Missouri NG9-1-1 GIS Data Standard & Best Practices Educational Seminar

Missouri 911 Service Board

Prepared by: Jessica Frye, Kathy Liljequist & Brian Maydwell

Today's Agenda

1. Missouri NG9-1-1 GIS Project Information
2. GIS Data Use in NG9-1-1

   <10 minute break>
3. Missouri NG9-1-1 GIS Data Standards

   <45 minute lunch break>
4. Parsing Addresses into NENA Compliant Fields
5. QC Checks

   <10 minute break>
6. Best Practices

What do you want to get out of today's session?

<please answer in chat>

Introductions

Brian Maydwell
9-1-1 Services Board

Jessica Frye
Kathy Liljequist

Missouri NG9-1-1 GIS Project Introduction

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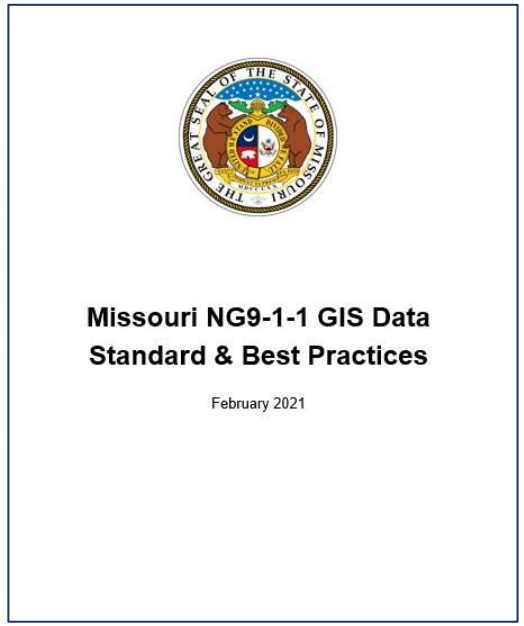
Statewide GIS Project

Task One:
NG9-1-1 GIS Data Standards and Best Practices



- MO NG9-1-1 GIS Data Standards and Best Practices Approved February, 2021

- Available for Viewing/Downloading on the Board's website https://www.missouri911.org/gis-resources

Statewide GIS Project

Task Two: Individual GIS Assessments and Reports

- Data requests began January 4th, 2021
- If you haven't already, please complete the GIS Data request

Data requested:

- Road Centerlines
- Site/Structure Address Points
- Emergency Service Boundaries (ESZ or Fire, Law, EMS)
- PSAP Boundary
- Provisioning Boundary
- County Boundary
- Incorporated Municipality Boundaries
- ALI
- MSAG

Statewide GIS Project

Task Three: Educational Sessions

Date	Time
Tuesday, March 23rd, 2021	9 am – 2 pm
Thursday, March 25th, 2021	9 am – 2 pm
Wednesday, March 31st, 2021	9 am – 2 pm
Wednesday, April 7th, 2021	9 am – 2 pm
Thursday, April 8th, 2021	9 am – 2 pm

Provide:

- Brief overview of the Missouri NG911 program
- Training on recently published Missouri NG9-1-1 GIS Standards and Best Practices Guide
- Information on the NG911 GIS Data Assessment and NG911 GIS best practices

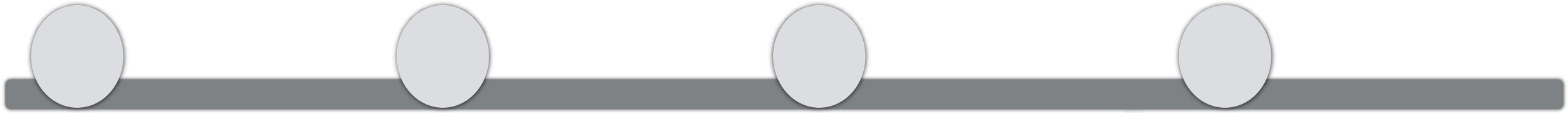
Statewide GIS Project

Task Four:
Final Report Due by December 31, 2021

- GeoComm expected completion with Final report September 2021

NextGen9-1-1 Feasibility Study

- Statewide 911 System Assessment
- Assess Existing Infrastructure to serve as potential ESInets
- Feasibility Study report with State NG911 Plan and recommendations
- Establishment of NG911 Pilot project/proof of concept



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GIS Data Use in NG9-1-1

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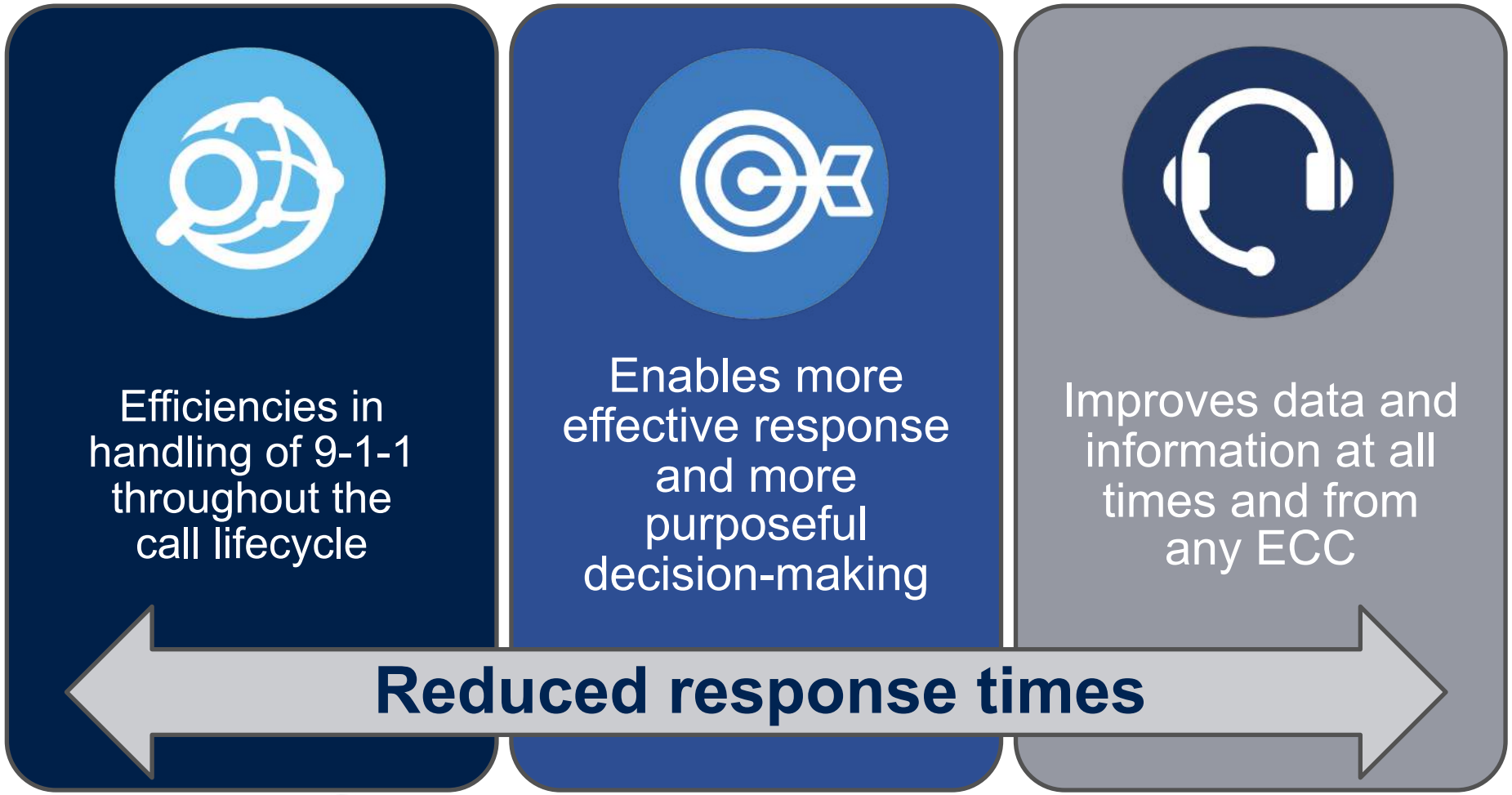
NG9-1-1 Advantages



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NG9-1-1

Framework

- ESInet
- GIS Data
- Standards, policies, funding

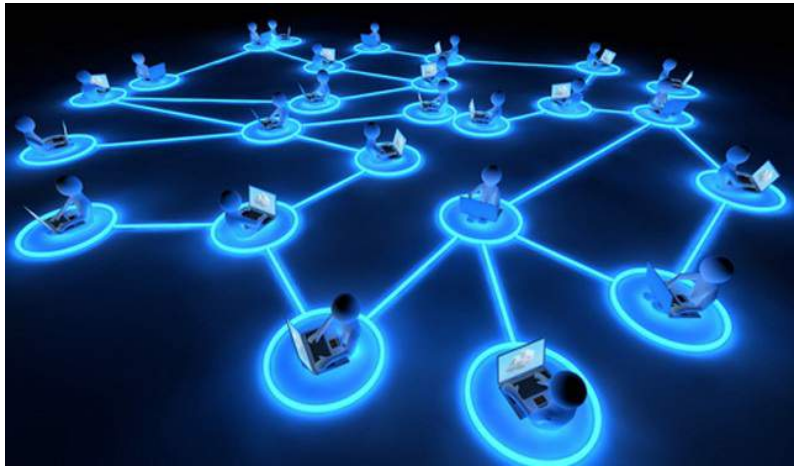
NG9-1-1 Acronyms

BCF: Border Control Function
ECRF: Emergency Call Routing Function
ESRP: Emergency Services Routing Proxy
GCS: Geocode Service
LIS: Location Information Server
LVF: Location Validation Function
MCS: MSAG Conversion Service
MDS: Mapping Data Service
NGCS: Next Generation 9-1-1 Core Services
PIDF-LO: Presence Information Data Format – Location Object
PRF: Policy Routing Function
PSTN: Public Switched Telephone Network
SI: Spatial Interface
VoIP: Voice Over Internet Protocol

GIS is Central to Public Safety

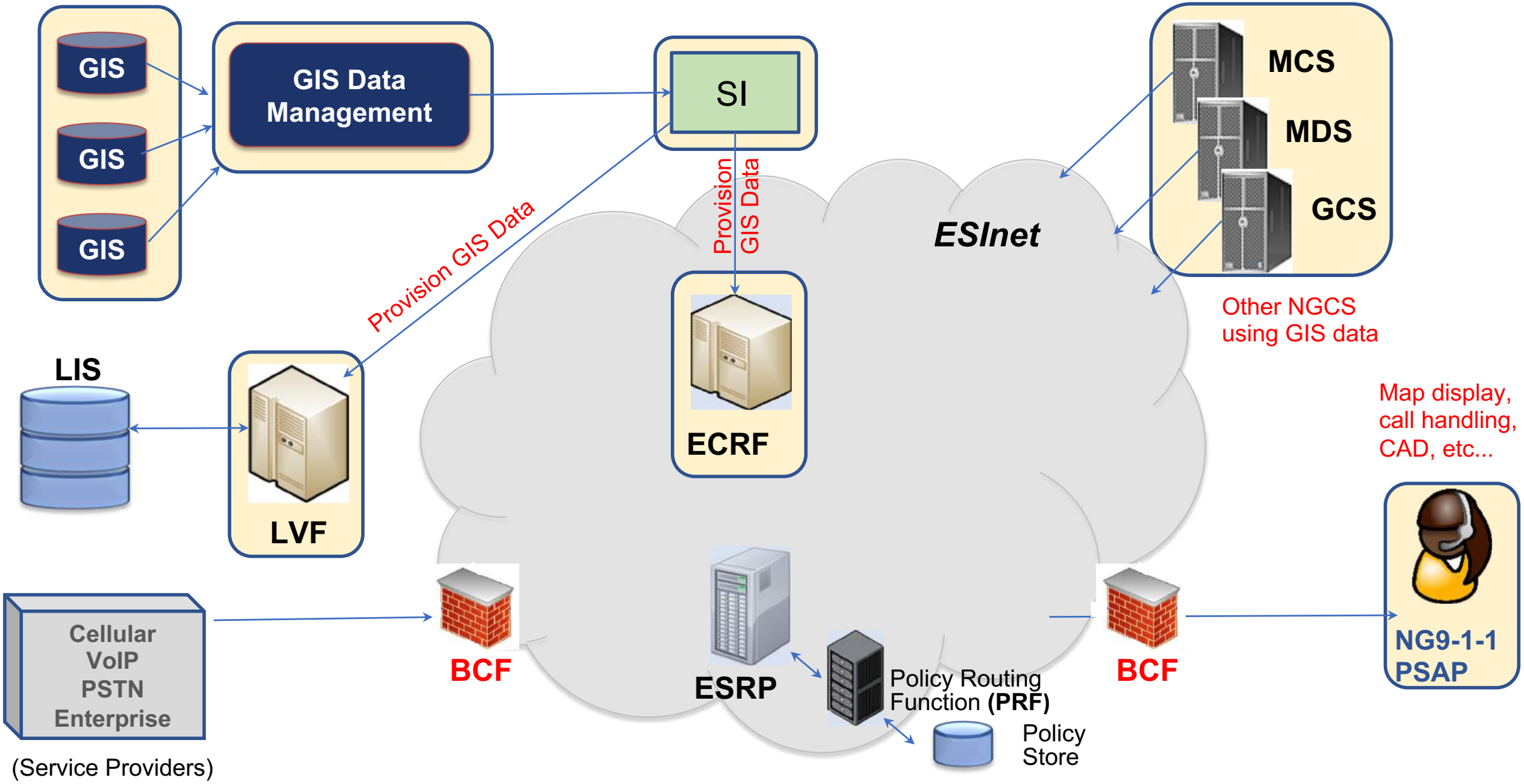
ECC systems
CAD systems
Mobile systems

GIS departments

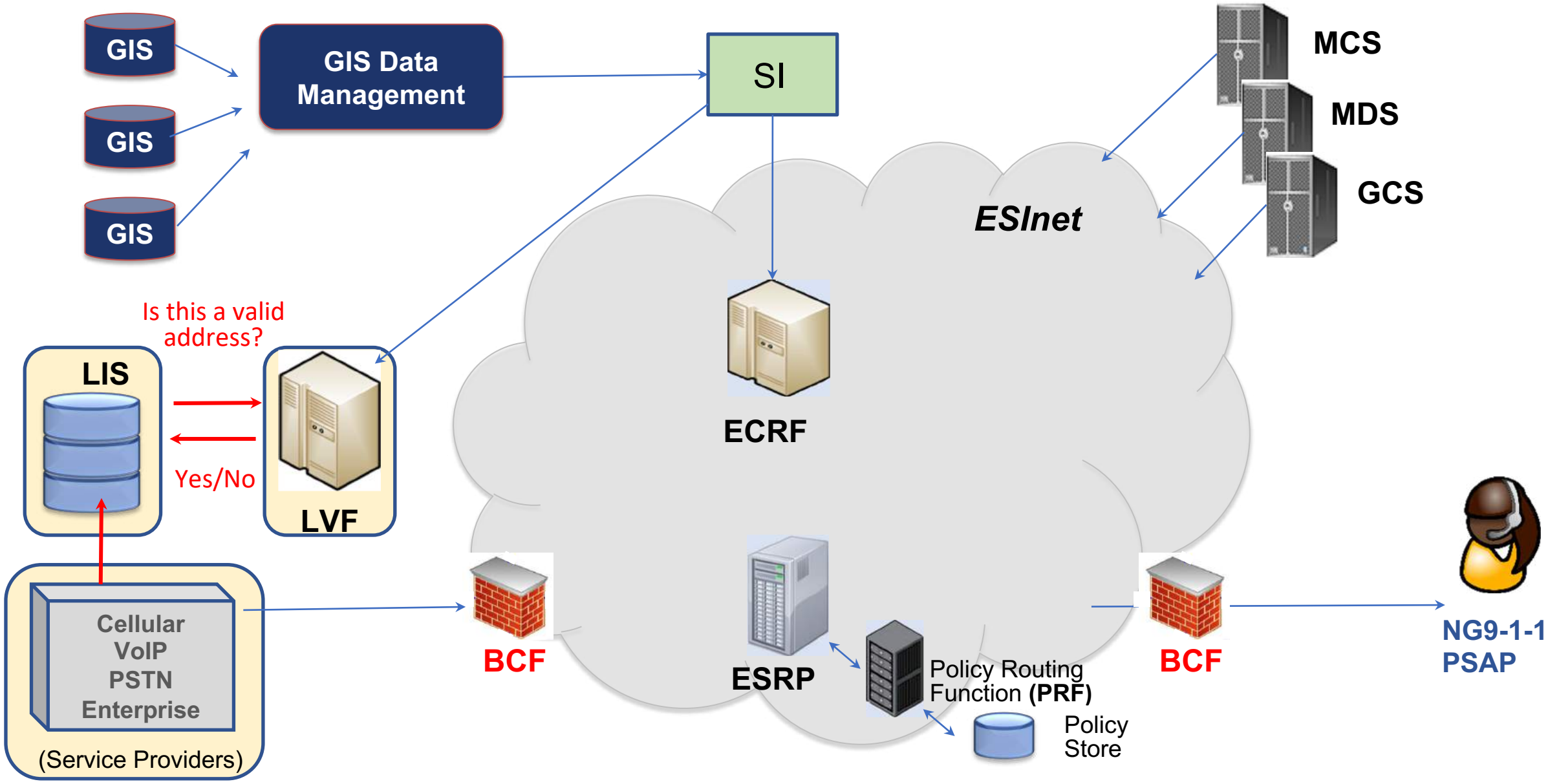


NG9-1-1 systems

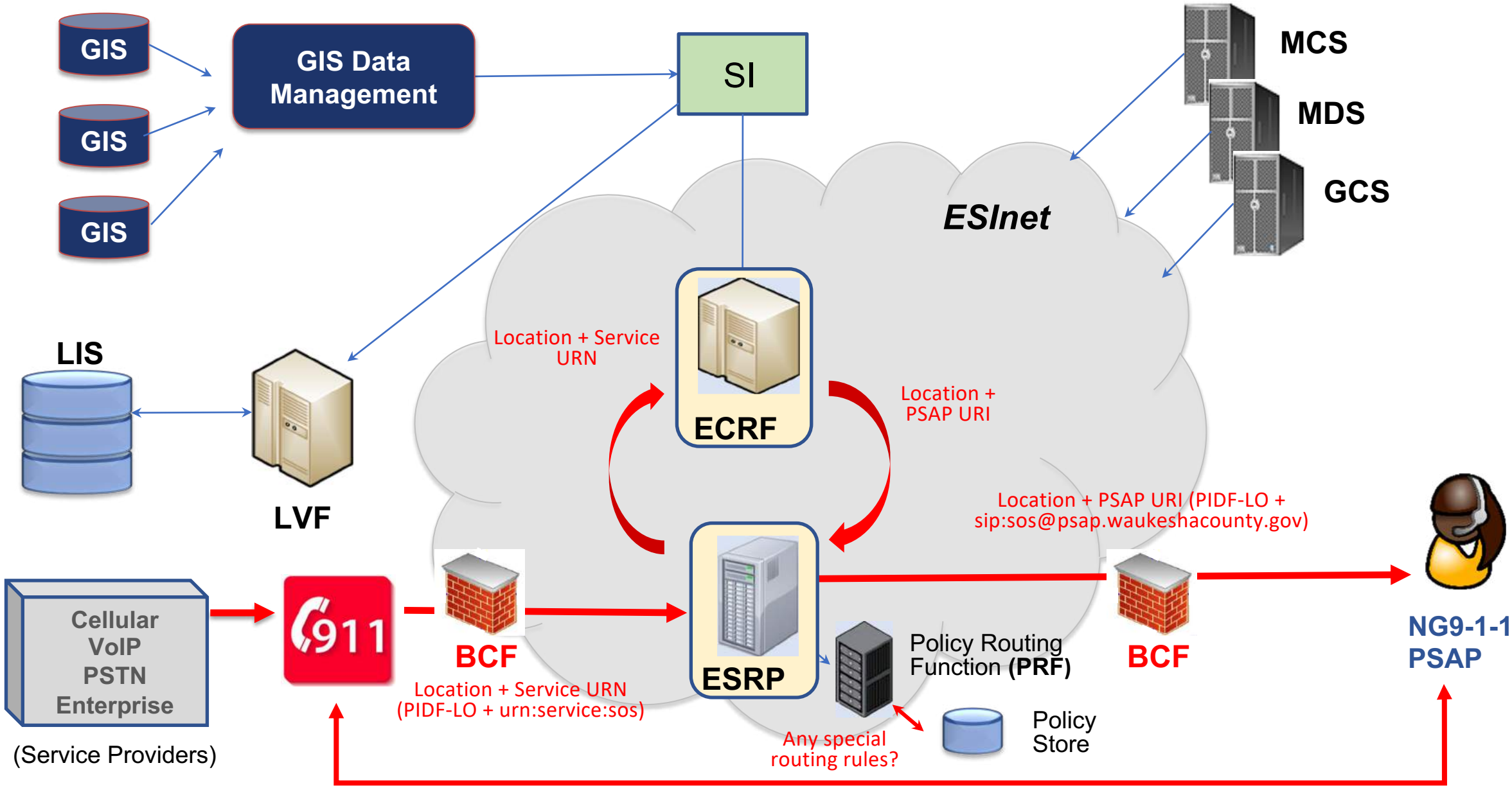
Where GIS Data is Used in NG9-1-1



Location Validation - Before a 9-1-1 Call is Made



Basic Call Flow Routing NG9-1-1



Why do we need Standardized Data?

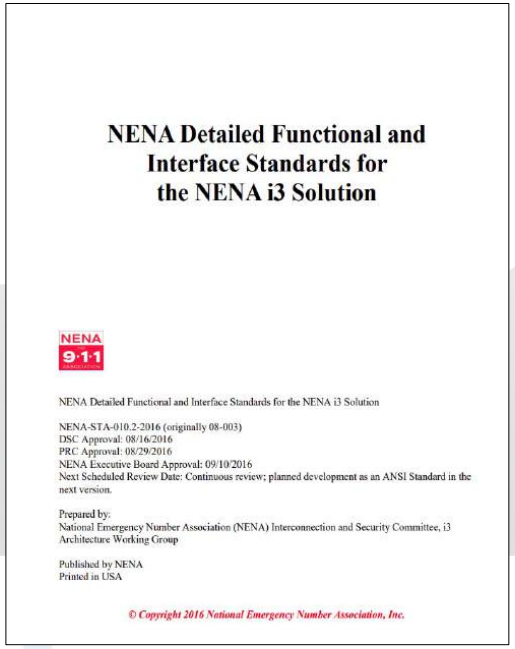
Required for NG9-1-1 functionality

- Allow exchange of data with local, regional, state and federal agencies
- Allow interoperability
- Allow call transfers to anywhere

NENA Sets Technical Standards for 9-1-1

NENA-STA-010

NENA i3 Standard for Next Generation 9-1-1 Appendix B



NENA Detailed Functional and Interface Standards for the NENA i3 Solution

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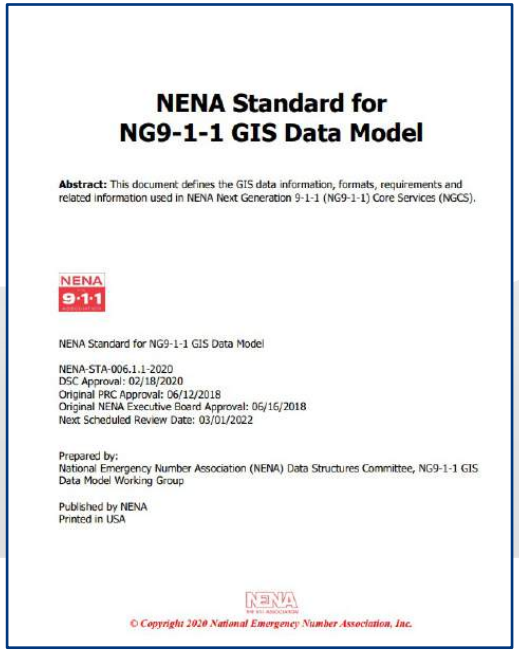
NENA-STA-010.2-2016 (originally 08-003)
DSC Approval: 08/16/2016
PRC Approval: 08/29/2016
NENA Executive Board Approval: 09/10/2016
Next Scheduled Review Date: Continuous review; planned development as an ANSI Standard in the next version.

Prepared by:
National Emergency Number Association (NENA) Interconnection and Security Committee, i3 Architecture Working Group

Published by NENA
Printed in USA

NENA-STA-006

NENA Standards for NG9-1-1 GIS Data Model



NENA Standard for NG9-1-1 GIS Data Model

Abstract: This document defines the GIS data information, formats, requirements and related information used in NENA Next Generation 9-1-1 (NG9-1-1) Core Services (NGCS).

NENA Standard for NG9-1-1 GIS Data Model

NENA-STA-006.1.1-2020
DSC Approval: 02/18/2020
Original PRC Approval: 06/12/2018
Original NENA Executive Board Approval: 06/16/2018
Next Scheduled Review Date: 03/01/2022

Prepared by:
National Emergency Number Association (NENA) Data Structures Committee, NG9-1-1 GIS Data Model Working Group

Published by NENA
Printed in USA

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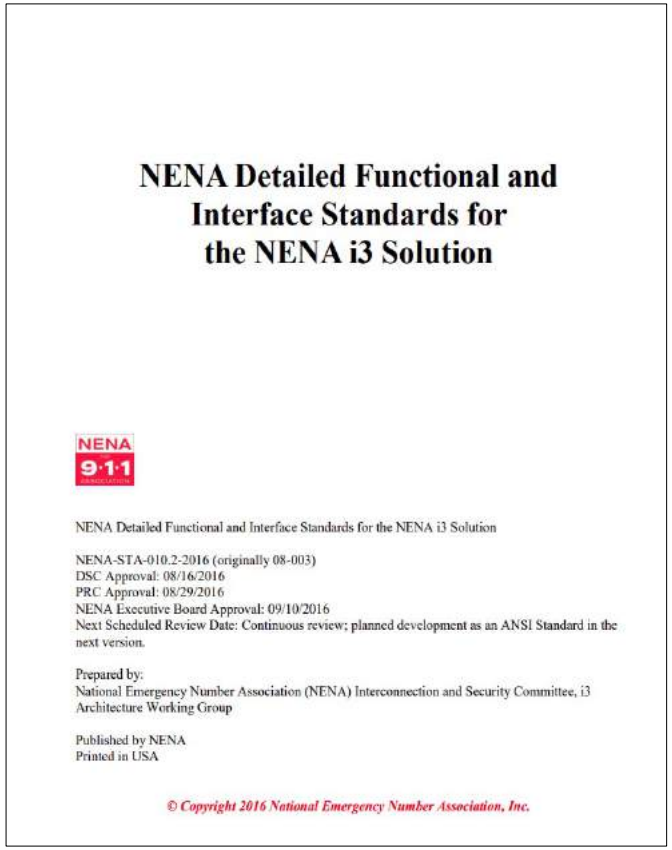
NENA i3 Standard for NG9-1-1, Appendix B

- Defines Spatial Interface (SI) Provisioning Data Model
- SI standardized interface between the GIS data and the NG9-1-1 functional elements that consume GIS data
- SI uses XML data structures
- “Machine to Machine” communication



NENA Detailed Functional and Interface Standards for the NENA i3 Solution

NENA 9-1-1

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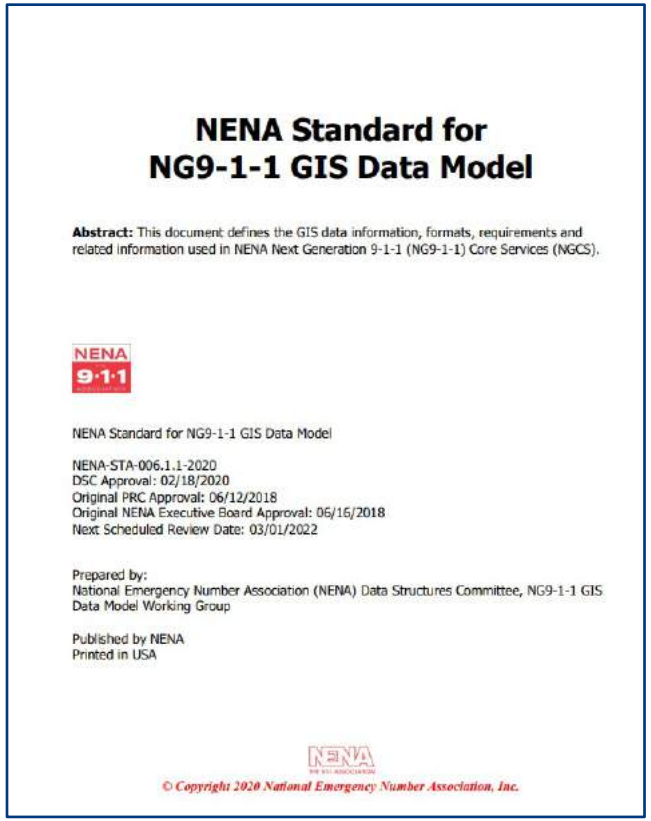
NENA NG9-1-1 GIS Data Model

- Defines GIS data layers
  - Location Validation
  - Geospatial Call Routing
  - Dispatch Routing
  - Public Safety Mapping Applications
- Data structure for GIS data exchange
  - May use local GIS data model for daily maintenance
  - Must export into NG9-1-1 GIS Data Model
- Backwards compatibility with E9-1-1 systems



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NG9-1-1 GIS Data

Data Layers

Required

Strongly Recommended

Recommended

Attributes

Mandatory

Conditional

Optional

GIS Data Layers in NG9-1-1

Required Data Layers

- Road Centerlines (RCL)
- Site/Structure Address Points (SSAP)
- PSAP Boundaries
- Emergency Services Boundaries (ESB)
- Provisioning Boundaries
- *Incorporated Municipality Boundaries*
- *County Boundaries*

GIS Data Layers in NG9-1-1

Strongly Recommended Data Layers

- Street Name Alias Table
- Landmark Name Part Table
- Complete Landmark Name Alias Table
- States or Equivalents
- Unincorporated Community Boundary
- Neighborhood Community Boundary
- Other Emergency Service Boundaries (e.g. Poison Control, Forest Service, Coast Guard, Animal Control, etc.)

GIS Data Layers in NG9-1-1

Other Recommended Data Layers

- Railroad Centerlines
- Hydrology Line
- Hydrology Polygon
- Cell Site Location
- Mile Marker Location

Focus on Required Layers

- **Road Centerlines (RCL)**
  - Represent the approximate centerline of a real-world roadway
  - Each road segment has attribute data associated with it
- **Site/Structure Address Points (SSAP)**
  - Represent approximate location of a site, structure, subsite, substructure, or access location
  - Each point has attribute data associated with it
  - More precise location than geocoding to road centerlines

Also Mentioned in Today's Discussion

- **PSAP Boundaries**
  - Geographic area of a PSAP that has primary responsibility for a 9-1-1 call
  - Used to identify which PSAP to route 9-1-1 calls
- **Emergency Service Boundaries**
  - Geographic area of Police, Fire, and EMS responders
  - Separate layers in NG9-1-1; Used to identify the responding agencies responsible for providing emergency services at the location of a 9-1-1 call
- **Provisioning Boundaries**
  - Geographic area of GIS data responsibility for data stewards
  - Used to identify who provides GIS data for NG9-1-1 and fixes GIS data issues

Also Mentioned in Today's Discussion

- **Incorporated Municipal Boundaries**
  - Geographic area of a city, town or village that has local governmental powers
  - Can be used to populate mandatory attributes in RCL/SSAP
- **County Boundaries**
  - County or equivalent boundary is the primary legal division
  - Can be used to populate mandatory attributes in RCL/SSAP

How Long will Transition to NG9-1-1 Take?

- Statewide 911 System Assessment
- Existing infrastructure is not going away overnight
- Multi-year implementation across the State
- GIS data development, standardization, and synchronization to be NG9-1-1 compliant will take time
- MSAG and ALI will still exist during transition
- NG9-1-1 Data Model includes legacy fields for use during the transitional period

Referenced NENA Documentation

https://www.nena.org/page/NG911GISDataModel

- **NENA-STA-006,** NENA Standards for NG9-1-1 GIS Data Model
- **NENA-REF-006,** NENA NG9-1-1 GIS Data Template

https://www.nena.org/page/NG911CLDXF

- **NENA-STA-004,** NENA NG9-1-1 Civic Location Data Exchange Format (CLDXF) Standard

All NENA standards at *https://www.nena.org/page/Standards*

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

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NG9-1-1 GIS Data Standard & Best Practices

Did you respond to our poll?

Have you seen or reviewed the Missouri NG9-1-1 GIS Data Standard & Best Practices?

https://strawpoll.com/pjs2wjr8p

Standards document posted on Missouri 911 Service Board website at:

https://www.missouri911.org/gis-resources

NG9-1-1 GIS Data Standard & Best Practices

- Missouri NG9-1-1 GIS Data Model
  - Required GIS data layers
  - Missouri specific fields - Full Street Name, Legacy Full Street Name
- Impacts from Potential Changes in NENA Standards
- Quality Control Checks
- Parsing Street Names and Addresses into the Missouri Standard
- Best Practices for Road Centerlines and Address Points
  - RCL segmentation and placement
  - Naming and addressing
  - Unique situations

Missouri GIS Data Standard

- Based on NENA's NG9-1-1 GIS Data Model Standard
  - Not intended to replace any local data schema
- Defines the required data schema and associated fields
  - "Data schema" = database structure of the data
- Includes all NENA fields and a few Missouri-specific fields
- ALL fields MUST be carried for NG9-1-1 compliance
- Local data may be stored in any projection
  - NG9-1-1 requires World Geodetic System of 1984 (WGS84)
  - Local data must be transformed to WGS84 prior to NG9-1-1 use

Missouri NG9-1-1 Data Schema

- Summary table for each GIS data layer describing its attributes
- Information provided:
  - **Element Name:** Basic description of the data field
  - **Database Field Name:** Standardized field name in the NG9-1-1 GIS data
  - **Field Type:** Required attribute type as defined by the NENA standard
  - **Field Width:** The maximum field width
  - **Inclusion:** Indicates whether populating the field is:
    - Mandatory
    - Conditional
    - Optional
  - **Domain:** The set of all valid values for the data field
  - **Reference Standard:** The standard(s) the data field is based upon

Chart Legend

Element Type	Description	Color
Identification Elements	Data elements required for feature level identification	
Relate Elements	Data elements used to relate features to other features	
Address Elements	Data elements required for addressing	
Area Elements	Data elements used for location identification	
Functional Elements	Data elements used for functionality in supported systems	
Management Elements	Data elements required for feature level management	
9-1-1 Elements	Data elements required to support 9-1-1	

Data Element Details Section

3.3.7 Street Name Pre Modifier

Database Field Name	St_PreMod		
Data Type	TEXT	Inclusion	Conditional
Width	15	Domain	
Examples	**Old** North Highway 63		
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.		

- Separate table for each data element, includes:
  - All information in the Summary Table
  - Detailed description of the data element
  - Example field values
- **Unless otherwise noted**, all field values must:
  - Be fully spelled out
  - Use Title Case

NENA Globally Unique ID (NGUID)

- Each record in a GIS data layer must have a globally unique ID
- Must only occur once when merging data into a national dataset
- Created by concatenating:
  - prefix suggestive of the layer (e.g., PSAP, LAW, FIRE, EMS)
  - the locally assigned unique ID
  - the “@” symbol
  - the Agency Identifier (registered domain name)
- **Example:**
  - RCL25367393@co.polk.mo.us
  - PSAP57589621@co.cass.mo.us

Missouri NG9-1-1 Data Schema for Road Centerlines

Missouri NG9-1-1 Data Schema for RCL

1 of 4

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
0 Identification Elements							
3.1.1	Road Centerline NENA Globally Unique ID	RCL_NGUID	TEXT	254	**Mandatory**		NENA
3.2 Relate Elements							
3.3 Address Elements							
3.3.1	Left Address Number Prefix	AdNumPre_L	TEXT	15	Conditional		NENA
3.3.2	Left FROM Address	FromAddr_L	LONG	6	**Mandatory**	Whole numbers from 0 to 999999	NENA
3.3.3	Left TO Address	ToAddr_L	LONG	6	**Mandatory**	Whole numbers from 0 to 999999	NENA
3.3.4	Right Address Number Prefix	AdNumPre_R	TEXT	15	Conditional		NENA
3.3.5	Right FROM Address	FromAddr_R	LONG	6	**Mandatory**	Whole numbers from 0 to 999999	NENA
3.3.6	Right TO Address	ToAddr_R	LONG	6	**Mandatory**	Whole numbers from 0 to 999999	NENA
3.3.7	Street Name Pre Modifier	St_PreMod	TEXT	15	Conditional		NENA
3.3.8	Street Name Pre Directional	St_PreDir	TEXT	9	Conditional		NENA
3.3.9	Street Name Pre Type	St_PreTyp	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry [15]*	NENA

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Missouri NG9-1-1 Data Schema for RCL

2 of 4

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
3.3.10	Street Name Pre Type Separator	St_PreSep	TEXT	20	Conditional	NENA *Street Name Pre Type Separators Registry [16]*	NENA
3.3.11	Street Name	St_Name	TEXT	60	**Mandatory**		NENA
3.3.12	Street Name Post Type	St_PosTyp	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry [15]*	NENA
3.3.13	Street Name Post Directional	St_PosDir	TEXT	9	Conditional		NENA
3.3.14	Street Name Post Modifier	St_PosMod	TEXT	25	Conditional		NENA
3.3.15	Full Street Name	FullStNm	TEXT	245	Optional	Concatenated field for NG9-1-1 formatted street names including: *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,* and *Street Name Post Modifier*	
3.3.16	Legacy Full Street Name	LgFullStNm	TEXT	175	Optional	Concatenated field for legacy formatted street names including: *Legacy Street Name Pre Directional, Legacy Street Name, Legacy Street Name Type,* and *Legacy Street Name Post Directional*	

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Missouri NG9-1-1 Data Schema for RCL

3 of 4

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
3.3.17	Legacy Street Name Pre Directional	LSt_PreDir	TEXT	2	Conditional		NENA
3.3.18	Legacy Street Name	LSt_Name	TEXT	75	Conditional		NENA
3.3.19	Legacy Street Name Type	LSt_Type	TEXT	4	Conditional	USPS Publication 28, Appendix C1	NENA
3.3.20	Legacy Street Name Post Directional	LSt_PosDir	TEXT	2	Conditional		NENA
3.3.21	Postal Code Left	PostCode_L	TEXT	7	Optional	USPS City State File Product	USPS, NENA
3.3.22	Postal Code Right	PostCode_R	TEXT	7	Optional	USPS City State File Product	USPS, NENA
3.3.23	Postal Community Name Left	PostComm_L	TEXT	40	Optional	USPS City State File Product	USPS, NENA
3.3.24	Postal Community Name Right	PostComm_R	TEXT	40	Optional	USPS City State File Product	USPS, NENA
3.4 Area Elements							
3.4.1	Country Left	Country_L	TEXT	2	**Mandatory**	ISO 3166-1 alpha-2 codes	NENA
3.4.2	Country Right	Country_R	TEXT	2	**Mandatory**	ISO 3166-1 alpha-2 codes	NENA
3.4.3	State Left	State_L	TEXT	2	**Mandatory**		US Census, NENA
3.4.4	State Right	State_R	TEXT	2	**Mandatory**		US Census, NENA
3.4.5	County Left	County_L	TEXT	40	**Mandatory**	*MONG911CountyDomain*	US Census, NENA
3.4.6	County Right	County_R	TEXT	40	**Mandatory**	*MONG911CountyDomain*	US Census, NENA

Missouri NG9-1-1 Data Schema for RCL

4 of 4

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
3.4.7	Incorporated Municipality Left	IncMuni_L	TEXT	100	**Mandatory**		NENA
3.4.8	Incorporated Municipality Right	IncMuni_R	TEXT	100	**Mandatory**		NENA
3.4.9	Unincorporated Community Left	UnincCom_L	TEXT	100	Optional		NENA
3.4.10	Unincorporated Community Right	UnincCom_R	TEXT	100	Optional		NENA
3.4.11	Neighborhood Community Left	NbrhdCom_L	TEXT	100	Optional		NENA
3.4.12	Neighborhood Community Right	NbrhdCom_R	TEXT	100	Optional		NENA
3.4.13	Additional Code Left	AddCode_L	TEXT	6	Conditional		NENA
3.4.14	Additional Code Right	AddCode_R	TEXT	6	Conditional		NENA
3.5 Functional Elements							
3.5.1	One-Way	OneWay	TEXT	2	Optional		NENA
0	Speed Limit	SpeedLimit	SHORT	3	Optional		NENA
3.5.3	Road Class	RoadClass	TEXT	15	Optional		NENA
3.6 Management Elements							
3.6.1	Date Updated	DateUpdate	DATE		**Mandatory**		NENA
3.6.2	Effective Date	Effective	DATE		Optional		NENA
3.6.3	Expiration Date	Expire	DATE		Optional		NENA
0 9-1-1 Elements							
3.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	75	**Mandatory**		NENA
3.7.2	Parity Left	Parity_L	TEXT	1	**Mandatory**	O, E, B, Z	NENA
3.7.3	Parity Right	Parity_R	TEXT	1	**Mandatory**	O, E, B, Z	NENA
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	Optional		NENA
3.7.9	Validation Right	Valid_R	TEXT	1	Optional		NENA

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Missouri NG9-1-1 Data Schema for Site/Structure Address Points

Missouri NG9-1-1 Data Schema for SSAP

1 of 4

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
4.1 Identification Elements							
4.1.1	Site NENA Globally Unique ID	Site_NGUID	TEXT	254	**Mandatory**		NENA
4.2 Relate Elements							
4.2.1	Road Centerline NENA Globally Unique ID	RCL_NGUID	TEXT	254	**Mandatory**		NENA
4.3 Address Elements							
4.3.1	Address Number Prefix	AddNum_Pre	TEXT	15	Conditional		NENA
4.3.2	Address Number	Add_Number	LONG	6	Conditional	Whole numbers from 0 to 999999	NENA
4.3.3	Address Number Suffix	AddNum_Suf	TEXT	15	Conditional		NENA
4.3.4	Complete Landmark Name *	LandmkName	TEXT	150	Conditional		NENA
4.3.5	Mile Post	Mile_Post	TEXT	150	Conditional		NENA
4.3.6	Building *	Building	TEXT	75	Optional		NENA
4.3.7	Floor	Floor	TEXT	75	Optional		NENA
4.3.8	Unit *	Unit	TEXT	75	Optional		NENA
4.3.9	Room	Room	TEXT	75	Optional		NENA
4.3.10	Seat	Seat	TEXT	75	Optional		NENA
4.3.11	Additional Location Information	Addtl_Loc	TEXT	225	Optional		NENA
4.3.12	Street Name Pre Modifier	St_PreMod	TEXT	15	Conditional		NENA
4.3.13	Street Name Pre Directional	St_PreDir	TEXT	9	Conditional		NENA
4.3.14	Street Name Pre Type	St_PreTyp	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry [15]*	NENA
4.3.15	Street Name Pre Type Separator	St_PreSep	TEXT	20	Conditional	NENA *Street Name Pre Type Separators Registry [16]*	NENA

* Fields changing in future update of NENA NG9-1-1 Data Model and NENA CLDXF

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Missouri NG9-1-1 Data Schema for SSAP

2 of 4

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
4.3.17	Street Name Post Type	St_PosTyp	TEXT	50	Conditional	NENA *Street Name Pre Types and Street Name Post Types Registry [15]*	NENA
4.3.18	Street Name Post Directional	St_PosDir	TEXT	9	Conditional		NENA
4.3.19	Street Name Post Modifier	St_PosMod	TEXT	25	Conditional		NENA
4.3.20	Full Street Name	FullStNm	TEXT	245	**Mandatory** *	Concatenated field for NG9-1-1 formatted street names including: *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,* and *Street Name Post Modifier*	
4.3.21	Legacy Full Street Name	LgFullStNm	TEXT	175	Optional	Concatenated field for legacy formatted street names including: *Legacy Street Name Pre Directional, Legacy Street Name, Legacy Street Name Type,* and *Legacy Street Name Post Directional*	
4.3.22	Legacy Street Name Pre Directional	LSt_PreDir	TEXT	2	Conditional		NENA
4.3.23	Legacy Street Name	LSt_Name	TEXT	75	Conditional		NENA
4.3.24	Legacy Street Name Type	LSt_Type	TEXT	4	Conditional	USPS Publication 28, Appendix C1	NENA
4.3.25	Legacy Street Name Post Directional	LSt_PosDir	TEXT	2	Conditional		NENA

* Should be Conditional

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Missouri NG9-1-1 Data Schema for SSAP

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Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
4.3.26	Postal Code	Post_Code	TEXT	7	Optional	USPS City State File Product	USPS, NENA
4.3.27	ZIP Plus 4	Post_Code4	TEXT	4	Optional	USPS City State File Product	USPS, NENA
4.3.28	Postal Community Name	Post_Comm	TEXT	40	Optional	USPS City State File Product	USPS, NENA
4.4 Area Elements							
4.4.1	Country	Country	TEXT	2	**Mandatory**	ISO 3166-1 alpha-2 codes	NENA
4.4.2	State	State	TEXT	2	**Mandatory**		US Census, NENA
4.4.3	County	County	TEXT	40	**Mandatory**	*MONG911CountyDomain*	US Census, NENA
4.4.4	Incorporated Municipality	Inc_Muni	TEXT	100	**Mandatory**		US Census, NENA
4.4.5	Unincorporated Community	Uninc_Comm	TEXT	100	Optional		NENA
4.4.6	Neighborhood Community	Nbrhd_Comm	TEXT	100	Optional		NENA
4.4.7	Additional Code	AddCode	TEXT	6	Conditional		NENA
4.5 Functional Elements							
4.5.1	Placement Method	Placement	TEXT	25	Optional	NENA *Site/Structure Address Point Placement Method Registry*	NENA

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Missouri NG9-1-1 Data Schema for SSAP

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Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
4.5.2	Place Type	Place_Type	TEXT	50	Optional		NENA
4.5.3	Additional Data URI	AddDataURI	TEXT	254	Conditional		NENA
4.6 Management Elements							
4.6.1	Date Updated	DateUpdate	DATE		**Mandatory**		NENA
4.6.2	Effective Date	Effective	DATE		Optional		NENA
4.6.3	Expiration Date	Expire	DATE		Optional		NENA
4.7 9-1-1 Elements							
4.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	75	**Mandatory**		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		Optional		NENA
4.7.5	Longitude	Long	FLOAT		Optional		NENA
4.7.6	Elevation	Elev	LONG	6	Optional		NENA

Missouri NG9-1-1 Data Schema for PSAP Boundaries

Missouri NG9-1-1 Data Schema for PSAP

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
6.1 Identification Elements							
6.1.1	Emergency Service Boundary NENA Globally Unique ID	ES_NGUID	TEXT	254	**Mandatory**		NENA
6.2 Relate Elements							
6.3 Address Elements							
6.4 Area Elements							
6.4.1	State	State	TEXT	2	**Mandatory**		US Census, NENA
6.5 Functional Elements							
6.5.1	Agency ID	Agency_ID	TEXT	100	**Mandatory**		NENA
6.5.2	Service URI	ServiceURI	TEXT	254	**Mandatory**		NENA
6.5.3	Service URN	ServiceURN	TEXT	50	**Mandatory**	NENA *urn:nena:service:sos* *Registry*	NENA
6.5.4	Service Number	ServiceNum	TEXT	15	Optional		NENA
6.5.5	Agency vCard URI	AVcard_URI	TEXT	254	**Mandatory**		NENA
6.5.6	Display Name	DsplayName	TEXT	60	**Mandatory**		NENA
6.6 Management Elements							
6.6.1	Date Updated	DateUpdate	DATE		**Mandatory**		NENA
6.6.2	Effective Date	Effective	DATE		Optional		NENA
6.6.3	Expiration Date	Expire	DATE		Optional		NENA
6.7 9-1-1 Elements6.7 9-1-1 Elements							
6.7.16.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	75	**Mandatory**		NENA

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Missouri NG9-1-1 Data Schema for Emergency Service Boundaries (ESB)

Missouri NG9-1-1 Data Schema for ESB

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
6.1 Identification Elements							
6.1.1	Emergency Service Boundary NENA Globally Unique ID	ES_NGUID	TEXT	254	**Mandatory**		NENA
6.2 Relate Elements							
6.3 Address Elements							
6.4 Area Elements							
6.4.1	State	State	TEXT	2	**Mandatory**		US Census, NENA
6.5 Functional Elements							
6.5.1	Agency ID	Agency_ID	TEXT	100	**Mandatory**		NENA
6.5.2	Service URI	ServiceURI	TEXT	254	**Mandatory**		NENA
6.5.3	Service URN	ServiceURN	TEXT	50	**Mandatory**	NENA *urn:nena:service:sos Registry*	NENA
6.5.4	Service Number	ServiceNum	TEXT	15	Optional		NENA
6.5.5	Agency vCard URI	AVcard_URI	TEXT	254	**Mandatory**		NENA
6.5.6	Display Name	DsplayName	TEXT	60	**Mandatory**		NENA
6.6 Management Elements							
6.6.1	Date Updated	DateUpdate	DATE		**Mandatory**		NENA
6.6.2	Effective Date	Effective	DATE		Optional		NENA
6.6.3	Expiration Date	Expire	DATE		Optional		NENA
6.7 9-1-1 Elements6.7 9-1-1 Elements							
6.7.16.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	75	**Mandatory**		NENA

Missouri NG9-1-1 Data Schema for Provisioning Boundaries

Missouri NG9-1-1 Data Schema for Provisioning Boundary

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
7.1 Identification Elements							
7.1.1	Provisioning Boundary NENA Globally Unique ID	PB_NGUID	TEXT	254	**Mandatory**		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		**Mandatory**		NENA
7.6.2	Effective Date	Effective	DATE		Optional		NENA
7.6.3	Expiration Date	Expire	DATE		Optional		NENA
7.7 9-1-1 Elements7.7 9-1-1 Elements							
7.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	75	**Mandatory**		NENA

Missouri NG9-1-1 Data Schema for Incorporated Municipality Boundaries

Missouri NG9-1-1 Data Schema for Incorporated Municipality Boundaries

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
7.1 Identification Elements							
7.1.1	Incorporated Municipality NENA Globally Unique ID	IncM_NGUID	TEXT	254	**Mandatory**		NENA
7.2 Relate Elements							
7.3 Address Elements							
7.4 Area Elements							
8.4.1	Country	Country	TEXT	2	**Mandatory**		NENA
8.4.2	State	State	TEXT	2	**Mandatory**		US Census, NENA
8.4.3	County	County	TEXT	40	**Mandatory**	*MONG911CountyDomain*	US Census, NENA
8.4.4	Incorporated Municipality	Inc_Muni	TEXT	100	**Mandatory**		US Census, NENA
8.4.5	Additional Code	AddCode	TEXT	6	Conditional		NENA
7.5 Functional Elements							
7.6 Management Elements							
7.6.1	Date Updated	DateUpdate	DATE		**Mandatory**		NENA
7.6.2	Effective Date	Effective	DATE		Optional		NENA
7.6.3	Expiration Date	Expire	DATE		Optional		NENA
7.7 9-1-1 Elements							
7.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	75	**Mandatory**		NENA

Missouri NG9-1-1 Data Schema for County Boundaries

Missouri NG9-1-1 Data Schema for County Boundaries

Element Number	Element Name	Database Field Name	Field Type	Field Width	Inclusion	Domain	Reference Standard
9.1 Identification Elements							
9.1.1	County NENA Globally Unique ID	Cnty_NGUID	TEXT	254	**Mandatory**		NENA
9.2 Relate Elements							
9.3 Address Elements							
9.4 Area Elements							
9.4.1	Country	Country	TEXT	2	**Mandatory**		NENA
9.4.2	State	State	TEXT	2	**Mandatory**		US Census, NENA
9.4.3	County	County	TEXT	40	**Mandatory**	*MONG911CountyDomain*	US Census, NENA
9.5 Functional Elements							
9.6 Management Elements							
9.6.1	Date Updated	DateUpdate	DATE		**Mandatory**		NENA
9.6.2	Effective Date	Effective	DATE		Optional		NENA
9.6.3	Expiration Date	Expire	DATE		Optional		NENA
9.7 9-1-1 Elements							
9.7.1	Discrepancy Agency ID	DiscrpAgID	TEXT	75	**Mandatory**		NENA

Potential Future NENA Changes

- NENA standards undergo continuous review and update
- Many standards have cross dependencies
- Important to monitor NENA standards development
  - Anyone can participate in Public Review
  - Join a NENA workgroup
- NENA GIS standards with expected changes
  - NENA-STA-004, Civic Location Data Exchange Format (CLDXF)
  - NENA-STA-006, NG9-1-1 GIS Data Model

Potential Future NENA Changes

- New CLDXF elements (will also impact GIS Data Model):
  - Site
  - Subsite
  - Structure - expands on v1 Building field
  - Unit PreType
  - Unit Value

  } splits v1 Unit field into two fields

  - Wing
  - Section
  - Row

Potential Future NENA Changes

- Existing elements planned for removal or replacement:
  - **Complete Landmark Name** replaced by:
    - **Site** - large named area
    - **Subsite** - named sub-area within a Site
    - **Structure** - Any named or identified vertical feature
  - **Building** replaced by new **Structure** element
    - Building, cell tower, fuel tank, etc.
  - **Unit** separated into two elements:
    - **Unit PreType** - the kind of unit (e.g., apartment, suite)
    - **Unit Value** - uniquely identifies a particular unit (e.g., 101, 12B)

Parsing Addresses into NENA Compliant Fields

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Street Address Elements

- Address Number Prefix
- Address Number
- Address Number Suffix
- Milepost
- 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

Parsing Examples

123 ½ Prospect Avenue

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

123 ½ Prospect Avenue

AddressNumberPrefix	
AddressNumber	**123**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

123 ½ Prospect Avenue

AddressNumberPrefix	
AddressNumber	**123**
AddressNumberSuffix	**1/2**
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

123 ½ Prospect Avenue

AddressNumberPrefix	
AddressNumber	**123**
AddressNumberSuffix	**1/2**
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Prospect**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

123 ½ Prospect Avenue

AddressNumberPrefix	
AddressNumber	**123**
AddressNumberSuffix	**1/2**
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Prospect**
PostType	**Avenue**
PostDirectional	
PostModifier	

Parsing Examples

5246 North Lane Avenue

AddressNumberPrefix	
AddressNumber	**5246**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

5246 North Lane Avenue

AddressNumberPrefix	
AddressNumber	**5246**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Lane**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

5246 North Lane Avenue

AddressNumberPrefix	
AddressNumber	**5246**
AddressNumberSuffix	
PreModifier	
PreDirectional	**North**
PreType	
SeparatorElement	
StreetName	**Lane**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

5246 North Lane Avenue

AddressNumberPrefix	
AddressNumber	**5246**
AddressNumberSuffix	
PreModifier	
PreDirectional	**North**
PreType	
SeparatorElement	
StreetName	**Lane**
PostType	**Avenue**
PostDirectional	
PostModifier	

Parsing Examples

289 Northwest North Ridge Drive

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

289 Northwest North Ridge Drive

AddressNumberPrefix	
AddressNumber	**289**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

289 Northwest North Ridge Drive

AddressNumberPrefix	
AddressNumber	**289**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**North Ridge**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

289 Northwest North Ridge Drive

AddressNumberPrefix	
AddressNumber	**289**
AddressNumberSuffix	
PreModifier	
PreDirectional	**Northwest**
PreType	
SeparatorElement	
StreetName	**North Ridge**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

289 Northwest North Ridge Drive

AddressNumberPrefix	
AddressNumber	**289**
AddressNumberSuffix	
PreModifier	
PreDirectional	**Northwest**
PreType	
SeparatorElement	
StreetName	**North Ridge**
PostType	**Drive**
PostDirectional	
PostModifier	

Parsing Examples

38 West South 4th Street

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

38 West South 4th Street

AddressNumberPrefix	
AddressNumber	38
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

38 West South 4th Street

AddressNumberPrefix	
AddressNumber	**38**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**4th**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

38 West South 4th Street

AddressNumberPrefix	
AddressNumber	**38**
AddressNumberSuffix	
PreModifier	
PreDirectional	**South**
PreType	
SeparatorElement	
StreetName	**4th**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

38 West South 4th Street

AddressNumberPrefix	
AddressNumber	**38**
AddressNumberSuffix	
PreModifier	**West**
PreDirectional	**South**
PreType	
SeparatorElement	
StreetName	**4th**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

38 West South 4th Street

AddressNumberPrefix	
AddressNumber	**38**
AddressNumberSuffix	
PreModifier	**West**
PreDirectional	**South**
PreType	
SeparatorElement	
StreetName	**4th**
PostType	**Street**
PostDirectional	
PostModifier	

Parsing Examples

332 West South 4th Street

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

332 West South 4th Street

AddressNumberPrefix	
AddressNumber	332
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

332 West South 4th Street

AddressNumberPrefix	
AddressNumber	**332**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**South 4th**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

332 West South 4th Street

AddressNumberPrefix	
AddressNumber	**332**
AddressNumberSuffix	
PreModifier	
PreDirectional	**West**
PreType	
SeparatorElement	
StreetName	**South 4th**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

332 West South 4th Street

AddressNumberPrefix	
AddressNumber	**332**
AddressNumberSuffix	
PreModifier	
PreDirectional	**West**
PreType	
SeparatorElement	
StreetName	**South 4th**
PostType	**Street**
PostDirectional	
PostModifier	

Parsing Examples

355 Saint Catherines Lane

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

355 Saint Catherines Lane

AddressNumberPrefix	
AddressNumber	**355**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

355 Saint Catherines Lane

AddressNumberPrefix	
AddressNumber	**355**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Saint Catherines**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

355 Saint Catherines Lane

AddressNumberPrefix	
AddressNumber	**355**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Saint Catherines**
PostType	**Lane**
PostDirectional	
PostModifier	

Parsing Examples

8096 South Fox's Den Road

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

8096 South Fox's Den Road

AddressNumberPrefix	
AddressNumber	**8096**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

8096 South Fox’s Den Road

AddressNumberPrefix	
AddressNumber	**8096**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Fox’s Den**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

8096 South Fox’s Den Road

AddressNumberPrefix	
AddressNumber	**8096**
AddressNumberSuffix	
PreModifier	
PreDirectional	**South**
PreType	
SeparatorElement	
StreetName	**Fox’s Den**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

8096 South Fox’s Den Road

AddressNumberPrefix	
AddressNumber	**8096**
AddressNumberSuffix	
PreModifier	
PreDirectional	**South**
PreType	
SeparatorElement	
StreetName	**Fox’s Den**
PostType	**Road**
PostDirectional	
PostModifier	

Parsing Examples

10988 Old United States Highway 40

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

10988 Old United States Highway 40

AddressNumberPrefix	
AddressNumber	**10988**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

10988 Old United States Highway 40

AddressNumberPrefix	
AddressNumber	**10988**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**40**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

10988 Old United States Highway 40

AddressNumberPrefix	
AddressNumber	**10988**
AddressNumberSuffix	
PreModifier	**Old**
PreDirectional	
PreType	
SeparatorElement	
StreetName	**40**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

10988 Old United States Highway 40

AddressNumberPrefix	
AddressNumber	**10988**
AddressNumberSuffix	
PreModifier	**Old**
PreDirectional	
PreType	**United States Highway**
SeparatorElement	
StreetName	**40**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

7381 Old Hawthorne Drive East

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

7381 Old Hawthorne Drive East

AddressNumberPrefix	
AddressNumber	**7381**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

7381 Old Hawthorne Drive East

AddressNumberPrefix	
AddressNumber	**9709**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Old Hawthorne**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

7381 Old Hawthorne Drive East

AddressNumberPrefix	
AddressNumber	**7381**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Old Hawthorne**
PostType	**Drive**
PostDirectional	
PostModifier	

Parsing Examples

7381 Old Hawthorne Drive East

AddressNumberPrefix	
AddressNumber	**7381**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Old Hawthorne**
PostType	**Drive**
PostDirectional	**East**
PostModifier	

Parsing Examples

3134 Avenue of the Columns

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

3134 Avenue of the Columns

AddressNumberPrefix	
AddressNumber	**3134**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

3134 Avenue of the Columns

AddressNumberPrefix	
AddressNumber	**3134**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Columns**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

3134 Avenue of the Columns

AddressNumberPrefix	
AddressNumber	**3134**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	**Avenue**
SeparatorElement	
StreetName	**Columns**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

3134 Avenue of the Columns

AddressNumberPrefix	
AddressNumber	**3134**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	**Avenue**
SeparatorElement	**of the**
StreetName	**Columns**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

429 North Lake of the Woods Road

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

429 North Lake of the Woods Road

AddressNumberPrefix	
AddressNumber	429
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

429 North Lake of the Woods Road

AddressNumberPrefix	
AddressNumber	**429**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Lake of the Woods**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

429 North Lake of the Woods Road

AddressNumberPrefix	
AddressNumber	**429**
AddressNumberSuffix	
PreModifier	
PreDirectional	**North**
PreType	
SeparatorElement	
StreetName	**Lake of the Woods**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

429 North Lake of the Woods Road

AddressNumberPrefix	
AddressNumber	**429**
AddressNumberSuffix	
PreModifier	
PreDirectional	**North**
PreType	
SeparatorElement	
StreetName	**Lake of the Woods**
PostType	**Road**
PostDirectional	
PostModifier	

Parsing Examples

Interstate 35 northbound

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

Interstate 35 northbound

AddressNumberPrefix	
AddressNumber	
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**35**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

Interstate 35 northbound

AddressNumberPrefix	
AddressNumber	
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	**Interstate**
SeparatorElement	
StreetName	**35**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

Interstate 35 northbound

AddressNumberPrefix	
AddressNumber	
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	**Interstate**
SeparatorElement	
StreetName	**35**
PostType	
PostDirectional	
PostModifier	**northbound**

Parsing Examples

38 Buttonwood Access

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

38 Buttonwood Access

AddressNumberPrefix	
AddressNumber	38
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

38 Buttonwood Access

AddressNumberPrefix	
AddressNumber	**38**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Buttonwood**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

38 Buttonwood Access

AddressNumberPrefix	
AddressNumber	**38**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**Buttonwood**
PostType	
PostDirectional	
PostModifier	**Access**

Parsing Examples

934 East 14th Terrace Drive North

AddressNumberPrefix
AddressNumber
AddressNumberSuffix
PreModifier
PreDirectional
PreType
SeparatorElement
StreetName
PostType
PostDirectional
PostModifier

Parsing Examples

934 East 14th Terrace Drive North

AddressNumberPrefix	
AddressNumber	**934**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	
PostType	
PostDirectional	
PostModifier	

Parsing Examples

934 East 14th Terrace Drive North

AddressNumberPrefix	
AddressNumber	**934**
AddressNumberSuffix	
PreModifier	
PreDirectional	
PreType	
SeparatorElement	
StreetName	**14th Terrace**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

934 East 14th Terrace Drive North

AddressNumberPrefix	
AddressNumber	**934**
AddressNumberSuffix	
PreModifier	
PreDirectional	**East**
PreType	
SeparatorElement	
StreetName	**14th Terrace**
PostType	
PostDirectional	
PostModifier	

Parsing Examples

934 East 14th Terrace Drive North

AddressNumberPrefix	
AddressNumber	**934**
AddressNumberSuffix	
PreModifier	
PreDirectional	**East**
PreType	
SeparatorElement	
StreetName	**14th Terrace**
PostType	**Drive**
PostDirectional	
PostModifier	

Parsing Examples

934 East 14th Terrace Drive North

AddressNumberPrefix	
AddressNumber	**934**
AddressNumberSuffix	
PreModifier	
PreDirectional	**East**
PreType	
SeparatorElement	
StreetName	**14th Terrace**
PostType	**Drive**
PostDirectional	**North**
PostModifier	

QC Checks

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QC Checks

- **General QC Checks**
  - Missouri NG9-1-1 GIS Data Standard format
  - Mandatory fields populated
  - NGUIDs are unique
- **Boundary**
  - No gaps/overlaps
  - ESBs entirely cover the Provisioning Boundary
- **Site Structure Address Points**
  - Addresses are unique
  - Addresses are not outside Provisioning Boundary

QC Checks

- **Road Centerlines**
  - Segmented at boundaries and snapped to features
  - Segment long enough and drawn in correct direction
  - No address gaps, overlaps, directional or parity issues
  - Segments are not outside Provisioning Boundary
- **Site Structure Address Points to Road Centerlines**
  - Street name and place name matches
  - Address is in street segment range and block with no parity issue

QC Checks

- **ALI to Road Centerlines Synchronization**
  - Street name and place name matches
  - Address is in street segment range
- **ALI to Site Structure Address Points Synchronization**
  - Address number, street name and place name matches
- **MSAG (low to high) to Road Centerlines**
  - Address range, street name and place name matches
- 98% match rate often cited as a benchmark
- Quality Control Exceptions
  - Feature level flags to omit from QC checks

Best Practices

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Best Practices - Considerations

- **Develop and Provide Metadata for each layer**
  - Basic abstract with point of contact
  - Reference system information
  - Date Updated - when created or last made

If created/modified prior to edit tracking – any date prior to NG9-1-1 transition valid

- **Use of Orthoimagery versus GPS Data Collection**
  - High-res imagery can be cost effective for creating spatially accurate data

    Missouri State GIS Clearinghouse - MSDIS (missouri.edu).
  - Limit field data collection

Best Practices - Considerations

- **Road Centerline Considerations**
  - Alignment/segmentation
  - Limitations of CAD software
- **Site/Structure Address Point Considerations**
  - Placement Method (structure, site, property access, parcel, geocoding)
  - Amount of subaddress detail needed
  - Limitations of CAD Software

Best Practices - Considerations

- **PSAP, ESB & Provisioning Boundary Accuracy**
  - No unintentional gaps and overlaps
  - Provisioning Boundary goes not always equal the PSAP Boundary

Best Practices are just recommendations, not requirements

Best Practices - Road Centerlines (RCL)

- **Road Centerline Digitizing Direction**
  - Digitize RCLs in the direction of:
    - increasing addresses
    - increasing mile markers
    - the local addressing grid (if unaddressed or has parity issues)
  - Roads with a physical barrier should have two centerlines
  - Cul-de-sacs should show center physical median if it exists

Best Practices - Road Centerlines (RCL)

- **Road Centerline Segmentation**
  - Roads should always be split in the following cases:
    - Road intersections
    - Boundaries (e.g., County, PSAP, ESB, ESN, MSAG, etc.)
    - Change in the street name
    - Change in the addressing grid
    - Change in other attribute values (e.g., One-Way, Speed Limit)
  - Intersection at an overpass/underpass
    - Must carry elevation data
    - Dependent on CAD software

Best Practices - Road Centerlines (RCL)

- **Segmentation - Alignment at Boundaries**
  - Critical for providing accurate locations geocoded from RCLs
    - RCLS must be snapped to boundaries
    - RCLS must align node for node with corresponding boundaries
    - Must not have spatial gaps or overlaps
  - Neighboring jurisdictions must agree on boundary location
    - Create a “Stitch Point Layer”
    - Agreed upon point locations for data maintenance purposes

Example: Local Response Agreements

Break at PSAP and County Boundaries

Best Practices - Road Centerlines (RCL)

- **Naming and Addressing - Address Ranges**
  - Address ranges must not have unintentional gaps or overlaps
    - Intentional gaps may exist at jurisdictional boundaries
    - No NENA requirement for potential or actual address ranges
  - 0-0 address ranges should be avoided
    - CAD software may require them

Best Practices - Road Centerlines (RCL)

- **Naming and Addressing**
  - Different Street Names on Each Side of the RCL
    - Work towards a single street name
    - If necessary, create two centerlines slightly offset
  - RCL in a Different Jurisdiction than the Addressed Property
    - RCL attributes must reflect addressed properties on each side of the road centerline

Best Practices - Road Centerlines (RCL)

- **Naming and Addressing - Interstates/Highways**
  - Include travel direction in the Post Modifier (in lowercase)

Example: I70 EB

Street Name Pre Type:	**Interstate**
Street Name:	**70**
Street Name Post Modifier:	**eastbound**

Best Practices - Road Centerlines (RCL)

- **Naming and Addressing - Ramps and Interchanges**
  - Place everything in Street Name field as follows:

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

  - Some abbreviations may be necessary (due to 60 char limit):
    - **I, HWY, M/MO, RTE, CR -** road jurisdictions
    - **NB, SB, EB, WB -** travel direction
  - Examples

Street Name: Off Ramp Exit 127 I70 EB to MO763 NB

Street Name: Off Ramp 291 HWY NB to N 210 HWY SB

Street Name: On Ramp Oak Trafficway SB to I 70/35 EB

Best Practices - Road Centerlines (RCL)

- **Overlapping Routes and Multiple Street Names**
  - Roads may be known by many different names/route numbers
  - Populate RCL with official 9-1-1 name assigned by the Street Naming Authority
  - Future version of Missouri NG9-1-1 Standard expected to include an alias table to allow for multiple names
  - Develop alias table now if CAD system allows

Best Practices - Road Centerlines (RCL)

- **Street Naming Hierarchy**
  - **Where two official street names overlap** (e.g., traffic circles)
    - 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

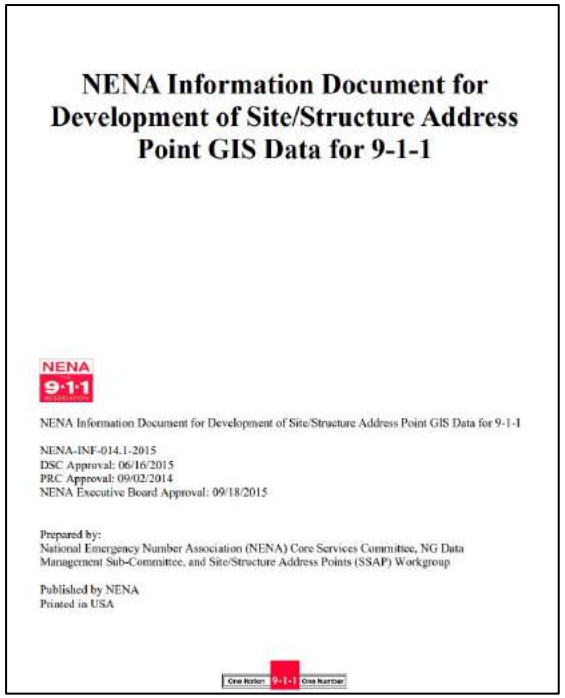
**If multiple routes are at same hierarchy level, the lower number takes priority*

Best Practices - Road Centerlines (RCL)

- **Roundabouts and Traffic Circles**
  - If applicable - Section 13.1.5 Overlapping Routes and Multiple Street Naming Hierarchy concepts
  - Future work - Develop a best practice for road names on roundabouts and traffic circles

Best Practices - Site Structure Address Points (SSAP)

- **Address Point Placement**
  - *NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1*
  - Five address point placement methodologies
    - Geocoding
    - Parcel
    - Site
    - Structure
    - Property Access


NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1

NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1

NENA-INF-014.1-2015
DSC Approval: 06/16/2015
PRC Approval: 09/02/2014
NENA Executive Board Approval: 09/18/2015

Prepared by:
National Emergency Number Association (NENA) Core Services Committee, NG Data Management Sub-Committee, and Site/Structure Address Points (SSAP) Workgroup

Published by NENA
Printed in USA

[Development of Site/Structure Address Point GIS Data for 9-1-1 - National Emergency Number Association (nena.org)]

Best Practices - Site Structure Address Points (SSAP)

- **Address Point versus Access Point**
  - Address points are placed on the addressed feature
  - Access Point is the point of access to the addressed feature
    - Driveway, Gate
    - Entrance to building containing multiple addresses
    - Entrance to building where the entrance serves specific addresses in the building
  - May be useful to provide an address point and access point
    - Placement Method attribute should be populated

Example: Long Driveway

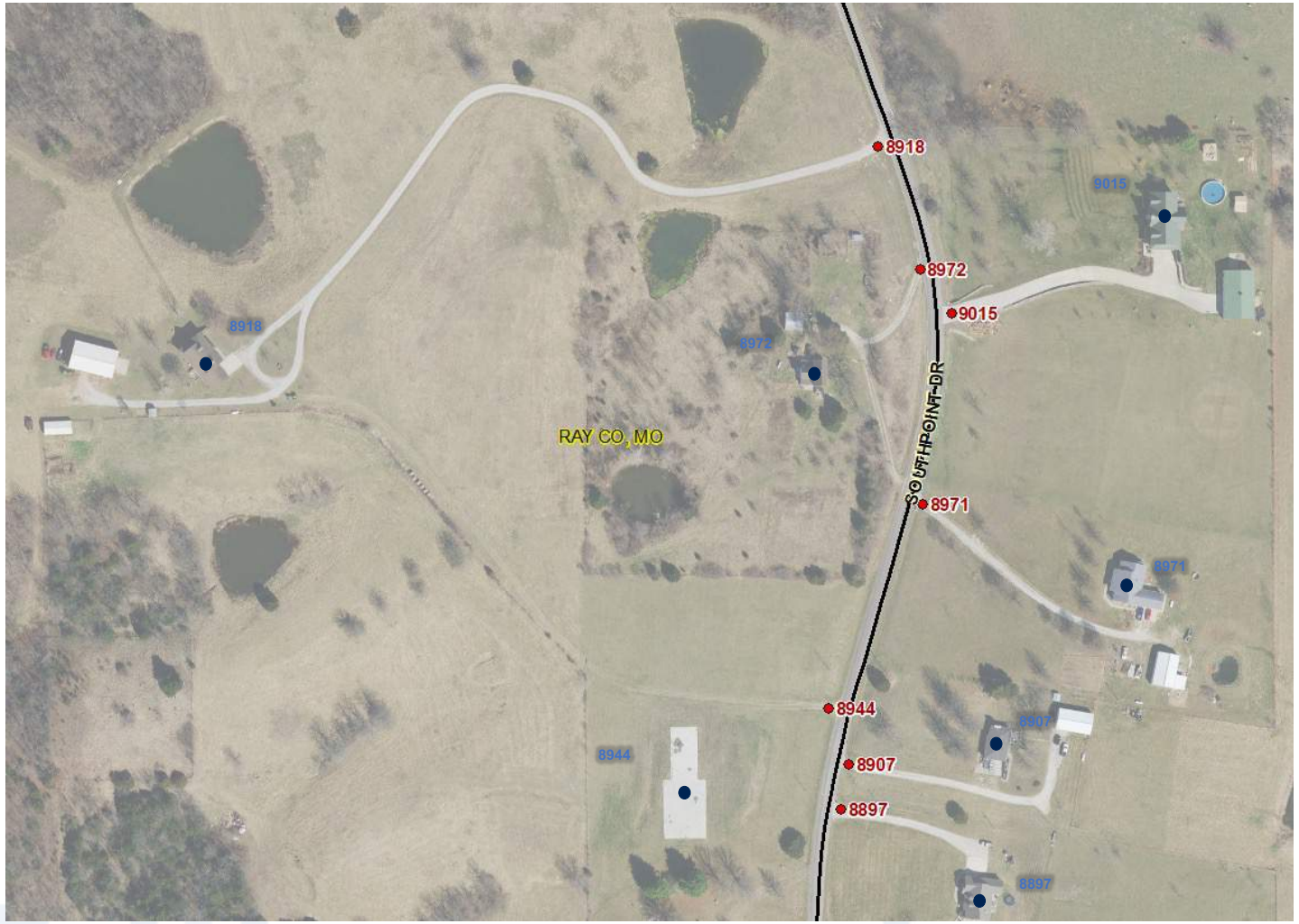


Figure 15-1 Structure Address Points structure placement versus driveway placement

Example: Shared Driveway

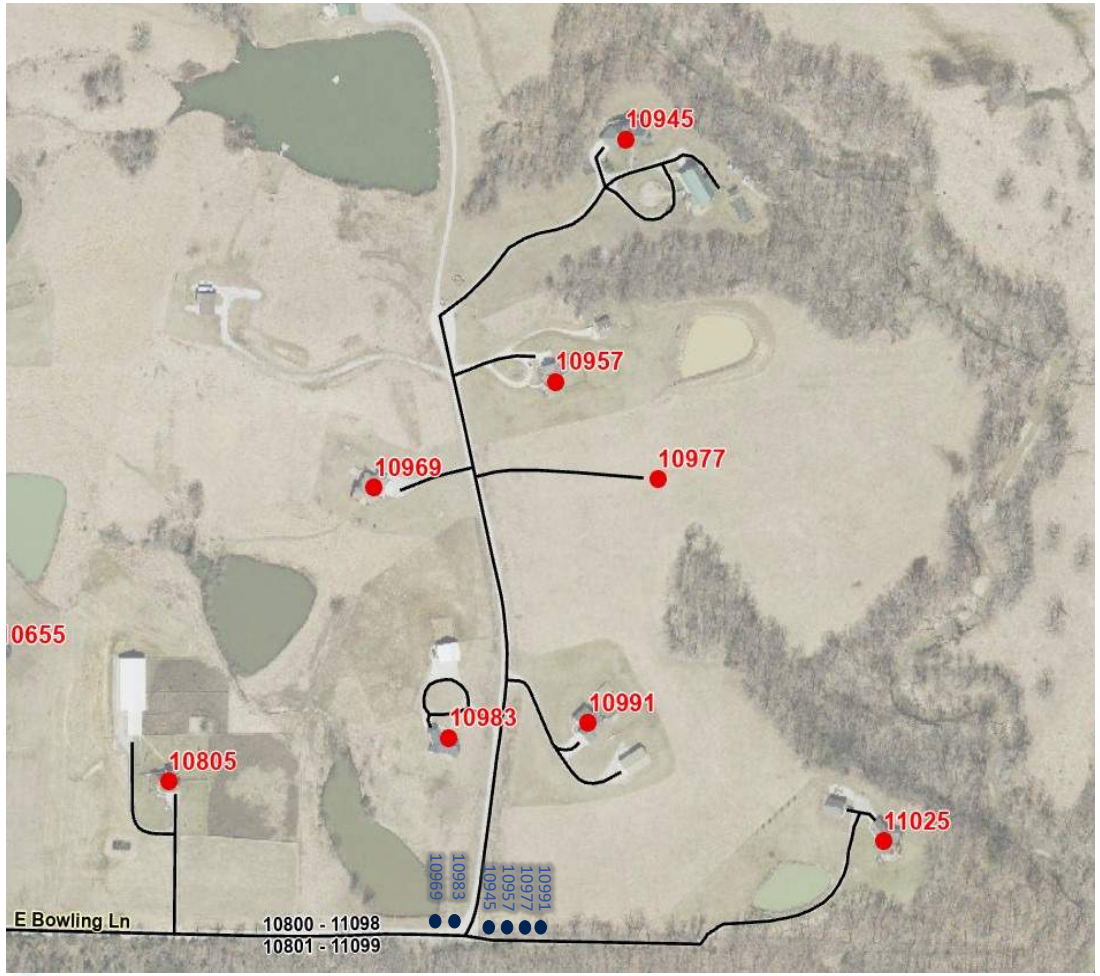


Figure 15-2 Structure Address Points on structures with property access address points at the shared driveway

Best Practices - Site Structure Address Points (SSAP)

- **Business Complex**
  - Common in shopping centers, condos, apartments, etc.
  - May have its own address number or be a subaddress
  - Placement - entrances separate or shared
  - If separate entrance, place entrance
  - Shared entrance - “stacked” address points
  - Place within building footprint near building base

Example: Business Complex

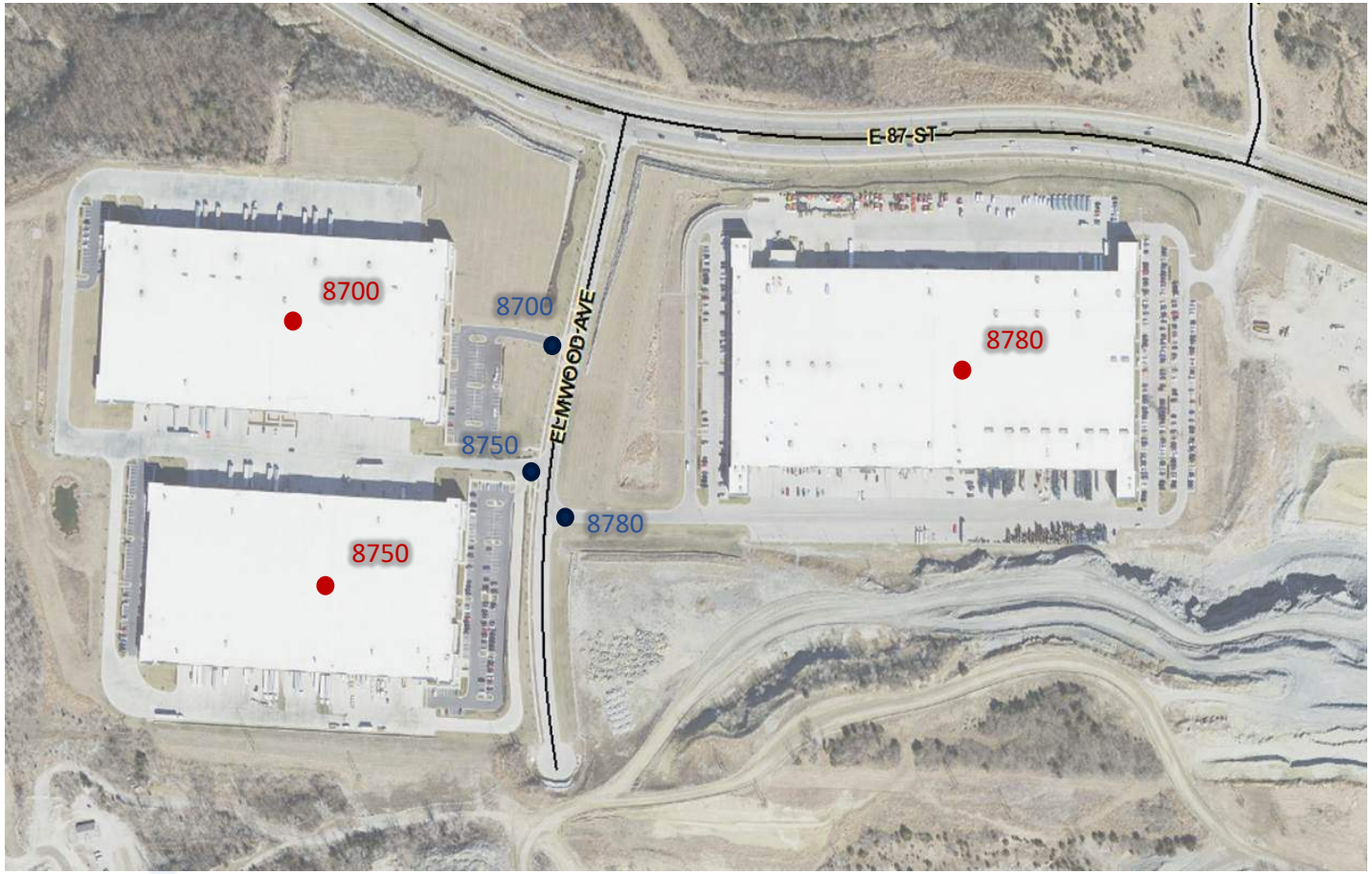


Figure 15-3 Property Access Address Points Indicating the Entrance to Use to Reach the Structure

Best Practices - Site Structure Address Points (SSAP)

- **Street name address and adjacent road not match**
  - Road Construction
  - Unable to readdress
  - Structure address point and a Property Access address point

Example: Street name not match address

Figure 15-4 Property Access Address Points indicating the entrance to use to reach the Structures

Best Practices - Site Structure Address Points (SSAP)

- **Multiple Addresses or Units in Single Structure**
  - Individual units in building may be have own address or share same address with subaddress
  - Subaddress example: apartment, unit, suite, etc.
  - Address placement - units share an entrance or separate entrance
  - Should be placed near addressed unit entrance (within building footprint)

Example: Multiple Addresses - Single Structure

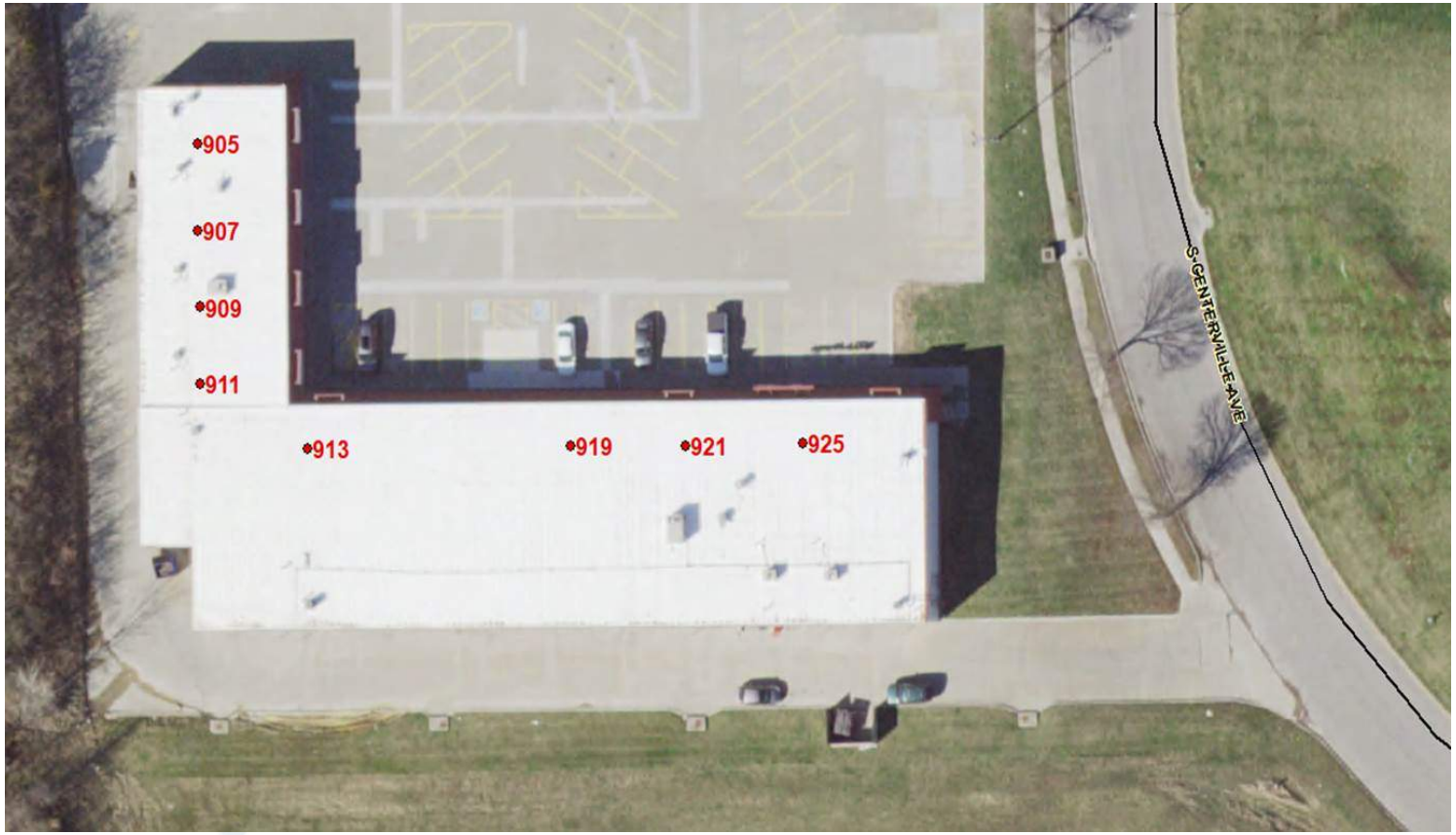


Figure 15-5 Multiple addresses within a single structure, all with separate entrances

Example: Multiple Addresses - Single Structure

Figure 15-6 Multiple addresses within a single structure, all with separate entrances with upper-level apartments addressed based on entrance location

Example: Multiple Addresses - Single Structure

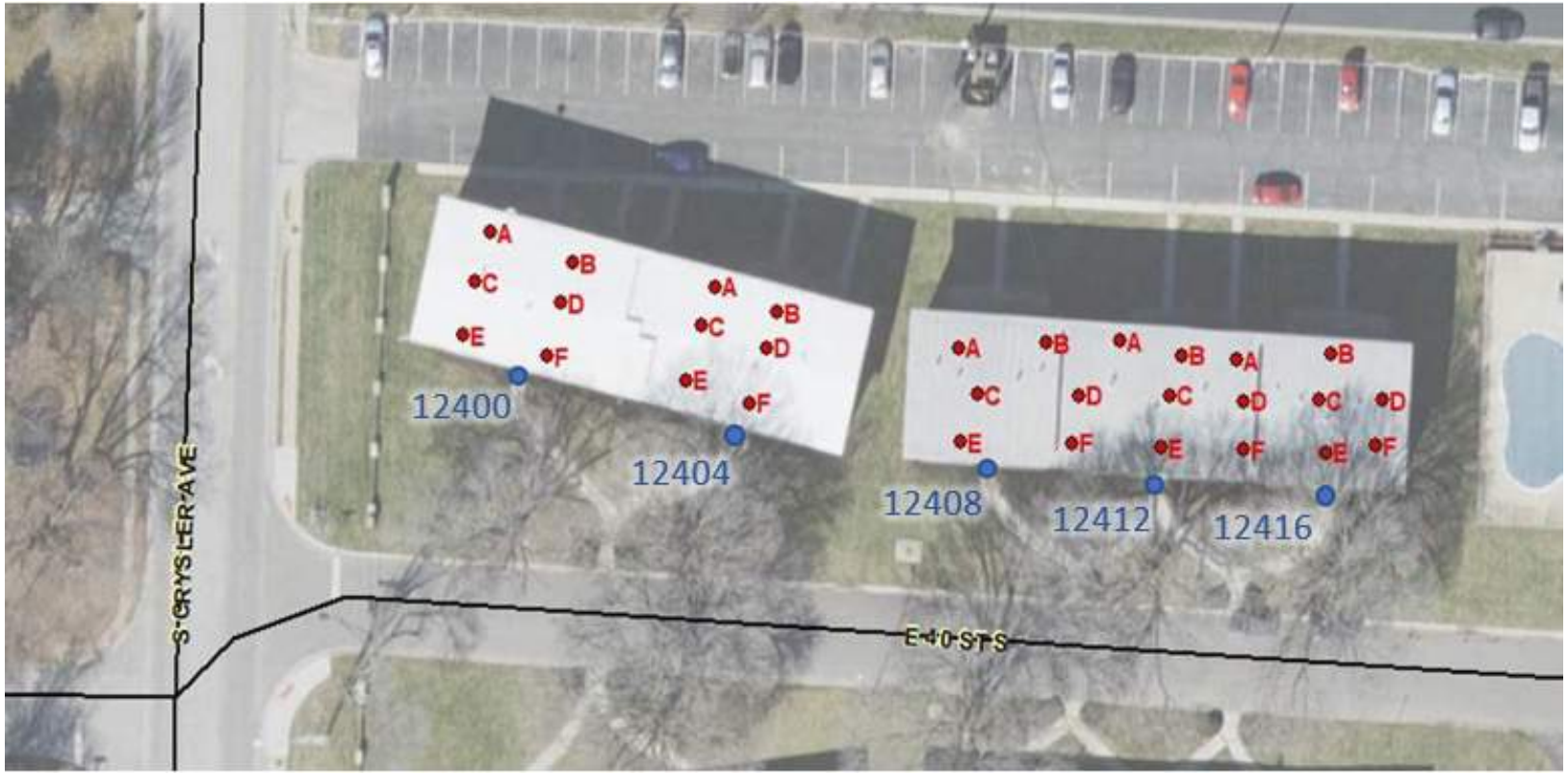


Figure 15-7 Multiple addresses within a single structure, sharing a common entrance

Best Practices - Site Structure Address Points (SSAP)

- **Multiple Structures and/or Sites Sharing the Same Address**
  - Common in medical/education campuses, office complexes, mobile home parks, campgrounds, recreation areas
  - Each structure/site should have its own address point with subaddress information
  - Create a Property Access point with only property address at primary property access

Example: Multiple Structures/Sites with Same Address

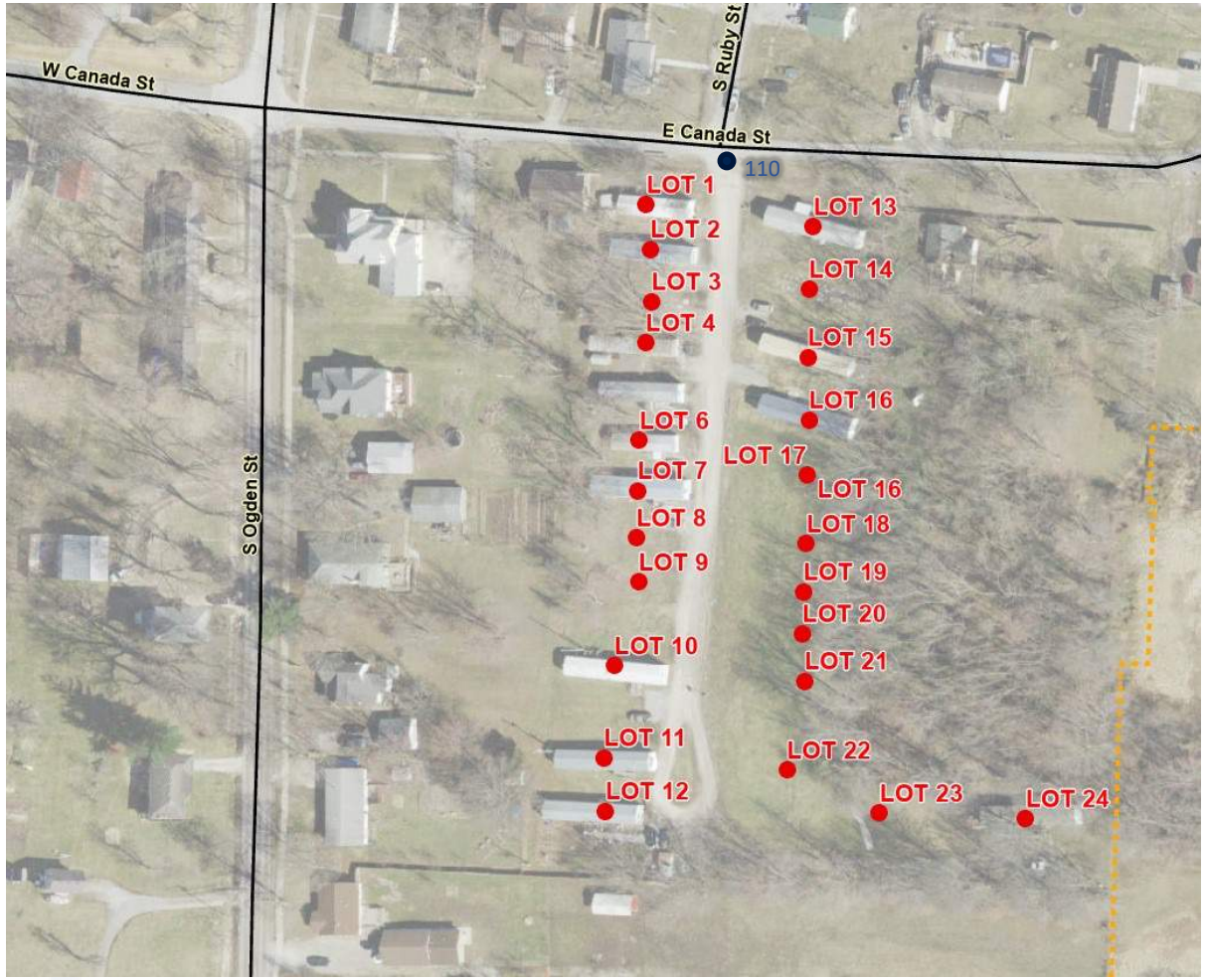


Figure 15-8 Structures share same address but are differentiated by their unit number

Example: Multiple Structures/Sites with Same Address

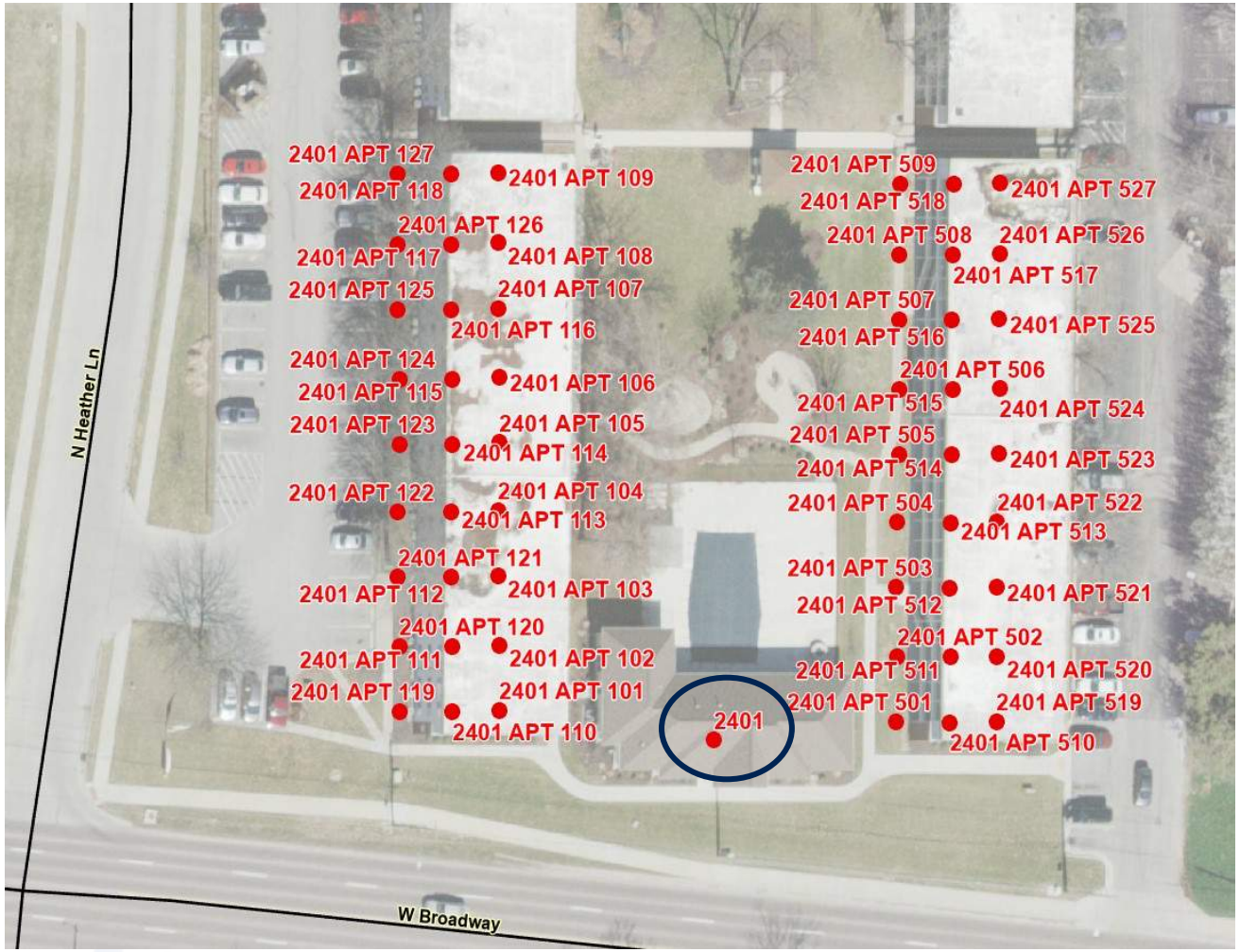


Figure 15-9 Administrative building has same address but no unit number as other subaddressed structures

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Best Practices - Site Structure Address Points (SSAP)

- **Multiple Properties Sharing One Address**
  - Large properties may have multiple parcels
  - May extend across road
  - Place address point on structure, (address may conflict with address range)
  - If no structure exists:
    - place Parcel point, avoiding parity conflict
    - place Property Access point, where a specific feature is being accessed (e.g., fishing pond, hunting camp)

Best Practices - Site Structure Address Points (SSAP)

- **Transient Structures**
  - Temporary structures that can be moved
  - If seasonal or frequently moved:
    - place Property Access point
    - place Parcel point if no obvious driveway or other entrance
  - If moved less frequently or a small area:
    - place point where transient structure would normally be
    - Placement Method = **site** if subaddress (e.g., lot #, unit #, campsite #)
    - Placement Method = **parcel** if only one address for entire property

Best Practices - Site Structure Address Points (SSAP)

- **Location Markers**
  - Mile posts, trailhead markers, trail intersection markers
  - Valuable reference when civic address information is not available
  - If used for call routing, create an address point and populate “MilePost” field
  - If used for map display, place in Mile Marker layer

Best Practices - Site Structure Address Points (SSAP)

- **Military Bases**
  - May or may not have their own PSAP
  - Will share limited address information - usually only street names
  - May restrict address information for 9-1-1 operations only
  - For assistance, contact the Missouri 911 Service Board

Pending Future Work

- Development and maintenance of domains used within Missouri
- Determine Discrepancy Agency Identifier values that will be standardized at the state level in conjunction with the NG Core Service provider
- Development of an Alias Street Names table
- 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

Pending Future Work

- Develop a best practice for road names on roundabouts and traffic circles
- Create a list of standardized QC exception codes and descriptions level in conjunction with the NG Core Service provider
- Minimum metadata elements required with local data submission and whether metadata should be on the data or in a separate file
- Discuss data sharing and add language to the Missouri GIS Data Standard and Best Practices once a policy is in place.

Pending Future Work

- Monitor changes to the NENA Site/Structure Address Point Placement Method Registry
- Monitor changes to NENA Civic Location Data Exchange Format (CLDXF)
- Monitor changes to NENA Standard for NG9-1-1 GIS Data Model
- Monitor work and output of NENA 3D GIS workgroup

Questions + Discussion

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