area Elements							
7.5 Functional Elements							
7.6 Management Elements							
7.6.1	Date Updated	DateUpdate	DATE		**Yes**		NENA
7.6.2	Effective Date	Effective	DATE		No		NENA
7.6.3	Expiration Date	Expire	DATE		No		NENA
7.7 9-1-1 Elements							
7.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	100	**Yes**		NENA

ProvisioningPolygon (Provisioning Boundary) - Data Element Details

7.1 Identification Elements

7.1.1 NENA Globally Unique ID

Database Field Name	NGUID		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	urn:emergency:uid:gis:Prov:16424289:co.polk.wi.us, urn:emergency:uid:gis:Prov:210252128:waukeshacounty.gov, urn:emergency:uid:gis:Prov:65e160f2ad7f2g1w55k1hjwa74ap891v:countyofdane.com		
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 2.4 NENA Globally Unique IDs (NGUID).		

7.2 Relate Elements

Not applicable.

7.3 Address Elements

Not applicable.

7.4 Area Elements

Not applicable.

7.5 Functional Elements

Not applicable.

7.6 Management Elements

7.6.1 Date Updated

Database Field Name	DateUpdate		
Data Type	DATE	Inclusion	**Yes**
Width		Domain	
Examples	2020-01-28T15:47.09.3-06:00 (representing a record updated on January 28, 2020 at 3:47 and 9.3 seconds PM US Central Standard Time, with a precision of .1 second); 2020-07-16T08:31:15.2-05:00 (representing a record updated on July 16, 2020 at 8:31 and 15.2 seconds AM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record was created or last modified.		

7.6.2 Effective Date

Database Field Name	Effective		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will become active on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will become active on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record is scheduled to take effect (e.g., the date and time an annexation takes effect and the new Provisioning Boundary is recognized for use in the NG9-1-1 system).		

7.6.3 Expiration Date

Database Field Name	Expire		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will expire and no longer be valid on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will expire and no longer be valid on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time when the information in the record is no longer considered valid (e.g., the date and time an annexation takes effect and the former Provisioning Boundary is no longer recognized for use in the NG9-1-1 system).		

7.7 9-1-1 Elements

7.7.1 Discrepancy Agency ID

Database Field Name	DiscrpAgID		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	
Examples	co.polk.wi.us, waukeshacounty.gov, countyofdane.com		
Description	Agency that receives a Discrepancy Report (DR), should a discrepancy be discovered in the GIS data, 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-000.23-2020 [21].		

8 Schema Crosswalk Tables

Data maintained locally in the Wisconsin Land Information Association (WLIA) Street Centerline Data Standard [3] or the WLIA Address Point Data Standard [4] contains many of the same data fields as in the Wisconsin NG9-1-1 GIS Data Standard. Most fields in the WLIA Standards can be directly crosswalked into this standard. The Road Centerline and Site/Structure Address Point tables below list all of the Wisconsin NG9-1-1 Element Names and their associated Field Names. Where an equivalent WLIA data field exists, the WLIA Element Name and WLIA Field Name are provided in the first two columns, otherwise if no equivalent WLIA field exists, the columns are left blank. The Crosswalk Notes column provides information regarding WLIA data fields that may be helpful with initial data population of the Wisconsin NG9-1-1 GIS Data Standard elements if no equivalent WLIA element exists. The column also identifies fields that are not required in the NENA Standard for NG9-1-1 GIS Data Model [5] but were included in the Wisconsin NG9-1-1 GIS Data Standard to meet the State of Wisconsin's needs.

8.1 RoadCenterLine (Road Centerline)

WLIA Standard Element Name	WLIA Field Name	NG9-1-1 Standard Element Name	NG9-1-1 Field Name	Crosswalk Notes
3.1 Identification Elements				
		NENA Globally Unique ID	NGUID	
3.2 Relate Elements				
3.3 Address Elements				
Address Prefix Left	AddPre_L	Left Address Number Prefix	AdNumPre_L	
From Address Left	FrAdd_L	Left FROM Address	FromAddr_L	
To Address Left	ToAddr_L	Left TO Address	ToAddr_L	
Address Prefix Right	AddPre_R	Right Address Number Prefix	AdNumPre_R	
From Address Right	FrAdd_R	Right FROM Address	FromAddr_R	
To Address Right	ToAddr_R	Right TO Address	ToAddr_R	
Street Name Pre-Modifier	StPreMod	Street Name Pre Modifier	St_PreMod	
Street Name Pre-Directional	StPreDir	Street Name Pre Directional	St_PreDir	
Street Name Pre-Type	StPreType	Street Name Pre Type	St_PreType	
Street Name Pre-Type Separator	StPreSep	Street Name Pre Type Separator	St_PreSep	
Base Street Name	StBaseNm	Street Name	St_Name	
Street Name Post-Type	StPosTyp	Street Name Post Type	St_PosTyp	
Street Name Post-Directional	StPosDir	Street Name Post Directional	St_PosDir	
Street Name Post-Modifier	StPosMod	Street Name Post Modifier	St_PosMod	
Full Street Name	FullStNm	Full Street Name	FullStNm	Not a NENA field
Abbreviated Full Street Name	abFullStNm	Abbreviated Full Street Name	abFullStNm	Not a NENA field
		Legacy Street Name Pre Directional	LSt_PreDir	
		Legacy Street Name	LSt_Name	
		Legacy Street Name Type	LSt_Type	
		Legacy Street Name Post Directional	LSt_PosDir	
Zip Code Left	ZIPCode_L	Postal Code Left	PostCode_L	
Zip Code Right	ZIPCode_R	Postal Code Right	PostCode_R	
Municipal Zip Code Name Left	ZIPMuni_L	Postal Community Name Left	PostComm_L	
Municipal Zip Code Name Right	ZIPMuni_R	Postal Community Name Right	PostComm_R	
3.4 Area Elements				
		Country Left	Country_L	
		Country Right	Country_R	
State Name Left	StateNameL	State Left (A1)	State_L	
State Name Right	StateNameR	State Right (A1)	State_R	
County Name Left	CntyName_L	County Left (A2)	County_L	
County Name Right	CntyName_R	County Right (A2)	County_R	
Municipal Name Left	MuniName_L	Incorporated Municipality Left (A3)	IncMuni_L	
Municipal Name Right	MuniName_R	Incorporated Municipality Right (A3)	IncMuni_R	
		Unincorporated Community Left (A4)	UnincCom_L	

WLIA Standard Element Name	WLIA Field Name	NG9-1-1 Standard Element Name	NG9-1-1 Field Name	Crosswalk Notes
		Unincorporated Community Right (A4)	UnincCom_R	
		Neighborhood Community Left (A5)	NbrhdCom_L	
		Neighborhood Community Right (A5)	NbrhdCom_R	
		Additional Code Left	AddCode_L	
		Additional Code Right	AddCode_R	
3.5 Functional Elements				
The Flow of Routing	OneWay	One-Way	OneWay	Change WLIA "N" values to "B" for NG9-1-1 use
Speed Limit	SpeedLimit	Speed Limit	SpeedLimit	
		Road Class	RoadClass	WLIA Road Classification (RdCode) is not a 1-to-1 match with NENA Road Class but may be useful for initial population.
3.5.4 Management Elements				
Date Edited	DateChange	Date Updated	DateUpdate	
		Effective Date	Effective	
		Expiration Date	Expire	
3.7 9-1-1 Elements				
Discrepancy Agency Identifier	DiscrpAgID	Discrepancy Agency ID	DiscrpAgID	
Parity Left	Parity_L	Parity Left	Parity_L	
Parity Right	Parity_R	Parity Right	Parity_R	
Emergency Service Number Left	ESN_L	ESN Left	ESN_L	
Emergency Service Number Right	ESN_R	ESN Right	ESN_R	
		MSAG Community Name Left	MSAGComm_L	
		MSAG Community Name Right	MSAGComm_R	
		Validation Left	Valid_L	
		Validation Right	Valid_R	

8.2 SiteStructureAddressPoint (Site/Structure Address Point)

WLIA Standard Element Name	WLIA Field Name	NG9-1-1 Standard Element Name	NG9-1-1 Field Name	Notes
4.1 Identification Elements				
		NENA Globally Unique ID	NGUID	
4.2 Relate Elements				
		Road Centerline NENA Globally Unique ID	RCL_NGUID	
4.3 Address Elements				
Address Number Prefix	AddNumPre	Address Number Prefix	AddNum_Pre	
Address Number	AddNum	Address Number	Add_Number	
Address Number Suffix	AddNumSuf	Address Number Suffix	AddNum_Suf	
		Complete Landmark Name	LandmkName	
		Mile Post	MilePost	
Building Identifier	Building	Building	Building	
Building Floor	Floor	Floor	Floor	
Unit Type	UnitType	Unit Pre Type	Unit_PreType	
Unit Number	UnitNum	Unit Value	Unit_Value	
Building Room	Room	Room	Room	
Seat Identifier	Seat	Seat	Seat	
		Additional Location Information	Addtl_Loc	
Pre-Modifier	StPreMod	Street Name Pre Modifier	St_PreMod	
Pre-Directional	StPreDir	Street Name Pre Directional	St_PreDir	
Pre-Type	StPreTyp	Street Name Pre Type	St_PreTyp	
Pre-Type Separator	StPreSep	Street Name Pre Type Separator	St_PreSep	
Base Name	StBaseNm	Street Name	St_Name	
Post-Type	StPosTyp	Street Name Post Type	St_PosTyp	
Post-Directional	StPosDir	Street Name Post Directional	St_PosDir	
Post-Modifier	StPosMod	Street Name Post Modifier	St_PosMod	
Full Street Name	FullStNm	*Full Street Name*	FullStNm	Not a NENA field
Abbreviated Full Street Name	abFullStNm	*Abbreviated Full Street Name*	abFullStNm	Not a NENA field
		Legacy Street Name Pre Directional	LSt_PreDir	
		Legacy Street Name	LSt_Name	
		Legacy Street Name Type	LSt_Type	
		Legacy Street Name Post Directional	LSt_PosDir	
Zip Code	ZIPCode	Postal Code	Post_Code	
		ZIP Plus 4	Post_Code4	
Municipal Zip Code Name	ZIPMuni	Postal Community Name	Post_Comm	
4.4 Area Elements				
		Country	Country	
State Name	StateName	State (A1)	State	
US Census County name	CntyName	County (A2)	County	
US Census Municipal Name	MuniName	Incorporated Municipality (A3)	Inc_Muni	
		Unincorporated Community (A4)	Uninc_Comm	
		Neighborhood Community (A5)	Nbrhd_Comm	
		Additional Code	AddCode	
4.5 Functional Elements				
Location Type	Loc_Type	Placement Method	Placement	
		Place Type	Place_Type	
		Additional Data URI	AddDataURI	
Structure	Structure	*Structure*	Structure	Not a NENA field
4.6 Management Elements				
Date Edited	DateChange	Date Updated	DateUpdate	
		Effective Date	Effective	
		Expiration Date	Expire	
4.7 9-1-1 Elements				
Discrepancy Agency Identifier	DiscrpAgID	Discrepancy Agency ID	DiscrpAgID	

WLIA Standard Element Name	WLIA Field Name	NG9-1-1 Standard Element Name	NG9-1-1 Field Name	Notes
		ESN	ESN	
		MSAG Community Name	MSAGComm	
		Latitude	Lat	
		Longitude	Long	
		Elevation	Elev	

9 Potential Future Changes in NENA Standards Impacting this Standard

NENA NG9-1-1 Standards undergo continuous review and update, particularly as the implementation of the NENA Standards often identifies areas needing improvement, clarification, or reconsideration. It is important for the State of Wisconsin to monitor the development of NENA NG9-1-1 GIS standards and how elements in this standard may be impacted by potential future changes in the NENA Standards. The NENA NG9-1-1 Civic Location Data Exchange Format (CLDXF) Standard [17] and the NENA Standard for NG9-1-1 GIS Data Model [5] (NG9-1-1 GIS Data Model) are both undergoing an update as of the release of this document. Noted below are planned changes in these documents that may impact the Wisconsin NG9-1-1 GIS Data Standard.

New elements planned to be added in version 2 of the NENA CLDXF Standard, which will eventually result in equivalent additions to the NENA NG9-1-1 GIS Data Model Standard:

- Site
- Subsite
- Structure
- Unit PreType
- Unit Value
- Wing
- Section
- Row

Existing elements planned for removal and replacement with new element(s) in version 2 of the NENA CLDXF Standard, which will eventually result in equivalent changes to the NENA NG9-1-1 GIS Data Model Standard:

- Complete Landmark Name – to be replaced by new Site, Subsite, and Structure elements
- Building – to be replaced by new Structure element
- Unit – to be replaced with new Unit PreType and Unit Value elements

The Unit PreType element was added during the last revision to this document. The WLIA standard has an existing field, Unit Type, aligning both standards. Unit Value element was also updated to reflect the division of the field and alignment with the WLIA Address Point Data Standard [4].

10 Considerations for GIS Data Development and Maintenance

10.1 General Considerations

Not all attribute fields are required for the ECRF and LVF to function. Having a strategy to populate these optional fields over time will help keep costs in check while making the best use of available resources. A good local data development and maintenance plan should be created at the earliest stages to ensure the best use of available resources and address data. Considerations when developing such a plan are discussed throughout Section 10, Considerations for GIS Data Development and Maintenance.

10.1.1 Metadata

Metadata is information about the dataset that explains the who, what, where, when, why, and how. This information is important when sharing data with others so that the recipient clearly understands

what the data contains and who to contact if there are additional questions. Minimum metadata to consider providing with the data include:

- Identification information (abstract, purpose for creating)
- Date updated (date when changes were last made to the data)
- Point of Contact (person, position, organization, contact information)
- Reference system information (datum, coordinate system, projection)

10.1.2 Use of Orthoimagery versus GPS Data Collection Devices

The availability of current, high resolution orthoimagery can provide a cost-effective way to create spatially accurate address points, add new road centerlines, or compile changes in existing road centerlines. Road centerline compilation and address point placement that is done in the office is much more efficient than sending staff into the field with GPS units to collect geospatial coordinates for addressed locations and road alignments that clearly exist in the orthoimagery. Consider limiting GPS use to collect locations for:

- Subaddresses
- Sites, structures, and new roads not yet present in the existing imagery
- Sites, structures, and road centerlines that are not clearly discernible in the existing imagery

The State of Wisconsin does not have a statewide aerial imagery program. Instead, imagery acquisition is driven by the local governments and their business needs. Acquiring orthoimagery can be cost prohibitive for many organizations. The Wisconsin Regional Orthoimagery Consortium (WROC) [22] provides assistance coordinating the acquisition of digital orthoimagery across Wisconsin on a continuing 2-5 year cycle, at a reduced cost for participants in the program. Participants choose the products that meet their needs, manage their projects, and distribute their orthoimagery and other products. Participating in WROC is a cost-effective option for acquiring high resolution orthoimagery for maintaining and updating the required NG9-1-1 GIS data layers.

The State Cartographer's Office website [23] is a good resource for locating where to acquire existing aerial imagery data. While orthoimagery may provide an excellent resource for mapping existing features, updated imagery is necessary to capture new roads and addressed features.

The Wisconsin Department of Transportation (WisDOT) is another valuable resource for new road alignments. Prior to GPS collection of new road centerlines, consult with the WisDOT Regional Office [24] to see if they already have new road information available in their digital Roadway Design Files. These detailed engineering files provide not just the new road centerlines but also curbs, medians, and other edge of pavement designations.

10.2 Considerations for Road Centerlines

10.2.1 Accuracy of Boundary Data (for alignment/segmentation at boundaries)

Boundary data is essential for accurate NG9-1-1 data. Overlapping boundaries can create issues when segmenting data. This is especially important when aligning Road Centerlines with state and county boundaries. When aligning and segmenting Road Centerlines with any boundary, the local jurisdiction should always check with the entity responsible for maintaining that boundary alignment to ensure the correct boundary is being used.

10.2.2 Limitations of CAD Software

Each CAD software has its own requirements when dealing with road centerline data. In some cases, CAD software may require 0-0 ranges, while others may not. Some CAD software may also allow for Z (height) values which will affect how road centerlines are split at over/underpasses. Currently, not all CAD software programs can natively ingest GIS data in NENA's NG9-1-1 GIS Data Model [5] format (upon which

the Wisconsin NG9-1-1 GIS Data Standard is based) and may require the use of abbreviations or different parsing of the street names and addresses. These best practices do not take into account each CAD software vendor's solutions, and therefore the data developer should always refer to CAD software requirements when updating Road Centerlines.

10.3 Considerations for Site/Structure Address Points

Organizations developing Site/Structure Address Points need to carefully consider the level of positional accuracy desired and the resources available, not just for initial data development but long-term data maintenance. In general, address point placement methodologies that result in more spatially accurate points require more resources to create and maintain them.

10.3.1 Placement Method (e.g., Structure, Site, Property Access, Parcel, Geocoding)

Some address point placement methodologies require minimal resources while others are very resource intensive. Consider starting with a less spatially accurate placement method and over time gradually improve the spatially accuracy of the address points as resources allow. For example, use available parcel data to generate address points from parcel centroids and then as resources permit, use orthoimagery to move the address points onto the sites and structures. This allows for quick creation of a Site/Structure Address Point layer that can be used immediately in 9-1-1 applications. Similarly, if using orthoimagery to place address points but field research is required for an address that cannot be clearly discerned on the imagery, create a temporary address point using the parcel centroid location if the parcel upon which it is located is known or create a Property Access point at the driveway entrance to the addressed property if the driveway is visible in the orthoimagery. Population of the Placement Method attribute is recommended in these situations to provide data users with information on the address point's positional accuracy.

10.3.2 Amount of Subaddress Detail Needed

Costs increase directly with the amount of subaddress detail that is collected. When determining the amount of subaddress detail needed, consider how 9-1-1 applications will use the data and how precise the address point location needs to be. At a minimum, enough subaddress detail should be provided to route 9-1-1 calls to the appropriate PSAP and get first responders to the correct location. Consider beginning with a low level of subaddress information and increase in granularity as time and resources permit. For example, collect subaddress information that will at least get responders to a specific building. Additional subaddress detail may be needed where a large site or building is split by an Emergency Service Boundary and subaddresses at that location are served by different responding agencies.

10.3.3 Limitations of CAD Software

It is important to understand the limitations and requirements of your CAD software as currently not all CAD software programs can natively ingest GIS data in NENA's NG9-1-1 GIS Data Model [5] format and may require the use of abbreviations or different parsing of the street names and addresses. Some optional fields may not be recognized and therefore population of those fields could be postponed. Consider the CAD software's ability to use stacked points, subaddress data in a related table structure, or even recognize subaddresses as unique addresses. Also consider if the CAD software can differentiate between the Placement Methods or requires a specific Placement Method (e.g., Property Access versus Structure). For example, a structure located far from the road it is addressed off of may benefit from having two address points: a Property Access address point at the driveway entrance and a Structure address point on the structure. If the CAD software cannot differentiate between the points, it may be preferred to only show one point.

10.4 Considerations for PSAP, Emergency Service (Service), and Provisioning Boundaries

Organizations developing these GIS data layers need to understand that these layers often are not identical to the legal county, city, village, or other administrative boundaries within Wisconsin. Existing agreements between PSAPs that define their areas of responsibility, particularly in areas where the boundary differs from the administrative boundaries, need to be properly reflected in the GIS data layers.

10.4.1 Accuracy of the PSAP and Emergency Service Boundaries

There should be no unintentional gaps or overlaps within the PSAP Boundary layer or the Emergency Service Boundary layers. Gaps in PSAP boundaries prevent the ECRF from identifying which PSAP to route a call should a civic or geodetic location fall within that gap. Similarly, if a civic or geodetic location fell within an area where PSAP Boundaries overlapped, the ECRF would not be able to identify which of the PSAPs to route the call. Similarly, gaps and overlaps within an Emergency Service Boundary would prevent the ECRF from determining the correct Service Provider.

Boundaries with unintentional overlaps also create issues when segmenting data. For example, Road Centerlines segmenting at these boundaries would result in attribution conflicts for the segment in the overlapping area, including the address, area, and 9-1-1 attribution elements.

GIS Data Providers must work together to resolve any discrepancies in these layers such that there are no unintentional gaps or overlaps.

10.4.2 Accuracy of the Provisioning Boundary

There should be no unintentional gaps or overlaps within the Provisioning Boundary layer. Overlapping boundaries would result in multiple GIS Data Providers being able to submit GIS data for the same area which could result in duplicate GIS features (e.g., Road Centerlines, Site/Structure Address Points) in the overlapping area. GIS Data Providers must work together to resolve these discrepancies such that their Provisioning Boundary covers the entire extent of their geographic area of responsibility but does not extend beyond their coverage area into a neighboring jurisdiction's geographic area of responsibility.

11 Quality Control of Next Generation 9-1-1 GIS Data

Quality Control is an all-encompassing management approach that combines technical, qualitative and human resources to evaluate the quality of GIS data to meet the requirements of a system. Each GIS data layer, individually and in relation to each other, is analyzed to determine where integrity issues exist.

Integrity issues for NG9-1-1 GIS data is categorized into two categories: critical and non-critical. Critical issues will cause issues with the NG9-1-1 Location Validation and Emergency Call Routing Functions and will not be accepted into the NG9-1-1 Core Services components. Non-critical issues have the potential to cause issues with both of these functions, however additional features within the system will ensure the calls are correctly routed. Non-critical errors may be identified by the NG9-1-1 Core Services Provider but will not prevent the data from being provisioned into the system.

Prior to and during transition to a NG9-1-1 system, quality control between the 9-1-1 GIS data and the E9-1-1 routing databases, ALI and MSAG, must continue to be quality controlled through data synchronization. It is important to utilize the legacy street name elements within the Road Centerline and Site/Structure Address Point datasets for synchronization with the legacy E9-1-1 databases. Integrity issues identified during the data synchronization process may need to be resolved through updates to the ALI and/or MSAG and the GIS data.

The process for quality control can be dependent on a variety of factors, however the major factors are the software utilized to perform the analysis and the format of the GIS data. Resolution of all errors identified as ***Critical*** errors, is of utmost important. For NG9-1-1, 98% is often cited as a benchmark for resolution of GIS data errors and ALI to Road Centerlines errors, with a goal to continually improve the GIS data and achieve 100% resolution of all errors. Accuracy requirements should be discussed with your NGCS Provider.

11.1 Definitions of Commonly Used Quality Control Terms

11.1.1 Street Name Elements

Description: All the NENA CLDXF Standard [17] (fully spelled out) street name fields and/or all the legacy (abbreviated) street name fields in both the Road Centerline and Site/Structure Address Point feature classes.

CLDXF: Street Name Pre Modifier, Street Name Pre Directional, Street Name Pre Type, Street Name Pre Type Separator, Street Name, Street Name Post Type, Street Name Post Directional, Street Name Post Modifier

Legacy: Legacy Street Name Pre Directional, Legacy Street Name, Legacy Street Name Type, Legacy Street Name Post Directional

11.1.2 Zone

Description: Any field or combination of fields used to ensure location uniqueness.

CLDXF: May include Country, State (A1), County (A2), Incorporated Municipality (A3)

Legacy: May include MSAG Community Name and ESN

11.1.3 Address Elements

Description: All the address and subaddress elements including Address Number Prefix, Address Number, Address Number Suffix, Building, Floor, Unit, Room, Seat, Additional Location Information.

11.2 General Quality Control

The following checks should be performed during quality control on all GIS data layers by the WI GIS Data Management tool:

- *Field format validation **(Critical)**:* Check to identify where fields are not formatted to meet the Wisconsin NG9-1-1 GIS Data Standard.
- *Unique Identifier **(Critical)**:* Check to identify duplicate unique identifiers within individual or all source feature classes.
- *Missing mandatory field values **(Critical)**:* Check to identify where mandatory field attribution, as defined in the Wisconsin NG9-1-1 GIS Data Standard, is missing.
- *Field values outside of domain **(Critical)**:* Check to identify where field values are outside of the acceptable domain values as defined by the Wisconsin NG9-1-1 GIS Data Standard.

11.3 Boundary Quality Control

Includes Provisioning Boundary, PSAP Boundary and Emergency Service Boundary; may also include County Boundary, Incorporated Municipality Boundary, Unincorporated Community Boundary, and Neighborhood Community Boundary where available. Overlap errors are critical only for the Provisioning Boundary, PSAP Boundary, and Emergency Service Boundary layers.

The following quality control checks are performed for NG9-1-1 purposes by the WI GIS Data Management tool:

- *Boundary has gap **(Critical)**:* Check to identify where gaps exist between polygons in each boundary feature class.
- *Boundary has overlaps **(Critical)**:* Check to identify where overlaps exist between polygons in each boundary feature class.
- *Boundary does not cover the Provisioning Boundary **(Critical)**:* Check to identify where an Emergency Service Boundary does not cover the Provisioning Boundary in its entirety.

11.4 Site/Structure Address Point Quality Control

The following quality control checks are performed for NG9-1-1 purposes by the WI GIS Data Management tool:

- *Address found multiple times **(Critical)**:* Check to identify where site/structure addresses occur multiple times in a single Site/Structure Address Point dataset. This check analyzes all the street name elements, address elements and zone(s) to determine duplication of address points.
- *Site/Structure Address Point outside Provisioning Boundary **(Critical)**:* Check to identify where site/structure address points exist outside of the Provisioning Boundary.
- *Site/Structure Address Point multipart geometry **(Critical)**:* Check to identify features that contain more than one geometry.
- *Site/Structure Address Point full address does not match parsed values (Warning):* Check to identify where the individual parsed address fields of an address do not match the full address field.
- *Site/Structure Address Point zone attribution against intersecting polygon attribution (Warning):* Check to identify discrepancies between a site/structure address point's zone attribution (incorporated municipality) and the associated boundary (incorporated municipal boundary) it intersects within a buffer distance around the site/structure address point.

11.5 Road Centerline Quality Control

11.5.1 NG9-1-1 Quality Control Check

The following quality control checks are performed for NG9-1-1 purposes by the WI GIS Data Management tool:

- *Road Centerline segments have overlapping address range values **(Critical)**:* Check to identify where road segments have overlapping address ranges in a given zone. The zone must be defined by the governing entity.
- *Road Centerline outside Provisioning Boundary **(Critical)**:* Check to identify where road segments exist outside of the Provisioning Boundary.
- *Road Centerline segment crosses a boundary layer (**Critical** & Warning):* Check to identify where road segments cross a boundary and a split should occur. All boundaries where attribute values change should be included in the quality control. **Critical for Provisioning and PSAP Boundaries only; all other boundaries are warnings.** Includes, but may not be limited to: Incorporated Municipality Boundary, County Boundary, Provisioning Boundary, Emergency Service Boundary.
- *Road Centerline full street name does not match parsed values (Warning):* Check to identify where the individual parsed street name fields of an address do not match the full street name field.
- *Road Centerline segment not snapped to adjacent segments (Warning):* Check to identify where road segments are not snapped to an adjacent segment.
- *Road Centerline has stacked segments (Warning):* Check to identify where road segments are stacked.

11.5.2 Local 9-1-1 Mapping Quality Control Check

The following quality control checks should be performed for 911 mapping system purposes by each local entity:

- *Road Centerline segment FROM value is higher than the TO value:* Check to identify where road segment address ranges have a higher FROM value than TO value.
- *Road Centerline segment has incorrect line directions:* Check to identify where road segments are drawn in the opposite direction of addressing.
- *Road Centerline has incorrect one-way value:* Check to identify where roads are spatially continuous but one-way values are inconsistent or incorrect.

- *Road Centerline has range gaps:* Check to identify where theoretically/potentially ranged road centerlines have address range gaps; zero ranged roads are ignored. *Only ran on counties with potential ranging.*
- *Road Centerline segment parity issue:* Check to identify where a road segment has a mixture of even and odd address ranges on the same side of the segment and conflicts with the Parity Left and Parity Right field values.
- *Road Centerline segment has zero in address range value:* Check to identify where road segment address ranges have a zero in one address range value and the other has a nonzero value.
- *Road Centerline zone attribution against intersecting polygon attribution:* Check to identify discrepancies between a road centerline's zone attribution (incorporated municipality) and the associated boundary (incorporated municipal boundary) it intersects within a buffer distance around the road centerline.

11.6 Site/Structure Address Point to Road Centerline Quality Control

Site/Structure Address Point to Road Centerline Quality Control is considered a warning for the purpose of NG9-1-1.

- *Fail on full street name:* Check to identify where the site/structure address point's street name elements and road segment's street name elements are not identical.
- *Fail on zone:* Check to identify where the site/structure address point's address number and street name elements match the road segment but are not found in the same zone.
- *Fail on address range:* Check to identify where the site/structure address point's street name elements and zone match the road segment, but the address number falls outside of the road segment's address ranges.
- *Fail on block:* Check to identify where the site/structure address point's street name elements, zone and address number match the road segment, but the site/structure address point does not fall on the correct block.
- *Fail on parity:* Check to identify where the site/structure address point's street name elements, zone and address number match the road segment, but the site/structure address point falls on the wrong side of the road segment.

11.7 Synchronization of ALI and MSAG to GIS Data

In order to transition to NG9-1-1 the ALI to Road Centerline synchronization rate must be at or above 98% however the NG9-1-1 Core Service Provider may allow a lower initial synchronization rate in agreement with the PSAP for the transition.

11.7.1 ALI to Road Centerline Synchronization

- *Fail on full street name:* Check to identify where the ALI street name elements and road segment's street name elements are not identical.
- *Fail on zone:* Check to identify where the ALI address number and street name elements match the road segment but are not found in the same zone.
- *Fail on address range:* Check to identify where the ALI street name elements and zone match the road segment, but the address number falls outside of the road segment's address ranges.

11.7.2 ALI to Site/Structure Address Point Synchronization

- *Fail on full street name:* Check to identify where the ALI street name elements and site/structure address point's street name elements are not identical.
- *Fail on zone:* Check to identify where the ALI address number and street name elements match the site/structure address point but are not found in the same zone.

- *Fail on address range:* Check to identify where the ALI street name elements and zone match the site/structure address point, but no exact address number match can be made.
- *Fail on address number suffix:* Check to identify where the ALI address number, street name elements and zone match the site/structure address point, but no exact address number suffix match can be made.

11.7.3 MSAG (Low and High) to Road Centerlines

- *Fail on full street name:* Check to identify where the MSAG street name elements and the road segment's street name elements are not identical.
- *Fail on zone:* Check to identify where an MSAG address range (high or low) and street name elements match the road segment but are not found in the same zone.
- *Fail on address range:* Check to identify where the MSAG street name elements and zone match the road segment, but no exact address range value match can be made.

11.7.4 MSAG and GIS Alignment

Transition to NG9-1-1 requires alignment of the MSAG and ALI to the GIS data to ensure the E9-1-1 records can be located with the Road Centerlines and Site/Structure Address Points.

Counties should strive to standardize the abbreviations of Highways to ensure interoperability of datasets between counties. The standardization should occur in the GIS Data, if needed, and the MSAG database. The most common abbreviations are:

- County Highway = CTH
- State Highway = STH
- United State Highway = USH

Each Next Generation Core Service provider has a defined process to update MSAG records in bulk. If a bulk update is needed reach out to the provider and request an update.

It is vitally important that the GIS Data Provider and local MSAG Coordinator work closely together to ensure the legacy MSAG database and GIS data remain aligned as long as there is a legacy MSAG database for the PSAP. If an ALI Discrepancy Report (DR) occurs the MSAG Coordinator should confirm with the GIS Data Provider that the record is a valid address and ensure proper abbreviations are maintained.

There are cases in Wisconsin where surrounding counties MSAG and ALI records are contained within the PSAPs records. In these cases, the GIS Data Provider should determine which ESNs are outside their PSAP and provide the list to the GIS Data Management service provider to ensure those records are not geocoded within the Next Generation Core Service providers system.

The use of non-USPS abbreviations for types is allowed to standardize the Legacy Street Name Type values to the MSAG and ALI. Incorrect types, not specific to the abbreviation, found in the MSAG and ALI should be updated to match the actual type as issued by the Addressing Authority. Example: If a street name type is issued as Crescent (CRES) but the MSAG has an additional type of Street (ST) the MSAG should be updated to remove the ST. Questions related to the values in the Legacy Street Type can be sent to the GIS point of contact at OEM.

Below are examples from an MSAG where street name updates are required:

Original MSAG Street Name	Updated MSAG Street Name
CTY TK VV	**CTH** VV
HY 113	**STH** 113
HY 12	**USH** 12
MANCHESTER **CROSSING**	MANCHESTER **XING**
MANDAN **CRESCENT ST**	MANDAN **CRES**
MEADOW OAK **TR**	MEADOW OAK **TRL**
MILW ST	**MILWAUKEE** ST
MINERAL **PT** RD	MINERAL **POINT** RD
NEWMARKET MEWS **ST**	NEWMARKET MEWS
UNIV AV	**UNIVERSITY AVE**

11.8 Quality Control Exceptions

Exceptions are flags at the feature level that notify QC checks to omit the feature from a specific check. Features may have multiple exceptions. The use of exceptions should only be used to accommodate real-world situations that are identified as errors in the quality control process. Caution should be used when setting exceptions for features within a GIS dataset and should only be used when there is a viable exception that will cause an error to be identified. While there is no single specific process of implementing exceptions and the use of exception codes, the typical process is to add an exceptions field to each GIS data layer and populate with a defined code for each needed exception at the feature level. WI has multiple NGCS Providers; each jurisdiction should consult their NGCS Provider on quality control exception codes to be used within their system.

12 Parsing Street Names and Addresses into the Wisconsin Standard

Parsing addresses into their appropriate Address elements is not complicated. The Address Number is the integer portion with anything preceding the integer being placed in the Address Number Prefix field and anything following the integer being placed in the Address Number Suffix field. Most confusion arises when parsing addresses that are based on local addressing grids. Table 12-1 provides examples of how to parse address numbers into their appropriate fields.

Table 12-1 Example Parsing of Address Numbers

Address Number Prefix	Address Number	Address Number Suffix	Street Name Pre Modifier	Street Name Pre Directional	Street Name Pre Type	Street Name Pre Type Separator	Street Name	Street Name Post Type	Street Name Post Directional	Street Name Post Modifier
	2			East			Main	Street		
	45	A		East			Lakeview	Road		
	142	1/2					Main	Street		
	6895	.5					Gorham	Street		
	798	A					26th	Street		
N	2554						Johnson	Street		
S	12279						Liegel	Court		
W180N	8085						Town Hall	Road		
N54W	16164			West			Becker	Lane		

Parsing street names into their appropriate Street Name elements usually is straightforward and mirrors how the Street Name is parsed in legacy 9-1-1 databases. Most confusion arises when populating the Street Name Pre Modifier, Street Name Pre Type, Street Name Pre Type Separator, and Street Name Post Modifier elements as these are new fields not found in legacy 9-1-1 databases that were based on the USPS Publication 28 [9] postal addressing standard. Of these four new fields, the Street Name Pre Type field will be the one most used, mostly for numbered routes. The other three fields are not commonly used but must be populated if the

address parsing rules apply. It is recommended to avoid assigning new Street Names that require usage of the Street Name Pre Modifier or Street Name Post Modifier fields.

Details on each Street Name element are provided in Section 3, Road Centerline – Data Element Details. The NENA CLDXF Standard [17] defines the detailed civic location data elements needed for address data exchange. Review of the document is strongly recommended as it provides an in-depth discussion of address parsing for NG9-1-1 purposes.

Table 12-2 provides examples of how to parse Street Names into their appropriate fields. Footnotes immediately follow the table to explain the parsing of Street Names that have special considerations.

Table 12-2 Example Parsing of Street Names

Street Name Pre Modifier	Street Name Pre Directional	Street Name Pre Type	Street Name Pre Type Separator	Street Name	Street Name Post Type	Street Name Post Directional	Street Name Post Modifier
				Broadway			
				Saint Albert the Great	Drive		
				Saint Anne[1]	Street		
				O'Neil[2]	Road		
				Rod & Gun Club[2]	Road		
	South			Elmwood	Drive		
	East			South	Avenue		
				South Dakota[3]	Avenue		
				East Bluff[3]			
				North Star[3]	Road		
West[4]	South			4th	Street		
		Interstate		90			
		United States Highway		63			
		State Highway		21			
Old		State Highway		21	Road		
		State Highway		21			Frontage Road
		United States Highway		18 & 151[2,5]			
		State Highway		13/345[2,5]			
		Highway		45 and 32[5]			
		County Trunk Highway		E			
		County Highway		AA			
		County Road		G			
Old		County Road		W			
				75th Avenue County Road M[5]			
				75th	Avenue		County Road M[5]
		Rue[6]		Parc			
				Old Park	Street		
Old[7]				Park	Street		
		Avenue	of the	Arts			
		Path	of the	Bear			
				Chicken in the Woods[8]	Road		
				Azure	Court	South	
				East	Avenue	North	
				Nishishin		Northeast	
				Main	Street Road[9]		
				Main Street	Road[9]		
				Bermuda	Boulevard		Lower
	West			Washington	Avenue		Frontage Road
				Main	Street		Extended[10]
		Interstate		90			eastbound[11]
		United States Highway		151			southbound[11]

NOTES:

[1] All street name field values must be fully spelled out to remove confusion and ambiguity. This is important as abbreviations could have multiple interpretations. For example, “ST” could be Saint, Street, or Sandra Theresa (someone’s initials).

[2] Special characters are allowed in NG9-1-1 Street Name fields which have a field type of Printable ASCII characters (decimal codes 32 to 126) or UTF-8 character sets. Consult with your Core Service Provider regarding their recommendation for current 9-1-1 and CAD system requirements.

[3] When the Street Name is the name of a place, geographic feature, landmark, or other similar feature, the directional is included in the Street Name field and is not parsed as a Street Name Pre Directional (requires local knowledge as to whether the directional is part of the name of the place, geographic feature, landmark, or other similar feature).

[4] When two directional words occur together before the Street Name and the second directional is not the name of a place, geographic feature, landmark, or other similar feature, the first occurrence is a Street Name Pre Modifier and the second is a Street Name Pre Directional.

[5] Some street names are a combination of two route numbers or a route number and a local street name. When the street name is a combination of two route numbers, the jurisdiction is placed in the Street Name Pre Type and both route numbers are placed in the Street Name, typically separated by ‘&’, ‘/’, or ‘and’ (note: the separator used should be consistent across the jurisdiction). When the street name is a combination of a route number and a local street name, both are placed in the Street Name. Alternatively, the first name is parsed normally and the second name is placed in the Street Name Post Modifier. In all cases, consult with your Core Service Provider regarding their recommendation for current 9-1-1 and CAD system requirements.

[6] Foreign language (e.g. French, Spanish, Italian) equivalents of Street Name Pre Types and Street Name Pre Type Separators are parsed into these fields and not in the Street Name field.

[7] A Pre Modifier must be separated from the Street Name by either a Street Name Pre Directional or a Street Name Pre Type unless the Street Naming Authority has established a local practice where words such as “The” or “Old” that precede a Street Name are placed in the Street Name Pre Modifier field so the Street Name can be placed properly in an alphabetized list.

[8] Since “Chicken” is not a valid Street Name Pre Type and is not in the NENA *Street Name Pre Types and Street Name Post Types Registry* or USPS Publication 28, Appendix C1 [9], it is included in the Street Name.

[9] When two Street Name Post Types occur after the Street Name, both are placed in the Street Name Post Type. However, if local addressing rules consider the first occurrence part of the Street Name, the first occurrence is included in the Street Name field and the second is parsed as a Street Name Post Type.

[10] Since “Extended” is not in the NENA *Street Name Pre Types and Street Name Post Types Registry* or USPS Publication 28, Appendix C1 [9], it is parsed as a Street Name Post Modifier.

[11] The traveling direction on divided roads is parsed as a Street Name Post Modifier (in lowercase).

13 Road Centerline Recommendations and Best Practices for GIS Data Development and Maintenance

13.1 General Best Practices

The Quality Control checks described in Section 11, Quality Control of Next Generation 9-1-1 GIS Data, provide valuable information into how the validation software looks at the Road Centerline layer to identify integrity issues and ensure consistent, valid data throughout the dataset. Ensuring that the data meets the requirements of the Road Centerline QC checks and the synchronization of the ALI and MSAG to the Road Centerline layer will eliminate unnecessary rework and ensure that the data meets the required specifications for the NG9-1-1 Location Validation and Emergency Call Routing Functions. Quality control is a continuous process. The data maintenance plan for the Road Centerline layer must include these QC checks and at a minimum, resolution of all critical errors.

Road centerlines should be compiled from current orthoimagery or a high-quality data collection device and attributed using source data with reliable attribution. The accuracy of the Road Centerline layer is only as good as the least accurate data source or data collection device that was used to create it.

Additional guidance from NENA can be found in the NENA Information Document for GIS Data Stewardship for Next Generation 9-1-1 (NG9-1-1) NENA-INF-028.2-2023 [20].

13.2 Road Centerline Digitizing Direction

13.2.1 Limited Access Roads

Limited access roads typically have some type of physical barrier (e.g., concrete wall or curb, metal barrier, grassy median, ditches) separating the opposing traffic flow. These should be digitized with two centerlines, each representing a different direction of travel. A single centerline is used when there is only yellow painted striping or a flat surface separating the opposing traffic flow that can be easily driven over without damaging a vehicle.

13.2.2 Cul-de-sacs

Cul-de-sacs should be represented with linework that supports geocoding of a civic location with use of right and left offsets, as applicable, so that the geocoded location falls into the appropriate routing polygons within each Emergency Service Boundary layer. True curves and Bezier curves (i.e., curves that are mathematically derived rather than being represented by a series of connected vertices) should be avoided as they have been known to be problematic with data transformation.

For Location Validation Function (LVF) processing of location validation and ECRF call routing purposes, cul-de-sacs can be represented with a single, straight line segment, even if a physical island exists in the cul-de-sac.

13.2.3 Road Centerline Digitization

Road centerlines should be digitized in the direction of increasing addressing. Highways and other unaddressed limited-access roads should be digitized in the direction of increasing mile marker numbering, the direction of the local addressing grid, or the direction of travel. Whichever method is chosen, it is important to be consistent throughout the jurisdiction.

13.2.4 Unaddressed and Private Road Digitization

Addressed roads with parity issues and unaddressed local or private roads should be digitized following the direction of the local addressing grid. If a local addressing grid does not exist, they should be digitized in the same direction as other nearby road centerlines.

13.3 Road Centerline Segmentation

Road segmentation is an important consideration during development and maintenance of the NG9-1-1 Road Centerline layer. Roads should always be split in the following cases:

- Road intersections
- Boundaries: County, Incorporated Municipality, PSAP, Emergency Services, ESN, MSAG Community
- Other boundaries: Unincorporated Community, Neighborhood Community, Postal Community (only if these Optional fields are being maintained in the Road Centerline layer)
- Change in the Street Name
- Change in the addressing grid
- Change in other attribute values: One-Way, Speed Limit, Road Class (only if these Optional fields are being maintained in the Road Centerline layer)

13.3.1 Overpasses and Underpasses

It is standard practice to split road centerlines at intersections where two roads physically come together at the same elevation (at-grade intersections). Grade is the vertical position relative to ground level. This practice will not affect the functionality of the LVF or ECRF. To maintain vehicle routability in a road network, road centerlines must either contain elevation attributes (expressed as grades) or be split only at intersections where each intersecting road centerline is at the same grade. Recognizing the impact

that splitting road centerlines at intersections may have on internal uses of an RCL layer, it is recommended that these best practices are followed:

- If road centerline elevations are maintained internally, splitting them at intersections should not affect other business uses and they may be split at the discretion of the 9-1-1 GIS Data Provider. For example, the proper attribution of elevation in Figure 13-1 allows the road centerlines to be split at all intersections (regardless of whether the two intersecting road centerlines are at the same grade), if desired.
- In the absence of elevation attribution, splitting of road centerlines at intersections should only occur where the intersecting roads are at the same grade as shown in Figure 13-2.

One advantage of splitting road centerlines at intersections where two roads physically come together at the same elevation is that a geocoded location will then have cross-street information in systems such as CAD. Aside from considering other internal uses of the RCL data, it is a general best practice to represent the road centerline as it appears physically. Intersections in RCL data tend to represent physical intersection of roads. Roads that are not at-grade are not physically connecting; therefore, the two should not be split where they intersect without the proper elevation attribution.

Relative elevation (grade separation) is represented in the figures below as grades 0, 1, and 2. The labels represent the “from elevation” and “to elevation,” respectively.

Figure 13-1 Road Centerline Segments with Elevation Attribution

Figure 13-1 shows a junction of ramps where the road centerlines carry proper elevation attributes and therefore can be split at all intersections (regardless of whether these are true at-grade intersections) without affecting other business uses such as vehicle routing. Arrows along a road centerline indicate the end of that road centerline (i.e., a split).

Figure 13-2 Road Centerlines Without Elevation Attribution

Figure 13-2 shows the same junction of ramps as in Figure 13-1, but the road centerlines do not carry proper elevation attributes and therefore are only split at true at-grade intersections so as not to interfere with other business uses such as vehicle routing. Arrows along a road centerline indicate the end of that road centerline (i.e., a split).

13.3.2 Segmenting Roads Special Cases.

In most cases, roads should not be split at driveways, unnamed roads, or parking lots. There are some situations where splitting a road centerline at these intersections may be beneficial for routing first responders, particularly in rural areas where there are not many addressed properties or where an addressed structure may not be visible from or is located a long distance from the road. Breaking a road centerline at these intersections allows the address ranges to be refined and provide more accurate geocoding results.

Special consideration is needed for segmentation at intersections with unaddressed alleys. Generally, if an alley is named and routable, the intersecting street should be broken. However, these named alleys should be assigned a very low speed limit (e.g., 5 or 10mph maximum) to deter automated routing of vehicles down then. Inclusion of unaddressed alleys is a local decision and should consider the capabilities of the local CAD software.

There are often specific requirements for roads segmentation based on the needs of the local CAD software and attributes that may need to be carried in the Road Centerline layer to support CAD functionality. Consultation with the Core Services Provider and understanding the requirements of the local CAD software is necessary to determine when additional segmentation may be needed.

13.3.3 Changes in Addressing Grids

Road centerlines in the areas of Wisconsin that use local addressing grids require segmentation where the address range prefix changes. This can occur anywhere along a road centerline and not necessarily at an intersection with another road. Some of the local addressing grids in Wisconsin include directionals (N, S, E, W) in the address range prefix, representing a number of blocks in one direction, and then a second direction, from a starting point.

In Figure 13-3 below, Saint James Drive requires segmentation when crossing into the next grid block to the west, where the number part of the Address Number Prefix changes from W**184**N to W**185**N.

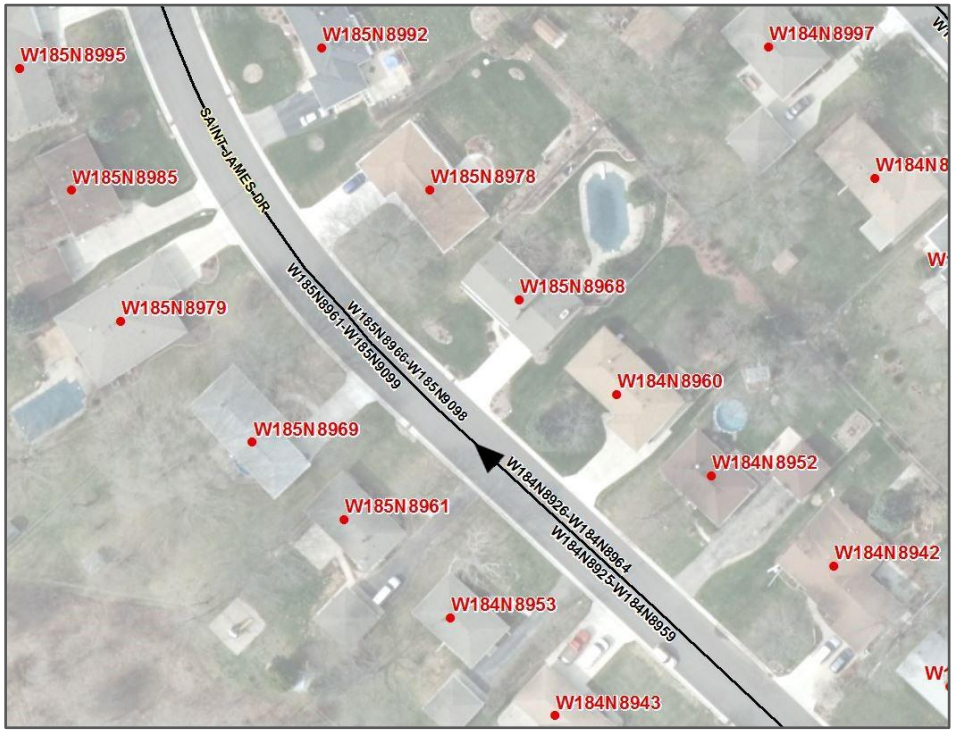


Figure 13-3 Addressing Grid Change – Address Number Prefix

Sometimes the entire Address Number Prefix changes such as when a road changes direction. For example, in Figure 13-4 below, where Quail Run is generally running E/W, the Address Number Prefix is **S37W**. However, when Quail Run turns and begins running in a more N/S direction, the Address Number Prefix changes to **W286S**. Quail Run requires segmentation when the Address Number Prefix changes from **S37W** to **W286S**.

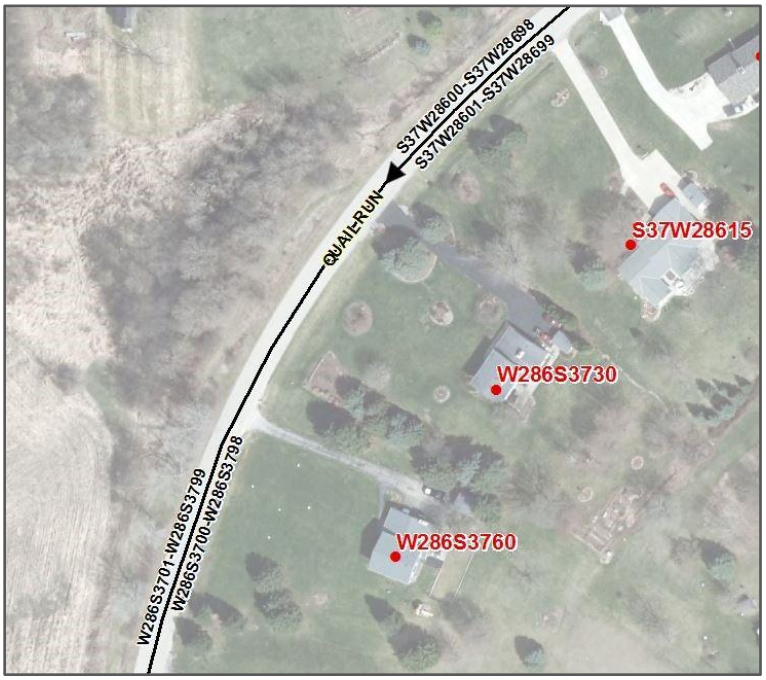


Figure 13-4 Addressing Grid Change – Address Number Prefix

Not all local addressing grids in Wisconsin include directionals in their grid system. In Figure 13-5 below, the address ranges for the N/S section of North Breezeland Road start at 1200/1201 while the address ranges for the E/W section of North Breezeland Road start at 34800/34801. Not only is there a large gap in the address ranges, the direction of increasing addressing is away from each other. North Breezeland Road requires segmentation where the address ranges change due to the local addressing grid numbering.

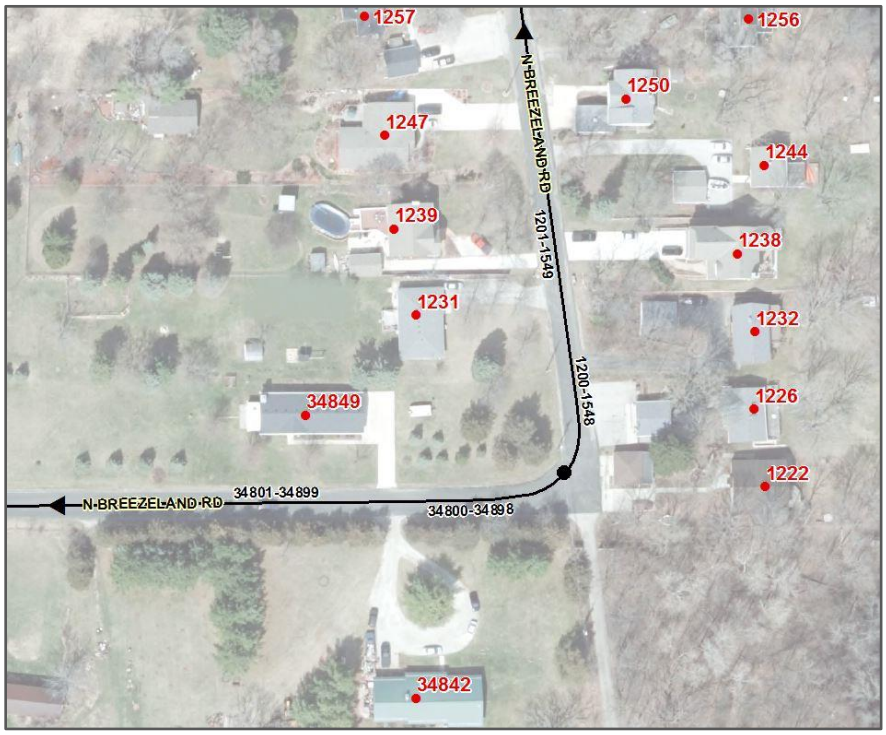


Figure 13-5 Addressing Grid Change – No Directionals in Address Number Prefix

13.3.4 Segmentation and Alignment at Boundaries

Aligning Road Centerlines at boundaries is essential for providing accurate locations for the NG9-1-1 Location Validation and Emergency Call Routing Functions and other 9-1-1 applications that rely upon geocoded locations derived from the Road Centerline address ranges. Road Centerlines must be aligned and snapped to boundaries with different jurisdictions or emergency service responsibilities so that the geocoded locations fall within the correct jurisdiction, PSAP, and Emergency Service Provider boundaries.

Road centerline splitting is critical when Required field values such as Country, State, County, Incorporated Municipality, or PSAP Boundary change as these values impact call routing.

To reduce the amount of road centerline splitting, some 9-1-1 Authorities have adopted best practices recommending Public Safety agencies develop jurisdictional boundaries that coincide with existing/natural centerline breaks such as intersections, bridges, etc.

If a Road Centerline is contiguous with a boundary (e.g., County Line Road), it must be aligned with the corresponding boundary, node for node. This is especially critical for Emergency Call Routing where the slightest deviation may result in a geocoded location being placed into the wrong PSAP Boundary polygon and then the call being routed to the incorrect PSAP.

Agreement on exactly where these boundaries are located is necessary for emergency response and data maintenance responsibilities. It is recommended that a “stitch point layer” be created that represents the location of points where GIS data from one jurisdiction ends and where the GIS data for the adjacent jurisdiction begins. These would be points where road centerline segments would be

snapped to and the vertices where polygon boundaries between neighboring jurisdictions would need to align and be snapped to. Counties and local municipalities must agree on the location of these points both within Wisconsin and between their neighboring states. These points do not need to represent formal or legal boundaries but instead represent their agreed upon location for data maintenance purposes.

When aligning road centerline data with these neighboring jurisdictions, counties and other states, care should be taken to ensure that there are no spatial overlaps or gaps in the data. Working directly with the neighboring jurisdictions will greatly reduce these issues with the data.

In some cases, a PSAP Boundary does not align with a County Boundary due to the agreed upon response areas. Road centerlines must be split at the PSAP boundary and the County Boundary, regardless of how close they may be located to each other. Figure 13-6 below shows Hahn Road split at the Vilas and Forest County line. Even if the three addresses in Vilas County were within the Forest County PSAP Boundary, Hahn Road must still be split at the county boundary to accommodate the Area Name elements (e.g., County, Incorporated Municipality) and the change in the local addressing grid for the address ranges.

Figure 13-6 Road Dead-Ending in Adjacent County

13.4 Naming and Addressing

13.4.1 Address Ranges

For use in NG9-1-1, the address ranges on adjacent Road Centerlines with the same street name that are within the same jurisdiction must not have unintentional gaps and overlaps. In Wisconsin, intentional gaps often exist at jurisdictional boundaries (e.g., ranges change from 4 digit numbers to 6 digit numbers) and at changes in the local addressing grid. When a street name extends over a boundary, the address ranges should be checked to confirm that there are no unintentional gaps or overlaps in the address ranges. Any issues should be brought to the attention of the local Addressing Authorities for resolution so that the address ranges properly reflect the addresses each PSAP is responsible for on the Road Centerlines within their PSAP Boundary.

There is no NENA requirement for address ranges to be populated as potential address ranges (also known as theoretical or buffered ranges) or as actual address ranges. There are pros and cons with each method, although potential address ranges generally require less maintenance. Consultation with the Core Services Provider and understanding the requirements of the local CAD software and other local GIS needs may impact which address range method to use.

Currently, some jurisdictions utilize 0-0 address ranges to accommodate local CAD software requirements such as on the median side of limited-access roads or within a large intersection of a divided road where there is no gap in the assigned addresses on each side of the intersection. In general, 0-0 address ranges should be avoided as 0-0 ranges may conflict with some quality control processes (e.g., duplicate 0-0 address ranges with the same Street Name). On rare occasions, an address range may need to start with 0 if the first assigned address has a value less than one (e.g., ½, ¼, .5).

13.4.2 Different Street Names on Each Side of the Road Centerline

Though uncommon, there are some roads along jurisdictional boundaries that have been assigned different street names on each side of the road. This can be confusing to responders and require GIS data to be falsely portrayed in order to include both street names for use in the NG9-1-1 Location Validation and Emergency Call Routing Functions. Rather than trying to make the GIS data fit the situation, the Street Naming Authorities should work together to come to agreement on a single street name that can be used for both sides of the street. If a common resolution is unable to be obtained, it is recommended that two Road Centerlines be created and placed slightly offset (parallel) to each other, representing their direction of travel, and be brought back together at a single point at intersections. Each alignment would be populated with the Street Name as assigned by its Street Naming Authority and addressed only on the side of the road with that Street Name. Stacked Road Centerlines are not recommended as they may cause issues with local CAD systems.

Figure 13-7 Left-Right Street Name Differences

13.4.3 Road Centerline in a Different Jurisdiction than the Addressed Properties

On occasion, jurisdictional boundaries may parallel and fall along one side of a Road Centerline rather than being coincident with the Road Centerline. For NG9-1-1 Location Validation and Emergency Call Routing purposes, the Road Centerline attributes must reflect the addressed properties on each side of the Road Centerline, regardless of where the physical roadway is located.

13.4.4 Interstates/Highways

Interstates and limited-access highways are named with their jurisdiction and route number. Travel direction (e.g., northbound, southbound, eastbound, westbound) is often not part of the official street name but is important for responders and other service providers that need to know which side of the highway a location is associated with. It is recommended that the travel direction be included in the Post Modifier in lowercase as “northbound”, “southbound”, “eastbound”, or “westbound”.

Example: I90 EB and I39 NB

Street Name Pre Type:	Interstate
Street Name:	90
Street Name Post Modifier:	eastbound
Street Name Pre Type:	Interstate
Street Name:	39
Street Name Post Modifier:	northbound

13.4.5 Ramps and Interchanges

Ramp and interchange naming can be a particularly challenging. It is strongly recommended that as much information as possible be put into the Street Name field for ramps, including the FROM road, TO road, travel direction, designation as an on ramp or off ramp, and exit number as appropriate. Ramps should be single segments unless a physical barrier exists that splits the ramp for separate travel directions.

The following ramp naming convention is recommended, with everything placed in the Street Name field:

<Ramp/Exit #> <FROM Street> <travel direction> to <TO Street> <travel direction>

Where:

- **Ramp/Exit #:** The text “On Ramp” or “Off Ramp” and, if applicable, “Exit <#>”

  Note: If there is no exit number for ramps connecting an undivided road and a limited-access road, then “On Ramp” and “Off Ramp” are preferred to a generic “Ramp” designation.

- **FROM Street:** Route/Street Name that the ramp is exiting from
- **TO Street:** Route/Street Name that the ramp is going to
- **Travel direction:** NB, SB, EB, WB

Due to the current 60 character field width limitation of the Street Name field, some abbreviations are necessary for the ramp names. For consistency, abbreviations are allowed ONLY for the travel direction (i.e., NB, SB, EB, WB) and the road jurisdiction for numbered routes in a ramp name. Everything else must be fully spelled out. The allowable abbreviations for the road jurisdiction in a ramp name are:

- I – Interstate
- USH – United States Highway, United States Route
- STH – State Highway, State Trunk Highway, State Route, State Road
- CTH – County Highway, County Trunk Highway, County Route, County Road, County

Example ramp names using the recommended ramp naming convention:

- **Street Name:** Off Ramp Exit 87 I39 NB to STH 33
- **Street Name:** Off Ramp Exit 240 I94 WB to STH30 WB
- **Street Name:** Off Ramp STH 54 WB to Bay Settlement Road
- **Street Name:** On Ramp West Silver Spring Drive EB to I43 SB

13.5 Overlapping Routes and Multiple Street Names

Street names are an important part of an NG9-1-1 system. However, in many cases, roads can be known by several different street names. Local jurisdictions may assign a local name for a road, while the Wisconsin DOT may assign a state highway number to that same road. As a further complication, the road may also carry a US route number, a second state route number, a county route number, or a memorial or honorarium name for that same road.

These multiple street names are all important, however, the official 9-1-1 name assigned by the Street Naming Authority is the Street Name that must be populated in the Road Centerlines layer for NG9-1-1 Location Validation and Emergency Call Routing purposes. To easily keep track of street name alias you can build a Street Name Alias Table. Documentation required to create a Street Name Alias Table is located in Appendix B | Street Name Aliases.

Organizations with local CAD systems that can currently use related tables should consider developing an Street Name Alias Table now in a format that can be used by their CAD system, if time and resources permit. More advanced CAD systems may allow alias street names to be parsed into the Street Name elements while others may initially only be able to handle a simple concatenated full street name. Any work done now would not be lost but be an important first step for development the future NG9-1-1 Street Name Alias Table.

13.5.1 Street Naming Hierarchy

The most important thing to remember is that for NG9-1-1 purposes, the official 9-1-1 name assigned by the Street Naming Authority is the Street Name that must be populated in the Road Centerlines layer. All other names are considered alias street names and would be populated in the Alias Street Name Table.

Where named and numbered roads overlap, it is usually clear which street name is the official 9-1-1 street name to populate in Road Centerline layer. However, there are some situations where the street name overlap is in a small, limited area (e.g., traffic circles, roundabouts, exit ramps that lead to multiple

roads) and determining which official 9-1-1 street name to populate in the Road Centerlines layer may not be straightforward. For these situations where two official 9-1-1 Street Names overlap, follow this hierarchy for populating the Street Name in the Road Centerlines:

- Interstate Name (highest priority)
- Interstate Business Route name
- US Route name
- US Business, Alternate, or Truck Route name
- State Route name
- State Business, Alternate, or Truck Route name
- County Route Name
- Other local or memorial street name (lowest priority)

Using this hierarchy, the highest jurisdiction route name would be put into the Road Centerline Street Name, and the lower jurisdiction route would go into the Street Name Alias Table. When multiple routes with the same jurisdiction overlap, the lowest route number would go into the Road Centerline Street Name and the higher route number(s) would go into the Street Name Alias Table.

For example, sometimes an exit ramp leads to more than one connected road but only one of the connected street names can be used for the “TO Street” in the ramp name. For the road centerline leaving the “FROM Street,” the “TO Street” in the ramp name should follow the naming hierarchy above and be populated with the highest jurisdiction route name. The lower jurisdiction route would go into the Street Name Alias Table. At some point, the ramp will split and the centerline for each ramp after the split should be named with the “TO Street” for the connected road it leads to.

13.6 Roundabouts and Traffic Circles

Naming of roundabouts and traffic circles can be complicated, particularly when routes overlap the official 9-1-1 street name or when street names end or change at the circle. Many of the Street Naming Hierarchy concepts discussed above in Section 13.5, Overlapping Routes and Multiple Street Names, can be applied to roundabouts and traffic circles.

13.6.1 If two roads intersect at a roundabout or traffic circle

Populate the Street Name elements with the official 9-1-1 street name on those segments in the circle that one would traverse to get to the other side of the circle. In situations where a segment in the circle would be traversed by both intersecting roads, populate the Street Name elements with the street name of the road with the higher jurisdiction, following the same Street Naming Hierarchy as established above in Section 13.5, Overlapping Routes and Multiple Street Names. If both roads only have a local street name, populate the Street Name elements with the name of the street that typically has a higher traffic flow. All other overlapping street names and route numbers would go into the Street Name Alias Table.

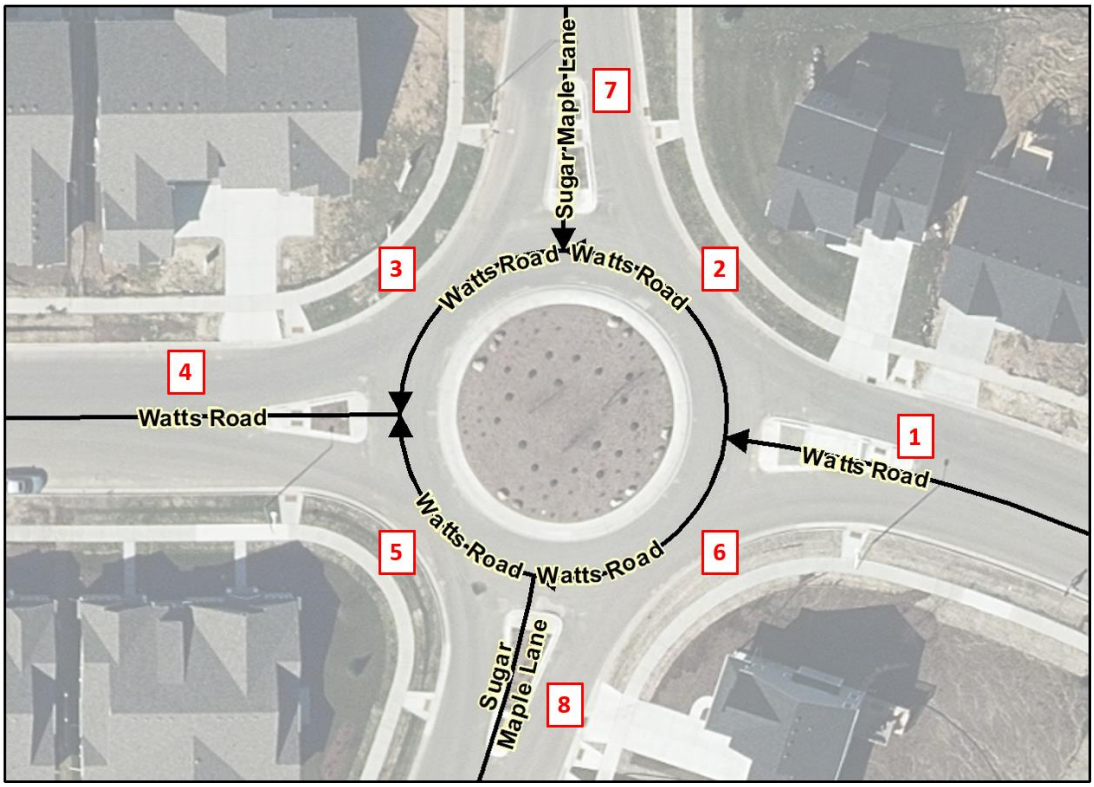


Figure 13-8 Roundabout with Two Intersecting Roads at the Same Hierarchy

For example, in Figure 13-8 above, Watts Road runs east-west through the roundabout and Sugar Maple Lane runs north-south through the roundabout. Both are the official 9-1-1 name as assigned by the Street Naming Authority and both are local roads at the same hierarchy. Since Watts Road has a higher traffic flow than Sugar Maple Lane, the Street Name elements for segments 2, 3, 5, and 6 in the circle are populated with Watts Road and Sugar Maple Lane would be populated as an Alias Street Name in the Street Name Alias Table for these segments. Table 13-1 below provides the recommended population of the Street Name elements and the Street Name Alias Table for all segments in Figure 13-8.

Table 13-1 Population of Street Names in Figure 13-5

Segment #	Street Name Pre Modifier	Street Name Pre Directional	Street Name Pre Type	Street Name Pre Type Separator	Street Name	Street Name Post Type	Street Name Post Directional	Street Name Post Modifier	Alias Street Name Table
1					Watts	Road			
2					Watts	Road			Sugar Maple Lane
3					Watts	Road			Sugar Maple Lane
4					Watts	Road			
5					Watts	Road			Sugar Maple Lane
6					Watts	Road			Sugar Maple Lane
7					Sugar Maple	Lane			
8					Sugar Maple	Lane			

13.6.2 If a single street name ends at a roundabout or traffic circle

Populate the Street Name elements with the official 9-1-1 street name of the primary road that traverses through the circle on those segments in the circle that one would traverse to get to the other side of the circle. Continue the ending street name into the circle, populating the ending street name on those segments in the circle that one would traverse to get to the other side of the circle and populating the ending street name on those segments in the circle one would have to traverse to get from the primary road to the ending street. For routing purposes, the street name of the primary road that

traverses through the circle would be populated as an Alias Street Name in the Street Name Alias Table for those segments in the circle populated with the ending street name.

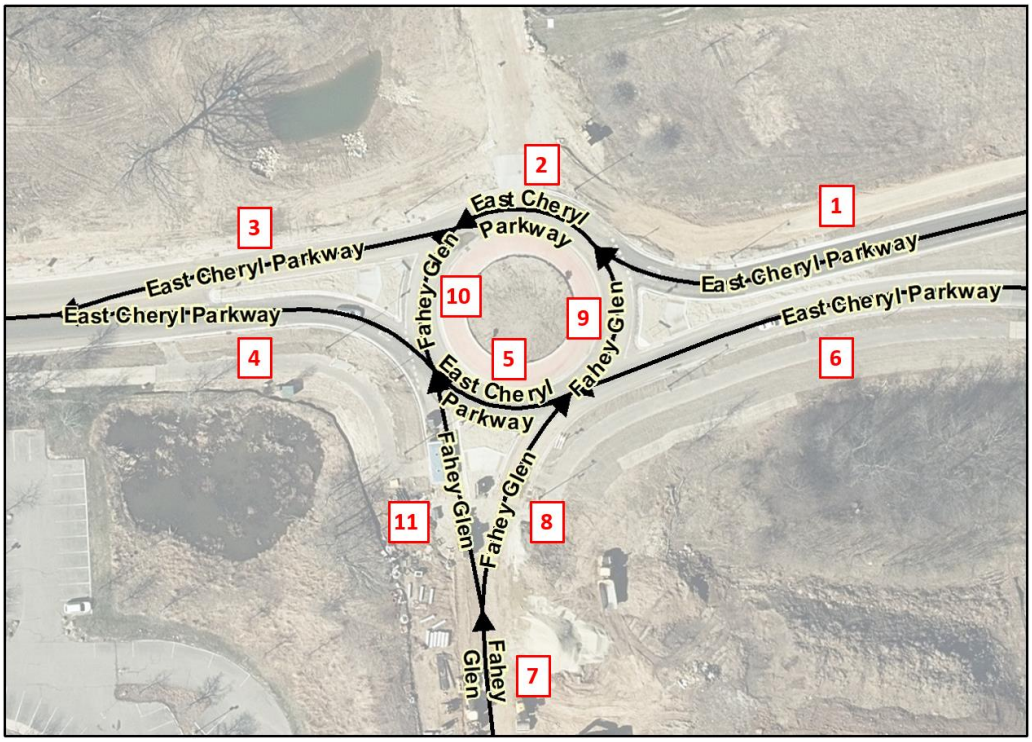


Figure 13-9 Roundabout with Road Ending at the Roundabout

For example, in Figure 13-9 above, Fahey Glen ends at the roundabout where it intersects with East Cheryl Parkway. The Street Name elements for segments 2 and 5 in the circle would be populated with East Cheryl Parkway since it runs east-west through the circle and these are the primary segments one would traverse through the circle. The Street Name elements for segment 9 in the circle would be populated with Fahey Glen in order to travel from Fahey Glen to westbound East Cheryl Parkway. The Street Name elements for segment 10 in the circle would also be populated with Fahey Glen in order to travel from westbound East Cheryl Parkway to Fahey Glen. For routing purposes, segments 9 and 10 in the circle would be populated with East Cheryl Parkway as an Alias Street Name in the Street Name Alias Table. Table 13-2 below provides the recommended population of the Street Name elements and the Street Name Alias Table for all segments in Figure 13-9.

Table 13-2 Population of Street Names in Figure 13-9

Segment #	Street Name Pre Modifier	Street Name Pre Directional	Street Name Pre Type	Street Name Pre Type Separator	Street Name	Street Name Post Type	Street Name Post Directional	Street Name Post Modifier	Alias Street Name Table
1		East			Cheryl	Parkway			
2		East			Cheryl	Parkway			
3		East			Cheryl	Parkway			
4		East			Cheryl	Parkway			
5		East			Cheryl	Parkway			
6		East			Cheryl	Parkway			
7					Fahey	Glen			
8					Fahey	Glen			
9					Fahey	Glen			East Cheryl Parkway
10					Fahey	Glen			East Cheryl Parkway
11					Fahey	Glen			

13.6.3 If multiple street names end at a roundabout or traffic circle

Populate the Street Name elements on those segments in the circle exactly as described above in Section 13.6.2, **If a single street name ends at a roundabout or traffic circle**, with one exception. Both ending street names would only be populated on those segments in the circle one would have to traverse to get to the road on the other side of the circle. For routing purposes, the ending street names would be populated as an Alias Street Name in the Street Name Alias Table for those segments in the circle one would traverse to get from the primary road to the ending street.

For example, in Figure 13-9 above, if a new road was built on the north side of East Cheryl Parkway and ended at the roundabout, all segments would be populated as noted above except:

- segment 10 would be populated with the new road's Street Name and Fahey Glen would be another Alias Street Name for that segment, and
- segment 9 would have the new road's Street Name as another Alias Street Name for that segment.

However, if multiple street names end at a roundabout or traffic circle and the primary road that traverses through the circle enters and exists the circle as undivided roads, all segments in the circle would be populated with the official 9-1-1 street name of the primary road. For routing purposes, the ending street names would be populated as an Alias Street Name on those segments in the circle that one would traverse to get to the road on the other side of the circle.

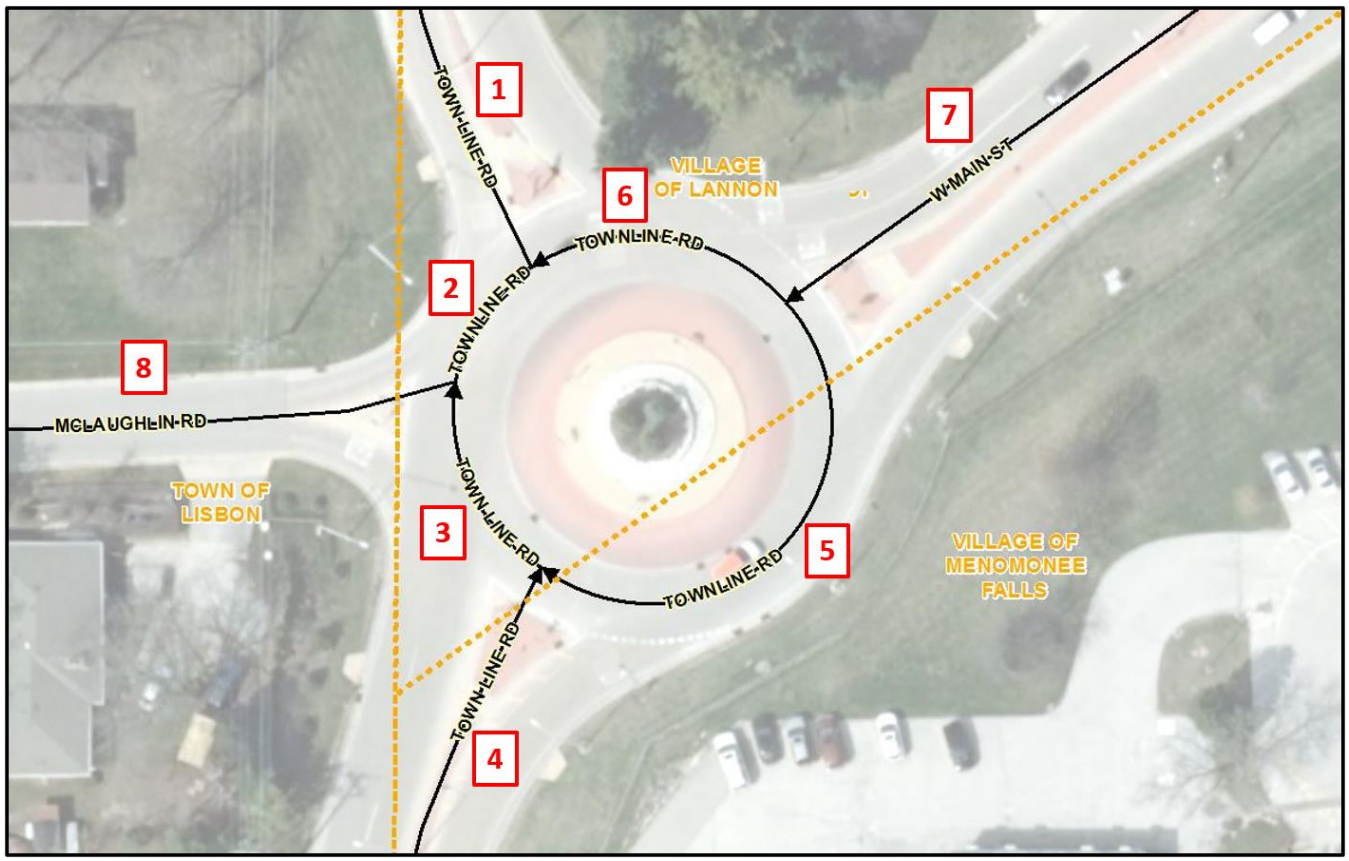


Figure 13-10 Roundabout with Multiple Roads Ending at the Roundabout

For example, in Figure 13-10 above, West Main Street and McLaughlin Road both end at the roundabout where they intersect with Town Line Road. Since Town Line Road enters and exists the roundabout as undivided roads, the Street Name elements for segments 2, 3, 5, and 6 in the circle are populated with Town Line Road. For routing purposes, segments 2 and 6 in the circle would be populated with West Main Street as an Alias Street Name in the Street Name Alias Table and segments 3 and 5 in the circle would be populated with McLaughlin Road as an Alias Street Name in the Street Name Alias Table.

To further complicate matters, Town Line Road is also known as County Trunk Highway V. In addition, County Trunk Highway F runs from West Main Street through the circle to the southern portion of Town Line Road. However, these are not the official 9-1-1 Street Names so they are populated as Alias Street Names in the Street Name Alias Table. Table 13-3 below provides the recommended population of the Street Name elements and the Street Name Alias Table for all segments in Figure 13-10.

Jurisdictional boundaries that cross through a traffic circle or roundabout such as in Figure 13-10 above, directly impact the Street Name assigned to the Road Centerline segments. It is important for the Street Naming Authorities to agree on the official 9-1-1 name for each of the segments within the circle so that NG9-1-1 Location Validation and Emergency Call Routing Functions operate as expected. Local CAD software requirements must also be considered as they may impact the assigned Street Name, particularly if the local CAD software cannot handle Street Name Alias Tables. Sometimes, assigning the traffic circle or roundabout its own unique 9-1-1 Street Name may resolve the conflicting needs of the different jurisdictions as well as the CAD software.

Table 13-3 Population of Street Names in Figure 13-10

Segment #	Street Name Pre Modifier	Street Name Pre Directional	Street Name Pre Type	Street Name Pre Type Separator	Street Name	Street Name Post Type	Street Name Post Directional	Street Name Post Modifier	Alias Street Name Table
1					Town Line	Road			County Trunk Highway V
2					Town Line	Road			West Main Street County Trunk Highway V County Trunk Highway F
3					Town Line	Road			McLaughlin Road County Trunk Highway V County Trunk Highway F
4					Town Line	Road			County Trunk Highway V County Trunk Highway F
5					Town Line	Road			McLaughlin Road County Trunk Highway V County Trunk Highway F
6					Town Line	Road			West Main Street County Trunk Highway V County Trunk Highway F
7		West			Main	Street			County Trunk Highway F
8					McLaughlin	Road			

13.7 Military Bases

Military bases may or may not have their own PSAP and responsibility for emergency services. In most cases, the military facility will share street name information but will not provide address specific information. It is recommended that the local 9-1-1 jurisdiction reach out to the military facility and work directly with them to obtain the most current information the facility is willing to provide.

14 Site/Structure Address Point Recommendations and Best Practices for GIS Data Development and Maintenance

14.1 General Best Practices

The Quality Control checks described in Section 11, Quality Control of Next Generation 9-1-1 GIS Data, provide valuable information into how the validation software looks at the Site/Structure Address Point layer to identify integrity issues and ensure consistent, valid data throughout the dataset. Ensuring that the data meets the requirements of the Address Point QC checks, Address Point to Road Centerline QC checks, and the synchronization of the ALI to the Site/Structure Address Point layer will eliminate unnecessary rework and ensure that the data meets the required specifications for the NG9-1-1 Location Validation and the Emergency Call Routing Functions. Quality control is a continuous process. The data maintenance plan for the Site/Structure Address Point layer must include these QC checks and at a minimum, resolution of all critical errors.

Address point placement should be based on an authoritative list of addresses, current orthoimagery or a high-quality data collection device, and source data with reliable attribution. The accuracy of the Site/Structure Address Point layer is only as good as the least accurate data source or data collection device that was used to create it.

Given today's navigation technologies used by consumers and emergency responders, it is strongly recommended that Addressing Authorities assign an address based on the named road used to access the structure. This is especially important when there is no direct access from the road that the front entrance to the addressed structure faces. Emergency responders may waste valuable time backtracking to an address if the assigned address does not provide the most direct route to the structure.

14.2 Address Point Placement

The NENA Information Document for Development of Site/Structure Address Point Data for 9-1-1 NENA-INF-014.1-2025 [18] provides detailed guidelines on address point placement and subaddress data development. Review of the document is strongly recommended as it provides an in-depth discussion of five address point placement methodologies that meet NG9-1-1 Location Validation and Emergency Call Routing requirements. These include:

- **Geocoding:** Placement of an Address Point Based on Geocoding off of Road Centerlines
- **Parcel:** Placement of an Address Point Based on a Parcel
- **Site:** Placement of an Address Point Based on a Site
- **Structure:** Placement of an Address Point Based on a Structure(s)
- **Property Access:** Placement of an Address Point Based on Property Access

The document also includes a section on Address Point Placement for Subaddresses (specific locations within structures, sites, or within a group of structures and/or sites). As such, the NENA Information Document for Development of Site/Structure Address Point Data for 9-1-1 NENA-INF-014.1-2015 [18] should be considered a companion document to Section 14, Site/Structure Address Point Recommendations and Best Practices for GIS Data Development and Maintenance, in this document.

Address point placement is especially critical for NG9-1-1 Emergency Call Routing and dispatch. During NG9-1-1 Emergency Call Routing, the location of an identified address point is spatially compared to the PSAP Boundary to determine which PSAP to send the call. The location of the same identified address point is also spatially compared to the Emergency Services Boundaries to provide the call taker with the recommended Law, Fire and EMS providers that should respond to the call. The address point must fall within the correct PSAP Boundary or valuable time will be lost for call transfer to the correct PSAP.

14.2.1 Address Point versus Access Point

Address points are typically placed on the addressed feature (e.g., a structure or a site). However, there are some situations where an access point may be preferred. An access point is the point of access to the addressed feature and may represent a driveway, gate, an entrance to a building containing multiple addresses, or other entrance. Access points can also be used for a building with multiple entrances where each entrance serves many specific addresses (e.g., a high-rise building where certain entrances only allow access to units on specific floors.)

The access point can be useful for directing emergency responders to a structure that may be located far from the road it is addressed off of or may share a long driveway with several other addressed structures as shown below in Figure 14-1. In such cases, it may be useful to include an address point and an access point. Access points should be placed as a Property Access address point, offset from the road centerlines and in alignment with the direction of the increasing address ranges. Attributes on a Property Access address point should be populated with the same values as on the Structure address point it represents, with only the Placement Method attribute being populated differently. This is regardless as to whether the access point is physically located in a different jurisdiction or responder area since its location only represents from where off of a named road one would turn to access the addressed structure.

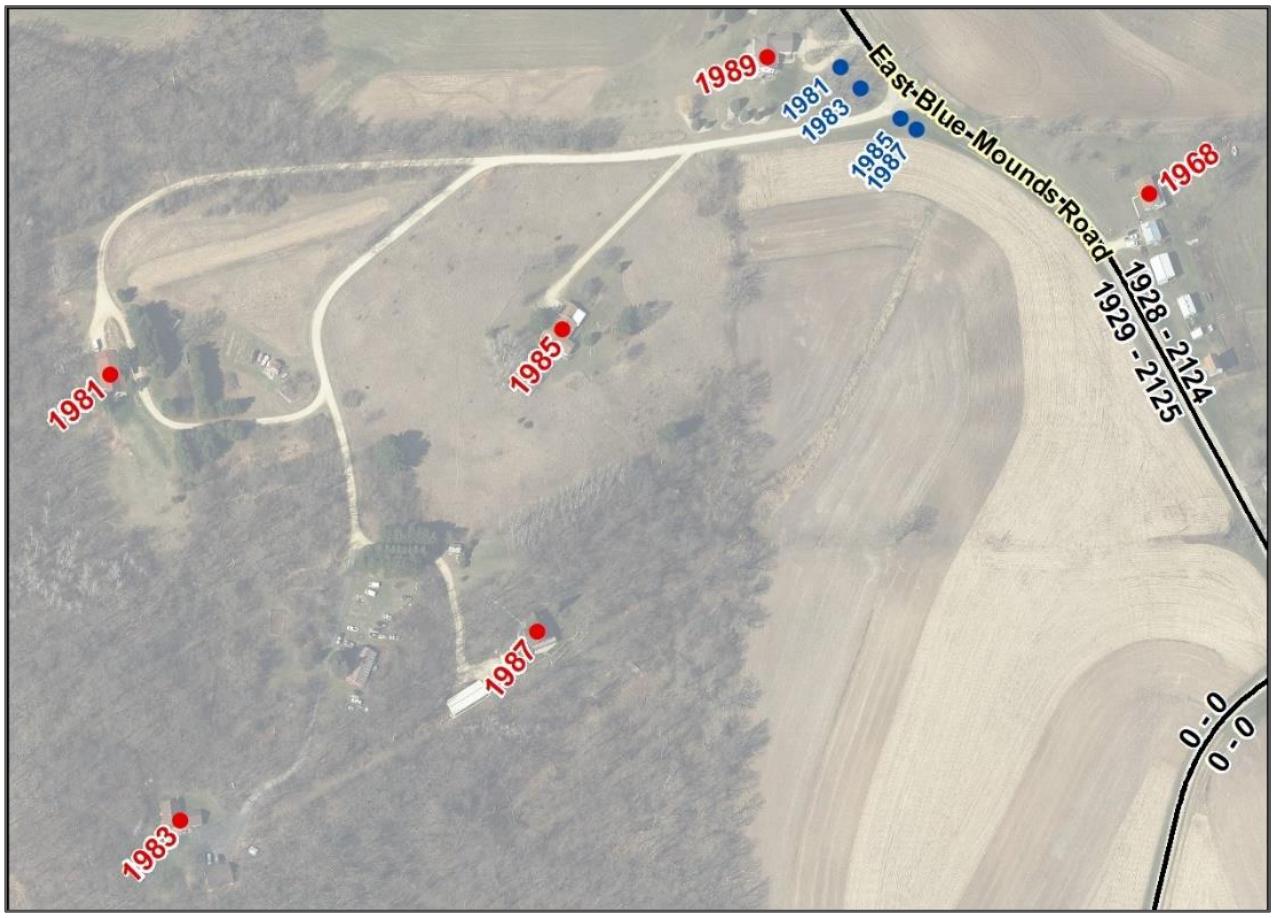


Figure 14-1 Structure Address Points on Structures with Property Access Address Points at the shared driveway

An access point can also be useful for directing emergency responders to the correct structure in a more expeditious manner when an addressed location has multiple entrances to the property as shown below in Figure 14-2, where there are three primary entrances into a campus that has two addressed structures.

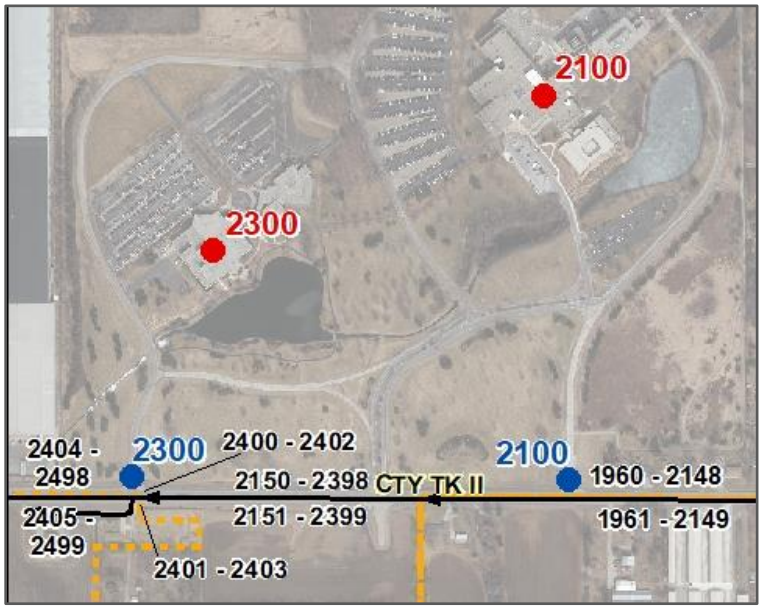


Figure 14-2 Property Access Address Points indicating the entrance to use to reach the Structure

Road reconstruction projects for more safe and efficient traffic flow may result in the access to addressed properties being relocated so that access is from a different road than what the property is addressed off of, as shown below in Figure 4-3. If the properties are unable to be readdressed to the new access road (which is strongly recommended), then including both a Structure address point and a Property Access address point may benefit emergency responders by directing them to the relocated entrance.

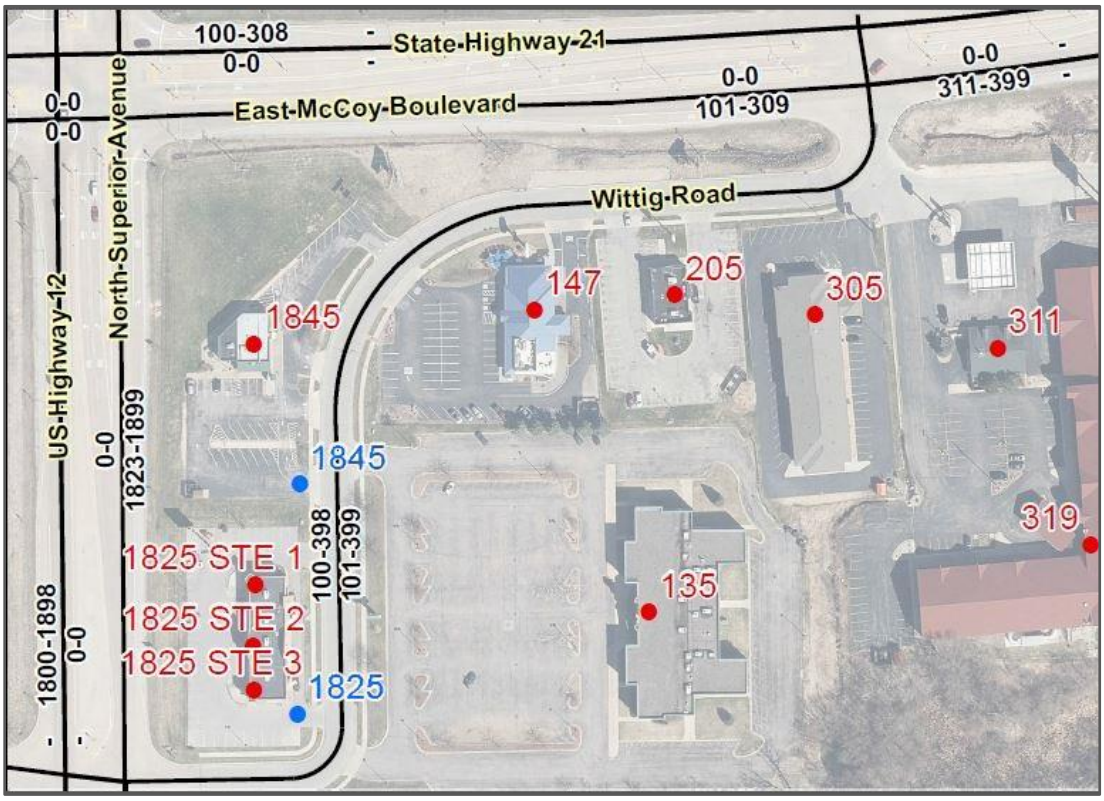


Figure 14-3 Property Access Address Points indicating the entrance to use to reach the Structures

If both an access point and address point are shown, population of the Placement Method attribute (see 4.5.1) is strongly recommended to clearly differentiate the two points. It also provides a means to easily remove one or the other if a 9-1-1 application is unable to differentiate between them. A list of acceptable values can be found here: http://technet.nena.org/nrs/registry/SiteStructureAddressPointPlacementMethod.xml. See NENA Information Document for Development of Site/Structure Address Point Data for 9-1-1 NENA-INF-014.1-2015 [18], Section 3.4.5, Placement of an Address Point Based on Property Access, for more information.

14.3 Address Point Placement for Special Cases

In most cases, address point placement is straightforward with points placed on the center of a structure or site. Large structures or sites, particularly those with multiple entry points, may benefit by having the address point placed at the primary entrance to the structure or site. However, there are some situations that may require a little more research or even field visits to determine the correct placement location.

14.3.1 Multiple Addresses or Units within a Single Structure

Shopping centers, commercial buildings, condominiums, and duplexes contain multiple businesses or residences that are located within the same structure. In some cases, the individual units have been addressed with their own individual address number but in many situations, they share the same address number and are only differentiated by subaddress information (e.g., apartment, unit, suite,

etc.). In both situations, address point placement is usually based on whether the units share an entrance to the building or have their own separate entrance.

Generally, Structure address points should be placed at or near each addressed unit's building entrance, just within the building footprint and near the building base. This will keep the address points very close to their true location, even if future imagery shifts slightly, and will help avoid the urge to move the address points each time new imagery is acquired. This point placement method is shown in Figure 14-4 below, where each unit in a shopping center has its own separate entrance.

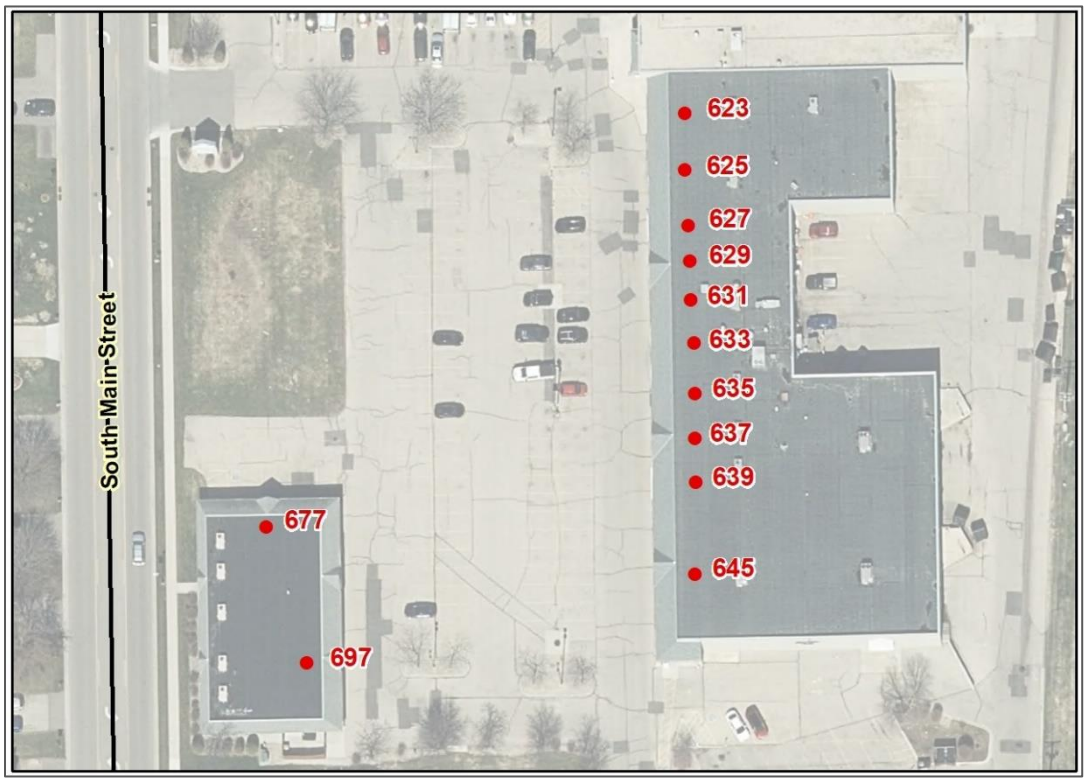


Figure 14-4 Multiple addresses within a single structure, all with separate entrances

When addressed units share a common entrance, typical practice is to stack the address points at the shared building entrance as exactly where within the structure an individual unit is located is usually unknown. Structure address points should be placed just within the building footprint, near the shared entrance for the addressed unit. Consultation with the Core Services Provider and understanding the requirements of the local CAD software is necessary to determine whether stacked points can be used.

In Figure 14-5 below, two buildings share the same address with each building having two primary entrances. Each entrance provide access to four separate apartments. Four Structure address points are stacked at each building entrance, representing the four apartments that can be accessed through that entrance. Providing this level of detail for complicated addressing situations will help direct responders to the correct entrance, saving valuable time during an emergency.

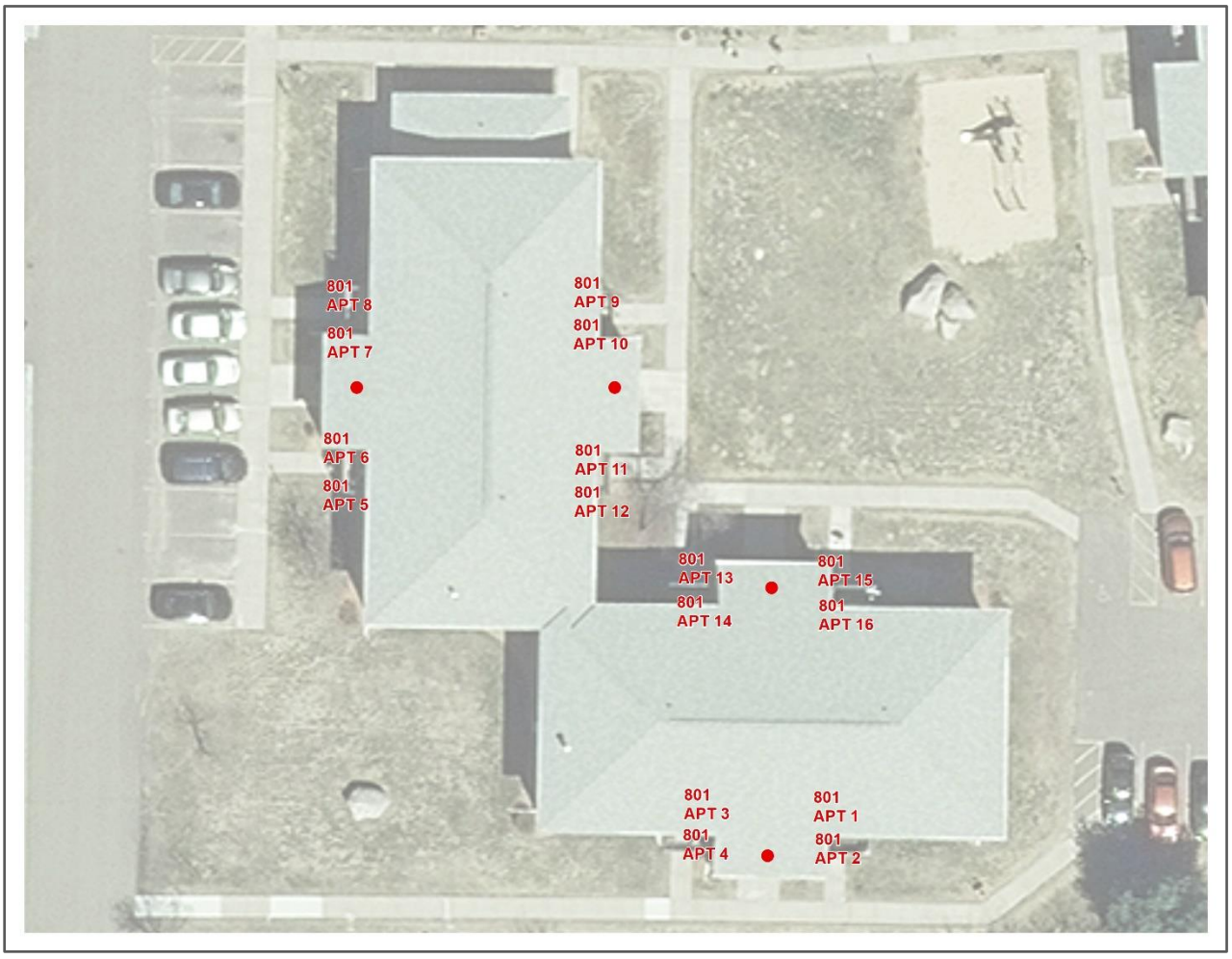


Figure 14-5 Multiple addresses within a single structure, sharing a common entrance

Some 9-1-1 applications and CAD software have difficulty with subaddresses. To alleviate this issue, an address point that has only the structure address and no subaddress information can be created and placed at the structure's primary entrance. The address points with subaddress information can then be stacked on it. If subaddresses are not usable in an application, address points with populated subaddress fields can then be easily extracted from the file while still allowing other applications full use of the address points with subaddress information.

Trying to place address points exactly where individual units are located can be resource intensive to research, create, and maintain. Placement at this level of detail should be reserved for locations where knowing that level of detail will be valuable to the responders.

Large buildings may sometimes have multiple entrances with elevators located nearby that only serve specific floors. In these situations, it is important to make sure that address points are stacked at the building entrance associated with the elevator that serves their floor so that responders are directed to the correct entrance.

In rare situations, a structure may be split by a PSAP Boundary or Emergency Service Boundary. In these situations, it is critical that the address points are placed within the corresponding PSAP and Emergency Services Boundaries that services the address. This may not be at the structure entrance.

14.3.2 Multiple Structures and/or Sites that Share the Same Address

Some properties contain multiple structures and/or sites that share the same address and are only differentiated by a number, name, or other unique identifier (e.g., medical campus, mobile home park, correctional facility, campground).

At a minimum, each structure and/or site should have its own Structure address point with subaddress fields populated so that responders can be sent to the correct location. This is especially critical when the property is spilt by a PSAP Boundary or Emergency Service Boundary. Address points must be placed so that calls can be routed to the correct PSAP and the appropriate emergency service providers can be identified.

To assist responders, it is often helpful to create a Property Access address point that contains only the property address (no subaddress information) and place the address point at the primary access to the property, particularly if the property is very large or the CAD software does not recognize subaddresses as unique addresses. If subaddress information is known but one is not able to identify the specific structure and/or site it is associated with, Property Access address points with subaddress information can be stacked on this access point.

In the mobile home park in Figure 14-6 below, there are three separate unnamed driveways where the structures on each driveway share the same address but have different unit numbers. For example, Units 1-10 are all addressed as 1325 Wedgewood Drive, Units 11-31 are all addressed as 1350 Wedgewood Drive, and Units 32-43 are all addressed as 1375 Wedgewood Drive. Structure address points with subaddress information are placed on each structure. A separate Property Access address point with no subaddress information is placed at each driveway entrance for the three driveways that provide access to their specific units.

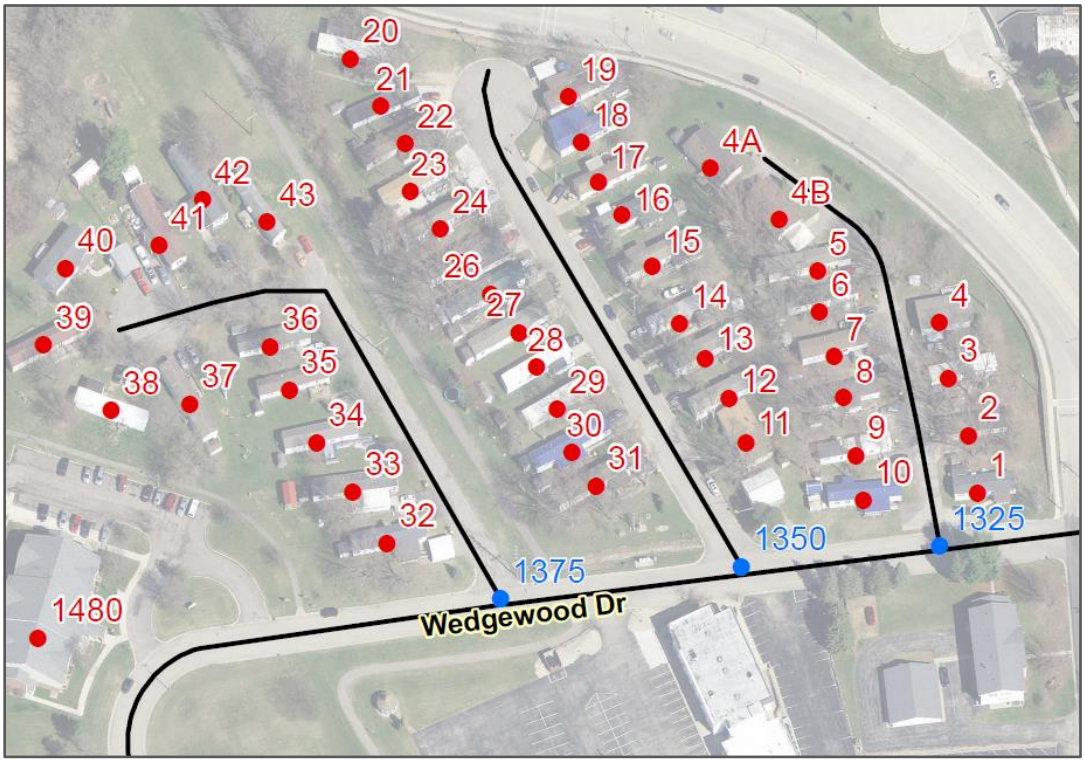


Figure 14-6 Structures share same address but are differentiated by their unit number

On occasion, properties containing multiple structures and/or sites that share the same address and are only differentiated by their subaddress information, may have an administrative building that carries the same address as the other units, but the administrative building does not have subaddress information.

Figure 14-7 below shows an example of this situation where all structures are addressed as 7539 US Highway 12 but are differentiated by their Trailer number, with the exception of the administrative building. It is addressed without any subaddress information.

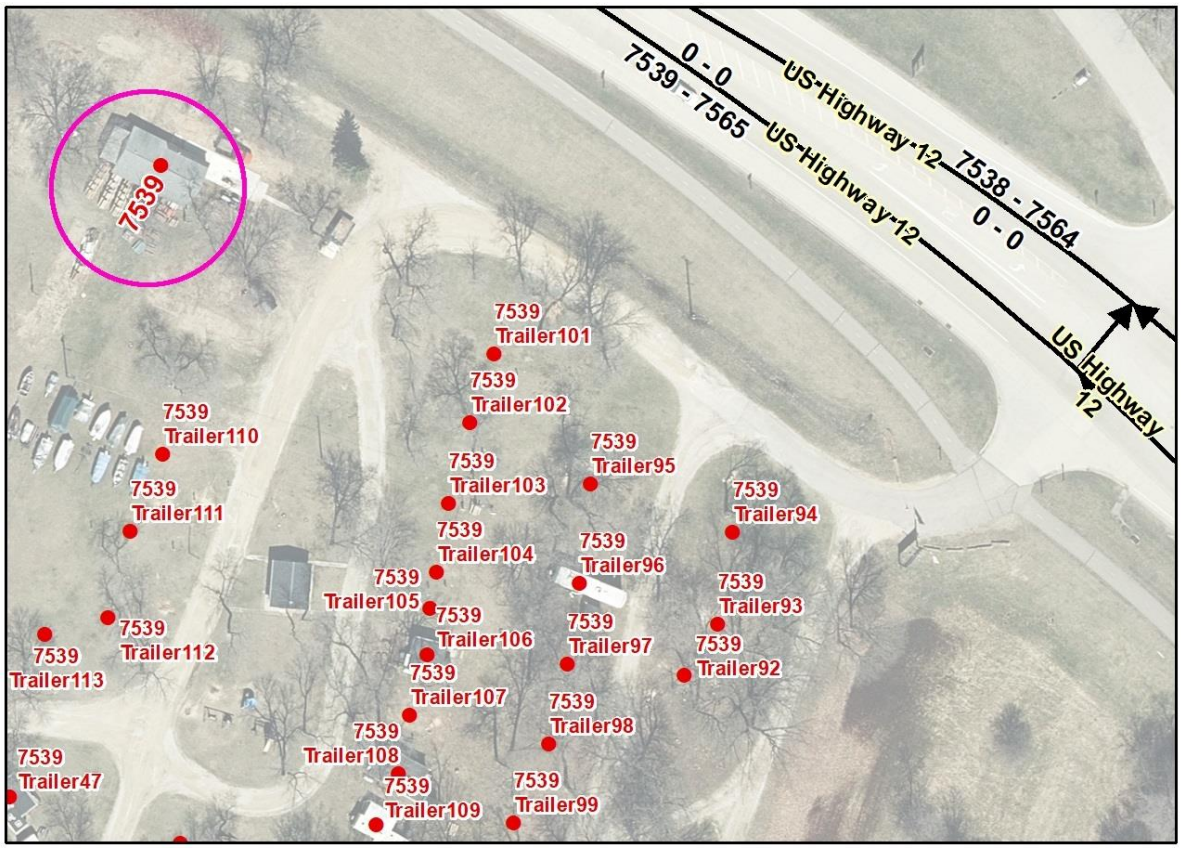


Figure 14-7 Administrative building has same address but no unit number as other subaddressed structures

If the CAD system does not recognize subaddresses as unique addresses, only the Structure address point placed on the administration building will be recognized. For such a situation, consideration should be given to create an additional Property Access address point that contains only the property address (no subaddress information) to represent the access for all units at that location and place the Property Access address point at the primary access to the property.

14.3.3 Multiple Properties Sharing One Address

Large properties assigned a single address may consist of multiple parcels and even span across a road. A Structure address point for the property should be placed on the addressed structure regardless if the address conflicts with the address range odd/even parity on that side of the road. In such a case, the Structure address point would need to be flagged as an exception for Parity Checks during the QC process. If no structure exists on the addressed property, a Parcel address point should be placed on the side of the road that does not conflict with the address range odd/even parity. If there is a driveway or other main access to the property that goes to a specific feature on the property such as a swimming hole or fishing pond, a Property Access address point could be used instead of a Parcel address point.

14.3.4 Transient Structures

Mobile home parks, seasonal camps, and other addressed locations often have temporary structures that can be moved to a different location on the addressed property or be removed entirely from the property. For large properties where the temporary structure is moved frequently, a Property Access

address point should be placed at the access to the property or, if there is no primary access to the property, a Parcel address point should be used.

For small areas or areas where the temporary structure is usually located when it is on the property (e.g. mobile home park, campsite), the address point can be placed where the transient structure would normally be located. To minimize maintenance of the Placement Method attribute for such situations, populate Placement Method as "Site" if the address contains subaddress information (e.g., Lot #, Unit #, etc.) and "Parcel" if there is only one address for the property. This avoids having to constantly update the record when the temporary structure is removed from the property.

14.4 Location Markers

Mile posts, trail head marker, trail intersection markers, and other location markers provide a valuable reference for 9-1-1 callers when a civic address location is unavailable. If these locations will used for call routing purposes, they can be represented as an address point in the Site/Structure Address Points dataset by populating the Milepost field instead of, or in addition to, the Address Number fields. Alternatively, they can be placed in a Mile Marker layer that can be referenced by the telecommunicator. This is a recommended layer in the NENA Standard for NG9-1-1 GIS Data Model [5], but it is not used for the Emergency Call Routing or Location Validation Functions. Development and maintenance of these features and their associated layers is an important consideration when deciding how to represent them in the NG9-1-1 GIS data.

14.5 Military Bases and Tribal Nations

Military bases and tribal nations may or may not have their own PSAP and responsibility for emergency services. In most cases, they will share street name information with the local 9-1-1 jurisdiction but may not provide address specific information. It is recommended that the local 9-1-1 jurisdiction reach out to the military facility and tribal nations and work directly with them to obtain the most current information they are willing to provide. Some may share their address information but restrict usage for 9-1-1 operations only, not allowing the data to be publicly shared.

Local 9-1-1 jurisdictions having difficulties obtaining address information from military bases or tribal nations should reach out to the Office of Emergency Communications under the Wisconsin Department of Military Affairs for assistance.

15 Items Pending Future Work

The following items require additional research and/or development work:

- Development and maintenance of domains used within Wisconsin
- Develop consistent naming/addressing convention for:
    - Crossover/connector roads on controlled-access highways
    - Rest areas, service plazas and their buildings on controlled-access highways
    - On and off ramps to rest areas and service plazas
- Minimum metadata elements required with local data submission and whether metadata should be on the data or in a separate file
- Monitor changes to the NENA Site/Structure Address Point Placement Method Registry
- Monitor changes to NENA Civic Location Data Exchange Format (CLDXF) Standard
- Monitor changes to NENA Standard for NG9-1-1 GIS Data Model

16 Terminology

Unless otherwise noted, the following terms are a subset of terms defined in the NENA Master Glossary of 9-1-1 Terminology [19] or the NENA Standard for NG9-1-1 GIS Data Model [5].

Term or Abbreviation	Definition / Description
Addressing Authority	In Wisconsin, an Addressing Authority is a local, tribal, military, or county department responsible for issuing addresses and reconciling addressing discrepancies, through administrative procedures, to locations within its jurisdiction. The local and county authority is provided by state statute for the specific purpose of aiding in fire protection, emergency services, and civil defense.
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.
CAD (Computer Aided Dispatch)	A computer-based system, which aids PSAP Telecommunicators by automating selected dispatching and record keeping activities.
CLDXF (Civic Location Data Exchange Format)	A United States emergency services profile of PIDF-LO that defines a set of data elements that describe detailed street address information.
Domain (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.
DNS (Domain Name System)	A globally distributed database for the resolution of host names to numeric IP addresses.
ECRF (Emergency Call Routing Function)	A functional element in an NGCS (Next Generation 9-1-1 Core Services) which is a 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.
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.
GCS (Geocode Service)	A web-based service that provides two functions: Geocoding and reverse-geocoding. Geocoding takes a PIDF-LO, which contains a civic address and returns a PIDF-LO containing a geodetic representation for the same location; reverse-geocoding takes a PIDF-LO, which contains a geodetic representation and returns a PIDF-LO that contains a civic address for the same location.

Term or Abbreviation	Definition / Description
i3	A shorthand term for a version of a NENA technical architecture that introduces the concept of an Emergency Services IP network (ESInet), which is designed as an IP-based inter-network (network of networks) shared by all agencies which may be involved in any emergency. An interim version of the NENA E9-1-1 architecture evolving to an IP infrastructure is referred to as 'i2'.
LoST (Location-to-Service Translation) Protocol	A protocol that takes location information and a Service URN and returns a URI. Used generally for location-based call routing. In NG9-1-1, used as the protocol for the ECRF and LVF.
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 Presence Information Data Format-Location Object (PIDF-LO) and Master Street Address Guide (MSAG) data.
MDS (Mapping Data Service)	A service that returns images or features stored in a GIS that can be used to create a display for a telecommunicator or facilitate spatial analyses. Often used to provide maps for handling out of area calls, the Mapping Data Service can also be used locally to provide a single, uniform map display for all functional elements in a PSAP that require maps.
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.
NENA (National Emergency Number Association)	NENA, also referred to as The 9-1-1 Association, 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. See www.nena.org.
NGCS (Next Generation 9-1-1 (NG9-1-1) Core Services)	The base set of services needed to process a 9-1-1 call on an ESInet. Includes 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.
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.
Registry	A single place for keeping valid data values associated with a specific data element.

Term or Abbreviation	Definition / Description
SI (Spatial Interface)	A standardized NG9-1-1 interface between the GIS data and the functional elements that consume GIS data, such as the ECRF/LVF, Map Database Services, etc.
Street Naming Authority	In Wisconsin, a Street Naming Authority is the local, tribal, military, or county department responsible for approving or issuing street names and reconciling street name discrepancies, through resolution or ordinance, to public streets and private driveways within its jurisdiction. The local and county authority is provided by state statute for the specific purpose of aiding in fire protection, emergency services, and civil defense.
URI (Uniform Resource Identifier)	An identifier consisting of a sequence of characters matching the syntax rule that is named <URI> in RFC 3986 [7]. It enables uniform identification of resources via a set of naming schemes. A URI can be further classified as a locator (URL), a name (URN), or both. A Uniform Resource Locator (URL) is a type of URI that provides a means of locating the resource by describing its primary access mechanism (e.g., its network "location"). 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 Identifier). 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.
WGS 84 (World Geodetic System 1984)	The reference coordinate system used by the Global Positioning Systems and in cartography and navigation.

17 References

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Appendix A | Change Log

Approval Date	Section	Reason for Update
4/16/2024	1 Introduction	Addition of Appendix A | Change Log text
4/16/2024	2.1 Spatial Reference	Addition of the WI NG911 GIS Data Management Process
4/16/2024	2.3 Abbreviations	Addition of information on non-USPS abbreviations as related to the existing legacy databases
4/16/2024	2.4 NENA Globally Unique IDs (NGUID)	Update to the NENA standard (v2a)
4/16/2024	2.4.1 Layer Indicators	Addition of section
4/16/2024	2.5 Field Types	Update to the NENA standard (v2a)
4/16/2024	2.6 Field Width	Update to the NENA standard (v2a)
4/16/2024	2.7 Inclusion	Update to the NENA standard (v2a)
4/16/2024	2.8 Domains	Update to the email address
4/16/2024	3 RoadCenterline (Road Centerline) - Summary Table	Update to the NENA standard (v2a)
4/16/2024	3.1.1 NENA Globally Unique ID	Update to the NENA standard (v2a)
4/16/2024	3.3.19 Legacy Street Name Type	Update to Domain
4/16/2024	3.4.3 State - 3.4.12 Neighborhood Community	Addition of A1-A5 per update to the NENA standard (v2a)
4/16/2024	3.5.3	Addition of Walkway/Peditrian Trail and Bike Path or Trail
4/16/2024	3.7.1 Discrepancy Agency ID	Update to the NENA standard (v2a)
4/16/2024	3.7.10 Exception	Addition of field
4/16/2024	4 SiteStructureAddressPoint (Site/Structure Address Point) - Summary Table	Update to the NENA standard (v2a)
4/16/2024	4.1.1 NENA Globally Unique ID	Update to the NENA standard (v2a)
4/16/2024	4.2.1 Road Centerline NENA Globally Unique ID (Foreign Key)	Update from Required-Yes to Conditional
4/16/2024	4.3.8 Unit Pre Type	Addition
4/16/2024	4.3.9 Unit Value	Update from previous Unit field to Unit Value
4/16/2024	4.3.25 Legacy Street Name Type	Update to Domain
4/16/2024	4.4.3 State - Section 4.4.6 Neighborhood Community	Addition of A1-A5 per update to the NENA standard (v2a)
4/16/2024	4.7.1 Discrepancy Agency ID	Update to the NENA standard (v2a)
4/16/2024	4.7.7 Exception	Addition of field
4/16/2024	5 PsapPolygon (PSAP Boundary) - Summary Table	Update to the NENA standard (v2a)
4/16/2024	5.1.1 NENA Globally Unique ID	Update to the NENA standard (v2a)
4/16/2024	5.4.1 Country	Addition per update to the NENA standard (v2a)
4/16/2024	5.4.2 State (A1)	Addition per update to the NENA standard (v2a)
4/16/2024	5.5.3 Service URN	Update to the NENA standard (v2a) and addition of note
4/16/2024	5.5.5 Agency vCard URI	Update to the NENA standard (v2a) and addition of note
4/16/2024	5.7.1 Discrepancy Agency ID	Update to the NENA standard (v2a)

4/16/2024	5.7.2 Exception	Addition of field
4/16/2024	6 FirePolygon, PolicePolygon, EmsPolygon (Emergency Service Boundary) - Table Summary	Update to the NENA standard (v2a)
4/16/2024	6.1.1 NENA Globally Unique ID	Update to the NENA standard (v2a)
4/16/2024	6.4.1 Country	Addition per update to the NENA standard (v2a)
4/16/2024	6.4.2 State (A1)	Addition per update to the NENA standard (v2a)
4/16/2024	6.5.3 Service URN	Update to the NENA standard (v2a) and addition of note
4/16/2024	6.5.5 Agency vCard URI	Update to the NENA standard (v2a) and addition of note
4/16/2024	6.7.1 Discrepancy Agency ID	Update to the NENA standard (v2a)
4/16/2024	6.7.2 Exception	Addition of field
4/16/2024	7 ProvisioningPolygon (Provisioning Boundary) - Table Summary	Update to the NENA standard (v2a)
4/16/2024	7.1.1 NENA Globally Unique ID	Update to the NENA standard (v2a)
4/16/2024	7.7.1 Discrepancy Agency ID	Update to the NENA standard (v2a)
4/16/2024	8.1 RoadCenterline (RoadCenterline)	Removal of Crosswalk Notes for 3.1 and addition of A1 - A5 to Section 3.4
4/16/2024	8.2 SiteStructureAddressPoint (Site/Structure Address Point)	Removal of Crosswalk Notes for 4.1, addition of Unit Type, update to Unit Number, and addition of A1 - A5 to Section 4.4
4/16/2024	9 Potential Future Changes in NENA Standards Impacting this Standard	Addition of note on Unit PreType
4/16/2024	10.1.2 Use of Orthoimagery versus GPS Data Collection Devices	Removal of hyperlinks and addition of references to Section 17
4/16/2024	11.1 Definitions of Commonly Used Quality Control Terms	Addition of A1 - A3
4/16/2024	11.2 General Quality Control	Addition of the WI GIS Data Management tool and update of quality control checks
4/16/2024	11.3 Boundary Quality Control	Addition of the WI GIS Data Management tool and update of quality control checks
4/16/2024	11.4 Site/Structure Address Point Quality Control	Addition of the WI GIS Data Management tool and update of quality control checks
4/16/2024	11.5 Road Centerline Quality Control	Addition of the WI GIS Data Management tool and update of quality control checks, division of section into Section 11.5.1 NG9-1-1 Quality Control and 11.5.2 Local 9-1-1 Mapping Quality Control
4/16/2024	11.6 Site/Structure Address Point to Road Centerline Quality Control	Addition of text
4/16/2024	11.7 Synchronization of ALI and MSAG to GIS Data	Addition of text
4/16/2024	11.7.4 MSAG and ALI Examples	Addition of section to provide clarification
4/16/2024	11.8 Quality Control Exceptions	Addition of text

4/16/2024	13 Road Centerline Recommendations and Best Practices for GIS Data Development and Maintenance	Updated figure numbers throughout subsections
4/16/2024	13.1 General Best Practices	Addition of the NENA Informational Document for GIS Stewardship for NG9-1-1
4/16/2024	13.2 Road Centerline Digitizing Direction	Division of information into subsections 13.2.1-13.2.4
4/16/2024	13.2.2 Cul-de-sacs	Section update
4/16/2024	13.3 Road Centerline Segmentation	Division of information into subsections 13.3.1-13.3.4
4/16/2024	13.3.1 Overpasses and Underpasses	Section update
4/16/2024	13.3.4 Segmentation and Alignment at Boundaries	Addition of text
4/16/2024	13.4.2 Different Street Names on Each Side of the Road Centerline	Addition of figure
4/16/2024	13.5 Overlapping Routes and Multiple Street Names	Update to text and addition of Appendix B | Street Name Aliases
4/16/2024	14.2.1 Address Point versus Access Point	Addition of reference to Placement Method
4/16/2024	14.2 Address Point Placement	Update of figure references
4/16/2024	15 Items Pending Future Work	Removal of topics covered in the update
4/16/2024	16 Terminology	Addition of Domain to Data Domain
4/16/2024	17 References	Update to all changed documents and addition of reference added
4/16/2024	Appendix A | Change Log	Addition of this appendix
4/16/2024	Appendix B | Street Name Aliases	Addition of this appendix

Appendix B | Street Name Aliases

Street Name Alias Methodology

The street name as assigned by the local addressing authority MUST be the name in the RoadCenterLine layer. The street name assigned by the local addressing authority is the street name used for location validation, and call routing. However, many roads are known by more than one street name, and these are known as alias street names. There are many ways to represent an alias. This document describes one model. Regardless of the alias naming methodology selected, one MUST ensure it is compatible with the latest version of Appendix B of NENA-STA-010.3e-2021 [16]. Note that the representation shown in this section is compatible with the latest version of Appendix B of NENA-STA-010.3e-2021 [16].

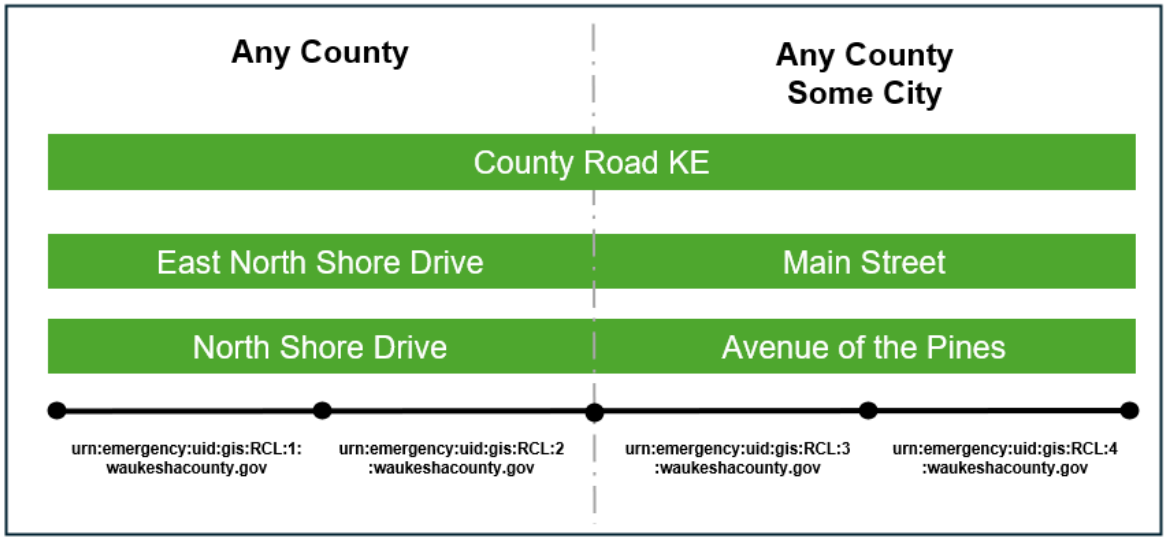
Alias street names are common and must be considered. Examples include when a state route or state highway crosses into a city jurisdiction, when several streets "merge" to traverse the same road segment, or when honorary names are given to previously named and addressed roads. Many 9-1-1 Authorities will need to accommodate for alias street names during call taking and data sharing.

The method of maintaining alias street names is illustrated below in the StreetNameAliasTable, Figure B-3. The attribute data in Figure B-1 and Figure B-3 below is only to illustrate the concept of managing alias street names. In the RoadCenterLine layer in Figure B-1, the street names "Avenue of the Pines" and "Main Street" have been assigned by the local addressing authority. Each street name has two different segments associated with it. All the segments are in Any County, with the two segments associated with Main Street also being in Some City. Each road centerline segment has a NENA Globally Unique ID (NGUID) assigned to it as a primary key. In this example, the NGUID for each road centerline segment is in the first column.

Figure B-1 RoadCenterline Tabular Data

NGUID (Primary Key)	St_Pre Mod	St_Pre Dir	St_PreTyp	St_Pre Sep	St_Name	St_Pos Typ	St_Pos Dir	St_Pos Mod	IncMuni_L	IncMuni_R
urn:emergency:uid: gis:RCL:1:waukeshacounty.gov					North Shore	Drive			City of Pewaukee	City of Pewaukee
urn:emergency:uid: gis:RCL:2:waukeshacounty.gov					North Shore	Drive			City of Pewaukee	City of Pewaukee
urn:emergency:uid: gis:RCL:3:waukeshacounty.gov			Avenue	of the	Pines	Drive			Village of Pewaukee	Village of Pewaukee
urn:emergency:uid: gis:RCL:4:waukeshacounty.gov			Avenue	of the	Pines	Drive			Village of Pewaukee	Village of Pewaukee

Figure B-2 Graphic Depiction of Figure B-1



In Figure B-1, North Shore Drive and Avenue of the Pines that have been assigned by the local addressing authority each has several alias street names:

- County Road KE, the street name assigned by the county highway department, is used as an alias for North Shore Drive and Avenue of the Pines. These four segments have an individual RoadCenterLine layer NGUID of:
    - urn:emergency:uid:gis:RCL:1:waukeshacounty.gov
    - urn:emergency:uid:gis:RCL:2: waukeshacounty.gov
    - urn:emergency:uid:gis:RCL:3: waukeshacounty.gov
    - urn:emergency:uid:gis:RCL:4: waukeshacounty.gov
- East North Shore Drive is an alias for the two segments of North Shore Drive that are in Waukesha County but not in Village of Pewaukee. These two segments have an individual RoadCenterLine layer NGUID of:
    - urn:emergency:uid:gis:RCL:1: waukeshacounty.gov
    - urn:emergency:uid:gis:RCL:2: waukeshacounty.gov
- Main Street is an alias for the two segments of Avenue of the Pines that are in Village of Pewaukee. These two segments have an individual RoadCenterLine layer NGUID of:
    - urn:emergency:uid:gis:RCL:3: waukeshacounty.gov
    - urn:emergency:uid:gis:RCL:4: waukeshacounty.gov

The RoadCenterLine layer NGUID is used to relate the alias street names in the StreetNameAliasTable to the road centerline segments in the RoadCenterLine layer in Section 3. Using this methodology, one can add as many alias street names as needed.

To ensure data integrity, the user MUST assign an NGUID (Primary Key) to each record in the StreetNameAliasTable. The NGUID (Primary Key), as with the other respective Unique IDs for each layer, MUST be globally unique and therefore has only one occurrence.

Figure B-3 StreetNameAliasTable Methodology

NGUID (Primary Key)	RCL_NGUID (Foreign Key)	ASt_Pre Mod	ASt_Pre Dir	ASt_PreTyp	ASt_Pre Sep	ASt_Name	ASt_Pos Typ	ASt_Pos Dir	ASt_Pos Mod
urn:emergency:uid: gis:StrNA:1:waukeshacounty.gov	urn:emergency:uid: gis:RCL:1:waukeshacounty.gov			County Road		KE			
urn:emergency:uid: gis:StrNA:2:waukeshacounty.gov	urn:emergency:uid: gis:RCL:2:waukeshacounty.gov			County Road		KE			
urn:emergency:uid: gis:StrNA:3:waukeshacounty.gov	urn:emergency:uid: gis:RCL:3:waukeshacounty.gov			County Road		KE			
urn:emergency:uid: gis:StrNA:4:waukeshacounty.gov	urn:emergency:uid: gis:RCL:4:waukeshacounty.gov			County Road		KE			
urn:emergency:uid: gis:StrNA:5:waukeshacounty.gov	urn:emergency:uid: gis:RCL:1:waukeshacounty.gov		East			North Shore	Drive		
urn:emergency:uid: gis:StrNA:6:waukeshacounty.gov	urn:emergency:uid: gis:RCL:2:waukeshacounty.gov		East			North Shore	Drive		
urn:emergency:uid: gis:StrNA:7:waukeshacounty.gov	urn:emergency:uid: gis:RCL:3:waukeshacounty.gov					Main	Street		
urn:emergency:uid: gis:StrNA:8:waukeshacounty.gov	urn:emergency:uid: gis:RCL:4:waukeshacounty.gov					Main	Street		

From the StreetNameAliasTable in Figure B-3 above, we can tell that:

- RCL_NGUID (Foreign Key) = urn:emergency:uid:gis:RCL:1:waukeshacounty.gov has an alias of County Road KE and another alias of East North Shore Drive
- RCL_NGUID (Foreign Key) = urn:emergency:uid:gis:RCL:2:waukeshacounty.gov has an alias of County Road KE and another alias of East North Shore Drive
- RCL_NGUID (Foreign Key) = urn:emergency:uid:gis:RCL:3:waukeshacounty.gov has an alias of County Road KE and another alias of Main Street
- RCL_NGUID (Foreign Key) = urn:emergency:uid:gis:RCL:4:waukeshacounty.gov has an alias of County Road KE and another alias of Main Street

StreetNameAliasTable (Street Name Aliases) – Strongly Recommended

Street Name Aliases data is maintained as a table containing alternate street names related to the legal street name contained in the RoadCenterLine layer. This dataset is referred to as the StreetNameAliasTable in the GIS Data Layers Registry in NENA-STA-010.3e-2021 [16] and in NENA documents going forward.

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
B.1 Identification Elements							
B.1.1	NENA Globally Unique ID (Primary Key)	NGUID	TEXT	254	**Yes**		NENA
B.2 Relate Elements							
B.2.1	Road Centerline NENA Unique ID (Foreign Key)	RCL_NGUID	TEXT	254	**Yes**		NENA
B.3 Address Elements							
B.3.1	Street Name Pre Modifier	St_PreMod	TEXT	15	Conditional		NENA, WLIA
B.3.2	Street Name Pre Directional	St_PreDir	TEXT	10	Conditional	WLIA *DirectionDomain*	NENA, WLIA
B.3.3	Street Name Pre Type	St_PreType	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry*	NENA, WLIA
B.3.4	Street Name Pre Type Separator	St_PreSep	TEXT	20	Conditional	NENA *Street Name Pre Type Separators Registry*	NENA, WLIA
B.3.5	Street Name	St_Name	TEXT	254	**Yes**		NENA, WLIA
B.3.6	Street Name Post Type	St_PosTyp	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry*	NENA, WLIA
B.3.7	Street Name Post Directional	St_PosDir	TEXT	10	Conditional	WLIA *DirectionDomain*	NENA, WLIA
B.3.8	Street Name Post Modifier	St_PosMod	TEXT	25	Conditional		NENA, WLIA
B.3.9	Full Street Name	FullStNm	TEXT	245	**Yes**		WLIA
B.3.10	Abbreviated Full Street Name	abFullStNm	TEXT	175	No		WLIA
B.4 Area Elements							
B.5 Functional Elements							
B.6 Management Elements							
B.6.1	Date Updated	DateUpdate	DATE		**Yes**		NENA
B.6.2	Effective Date	Effective	DATE		No		NENA
B.6.3	Expiration Date	Expire	DATE		No		NENA
B.7 9-1-1 Elements							
B.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	100	**Yes**		NENA

StreetNameAliasTable (Street Name Alias Table) - Data Element Details

B.1 Identification Elements

B.1.1 NENA Globally Unique ID

Database Field Name	NGUID		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	urn:emergency:uid:gis:RCL:47824393:co.polk.wi.us, urn:emergency:uid:gis:RCL:587392034:waukeshacounty.gov, urn:emergency:uid:gis:RCL:90a942e1bc7f4g1h94c5acaadv24r89h:countyofdane.com		
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 2.4 NENA Globally Unique IDs (NGUID).		

B.2 Relate Elements

B.2.1 Road Centerline NENA Globally Unique ID (Foreign Key)

Database Field Name	RCL_NGUID		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	urn:emergency:uid:gis:RCL:47824393:co.polk.wi.us, urn:emergency:uid:gis:RCL:587392034:waukeshacounty.gov, urn:emergency:uid:gis:RCL:90a942e1bc7f4g1h94c5acaadv24r89h:countyofdane.com		
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.		

B.3 Address Elements

B.3.1 Street Name Pre Modifier

Database Field Name	St_PreMod		
Data Type	TEXT	Inclusion	Conditional
Width	15	Domain	
Examples	**Old** North County Highway 12		
Description	A word or phrase that precedes all other Street Name elements and is separated from the Street Name element by a Street Name Pre Directional and/or a Street Name Pre Type element. Not commonly used and use should be minimized.		

B.3.2 Street Name Pre Directional

Database Field Name	St_PreDir		
Data Type	TEXT	Inclusion	Conditional
Width	10	Domain	*WLIA DirectionDomain*
Examples	**East** Main Street, Old **North** County Highway 12		
Description	A word or phrase preceding the Street Name element that indicates the direction taken by the road from an arbitrary starting point or the sector where it is located.		

B.3.3 Street Name Pre Type

Database Field Name	St_PreType		
Data Type	TEXT	Inclusion	Conditional
Width	50	Domain	*NENA Street Name Pre Types and Street Name Post Types Registry*
Examples	**Avenue** A, Old North **County Highway** 12, **United States Highway** 151, **State Highway** 46, **Interstate** 90		
Description	A word or phrase that precedes the Street Name element and identifies the type of thoroughfare in the Full Street Name.		

B.3.4 Street Name Pre Type Separator

Database Field Name	St_PreSep		
Data Type	TEXT	Inclusion	Conditional
Width	20	Domain	*NENA Street Name Pre Type Separators Registry*
Examples	Avenue **of the** Arts, Avenue **of** Champions		
Description	A preposition or prepositional phrase between the Street Name Pre Type and the Street Name element.		

B.3.5 Street Name

Database Field Name	St_Name		
Data Type	TEXT	Inclusion	**Yes**
Width	254	Domain	
Examples	**Jones** Road, County Highway **KP**, Avenue of the **Arts**, Avenue **C**, **Azure** Court South		
Description	The official name of the road as defined by the official Street Naming Authority for the given jurisdiction. The Street Name element does not include a street type, directional, or modifier unless assigned as such by the official Street Naming Authority.		

B.3.6 Street Name Post Type

Database Field Name	St_PosTyp		
Data Type	TEXT	Inclusion	Conditional
Width	50	Domain	*NENA Street Name Pre Types and Street Name Post Types Registry*
Examples	Jones **Road**, Azure **Court** South		
Description	A word or phrase that follows the Street Name element and identifies the type of thoroughfare in the Full Street Name.		

B.3.7 Street Name Post Directional

Database Field Name	St_PosDir		
Data Type	TEXT	Inclusion	Conditional
Width	10	Domain	*WLIA DirectionDomain*
Examples	Azure Court **South**, 10th Avenue **West**		
Description	A word or phrase following the Street Name element that indicates the direction taken by the road from an arbitrary starting point or the sector where it is located.		

B.3.8 Street Name Post Modifier

Database Field Name	St_PosMod		
Data Type	TEXT	Inclusion	Conditional
Width	25	Domain	
Examples	Bermuda Boulevard **Lower**, Lake Road **Fire Road 8**, Stoughton Road **Frontage Road**, Interstate 90 **westbound**		
Description	A word or phrase that follows all other Street Name elements and is separated from the Street Name element by a Street Name Post Directional and/or Street Name Post Type element. Not commonly used and use should be minimized.		

B.3.9 Full Street Name

Database Field Name	FullStNm		
Data Type	TEXT	Inclusion	**Yes**
Width	245	Domain	
Examples	Old North County Highway 12, Azure Court South, Lake Road Fire Road 8		
Description	The Street Name with all Pre/Post Modifiers, Pre/Post Directionals, Pre Type Separator, and Pre/Post Types concatenated: St_PreMod + St_PreDir + St_PreTyp + St_PreSep + St_Name + St_PosTyp + St_PosDir + St_PosMod		

B.3.10 Abbreviated Full Street Name

Database Field Name	abFullStNm		
Data Type	TEXT	Inclusion	No
Width	175	Domain	
Examples	Old N CTH 12, Azure Ct S, Lake Rd Fire Rd 8		
Description	The Full Street Name with abbreviations (where appropriate) used for the Pre/Post Modifiers, Pre/Post Types, and Pre/Post Directionals. This field is equivalent to the abFullStNm field in the WLIA Standard.		

B.4 Area Elements

Not Applicable

B.5 Functional Elements

Not Applicable

B.6 Management Elements

B.6.1 Date Updated

Database Field Name	DateUpdate		
Data Type	DATE	Inclusion	**Yes**
Width		Domain	
Examples	2020-01-28T15:47.09.3-06:00 (representing a record updated on January 28, 2020 at 3:47 and 9.3 seconds PM US Central Standard Time, with a precision of .1 second); 2020-07-16T08:31:15.2-05:00 (representing a record updated on July 16, 2020 at 8:31 and 15.2 seconds AM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record was created or last modified.		

B.6.2 Effective Date

Database Field Name	Effective		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will become active on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will become active on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time that the record is scheduled to take effect (e.g., the date and time an annexation takes effect and a copy of the road centerlines within the annexed area that have had their Incorporated Municipality, ESN, and MSAG Community Name fields populated with the new values are recognized for use in the NG9-1-1 system).		

B.6.3 Expiration Date

Database Field Name	Expire		
Data Type	DATE	Inclusion	No
Width		Domain	
Examples	2021-02-11T01:30:00.1-06:00 (representing a record that will expire and no longer be valid on February 11, 2021 at 1:30 and 0.1 seconds AM US Central Standard Time, with a precision of .1 second); 2021-10-15T20:15:30.5-05:00 (representing a record that will expire and no longer be valid on October 15, 2021 at 8:15 and 30.5 seconds PM US Central Daylight Time, with a precision of .1 second)		
Description	The date and time when the information in the record is no longer considered valid (e.g., the date and time an annexation takes effect and the road centerlines within the annexed area that have their Incorporated Municipality, ESN, and MSAG Community Name fields populated with the former values are no longer recognized for use in the NG9-1-1 system).		

B.7 9-1-1 Elements

B.7.1 Discrepancy Agency ID

Database Field Name	DiscrpAgID		
Data Type	TEXT	Inclusion	**Yes**
Width	100	Domain	
Examples	co.polk.wi.us, waukeshacounty.gov, countyofdane.com		
Description	Agency that receives a Discrepancy Report (DR), should a discrepancy be discovered in the GIS data, 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-000.23.2020 [19].		