COMMONWEALTH OF VIRGINIA

Information Technology Resource Management (ITRM)

ADDRESS POINTS

GEOSPATIAL DATA STANDARD

VIRGINIA INFORMATION TECHNOLOGIES AGENCY (VITA)

VIRGINIA GEOGRAPHIC INFORMATION NETWORK (VGIN)

Reviews

- Agency and peer review was provided for agencies and other interested parties via series of Internet based forum of local and state government technologists.

Publication Version Control

Questions related to this publication should be directed to EA@vita.virginia.gov

This following table contains a history of revisions to this publication.

Version	Date	Revision Description
00	06/20/2017	Original

Identifying Changes in This Document

- See the latest entry in the revision table above.
- Vertical lines in the left margin indicate the paragraph has changes or additions. Specific changes in wording are noted using italics and underlines; with italics only indicating new/added language and italics that are underlined indicating language that has changed.

The following examples demonstrate how the reader may identify requirement and recommend practice updates and changes:

EXA-R-01 **Example with No Change –** The text is the same. The text is the same. The text is the same.

EXA-R-02 **Example with Revision –** The text is the same. *A wording change, update or clarification is made in this text.*

EXA-R-03 ***Example of New Text –*** *This language is new.*

~~**EXA-R-04** **Technology Standard Example of Deleted Standard –** This standard was rescinded on mm/dd/yyyy.~~

Preface

Publication Designation
Address Points Geospatial Data Standard (OTH 704-00)

Subject
Address Points – structure and site addressed geo-spatial entities

Effective Date
09/21/2017

Compliance Date
09/21/2017

Supersedes
N/A

Scheduled Review:
This standard shall be reviewed on an annual basis

Authority
Code of Virginia, *§ 2.2-225* (Powers and duties of the Secretary of Technology (SoTech)

Code of Virginia, *§2.2-2007* (Powers of the CIO)

Code of Virginia, § 56.484-14, gives the 9-1-1 Services Board the power and duty to develop a comprehensive single, statewide electronic addressing database to support geographic data and statewide base map data programs pursuant to § 2.2-2027.

Scope
This standard is applicable to all Executive Branch state agencies and institutions of higher education (hereinafter collectively referred to as "agencies") that are responsible for the management, development, purchase and use of information technology resources in the Commonwealth of Virginia. This standard does not apply to research projects, research initiatives or instructional programs at public institutions of higher education.

Purpose
This standard establishes direction and technical requirements which govern the acquisition, use and management of information technology resources by executive branch agencies.

Chief Information Officer of the Commonwealth (CIO)
Develops and approves statewide technical and data policies, standards and guidelines for information technology and related systems.

Virginia Information Technologies Agency (VITA)
At the direction of the CIO, VITA leads efforts that draft, review and update technical and data policies, standards, and guidelines for information technology and related systems. VITA uses requirements in IT technical and data related policies and standards when establishing contracts; reviewing procurement requests, agency IT projects, budget requests and strategic plans; and when developing and managing IT related services

Information Technology Advisory Council (ITAC)
Advises the CIO and Secretary of Technology on the development, adoption and update of statewide technical and data policies, standards and guidelines for information technology and related systems

Executive Branch Agencies
Provide input and review during the development, adoption and update of statewide technical and data policies, standards and guidelines for information technology and related systems. Comply with the requirements established by COV policies and standards. Apply for exceptions to requirements and standards when necessary.

Related ITRM Policies, Standards, and Guidelines
Current version of ITRM Standard/Guideline:
GIS Data Standards, 3/14/2015 (VITA-VGIN)

Table of Contents

1) Address Points Geospatial Data Development

1.1 Introduction and Scope

The *Address Points Geospatial Data Standard* document implements, as a commonwealth ITRM Standard, the data file naming conventions, coordinate systems, geometry, attributes, dataset type and specifications for the Virginia Address Points dataset. The standard shall be applicable to commonwealth local governments and state agencies and serve as the data source of record at the state level for address point spatial features within the Commonwealth of Virginia.

Address points represent the locations and address elements of addressable structures and locations. Address point data are critical to the geolocation of people, property, and physical assets in proximity to the addressed features. These data support functions such as emergency response, civic commerce, navigation, and government management.

In order to support these uses, there should potentially be an address point representing:

- Every street addressable single-unit building.
- A point on each living unit, or occupancy of every multi-unit building or complex.
- A point for telephone serviced street address in the service provider's listings.
- A point for addressed land parcel where addressed structure does not exist.
- A point for commonly known landmarks.
- Communication assets that are telephoned serviced are not required at this time.
- Infrastructure assets that are addressed but not human occupied are not required at this time.

The Virginia Geographic Information Network (VGIN) is coordinating the development and maintenance of the statewide Address Point data layer in conjunction with local governments across the commonwealth in order to create a seamless georeferenced database feature class containing address numbers and road names. These data are to complement the Virginia Base Mapping Program's (VBMP) Road Centerline (RCL) product by providing even more accurate geocoding results. Address points are data developed and produced by Virginia's local governments and sent to VGIN along with their road centerline updates. An extract, transform and load (ETL) process is run to load these local data into the Virginia Base Mapping Address Point schema.

The Virginia Address Point dataset leverages the commonwealth's investment in VBMP digital ortho-photography as well as focusing its efforts to create a single statewide address point layer to be used in the VGIN Geocoding Web Service (GWS). The statewide dataset can also be used as a quality control resource for checking and improving upon the consistency and accuracy of other local and statewide datasets that use or reference addresses.

Implementation of these standards by local addressing authorities may require changes to current practice; however, there is recognition that not all of the identified standards can be accommodated or incorporated immediately. A direct result of the standards included in this documentation will be adopted over time while local addressing authorities and VGIN develop and maintain address databases and modify and improve upon address point data and the data transfer process.

1.2 Background

The Virginia Geographic Information Network (VGIN) has produced this document to provide guidance for the development and maintenance of the statewide Address Points dataset. The National Emergency Number Association (NENA) specializes in standardizing data to be used in public safety systems for the purpose of emergency response. The creation of a statewide aggregated dataset is a necessary foundation to support Next Generation 9-1-1 (NG9-1-1) technologies which utilize GIS-based call routing.

NG9-1-1 is an Internet Protocol (IP) based system comprised of managed Emergency Services IP networks (ESInets), functional elements (applications), and databases that replicate traditional E9-1-1 features and functions and provides additional capabilities. NG9-1-1 is designed to provide access to emergency services from all connected communication sources, and provide multimedia data capabilities for Public Safety Answering Points (PSAPs) and other emergency service organizations (www.nena.org/resource/resmgr/ng9-1-1_project/whatisng911.pdf).

The NENA NG9-1-1 GIS Data Model (NENA-STA-006) was used as the authoritative basis for this document. This was augmented by input from local government addressing authorities and emergency management agencies. This document will guide the creation of a consistent seamless address point dataset for the commonwealth that will meet the requirements to allow proper functioning of NG9-1-1 call routing.

§ 56.484-14 of the Code of Virginia gives the 9-1-1 Services Board the power and duty to develop a comprehensive single, statewide electronic addressing database to support geographic data and statewide base map data programs pursuant to § 2.2-2027. The VGIN Coordinator is given the charge to initiate and manage projects or conduct procurement activities relating to the development or acquisition of geographic data or statewide base map data or both.

1.3 Definitions

Addressing shall include the required attributes to uniquely identify and locate individual structures, parcels, sites and access points referenced above. Addressing of points reflect the addresses that are assigned by local addressing authorities. These typically are in sequence with the linear referenced address numbering of the road segments with which they are paired. Addressing shall be unique for each point residing within the source jurisdiction's boundary. Address points shall be defined as a geographically correct and digitally rendered point geometric representation of any of the following:

- an addressed structure (residential, commercial, industrial, or institutional)
- a subaddressed unit (apartment, office suite, or floor unit)
- a property parcel
- a named site (named as in a colloquial or commonly understood name)
- an access point (driveway to a property, or entrance to large structure)

Unique address will be comprised of the combination of all naming elements of the full address. In cases where the same addressed structure, parcel, site or access point is provided by multiple localities, VGIN shall coordinate with those localities to resolve the duplication of addressing within the Address Points dataset.

Address points data development must be compatible with both existing emergency call center communications systems and support basic civic navigational systems. The reader of this document may consider data scalability and relationships with thematically connected datasets in an enterprise database system. The latter includes the relationships between geospatially rendered building footprints, road centerlines, road name alias tables, master address tables, and tax parcel boundary datasets.

2) Address Points Geometry Standardization

In addition to how Virginia localities maintain their address points, the United States Postal Service (USPS), NENA, individual state departments of transportation and emergency response agencies provide valuable insight on address point data development. The following components of geometric characteristics will determine consistency within the Virginia Address Points data.

2.1 Address Points Geometry Representation

The recommended geometry representation standards should be applied to current data management practices. NENA-STA-006 (NG9-1-1 GIS Data Model) and NENA-INF-014 (Site/Structure Address Point) do not clarify on the type of feature that an address point should be (point or multipoint), NENA-INF-014 does suggest that future NENA workgroups consider allowing the usage of multi-points:

> "A multipoint is a single feature in a GIS, consisting of a collection of one or more individual point locations, stored as coordinate pairs (these are referred to in some software packages as "parts" of the feature.) A multipoint feature has a single record in the database – this reflects the fact that the collection of point locations has a single identity. For example, a set of building centroids representing a condo development where all the buildings have the same numbered address might be represented as a multipoint.
>
> In a data production environment, that includes requirements from outside the 911 center, multipoints can resolve a dilemma associated with developing an address point data set using commonly available resources: aerial imagery, structure footprints and parcel maps. The dilemma is that on the one hand, associating simple (single-part) point geometries with address records is intuitively understood as the "correct" methodology and is more compatible with many software packages currently in use. On the other hand, it is very common to have multiple structures at a site with just one address, any of which might be the source of a call or the location of an incident, so a collection of points is really a more accurate representation of reality.
>
> Not every structure can be separately addressed, but it is still desirable to assign an address to every structure. Multipoints allow the user to do this while avoiding an ambiguous, many-to-one relationship between the geometry and the address record. The user can disaggregate or "explode" the multipoint and add address detail where necessary to support call routing, dispatch or any other 9-1-1 function. If necessary, single points (feature centroids) can be generated from multipoints to provide compatibility with software and display requirements. Further standards development is needed to support the potential use of multipoints."

This recommendation is proposed for inclusion in future NENA workgroups, standards and information documents, the Virginia Address Points standard shall allow the use of multipoint features with the understanding that some systems may not be able to accommodate the geometry, and additional steps can be taken to generate single point feature centroids for those features that are more easily captured by multipoints features.

2.2 Generating Address Points

When developing an Address Points dataset, the beginning stages use computer digitization methods. The following should be considered when digitizing and placing the point for an Address Points feature in a database:

Ranking the preferred point placement methods for public safety applications, the five placement methods practices are as follows:

- Structure – best option
- Site – next best option
- Property Access – conditionally best option
- Parcel centroid – acceptable option
- Geocoding from street centerlines– least desirable

Location Placement Methods

There are a number of ways that address points can be generated. Most address points datasets utilize one or several methods for placing address points. Within the address points data collection, it is critical to understand placement methodologies because there are some methods that are preferred over others for various applications.

2.2.1. Structure Placement Method: Structures such as residential houses, commercial or institutional buildings, or industrial buildings that are address and identifiable on spatially registered ortho-imagery should be captured as either a point centroid of the outline of the structure, or at the main access / entrance of a large structure. For an emergency response it may be helpful to distinguish locations at the level of sub address where they exist. Additionally, for large structures with one address and no subaddressing, placing the address point at the structure's entrance will support human response to events located at that address.

When points are created or updated using the centroids of a building footprint polygon layer, those points should reside inside the structure's planimetric footprint. The building polygon layers used to create the points should reflect the location of buildings in the best available orthoimagery. When better orthoimagery becomes available, any new or updated points may be shifted or updated to the more accurate geolocation.

Structure points placed at the entrance of a building are usually developed using field tools or GPS measurements. This does take more time to develop and maintain the dataset, but there are definite benefits for emergency response when the primary structure entrance is used as the location for the address point especially for larger buildings.

If subaddressing of an apartment complex or high-rise building exists then multiple address points per the one structure can be employed. These point locations may be stacked or off-set but should be placed with-in the structure footprint. Subaddress attributes must be recorded so that each point is unique with the subaddress element.

In situations where locality address points do not exist, but where a locality provides VGIN with a building footprint dataset with address information, VGIN may create structure centroids for those footprints that contain supporting address information.

2.2.2. Site Placement Method: Sites are defined as a location that is either: not well defined, or has no visible boundary, or a site that can be a commonly known location such as an athletic field, picnic area, or botanical garden. Address locations derived from site centroids may be a starting point, but in many situations a more detailed and accurate placement (manual placement) will be needed to achieve useful representation. Site placement may be better served with entrance / access points especially if it is a large property.

2.2.3. Property Access / Entrance Placement Method: The location of this address point would typically represent where a driveway, access road, or other primary entrance to a property meets a named road. Note that there can be more than one access to a property, so it is recommended that the address point be placed at the center of the property's primary access route. It is also typically located near the named road that is part of the full address in the address point. This method best supports human actions in situations where the primary use or activity is far from the property center or where the property is so large that sites and structures would not be discernable from the road or adjacent open space. For example: larger parcels or complexes with multiple accesses may benefit from this placement method.

2.2.4. Parcel Placement Method: Address locations derived from parcels are an easy initial address placement. While this will make for an easy starting point in most address point development, a more detailed and accurate placement will likely be needed later to achieve useful presentation of information. While some address points may be placed by hand within the boundary of a parcel, most often, the parcel placement method reflects the centroid of a parcel. Parcel centroids can be created by automatically calculating the center of a parcel polygon using an automated centroid creation process. This is typically performed as a geoprocessing operation in a geographic information system (GIS). A case may exist for having multiple points assigned to one record as parcel polygons may include more than one polygon for that parcel. Additionally, it will be important to consider that a complete dataset of address points for parcels with addresses will likely not represent the full domain of valid addresses within a locality. For example, it is commonplace to have several unique addresses located on a single parcel (i.e. in apartment complexes). In these situations, the parcel placement method would also need to be supplemented in order to create a complete listing of valid addresses within a locality.

2.2.5. Geocoding Placement Method: When no other datasets are available to base addresses on, address points can be created using address ranges from a road centerline dataset. When geocoded, points are created by interpolating the address along the address range. While this is one of the quickest ways to create address points, the placement of the points is highly inaccurate compared to where an address point should be located. When locality address points are found to have been created using this method, VGIN will coordinate with the locality to determine potential options for improving the quality and accuracy of the locality dataset by utilizing another placement method.

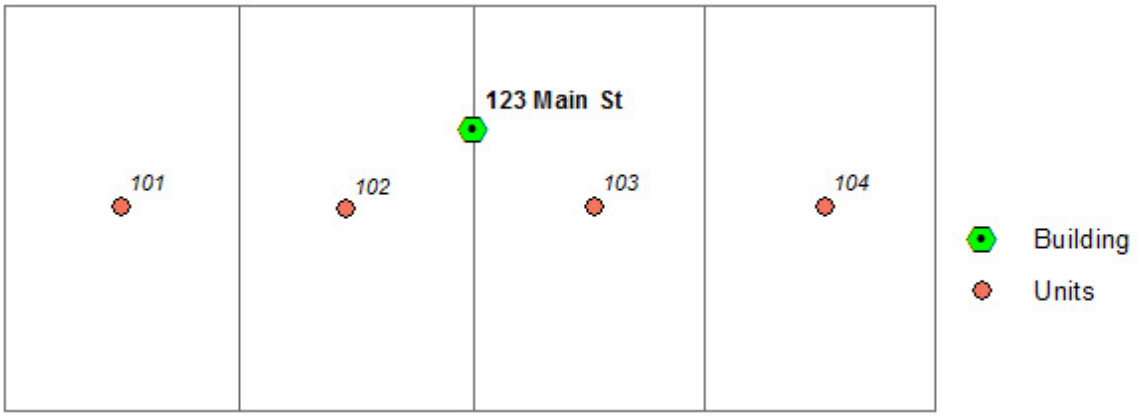
2.3 Subaddresses and Occupancy Units

Subaddresses are elements of addresses used to identify and differentiate from one another specific locations within structures/sites or within a group of structures/sites. Subaddresses may also be used to reflect commonly used names such as areas in a park (15000

Livingston Rd, Softball Field). Point placement considerations should encompass use of the NG9-1-1 GIS Data Model structure (NENA-STA-006) and the six sub address elements (Building, Floor, Unit, Room, Seat, and Additional Location Information) described in the Civic Location Data Exchange Format standard (NENA-STA-004).

It will be critical for those placing points to consider how much (or to what level) detail will be used to place an address point. A balance will have to be struck for the level of subaddress detail needed depending upon the application use (e.g., one point for an entire building vs. one point for each floor, unit, room or seat within a building). Often, the level of detail associated with subaddress information is not needed for routing a call but may be helpful for identifying the location for responders.

Figure 2a: *Multiple Unit Dwelling – Unit access at ground floor. Unit designation makes each point unique. (Figure courtesy of Kansas_NG911_GIS_Data_Model_v1_1.pdf)*



2.4 Geometry Data Rules

RULE 1 - Address Points Must Have Valid Geometry

This inconsistency type is normally where ESRI geodatabases have empty geometry (rows

in feature class with no associated spatial data). It can be problematic when comparing shapes to table records or performing database queries. The evaluation reveals specific geometry data errors, many caused by editing tools and data environment.

RULE 2 - Address Points Must Not Have Duplicate Geometry for Same Nominal Address

Duplicate geometry can occur where the same point been manually inserted into a schema twice instead of once due to errant data update procedure. The Quality Control evaluation will locate where local data or state data is completely on top of another feature of the same coordinate and contains all attributes that are identical. Stacking points is permissible if subaddressing is unique.

RULE 3 - Multipart Features

Multipart features are allowed provided one unique record with consistent address is recorded in the database.

RULE 4 - Address Points Must Correspond to Street Addressing

Address Point addressing must exist along a road segment with corresponding address numeric ranging, street-side parity, and consistent street naming.

RULE 5 – Stacking Address Points

Having address points stacked on top of each other – sharing the same geographic place to capture unique subaddressed units within a greater structure or campus is permissible.

3) Address Points Attribute Standardization

NENA specializes in standardizing data to be used in public safety systems for the purpose of emergency response. The United States Postal Service (USPS) also specializes in standardizing road name and address information so that databases accurately reflect ground condition for mail delivery.

A geospatial database of Address Points features enables geocoding and routing functionality to the geographic shapes by using shape length and direction along with the non-spatial attribute information that can be stored alongside or specifically within the features themselves. While point geometry provides a spatial basis for location, the address attributes impart a degree of success in communicating the location and determining the most effective routing to and from the location. Placing standards on the input attribution will support the effectiveness of operational functions and all subsequent generated communication.

By using existing NENA and USPS standards for address and street name location, it is the goal of VGIN to be able to define the Address Points data model schema outlined in this section with a proper data entry methodology. By specifying domain values as well as using data entry standards for free-text fields, the information in this section will ensure that the dataset is properly formatted. This field standardization will enable output publications to be checked against provider databases (MSAG/ALI) and it will also ensure that the data is compatible with Next Generation 9-1-1 systems.

3.1 Address Points Publication Format

File and Feature Naming Conventions

Dataset Published Title (Release in YYYY Format)	"VIRGINIA_ADDRESS_POINTS_YYYYMM"
Dataset Type	ESRI-compatible File Geodatabase
Feature Geodatabase **File Name**	"VIRGINIA_ADDRESS_POINTS"
Geodatabase Feature Classes	"VIRGINIA_ADDRESS_POINTS" – Contains Address Points feature class as provided by the Virginia Geographic Information Network (VGIN)

Coordinate Systems and Geometry

Projected Coordinate System	Lambert Conformal Conic Virginia
Geographic Coordinate System	GCS North American 1983
Geometry Type	ESRI Multi-Point

3.2 Address Points Table Schema

Feature Class: VA_ADDRESS_POINTS					
Field Name	**Data Type**	**Length/ Precision**	**Description**	**LOV/ Domain**	**M/C/O/V ***
OBJECTID	Object ID	Default	Geodatabase feature ID	None	System-Generated
Shape	Geometry	Default	Feature geometry. Coordinates defining the features.	None	System-Generated
STREET_NAME_ID	Double	16	Unique statewide VGIN Address	None	Conditional
ADDRESS_ID	Double	16	Unique statewide VGIN Address Points ID	None	VGIN
LOCAL_ADDR_ID	Double	16	Address Points ID from Locality	None	Mandatory
BUILDING_ID	Double	16	Foreign ID key link to building footprint layer	None	Conditional
PARCEL_ID	Text	20	Property parcel ID if identified from source.	None	Conditional
ADDPTGEO_ID	Double	8	Geo ID generated by VGIN	None	VGIN
MFIPS	Text	7	Maintenance FIPS code of locality	FIPS	Mandatory
GEOMETRY_EDIT_TYPE	Short	Default	Type of edit made to geometry	EDIT_TYPE	Optional
GEOMETRY_EFFECTIVE_DATE	Date	Default	Date of segment entry	None	Optional
GEOMETRY_EDIT_DATE	Date	Default	Date of segment edit	None	VGIN
LOCATION_TYPE	Text	9	Structure, Access, Site, Parcel Centroid	LOC_TYPE	Conditional
ADDRESS	Long	Default	Address (single unit numeric)	None	Mandatory
ADDRESS_SUFFIX	Text	11	Modifier to numeric address, can include half address	None	Conditional
SUB_ADDRESS_UNIT	Text	10	Unit identifier	None	Conditional
SUB_ADDRESS_TYPE	Text	10	APT, FLOOR, SUITE, UNIT, Department	USPS **	Optional
BUILDING	Text	5	Building subaddress designation	None	Conditional

LANDMARK_NAME	Text	60	Common name	None	Conditional
STREET_PREMODIFIER	Text	10	USPS Street Modifier - PRE	USPS **	Conditional
STREET_PREFIX_DIRECTION	Text	2	USPS / NENA Standard Street Prefix	DIRECTION	Conditional
STREET_NAME	Text	75	Standardized Street Name	None	Mandatory
STREET_SUFFIX	Text	4	USPS/NENA Street Suffix Type	SUFFIX	Mandatory
STREET_SUFFIX_DIRECTION	Text	2	USPS/NENA Street Suffix Direction	DIRECTION	Conditional
STREET_POSTMODIFIER	Text	10	USPS Street Modifier - Post	USPS **	Conditional
STREET_NAME_FULL	Text	100	Full title concatenated street name	None	VGIN
STREET_NAME_SOURCE	Text	4	Source of street name	SOURCE	Optional
STREET_NAME_EDIT_DATE	Date	Default	Date of street name edit	None	Optional
ROUTE_IDENTIFIER	Text	20	VDOT Route	None	Optional
ADDRESS_LABEL	Text	50	Fully concatenated address as found in mailing label	None	VGIN
POST_OFFICE	Text	40	Name of postal office servicing area	USPS **	VGIN
POSTAL_CODE	Text	5	5-digit Postal Code	USPS **	Mandatory
SEC_STREET_PREFIX	Text	2	Secondary Standard Prefix	Direction	Conditional
SEC_STREET_NAME	Text	75	Secondary Standard Street Name	None	Conditional
SEC_STREET_SUF	Text	4	Secondary Standard Street Type	Suffix	Conditional
SEC_STREET_DIR	Text	2	Secondary Stand Street Suffix	Direction	Conditional
SEC_STREET_MOD	Text	10	Secondary USPS Street Modifier - Post	USPS **	Conditional
SEC_STREET_FULL	Text	100	Secondary Street Name concatenated	None	Conditional
MUNICIPALITY	Text	60	Name of incorporated town, or city	Census	Mandatory
COUNTY	Text	60	Name of County	Census	Mandatory
UNINCORP_JURISDICTION	Text	60	Name of	None	Conditional

			Unincorporated Town or Village		
NEIGHBORHOOD	Text	40	Subdivision or urban neighborhood	None	Optional
STATE	Text	2	US Postal abbreviated state	default	Mandatory
US_NAT_GRID	Text	20	US National Grid coordinates to 10 digits (1 meter)	None	VGIN
PSAP	Text	4	Public Safety Answer Point	None	Mandatory
LAT	Integer		Latitude	None	VGIN
LONG	Integer		Longitude	None	VGIN
CAPTURE_METHOD	Text	30	Automated or manual	None	VGIN
ADDITIONAL_LOCATION	Text	40	Unique site information	None	Optional
ESN	Text	5	Emergency Service Number	None	VGIN
DATE_INTAKE	DATE		Data VGIN load	None	VGIN

*** M/C/O/V column definitions**:
M – Mandatory C – Conditional O – 0ptional V – VGIN coded

**** Sections 221 & 223 of USPS Publication 28**

Optional **Street Name Alias** table (if separate Street Name table is available)

Object Table: STREET_NAME_ALIAS				
Field Name	**Data Type**	**Length/ Precision**	**Description**	**LOV/ Domain**
OBJECTID	Object ID	Default	Geodatabase feature ID	None
STREET_ALIAS_ID	Double	16	Street Alias table ID	None
STREET_PREMODIFIER	Text	10	USPS Street Modifier - PRE	USPS **
STREET_PREFIX_DIRECTION	Text	2	USPS / NENA Standard Street Prefix	DIRECTION
STREET_NAME	Text	75		None
STREET_SUFFIX	Text	4	USPS/NENA Street Suffix Type	SUFFIX
STREET_SUFFIX_DIRECTION	Text	2	USPS/NENA Street Suffix Direction	DIRECTION
STREET_POSTMODIFIER	Text	10	USPS Street Modifier - Post	USPS **
STREET_NAME_FULL	Text	100	Full title concatenated street name	None
STREET_NAME_SOURCE	Text	4	Source of street name	SOURCE
STREET_NAME_EDIT_DATE	Date	Default	Date of street name edit	None

Optional **Street Name Join** table (separate Street Name table if cardinality requires)

Object Table: STREET_NAME_JOIN				
Field Name	**Data Type**	**Length / Precision**	**Description**	**LOV / Domain**
OBJECTID	Object ID	Default	Geodatabase feature ID	None
STREET_NAME_ID	Double	16	Unique statewide VGIN Address	None
STREET_ALIAS_ID	Double	16	Street Alias table ID	None

3.3 Address Points Domains and Domain Values

See Appendix A

3.4 Street Name Standardization

The following recommendations are based on NENA standards and should be implemented in the local Address Points database. Data input rules and pre-defined domains can be implemented to check for many of the following standards:

1. Uppercase characters - except for mailing label field.
2. The "Street Name" fields should contain the official naming convention as assigned by the local addressing authority including punctuation were officially assigned.
3. No special characters such as: underscores, quotes, apostrophes, ampersands, diacritical marks, or non-ISO-Latin characters. These characters would cause problems with geocoding applications or database queries.
4. Street address ranges for one address point location is not acceptable.
5. Use complete spelling of the legal street name assigned by the addressing authority unless the abbreviation is the official name of the street from the addressing authority.
   "MOUNTAIN VIEW RD" versus "MTN VIEW RD"
   "SAINT PAULS AVE" versus "ST PAULS AVE"
6. Street Prefix Directional and Suffix Directional are only abbreviated when not part of the actual street name.
   "EAST DR" would not be abbreviated "E DR"
   "SOUTHEAST SIDE HIGHWAY" would be abbreviated "SE SIDE HWY"
   "SOUTH EAST SIDE HIGHWAY" would be abbreviated "S EAST SIDE HWY"
   "21ST STREET SOUTH" would be abbreviated "21ST ST S"
7. Street Suffix standardized according to most recent USPS publication. Options not listed in the domain should be included in the Street Name field.
   "WASHINGTON ST EXTENSION" would use "WASHINGTON ST" as the street name and "EXT" as the Street Suffix using the valid USPS domain.

Figure 3a: Street Standardization shown by concatenation and parsed via Point Address standard model

Not Standardized	Standardization with RCL					
Original	**Premod**	**Predir**	**Street_Name**	**Suffix**	**SufDir**	**Post mod**
MTN VIEW ROAD			MOUNTAIN VIEW	RD		
ST. PAUL'S AVENUE			SAINT PAULS	AVE		
N BENJAMIN R. LEE ST.		N	BENJAMIN R LEE	ST		
C-B LN			C B	LN		
EAST DR			EAST	DR		
E ST			E	ST		
N WAYNE AVE		N	WAYNE	AVE		
NORTH WAYNE AVE			NORTH WAYNE	AVE		
S EAST SIDE HWY		S	EAST SIDE	HWY		
21ST ST SOUTH			21ST	ST	S	
S ARC NE		S	ARC		NE	
SOUTH LAWN			SOUTH LAWN			

US ROUTE 29 BYPASS			US ROUTE 29			BYPASS
ALTERNATE ROUTE 28 N	ALTERNATE		ROUTE 28		N	
I-64 WEST			INTERSTATE 64		W	
N.E. CHARLES DR		NE	CHARLES	DR		
WASHINGTON ST EXT			WASHINGTON ST	EXT		

For Street Standardization best practices, see the USPS URL in the resource section below.

3.5 Subaddresses

Subaddresses identify specific smaller locations within structures and sites or within a group of structures and sites that have one numeric site or structure address number. The purpose of Subaddresses is to differentiate residential and office units within a structure or site location and to retain the uniqueness of addressing where multiple address points would otherwise overlap. Subaddresses may also be used to reflect commonly used names such as an area in a park (15000 Livingston Rd, Softball Field).

Subaddressed point locations must have unique addressing when combined with all street addressing elements. Type of sub address is recommended. Emergency responders are better served knowing the subaddressing reflects floors of a multi-unit structure rather than all accessing on ground floor. Note that the access to an upper level unit may be a ground floor entrance with a dedicated stairway or elevator to the upper floor.

3.6 Normalized Relational Database Models

The database schema standard defined in this document represents a “flat” table structure with possible related street name alias table. The flat structure provides in one table all necessary addressing attributes and management codes to meet operational functions. However, this standard does contain additional relationship “linkages” through Street Name ID and Local Address ID to connect to master address tables, alias street names table, or possibly parcel and structure polygon (footprint) tables.

These normalized relational database schemas make intrinsic sense for internal operations however they can be hard to translate or transfer to partnering organizations. There should be a means to extract the normalized data records and “fill in” the otherwise linked (child record) record value. For cardinalities of many to one, or many to many a “join” table is to be included.

3.7 Street Name Alias Table

The Street Name Alias table is designed to incorporate additional names of streets that may have:

- Honorary name
- Name of overlapping route where they exist.
- Route number
- Historic name if name has officially changed.

3.8 Attribute Data Rules Using

RULE 1 – Address Points ID Must Be Unique and Persistent

Violations of this rule are systematic in nature. ID codes that are not kept unique and persistent in a relational database environment fail to allow proper feature connectivity and correct data normalization in the GIS data model. It is recommended that all local address authorities implement ID discipline and as a preprocess QC measure VGIN will check for duplicates or zeroes in the data. This check will not be performed on local data by default until the majority of centerline databases presented to VGIN contain a managed Unique ID. The localities who have notified VGIN of the presence of a unique ID available in the centerline data will have the check performed.

Figure 3b: Violation of Uniqueness as both locations have same ID from source.

House A	
LOCAL_ID	1951

House next door to A	
LOCAL_ID	1951

RULE 2 – Address Points Must Not Have Duplicate Address Numbers and Duplicate Subaddressing

Violation of this rule affects Geocoding. With duplicate address number, geocoding processors may erroneously place the input address result on the wrong address point affecting routing destination.

RULE 3 – Street Modifiers, Directionals and Suffixes will follow the Virginia/USPS Standard

In cases where domain values are not present locally, inconsistencies are entered into the street suffix field. Those include additional spaces, incorrect suffix, or non-alpha characters. This check will isolate those values not in synch with the USPS standard through the Virginia standard.

Figure 3c: Violation examples and corrected street names parsed to standard.

Assumed Official Street Names
A: West Main Street
B: East Walnut Avenue
C: Cherrywood Parkway North

West Main Street	
STREET_PREMODIFIER	
STREET_PREFIX_DIRECTION	W
STREET_NAME	MAIN
STREET_SUFFIX	ST
STREET_SUFFIX_DIRECTION	
STREET_POSTMODIFIER	

East Walnut Avenue	
STREET_PREMODIFIER	
STREET_PREFIX_DIRECTION	E
STREET_NAME	WALNUT
STREET_SUFFIX	AVE
STREET_SUFFIX_DIRECTION	
STREET_POSTMODIFIER	

Cherrywood Parkway North	
STREET_PREMODIFIER	
STREET_PREFIX_DIRECTION	
STREET_NAME	CHERRYWOOD
STREET_SUFFIX	PKWY
STREET_SUFFIX_DIRECTION	N
STREET_POSTMODIFIER	

RULE 4 – Addresses Must Not Equal Zero or Null

Address numbers that have “0” values can cause confusion in address sequencing and will be skipped in geocoding. Street name and type must exist and be recorded as such in the database.

RULE 5 - Street address number ranges are not acceptable.

A single address points should not include a range of address numbers for primary street address number of the one structure.

4) Address Points Data Quality

NENA standards recommend specific quality control and geometric topology elements reside within the Address Points data workflow and VGIN has extended the recommendations and additional data checks to a series of data quality rules. By using additional industry standards provided by ESRI software topology functionality, desktop extensions, and out of the box modeling and/or scripting, it is relatively easy to achieve a methodology for isolating inconsistencies. VGIN will utilize an out of the box solution to check for and ensure that quality resides within the data based on a specific rule set of rules to identify inconsistencies.

4.1 Quality Control Criteria

A position correct address point allows the systems to verify addresses and assign those addresses to specific agencies, cities, ESN areas, districts, beats, units, etc. It is also vital for defining intersections, common place names, and vehicle routing, premise and hazard data.

To maintain proper topology the addressed centerline data and related area boundary layers must adhere to the following minimum address and geometry.

Criteria 1 Completeness

Completeness is the degree to which all addresses are represented as points within a data layer without redundancy with in a community and the degree to which all required attribution is provided.

Criteria 2 Logical consistency

A description of an address point location in the context of other features (i.e., is the address point correctly positioned relative to other address points, road centerlines, emergency service zones, etc.?). The issue of address point “stacking” would be a part of logical consistency criteria.

Criteria 3 Positional accuracy

How closely the stored location of an address point represents its real location on the earth’s surface, consistent with the intent of the placement. Does its position make sense operationally?

Criteria 4 Temporal quality

How well the information in the database reflects the current state of the address points being captured. Both the location of an address point and its attributes has aspects of temporal quality that must be considered. For example, the amount of time between when source data was last observed or collected (e.g., date of flight for imagery, or GPS location collection) and when the data is being used is especially important.

Criteria 5 Thematic accuracy

The consistency of the types of data in a data set (e.g., only address points are contained in

the address point data layer) and whether the address point attribute values are correct.

4.2 Systems Integration and Operational Functionality

The goal with any operationalized data is the success of real world and real time operations. For navigational/location data the success will be measured in the accurate and faultless execution for the communication and navigational systems dependent upon this data. While address point data is generated primarily to support emergency response its role in commercial location systems (web-based map search engines for example) are critical to the health of the local economy as well.

Figure 4a: *Preferred point placement methodologies for Public Safety Applications based on NENA-INF-014. (One asterisk represents the least recommended method and three asterisks represent the most recommended method. Point placement methods are listed from low to high resources required for data development and maintenance).*

	Public Safety Application				
Point Placement Method	NG9-1-1 Location Validation / Call Routing	9-1-1 Map Display	Computer Aided Dispatch	Vehicle Routing	Emergency Notification
Geocoding	*	*	*	**	*
Parcel	**	**	**	*	**
Site	**	**	**	*	**
Structure	***	***	***	*	***
Property Access	*	**	**	***	**

(Courtesy of NENA-INF-014)

NG9-1-1 Location Validation / Call Routing

NG9-1-1 routes calls based on point in polygon routing. When a caller calls 9-1-1 from a phone line at a civic location, the NG9-1-1 Core Services will look up the civic address for that phone number and determine to which PSAP a call from that location should be sent. Since these phone lines at civic locations will typically be tied to structures, the preferred placement for this application is structure centroids or at the entrance of those structures.

Computer Aided Dispatch (CAD)

Address points should be located within the correct response boundary in order to support CAD dispatch. Manual review or GIS overlay using accurate response boundaries is needed to validate point placement.

Vehicle Routing

Address points is critical to direct responding units being directed to incidents. However, a separate Access Point layer could be a more suitable layer to support the needs of vehicle routing. Specifically, the function of an Access Point is to reflect the location of roadway access to an address along the road network, supplying the necessary information critical to vehicle routing. Reduction of miss-routed calls is a critical operational performance measure.

Emergency Notification

Address Points are to support emergency notification of events. Emergency operational areas are often created by geospatially buffering an incident location (address point, road segment, rail line, utility, assets …) a specified distance outward from the specific geospatial feature. These buffered features can originate as points, lines or polygons and from there generate notification areas, which can then be used to select nearby address points for notification or other actions.

Composite Geolocation

Address points often make up a data layer component along with addressed road segments in a GIS enabled geolocator "tool". These types of locator tools will generate a list of potentially correct locations for the address or coordinate entered. Naturally a coordinated dataset will undoubtedly produce the more precise output in the mapping environment. Parsed addressing can be more difficult to read. People often refer to locations based on street and house number, or distance from landmark, or street intersection. Composite geolocators interrogate the data layers that are supported and linked to produce a "graded" return list of possible locations. It is up to the analyst or dispatcher to determine the correct result from the output of possible candidate results. The better the input data for the geolocator the fewer the possible candidate results and the stronger the confidence grade for the hopefully one correct and precise return.

4.3 Data Review

An important step in successful generation and deployment of the Address Points data layer across jurisdictions is to identify all parties who have address points data maintenance responsibilities for their jurisdictions and those in neighboring jurisdictions. Examples of potential partners may include:

- Local GIS coordinators
- Local 9-1-1/PSAP Directors
- Local addressing authorities
- Third party (private) data technology firms
- State GIS coordination office

4.4 Actions to Undertake with Partnering Authorities

The following actions are recommended between local governments and VGIN. Some of these practices are quality control methods across supporting data layers. Many of these actions already take place in the locality's data shop. It is encouraged that these practices are formalized and communicated to all engaging partners.

- Utilize most recent locality, adjacent locality, and VGIN Address Points, Administrative Boundary, Address Points, and Orthophotography products as source base map data starting points.
- Identify structures being addressed are unique to one jurisdiction in the local Address Points and the VBMP Address Points.
- Identify discrepancies between jurisdictional data, centerline placement, address point data, address ranges, and street names are develop a corrective action plan.

- Coordinate with adjacent local governments and states to review addressed points overlapping jurisdictional boundary.
- Modify address data to meet the agreed upon boundary locations, including centerline parity placement and address range distribution.
- Establish procedures for future updates of data at boundary locations.
- Establish procedures for re-addressing structures and sites already in the address point collection.

5) Metadata

VA_Address_Points

File Geodatabase Feature Class

Summary

The ongoing goal of the VBMP is to establish a consistent, seamless base and foundation for local and state government mapping systems (GIS) that will help all increase efficiency and reduce redundant efforts in developing these systems. The seamless Address Points base layer is critical to the effective and efficient delivery of wireless E-911 and many other government services and is a critical component in the development of spatial data guidelines and standards, supporting the cost-effective sharing of GIS data and expertise across the commonwealth.

Description

The Virginia Geographic Information Network (VGIN) coordinates and manages the development of a consistent, seamless, statewide digital Address Points file with address, road name, state route number, and many other components as part of the Virginia Base Mapping Program (VBMP). The Address Points Program leverages the commonwealth's investment in the VBMP digital orthophotography and is focused on creating a single statewide, consistent digital address point file. The Address Point data layer is a dynamic dataset supported and maintained by Virginia's Local Governments and VGIN. VBMP address point data layer is extracted and provided back to local governments and state agencies in many geographic data sets every quarter.

Credits

VITA, VGIN

Use limitations
As of January 1, 2012, Address Point geometry and attributes are public domain.

Virginia Geographic Information Network (VGIN)

Virginia Base Mapping Program (VBMP)

Geospatial Data Sharing

VGIN was established in 1997 in Virginia Code to "foster the creative utilization of geographic information and oversee the development of a catalog of GIS data available in the Commomwealth". One of the main core functions of VGIN according to the code is:

* Provide services, geographic data products, and access to the repository

Source: Virginia Code § 2.2-2026 and § 2.2-2027

cwide GIS data initiatives require the active participation by local government entities. Many services and data products are readily available through the Virginia GIS clearinghouse and could not function without local government geospatial data input. These data sets are the source for data sharing between Local, State, Federal, and commercial geospatial entities through VGIN.

The following programs or initiatives require the active participation by Virginia Local governments.

VA_Address_Points:

The Address Points (AP) dataset provides a consistent and seamless statewide digital dataset of all addressed structures in the Commonwealth of Virginia. The purpose for the continued development of this dataset is to support the base mapping needs of state, regional, and local governments as well as to provide the most accurate representation of structures within the commomwealth to as commercial entities and the general public. The purpose is to achieve a singular, consistent and maintainable base map dataset usable by all entities. The high quality of this product is available for use within a geographic information system (GIS) or a computer aided dispatch (CAD) / 911 systems, however all warranties regarding the accuracy of the map data and any representation or inferences derived there from are hereby expressly disclaimed.

i Executive Order 12906, published in the April 13, 1994, edition of the Federal Register, Volume 59, Number 71, pp. 17671-17674; and amended by Executive Order 13286, published in the March 5, 2003, edition of the Federal Register, Volume 68, Number 43, pp. 10619-10633. Framework layers are detailed in OMB Circular A-16. http://www.whitehouse.gov/omb/circulars/a016/a016_rev.html#4#4

Extent

West -77.256731 **East** -77.253991
North 37.559125 **South** 37.557961

Scale Range

Maximum (zoomed in) 1:5,000
Minimum (zoomed out) 1:150,000,000

6) References

1) NENA GIS Data Collection and Maintenance Standards
http://c.ymcdn.com/sites/www.nena.org/resource/collection/C74A8084-E3BD-405D-93C2-48AFCFA5B490/NENA_02-014-v1_GIS_Data_Collection_and_Maintenance.pdf

2) NENA Standard Data Formats for 9-1-1 Data Exchange & GIS Mapping
http://c.ymcdn.com/sites/www.nena.org/resource/collection/C74A8084-E3BD-405D-93C2-48AFCFA5B490/NENA_02-010-v9_Data_Formats_for_ALI_MSAG_GIS.pdf

3) NENA Information For Synchronizing MSAG/ALI Databases with GIS data
https://c.ymcdn.com/sites/www.nena.org/resource/collection/F2E0D66A-4824-418C-8670-3238D262B84A/NENA_71-501-v1_Synchronizing_GIS_Databases_with_MSAG_and_ALI.pdf

4) USPS Postal Addressing Standards
http://pe.usps.gov/text/pub28/welcome.htm

5) FGDC Content standard for digital geospatial metadata
https://www.fgdc.gov/standards/projects/metadata/base-metadata/v2_0698.pdf

6) US Census Bureau FIPS Codes
https://www.census.gov/geo/reference/codes/cou.html
http://www2.census.gov/geo/docs/reference/codes/files/st51_va_cou.txt

7) ANSI X3.61-1986, Representation of Geographic Point Locations for Information Interchange, which standardizes representation of UTM coordinates for computer representation.

8) NENA-STA-006 NG9-1-1 GIS Data Model (DRAFT)
http://www.nena.org/?page=NG911GISDataModel

9) NENA-STA-004.1.1.2014 – NENA Next Generation 9-1-1 (NG9-1-1) United States Civic Location Data Exchange Format (CLDXF) Standard
http://www.nena.org/?NG911CLDXF

10) NENA-INF-014.1.2015 – NENA Informational Document for Development of Site/Structure Address Points GIS Data for 9-1-1
https://www.nena.org/?SSAP

7) Appendix A: Domain and Domain Values

Domain: **SOURCE**

Code	Description	Source
L	Local Government	VGIN
VGIN	Virginia Geographic Information Network	VGIN
VDOT	Virginia Department of Transportation	VGIN
USCB	U.S. Census Bureau	VGIN
O	Commercial / Other	VGIN

Domain: **EDIT_TYPE**

Code	Description	Source
1	Point Addition	VGIN
2	Cartographic Location Change / move	VGIN

Domain: **LOC_TYPE**

Code	Description	Source
1	Structure	VGIN
2	Site	VGIN
3	Access Point	VGIN
4	Parcel Centroid	VGIN

Domain: **DIRECTION**

Code	Description	Source
N	North	USPS
S	South	USPS
E	East	USPS
W	West	USPS
NE	Northeast	USPS
NW	Northwest	USPS
SE	Southeast	USPS
SW	Southwest	USPS

Domain: **SUFFIX**

Code	Description	Source
ALY	ALLEY	USPS
ANX	ANEX	USPS
ARC	ARCADE	USPS
AVE	AVENUE	USPS
BYU	BAYOU	USPS
BCH	BEACH	USPS
BND	BEND	USPS

BLF	BLUFF	USPS
BLFS	BLUFFS	USPS
BTM	BOTTOM	USPS
BLVD	BOULEVARD	USPS
BR	BRANCH	USPS
BRG	BRIDGE	USPS
BRK	BROOK	USPS
BRKS	BROOKS	USPS
BG	BURG	USPS
BGS	BURGS	USPS
BYP	BYPASS	USPS
CP	CAMP	USPS
CYN	CANYON	USPS
CPE	CAPE	USPS
CSWY	CAUSEWAY	USPS
CTR	CENTER	USPS
CTRS	CENTERS	USPS
CIR	CIRCLE	USPS
CIRS	CIRCLES	USPS
CLF	CLIFF	USPS
CLFS	CLIFFS	USPS
CLB	CLUB	USPS
CMN	COMMON	USPS
CMNS	COMMONS	USPS
COR	CORNER	USPS
CORS	CORNERS	USPS
CRSE	COURSE	USPS
CT	COURT	USPS
CTS	COURTS	USPS
CV	COVE	USPS
CVS	COVES	USPS
CRK	CREEK	USPS
CRES	CRESCENT	USPS
CRST	CREST	USPS
XING	CROSSING	USPS
XRD	CROSSROAD	USPS
XRDS	CROSSROADS	USPS
CURV	CURVE	USPS
DL	DALE	USPS
DM	DAM	USPS
DV	DIVIDE	USPS
DR	DRIVE	USPS
DRS	DRIVES	USPS
EST	ESTATE	USPS
ESTS	ESTATES	USPS
EXPY	EXPRESSWAY	USPS
EXT	EXTENSION	USPS
EXTS	EXTENSIONS	USPS
FALL	FALL	USPS
FLS	FALLS	USPS
FRY	FERRY	USPS

FLD	FIELD	USPS
FLDS	FIELDS	USPS
FLT	FLAT	USPS
FLTS	FLATS	USPS
FRD	FORD	USPS
FRDS	FORDS	USPS
FRST	FOREST	USPS
FRG	FORGE	USPS
FRGS	FORGES	USPS
FRK	FORK	USPS
FRKS	FORKS	USPS
FT	FORT	USPS
FWY	FREEWAY	USPS
GDN	GARDEN	USPS
GDNS	GARDENS	USPS
GTWY	GATEWAY	USPS
GLN	GLEN	USPS
GLNS	GLENS	USPS
GRN	GREEN	USPS
GRNS	GREENS	USPS
GRV	GROVE	USPS
GRVS	GROVES	USPS
HBR	HARBOR	USPS
HBRS	HARBORS	USPS
HVN	HAVEN	USPS
HTS	HEIGHTS	USPS
HWY	HIGHWAY	USPS
HL	HILL	USPS
HLS	HILLS	USPS
HOLW	HOLLOW	USPS
INLT	INLET	USPS
IS	ISLAND	USPS
ISS	ISLANDS	USPS
ISLE	ISLE	USPS
JCT	JUNCTION	USPS
JCTS	JUNCTIONS	USPS
KY	KEY	USPS
KYS	KEYS	USPS
KNL	KNOLL	USPS
KNLS	KNOLLS	USPS
LK	LAKE	USPS
LKS	LAKES	USPS
LAND	LAND	USPS
LNDG	LANDING	USPS
LN	LANE	USPS
LGT	LIGHT	USPS
LGTS	LIGHTS	USPS
LF	LOAF	USPS
LCK	LOCK	USPS
LCKS	LOCKS	USPS
LDG	LODGE	USPS

LOOP	LOOP	USPS
MALL	MALL	USPS
MNR	MANOR	USPS
MNRS	MANORS	USPS
MDW	MEADOW	USPS
MDWS	MEADOWS	USPS
MEWS	MEWS	USPS
ML	MILL	USPS
MLS	MILLS	USPS
MSN	MISSION	USPS
MTWY	MOTORWAY	USPS
MT	MOUNT	USPS
MTN	MOUNTAIN	USPS
MTNS	MOUNTAINS	USPS
NCK	NECK	USPS
ORCH	ORCHARD	USPS
OVAL	OVAL	USPS
OPAS	OVERPASS	USPS
PARK	PARK	USPS
PARK	PARKS	USPS
PKWY	PARKWAY	USPS
PKWY	PARKWAYS	USPS
PASS	PASS	USPS
PSGE	PASSAGE	USPS
PATH	PATH	USPS
PIKE	PIKE	USPS
PNE	PINE	USPS
PNES	PINES	USPS
PL	PLACE	USPS
PLN	PLAIN	USPS
PLNS	PLAINS	USPS
PLZ	PLAZA	USPS
PT	POINT	USPS
PTS	POINTS	USPS
PRT	PORT	USPS
PRTS	PORTS	USPS
PR	PRAIRIE	USPS
RADL	RADIAL	USPS
RAMP	RAMP	USPS
RNCH	RANCH	USPS
RPD	RAPID	USPS
RPDS	RAPIDS	USPS
RST	REST	USPS
RDG	RIDGE	USPS
RDGS	RIDGES	USPS
RIV	RIVER	USPS
RD	ROAD	USPS
RDS	ROADS	USPS
RTE	ROUTE	USPS
ROW	ROW	USPS
RUE	RUE	USPS

RUN	RUN	USPS
SHL	SHOAL	USPS
FRD	FORD	USPS
FRDS	FORDS	USPS
FRST	FOREST	USPS
FRG	FORGE	USPS
FRGS	FORGES	USPS
FRK	FORK	USPS
FRKS	FORKS	USPS
FT	FORT	USPS
FWY	FREEWAY	USPS
GDN	GARDEN	USPS
GDNS	GARDENS	USPS
GTWY	GATEWAY	USPS
GLN	GLEN	USPS
GLNS	GLENS	USPS
GRN	GREEN	USPS
GRNS	GREENS	USPS
GRV	GROVE	USPS
GRVS	GROVES	USPS
HBR	HARBOR	USPS
HBRS	HARBORS	USPS
HVN	HAVEN	USPS
HTS	HEIGHTS	USPS
HWY	HIGHWAY	USPS
HL	HILL	USPS
HLS	HILLS	USPS
HOLW	HOLLOW	USPS
INLT	INLET	USPS
IS	ISLAND	USPS
ISS	ISLANDS	USPS
ISLE	ISLE	USPS
JCT	JUNCTION	USPS
JCTS	JUNCTIONS	USPS
KY	KEY	USPS
KYS	KEYS	USPS
KNL	KNOLL	USPS
KNLS	KNOLLS	USPS
LK	LAKE	USPS
LKS	LAKES	USPS
LAND	LAND	USPS
LNDG	LANDING	USPS
LN	LANE	USPS
LGT	LIGHT	USPS
LGTS	LIGHTS	USPS
LF	LOAF	USPS
LCK	LOCK	USPS
LCKS	LOCKS	USPS
LDG	LODGE	USPS
LOOP	LOOP	USPS
MALL	MALL	USPS

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

Domain: **FIPS**

Domain: FIPS

Code	Description	Source
51001	Accomack County	Census
51003	Albemarle County	Census
51510	Alexandria city	Census
51005	Alleghany County	Census
51007	Amelia County	Census
51009	Amherst County	Census
51011	Appomattox County	Census
51013	Arlington County	Census
51015	Augusta County	Census
51017	Bath County	Census
51019	Bedford County	Census
51021	Bland County	Census
51023	Botetourt County	Census
51520	Bristol city	Census
51025	Brunswick County	Census
51027	Buchanan County	Census
51029	Buckingham County	Census
51530	Buena Vista city	Census
51031	Campbell County	Census
51033	Caroline County	Census
51035	Carroll County	Census
51036	Charles City County	Census
51037	Charlotte County	Census
51540	Charlottesville city	Census
51550	Chesapeake city	Census
51041	Chesterfield County	Census
51043	Clarke County	Census
51570	Colonial Heights city	Census
51580	Covington city	Census
51045	Craig County	Census
51047	Culpeper County	Census
51049	Cumberland County	Census
51590	Danville city	Census
51051	Dickenson County	Census
51053	Dinwiddie County	Census
51595	Emporia city	Census
51057	Essex County	Census
51600	Fairfax city	Census
51640	Galax city	Census
51071	Giles County	Census
51073	Gloucester County	Census
51075	Goochland County	Census
51077	Grayson County	Census
51079	Greene County	Census
51081	Greensville County	Census
51083	Halifax County	Census
51650	Hampton city	Census
51085	Hanover County	Census
51660	Harrisonburg city	Census
51087	Henrico County	Census
51089	Henry County	Census
51091	Highland County	Census
51670	Hopewell city	Census
51093	Isle of Wight County	Census
51095	James City County	Census
51097	King and Queen County	Census
51099	King George County	Census
51101	King William County	Census
51103	Lancaster County	Census
51105	Lee County	Census
51678	Lexington city	Census
51107	Loudoun County	Census
51109	Louisa County	Census
51111	Lunenburg County	Census
51680	Lynchburg city	Census
51113	Madison County	Census
51683	Manassas city	Census
51685	Manassas Park city	Census
51690	Martinsville city	Census
51115	Mathews County	Census
51117	Mecklenburg County	Census
51119	Middlesex County	Census
51121	Montgomery County	Census
51125	Nelson County	Census
51127	New Kent County	Census
51700	Newport News city	Census

51059	Fairfax County	Census
51610	Falls Church city	Census
5127440	Farmville Town	Census
51061	Fauquier County	Census
51063	Floyd County	Census
51065	Fluvanna County	Census
51620	Franklin city	Census
51067	Franklin County	Census
51069	Frederick County	Census
51630	Fredericksburg city	Census
51735	Poquoson city	Census
51740	Portsmouth city	Census
51145	Powhatan County	Census
51147	Prince Edward County	Census
51149	Prince George County	Census
51153	Prince William County	Census
51155	Pulaski County	Census
51750	Radford city	Census
51157	Rappahannock County	Census
51760	Richmond city	Census
51159	Richmond County	Census
51770	Roanoke city	Census
51161	Roanoke County	Census
51163	Rockbridge County	Census
51165	Rockingham County	Census
51167	Russell County	Census
51775	Salem City	Census
51169	Scott County	Census
51171	Shenandoah County	Census
51173	Smyth County	Census
51175	Southampton County	Census
51177	Spotsylvania County	Census
51179	Stafford County	Census
51790	Staunton City	Census
51800	Suffolk City	Census
51181	Surry County	Census
51183	Sussex County	Census
51185	Tazewell County	Census
51810	Virginia Beach City	Census
51187	Warren County	Census
51191	Washington County	Census

Code	Description	Source
51710	Norfolk city	Census
51131	Northampton County	Census
51133	Northumberland County	Census
51720	Norton city	Census
51135	Nottoway County	Census
51137	Orange County	Census
51139	Page County	Census
51141	Patrick County	Census
51730	Petersburg city	Census
51143	Pittsylvania County	Census
24039	Somerset County (MD)	Census
37171	Surry County (NC)	Census
37005	Alleghany County (NC)	Census
37169	Stokes County (NC)	Census
37009	Ashe County (NC)	Census
37157	Rockingham County (NC)	Census
37185	Warren County (NC)	Census
37181	Vance County (NC)	Census
37131	Northampton County (NC)	Census
37145	Person County (NC)	Census
37033	Caswell County (NC)	Census
37077	Granville County (NC)	Census
37053	Currituck County (NC)	Census
37091	Hertford County (NC)	Census
37073	Gates County (NC)	Census
37029	Camden County (NC)	Census
47091	Johnson County (TN)	Census
47067	Hancock County (TN)	Census
47163	Sullivan County (TN)	Census
47025	Claiborne County (TN)	Census
47073	Hawkins County (TN)	Census
54031	Hardy County (WV)	Census
54037	Jefferson County (WV)	Census
54065	Morgan County (WV)	Census
54027	Hampshire County (WV)	Census
54003	Berkeley County (WV)	Census
54063	Monroe County (WV)	Census
54075	Pocahontas County (WV)	Census
54059	Mingo County (WV)	Census
54055	Mercer County (WV)	Census
54025	Greenbrier County (WV)	Census

51820	Waynesboro City	Census
5184960	West Point Town	Census
51193	Westmoreland County	Census
51830	Williamsburg City	Census
51840	Winchester City	Census
51195	Wise County	Census
51197	Wythe County	Census
51199	York County	Census
11001	District of Columbia (DC)	Census
21013	Bell County (KY)	Census
21095	Harlan County (KY)	Census
21133	Letcher County (KY)	Census
21195	Pike County (KY)	Census
24017	Charles County (MD)	Census
24021	Frederick County (MD)	Census
24047	Worcester County (MD)	Census
24043	Washington County (MD)	Census
24033	Prince George's County (MD)	Census
24031	Montgomery County (MD)	Census
24037	St. Mary's County (MD)	Census
54071	Pendleton County (WV)	Census
54047	McDowell County (WV)	Census
54089	Summers County (WV)	Census