VERSION 7.3.4

MARCH 24, 2022

GIS DATA STANDARDS FOR NG9-1-1

FOR THE EMERGENCY COMMUNICATIONS DISTRICTS OF TENNESSEE

TENNESSEE EMERGENCY COMMUNCIATIONS BOARD
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RELEASE AND VERSIONING

Type	Version	Description
Working Draft	0.1	Revising text, tables, definitions.
	0.202	Addition of Address Point attribution.
	0.305	Addition of ESN polygonal layer.
Public Release	1.0	Addition of *Version Changes*.
	1.2	Upper-case formatting for [DESCRIPTION] field in street centerline attribution.
	1.3	Addition of Driveways centerline layer.
	1.5	Addition of Trail centerline layer.
	2.0	Removed underscore (_) as non-Uniform punctuation.
	2.5	Changed [LAT], [LONG], [X_SP], [Y_SP] fields from Long Integer to Double to allow for decimal.
	3.0	Removed [DELETE_} field form *Common Attribution* (merged requirements into [STATUS] field). Added [STATUS] field to *Common Attribution.* Removed [STATUS] field treatment under *Address Point Attribution.* Changed [STRUCTYPE] requirements. Revised [STPRETYPE], [STTYPE] field requirements referencing Appendix A.
	3.1	Changed [TLENGTH] to Double.
	3.2	Removed pseudo-ESN fields. Whether the zones are pseudo-ESNs or not, the values need to appear in the [ESN] field.
	3.3	Changed [LAT], [LONG] fields to String type with a width of 10. Field values will be in Degrees, Decimal Minutes in the form "XX XX.XX". This is to accommodate incident location from an aircraft (e.g., Med-Evac).
	3.5	Added pavement type [PTYPE] to the driveway centerline.
		Changed [PARKTYPE] to Short Integer type with coded values.
	3.6	Changed [LAT], [LONG] fields to a width of 15 and waved the aforementioned format restriction to allow a more flexible field value (see documentation for examples). Coordinate values remain Degrees, Decimal Minutes and the field type remains String. The **Calculate Geometry…** option in ArcGIS allows for populating values containing the degree (°) and minute (') symbols with cardinal direction or negative Longitude options.

	3.7	Added [LE], [FD] and [EMS] fields to the ESN attribute table to accommodate Law Enforcement, Fire Department and Emergency Medical Services values respectively.
	4.0	Modified tables to support more attribution and functionality: a. Eliminated the *Common Attributes* section to make layer definitions more accessible. b. Modified street centerline description to include reference to an alternate names table. c. Modified table to be reflective of how the product looks. d. Added the following fields to the Street Centerline table: a. [NAMETYPE] b. [LANES] e. Lengthen [SEGID] field. f. Added Alternate Names table and field descriptions. g. Added [SEGID] to the Driveway centerlines table. h. Added [OIR] field to Trail centerlines table. i. Added the following fields to the Address point table: a. [R_SEGID] b. [L_SEGID] c. [STRUCDESC] d. [SECUNTNUM] e. [SUBNAME] j. Modified the following field definitions for the Address point table: a. [STRUCTYPE] b. [FLOOR]
	4.1	Full re-write/re-format of document. Added Layers: Linear Water Railroads Landmark/Points of Interest State Boundaries County Boundaries Zip Code Boundaries Municipal Boundaries Landmark Boundaries Major Water Features Airports These layers are in the initial part of implementation and some have yet to have their fields defined. Expanded field length of PRETYPE and TYPE to be a string of 5 instead of 4. Changed layer name from “DRIVEWAYS” to “PRIVATE SEGMENTS”.
	5.0	Update of document to reflect updates to centerlines, address points and ESN boundaries. As these are the only layers that

		TIPS is defining a standard for and maintaining at the state level utilizing feeds from the locals these are the only layers defined here. Removed Layers: Linear Water Railroads Landmark/Points of Interest State Boundaries County Boundaries Zip Code Boundaries Municipal Boundaries Landmark Boundaries Major Water Features Airports Expanded field length of PRETYPE and TYPE to be a string of 5 instead of 4. Changed layer name from “DRIVEWAYS” to “PRIVATE SEGMENTS”. Reconfigured Street Centerlines file: Renamed the L-R-T-F Add fields Added ADDR_TYPE field Added POSTMOD field Changed DESACRIPTION TO VANITY Added SUBNAME field Reconfigured Address Points: Added SEG_SIDE field Added UNIT_TYPE field Renamed PREDIR, PRETYPE, NAME, TYPE, SUFDIR Added POSTMOD field Changed LONG to LON Changed field widths on ADDRESS, ADDR_ESN, LABEL
	7.0	Rebranding of the standard to alleviate issues related to multiple version circulation, misinformation, and ownership of said standard. Consolidated schema and modeling specifications into one document. New format for individual field explanations with more thorough definitions and examples. New figures to aid cognition. Removed SECUNTNUM from Site Address Point layer, ESZ and ESQK from the ESN layer. Added sections and appendices that deal with MSAG and call routing in the Tennessee NG architecture.
	7.1	Added STRUCTYPE codes: 16 – Bus 17 – Quadplex 1309 – Storage Facility

	7.2	Added 18 – Communal Area to the STRUCTYPE codes Removed the decimal restriction in SPDLIMIT
	7.3	Added 1016 – Ferry Terminal to the STRUCTYPE codes
	7.3.1	Added distinction in the secondary address fields that isolate UNIT_TYPE and UNIT_NUM as impacting MSAG.
	7.3.2	Added STRUCTYPE codes: 19 – Residential Garage 808 – Saw Mill 912 – Guard Shack 1204 – Traffic Control Box 1410 – Food Truck 1411 – Zoo 1507 – Swimming Pool Removed “Garage” from 1304
	7.3.3	Added Emergency Service Boundaries as section 4 Changed General Modeling Specifications to section 5
	7.3.4	Updated section 4 (Service Boundaries) per GIS Advisory Committee vote to include the schema breakdown in the document and based on the upcoming version 2 of the NENA GIS Data Model

EXECUTIVE SUMMARY

This product specification provides detailed information about the geographic information system (GIS) layers available as part of the on-going conversion project by the State of Tennessee to Next Generation 9-1-1 (NG9-1-1). Formerly referred to as the Tennessee Information for Public Safety (TIPS) standard, this schema standards and modeling document provides the foundation for a successful migration and continued participation in the Next Generation architecture. It melds the former TIPS schema and modeling specifications into one document to provide a single reference source. The rebranding of this standard is to ensure that all Emergency Communications District (ECD) personnel and their vendors are utilizing the most up-to-date and currently authorized standard, and to show ownership of this standard by the Tennessee Emergency Communications Board (TECB).

Originally authored in 2008, before many standards governing GIS data for the NG transition were written, this schema has undergone various revisions. Beginning with version 7.0, attempts to bring these standards back in line with the NENA expectations, and clarify some ambiguity that has arisen out of the previous edits are primary goals. This document supersedes all other previous versions of this schema standard.

Working with local ECDs within the state and utilizing the project partners, the State of Tennessee aggregates locally updated geometry and attribute information and integrates these into a single consolidated and standardized database utilizing its partner resources. In turn, the State provides the ECDs with the updated statewide database at no cost. The ability for the ECDs to share and exchange data with the State allows the Districts to effectively manage their operations and improve public safety.

TECHNICAL REQUIREMENTS

BACKGROUND

In 1992, the Tennessee State Information Systems Council adopted Environmental Systems Research Institute (Esri) as the State of Tennessee standard GIS software platform. Pursuant to this, the aggregated and quality controlled statewide GIS data layers will be maintained by the program partner True North Geographic Technologies (True North) and distributed to local ECDs in an Esri data format. If an ECD is unsure if their current software platform supports and/or natively uses the Esri file format, please contact True North (see below under *Acknowledgements and Feedback* for contact information) or the software vendor directly.

The first data layers were created through the Tennessee Base Mapping Program (TNBMP). The TNBMP data products included not only street centerlines, but digital ortho imagery, a digital surface model, hydrography and drainage data, along with a comprehensive property (cadastral) ownership layer. The project is now complete, and the TNBMP has become a statewide digital orthophotography program, conducted in cooperation with the Tennessee Department of Transportation (TDOT). This program updates ortho imagery for a quarter of the state annually. With four regions, TDOT collects 1-foot digital color orthoimagery for the entire state once every four years. These orthoimagery data products are delivered free of charge to the ECDs as a part of this program, but have no editing specifications for the local Districts, and thus are not a part of this documentation.

Each participating ECD has the responsibility for maintaining the GIS data layers that not only support operations at their local PSAP(s), but directly affect the NG9-1-1 system as a whole for the state. The standards outline the common set of criteria that must be present in each District dataset that is uploaded to the State for processing.

True North Geographic Technologies (True North), in conjunction with Comtech, has been under contract with the TECB to maintain a comprehensive Spatial Interface (SI) and provide related services to the ECDs since July 2015. The vision for this effort is to develop a system that allows True North to facilitate the SI, provide standardized civic location data to other project constituents, and provide an up-to-date, statewide set of site address, road centerline and ESN layers in this schema format to any ECD for use in dispatching and emergency services. In particular, this statewide database will be essential for implementation of NG9-1-1 and the location of misrouted cell phone calls and Voice over Internet Protocol (VoIP) calls in adjacent Districts or any part of the State.

METADATA

The term *metadata* is defined as "information that describes the content, quality, condition, origin, and other characteristics of data or other pieces of information. Metadata for spatial data may describe and document its subject matter; how, when, where, and by whom the data was collected; availability and distribution information; its projection, scale, resolution, and accuracy; and its reliability with regard to some standard. Metadata consists of properties and documentation. Properties are derived from the data source (for example, the coordinate system and projection of the data), while documentation is entered by a person (for example, keywords used to describe the data)."[1]

Metadata is key to the lifecycle of any dataset. It effectively protects the investment of data compilation, re-use and updating. It provides the user with consistent terminology, key elements and describes the fitness for use. Moreover, it enables discovery when combined with other data in a clearinghouse or data catalog.[2]

Metadata maintained with the addressing layers will be FGDC-compliant. For more information on this topic, see the Content Standard for Digital Geospatial Metadata (CSDGM)[3] and the Metadata Quick Guide[4].

REFERENCE

Referencing standards for addressing that govern this document include the FGDC United States Thoroughfare, Landmark, and Postal Address Data Standard document number FGDC-STD-016-

[1] http://support.esri.com/sitecore/content/support/Home/other-resources/gis-dictionary/term/metadata. Retrieved 15 January 2017.
[2] Wyoming Geographic Information Science Center. Metadata Education Project. Retrieved 18 December 2006 from http://www.wygisc.uwyo.edu/metadata/why.html#benefit.
[3] https://www.fgdc.gov/metadata/csdgm-standard. Retrieved 15 January 2017.
[4] https://www.fgdc.gov/metadata/documents/MetadataQuickGuide.pdf. Retrieved 15 January 2017.

2011[5], the United States Postal Service Publication 28[6], and standards developed by NENA utilized for inclusion of geospatial information into the enterprise GIS solution.

COORDINATE SYSTEM AND PROJECTION

TCA § 66-6 defines the legislation for the Tennessee Coordinate System, describing the geodetic survey system, coordinates, and technical definitions. The following outlines the current State of Tennessee standard for GIS data:

Coordinate System: State Plane
Zone: 4100 (Tennessee)
Projection: Lambert Conformal Conic
False Easting: 1968500.000000
False Northing: 0.000000
Central Meridian: -86.000000
First Standard Parallel 1: 35.250000
Second Standard Parallel: 36.416667
Latitude of Origin: 34.333333
Linear Unit: U.S. Foot (0.304801)
Geographic Coordinate System:
Name: Geographic Coordinate System (GCS)
Angular Unit: Degree (0.017453292519943295)
Prime Meridian: Greenwich (0.000000000000000000)
Datum: North American Datum of 1983
Spheroid: GRS 1980
Semi-major Axis: 6378137.000000000000000000
Semi-minor Axis: 6356752.314140356100000000
Inverse Flattening: 298.257222101000020000

In 2022, the National Geodetic Survey will replace NAD83 and NAVD88 horizontal and vertical datums for the entire North American Plate. The new reference frame that will affect Tennessee will be the North American Terrestrial Reference Frame of 2022 (NATRF2022). See the NGS website[7] for more details and progress updates.

HORIZONTAL ACCURACY

Horizontal accuracy will apply to address points and street centerline nodes and vertices. The requirement for acceptance shall be +/- 3 meters.[8] At this time, there are no requirements surrounding vertical accuracy.

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[5] https://www.fgdc.gov/standards/projects/address-data. Retrieved 15 January 2017.
[6] http://pe.usps.gov/cpim/ftp/pubs/Pub28/pub28.pdf or http://pe.usps.gov/text/pub28/welcome.htm. Retrieved 15 January 2017.
[7] https://geodesy.noaa.gov/datums/newdatums/index.shtml Retrieved 14 October 2017.
[8] meets National Map Accuracy Standards of 1947 ("NMAS") (http://rockyweb.cr.usgs.gov/nmpstds/nmas.html) and complies with the National Standard for Spatial Data Accuracy ("NSSDA") http://www.fgdc.gov/standards/projects/FGDC-standardsprojects/accuracy/part3/chapter3.

SCHEMA AND MODELING SPECIFICATIONS

This specification currently provides for the standardization of three (3) GIS data layers: the site address points, the road centerlines and the ESN boundaries. As NENA standards progress, other layers may be optional or required as uploads to the State program. Unlike other transitional i3 solutions, the State decided to migrate based on MSAG and ALI creation from the Site Address Points. This is advantageous as it puts ground truth in the MSAG. The Road Centerlines will still play a pivotal role, but the Site Address Points have become the de facto addressing layer. The ESN boundaries are also the gateway layer as processing begins, and thus could make or break a successful processing run in downstream QA for a particular ECD. As such, stringent rules regarding field population for each of the layers must be adhered to for the MSAG and ALI processes.

The very first draft of this schema definition for the State of Tennessee pre-dates many NENA standards documents governing GIS data for NG9-1-1. The business model dictated the distribution of this base set of layers and attributes to the local Districts who are maintaining the layers. As schema changes are difficult to promulgate effectively, especially with the various vendor software used throughout the state, this initial schema has been, for the most part, adhered to throughout its lifecycle. As a result, this standard will vary from some more recent NENA specifications. As an example, current NENA documents dictate that no abbreviations should be used in the addressing fields. Spelling everything out alleviates any ambiguity. This is in direct conflict with the federal standards used as a base to initially author this specification (and were once promoted by NENA during the inception of this specification). Care is being taken to review new standards and migration pathways to satisfy the new requirements.

The GIS Identifier (OIRID) for each of the layers is probably the most crucial attribute. This value MUST be unique and persistent for each individual record across time and space. Duplication of this value is not allowed within a single feature class. At this time, these unique identifiers cannot be reused once a record is deleted. These values cannot be changed once assigned unless coordinated with the NG9-1-1 program partners. Unplanned changes in the GIS Identifiers between data deliverables are caught in the nightly QA and the ECD data is prevented from processing. This constitutes a disaster recovery level scenario for the NG9-1-1 databases should those be allowed through (current NOC level SIL 1). The dataset containing the original GIS Identifiers should be recovered from local backups so that the ECD can begin processing again. An ECD dataset will remain stagnant in the statewide production databases until the recovery is complete. Should this issue be identified, please contact your vendor (if applicable) and True North at support@tngeo.com or one of the program offices to alert that this has happened.

As this project has progressed, various artifacts and non-standard field population have been caught in the nightly QA process. Some of these are due to misinformation about those fields in the schema, but most are due to accidental typographic data entry errors. Habitual repetitions, like tabbing through fields or hitting Enter to move through a table or form, can result in erroneous (and sometimes unseen) characters depending on the editing software in use. The toughest one of these to find is the carriage return <CR>. The most frequent of these errors is a leading or trailing space in the field value. These are of greatest consequence in the fields which determine MSAG inserts or changes.

A companion template file geodatabase is available which includes templates for the three layers, tables reflecting domain values for the fields, Attribute Assistant baseline tables, and linking tables (such as the optional *contact* table).

1.0 SITE ADDRESS POINT

Site address point features represent locations where civic addresses are assigned. Features in this layer should represent addressable structures only. Any locations that do not have an authoritatively assigned address should be put into a separate landmark or POI layer, or into a layer by themselves. Conversely, if a usually un-addressable structure has a telephone associated with it (e.g., a pole with a call box), that location can be addressed and included in this layer.

Duplication of address points with the same attribution should be avoided and are reported back as "coincident points". Occasionally this is the result of a copy/paste function in the GIS editing software, after which the added point is never moved and the attributes never altered. However, this most frequently occurs when trying to maintain occupant and/or phone number information as additional fields to the base schema. Best practices for the implementation of this schema to benefit both the NG9-1-1 project and localized PSAP operations is to maintain as much of the extraneous information (not found in this standard) in a linking table which utilizes the GIS Identifier. Not only does this keep the added information separate, but the imperative to keep the GIS Identifier unique and persistent also has application locally.

As of the release of this standard, any previous modeling specification document is obsolete. Although some specific examples will be provided throughout this treatment for special situations, the placement of the site address point geometry should generally follow the more stringent guidelines for accuracy (e.g., § 3.4.4) found in the NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1 document NENA-INF-014.1-2015[9]. Any new placement requirements or options will be cited in this standard and not in a separate document. Any specifications herein supersede the NENA document options for Tennessee.

1.1 Identifier and Reference Fields

1.1.1 OIRID

Field Alias	GIS Identifier
PIDF-LO	
Common Names	Address ID, Unique_ID, Site ID
Field Type	Text
Field Length	20
Reference	FGDC-STD-016-2011§2.3.1.1, NENA-STA-010.2-2016, NENA 02-010
Domain	
Definition	Currently, this value is an alphanumeric patterned after the format: '%ECD name%_%numeric sequence%' The ECD name is a one-word moniker for the District and MUST be in uppercase. For each individual record, this value MUST be **unique** among all address point records and **persist** for the lifetime of that record. The numeric sequence should increment by one (1) with each successive edit, but there is no requirement for consecutive numbering as long as the values are unique and persistent for each record. At this time, these unique identifiers cannot be reused once an address point record is deleted.

[9] https://www.nena.org/?SSAP. Retrieved 29 January 2018.

Examples	‘ANDERSON_123’, ‘WILSON_45678’

1.1.2 R_SEGID

Field Alias	Route Segment Identifier
PIDF-LO	
Common Names	
Field Type	Text
Field Length	25
Reference	
Domain	
Definition	Identifier linking the address point to the road centerline segment that it is routed from. The value should mirror the [SEGID] value on the related centerline segment. This can be different from the segment it is addressed from. If there is more than one routable segment, the primary segment should be referenced here. If the [A_SEGID] is also a routable segment, it should be referenced as the primary (see 1.1.3, 2.1.2, and Figure 1).
Examples	

1.1.3 A_SEGID

Field Alias	Address Segment Identifier
PIDF-LO	
Common Names	
Field Type	Text
Field Length	25
Reference	
Domain	
Definition	Identifier linking the address point to the road centerline segment that it is addressed from. The value should mirror the [SEGID] value on the referenced centerline segment. The same address can be routed-to from a different centerline segment (see 1.1.2 , 2.1.2, and Figure 1).
Examples	

1.1.4 SEG_SIDE

Field Alias	Segment Side
PIDF-LO	
Common Names	
Field Type	Text
Field Length	1
Reference	
Domain	‘L’ = Left side of the segment ‘R’ – Right side of the segment
Definition	Identifies the side of the related centerline segment that the site address point is addressed from. The centerline segment has direction based on its *From* and *To* nodes, not its address range assignment (though both should align).
Examples	

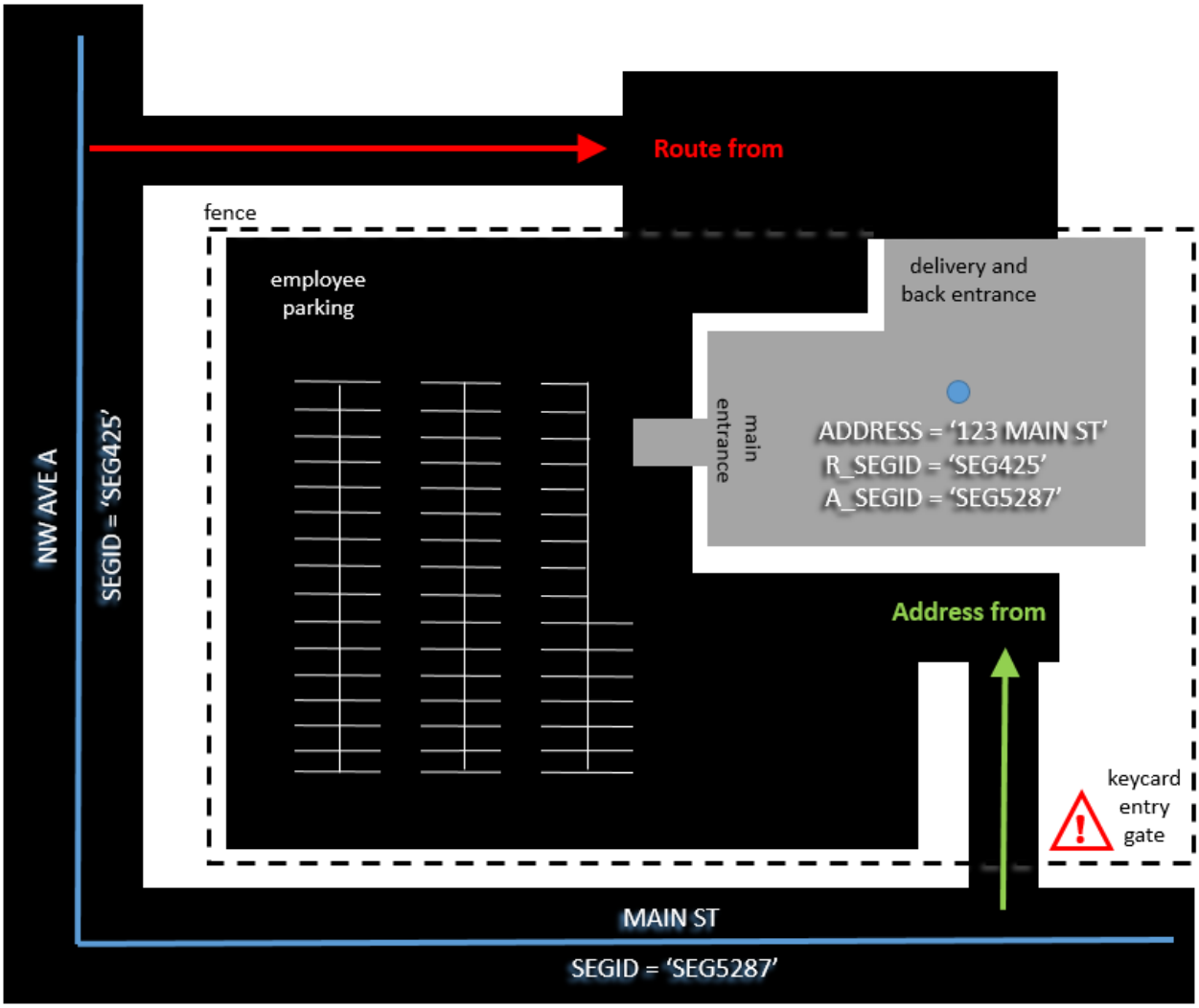


Figure 1

In the above figure, an example is given of a hypothetical scenario where the [R_SEGID] and the [A_SEGID] would be different. The address point is addressed from MAIN ST, therefore the [A_SEGID] is populated with the [SEGID] value from the MAIN ST road segment. However, the best route to the structure for first responders is the back entrance (avoiding the keycard activated gate). The [R_SEGID] value would reflect the [SEGID] for the NW AVE A road segment to show the relationship.

1.1.5 GISLINK

Field Alias	Parcel Link Identifier
PIDF-LO	
Common Names	Address Parcel Identifier
Field Type	Text
Field Length	15

Reference	Tennessee Base Mapping Program Technical Specifications[10], FGDC-STD-016-2011§2.2.3.2
Domain	
Definition	Links the site address point to the parcel it is within. The relationship affords access to information about owner/occupancy, acreage, subdivision names, and other CAAS attributes.
Examples	'001032B E 00700', '001005 05800'

1.2 Descriptors

1.2.1 STRUCTYPE

Field Alias	Structure Type
PIDF-LO	maps to PLC
Common Names	
Field Type	Short Integer
Field Length	
Reference	RFC 4589
Domain	See Appendix E
Definition	Domain of values that describe the type of structure represented by the site address point. Only one value can be chosen. If multiple values apply, choose the one that best describes the type of site address point this represents.
Examples	

1.2.2 STRUCDESC

Field Alias	Structure Description
PIDF-LO	
Common Names	
Field Type	Text
Field Length	30
Reference	
Domain	
Definition	Value describing the characteristics of the structure represented by the site address point.
Examples	'RED BRICK', 'BROWN SIDING'

1.3 Complete or Primary Address Number Fields

1.3.1 STNUM_H

Field Alias	Street Number High
PIDF-LO	
Common Names	

[10] http://tn.gov/assets/entities/finance/oir/attachments/200612_Tech_Spec.pdf. Retrieved 4 February 2017.

Field Type	Text
Field Length	10
Reference	
Domain	
Definition	Contains the largest value (MAX) of an address range for a single structure.
Examples	‘123’, ‘456B’, ‘789-C’ ⃠ Do not use decimals to delineate incremental values in this field.

1.3.2 STNUM_L

Field Alias	Street Number Low
PIDF-LO	
Common Names	
Field Type	Text
Field Length	10
Reference	
Domain	
Definition	Contains the lowest value (MIN) of an address range for a single structure.
Examples	‘123’, ‘456B’, ‘789-C’ ⃠ Do not use decimals to delineate incremental values in this field.

1.3.3 STNUM

Field Alias	Street Number
PIDF-LO	HNO
Common Names	Address Number, Building Number, House Number, Site Number, Structure Number
Field Type	Text
Field Length	10
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, USPS Publication 28
Domain	
Definition	Alpha-numeric field containing the structure number or value for the site address civic location assigned by the local addressing authority. Usually an integer which defines the individual address number for the structure. As this is the primary structure value, alphabetic characters should only appear in this field if they are part of the house number, not a secondary address (like an apartment, suite or unit). Duplex structures with no primary address can be populated in this field (i.e., ‘101A’ and ‘101B’).
Examples	‘123’, ‘456B’, ‘789-C’ ⃠ Do not use decimals to delineate incremental values in this field.

1.3.4 STNUMSUF

Field Alias	Street Number Suffix
PIDF-LO	HNS
Common Names	Address Number Suffix, House Number Suffix, Building Number Suffix, Fractional Street Number (USPS), Structure Number Suffix
Field Type	Text
Field Length	10

Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, RFC 4776, USPS Publication 28
Domain	
Definition	A non-integer value that accompanies the street number. Always use the virgule (/) when noting a half address.
Examples	‘A’, ‘1/2’ ⃠ Do not use decimals to delineate incremental values in this field.

1.4 Secondary Address Fields

Secondary or subaddress information further defines the primary address to a more granular level. Populating these fields correctly is crucial because MSAG records are only created from primary addresses. Therefore, every secondary address MUST have a primary address point. The fields in this subsection identify whether an address point is representing a secondary address. If there is any value in the UNIT_TYPE or UNIT_NUM, the point is marked as secondary in the exchange format. For a treatise on how to correctly populate these fields, see Appendix F.

1.4.1 BUILDING

Field Alias	Building
PIDF-LO	BLD
Common Names	
Field Type	Text
Field Length	35
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 5139, RFC 4776, USPS Publication 28
Domain	
Definition	[VANITY] may describe a complex of buildings, but this field identifies the specific building associated with this site address point. As this is already identified as the building by the field name, do not add or abbreviate “BUILDING” for the field value, (e.g., if it is ‘BLDG A’ simply enter ‘A’).
Examples	‘A’, ‘2’, ‘MORGAN UNIVERSITY CENTER’, ‘TERMINAL 3’ (airport usage)

1.4.2 FLOOR

Field Alias	Floor
PIDF-LO	FLR
Common Names	
Field Type	Text
Field Length	10
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, USPS Publication 28
Domain	
Definition	The floor of the building specific to this site address point. If there is only one floor, leave this field blank. As this is already identified as the floor by the field name, do not add or abbreviate “FLOOR” for the field value, (e.g., if it is ‘FLR 2’ simply enter ‘2’). Use the USPS secondary unit designator abbreviations found in Appendix C2 of the Publication 28 standard where applicable.

Examples	‘2’, ‘PH’, ‘LBBY’, ‘BSMT’, ‘MEZZANINE’

1.4.3 UNIT_TYPE

Field Alias	Unit Type
PIDF-LO	Along with UNIT_NUM, concatenates to UNIT
Common Names	Subaddress Type (FGDC), Secondary Address Identifier
Field Type	Text
Field Length	4
Reference	FGDC-STD-016-2011, RFC 5139, RFC 4776, USPS Publication 28
Domain	USPS Publication 28 Appendix C2 applicable values, see also Appendix B of this document
Definition	The type of secondary address location.
Examples	‘APT’, ‘STE’, ‘SLIP’, ‘TRLR’

1.4.4 UNIT_NUM

Field Alias	Unit Number
PIDF-LO	Along with UNIT_TYPE, concatenates to UNIT
Common Names	Subaddress Identifier (FGDC), Secondary Address Range (USPS)
Field Type	Text
Field Length	10
Reference	FGDC-STD-016-2011, RFC 5139, RFC 4776, USPS Publication 28
Domain	
Definition	The secondary unit number or identifier that specifies the individual unit.
Examples	‘A’, ‘247’, ‘1B’

1.5 Road Designation Fields

1.5.1 PREDIR

Field Alias	Prefix Directional
PIDF-LO	PRD
Common Names	Predirectional (USPS), sometimes referred to as Street Prefix
Field Type	Text
Field Length	2
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, RFC 5139, RFC 4776, USPS Publication 28
Domain	‘N’, ‘S’, ‘E’, ‘W’, ‘NW’, ‘NE’, ‘SW’,’SE’
Definition	An abbreviated directional indicator for the road.
Examples	

1.5.2 PRETYPE

Field Alias	Prefix Type
PIDF-LO	PRM
Common Names	Road Pre-modifier
Field Type	Text
Field Length	5
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 5139, RFC 4776, USPS Publication 28

Domain	USPS Publication 28 Appendices C1, H, see also Appendix A of this document
Definition	A type modifier for the road placed in front of the road name. The field length is currently 5 for existing special cases, but all attempts should be made to follow the domain for this field.
Examples	'AVE', 'ST', 'BLVD', 'CLL', 'VIS' ⃠ Do not use ATTSE Standard Thoroughfare Designations.

1.5.3 NAME

Field Alias	Street Name
PIDF-LO	RD
Common Names	
Field Type	Text
Field Length	40
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, USPS Publication 28
Domain	
Definition	The name of the thoroughfare or throughway only (without the street type or directionals).
Examples	

1.5.4 TYPE

Field Alias	Street Type
PIDF-LO	STS
Common Names	Suffix Type, Street Name Posttype (FGDC)
Field Type	Text
Field Length	5
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 5139, RFC 4776, USPS Publication 28
Domain	USPS Publication 28 Appendices C1, H, see also Appendix A of this document
Definition	A type modifier for the road placed after the street name. The field length is currently 5 for existing special cases, but new assignments should follow the domain for this field.
Examples	'AVE', 'ST', 'BLVD', 'CLL', 'VIS' ⃠ Do not use ATTSE Standard Thoroughfare Designations.

1.5.5 SUFDIR

Field Alias	Suffix Directional
PIDF-LO	POD
Common Names	Postdirectional, in some standards referred to as the Street Suffix
Field Type	Text
Field Length	2
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, USPS Publication 28
Domain	'N', 'S', 'E', 'W', 'NW', 'NE', 'SW','SE'
Definition	An abbreviated directional indicator for the road.

Examples	

1.5.6 POSTMOD

Field Alias	Post Modifier
PIDF-LO	POM
Common Names	Road Post Modifier
Field Type	Text
Field Length	20
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 5139, USPS Publication 28
Domain	USPS Publication 28 Appendix C1
Definition	Always follows and modifies the street name.
Examples	‘EXT’, ‘BYP’

1.6 Complete Address and Label Fields

1.6.1 ADDRESS

Field Alias	Address
PIDF-LO	
Common Names	Complete Address
Field Type	Text
Field Length	100
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), USPS Publication 28
Domain	
Definition	The concatenation of all parsed street number and street name elements consisting of STNUM, PREDIR, PRETYPE, NAME, TYPE, SUFDIR, POSTMOD. If the secondary address information must be used in this field, it should be appended to the end so that logical queries can still find the primary address.
Examples	‘123 MAIN ST’, ‘405 W BROAD AVE’, ‘275 HWY 54 W EXT’

1.6.2 ADDR_ESN

Field Alias	Address with ESN
PIDF-LO	
Common Names	
Field Type	Text
Field Length	100
Reference	
Domain	
Definition	The concatenation of the ADDRESS field with the ESN at the end separated by a space.
Examples	‘123 MAIN ST 301’, ‘405 W BROAD AVE 001’, ‘275 HWY 54 W EXT 204’

1.6.3 LABEL

Field Alias	Label
PIDF-LO	
Common Names	

Field Type	Text
Field Length	100
Reference	
Domain	
Definition	This is a freeform field for use in cartographic design. The values here can (and probably should) be proper case. Typically for the Site Address Points, this field would hold the street number or individual unit designation for this address. Recommended population would show street number for primary addresses and a concatenation of the UNIT_TYPE and UNIT_NUM for secondary addresses.
Examples	'123' for Address = 123 MAIN ST, 'APT B2' for address containing secondary address values

1.6.4 SUBNAME

Field Alias	Subdivision Name
PIDF-LO	A5
Common Names	Place Name (FGDC), Neighborhood Community (CLDXF)
Field Type	Text
Field Length	50
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF)
Domain	
Definition	The name of the subdivision this address participates in.
Examples	

1.6.5 VANITY

Field Alias	Vanity
PIDF-LO	LMK
Common Names	Landmark Name (FGDC), Complete Landmark Name (CLDXF)
Field Type	Text
Field Length	50
Reference	FGDC-STD-016-2011§2.2.5.1, NENA-STA-004.1-2014 (CLDXF), RFC 4119
Domain	
Definition	Colloquial landmark name identifying an address location. Field values can be proper case for labeling/cartographic purposes.
Examples	'Library', 'Capitol', 'Ellington Human Sciences Building', 'Blanchfield Army Community Hospital'

1.7 Zonal Aggregates

1.7.1 ZIP

Field Alias	ZIP
PIDF-LO	PC
Common Names	Postal Code, ZIP Code
Field Type	Text
Field Length	5
Reference	FGDC-STD-016-2011§2.2.6.3, NENA-STA-004.1-2014 (CLDXF)
Domain	Defined by the US Postal Service

Definition	The 5-digit code assigned to the USPS post office servicing this address location.
Examples	‘37129’

1.7.2 ZIP4

Field Alias	ZIP4
PIDF-LO	
Common Names	ZIP+4
Field Type	Text
Field Length	4
Reference	FGDC-STD-016-2011§2.2.6.4, NENA-STA-004.1-2014 (CLDXF)
Domain	Defined by the US Postal Service
Definition	The 4-digit code that value-adds the 5-digit ZIP that identifies a finite range of delivery addresses within the area serviced by the specific USPS post office.
Examples	

1.7.3 ESN

Field Alias	Emergency Service Number
PIDF-LO	
Common Names	
Field Type	Text
Field Length	3
Reference	
Domain	
Definition	The Emergency Service Number is actually a 5-digit string, of which this schema is only capturing the last 3. The 3-digit code is prefixed with leading zeros. The ESN is a legacy element used for 10-digt routing.
Examples	‘001’, ‘016’, ‘234’

1.7.4 CITY

Field Alias	MSAG Community Name
PIDF-LO	
Common Names	MCN (NENA)
Field Type	Text
Field Length	30
Reference	
Domain	
Definition	This is not the administrative or postal city designation. This field should contain the MSAG Community Name, assigned by the 9-1-1 authority, which the address point is contained within.
Examples	‘MURFREESBORO’, ‘DEKALB COUNTY’

1.7.5 COUNTY

Field Alias	County
PIDF-LO	A2
Common Names	

Field Type	Text
Field Length	30
Reference	NENA-STA-004.1-2014 (CLDXF)
Domain	
Definition	The administrative county area that contains the address point
Examples	‘LAKE’, ‘POLK’

1.7.6 STATE

Field Alias	State
PIDF-LO	A1
Common Names	
Field Type	Text
Field Length	2
Reference	FGDC-STD-016-2011§2.2.6.3, NENA-STA-004.1-2014 (CLDXF)
Domain	‘TN’, ‘AL’, ‘AR’, ‘GA’, ‘KY’, ‘MS’, ‘MO’, ‘NC’, ‘VA’
Definition	The 2-letter abbreviation for the federal state area that contains the address point.
Examples	

1.8 Coordinate and Elevation Information

1.8.1 LON

Field Alias	Longitude
PIDF-LO	
Common Names	
Field Type	Text
Field Length	15
Reference	FGDC-STD-016-2011§2.3.2.3
Domain	
Definition	The longitude of the address point in Geographic coordinates. Formatting can vary.
Examples	

1.8.2 LAT

Field Alias	Latitude
PIDF-LO	
Common Names	
Field Type	Text
Field Length	15
Reference	FGDC-STD-016-2011§2.3.2.4
Domain	
Definition	The latitude of the address point in Geographic coordinates. Formatting can vary.
Examples	

1.8.3 X_SP

Field Alias	X Coordinate
PIDF-LO	
Common Names	
Field Type	Double
Field Length	
Reference	FGDC-STD-016-2011§2.3.2.1
Domain	
Definition	Longitude-equivalent information catalogued in State Plane coordinates that meet the specifications under the *Coordinate System and Projection* subsection of this document.
Examples	

1.8.4 Y_SP

Field Alias	Y Coordinate
PIDF-LO	
Common Names	
Field Type	Double
Field Length	
Reference	FGDC-STD-016-2011§2.3.2.2
Domain	
Definition	Latitude-equivalent information catalogued in State Plane coordinates that meet the specifications under the *Coordinate System and Projection* subsection of this document.
Examples	

1.8.5 Z_VAL

Field Alias	Elevation
PIDF-LO	
Common Names	Altitude, Z-coordinate
Field Type	Long Integer
Field Length	
Reference	FGDC-STD-016-2011§2.3.2.6,
Domain	
Definition	Metric elevation above mean sea level
Examples	

1.9 Catalogue

1.9.1 GPSDATE

Field Alias	Initial Edit Date
PIDF-LO	
Common Names	
Field Type	Date
Field Length	
Reference	ISO 8601

Domain	
Definition	Datetime stamp the address point was initially created. Once this value is established, it should never change. It should be noted that datetime values are not permissible in Shapefiles. Date fields in Shapefiles can hold a date or a time, but not both.
Examples	'2018-01-15T20:10:30'

1.9.2 ADDRAUTH

Field Alias	Addressing Authority
PIDF-LO	
Common Names	
Field Type	Text
Field Length	50
Reference	FGDC-STD-016-2011§2.3.1.2
Domain	
Definition	The addressing authority responsible for assigning the address for the current point. Although usually a single entity, addressing authorities can vary within a given jurisdiction.
Examples	

1.9.3 SOURCE

Field Alias	Derived Source
PIDF-LO	
Common Names	
Field Type	Short Integer
Field Length	
Reference	
Domain	1 = Parcel centroid; 2 = Driveway entrance; 3 = Structure centroid; 4 = Main entrance; 5 = Frontage centroid; 0 = Undefined
Definition	A description of what the address point is representing, be it a parcel centroid or a driveway entrance point or a main entrance point to the address represented by the attribution.
Examples	

1.9.4 EDITOR

Field Alias	Editor
PIDF-LO	
Common Names	
Field Type	Text
Field Length	10
Reference	
Domain	
Definition	Moniker identifying the last editor for this address point. It is at the District's discretion as to whether this identifies an agency or individual.
Examples	

1.9.5 GEOMOD

Field Alias	Geometry Modification Type
PIDF-LO	
Common Names	
Field Type	Text
Field Length	75
Reference	
Domain	
Definition	Brief description of the type of geometry edit that was last performed on this address location.
Examples	‘MOVED TO ROOFTOP’, ‘ADJUSTED FOR ACCURACY’

1.9.6 GEOSRCE

Field Alias	Geometry Modification Source
PIDF-LO	
Common Names	
Field Type	Text
Field Length	45
Reference	
Domain	
Definition	The source that was used to make the geometry edit described in GEOMOD.
Examples	‘AERIAL 2015’, ‘CENTERLINE GEOCODE’, ‘GPS’

1.9.7 GEODATE

Field Alias	Geometry Modification Date
PIDF-LO	
Common Names	
Field Type	Date
Field Length	
Reference	ISO 8601
Domain	
Definition	The datetime stamp the last geometry edit was made to this address location. It should be noted that datetime values are not permissible in Shapefiles. Date fields in Shapefiles can hold a date or a time, but not both.
Examples	‘2018-01-15T20:10:30’

1.9.8 ATTMOD

Field Alias	Attribute Modification Type
PIDF-LO	
Common Names	
Field Type	Text
Field Length	75
Reference	
Domain	
Definition	Brief description of the type of attribute edit that was last performed on this address location.

Examples	‘CITY AND ESN CHANGES DUE TO ANNEXATION’

1.9.9 ATTSRCE

Field Alias	Attribute Modification Source
PIDF-LO	
Common Names	
Field Type	Text
Field Length	45
Reference	
Domain	
Definition	The source that was used to make the attribute edit described in ATTMOD.
Examples	‘FIELD-VERIFIED’

1.9.10 ATTDATE

Field Alias	Attribute Modification Date
PIDF-LO	
Common Names	
Field Type	Date
Field Length	
Reference	ISO 8601
Domain	
Definition	The datetime stamp the last attribute edit was made to this address location. It should be noted that datetime values are not permissible in Shapefiles. Date fields in Shapefiles can hold a date or a time, but not both.
Examples	‘2018-01-15T20:10:30’

1.9.11 STATUS

Field Alias	Lifecycle Status
PIDF-LO	
Common Names	Address Lifecycle Status
Field Type	Short Integer
Field Length	
Reference	FGDC-STD-016-2011§ 2.3.7.3
Domain	730 = ACTIVE; 734 = PROPOSED; 736 = POTENTIAL; 799 = RETIRED
Definition	Defines the current lifecycle status of the address.
Examples	

1.9.12 DELNOTES

Field Alias	Delete Notes
PIDF-LO	
Common Names	
Field Type	Text
Field Length	75
Reference	
Domain	
Definition	A notation field explaining the reason for a 799 lifecycle status.
Examples	

2.0 ROAD CENTERLINE

Road centerlines are comprised of interconnected linear segments that generally define the center of pavement or throughway. In the NG system, this layer can actively participate in ALI geocoding and call routing. As such, attributes on the road segments MUST match the associated address points in zonal distinction and parity accuracy. From a strictly addressing perspective, identifying anomalies in the data is sufficient, however, from a call routing perspective, the road centerlines MUST be broken and attributed correctly to match the authoritative street numbering, whether that is orderly or not.

As of the release of this standard, any previous modeling specification document is obsolete. See section 5 of this document for general modeling requirements. The specifications herein supersede any NENA document options for Tennessee.

2.1 Identifier and Reference Fields

2.1.1 OIRID

Field Alias	GIS Identifier
Common Names	Unique ID, Site ID
Field Type	Text
Field Length	20
Reference	NENA-STA-010.2-2016, NENA 02-010
Domain	
Definition	Currently, this value is an alphanumeric patterned after the format: '%ECD name%_%numeric sequence%' The ECD name is a one-word moniker for the District and MUST be in uppercase. For each individual record, this value MUST be **unique** among all road centerline records and **persist** for the lifetime of that record. The numeric sequence should increment by one (1) with each successive edit, but there is no requirement for consecutive numbering as long as the values are unique and persistent for each record. At this time, these unique identifiers cannot be reused once a road centerline record is deleted.
Examples	'ANDERSON_123', 'WILSON_45678'

2.1.2 SEGID

Field Alias	Segment Identifier
Common Names	
Field Type	Text
Field Length	25
Reference	
Domain	
Definition	Unique identifier tying vertical alignments between segments together within the road centerline layer (see Figure 2). This field also serves to link the individual road centerline segments to the site address points they are routed and addressed from (see 1.1.2, 1.1.3, and Figure 1). This necessarily implies an auto-sequence number component, but the overall field value format is free-form.
Examples	SEG-123; This is a free-form field, but there should be an auto-number sequence for each centerline segment for uniqueness.

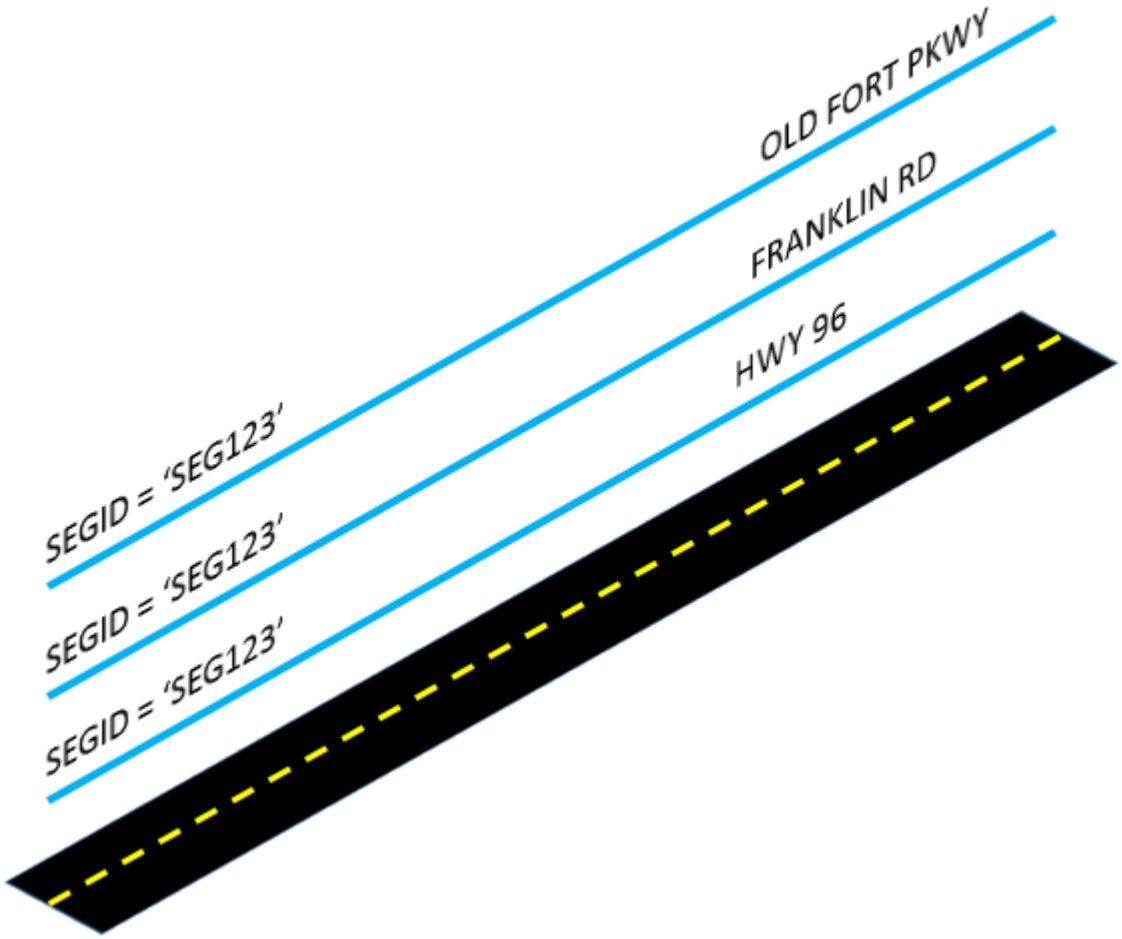


FIGURE 2
Current modeling standards permit stacked centerline segments to allow for the use of multiple road names. The [SEGID] ties each of the segments together to show relationship

2.2 Address Ranges

Each road segment has a start and an end point (a *From* and *To* node). These are created when the segment is digitized and constitute the direction of the segment. Generally, each segment should be digitized in the direction of ascending address ranges (minimum range values should start at the *From* node and increase to the maximum for that segment at the *To* node. Regardless of the direction of digitization, the parity should match the address points on either side of that segment

2.2.1 L_F_ADD

Field Alias	Left From Address
Common Names	
Field Type	Text
Field Length	11
Reference	
Domain	
Definition	The address range extremity at the *From* node as defined by the associated address points on the left-side directionality of the centerline segment.

Examples	

2.2.2 L_T_ADD

Field Alias	Left To Address
Common Names	
Field Type	Text
Field Length	11
Reference	
Domain	
Definition	The address range extremity at the *To* node as defined by the associated address points on the left-side directionality of the centerline segment.
Examples	

2.2.3 R_F_ADD

Field Alias	Right From Address
Common Names	
Field Type	Text
Field Length	11
Reference	
Domain	
Definition	The address range extremity at the *From* node as defined by the associated address points on the right-side directionality of the centerline segment.
Examples	

2.2.4 R_T_ADD

Field Alias	Right To Address
Common Names	
Field Type	Text
Field Length	11
Reference	
Domain	
Definition	The address range extremity at the *To* node as defined by the associated address points on the right-side directionality of the centerline segment.
Examples	

2.2.5 ADDR_TYPE

Field Alias	Address Type
Common Names	Address Range Type
Field Type	Text
Field Length	1
Reference	FGDC-STD-016-2011§ 2.3.5.1
Domain	‘A’ or ‘P’
Definition	Describes the address ranges as actual (A) or potential (P). These can be mixed in the centerline dataset. NENA-preferred values are actual.
Examples	

2.3 Road Designation Fields

2.3.1 PREDIR

Field Alias	Prefix Directional
Common Names	Predirectional (USPS), sometimes referred to as Street Prefix
Field Type	Text
Field Length	2
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, RFC 5139, RFC 4776, USPS Publication 28
Domain	'N', 'S', 'E', 'W', 'NW', 'NE', 'SW','SE'
Definition	An abbreviated directional indicator for the road.
Examples	

2.3.2 PRETYPE

Field Alias	Prefix Type
Common Names	Road Pre-modifier
Field Type	Text
Field Length	5
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 5139, RFC 4776, USPS Publication 28
Domain	USPS Publication 28 Appendices C1, H, see also Appendix A of this document
Definition	A type modifier for the road placed in front of the road name. The field length is currently 5 for existing special cases, but all attempts should be made to follow the domain for this field.
Examples	'AVE', 'ST', 'BLVD', 'CLL', 'VIS' ⃠ Do not use ATTSE Standard Thoroughfare Designations.

2.3.3 NAME

Field Alias	Street Name
Common Names	
Field Type	Text
Field Length	40
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, USPS Publication 28
Domain	
Definition	The name of the thoroughfare or throughway only (without the street type or directionals).
Examples	

2.3.4 TYPE

Field Alias	Street Type
Common Names	Suffix Type, Street Name Posttype (FGDC)
Field Type	Text
Field Length	5

Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 5139, RFC 4776, USPS Publication 28
Domain	USPS Publication 28 Appendices C1, H, see also Appendix A of this document
Definition	A type modifier for the road placed after the street name. The field length is currently 5 for existing special cases, but new assignments should follow the domain for this field.
Examples	'AVE', 'ST', 'BLVD', 'CLL', 'VIS' ⃠ Do not use ATTSE Standard Thoroughfare Designations.

2.3.5 SUFDIR

Field Alias	Suffix Directional
Common Names	Postdirectional, in some standards referred to as the Street Suffix
Field Type	Text
Field Length	2
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 4119, USPS Publication 28
Domain	'N', 'S', 'E', 'W', 'NW', 'NE', 'SW','SE'
Definition	An abbreviated directional indicator for the road.
Examples	

2.3.6 POSTMOD

Field Alias	Post Modifier
Common Names	Road Post Modifier
Field Type	Text
Field Length	20
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF), RFC 5139, USPS Publication 28
Domain	USPS Publication 28 Appendix C1
Definition	Always follows and modifies the street name.
Examples	'EXT', 'BYP'

2.4 Label and Categorization

2.4.1 LABEL

Field Alias	Label
Common Names	
Field Type	Text
Field Length	100
Reference	
Domain	
Definition	This is a freeform field for use in cartographic design. The values here can (and probably should) be proper case. Typically for the Site Address Points, this field would hold the street number or individual unit designation for this address. Recommended population would show street number for primary addresses and a concatenation of the UNIT_TYPE and UNIT_NUM for secondary addresses.

Examples	‘123’ for Address = 123 MAIN ST, ‘APT B2’ for address containing secondary address values

2.4.2 VANITY

Field Alias	Vanity
Common Names	Landmark Name (FGDC), Complete Landmark Name (CLDXF)
Field Type	Text
Field Length	75
Reference	FGDC-STD-016-2011§2.2.5.1, NENA-STA-004.1-2014 (CLDXF), RFC 4119
Domain	
Definition	Colloquial landmark name identifying an address location. Field values can be proper case for labeling/cartographic purposes.
Examples	‘Library’, ‘Capitol’, ‘Ellington Human Sciences Building’, ‘Blanchfield Army Community Hospital’

2.4.3 SUBNAME

Field Alias	Subdivision Name
Common Names	Place Name (FGDC), Neighborhood Community (CLDXF)
Field Type	Text
Field Length	50
Reference	FGDC-STD-016-2011, NENA-STA-004.1-2014 (CLDXF)
Domain	
Definition	The name of the subdivision this address participates in.
Examples	

2.4.4 NAMETYPE

Field Alias	Type of Name
Common Names	
Field Type	Short Integer
Field Length	
Reference	
Domain	1 = Signed Name 2 = Long Haul Name – State Wide 3 = Long Haul Name – County Wide 4 = Long Haul Name - City Wide 5 = Postal Name 6 = MSAG Name 7 = Inventory Name
Definition	Populate this field when there are multiple names associated with each segment (e.g., when a street contains both a locally known as well as a County, State or US highway designation).
Examples	

2.4.5 CFCC

Field Alias	Census Feature Class Code
Common Names	
Field Type	Text

Field Length	3
Reference	
Domain	See Appendix D
Definition	Now outdated 3-character alphanumeric Census codes classifying geographical features. These will be mapped to the current 5-character alphanumeric MTFCC codes in the NG exchange formats. It is important to correctly classify certain centerline segments to isolate them during processing (e.g., connectors, bridges, ramps) and for linear network routing purposes (e.g., AVL).
Examples	

2.5 Zonal Aggregates

2.5.1 ESN_L

Field Alias	ESN Left
Common Names	
Field Type	Text
Field Length	3
Reference	
Domain	
Definition	The Emergency Service Number as defined by the associated address points on the left-side directionality of the centerline segment
Examples	‘001’, ‘016’, ‘234’

2.5.2 ESN_R

Field Alias	ESN Right
Common Names	
Field Type	Text
Field Length	3
Reference	
Domain	
Definition	The Emergency Service Number as defined by the associated address points on the right-side directionality of the centerline segment
Examples	‘001’, ‘016’, ‘234’

2.5.3 ZIP_L

Field Alias	ZIP Left
Common Names	Postal Code, ZIP Code
Field Type	Text
Field Length	5
Reference	FGDC-STD-016-2011§2.2.6.3, NENA-STA-004.1-2014 (CLDXF)
Domain	Defined by the US Postal Service
Definition	The 5-digit code assigned to the USPS post office servicing the associated address points on the left-side directionality of the centerline segment
Examples	‘37129’

2.5.4 ZIP_R

Field Alias	ZIP Right
Common Names	Postal Code, ZIP Code
Field Type	Text
Field Length	5
Reference	FGDC-STD-016-2011§2.2.6.3, NENA-STA-004.1-2014 (CLDXF)
Domain	Defined by the US Postal Service
Definition	The 5-digit code assigned to the USPS post office servicing the associated address points on the right-side directionality of the centerline segment
Examples	'37129'

2.5.5 CITY_L

Field Alias	MSAG Community Name Left
Common Names	
Field Type	Text
Field Length	30
Reference	
Domain	
Definition	This is not the administrative or postal city designation. This field should contain the MSAG Community Name, assigned by the 9-1-1 authority, which the associated address points on the left-side directionality of the centerline segment are contained within.
Examples	'MURFREESBORO', 'DEKALB COUNTY'

2.5.6 CITY_R

Field Alias	MSAG Community Name Right
Common Names	
Field Type	Text
Field Length	30
Reference	
Domain	
Definition	This is not the administrative or postal city designation. This field should contain the MSAG Community Name, assigned by the 9-1-1 authority, which the associated address points on the right-side directionality of the centerline segment are contained within.
Examples	'MURFREESBORO', 'DEKALB COUNTY'

2.5.7 COUNTY_L

Field Alias	County Left
Common Names	
Field Type	Text
Field Length	30
Reference	NENA-STA-004.1-2014 (CLDXF)
Domain	
Definition	The administrative county area that the associated address points on the left-side directionality of the centerline segment are contained within.
Examples	'LAKE', 'POLK'

2.5.8 COUNTY_R

Field Alias	County Right
Common Names	
Field Type	Text
Field Length	30
Reference	NENA-STA-004.1-2014 (CLDXF)
Domain	
Definition	The administrative county area that the associated address points on the right-side directionality of the centerline segment are contained within.
Examples	‘LAKE’, ‘POLK’

2.5.9 STATE_L

Field Alias	State Left
Common Names	
Field Type	Text
Field Length	2
Reference	FGDC-STD-016-2011§2.2.6.3, NENA-STA-004.1-2014 (CLDXF)
Domain	‘TN’, ‘AL’, ‘AR’, ‘GA’, ‘KY’, ‘MS’, ‘MO’, ‘NC’, ‘VA’
Definition	The 2-letter abbreviation for the federal state area that the associated address points on the left-side directionality of the centerline segment are contained within.
Examples	

2.5.10 STATE_R

Field Alias	State Right
Common Names	
Field Type	Text
Field Length	2
Reference	FGDC-STD-016-2011§2.2.6.3, NENA-STA-004.1-2014 (CLDXF)
Domain	‘TN’, ‘AL’, ‘AR’, ‘GA’, ‘KY’, ‘MS’, ‘MO’, ‘NC’, ‘VA’
Definition	The 2-letter abbreviation for the federal state area that the associated address points on the right-side directionality of the centerline segment are contained within.
Examples	

2.6 Speed and Linear Network Attributes

2.6.1 SPDLIMIT

Field Alias	Speed Limit
Common Names	
Field Type	Double
Field Length	
Reference	
Domain	
Definition	The posted speed limit for the centerline segment. This field is typed as Double because, although rare, decimals are allowed.
Examples	

2.6.2 ONEWAY

Field Alias	Oneway
Common Names	
Field Type	Text
Field Length	2
Reference	
Domain	
Definition	Directional travel indicator
Examples	‘N’, ‘TF’, ‘FT’, ‘T’, ‘F’

2.6.3 LANES

Field Alias	Lanes
Common Names	
Field Type	Short Integer
Field Length	
Reference	
Domain	
Definition	Number of lanes per road segment
Examples	

2.6.4 T_ELEV

Field Alias	To Elevation
Common Names	
Field Type	Short Integer
Field Length	
Reference	
Domain	
Definition	Connectivity policy value for modeling overpasses and underpasses
Examples	

2.6.5 F_ELEV

Field Alias	From Elevation
Common Names	
Field Type	Short Integer
Field Length	
Reference	
Domain	
Definition	Connectivity policy value for modeling overpasses and underpasses
Examples	

2.6.6 TFCOST

Field Alias	Travel Cost (To-From)
Common Names	
Field Type	Double
Field Length	

Reference	
Domain	
Definition	Travel time impedance value
Examples	2.313292, 0.076317

2.6.7 FTCOST

Field Alias	Travel Cost (From-To)
Common Names	
Field Type	Double
Field Length	
Reference	
Domain	
Definition	Travel time impedance value
Examples	2.313292, 0.076317

2.7 Catalogue

2.7.1 EDITOR

Field Alias	Editor
PIDF-LO	
Common Names	
Field Type	Text
Field Length	10
Reference	
Domain	
Definition	Moniker identifying the last editor for this centerline segment. It is at the District's discretion as to whether this identifies an agency or individual.
Examples	

2.7.2 GEOMOD

Field Alias	Geometry Modification Type
PIDF-LO	
Common Names	
Field Type	Text
Field Length	75
Reference	
Domain	
Definition	Brief description of the type of geometry edit that was last performed on this centerline segment.
Examples	'ADJUSTED FOR ACCURACY'

2.7.3 GEOSRCE

Field Alias	Geometry Modification Source
PIDF-LO	
Common Names	
Field Type	Text
Field Length	45

Reference	
Domain	
Definition	The source that was used to make the geometry edit described in GEOMOD.
Examples	‘AERIAL 2015’, ‘GPS’

2.7.4 GEODATE

Field Alias	Geometry Modification Date
PIDF-LO	
Common Names	
Field Type	Date
Field Length	
Reference	ISO 8601
Domain	
Definition	The datetime stamp the last geometry edit was made to this centerline segment. It should be noted that datetime values are not permissible in Shapefiles. Date fields in Shapefiles can hold a date or a time, but not both.
Examples	‘2018-01-15T20:10:30’

2.7.5 ATTMOD

Field Alias	Attribute Modification Type
PIDF-LO	
Common Names	
Field Type	Text
Field Length	75
Reference	
Domain	
Definition	Brief description of the type of attribute edit that was last performed on this centerline segment.
Examples	‘CITY AND ESN CHANGES DUE TO ANNEXATION’

2.7.6 ATTSRCE

Field Alias	Attribute Modification Source
PIDF-LO	
Common Names	
Field Type	Text
Field Length	45
Reference	
Domain	
Definition	The source that was used to make the attribute edit described in ATTMOD.
Examples	‘FIELD-VERIFIED’

2.7.7 ATTDATE

Field Alias	Attribute Modification Date
PIDF-LO	
Common Names	
Field Type	Date

Field Length	
Reference	ISO 8601
Domain	
Definition	The datetime stamp the last attribute edit was made to this centerline segment. It should be noted that datetime values are not permissible in Shapefiles. Date fields in Shapefiles can hold a date or a time, but not both.
Examples	'2018-01-15T20:10:30'

2.7.8 STATUS

Field Alias	Lifecycle Status
PIDF-LO	
Common Names	Address Lifecycle Status
Field Type	Short Integer
Field Length	
Reference	FGDC-STD-016-2011§ 2.3.7.3
Domain	730 = ACTIVE; 734 = PROPOSED; 736 = POTENTIAL; 799 = RETIRED
Definition	Defines the current lifecycle status of the centerline segment.
Examples	

3.0 ESN BOUNDARIES

This polygonal layer represents the last 3 digits of the Emergency Service Number used by a selective router to route a 9-1-1 call in a legacy system. It can facilitate dispatching of the proper emergency service agency(ies) to the call location.[11]

As of the release of this standard, any previous modeling specification document is obsolete. See section 5 of this document for general modeling requirements. The specifications herein supersede any NENA document options for Tennessee.

3.1 Identifier

3.1.1 OIRID

Field Alias	GIS Identifier
Common Names	Unique ID, Site ID
Field Type	Text
Field Length	20
Reference	NENA-STA-010.2-2016, NENA 02-010
Domain	
Definition	Currently, this value is an alphanumeric patterned after the format: '%ECD name%_%numeric sequence%' The ECD name is a one-word moniker for the District and MUST be in uppercase. For each individual record, this value MUST be **unique** among all ESN polygon records and

[11] Derived from the NENA Master Glossary of 9-1-1 Terminology https://c.ymcdn.com/sites/www.nena.org/resource/resmgr/standards/NENA-ADM-000.21-2017_FINAL_2.pdf accessed 12 February 2018

	persist for the lifetime of that record. The numeric sequence should increment by one (1) with each successive edit, but there is no requirement for consecutive numbering as long as the values are unique and persistent for each record. At this time, these unique identifiers cannot be reused once a ESN polygon record is deleted.
Examples	'ANDERSON_123', 'WILSON_45678'

3.2 Coded Values

3.2.1 ESN

Field Alias	Emergency Service Number
Common Names	
Field Type	Text
Field Length	3
Reference	NENA-STA-010.2-2016, NENA 02-010
Domain	
Definition	The Emergency Service Number is actually a 5-digit string, of which this schema is only capturing the last 3. The 3-digit code is prefixed with leading zeros. The ESN is a legacy element used for 10-digt routing.
Examples	'001', '016', '234'

3.2.2 WESN

Field Alias	Wireless ESN
Common Names	
Field Type	Text
Field Length	3
Reference	
Domain	
Definition	3-digit code representative of the wireless ESN. Populate this field only if the WESN and overlapping ESN are congruent or if there is a single WESN for the entire jurisdiction.
Examples	

3.2.3 VESN

Field Alias	VoIP ESN
Common Names	
Field Type	Text
Field Length	3
Reference	
Domain	
Definition	3-digit code representative of the Voice over IP ESN. Populate this field only if the VESN and overlapping ESN are congruent or if there is a single VESN for the entire jurisdiction.
Examples	

3.3 Reference and Date

3.3.1 SRTE

Field Alias	Selective Router
Common Names	
Field Type	Text
Field Length	25
Reference	
Domain	
Definition	The selective router associated with this ESN if known.
Examples	

3.3.2 PSAPID

Field Alias	PSAP Identifier
Common Names	FCC ID
Field Type	Text
Field Length	4
Reference	FGDC-STD-016-2011§2.3.1.1, NENA-STA-010.2-2016, NENA 02-010
Domain	
Definition	The FCC maintains a registry of PSAPs within the US and its territories, and assigns a unique 4-digit key to each. This field value should be the primary PSAP identifier from the FCC Master PSAP Registry assigned to the PSAP that this ESN would default route to. You may download the FCC Master PSAP Registry from here: https://www.fcc.gov/general/9-1-1-master-psap-registry If you do not find your PSAP or if a change has taken place, please advise the FCC using the contact information in the link provided and register.
Examples	'8533', '6322'

3.3.3 GEODATE

Field Alias	Geometry Modification Date
Common Names	
Field Type	Date
Field Length	
Reference	ISO 8601
Domain	
Definition	Datetime stamp the polygonal geometry was last modified. It should be noted that datetime values are not permissible in Shapefiles. Date fields in Shapefiles can hold a date or a time, but not both.
Examples	'2018-01-15T20:10:30'

3.4 English Language Translation

3.4.1 LE

Field Alias	Law Enforcement ELT
Common Names	
Field Type	Text
Field Length	75
Reference	NENA-ADM-000.21-2017
Domain	

Definition	Designation for the law enforcement response agency associated with this ESN. This field can identify more than one response agency. Although this is a freeform field, consistency in the values should still be employed.
Examples	

3.4.2 FD

Field Alias	Fire Department ELT
Common Names	
Field Type	Text
Field Length	75
Reference	NENA-ADM-000.21-2017
Domain	
Definition	Designation for the responding fire department associated with this ESN. This field can identify more than one response agency. Although this is a freeform field, consistency in the values should still be employed.
Examples	

3.4.3 EMS

Field Alias	Emergency Medical ELT
Common Names	
Field Type	Text
Field Length	75
Reference	NENA-ADM-000.21-2017
Domain	
Definition	Designation for the emergency medical response agency associated with this ESN. This field can identify more than one response agency. Although this is a freeform field, consistency in the values should still be employed.
Examples	

4.0 SERVICE BOUNDARIES

There are multiple service boundary layers that can be created and maintained for use in NGCS, but only three are currently required for provisioning into the NGCS. As with other polygon submissions, these must be topologically sound (no gaps or overlaps) either within the individual layers, and as they fit into the statewide data product. External boundaries should exactly match the ESNs. They may be maintained in a single polygon layer at the local district but, as a pre-condition of the current NGCS provider, must be submitted individually. Because there are now multiple polygon layers that will be uploaded, there is a naming convention requirement in order to properly identify these.

4.1 General Data Structure for all Service Boundaries

Unlike other layers in this Standard, the schema is sourced from version two of the NENA GIS Data Model.

4.1.1 DiscrpAgID

Field Alias	Discrepancy Agency Identifier
Common Names	
Field Type	Text
Field Length	100
Reference	NENA-STA-006.2-202X, NENA-ADM-000
Domain	
Definition	A DNS registry lookup of the agency responsible for receipt of the discrepancy reporting.
Examples	‘Vermont911.vt.us.gov’, ‘nct911.dst.tx.us’

4.1.2 DateUpdate

Field Alias	Date Updated
Common Names	
Field Type	Date
Field Length	
Reference	ISO 8601, NENA-STA-006.2-202X
Domain	
Definition	The datetime stamp of when the record was last updated.
Examples	

4.1.3 Effective

Field Alias	Effective Date
Common Names	
Field Type	Date
Field Length	
Reference	ISO 8601, NENA-STA-006.2-202X
Domain	
Definition	The datetime stamp of when the record is to go into effect.
Examples	

4.1.4 Expire

Field Alias	Expiration Date
Common Names	
Field Type	Date
Field Length	
Reference	ISO 8601, NENA-STA-006.2-202X
Domain	
Definition	The datetime stamp of when the record is set to expire.
Examples	

4.1.5 NGUID

Field Alias	NENA Globally Unique Identifier
Common Names	
Field Type	Text
Field Length	254
Reference	NENA-STA-006.2-202X
Domain	
Definition	Globally unique ID within the GIS database (locally and statewide). Every UID will be a concatenation of 'urn:emergency:uid:gis' + [Layer Indicator] + [Local Unique Identifier] + [Agency Identifier]. The [Layer Indicator] placeholder can be one of three currently required values: 'Pol', 'Fire', 'Ems". The [Local Unique Identifier] placeholder can contain any combination of numbers and letters that create a unique ID. The [Agency Identifier] is a DNS registry, and is assigned by the NGCS provider.
Examples	'urn:emergency:uid:gis:Pol:3184974-8:coronado.ca.us', 'urn:emergency:uid:gis:Fire:3458:hanovercounty.gov', 'urn:emergency:uid:gis:Ems:6ee38f8e-20e4-4e5e-aa37-a22b7a42d9b4:alleghany.pa.us'

4.1.6 Country

Field Alias	Country
Common Names	
Field Type	Text
Field Length	2
Reference	NENA-STA-006.2-202X
Domain	
Definition	
Examples	'US'

4.1.7 State

Field Alias	State
Common Names	
Field Type	Text
Field Length	2
Reference	NENA-STA-006.2-202X
Domain	
Definition	

Examples	‘TN’

4.1.8 Agency_ID

Field Alias	Agency Identifier
Common Names	
Field Type	Text
Field Length	100
Reference	NENA-STA-006.2-202X
Domain	
Definition	A Domain Name System (DNS) identifier that uniquely represents the agency associated with the polygon of record. This will be the same domain found in the NGUID
Examples	‘police.allegheny.pa.us’, ‘flctnecd.gov’

4.1.9 ServiceURI

Field Alias	Service URI
Common Names	
Field Type	Text
Field Length	254
Reference	RFC 3986, NENA-STA-006.2-202X
Domain	
Definition	Uniform Resource Identifier which describes the resource unique location for call routing. It is usually a Session Initiation Protocol (SIP) that defines the route to reach the service.
Examples	‘sip:sos@example.com’, ‘tel:1123456789’

4.1.10 ServiceURN

Field Alias	Service URN
Common Names	
Field Type	Text
Field Length	50
Reference	RFC 8141, NENA-STA-006.2-202X
Domain	‘urn:emergency:service:responder.police’, ‘urn:emergency:service:responder.fire’, ‘urn:emergency:service:responder.ems’
Definition	Uniform Resource Name which is a type of URI. The URN is used to select the service for the desired route. In the service boundaries described here, there are three options.
Examples	

4.1.11 ServiceNum

Field Alias	Service Number
Common Names	
Field Type	Text
Field Length	15
Reference	NENA-STA-006.2-202X
Domain	

Definition	The number (without hyphens) that would be dialed to reach the service.
Examples	‘911’

4.2 Law Enforcement Boundaries

These polygons should reflect the geographic area for each of the responding law enforcement agencies within the respective Emergency Communications District. The submitted layer must be named “ESB_LAW”.

4.3 Fire Department Boundaries

These polygons should reflect the geographic area for each of the responding fire department agencies within the respective Emergency Communications District. The submitted layer must be named “ESB_FIRE”.

4.4 Emergency Medical Services Boundaries

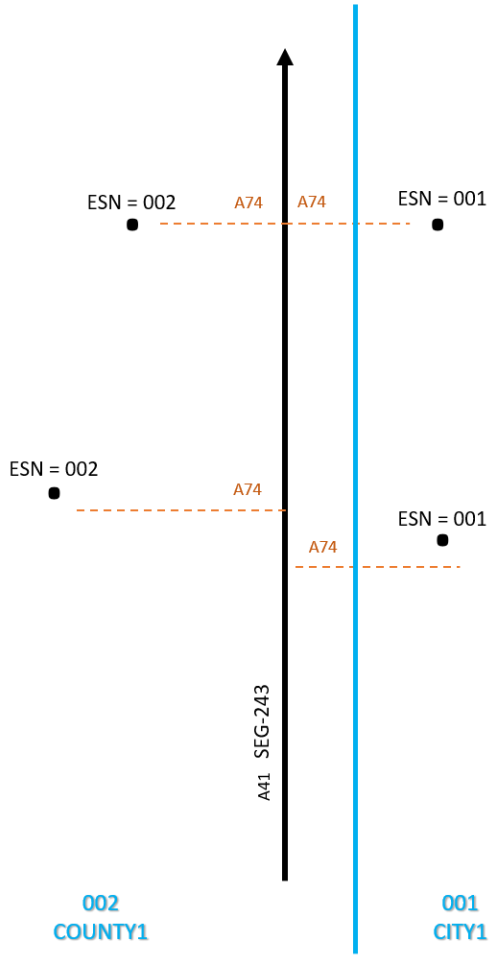
These polygons should reflect the geographic area for each of the responding emergency medical services agencies within the respective Emergency Communications District. The submitted layer must be named “ESB_EMS”.

5.0 GENERAL MODELING SPECIFICATIONS: ROAD CENTERLINE AND ESN POLYGON

This section provides general guidance as to how both the road centerline and ESN polygons should be modeled to create effective layers for use in the NG ecosystem. Modeling for NG should be functional-driven, not data-driven. Features should be digitized and interact with each other in light of the call-routing functionality they will participate in, not simply an attempt to render the attributes.

5.1 ESN Buffers Along Roadways

Road centerlines digitized completely within a single ESN, but that run close to the boundary of an adjacent ESN, reflect the ESN Left and Right values contingent on the address ranges. Roadways are usually the responsibility of one responding agency. Therefore, the centerline of the pavement should usually be within one ESN. As much as possible, the ESN boundary should be digitized within a buffer of the edge of pavement, especially when considering Tenn. Code Ann. § 55-10-117. This is because of call routing for a wireless call that may come from the street or side of the road (notice the offset or buffer provided by the placement of the ESN boundary). If there are addresses on one side of the street that are in a different ESN, that should be reflected in the Left/Right fields of the road centerline (see Figures 3, 4 and 5).



SEGID	SEG-243
L_F_ADD	101
L_T_ADD	199
R_F_ADD	100
R_T_ADD	198
PREDIR	
PRETYPE	
NAME	MAIN
TYPE	ST
SUFDIR	
POSTMOD	
CFCC	A41
ESN_L	002
ESN_R	001
CITY_L	COUNTY1
CITY_R	CITY1
COUNTY_L	THISCOUNTY
COUNTY_R	THISCOUNTY
STATE_L	THISSTATE
STATE_R	THISSTATE

FIGURE 3

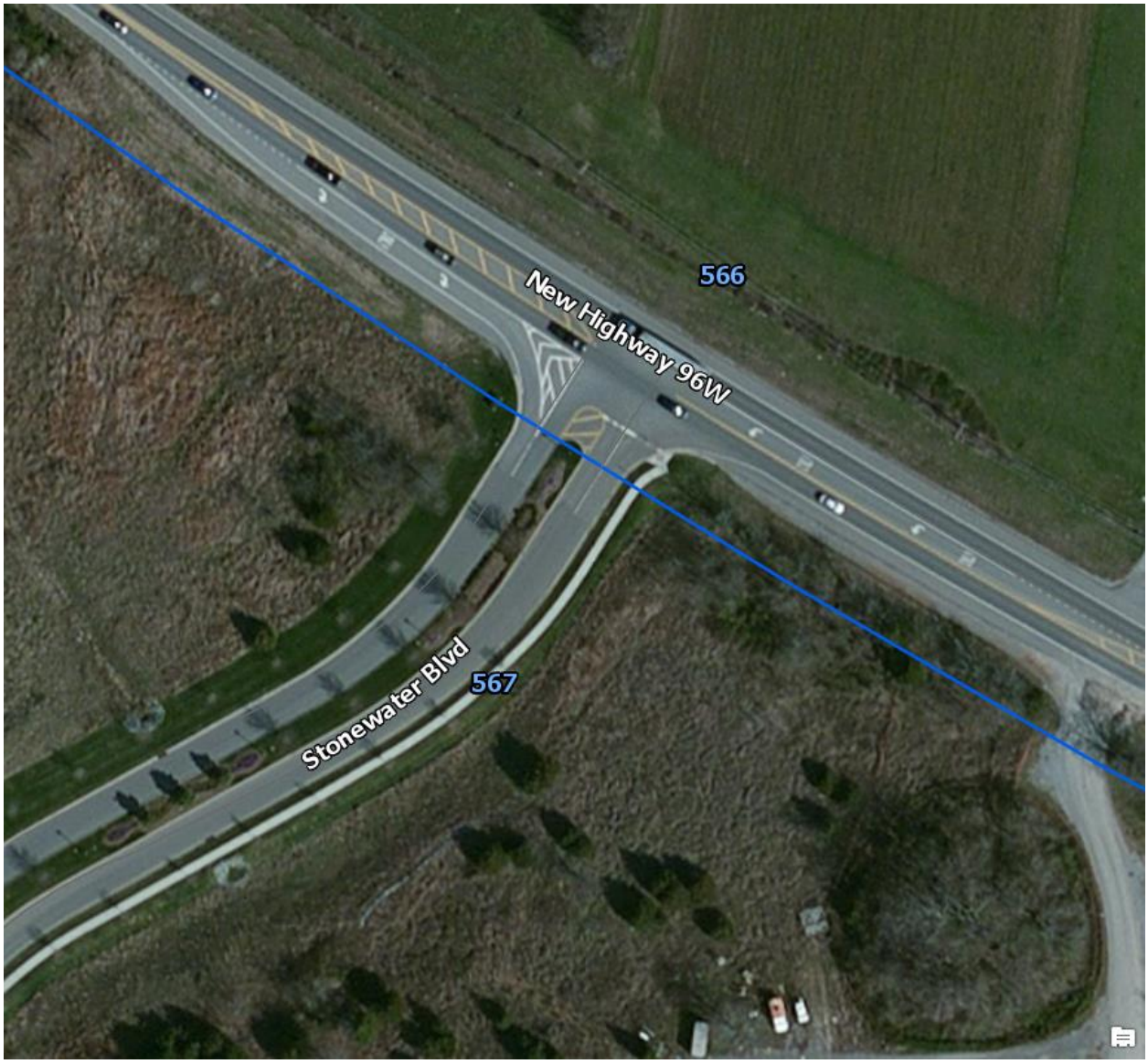
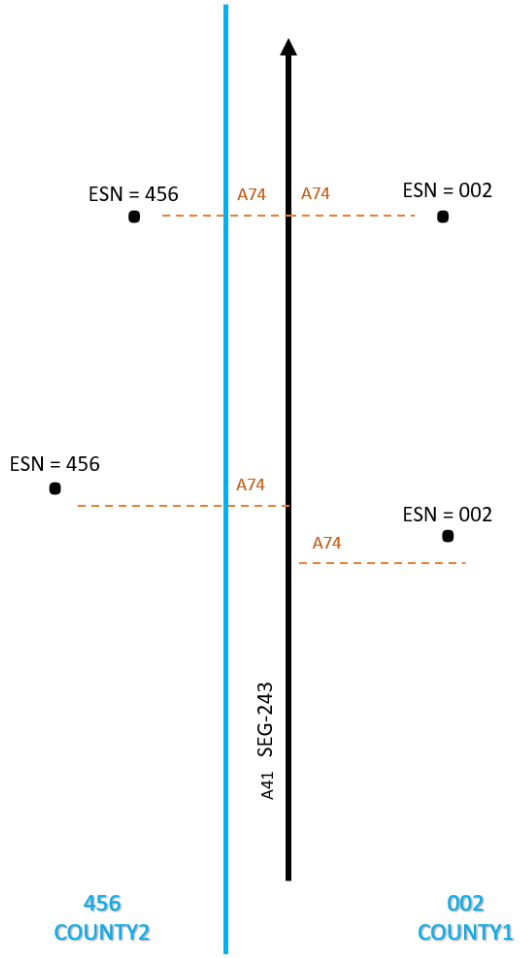


FIGURE 4

Real-world example of an ESN polygonal buffer of New Highway 96 W. This allows for 9-1-1 calls to still be routed correctly, even when the call is made from the shoulder. With the centerline digitized in a northwesterly direction, ESN_L = 567 and ESN_R = 566.

This also means that District-bordering centerlines will need the MSAG Community Name (MCN), ESN and County name from the neighboring District to be placed in the appropriate fields that describes the addresses on that side of the road.

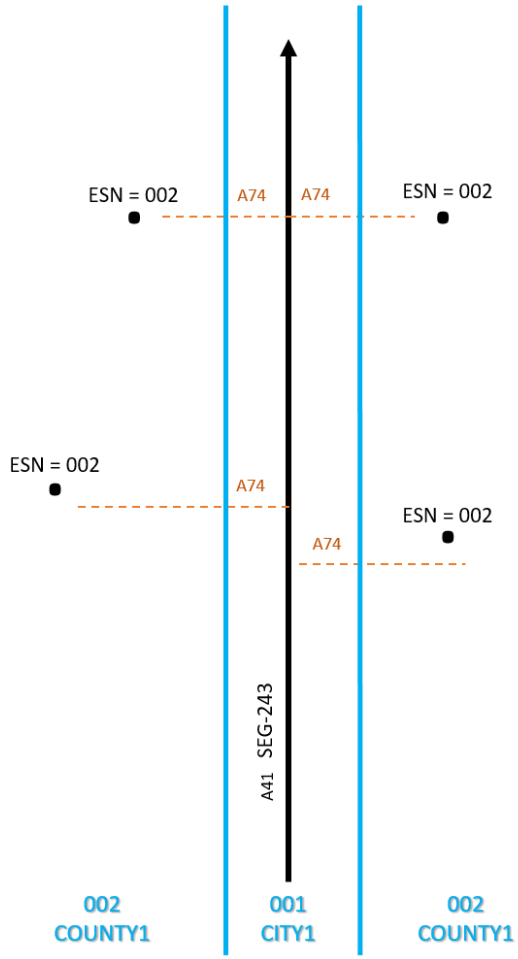


SEGID	SEG-243
L_F_ADD	101
L_T_ADD	199
R_F_ADD	100
R_T_ADD	198
PREDIR	
PRETYPE	
NAME	MAIN
TYPE	ST
SUFDIR	
POSTMOD	
CFCC	A41
ESN_L	456
ESN_R	002
CITY_L	COUNTY2
CITY_R	COUNTY1
COUNTY_L	THATCOUNTY
COUNTY_R	THISCOUNTY
STATE_L	THISSTATE
STATE_R	THISSTATE

FIGURE 5

5.2 Response Agencies Isolated to Pavement RoW

In the same way, if the pavement is the responsibility of an agency that is different from the surrounding property, the ESN should be modeled accordingly. However, the Left/Right fields of the road centerline should reflect the left and right values of the surrounding addresses (see Figure 6). The road centerline is a fallback to the address points during ALI geocoding and should reflect the same addressing values. You will never get a landline call in the middle of the street, and the address points and road centerlines will never be referenced when geocoding a wireless 9-1-1 call.

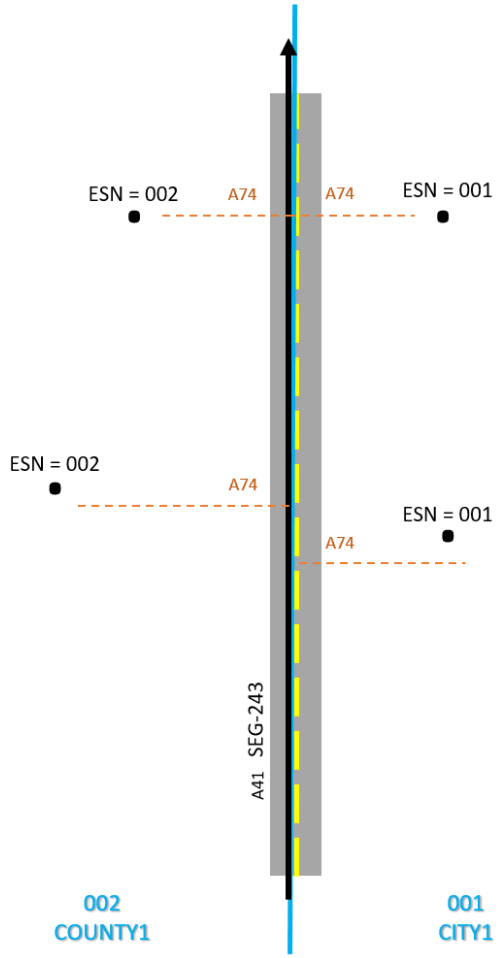


SEGID	SEG-243
L_F_ADD	101
L_T_ADD	199
R_F_ADD	100
R_T_ADD	198
PREDIR	
PRETYPE	
NAME	MAIN
TYPE	ST
SUFDIR	
POSTMOD	
CFCC	A41
ESN_L	002
ESN_R	002
CITY_L	COUNTY1
CITY_R	COUNTY1
COUNTY_L	THISCOUNTY
COUNTY_R	THISCOUNTY
STATE_L	THISSTATE
STATE_R	THISSTATE

FIGURE 6

5.3 Response Agencies Isolated by Lane Coverage

The ESN boundary should never run the centerline of the pavement unless there is dual-agency response coverage based on lane division. As an example, for accidents on the pavement, if the city covers the south-bound lane, and the county covers the north-bound lane, then the ESN boundary should snap to the centerline segments for the length of that condition. In Figure 7, the individual representations for centerline, ESN, and median pavement striping are slightly offset for visualization, but the intent is that they should be coincident.

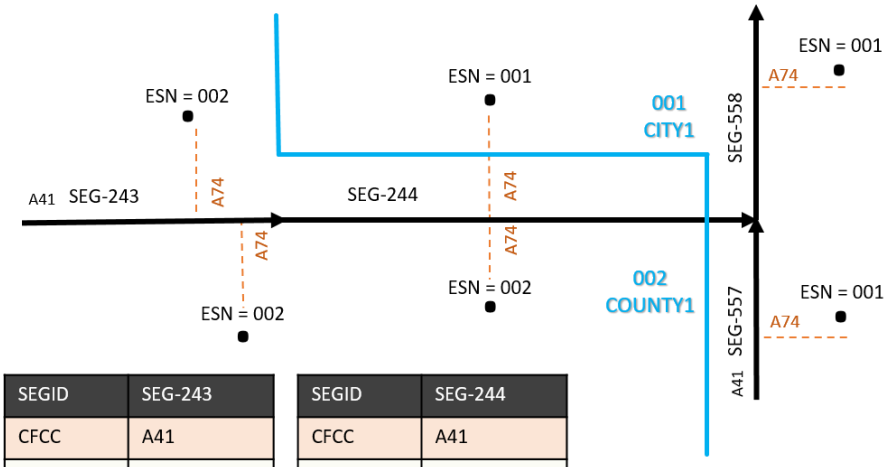


SEGID	SEG-243
L_F_ADD	101
L_T_ADD	199
R_F_ADD	100
R_T_ADD	198
PREDIR	
PRETYPE	
NAME	MAIN
TYPE	ST
SUFDIR	
POSTMOD	
CFCC	A41
ESN_L	002
ESN_R	001
CITY_L	COUNTY1
CITY_R	CITY1
COUNTY_L	THISCOUNTY
COUNTY_R	THISCOUNTY
STATE_L	THISSTATE
STATE_R	THISSTATE

FIGURE 7

5.4 ESN Tapered Angles at Intersections

The use of tapered angles in the ESN polygons in an attempt to visually reflect the centerline attribution should be avoided, especially at intersections. This concept goes back to the distinction between data-driven and functional modeling. From a data-driven standpoint, the polygons must always have an edge or a vertex at the end of a centerline that they break. However, from a functional conceptualization, this can cause an issue with call routing, especially if the involved polygons route to different PSAPs. Figure 8 shows functional modeling employing buffers vs. data-driven modeling using tapered angles at a T-intersection. Should an accident happen and a 9-1-1 call be placed at the intersection, the tapered angle could cause a misroute.



SEGID	SEG-243
CFCC	A41
ESN_L	002
ESN_R	002
CITY_L	COUNTY1
CITY_R	COUNTY1

SEGID	SEG-244
CFCC	A41
ESN_L	001
ESN_R	002
CITY_L	CITY1
CITY_R	COUNTY1

SEGID	SEG-557
CFCC	A41
ESN_L	002
ESN_R	001
CITY_L	COUNTY1
CITY_R	CITYY1

SEGID	SEG-558
CFCC	A41
ESN_L	001
ESN_R	001
CITY_L	CITY1
CITY_R	CITY1

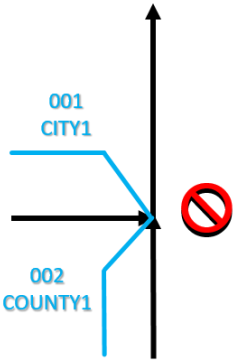


FIGURE 8

5.5 Road Centerline Snapping

A very simple modeling requirement is that all road centerline segments must snap to adjoining segments. Gaps between segments do not meet the geometry standards for the State of Tennessee. This means that centerline segments that meet at jurisdictional boundaries must also snap. The State provides a download of all surrounding District data (as outlined in this specification). The recommended workflow is to download this data and snap your segments to the surrounding District segments at the boundaries to facilitate a seamless centerline dataset when it is aggregated.

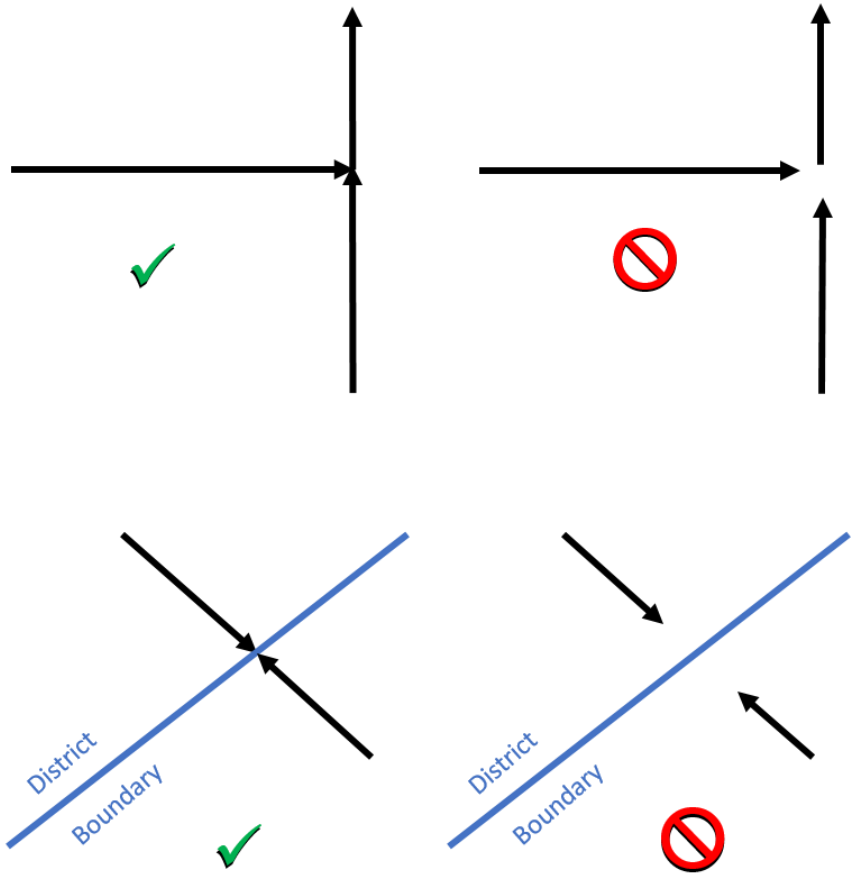
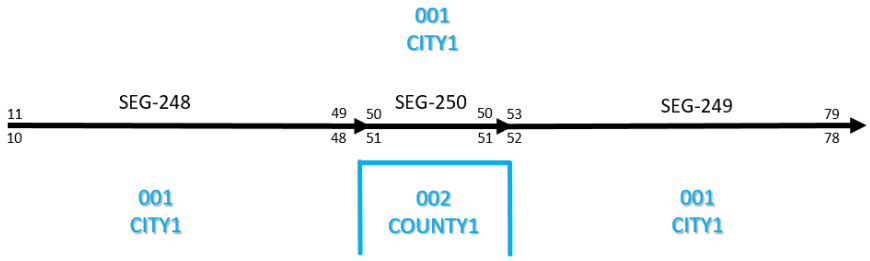


FIGURE 9
Topological gaps between road centerline segments do not meet standard specifications.

5.6 Parity and Zonal Anomalies

Previously, instructions were given to the Districts to "flag" parity anomalies in the data with an alternate STATUS value. That way the segmentation did not have to be changed and those were archived so that they did not affect reporting. That works OK if you are simply querying the data, but the alternate values were never catalogued in the standard, and geoprocessing functions like geocoding, and the NG elements handling MSAG and ALI, know nothing about any anomaly flags. As the standard outlines in §2.2, the address ranges must reflect the associated address points for the left and right side of the segment. This means that if there are places along a centerline where the parity swaps sides, or the zones change, the segment must be modeled accordingly. Call routing functions could be affected if this is not done correctly.

In Figure 10, JONES RD generally has a parity of odd on the left side, even on the right. However, 51 JONES RD was formerly addressed on the wrong side of the street. This address is also in the county, whereas all other addresses are in the city. The line segment should be broken, and the address ranges, as well as the zonal information, should be adjusted to show this discrepancy.



SEGID	SEG-248
L_F_ADD	11
L_T_ADD	49
R_F_ADD	10
R_T_ADD	48
PREDIR	
PRETYPE	
NAME	JONES
TYPE	RD
SUFDIR	
POSTMOD	
ESN_L	001
ESN_R	001
CITY_L	CITY1
CITY_R	CITY1

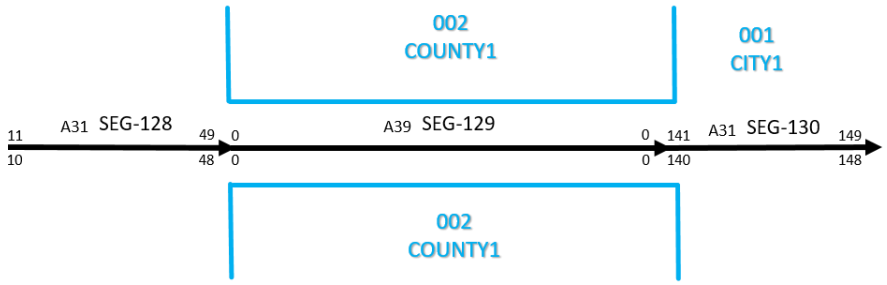
SEGID	SEG-250
L_F_ADD	50
L_T_ADD	50
R_F_ADD	51
R_T_ADD	51
PREDIR	
PRETYPE	
NAME	JONES
TYPE	RD
SUFDIR	
POSTMOD	
ESN_L	001
ESN_R	002
CITY_L	CITY1
CITY_R	COUNTY1

SEGID	SEG-249
L_F_ADD	53
L_T_ADD	79
R_F_ADD	52
R_T_ADD	78
PREDIR	
PRETYPE	
NAME	JONES
TYPE	RD
SUFDIR	
POSTMOD	
ESN_L	001
ESN_R	001
CITY_L	CITY1
CITY_R	CITY1

FIGURE 10

5.7 Bridges

Bridges can be attributed in the road centerline with no address ranges and no left/right zones. If there is an authoritative address on the bridge (e.g., a call box) or if addresses are generated from the centerline for CAD incidents on bridges, then those attributes need to be present.



SEGID	SEG-128
CFCC	A31
ESN_L	001
ESN_R	001
CITY_L	CITY1
CITY_R	CITY1

SEGID	SEG-129
CFCC	A39
ESN_L	
ESN_R	
CITY_L	
CITY_R	

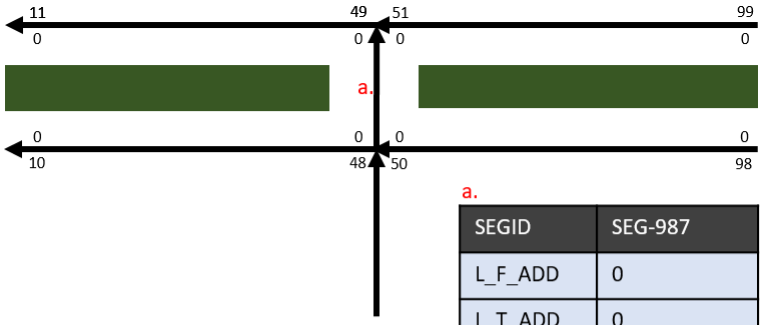
SEGID	SEG-130
CFCC	A31
ESN_L	001
ESN_R	001
CITY_L	CITY1
CITY_R	CITY1

FIGURE 11

5.8 Dual Carriageways and Connectors

Road centerlines represent the center of pavement or throughway. When the pavement is divided, the road centerline needs to depict the branched nature of the road. The address ranges also need to correctly reflect the physical relationship of the range to the correct side of the individual centerline. For instance, address ranges on the median side of a road centerline segment should be zero (0) for both *To* and *From* values.

There are few restrictions when it comes to connectors, because they are mostly there for creating network datasets and for AVL implementations. The only stipulation is that there should be no address ranges present in their attributes (see Figure 12).



a.

SEGID	SEG-987
L_F_ADD	0
L_T_ADD	0
R_F_ADD	0
R_T_ADD	0
PREDIR	
PRETYPE	
NAME	
TYPE	
SUFDIR	
POSTMOD	
CFCC	A60
ESN_L	
ESN_R	
CITY_L	
CITY_R	

FIGURE 12
Example of a connector joining dual carriageway lanes at an intersection.

ACKNOWLEDGEMENTS AND FEEDBACK

The Tennessee Emergency Communications Board (TECB) is the sole owner of this standard for the State of Tennessee.

True North Geographic Technologies, the NG9-1-1 program partner which facilitates the Spatial Interface and maintains the GIS standards document for the TECB, welcomes any observations or constructive criticisms regarding the maintenance standards. Please remit any comments to:

James Wood
True North Geographic Technologies
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Many thanks to the ECD staff across the state that participated in providing feedback and contributing domain values to enhance this standard.

APPENDIX A

USPS Standard Street Suffix Abbreviations

Primary Suffix	Standard
ALLEY	**ALY**
ANEX	**ANX**
ARCADE	**ARC**
AVENUE	**AVE**
BAYOU	**BYU**
BEACH	**BCH**
BEND	**BND**
BLUFF	**BLF**
BLUFFS	**BLFS**
BOTTOM	**BTM**
BOULEVARD	**BLVD**
BRANCH	**BR**
BRIDGE	**BRG**
BROOK	**BRK**
BROOKS	**BRKS**
BURG	**BG**
BURGS	**BGS**
BYPASS	**BYP**
CAMP	**CP**
CANYON	**CYN**
CAPE	**CPE**
CAUSEWAY	**CSWY**
CENTER	**CTR**
CENTERS	**CTRS**
CIRCLE	**CIR**
CIRCLES	**CIRS**
CLIFF	**CLF**
CLIFFS	**CLFS**
CLUB	**CLB**
COMMON	**CMN**
COMMONS	**CMNS**
CORNER	**COR**
CORNERS	**CORS**
COURSE	**CRSE**
COURT	**CT**
COURTS	**CTS**
COVE	**CV**
COVES	**CVS**
CREEK	**CRK**
CRESCENT	**CRES**
CREST	**CRST**

Primary Suffix	Standard
CROSSING	**XING**
CROSSROAD	**XRD**
CROSSROADS	**XRDS**
CURVE	**CURV**
DALE	**DL**
DAM	**DM**
DIVIDE	**DV**
DRIVE	**DR**
DRIVES	**DRS**
ESTATE	**EST**
ESTATES	**ESTS**
EXPRESSWAY	**EXPY**
EXTENSION	**EXT**
EXTENSIONS	**EXTS**
FALL	**FALL**
FALLS	**FLS**
FERRY	**FRY**
FIELD	**FLD**
FIELDS	**FLDS**
FLAT	**FLT**
FLATS	**FLTS**
FORD	**FRD**
FORDS	**FRDS**
FOREST	**FRST**
FORGE	**FRG**
FORGES	**FRGS**
FORK	**FRK**
FORKS	**FRKS**
FORT	**FT**
FREEWAY	**FWY**
GARDEN	**GDN**
GARDENS	**GDNS**
GATEWAY	**GTWY**
GLEN	**GLN**
GLENS	**GLNS**
GREEN	**GRN**
GREENS	**GRNS**
GROVE	**GRV**
GROVES	**GRVS**
HARBOR	**HBR**
HARBORS	**HBRS**

Primary Suffix	Standard
HAVEN	**HVN**
HEIGHTS	**HTS**
HIGHWAY	**HWY**
HILL	**HL**
HILLS	**HLS**
HOLLOW	**HOLW**
INLET	**INLT**
ISLAND	**IS**
ISLANDS	**ISS**
ISLE	**ISLE**
JUNCTION	**JCT**
JUNCTIONS	**JCTS**
KEY	**KY**
KEYS	**KYS**
KNOLL	**KNL**
KNOLLS	**KNLS**
LAKE	**LK**
LAKES	**LKS**
LAND	**LAND**
LANDING	**LNDG**
LANE	**LN**
LIGHT	**LGT**
LIGHTS	**LGTS**
LOAF	**LF**
LOCK	**LCK**
LOCKS	**LCKS**
LODGE	**LDG**
LOOP	**LOOP**
MALL	**MALL**
MANOR	**MNR**
MANORS	**MNRS**
MEADOW	**MDW**
MEADOWS	**MDWS**
MEWS	**MEWS**
MILL	**ML**
MILLS	**MLS**
MISSION	**MSN**
MOTORWAY	**MTWY**
MOUNT	**MT**
MOUNTAIN	**MTN**
MOUNTAINS	**MTNS**

Primary Suffix	Standard
NECK	**NCK**
ORCHARD	**ORCH**
OVAL	**OVAL**
OVERPASS	**OPAS**
PARK	**PARK**
PARKS	**PARK**
PARKWAY	**PKWY**
PARKWAYS	**PKWY**
PASS	**PASS**
PASSAGE	**PSGE**
PATH	**PATH**
PIKE	**PIKE**
PINE	**PNE**
PINES	**PNES**
PLACE	**PL**
PLAIN	**PLN**
PLAINS	**PLNS**
PLAZA	**PLZ**
POINT	**PT**
POINTS	**PTS**
PORT	**PRT**
PORTS	**PRTS**
PRAIRIE	**PR**
RADIAL	**RADL**
RAMP	**RAMP**
RANCH	**RNCH**
RAPID	**RPD**
RAPIDS	**RPDS**
REST	**RST**
RIDGE	**RDG**
RIDGES	**RDGS**
RIVER	**RIV**
ROAD	**RD**
ROADS	**RDS**
ROUTE	**RTE**
ROW	**ROW**
RUE	**RUE**
RUN	**RUN**
SHOAL	**SHL**
SHOALS	**SHLS**
SHORE	**SHR**

Primary Suffix	Standard
SHORES	**SHRS**
SKYWAY	**SKWY**
SPRING	**SPG**
SPRINGS	**SPGS**
SPUR	**SPUR**
SPURS	**SPUR**
SQUARE	**SQ**
SQUARES	**SQS**
STATION	**STA**
STRAVENUE	**STRA**
STREAM	**STRM**
STREET	**ST**
STREETS	**STS**
SUMMIT	**SMT**
TERRACE	**TER**
THROUGHWAY	**TRWY**
TRACE	**TRCE**
TRACK	**TRAK**
TRAFFICWAY	**TRFY**
TRAIL	**TRL**
TRAILER	**TRLR**
TUNNEL	**TUNL**
TURNPIKE	**TPKE**
UNDERPASS	**UPAS**
UNION	**UN**
UNIONS	**UNS**
VALLEY	**VLY**
VALLEYS	**VLYS**
VIADUCT	**VIA**
VIEW	**VW**
VIEWS	**VWS**
VILLAGE	**VLG**
VILLAGES	**VLGS**
VILLE	**VL**
VISTA	**VIS**
WALK	**WALK**
WALKS	**WALK**
WALL	**WALL**
WAY	**WAY**
WAYS	**WAYS**
WELL	**WL**

Primary Suffix	Standard
WELLS	**WLS**

APPENDIX B

USPS Standard Secondary Unit Abbreviations

Description	USPS Standard
APARTMENT	APT
BASEMENT	BSMT **
BUILDING	BLDG
DEPARTMENT	DEPT
FLOOR	FL
FRONT	FRNT **
HANGAR	HNGR
LOBBY	LBBY **
LOT	LOT
LOWER	LOWR **
OFFICE	OFC **
PENTHOUSE	PH **
PIER	PIER
REAR	REAR **
ROOM	RM
SIDE	SIDE **
SLIP	SLIP
SPACE	SPC
STOP	STOP
SUITE	STE
TRAILER	TRLR
UNIT	UNIT
UPPER	UPPR **
GARAGE	GAR
OTHER	OTH

** Does not require Secondary Range Number to follow

This list and other abbreviation standards can be found at:

https://pe.usps.com/cpim/ftp/pubs/pub28/pub28.pdf

cf. USPS Publication 28

APPENDIX C

Non-Uniform Punctuation

These punctuation marks should not be used when editing address field values.

Description	Punctuation
Ampersand	&
Apostrophe	‘
Asterisk	*
At	@
Back Slash	\
Braces Open	{
Braces Close	}
Bracket Open	[
Bracket Close	]
Caret	^
Colon	:
Comma	,
Dollar Sign	$
Double Quotes	“
Ellipsis	…
Equal Sign	=
Exclamation Mark	!
Greater Than	>
Less Than	<
Number Sign	#
Parenthesis Open	(
Parenthesis Close	)
Percent Sign	%
Period	.
Pipe	|
Plus	+
Prime	`
Question Mark	?
Semi-Colon	;
Virgule	/
Tilde	~

APPENDIX D

Census Feature Class Codes (CFCC)

The U.S. Bureau of the Census feature class codes (CFCC) provide information on the classification of a feature. The census feature class codes are used in many geodatasets. The codes are made up of an uppercase letter and a two-digit number followed by their one or two-line definition.

ROAD FEATURE (A)

Code	Description
A10	Road, major and minor categories unknown
A11	Primary road with limited access or interstate highway, unseparated
A12	Primary road with limited access or interstate highway, unseparated, in tunnel
A13	Primary road with limited access or interstate highway, unseparated, underpassing
A14	Primary road with limited access or interstate highway, unseparated, with rail line in center
A15	Primary road with limited access or interstate highway, separated
A16	Primary road with limited access or interstate highway, separated, in tunnel
A17	Primary road with limited access or interstate highway, separated, underpassing
A18	Primary road with limited access or interstate highway, separated, with rail line in center
A19	Primary road with limited access or interstate highway, bridge
A21	Primary road without limited access, U.S. and State highways, unseparated
A22	Primary road without limited access, U.S. and State highways, unseparated, in tunnel
A23	Primary road without limited access, U.S. and State highways, unseparated, underpassing
A24	Primary road without limited access, U.S. and State highways, unseparated, with rail line in center
A25	Primary road without limited access, U.S. and State highways, separated
A26	Primary road without limited access, U.S. and State highways, separated, in tunnel
A27	Primary road without limited access, U.S. and State highways, separated, underpassing
A28	Primary road without limited access, U.S. and State highways, separated, with rail line in center
A29	Primary road without limited access, US highways, bridge
A31	Secondary and connecting road, State and county highways, unseparated

A32	Secondary and connecting road, State and county highways, unseparated, in tunnel
A33	Secondary and connecting road, State and county highways, unseparated, underpassing
A34	Secondary and connecting road, State and county highways, unseparated, with rail lin in center
A35	Secondary and connecting road, State and county highways, separated
A36	Secondary and connecting road, State and county highways, separated, in tunnel
A37	Secondary and connecting road, State and county highways, separated, underpassing
A38	Secondary and connecting road, State and county highway, separated, with rail line in center
A39	Secondary and connecting road, state and county highways, bridge
A41	Local, neighborhood, and rural road, city street, unseparated
A42	Local, neighborhood, and rural road, city street, unseparated, in tunnel
A43	Local, neighborhood, and rural road, city street, unseparated, underpassing
A44	Local, neighborhood, and rural road, city street, unseparated, with rail line in center
A45	Local, neighborhood, and rural road, city street, separated
A46	Local, neighborhood, and rural road, city street, separated, in tunnel
A47	Local, neighborhood, and rural road, city street, separated, underpassing
A48	Local, neighborhood, and rural road, city street, separated, with rail line in center
A49	Local, neighborhood, and rural road, city street, bridge
A50	Vehicular trail, road passable only by four-wheel drive (4WD) vehicle, major category
A51	Vehicular trail, road passable only by 4WD vehicle, unseparated
A52	Vehicular trail, road passable only by 4WD vehicle, unseparated, in tunnel
A53	Vehicular trail, road passable only by 4WD vehicle, unseparated, underpassing
A60	Special road feature, major category used when the minor category could not be determined
A61	Cul-de-sac, the closed end of a road that forms a loop or turn around
A62	Traffic circle, the portion of a road or intersection of roads that form a roundabout
A63	Access ramp, the portion of a road that forms a cloverleaf or limited access interchange
A64	Service drive, road that provides access to businesses, facilities, and rest areas along limited-access highway
A65	Ferry crossing, the representation of a route over water that connects roads on opposite shores

A66	Gated barrier to travel
A67	Toll booth barrier to travel
A70	Other thoroughfare, major category used when the minor category could not be determined
A71	Walkway, nearly level road for pedestrians, usually unnamed
A72	Stairway, stepped road for pedestrians, usually unnamed
A73	Alley, road for service vehicles, usually unnamed, located at the rear of buildings and property
A74	Driveway or service road, usually privately owned and unnamed, used as access to residences, etc., or as access to logging areas, etc.

RAILROAD FEATURE (B)

Code	Description
B00	Railroad, major and minor categories unknown
B11	Railroad main track, not in tunnel or underpassing
B12	Railroad main track, in tunnel
B13	Railroad main track, underpassing
B21	Railroad spur track, not in tunnel or underpassing
B22	Railroad spur track, in tunnel
B23	Railroad spur track, underpassing
B31	Railroad yard track, not in tunnel or underpassing
B32	Railroad yard track, in tunnel
B33	Railroad yard track, underpassing
B40	Railroad ferry crossing, route over water used by ships carrying train cars to connecting railroads on opposite shores, major category
B50	Other rail line; major category used alone when the minor category could not be determined
B51	Carline, a track for street cars, trolleys, and other mass transit rail systems
B52	Cog railroad, incline railway, or logging tram

APPENDIX E

STRUCTYPE Domain Values

The revised list (2019) of structure type values.

Familial

Codes	Description
1	House
2	Duplex
3	Mobile Home
4	Apartment
5	Secondary Structure (e.g., mother-in-law suite)
6	Underground House
7	Condominium
8	Townhome
9	Triplex
10	Trailer Park
11	RV / Camper
12	Cabin
13	Day Care (Child)
14	Day Care (Adult)
15	Senior Citizen Center
16	Bus
17	Quadplex
18	Communal Area
19	Residential Garage

Religious

Codes	Description
200	Religious (General)
201	Place of Worship

Education

Codes	Description
300	Education (General)
301	School
302	University / College
303	Library
304	Dormitory

Medical

Codes	Description
400	Medical (General)
401	Hospital
402	Clinic
403	Pharmacy
404	Dental
405	Vision
406	Nursing Home
407	Assisted Living Facility
408	Rehabilitation Center
409	Morgue

Agricultural

Codes	Description
500	Agricultural (General)
501	Farm
502	Barn
503	Veterinary
504	Animal Shelter
505	Fish Hatchery

506	Greenhouse / Nursery
507	Chicken House

Government

Codes	Description
600	Government (General)
601	Capitol
602	City Hall
603	Court House
604	Post Office
605	DoD / Military

Utility

Codes	Description
700	Utility (General)
701	Tower (General)
702	Cell Tower
703	Radio Tower
704	TVA Siren
705	Water Tank
706	Oil Tank
707	Oil Well
708	Natural Gas Tank
709	Natural Gas Well
710	Natural Gas Pipeline
711	Power Substation
712	Pump Station

Industrial

Codes	Description
800	Industrial (General)
801	Warehouse
802	Recycle Facility
803	Bottling Plant
804	Treatment Plant
805	Landfill
806	Mine
807	Rock Quarry
808	Saw Mill

Public Safety

Codes	Description
900	Public Safety (General)
901	Prison
902	Detention Center
903	Police
904	Sheriff
905	Fire
906	Rescue Squad
907	EMS
908	Shelter
909	Fire Hydrant
910	PELA / LZ / Helicopter Pad
911	PSAP
912	Guard Shack

Transportation

Codes	Description
1000	Transportation (General)
1001	Airport (General)
1002	Airport Hanger
1003	Airport Terminal
1004	Bus Station
1005	Gas Station
1006	Bridge
1007	Rest Area

1008	Railroad (General)
1009	Roundhouse
1010	Train Station
1011	Railroad Crossing
1012	Railroad Equipment
1013	Railroad Mile Marker
1014	River Marker
1015	Mile Marker
1016	Ferry Terminal

Assets

Codes	Description
1200	Asset (General)
1201	Gate
1202	Call Box / Phone Cabinet
1203	Billboard
1204	Traffic Control Box

Commercial

Codes	Description
1300	Commercial (General)
1301	Shopping Area
1302	Store
1303	Office
1304	Parking
1305	Bank
1306	Massage Parlor
1307	Hotel / Motel
1308	Laundry Mat
1309	Storage Facility
1310	ATM

Entertainment

Codes	Description
1400	Entertainment (General)
1401	Restaurant
1402	Café
1403	Bar
1404	Club
1405	Theater
1406	Convention Center
1407	Stadium
1408	Arena
1409	Sports Complex
1410	Food Truck
1411	Zoo

Recreational

Codes	Description
1500	Recreational (General)
1501	Park
1502	Campground
1503	Lodge
1504	Golf Course
1505	Boat Dock
1506	Watercraft
1507	Swimming Pool

Historical

Codes	Description
1600	Historical (General)
1601	Museum
1602	Cemetery

Miscellaneous

Codes	Description
9000	Temporary
9001	Vacant
9002	Unknown

APPENDIX F

Populating Street Address Fields Correctly

[STNUM] and [STNUMSUF] collectively comprise the complete street number. [STNUMSUF] is not a secondary address field. It is a part of the primary street or house number. [STNUMSUF] should not contain values that are found in Appendix B of this document. It is an alphanumeric field, but if the value is not a part of the primary street number, it does not belong in the [STNUMSUF] field. See § 1.3 for individual primary address number field definitions.

The secondary address fields in the address point layer are crucial to identifying legitimate address points for MSAG creation. Every secondary address point MUST have a primary address point, and the secondary address fields are the distinction. See § 1.4 for individual secondary field definitions. If any values are found in the UNIT_TYPE or UNIT_NUM fields, then that record is isolated as a secondary address. Be sure these fields are blank when creating a primary address.

Primary Address

123 Main Street West

STNUM	STNUMSUF	BUILDING	FLOOR	UNIT_TYPE	UNIT_NUM	PREDIR	PRETYPE	NAME	TYPE	SUFDIR
123								MAIN	ST	W

Secondary Address

123 Main Street West, Apartment A

STNUM	STNUMSUF	BUILDING	FLOOR	UNIT_TYPE	UNIT_NUM	PREDIR	PRETYPE	NAME	TYPE	SUFDIR
123				APT	A			MAIN	ST	W

Secondary Address: Multiple Buildings and Floors

456 Main Street West, Building B, Floor 2, Suite 205

STNUM	STNUMSUF	BUILDING	FLOOR	UNIT_TYPE	UNIT_NUM	PREDIR	PRETYPE	NAME	TYPE	SUFDIR
456		B	2	STE	205			MAIN	ST	W

Primary Address: Duplex

789A East Broad Way

STNUM	STNUMSUF	BUILDING	FLOOR	UNIT_TYPE	UNIT_NUM	PREDIR	PRETYPE	NAME	TYPE	SUFDIR
789	A					E		BROAD	WAY	

or

STNUM	STNUMSUF	BUILDING	FLOOR	UNIT_TYPE	UNIT_NUM	PREDIR	PRETYPE	NAME	TYPE	SUFDIR
789A						E		BROAD	WAY	