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Street Address Data Standard (Working Draft 2.0)

Address Standards Working Group
The Subcommittee on Cultural and Demographic Data
Federal Geographic Data Committee

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Federal Geographic Data Committee
Department of Agriculture • Department of Commerce • Department of Defense • Department of Energy
Department of Housing and Urban Development • Department of the Interior • Department of State
Department of Transportation • Environmental Protection Agency
Federal Emergency Management Agency • Library of Congress
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Federal Geographic Data Committee

Established by Office of Management and Budget Circular A-16, the Federal Geographic Data Committee (FGDC) promotes the coordinated development, use, sharing, and dissemination of geographic data.

The FGDC is composed of representatives from the Departments of Agriculture, Commerce, Defense, Energy, Housing and Urban Development, the Interior, State, and Transportation; the Environmental Protection Agency; the Federal Emergency Management Agency; the Library of Congress; the National Aeronautics and Space Administration; the National Archives and Records Administration; and the Tennessee Valley Authority. Additional Federal agencies participate on FGDC subcommittees and working groups. The Department of the Interior chairs the committee.

FGDC subcommittees work on issues related to data categories coordinated under the circular. Subcommittees establish and implement standards for data content, quality, and transfer; encourage the exchange of information and the transfer of data; and organize the collection of geographic data to reduce duplication of effort. Working groups are established for issues that transcend data categories.

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Introduction

Street addresses are the location identifiers most widely used by state and local government and the public. Street addresses are critical information for administrative, emergency response, research, marketing, mapping, GIS, routing and navigation, and many other purposes. Because they have evolved over many decades, under the control of thousands of local jurisdictions, in many different record and database formats, and to serve many purposes, different address formats and types pose a number of complex geoprocessing and modeling issues. As a consequence, government agencies struggle with these issues as they seek to integrate large, mission-critical files into master address repositories.

In sponsoring the creation of the Street Address Data Standard, the FGDC has sought to convene, under the auspices of its Subcommittee on Cultural and Demographic Data, interested parties from among the local, state, federal, and non-government sectors to create a forum wherein these issues can be resolved, thereby helping to make our spatial data infrastructure truly national.

Objective

The Street Address Data Standard provides, in four separate parts, data content, classification, quality, and exchange standards for street, landmark, and postal addresses:

- **Data Content** provides semantic definitions of a set of objects. This part specifies and defines the data elements that may appear in or describe street, landmark, and postal addresses.
- **Data Classification** provides groups or categories of data that serve an application. Classification data are the attributes common to elements of a group. This part defines classes of addresses according to their syntax, that is, their data elements and the order in which the elements are arranged.
- **Data Quality** describes how to express the applicability or essence of a data set or data element and include data quality, assessment, accuracy, and reporting or documentation standards.
- **Data Exchange** describes how to produce or consume packages of data, independent of technology and applications that will facilitate moving data between agencies and systems.

The standard has been created to meet the following objectives:

1. Describe a way to express the content, applicability, data quality, and accuracy of an address dataset or data element.
2. Codify some commonly used discrete units of address information, referred to as address elements, and thereby provide standardized terminology and definitions to alleviate inconsistencies in the use of address elements and to simplify the documentation process.
3. Provide a method for documenting the content of address information in order to facilitate street address data exchange, and offer a migration path from legacy formats to standards compliant ones.

4. Provide a statement of best practices for street address data content and classification.
5. Recognize, as a practical matter, that different users may require different levels of standardization.
6. Define standard tests and the means of describing street address data quality.

Benefits of an Address Data Standard

The collection, storage, and management of address data are important components of everyday business activities in many organizations. Today, digital address data are a necessity throughout an address data management life-cycle, from system planning through application design, operations, and maintenance. Automating, sharing, and leveraging address data through a widely-accepted standard can provide a continuum of benefits:

- Á Allowing address data to be gathered and created in a single cycle management phase can make it readily usable in subsequent phases
- Á Address data compiled for one project or discipline becomes compatible with other applications
- Á Address data produced by one organization will conform to the same data standards as those developed by another organization
- Á Address data can be provided more quickly through a reduction in duplicative efforts and lowered production costs
- Á Applications can be developed more quickly by using existing standards-compliant data
- Á A standards-compliant address data repository may be useful in providing direction to data users regarding specific technical features
- Á Conflicting address data are more easily resolved if it is standards-compliant
- Á Sharing address data can improve quality by increasing the number of individuals who find and correct errors

Scope

This standard covers street addresses. A street address specifies a location by reference to a thoroughfare, or a landmark; or it specifies a point of postal delivery. There are thus four basic types of street address:

1. Thoroughfare addresses specify a location by reference to a thoroughfare. A thoroughfare in this context is a linear feature, typically designated by a name, which is used to travel from or to specific locations along the street, and are numbered sequentially. A thoroughfare is typically but not always a road — it may be, for example, a walkway, a railroad, or a river.
2. Landmark addresses specify a location by reference to a named landmark. A landmark is named point or area that is prominent enough in the local landscape as to be publicly known.

3. Postal addresses specify points of postal delivery that have no definite relation to the location of the recipient, such as post office boxes, rural route boxes, etc.
4. General addresses contain all of the above classes, for those files in which the various classes are mixed together.

This definition excludes addressees, occupants, persons, or businesses. An addressee may have multiple addresses, and an address may have many occupants. For data processing purposes, address and addressee should be treated as separate entities, and defined by separate standards. In addition, the standard excludes electronic addresses, such as e-mail addresses.

The definition also excludes coordinate values. Coordinate values are an alternative way to specify location: coordinates specify locations by reference to a grid, spheroid, or geoid. Coordinates require different data items and data processing operations, and therefore different standards. Within the context of this standard, coordinates are treated as attributes of street addresses, and, in the case of certain postal addresses, as inapplicable.

This standard only applies to addresses within the United States, including all U.S. territories and outlying possessions.

For English-language addresses, this standard can be implemented with the standard ASCII character set. To facilitate reproduction in the widest variety of media, the standard has been composed with the standard ASCII character set, even at the cost of simplifying the representation of certain non-English words. Other character sets, such as Unicode, are required to correctly represent addresses that use other languages. The character set should be specified in the file-level metadata for any address file.

This Street Address Data Standard is fundamentally a data processing standard. It is not intended to be an implementation guide for the development of a standards-compliant address database. The standard does not include a formal data model or Unified Modeling Language (UML) diagram. It does not offer a standard database design for constructing complex elements from simple elements, or addresses from their complex and simple elements. It does not specify how to relate address numbers to street names, for example, or how to relate landmark addresses to their corresponding street addresses, or how to relate current addresses to their retired predecessors, even though these and other tasks are crucial to the creation and maintenance of an address database. There are many ways to accomplish these tasks, and the best way depends on local circumstances, rules, customs, and anomalies.

Implementation rules can be established and maintained in various ways, and it is beyond the scope of the standard to provide guidance as to which way might be best under given circumstances. Subsequent to the acceptance of this standard, an implementation guide that concentrates on various data models, relationships, best practices, and implementation strategies should be developed as a companion to the standard.

Applicability

This standard is intended for use within and among federal, state, regional, local government agencies, nongovernmental sectors, and the general public.

Related Standards

Related standards are listed in Appendix A (Informative).

Standards Development Procedures

This standard builds on USPS Publication 28, and on the Address Data Content Standard previously proposed by the FGDC (Public Review Draft, April 17, 2003).

The FGDC effort led the Urban and Regional Information Systems Association (URISA) to propose, with the support of the National Emergency Number Association (NENA) and the U.S. Bureau of the Census, the convening of an Street Address Standards Working Group to include representatives from a range of interested federal, state, regional, and local government agencies, the private-sector, and professional associations. The proposal was accepted by the FGDC Standards Working Group on April 13, 2005.

The following steps were undertaken to facilitate this effort:

1. Establish a collaborative website to facilitate discussion and consensus of administrative needs, best practices, and technical details
2. Teleconferences and in-person meetings
3. Circulate the small-group consensus for comment to memberships of all participating organizations
4. Submit final draft through the FGDC formal standards approval process

Maintenance authority

The Census Bureau will maintain the standard under the auspices of its duties as theme lead for the FGDC Subcommittee on Cultural and Demographic Data (SCDD), ensuring that the standard is revisited on the 5-year schedule as stipulated, or updating and revising as necessary. Direct any questions to Chief, Geography Division, U.S. Bureau of the Census.

Acronyms Used Throughout the Standard

- AIS - Address Information System
- ALI - Automatic Location Information
- ANSI - American National Standards Institute
- ASWG - Address Standards Working Group
- CMR - Common Mail Room
- CRMA - Commercial Mail Receiving Agency
- CSDGM - Content Standard for Digital Geospatial Metadata
- EPA - Environmental Protection Agency
- ERD - Entity Relationship Diagram
- FGDC - Federal Geographic Data Committee
- FIPS - Federal Information Processing Standard
- GML - Geography Markup Language
- GNIS - Geographic Names Information System
- GPS - Global Positioning System
- GZD - Grid Zone Designation
- HC - Highway Contract Route
- ISO - International Standards Organization
- MSAG - Master Street Address Guide
- MGRS - Military Grid Reference System
- NAD - North American Datum
- NCITS - National Committee for Information Technology Standards
- NENA - National Emergency Number Association
- OGC - Open Geospatial Consortium
- PMB - Private Mail Box
- PO Box - Post Office Box
- PSC - Postal Service Center
- RR - Rural Route
- SCDD - FGDC Subcommittee on Cultural and Demographic Data
- TIGER - Topologically Integrated Geographic Encoding and Referencing System
- UML - Unified Modeling Language
- URISA - Urban and Regional Information Systems Association
- USNG - United States National Grid
- USPS - United States Postal Service
- UTM - Universal Transverse Mercator
- XML - Extensible Markup Language
- XSD - XML Schema Document
- ZIP Code - Zoning Improvement Plan Code

Part 1: Street Address Data Content

Introduction

Data content standards provide semantic definitions of a set of objects. The content part of the street address data standard specifies and defines the data elements which may appear in or describe street, landmark, and postal addresses.

1.1 Organization

The content part defines address elements, followed by address attributes. The address elements are grouped according to the major components of an address. The address attribute elements are grouped by subject.

- Address Elements
    - Address Number
    - Street Name
    - Building, Floor, and Unit
    - Landmark Name
    - Larger Areas (Place, State, ZIP)
    - USPS Postal Address Elements (PO Box, etc.)
    - USPS Address Lines
- Attribute Elements
    - Address ID
    - Address Coordinates
    - Descriptive Attributes
    - Quality Testing Attributes
    - Address Lineage Attributes

1.2 Simple, Complex, and Attribute Elements

The content part defines three types of elements: simple address elements, complex address elements, and address attributes.

1. Simple address elements are address components that are defined independently of all other elements
2. Complex address elements are formed from two or more simple or other complex elements
3. Address attributes provide descriptive information about an address, including geospatial information.

The table in Appendix B: Table of Element Relationships provides a list of all the address elements, their type, and their relations to each other.

1.3 Notation for Constructing Complex Elements

The following notation is used to show how complex elements are constructed from simple or other complex elements:

{} enclose the name of an element.

***** indicates that the element is **required** to create the complex element. Otherwise the element may be omitted when desired.

+ indicates "and" (concatenation), with a space implied between each component unless stated otherwise.

1.4 Open Discussion Item 1: Abbreviating Street Directionals and Types

There was difference of opinion on whether to enter street types and directionals (and implicitly building, floor, and unit types too) into master address records as USPS abbreviations or spelled out in full. This note summarizes the differing arguments and invites further comment.

1.4.1 Considerations for placing abbreviations in the master record

1. The USPS abbreviations provide good guidance. They are in common use and widely recognized.
2. Abbreviations are more efficient to enter. For emergency dispatchers, IH 35 or SH 225 or US 90 is much faster than spelling out “Interstate Highway” or “State Highway” of “United States.” Also, many legacy dispatch systems now in use by many of the police and fire units greatly limit the amount of text that can be passed to the unit.
3. Abbreviations could provide a way to indicate that the abbreviated element is part of a directional or type, rather than part of the street name. Thus “N Carolina St” would signify that N is a predirectional for Carolina St. (As opposed “North Carolina St”, named after the state.
4. The abbreviations could be viewed or exported fully spelled out or converted to different abbreviations as desired.
5. Data storage would be minimized.

1.4.2 Considerations for placing complete words in the master record

1. Abbreviations are ambiguous, and no set of abbreviations serves all needs.
2. As an example of ambiguity, consider “123 W Jones St.”—Is it West Jones, or William Jones? How could one know? Abbreviations discard useful information, and this hampers data quality testing and data exchange.
3. Abbreviations are convenient for many and absolutely necessary for 911 applications, where keystrokes add time. 911 applications also often involve local abbreviations (e.g., NCap for North Capitol Street). However no set of abbreviations serves all

needs. USPS abbreviations differ from emergency dispatch abbreviations and from other abbreviations in use.

4. Any list of standard abbreviations is bound to be incomplete. A few examples of street types missing from the USPS list include: Alcove, Close, Connector, Downs, Exchange, and Promenade. No standard can cover every last street type used in every locality in the US. Local authorities must establish their own abbreviations for unusual local examples. These abbreviations will be known locally but not necessarily to outsiders.
5. Even if the standard were to permit abbreviations only within street directional and type elements, people would be unlikely to observe the distinction in practice. For North Carolina Street (named after the state), people would often write "N Carolina St" or "NC St" even though it should be spelled out, and this will be a source of ongoing confusion.
6. Data can be stored in full format, and and views or export routines can be created that meet the needs of E-911, mailing addresses, etc.
7. Finally, abbreviations may be efficient to enter, but they also cause time lost to checking ambiguous addresses.

To support data quality and data exchange, the Address Standard Working Group considers at this point that the considerations against abbreviations outweigh those in favor. The Group invites comments that support either view, or that offer a different perspective.

1.5 Open Discussion Item 2: Use of FIPS Codes and Similar Codes within the Standard

Several ideas and questions have been raised concerning the use of FIPS codes to identify addressing authorities, municipalities, counties, states, and nations. The Address Standards Working Group welcomes further input on these questions:

1. Should the standard use FIPS codes to identify municipalities and counties issuing addresses, and in combination with the Address ID's of the address authority, creating unique national address ID's?

Considerations:

- A national address ID would greatly simplify data exchange and standardization. Creating the ID's from FIPS codes and locally unique ID's is conceptually simple, but there are some practical complications to overcome.
- Often there are multiple authorities for a given area. Generally the local addressing authority is a city or county government, but within its jurisdiction other agencies may have some limited addressing authority, such as housing authorities (housing projects), state agencies (state colleges), or federal agencies (military bases; Forest Service or BLM lands). It is unclear how these agencies would be identified or incorporated into a national address ID schema.
- FIPS codes identify a county or municipality, but often it is necessary to know the specific agency responsible for issuing or maintaining address. It is unclear how

FIPS codes might be extended to identify agencies, especially if the issuing and maintaining agencies are different.

- FIPS codes are not always updated quickly when a new government unit is formed.
- FIPS codes may be integrated, over the next few years, with GNIS codes. The Address Standard Working Group has not yet evaluated how this might affect the use of FIPS codes in address identifiers.

2. Should the standard include elements for FIPS municipality and county codes? Should the standard provide FIPS state codes and complete state names as well as the two-letter state abbreviations?
   - To limit the number of elements, the standard is based on the name only (or, for states, the two-letter abbreviation). A local implementation could use a lookup table to provide abbreviations (or complete state names), or their numeric FIPS codes.
3. Should the standard provide for nation codes, as given in ISO-3166?
   - The address standard working group has not yet evaluated which authority is best-suited to be the basis for the codes that may be used in the address standard, or whether the nation codes or the nation names should be used in the standard.

1.6 Open Discussion Item 3: Start and End Dates

The Address Standard Working Group has discussed two questions:

1. How much change in an address is sufficient to warrant retirement and the "assignment" of a new address and new Address ID?
2. What is meant by "Start Date" and "End Date"?

At this point, the provisional conclusions are:

- Changes to the Address Number or to the Street Name warrant retirement and a "new" address.
- Changes to the Occupancy, Place Name, and Zip Code do not necessarily warrant a "new" address.
- Therefore, the Complete Address Number and the Complete Street Name, and the Municipal Jurisdiction, Address Authority, and Zip Code elements should have start dates and end dates for the element itself, separate from the dataset start/end dates. The simple elements that make up the Complete Address Number and Complete Street Name do not need to have individual start/end dates.
- Start date is defined as the earliest known date on which the address authority had knowledge of the addressee as a valid address.
- End date is defined as the last known date on which the address authority deemed the address to be a valid address.

1.7 Address Elements

1.7.1 Address Number Elements

1.7.1.1 Address Number Prefix

Element Name	Address Number Prefix
Other common names for this element	Street Number Prefix, Building Number Prefix, House Number Prefix, Site Number Prefix, Structure Number Prefix
Definition	The non-integer portion of the identifier for the house, building or other feature which **precedes** the address number itself, as defined by the official address authority for the given jurisdiction.
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	No
Source of Values	
How Defined	
Example	▪ **N6W2** 3001 Bluemound Road ▪ **A** 19 Calle 117
Notes/Comments	▪ This element will not be applicable for most addresses. When township-range or other non-numeric geographic index references precede an address number, they are placed in this field. The address number can then be maintained as an integer for sorting and quality control tests. ▪ If necessary, the Separator can be used to separate the address number from the prefix or suffix elements in constructing the complete address number.

1.7.1.2 Address Number

Element Name	Address Number
Other common names for this element	Street Number, Building Number, House Number, Site Number, Structure Number
Definition	The numeric identifier for a land parcel, house, building or other feature, as defined by the official address authority for the given jurisdiction.
Definition Source	New
Data Type	Integer
Existing Standards for this Element	
Domain of Values for this Element	Based on local address ranges associated with individual streets and blocks.
Source of Values	Local jurisdiction
Example	▪ **1234** North Main Street

Element Name	Address Number
How Defined	
Notes/Comments	▪ The address number is defined as an integer to support address sorting, parity (even/odd) definition, and in/out of address range tests. ▪ Special care should be taken with records where the address number is 0 (zero). Occasionally zero is issued as a valid address number (e.g. Zero Prince Street, Alexandria, VA 22314) or it can be imputed (1/2 Fifth Avenue, New York, NY 10003 (for which the address number would be 0 and the suffix would be "1/2")). More often, though, the address number is either missing or non-existent, and null value has been converted to zero. ▪ Some addresses may contain letters, fractions, hyphens, decimals and other non-integer content within the complete address number. Those non-integer elements should be placed in the Address Number Prefix if they appear before the site number, or in the Address Number Suffix if they follow the number. ▪ The address number must be converted to text when it is combined with the prefix and suffix into a complete address number. ▪ If necessary, the Separator can be used to separate the address number from the prefix or suffix elements in constructing the complete address number.

1.7.1.3 Address Number Suffix

Element Name	Address Number Suffix
Other common names for this element	Street Number Suffix, Building Number Suffix, House Number Suffix, Fractional Street Number (USPS), Structure Number Suffix
Definition	The non-integer portion of the identifier for the house, building or other feature which **follows** the address number itself, as defined by the official address authority for the given jurisdiction.
Definition Source	New
Data Type	Text
Existing Standards for this Element	
Domain of Values for this Element	No
Source of Values	
How Defined	
Example	▪ 123 **1/2** Main Street ▪ 456 **B** Wilson Street ▪ B317 **A** Calle 117
Notes/Comments	▪ This element will not be applicable for most addresses. When township-range or other non-numeric geographic index references follow an address number, they are placed in this field. The address number can then be maintained as an integer for sorting and quality control tests. ▪ If necessary, the Separator can be used to separate the address number from the prefix or suffix elements in constructing the complete address number.

1.7.1.4 Separator Element

Element Name	Separator Element
Other common names for this element	
Definition	A symbol or word required as a separator between components of a complex element or class. The separator is required for address number ranges and for intersection addresses, and it is occasionally needed in constructing complete street numbers.
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	Typical values may include: ▪ For complete street numbers: - (hyphen)(spaces optional before or after) ▪ For address number ranges: - (hyphen)(spaces optional before or after) ▪ For intersection addresses: "and", "&", and "&&" "+","-", and "y" or "con" (Spanish) each having a space before and after.
Source of Values	New
How Defined	Locally.
Example	▪ Complete Street Number (hyphen): 61-43 Springfield Boulevard ▪ Address Number Range (hyphen): 206-210 Fourth Street ▪ Complete Street Numbers and Address Number Range (hyphens, with spaces before and after the range separator): 214-02 - 214-14 1/2 Evergreen Street ▪ Intersection Address ("and"): Eighth Street and Pine Street
Notes/Comments	▪ The default separator, an empty space, is implicit and is not shown in the syntaxes of complex elements and classes. ▪ An explicit separator is required for address ranges and intersection addresses. ▪ Within a given dataset, one value should be used consistently within a given complex element. ▪ For complete street numbers, the separator is rarely needed and its use should be minimized. As an alternative, the separator symbol usually can be included with the address number prefix or suffix. ▪ The separator is not needed in creating fractions (1/2, etc.) for address number suffixes. ▪ Some address parsing software permits the use of ampersands ("&" or "&&") to signify intersection addresses. Be wary, though--in many programming languages, ampersands are reserved for other uses, which could complicate data exchange.

1.7.1.5 Complex Element: Complete Address Number

Element Name	Complete Address Number
Other common names for this element	complete street number, full street number
Definition	{ Address Number Prefix } + { Separator Element } + { Address Number *} + { Separator Element } + { Address Number Suffix }
Definition Source	New
Data Type	Text
Required Element	Refer to component elements
Existing Standards for this Element	Refer to component simple elements
Domain of Values for this Element	Refer to component simple elements
Source of Values	Refer to component simple elements
How Defined	Refer to component simple elements
Example	▪ **123** Main Street ▪ **123 A** Main Street ▪ **0** Prince Street ▪ **0 1/2** Fifth Avenue ▪ **27N4W305-A** County Road 45 ▪ **194-03 1/2** 50th Avenue, New York, NY 11365
Notes/Comments	▪ The Address Number element is required to compose a Complete Address Number. The other elements are optional. ▪ The Address Number must be converted from integer to text when constructing the Complete Address Number. ▪ The Separator Element is rarely needed and its use should be minimized. As an alternative, the separator symbol usually can be included with the Address Number Prefix or Address Number Suffix. ▪ Special care should be taken with records where the Address Number is 0 (zero)). Occasionally zero is issued as a valid address number (e.g. 0 Prince Street, Alexandria, VA 22314) or it can be imputed (1/2 Fifth Avenue, New York, NY 10003, for which the Address Number would be 0 and the Address Number Suffix would be "1/2")). More often, though, the Address Number is either missing or non-existent, and null value has been converted to zero. ▪ In some areas (notably certain parts of New York City, southern California, and Hawaii), Complete Address Numbers include two numbers separated by a hyphen. Hyphenated Complete Address Numbers should not be confused with Address Number Ranges. The former is a single Address Number while the latter comprises two Address Numbers. ▪ Hyphenated Complete Address Numbers can be parsed so that the number indicating the site or structure is the Address Number, and the remainder (including the hyphen) is the Address Number Prefix or Address Number Suffix (a text element). If necessary, the hyphen can be parsed as a Separator Element, to separate it from both the Address Number and the Address Number Prefix or Address Number Suffix. ▪ In New York City, hyphenated Complete Address Numbers follow a more complex set of rules. The number to the left of the hyphen indicates the "block"

Element Name	Complete Address Number
	(conceptually--the number does not always change at street intersections). The number to the right of the hyphen indicates the site or house number within the "block". If the Address Number is less than ten, it is written with a leading zero, as in 194-03 1/2 above. Additional leading zeros may be added to either number to provide for correct sorting if the entire Complete Address Number is treated as text with the hyphen included. Within the address standard, these numbers can be constructed and parsed as follows: The left-side number is the Address Number Prefix element (text), with leading zeros shown as needed. The hyphen is a Separator Element. The right-side number is the Address Number (integer), with leading the zero(s) added upon conversion to Complete Address Number. The suffix, if any (such as the "1/2" in 194-03 1/2), is an Address Number Suffix.

1.7.1.6 Complex Element: Address Number Range

Element Name	Address Number Range
Other common names for this element	
Definition	**{** Complete Address Number **(low)*} + {** Separator Element ***} + {** Complete Address Number **(high)*}** A set of two address numbers, separated by a hyphen, representing the low and high numbers of an address range. An address number range element should be accompanied by an Address Range Type Attribute that describes the type of range presented in this element.
Definition Source	New
Data Type	Text
Existing Standards for this Element	Refer to component elements.
Domain of Values for this Element	Refer to component elements.
Source of Values	Refer to component elements.
How Defined	Refer to component elements.
Example	▪ **405-411** West Green Street ▪ **1400-1420** Smith Street ▪ **13-25** Elm Street ▪ 214-02 - 214-14 1/2 Evergreen Street
Notes/Comments	▪ There are several types of address ranges: ▪ Site address ranges, where a range of numbers apply to a single structure or site. ▪ Block face ranges, where the low and high numbers express the range of numbers along a single side of a street segment between two intersecting streets. ▪ Block ranges, where the low and high numbers represent the range of numbers found along both sides of a street segment. ▪ Street ranges, where the numbers express the low and high range of site numbers for an entire named street. These are found in Master Street Address Guides (MSAG) used in E-911 dispatching.

Element Name	Address Number Range
	▪ Use the Address Range Type Attribute with all address ranges to show what type of range it is. ▪ By convention, the first number represents the low end of the range, the second number represents the high end, and they are separated by a hyphen. ▪ In some areas (notably certain parts of New York City, southern California, and Hawaii), address numbers commonly include hyphens. Address ranges may look exactly like hyphenated address numbers, but they are radically different. The former comprises two address numbers while the latter represents one only. In the fourth example above, "214-02 Evergreen St" would one address, and "214-14 1/2 Evergreen Street" would be a second address, and neither one alone is an address range.

1.7.2 Street Name Elements

1.7.2.1 Street Name Pre Modifier

Element Name	Street Name Pre Modifier
Other common names for this element	
Definition	A word or phrase that precedes all other elements of the street name and modifies it, but is separated from the street name by a street name pre-directional and/or pre-type.
Definition Source	New
Data Type	Text
Existing Standards for this Element	No
Domain of Values for this Element	No
Source of Values	
How Defined	
Example	▪ 123 **Old** North First Street
Notes/Comments	▪ The street name pre-modifier is rarely needed and its use should be minimized. The modifier can be included in the Street Name element unless it is separated from the street name by a pre-type or a pre-directional.

1.7.2.2 Street Name Pre Directional

Element Name	Street Name Pre Directional
Other common names for this element	Prefix Directional, Prefix Direction, Predir
Definition	A word preceding the street name that indicates the directional taken by the thoroughfare from an arbitrary starting point, or the sector where it is located.
Definition Source	New
Data Type	Text

Element Name	Street Name Pre Directional
Existing Standards for this Element	USPS Publication 28 Section 233 and 294
Domain of Values for this Element	English: East, West, South, North, Northeast, Southeast, Southwest, Northwest Spanish: Este, Oeste, Sur, Norte; Noreste, Sureste, Suroeste, Noroeste
Source of Values	USPS Publication 28 Sections 233 and 294 (unabbreviated)
How Defined	As provided by USPS Publication 28 Section 233 and 294
Example	▪ 1234 **North** Main Street
Notes/Comments	▪ Standard USPS English abbreviations are E, W, S, N, NE, SE, SW, NW ▪ Standard USPS Spanish abbreviations are E, O, S, N, NE, SE, SO, NO ▪ USPS Publication 28 recommends abbreviating post-directionals. The Address Standards Working Group differs, and recommends storing post-directionals fully spelled out, exactly as given by the local naming authority, to avoid confusion. For example: "N W Jones St": Is it Northwest Jones Street? Ned Walter Jones Street? North Walter Jones Street? The abbreviations create ambiguity. If stored unabbreviated, directionals can be exported as standard abbreviations as needed for mailing and other purposes.

1.7.2.3 Street Name Pre Type

Element Name	Street Name Pre Type
Other common names for this element	Street Prefix type, Pre-type, prefix type
Definition	The element of the complete street name **preceding** the street name element that indicates the type of street.
Definition Source	New
Data Type	Text
Existing Standards for this Element	Section 234 and Appendix C of USPS Publication 28 with provision for local additions.
Domain of Values for this Element	Section 234 and Appendix C of USPS Publication 28 with provision for local additions.
Source of Values	Section 234 and Appendix C of USPS Publication 28 Appendix C, with provision for local additions.
How Defined	By local addressing authority.
Example	▪ 1234 **Avenue** A ▪ 1234 **Calle** Aurora ▪ 901 **Boulevard** of the Allies ▪ **Avenue** at Port Imperial
Notes/Comments	▪ A street may have either a pre-type or a post-type, or neither, but not both. ▪ USPS Publication 28 provides the best list of pre-types and post-types, but it is not exhaustive. ▪ USPS Publication 28 provides a standard list of street type abbreviations, and recommends their use. The Address Standards Working Group differs, and recommends storing pre-types and post-types fully spelled out, exactly as given by the local naming authority, to avoid confusion. If stored unabbreviated,

Element Name	Street Name Pre Type
	directionals can be exported as standard abbreviations as needed for mailing and other purposes. ▪ Pre-types are much less common than post-types in English. They are typically used for numbered highway routes and roads. ▪ Occasionally a street name may have neither a prefix type or a suffix type (e.g., "Broadway.") ▪ Names like "County Road 28", where the street type occurs in the middle of the name, should be treated as a street name with no pre-type or post-type.

1.7.2.4 Street Name

Element Name	Street Name
Other common names for this element	Primary Street Name
Definition	Official name of a street as assigned by a local governing authority, or an alternate (alias) name that is used and recognized, excluding street types, directionals, and modifiers.
Definition Source	FGDC Draft Address Data Content Standard v. 3 (citing Census), adapted
Data Type	Text
Existing Standards for this Element	Section 232 of USPS Publication 28
Domain of Values for this Element	Yes
Source of Values	Locally developed
How Defined	Official list of street names maintained by local authority
Example	▪ 1234 **Central** Street Southwest
Notes/Comments	▪ Each jurisdiction should establish its own list of street names and use it as a domain of values to validate addresses. Alternate and Official names are distinguished by the address attribute "Alias Status Attribute" ▪ Local addressing authorities are urged to follow consistent internal street naming practices, and to resolve internal street name inconsistencies, especially for numbered streets ("Twentieth" or "20th" ?), internal capitalization ("McIntyre" or "Mcintyre" ?), hyphens, and apostrophes. ▪ If alternate or abbreviated versions of street names are needed for a specialized purpose such as mailing or emergency dispatch, they can be created in views or export routines.

1.7.2.5 Street Name Post Type

Element Name	Street Name Post Type
Other common names for this element	Street Type, Street Suffix, Street Suffix Type, Suffix (USPS)
Definition	The element of the complete street name **following** the street name element that indicates the type of street.
Definition Source	New

Element Name	Street Name Post Type
Data Type	Text
Existing Standards for this Element	Section 234 and Appendix C of USPS Publication 28 with provision for local additions
Domain of Values for this Element	USPS Publication 28 Appendix C with provisions for local additions.
Source of Values	Section 234 and Appendix C of USPS Publication 28 Appendix C with provision for local additions.
How Defined	By local addressing authority.
Example	▪ 1234 Central **Street** Southwest
Notes/Comments	▪ A street may have either a pre-type or a post-type, or neither, but not both. ▪ USPS Publication 28 provides the best list of pre-types and post-types, but it is not exhaustive. ▪ USPS Publication 28 provides a standard list of street type abbreviations, and recommends their use. The Address Standards Working Group differs, and recommends storing pre-types and post-types fully spelled out, exactly as given by the local naming authority, to avoid confusion. If stored unabbreviated, directionals can be exported as standard abbreviations as needed for mailing and other purposes. ▪ Pre-types are much less common than post-types in English. They are typically used for numbered highway routes and roads. They are much more common in Spanish and French language street names. ▪ Occasionally a street name may have neither a prefix type or a suffix type (e.g., "Broadway.") ▪ Names like "County Road 28", where the street type occurs in the middle of the name, should be treated as a street name with no pre-type or post-type.

1.7.2.6 Street Name Post Directional

Element Name	Street Name Post Directional
Other common names for this element	Post Directional, Suffix Directional, Post-direction, Suffix Direction, Postdir
Definition	A word following the street name that indicates the directional taken by the thoroughfare from an arbitrary starting point, or the sector where it is located.
Definition Source	New
Data Type	Text
Existing Standards for this Element	USPS Publication 28 Sections 233 and 294
Domain of Values for this Element	English: East, West, South, North, Northeast, Southeast, Southwest, Northwest Spanish: Este, Oeste, Sur, Norte; Noreste, Sureste, Suroeste, Noroeste
Source of Values	USPS Publication 28 Sections 233 and 294 (unabbreviated)
How Defined	As provided by USPS Publication 28 Sections 233 and 294
Example	▪ 1234 Cherry Street **North** ▪ 1234 WILD WEST STREET **SOUTH**

Element Name	Street Name Post Directional
Notes/Comments	▪ Standard USPS English abbreviations are E, W, S, N, NE, SE, SW, NW ▪ Standard USPS Spanish abbreviations are E, O, S, N, NE, SE, SO, NO ▪ USPS Publication 28 recommends abbreviating post-directionals. The Address Standards Working Group differs, and recommends storing post-directionals fully spelled out, exactly as given by the local naming authority, to avoid confusion. For example: "N W Jones St": Is it Northwest Jones Street? Ned Walter Jones Street? North Walter Jones Street? The abbreviations create ambiguity. If stored unabbreviated, directionals can be exported as standard abbreviations as needed for mailing and other purposes. ▪ USPS Publication 28 Notes (paraphrased to omit reference to abbreviations): ▪ "233.22 Postdirectional Field -- When parsing from right to left, if a directional word is located to the right of the street name and suffix,locate it in the postdirectional field. " ▪ "233.23 Two Directionals -- When two directional words appear consecutively as one or two words, before the street name or following the street name or suffix, then the two words become either the pre- or the post-directionals. Exceptions are any combinations of NORTH-SOUTH or EAST-WEST as consecutive words. In these cases the second directional becomes part of the primary name and is spelled out completely in the street name element. ▪ "233.23 The other exception is when the local address information unit has determined that one of the directional letters (N, E, W, S) is used as an alphabet indicator and not as a directional." ▪ "233.3 Directional as Part of Street Name ▪ If the directional word appears between the street name and the street type, then it should be considered part of the primary name and spelled out in that element. Examples: 12334 NORTH AVENUE (street name is "North"), 1234 WILD WEST STREET **SOUTH** (Street Name is "Wild West", "South" is a post-directional. ▪ "233.3 The exception is when the local AIS unit has determined that the letters (E, N, S, or W) are used as alphabet indicators and not as directionals [abbreviations]." Example: "Avenue E". ▪ In short, when parsing street names, types and directionals, the street name is required, other elements are inferred from the context and syntax.

1.7.2.7 Street Name Post Modifier

Element Name	Street Name Post Modifier
Other common names for this element	
Definition	A word or phrase that follows all other elements of the street name and modifies it, but is separated from the street name by a street name post-directional and/or post-type.
Definition Source	New
Data Type	Text
Existing Standards for this Element	No
Domain of Values for this Element	No
Source of Values	

Element Name	Street Name Post Modifier
How Defined	
Example	▪ Extended, Cutoff, Bypass, Frontage, Service ▪ 1230 East End Avenue **Extended**
Notes/Comments	▪ The street name post-modifier is rarely needed and its use should be minimized. If the modifier is not separated from the street name by a post-type or a post-directional, then it can be combined into the street name element.

1.7.2.8 Complex Element: Complete Street Name

Element Name	Complete Street Name
Other common names for this element	
Definition	{ Street Name Pre Modifier } + { Street Name Pre Directional } + { Street Name Pre Type } + { Street Name *} + { Street Name Post Type } + { Street Name Post Directional } + { Street Name Post Modifier } Official name of a street as assigned by a local governing authority, or an alternate (alias) name that is used and recognized.
Definition Source	New
Data Type	Text
Existing Standards for this Element	Refer to Component Elements
Domain of Values for this Element	Refer to Component Elements
Source of Values	Refer to Component Elements
How Defined	Refer to Component Elements
Example	▪ 123 North Main Street Extended ▪ 123 Old Avenue B North
Notes/Comments	▪ The street name element is required to compose a complete street name; the other elements are optional. Street Name Pre Type and Street Name Post Type are not found in the same street name. ▪ Each jurisdiction should establish its own list of complete street names and use it as a domain of values to validate addresses. Alternate and Official names are distinguished by the address attribute "Alias Status Attribute" ▪ Local addressing authorities are urged to follow consistent internal street naming practices, and to resolve internal street name inconsistencies, especially for numbered streets ("Twentieth Street" or "20th Street" ?), internal capitalization ("McIntyre Street" or "Mcintyre Street"?), hyphens, and apostrophes. ▪ If alternate or abbreviated versions of street names are needed for a specialized purpose such as mailing or emergency dispatch, they can be created in views or export routines.

1.7.3 Building, Floor, and Unit Elements

1.7.3.1 Building Type

Element Name	Building Type
Other common names for this element	Condominium (especially in Puerto Rican addressing usage)
Definition	The type of structure (when several structures are found at the same address), e.g., Apartment, Tower, Block
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	Can be locally created from existing values
Source of Values	Locally determined
How Defined	
Example	▪ **Building** 6 123 Main Street Northwest ▪ 123 Main Street **Block** 5
Notes/Comments	▪ Used with Building Identifier to designate one of several structures at a given site. Fits within the general USPS definition of a "secondary address designator" and EPA definitions of "secondary address identifier"

1.7.3.2 Building Identifier

Element Name	Building Identifier
Other common names for this element	Building ID
Definition	The letters, numbers, words or combination thereof used to distinguish one structure from another when several occur at the same address.
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	No
Source of Values	
How Defined	
Example	▪ Tower **B** ▪ Block **12**
Notes/Comments	▪ Used with Building Type to designate one of several structures at a given site. Fits within the USPS definition of a "secondary address designator" and the general EPA definition of "secondary address identifier"

1.7.3.3 Complex Element: Building Element

Element Name	Building Element
Other common names for this element	
Definition	{ Building Type } + { Building Identifier *}
Definition Source	New
Data Type	Text
Existing Standards for this Element	Refer to component simple elements
Domain of Values for this Element	Refer to component simple elements
Source of Values	Refer to component simple elements
How Defined	Refer to component simple elements
Example	▪ 123 A Main Street, **Building B**
Notes/Comments	▪ Building Identifier is required if Building Type is present. If the Building Element contains only one value, it is assumed to be the Building Identifier, and not the Building Type.

1.7.3.4 Floor Type

Element Name	Floor Type
Other common names for this element	
Definition	The word describing the horizontal division of a building where an address is located.
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	Can be locally developed using existing data
Source of Values	Locally determined
How Defined	
Example	▪ Mezzanine **Level** ▪ Floor 2
Notes/Comments	▪ Used with Floor Identifier to designate which floor of a given structure contains the address. May precede or follow the floor identifier. Fits within the USPS definition of a "secondary address designator" and the general EPA definition of "secondary address identifier."

1.7.3.5 Floor Identifier

Element Name	Floor Identifier
Other common names for this element	
Definition	The numbers, letters, words or combination thereof distinguishing one floor from another within a structure.
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	No
Source of Values	
How Defined	
Example	▪ Floor **2** ▪ Mezzanine Level
Notes/Comments	▪ Used with Floor Type to designate which floor of a given structure contains the address. If only a Floor name appears (such as Mezzanine) it should be parsed as a Floor Identifier rather than as a Floor Type. Fits within the general USPS definition of a "secondary address designator" and the EPA definitions of "secondary address identifier."

1.7.3.6 Complex Element: Floor Element

Element Name	Floor Element
Other common names for this element	Level, Story
Definition	1. { Floor Type *} + { Floor Identifier } or 2. { Floor Identifier } + { Floor Type *}
Definition Source	New
Data Type	Text
Existing Standards for this Element	Refer to component simple elements
Domain of Values for this Element	Refer to component simple elements
Source of Values	Refer to component simple elements
How Defined	Refer to component simple elements
Example	▪ 123 A Main Street, **Floor 6** ▪ 123 A Main Street, **6th Floor** ▪ 123 A Main Street, **Mezzanine Level** ▪ 123 Main Street, **Penthouse** ▪ 123 Main Street, **Garage Level C**

Element Name	Floor Element
Notes/Comments	▪ Usage is inconsistent. Examples include "Mezzanine" (sometimes "Mezzanine Level"), "Garage", and "Penthouse." Also, Floor 6 or 6th Floor, and Level C, or C Level. ▪ Not all Floor Identifier values require a Floor Type. "Basement", for example, may be a Floor Type or a Floor Identifier. If this element contains only one value, it is assumed to be the Floor Identifier not the Floor Type.

1.7.3.7 Unit Type

Element Name	Unit Type
Other common names for this element	Secondary Address Unit Designator (USPS term)
Definition	The word describing the type of occupancy within a building or structure.
Definition Source	Paraphrased from USPS Publication 28 Section 213
Data Type	Text
Existing Standards for this Element	Section 213 and Appendix C2 of USPS Publication 28
Domain of Values for this Element	Yes
Source of Values	USPS Publication 28 Appendix C2, with provision for local additions
How Defined	USPS Publication 28 Appendix C2 with provision for local additions
Example	▪ Apartment 2B ▪ **Suite** 1040 ▪ Apartamento 1A
Notes/Comments	▪ Used with the Unit Identifier element to designate one of several occupancy units within a building.

1.7.3.8 Unit Identifier

Element Name	Unit Identifier
Other common names for this element	Unit Number, Secondary Address Unit Designator (USPS term)
Definition	The numbers, letters, words, or combination thereof distinguishing one occupancy from another within a given address.
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	
Source of Values	
How Defined	

Element Name	Unit Identifier
Examples	▪ Apartment **2B** ▪ Suite **1040** ▪ Apartamento **1B**
Notes/Comments	▪ Used with the Unit Type to designate different occupancies at the same address. Fits within the USPS definition of "secondary address designator" and the general EPA definition of "secondary address identifier."

1.7.3.9 Complex Element: Unit Element

Element Name	Unit Element
Other common names for this element	
Definition	{ Unit Type } + { Unit Identifier *}
Definition Source	New
Data Type	Text
Existing Standards for this Element	Refer to component simple elements
Domain of Values for this Element	Refer to component simple elements
Source of Values	Refer to component simple elements
How Defined	Refer to component simple elements
Example	▪ 123 A Main Street, **Apartment 27-B** ▪ 1234 Avenida Ashford, **Apartamento 1A** ▪ 123 Main Street, **Basement** ▪ 123 Main Street, **#3**
Notes/Comments	▪ Some Unit Identifier's need not be preceded by a Unit Type. Examples (from USPS Publication 28 Appendix C2) include: basement, front, lobby, lower, office, penthouse, rear, side, and upper. ▪ If the Unit Element contains only one value, it is assumed to be the Unit Identifier, and not the Unit Type.

1.7.3.10 Private Mail Box (PMB)

Element Name	Private Mail Box (PMB)
Other common names for this element	
Definition	A mailbox rented from a private commercial mail receiving agency (CMRA)
Definition Source	Adapted from USPS Publication 28, Section 284
Data Type	Text
Existing Standards for this Element	USPS Pub 28, Section 284
Domain of Values for this Element	No

Element Name	Private Mail Box (PMB)
Source of Values	
How Defined	
Example	▪ Rural Route 1 Box 12 **PMB 596** ▪ 10 Main Street Suite 11 **PMB 234**
Notes/Comments	▪ USPS Pub 28 Section 284: Normally Private Mail Box identifiers, like mailstop codes and other internal mail distribution codes, pertain to the recipient and are not part of the address. "Exception: When the CMRA mailing address contains a secondary address element (e.g. rural route box number, suite, # or other term), the CMRA customer must use Private Mail Box (PMB) when utilizing a three line address format" (see examples above).

1.7.3.11 Complex Element: Complete Occupancy Identifier

Element Name	Complete Occupancy Identifier
Other common names for this element	
Definition	{ Building Element } + { Floor Element } + { Unit Element } + { Private Mail Box }
Definition Source	New
Data Type	Text
Existing Standards for this Element	Refer to component elements
Domain of Values for this Element	Refer to component elements
Source of Values	Refer to component elements
How Defined	Refer to component elements
Example	▪ Average Suburban Office Park, Building 12, Mezzanine Level, Suite 200 ▪ 800 West Mountain Road, **Building 5, Suite 450** ▪ 450 Green Street, **Apartment 12** ▪ 1324 Calle Amapolas, **Apartamento 103**
Notes/Comments	▪ None of these elements are required. Any or all may be filled as needed. In a general list of thoroughfare addresses all elements will be null in many cases. ▪ This element corresponds to the USPS "secondary address designator", and to the EPA "secondary address identifier".

1.7.4 Landmark Name Element

Element Name	Landmark Name
Other common names for this element	
Definition	The name by which a prominent feature is publicly known.
Definition Source	New
Data Type	Text
Existing Standards for this Element	
Domain of Values for this Element	No
Source of Values	
How Defined	
Examples	▪ Statue of Liberty ▪ White House ▪ Landmark Building ▪ Memorial Church ▪ Stanford University
Notes/Comments	▪ Landmarks usually have a street address. A landmark name does not imply official historic landmark status, but simply a commonly used name that substitutes for an address number and street name in identifying the location of a specific building or feature. Generally the use of a landmark's street address is preferable because it is unambiguous. All landmark names should be cross-referenced to a street address or other coordinate location.

1.7.5 Larger-Area Elements

1.7.5.1 Community Place Name

Element Name	Community Place Name
Other common names for this element	Urbanization Place Name, Urbanizacion (Puerto Rico); neighborhood, Census designated placename
Definition	A named area, sector, or development that is not an incorporated municipality or other governmental unit, such as a neighborhood or subdivision in a city, or a rural settlement in unincorporated area. Often called "urbanizacion" or "barrio" in Puerto Rican addressing usage.
Definition Source	FGDC Draft Address Data Content Standard v. 3 (defining "urbanizacion", citing USPS)
Data Type	Text
Existing Standards for this Element	
Domain of Values for this Element	Locally determined

Element Name	Community Place Name
Source of Values	Local usage
How Defined	Locally
Example	▪ New Hope Community ▪ **Capitol Hill** neighborhood ▪ Urbanizacion Los Olmos ▪ Jardine Fagota
Notes/Comments	▪ "Urbanizacion", commonly used in urban areas of Puerto Rico, is an important part of the address. Street names and address ranges are often repeated in a city, especially where a city has annexed older towns; they are distinguished by their urbanizacion or community name. ▪ Certain other words can be used in place of "urbanizacion": extenciones, mansiones, reparto, villa, parque, jardine, altura, alturas, colinas, estancias, extension, quintas, sector, terraza, villa, villas. ▪ For more information on Puerto Rican addressing conventions, see USPS Publication 28 Section 29, and USPS "Addressing Standards for Puerto Rico and the Virgin Islands".

1.7.5.2 Municipal Jurisdiction

Element Name	Municipal Jurisdiction
Other common names for this element	City, Actual City, Location City, Situs City, Municipality, Municipal Place Name, Village, Township, Minor Civil Division
Definition	The name of the incorporated municipality (city, township, or other local government, excluding counties) in which the address is physically located. In many places this will be different than the city name used by the U.S. Postal Service.
Definition Source	none
Data Type	Text
Existing Standards for this Element	
Domain of Values for this Element	Partial
Source of Values	State Government, and FIPS Publication 5 (National compendium)
How Defined	
Example	▪ **Birmingham**, Alabama ▪ Castle Rock Township, Minnesota
Notes/Comments	▪ Required by most local governments for tax and services determinations. This will be null for addresses in unincorporated portions of counties.

1.7.5.3 USPS Place Name

Element Name	USPS Place Name
Other common names for this element	Mailing City, City, place name
Definition	The name given by the U.S. Postal Service to the post office from which mail is delivered to the address. In many places this will be different from the name of the incorporated municipality in which the address is physically located.
Definition Source	New
Data Type	Text
Existing Standards for this Element	Sections 221 & 223 of USPS Publication 28
Domain of Values for this Element	Yes
Source of Values	USPS "City State File" as referenced in Section 221 of USPS Publication 28, FIPS City Codes
How Defined	As provided by Section 221 of USPS Publication 28 or FIPS City Code
Example	▪ Washington, DC
Notes/Comments	

1.7.5.4 County Name

Element Name	County Name
Other common names for this element	Parish (Louisiana); Borough (Alaska)
Definition	The primary political and administrative subdivision of a state in the United States.
Definition Source	FGDC Draft Address Data Content Standard v. 3 (citing EPA)
Data Type	Text
Existing Standards for this Element	
Domain of Values for this Element	Yes
Source of Values	State legislature
How Defined	By state, FIPS Publication 5 for County names and codes
Example	▪ Shelby County, Alabama
Notes/Comments	

1.7.5.5 Complex Element: Place Name

Element Name	Place Name
Other common names for this element	City
Definition	{ Municipal Jurisdiction *} or { Community Place Name *} or { USPS Place Name *} or { County Name *}
Definition Source	New
Data Type	Text
Existing Standards for this Element	Refer to component elements
Domain of Values for this Element	Refer to component elements
Source of Values	Refer to component elements
How Defined	Refer to component elements
Example	▪ **Ajo**, AZ
Notes/Comments	▪ This complex element was created to resolve, or at least recognize, the difficulties in assigning place names to thoroughfare and landmark addresses, and specifically to highlight the difficulties in using USPS-assigned place names for non-postal purposes such as navigation, public service delivery, and emergency response. The Content Standard recognizes four types of place names: ▪ Municipal Jurisdiction (the local unit of government within a county) ▪ Community Place Name (urbanization) names, which do not denote municipal government jurisdictions, but refer to districts or areas within municipalities, or to places in unincorporated areas. ▪ USPS Place Name, which is assigned to the post office from which the USPS delivers mail to the address. ▪ County Name ▪ Only one of these can appear as the place name in an address. In many cases they are the same. Where they differ, it is recommended that the place name be selected according to the following rules: ▪ If the address is within a municipality, use that name as the place name. If a community name is also needed, place the community name in the appropriate element of a landmark, community, or landmark-site address. ▪ f the address is in an unincorporated area, use the name that most specifically identifies the place--typically the community name. ▪ For postal delivery, the USPS-designated place name is preferred, but any place name is acceptable if the ZIP code is correct. ▪ By default, if no other name is known, use the USPS place name for the ZIP Code, or the county name.

1.7.5.6 State Name

Element Name	State Name
Other common names for this element	Commonwealth (e.g, PA, MA. VA, PR)
Definition	The fifty states, District of Columbia, and U.S. territories and outlying possessions, represented by their two-letter FIPS abbreviation.
Definition Source	FIPS Publication 5-2
Data Type	Text
Existing Standards for this Element	FIPS Publication 5-2
Domain of Values for this Element	Yes
Source of Values	FIPS Publication 5-2
How Defined	FIPS Publication 5-2
Example	▪ San Francisco, **CA** ▪ St. Louis, **MO** ▪ San Juan, **PR**
Notes/Comments	▪ This is the only element stored in abbreviated form. ▪ The FIPS standard abbreviations are identical to the USPS standard abbreviations, and also cover nine small. remote islands that do not receive direct mail delivery.

1.7.5.7 Zip Code

Element Name	Zip Code
Other common names for this element	ZIP5
Definition	A five-digit code that identifies a specific geographic [postal] delivery area. ZIP Codes can represent an area within a state, an area that crosses state boundaries (unusual condition) or a single building or company that has a very high mail volume. “ZIP” is an acronym for Zone Improvement Plan.
Definition Source	FGDC Draft Address Data Content Standard v. 3 (citing USPS)
Data Type	Text
Existing Standards for this Element	Yes
Domain of Values for this Element	Yes
Source of Values	USPS
How Defined	USPS is the sole source of this information.
Example	▪ Birmingham, Alabama **35305** ▪ Webster Groves, Missouri **63119**
Notes/Comments	

1.7.5.8 Zip Plus 4

Element Name	Zip Plus 4 Code
Other common names for this element	
Definition	A four-digit extension of the five-digit Zip Code that identifies a portion of a carrier route for USPS mail delivery.
Definition Source	FGDC Draft Address Content Standard v. 3 (citing USPS)
Data Type	Text
Existing Standards for this Element	Yes
Domain of Values for this Element	Yes
Source of Values	USPS is the sole source of this information.
How Defined	From USPS
Example	▪ Birmingham, Alabama 35242- **3426** ▪ Webster Groves, Missouri 63119- **3212**
Notes/Comments	

1.7.5.9 Nation Name

Element Name	Nation Name
Other common names for this element	Country
Definition	The name of the nation in which the address is located.
Definition Source	New
Data Type	Text
Existing Standards for this Element	
Domain of Values for this Element	Yes
Source of Values	To be determined.
How Defined	
Example	▪ United States of America
Notes/Comments	▪ Although the scope of this standard is restricted US addresses, this item is included for two reasons: to facilitate reconciliation with address standards of other nations, and to accommodate files which mix addresses from the US and other nations. ISO 3166-1 gives standard two-letter codes and official short names in English for the representation of names of countries.

1.7.6 USPS Postal Address Elements

1.7.6.1 USPS Box Type

Element Name	USPS Box Type
Other common names for this element	PO Box; Box
Definition	A box used for receipt of USPS mail. The box may be located in the post office lobby (e.g PO Box), on the customer's premises or other USPS authorized place (e.g. rural route box).
Definition Source	New
Data Type	Text
Existing Standards for this Element	USPS Pub 28
Domain of Values for this Element	Yes
Source of Values	USPS Pub 28
How Defined	USPS Pub 28
Example	▪ **PO Box** 489; **Box** AA
Notes/Comments	

1.7.6.2 USPS Box ID

Element Name	USPS Box ID
Other common names for this element	Box Number; PO Box Number
Definition	The numbers or letters distinguishing one box from another within a post office. May include slash, hyphen or period.
Definition Source	New
Data Type	Text
Existing Standards for this Element	Yes
Domain of Values for this Element	Yes, within each post office
Source of Values	Local post office
How Defined	Local post office
Example	▪ PO Box **6943**; PO Box **G**; PO Box **00145**
Notes/Comments	

1.7.6.3 USPS Box Group Type

Element Name	USPS Box Group Type
Other common names for this element	
Definition	A collection of postal boxes served from a single distribution point.
Definition Source	New
Data Type	Text
Existing Standards for this Element	Yes
Domain of Values for this Element	Yes
Source of Values	USPS Publication 28
How Defined	USPS Publication 28
Example	▪ **RR** 4, Box 10 ▪ **HC** 2, Box 7 ▪ **PSC** 4, Box 3 ▪ **CMR** 4, Box 2 ▪ **UNIT** 475
Notes/Comments	▪ This group includes rural routes, highway contract routes, postal service centers, overseas military common mail rooms and military unit numbers.

1.7.6.4 USPS Box Group ID

Element Name	USPS Box Group ID
Other common names for this element	Rural route number; HC number; PSC/CMR/Unit Number
Definition	The numbers or letters distinguishing one group of boxes from another within a distribution point. May include hyphen, slash or period.
Definition Source	New
Data Type	Text
Existing Standards for this Element	USPS Pub 28
Domain of Values for this Element	Yes
Source of Values	Local Post office
How Defined	Local Post office
Example	▪ RR **1** ▪ HC **28** ▪ PSC **1650**, CMR **830**, or UNIT **908** (overseas military)
Notes/Comments	

1.7.6.5 USPS General Delivery Point

Element Name	USPS General Delivery Point
Other common names for this element	
Definition	A central point where mail may be picked up by the addressee. Two values are permitted: "General Delivery" (for post offices), and ship's names (for overseas military addresses).
Definition Source	New
Data Type	Text
Existing Standards for this Element	Yes
Domain of Values for this Element	Yes
Source of Values	USPS
How Defined	USPS Publication 28 Sections 238.1 and 26
Example	▪ **General Delivery,** Tampa, FL 33602
Notes/Comments	

1.7.7 USPS Address Lines

1.7.7.1 Complex Element: Complete Feature Address

Element Name	Complete Feature Address
Other common names for this element	
Definition	{ Complete Address Number * } + { Complete Street Name * } + { Complete Occupancy Identifier } **OR** { USPS Box Type * } + { USPS Box ID * } **OR** { USPS Box Group Type * } + { USPS Box Group ID * } **OR** { USPS General Delivery Point * } All of any address, excluding the Place Name, State Name, Zip Code, and Zip Plus 4
Definition Source	New
Data Type	Text
Existing Standards for this Element	
Domain of Values for this Element	No
Source of Values	NA
How Defined	NA
Example	▪ **1 Main Street**, Ajo, AZ 85321
Notes/Comments	▪ This element is defined solely for use with the General Address class, which

Element Name	Complete Feature Address
	is constructed to accommodate and mix addresses of all types (e.g., a general postal mailing list or contact list). Place Name, State Name, Zip Code, and Zip Plus 4, which appear in all address classes, are kept separate from the rest of the address.

1.7.7.2 Complex Element: Place State ZIP

Element Name	Place State ZIP
Other common names for this element	Last Line (USPS)
Definition	{ Place Name *} + { State Name *} + { Zip Code *} + { Zip Plus 4}
Definition Source	New
Data Type	Text
Existing Standards for this Element	Refer to component elements
Domain of Values for this Element	Refer to component elements
Source of Values	Refer to component elements
How Defined	Refer to component elements
Example	▪ Atlanta, Georgia 30316 ▪ Pittsburgh, PA 15218-3456
Notes/Comments	

1.8 Address Attributes

1.8.1 Address ID

Element Name	Address ID
Other common names for this element	
Definition	The unique identification number assigned to an address by the addressing authority
Definition Source	New
Data Type	Integer
Existing Standards for this Element	None
Domain of Values for this Element	No
Source of Values	NA
How Defined	Locally
Notes/Comments	▪ The ID number must be unique for each address assigned by an addressing

Element Name	Address ID
	authority. This, combined with the FIPS number of the addressing authority, can provide a unique ID for every address in the US

1.8.2 Address Coordinates

1.8.2.1 Address X Coordinate

Element Name	Address X Coordinate
Other common names for this element	
Definition	The X coordinate of address location.
Definition Source	New
Data Type	Double
Existing Standards for this Element	Yes
Domain of Values for this Element	Spatial extent of the jurisdiction(s).
Source of Values	Source of spatial data collection.
How Defined	Coordinates are defined in terms of a projected spatial referencing system, described in file-level metadata per FGDC's Content Standard for Geospatial Metadata. Common projected spatial referencing systems include the State Plane Coordinate System and Universal Transverse Mercator (UTM).
Example	▪ 750908.04
Notes/Comments	▪ For point and polygon features, coordinate pairs typically locate the point of assignment: a centroid point, a point locating the entry to a property, etc.

1.8.2.2 Address Y Coordinate

Element Name	Address Y Coordinate
Other common names for this element	
Definition	The Y coordinate of the address location.
Definition Source	New
Data Type	Double
Existing Standards for this Element	Yes
Domain of Values for this Element	Spatial extent of the jurisdiction(s).
Source of Values	Source of spatial data collection.
How Defined	Coordinates are defined in terms of a projected spatial referencing system, described in file-level metadata per FGDC's Content Standard for Geospatial Metadata. Common projected spatial referencing systems include the State

Element Name	Address Y Coordinate
	Plane Coordinate System and Universal Transverse Mercator (UTM).
Example	▪ 3740623.06
Notes/Comments	▪ For point and polygon features coordinate pairs typically locate the point of assignment: a centroid point, a point locating the entry to a property, etc.

1.8.2.3 Address Longitude

Element Name	Address Longitude
Other common names for this element	
Definition	The longitude coordinate of the address location, noted in decimal degrees.
Definition Source	New
Data Type	Double
Existing Standards for this Element	FGDC, "Content Standard for Digital Geospatial Metadata (CSDGM)", which refers to the following standard ANSI INCITS 61-1986 (R2002), "Representation of Geographic Point Locations for Information Interchange".
Domain of Values for this Element	Spatial extent of the jurisdiction(s).
Source of Values	Source of spatial data collection.
How Defined	Coordinates are defined in terms of a geographic (longitude, latitude) spatial referencing system, described in file-level metadata per FGDC's Content Standard for Geospatial Metadata. Common geographic coordinate systems include North American Datum of 1983 (NAD83) and World Geodetic System of 1984 (WGS84).
Example	▪ -84.29049105
Notes/Comments	▪ For point and polygon features, coordinate pairs typically locate the point of assignment: a centroid point, a point locating the entry to a property, etc.

1.8.2.4 Address Latitude

Element Name	Address Latitude
Other common names for this element	
Definition	The latitude coordinate of the address location, noted in decimal degrees.
Definition Source	New
Data Type	Double
Existing Standards for this Element	FGDC, "Content Standard for Digital Geospatial Metadata (CSDGM)", which refers to the following standard ANSI INCITS 61-1986 (R2002), "Representation of Geographic Point Locations for Information Interchange".
Domain of Values for this Element	Spatial extent of the jurisdiction(s).
Source of Values	Source of spatial data collection.

Element Name	Address Latitude
How Defined	Coordinates are defined in terms of a geographic (longitude, latitude) spatial referencing system, described in file-level metadata per FGDC's Content Standard for Geospatial Metadata. Common geographic coordinate systems include North American Datum of 1983 (NAD83) and World Geodetic System of 1984 (WGS84).
Example	▪ 33.77603207
Notes/Comments	▪ For point and polygon features, coordinate pairs typically locate the point of assignment: a centroid point, a point locating the entry to a property, etc.

1.8.2.5 US National Grid Coordinate

Element Name	US National Grid Coordinate
Other common names for this element	USNG Coordinate
Definition	The USNG is an alphanumeric point reference system that overlays the Universal Transverse Mercator (UTM) numerical coordinate system. A USNG coordinate consists of **three parts**, the: ▪ **Grid Zone Designation (GZD)** for worldwide unique geoaddresses (two digits plus one letter, developed from the UTM system). ▪ **100,000-meter Square Identification** for regional areas (two letters). ▪ **Grid Coordinates** for local areas (always an even number of digits between 2 and 10 depending upon precision).
Definition Source	Adapted from US National Grid, FDGC-STD-011-2001, Section 3.3 Quoted from: Tom Terry, "The United States National Grid." *Professional Surveyor Magazine.* Oct. 2004, p. 12.
Data Type	Text
Required Element	No
Existing Standards for this Element	US National Grid, FGDC-STD-011-2001. A copy of this standard can be downloaded at: http://www.fgdc.gov/standards/documents/standards/xy_proj/fgdc_std_011_2001_usng.pdf
Domain of Values for this Element	No
Source of Values	
How Defined (from standard, other)	As prescribed in FGDC-STD-011-2001.
Example	18SUJ2348306479 or 18S UJ 23483 06479 ▪ **18S** – Identifies a **GZD** ▪ **18S UJ** – Identifies a specific **100,000-meter square** in the specified GZD ▪ **18S UJ** 2 0 - Locates a point with a precision of 10 km ▪ **18S UJ** 23 06 - Locates a point with a precision of 1 km ▪ **18S UJ** 234 064 - Locates a point with a precision of 100 meters ▪ **18S UJ** 2348 0647 - Locates a point with a precision of 10 meters ▪ **18S UJ** 23483 06479 - Locates a point with a precision of 1 meter
Notes/Comments	▪ USNG basic coordinate values and numbering are identical to Universal

Element Name	US National Grid Coordinate
	Transverse Mercator (UTM) coordinate values over all areas of the United States including outlying territories and possessions. ▪ USNG coordinates shall be identical to the Military Grid Reference System (MGRS) numbering scheme over all areas of the United States including outlying territories and possessions. ▪ While their coordinates are the same, the key difference between MGRS and USNG is organization of their 100,000-m Square Identification schemes. MGRS uses two 100,000-m Square Identification lettering schemes, depending on which datum is used, while USNG uses only the single scheme associated with NAD 83/WGS 84. When USNG values are referenced to NAD 83/WGS 84, USNG and MGRS values are identical and MGRS can be used as a surrogate when software does not yet support USNG. ▪ The USNG is not intended to replace the coordinate system that data is stored in a digital database. It provides a nationally consistent presentation format and grid for public safety, general public, and commercial activities that is user-friendly in both digital and hardcopy products. USNG values enable use of address data with low cost consumer grade GPS receivers and properly gridded maps. ▪ USNG values are intended to provide a highly accurate location description of the feature, i.e. within meters of a front door. For this reason, USNG coordinates should not be assigned based on positions geocoded by interpolation from address ranges, due to the imprecision inherent in the interpolation procedure. ▪ Additional information can be located at http://www.fgdc.gov/usng/index.html Complete definition from FGDC Standard: 3.3 Referencing Scheme Numbering scheme shall be alphanumeric as follows: 3.3.1 Grid Zone Designation ▪ First, the U.S. geographic area shall be divided into 6-degree longitudinal zones designated by a number and 8-degree latitudinal bands designated by a letter. Thus each area is given a unique alphanumeric Grid Zone Designator (GZD). ▪ The longitude zone numbers and latitude band letters for GZD over the United States shall be taken from the global scheme of MGRS. 3.3.2 100,000-meter Square Identification ▪ Each GZD 6x8 degree area shall be covered by a specific scheme of 100,000-meter squares where a two-letter pair identifies each square. 3.3.3 Grid Coordinates ▪ A point position within the 100,000-meter square shall be given by the UTM grid coordinates in terms of its Easting (E) and Northing (N). For specific requirements or applications, the number of digits will depend on the precision desired in position referencing. In this convention, the reading shall be from left with Easting first, then Northing. An equal number of digits shall always be used for E and N.

1.8.2.6 Address Z Value

Element Name	Address Z Value
Other common names for this element	
Definition	Ordinal or ratio ("true") measurement of the height of each level of a building.

Element Name	Address Z Value
Definition Source	New
Data Type	Integer (Ordinal) or Double (Ratio)
Existing Standards for this Element	
Domain of Values for this Element	
Source of Values	The source of ratio measurement is the source of spatial data collection. The source for ordinal measurement is locally defined.
How Defined	Ordinal measurements give relative vertical positions: the lowest level of a building is 1, the one above that 2, etc. Ratio measurements are elevations given in terms of a a spatial referencing system. Either method should be described in file-level metadata per FGDC's Content Standard for Geospatial Metadata.
Notes/Comments	

1.8.3 Descriptive Attributes

1.8.3.1 Address Classification

Element Name	Address Classification
Other common names for this element	Classification Type
Definition	The class of the address as defined in Part 2 (Classification) of this Standard.
Definition Source	New
Data Type	Text
Existing Standards for this Element	See Part 2 of this standard.
Domain of Values for this Element	See Part 2 of this standard.
Source of Values	Part 2 of this standard.
How Defined	In Part 2 of this standard.
Notes/Comments	

1.8.3.2 Feature Type

Element Name	Feature Type
Other common names for this element	
Definition	The type of feature identified by the address
Definition Source	New
Data Type	Text
Existing Standards for	None

Element Name	Feature Type
this Element	
Domain of Values for this Element	No
Source of Values	NA
How Defined	From this standard
Example	Occupancy unit; building entrance; building; parcel
Notes/Comments	Initial list of feature types: Block, block face, intersection, parcel, building, entrance, unit. The list might be expanded indefinitely to include infrastructure and other features.

1.8.3.3 Address Lifecycle Status

Element Name	Address Lifecycle Status
Other common names for this element	
Definition	The life cycle status of the address.
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	Potential, proposed, active, retired
Source of Values	New
How Defined	From this standard
Notes/Comments	▪ **Potential** = Address falls within a theoretical range, but has never been used; ▪ **Proposed** = Application pending for use of this address (e.g., address tentatively issued for subdivision plat that is not yet fully approved); ▪ **Active** = Address has been issued and is in use; ▪ **Retired** = Address was issued, but is now obsolete (e.g. street name has been changed), building was demolished, etc.

1.8.3.4 Address Official Status

Element Name	Address Official Status
Other common names for this element	Alias address, alternate address, variant address
Definition	Whether the address is as given by the official addressing authority (official), or an unofficial variant or equivalent of it (alias)
Definition Source	New
Data Type	Text
Existing Standards for this Element	No

Element Name	Address Official Status
Domain of Values for this Element	See notes below.
Source of Values	New
How Defined	New
Example	See notes below.
Notes/Comments	▪ Alternate Names In any of the address classes described in 2.2, the collective name element may have another acceptable form. Some alternate names may be conditional, on attempt, ie if the alias resolves the address no further alternate names should be considered. Other alternate names are always applied, such as official renamings. All alternate names carry a limit of applicability and a timeframe of applicability. The limit of applicability may be a limit to a single zip code, a naming authorities boundary, such as city or county limits, or a range of address numbers with such a boundary. ▪ Alternate Names Established by a Renaming Action of the Naming Authority Upon official renaming of an address, or renumbering of an address, or a series of addresses, the prior, older address will occur in address lists for a period of time and a conversion to current names or current addresses will need to be provided. Such an entity may match a single address or a range of addresses. ▪ Alternate Names Established by a Naming Authority The alternate name is established by a separate, or the same, naming authority. Such names may apply to any address class, including landmarks. Such names would be established by naming authorities with a geographically larger area of responsibility, containing all or part of a naming authority with a smaller region, such as a state name overlaying a county name or a county name overlaying a city or town name. Examples would be a state highway designation (State Highway 7) overlaid upon locally named roads or a memorial highway overlaid on local road names or state highway names. ▪ Alternate Names Established by Colloquial Use in a Community Local communities hold on to address names much longer than do regional agencies. A community may use a colloquial address name as much as 30 years after that name has either expired or is no longer salient. This entry provides a conversion to a current name. ▪ Unofficial Alternate Names Frequently Encountered In data processing, entry errors occur. Such errors if frequently encountered may be corrected by a direct match of the error and a substitution to a current name. ▪ Unofficial Alternate Names In Use by an Agency or Entity For data processing efficiency, entities often create alternate names for internal use. When such alternate names are exposed to other entities they need to be resolved to a current name. ▪ Posted or Vanity Address Address is posted, but not recognized by addressing authority (e.g. vanity address on a building); ▪ Verified Invalid Address Address is verified as being invalid, but keeps appearing in address lists. Different from Unofficial Alternname Names in that these are known not to exist;

1.8.3.5 Address Anomaly Status

Element Name	Address Anomaly Status
Other common names for this element	
Definition	A status flag, or an explanatory note, for an address that is not correct according to the address schema in which it is located, but is nonetheless a valid address.
Definition Source	New
Data Type	text
Existing Standards for this Element	No
Domain of Values?	May be Y/N, or may have an enumerated domain of anomaly types
How Defined	Locally
Example	▪ An address that has an even address number but is located on the odd numbered side of the street.
Notes/Comments	▪ This field may be used to identify the type of anomaly (e.g. wrong parity, out of sequence, out of range, etc.) rather than simply whether or not it is anomalous. Local jurisdictions may create specific categories for anomalies.

1.8.3.6 Address Range Type

Element Name	Address Range Type
Other common names for this element	
Definition	The type of address range represented by the data. Address ranges are ambiguous, in that a set of 2 site numbers and a street name can represent either a building, a block face range, a block range, or an entire street range.
Definition Source	New
Data Type	Text
Required Element	Required with Address Range element
Existing Standards for this Element	None
Domain of Values for this Element	Actual/theoretical site, block face, block, multi-block, street, unknown; hyphenated single address number (not a range at all).
Source of Values	New
How Defined	New
Example	
Notes/Comments	▪ The terms "actual" or "theoretical" indicate whether the range is based on existing (in-use) addresses or the potential address range (based on a grid or other numbering system) for the given range. ▪ Further discussion of ranges is found under Address Range

1.8.3.7 Location Description

Element Name	Location Description
Other common names for this element	Additional Location Information
Definition	A text description providing more detail on how to identify or find the addressed feature.
Definition Source	New
Data Type	Text
Existing Standards for this Element	Census Bureau practices? The NENA standard "Location" element seems similar. It is defined as "Additional address information (free formatted) describing the exact location of the Calling Number." However, the example content provided by NENA "(e.g. Apt 718)" would not be appropriate for the field we are describing here, since we have separate address elements for apartment numbers.
Domain of Values for this Element	No
Source of Values	
How Defined	Locally
Example	▪ White house at intersection. ▪ 400 yards west of water tank

1.8.4 Spatial Organization Attributes

1.8.4.1 Address Number Parity

Element Name	Address Number Parity
Other common names for this element	
Definition	"A relation between a pair of integers: if both integers are odd or both are even they have the same parity; if one is odd and the other is even they have different parity."[1] Odd and even addresses are usually associated with opposite sides of a street. For example, a jurisdiction may assign odd numbers to the right side of the street when moving away from an address axis.
Definition Source	WordNet: Cognitive Science Laboratory, Princeton University (http://wordnet.princeton.edu/)
Data Type	Text
Existing Standards for this Element	NA
Domain of Values for this Element	"odd", "even"
Source of Values	NA
How Defined	Defined in integer mathematics.
Notes/Comments	

1.8.4.2 Address Scheme Name

Element Name	Address Scheme Name
Other common names for this element	
Definition	Name of the address scheme that operates over a specified area, i.e.: mountain addresses, plains addresses.
Definition Source	New
Data Type	Text
Existing Standards for this Element	
Domain of Values for this Element	
Source of Values	
How Defined	Locally defined.
Notes/Comments	

1.8.4.3 Address Scheme Description

Element Name	Address Scheme Description
Other common names for this element	
Definition	A description of an Address Scheme that includes business rules about parity, naming conventions, and other matters concerning the assignment and maintenance of an addressing scheme.
Definition Source	New
Data Type	Text
Existing Standards for this Element	None
Domain of Values for this Element	No
Source of Values	
How Defined	Locally defined business rules
Example	▪ "Streets running in a north-south direction shall be Avenues, while streets running in an east-west direction shall be Streets." ▪ "Odd numbers shall be on the north and west sides of roads, while even numbers shall be on the south and east sides."
Notes/Comments	▪ This element may refer to an address ordinance, Standard Operating Procedures manual or other external document wherein the rules for addresses in a given scheme are written.

1.8.4.4 Address Scheme Origin

Element Name	Address Scheme Origin
Other common names for this element	
Definition	Location where the address axes meet.
Definition Source	New
Data Type	Geometry (Point)as defined in OpenGIS Simple Features Specification For SQL Revision 1.1, p. 2-4.
Existing Standards for this Element	
Domain of Values for this Element	Coordinate location of the intersection of the address axes.
Source of Values	Source of spatial data collection.
How Defined	Point location defined locally, often by ordinance, and encoded in terms of a spatial referencing system, described in file-level metadata per FGDC's Content Standard for Geospatial Metadata.
Example	Definition ▪ For Washington DC: The **US Capitol Building** (point of origin for North, South, and East Capitol Streets and the Capitol Mall, which divide DC into four quadrants, NW, NE, SE, and SW). Address numbers increase along those four axes as one travels away from the Capitol Building, and all other streets are addressed in parallel with one of the axis streets, and every address must include a quadrant designation. Element ▪ POINT(399216.07, 135772.41)
Notes/Comments	

1.8.4.5 Address Scheme Axes

Element Name	Address Scheme Axes
Other common names for this element	
Definition	Address axes define the boundaries between adjoining zones in address schema. Those zones may be quadrants (northwest, northeast, southeast, southwest) or other geographic divisions. Lowest address numbers occur nearest an axis.
Definition Source	New
Data Type	Geometry (Multilinestring), as defined OpenGIS Simple Features Specification For SQL Revision 1.1, p. 2-5.
Existing Standards for this Element	NA
Domain of Values for this Element	Spatial extents of the jurisdiction(s).
Source of Values	Source of spatial data collection.

Element Name	Address Scheme Axes
How Defined	Axis locations defined locally, often by ordinance, and encoded in terms of a spatial referencing system, described in file-level metadata per FGDC's Content Standard for Geospatial Metadata.
Notes/Comments	

1.8.4.6 Address Scheme Extent

Element Name	Address Scheme Extent
Other common names for this element	
Definition	Boundary of the area over which an address schema operates.
Definition Source	New
Data Type	Geometry (Multipolygon), as defined in OpenGIS Simple Features Specification For SQL Revision 1.1, p. 2-10.
Existing Standards for this Element	NA
Domain of Values for this Element	Spatial extent of the schema.
Source of Values	Source of spatial data collection.
How Defined	Locally defined.
Notes/Comments	

1.8.4.7 Complex Element: Address Scheme

Element Name	Address Scheme
Other common names for this element	Addressing system, address numbering system, address numbering grid
Definition	A system for assigning addresses in a given area. An addressing scheme is known by its Address Scheme Name (required), It is defined by its Address Scheme Origin (optional), Address Scheme Axes (optional), and Address Scheme Extent (optional). It is further described in its Address Scheme Description (required)
Definition Source	New
Data Type	Geometry Collection (as defined in OpenGIS Simple Features Specification For SQL Revision 1.1, section 2.1.2, p. 2-4)
Existing Standards for this Element	Refer to Component Elements
Domain of Values for this Element	Refer to Component Elements
Source of Values	Refer to Component Elements
How Defined	Refer to Component Elements
Example	▪ Address Scheme Name: Metro City Address Grid ▪ Address Scheme Origin: POINT(15000 15000)

Element Name	Address Scheme
	▪ Address Scheme Axes: MULTILINESTRING((1000 15000,20000 15000),(15000 1000,15000 25000)) ▪ Address Scheme Extent: MULTIPOLYGON(((1000 1000,20000 1000,20000 25000,1000 25000,1000 1000))) ▪ Address Scheme Description: Written information about parity, street naming conventions, numbering intervals, grids, and other business rules.
Notes/Comments	▪ A jurisdiction may have more than one addressing scheme within its area, and its addressing scheme(s) may change over time. Occasionally addresses from different schemes are intermingled along the same block face, which complicates the assignment of an address range to that block face.

1.8.5 Address Lineage Attributes

1.8.5.1 Address Start Date

Element Name	Address Start Date
Other common names for this element	
Definition	The earliest date on which the address is known to exist.
Definition Source	New
Data Type	Date
Existing Standards for this Element	MM/DD/YYYY
Domain of Values for this Element	No
Source of Values	
How Defined	MM/DD/YYYY
Example	▪ 6/12/2005
Notes/Comments	▪ Record level metadata, should be stored for each address

1.8.5.2 Address End Date

Element Name	Address End Date
Other common names for this element	
Definition	The date on which the address is known to no longer be valid.
Definition Source	New
Data Type	Date
Existing Standards for this Element	MM/DD/YYYY
Domain of Values for this Element	No

Element Name	Address End Date
Source of Values	NA
How Defined	MM/DD/YYYY
Example	▪ 10/24/2005
Notes/Comments	▪ Record level metadata, should be stored with each address.

1.8.5.3 Address Direct Source

Element Name	Address Direct Source
Other common names for this element	
Definition	Source from whom the data provider obtained the address, or with whom the data provider validated the address.
Definition Source	New
Data Type	Text
Domain of Values for this Element	No
Source of Values	NA
How Defined	By data provider
Example	▪ Tele Atlas, phone company, assessor, official addressing authority
Notes/Comments	▪ Important if the data provider did not obtain the address directly from the local authority.

1.8.5.4 Address Authority

Element Name	Address Authority
Other common names for this element	
Definition	The authority (e.g., municipality, county) that created or has jurisdiction over the creation of an address
Definition Source	New
Data Type	Text
Existing Standards for this Element	FIPS Standards for Municipal and County Names, FIPS Publication 5.
Domain of Values for this Element	See FIPS Standards, as supplemented by local usage
Source of Values	FIPS Standards, plus local additions
How Defined	FIPS with local additions
Notes/Comments	▪ The addressing authority may or may not be the same as the physical or postal jurisdiction noted for the address.

1.8.5.5 Address Authority Identifier

Element Name	Address Authority Identifier (FIPS/GNIS Code)
Other common names for this element	
Definition	The FIPS/GNIS identifier for the governmental unit issuing the address or responsible for its maintenance.
Definition Source	
Data Type	Integer
Existing Standards for this Element	
Domain of Values for this Element	Yes
Source of Values	
How Defined	From FIPS/GNIS standard
Notes/Comments	▪ This element, in conjunction with the address ID, could provide a unique ID for every address in the US. FIPS/GNIS codes have limitations: in some areas state or federal agencies, or the local postmaster, issue addresses. Likewise, in many jurisdictions, a State University campus is addressed by the State, even though the property and buildings are within a municipal jurisdiction. This designator can either be used to indicate the authority that issues the addresses in the dataset, or that maintains the repository of addresses contained in the dataset.

Part 2: Street Address Data Classification

Introduction

2.1 Basis for Classification

Data classification standards define groups or categories of data that serve an application. There are many valid potential ways to define groups or categories of addresses. The most appropriate way depends on the purpose the classification is intended to serve.

The classification part of this standard is created to serve geographic data processing needs, using the data elements defined in the content part of the standard. The standard classifies addresses according to their syntax, that is, their data elements and the order in which the elements are arranged. Syntax determines the record structure needed to hold and exchange the address, and often it is all we know about the addresses in a given file.

2.2 Organization

The classification part provides the name, syntax, examples, and notes for each address class. The classes are presented in four broad groups:

1. **Thoroughfare addresses** specify a location by reference to a thoroughfare.
2. **Landmark addresses** specify a location by reference to a named landmark. A landmark is a named point or area that is prominent enough in the local landscape to be known publicly by that name.
3. **Postal delivery addresses** specify points of postal delivery which have no definite relation to the location of the recipient, such as post office boxes, rural route boxes, etc.
4. The **general address class** handles all of the above classes, for files in which the various classes are mixed together. The feature address may have any syntax, but city, state, and ZIP are separated from the rest of the address.

2.3 A Note on Puerto Rico Addresses

None of the authors is knowledgeable about Puerto Rican address standards. We would welcome guidance from those who are.

Both USPS Publication 28 and the 2003 draft FGDC address standard recognize "Puerto Rico" address classes. This standard does not. Instead, it includes Puerto Rican addresses in the same general classes as addresses for the rest of the United States.

The examples given in USPS Publication 28, and in USPS "Addressing Standards for Puerto Rico and the U.S. Virgin Islands", suggest five factors that might seem to make Puerto Rican addresses a class unto themselves. This standard accommodates them as follows:

1. **Spanish vocabulary**. This can be accommodated by enlarging the relevant domains (street type, directional, and modifier; building, floor, and unit types) to include Spanish as well as English terms.

2. **Spanish syntax.** This is accommodated primarily by providing for a street pre-type for typical Spanish-language street names ("Avenida Ashford"). The pre-type is also needed for some English-language street names ("Avenue A").
3. **Alphanumeric site numbers.** Puerto Rican site numbers are sometimes alphanumeric, as are site numbers in the rest of the U.S. The standard provides site number prefixes and suffixes to accommodate site numbers like "B17A", "123 1/2", and "10N2W3001".
4. **Condominium addresses.** These fit in the landmark or landmark-site classes.
5. **Urbanization addresses.** These fit in the landmark-site or community (urbanization) classes.

Sources:

- USPS, "Addressing Standards for Puerto Rico and the U.S. Virgin Islands", as posted July 29, 2005 at: http://www.usps.com/ncsc/addressstds/addressstdsmenu.htm
- USPS Publication 28, as posted July 29, 2005 at: http://pe.usps.gov/text/pub28/welcome.htm

2.4 Formatting Conventions

1. Data element names are placed in curly brackets separated by a plus sign. Required elements have an asterisk:
   - Example: { Complete Address Number *}+{ Complete Street Name *}+{ Unit Element }
2. To avoid a multiplicity of insignificant permutations and combinations, complex elements are used to represent the various combinations of the simple elements that comprise them. Thus, for example, {Complete Address Number} includes all of the following combinations:
   1. { Address Number *}
   2. { Address Number* } + { Address Number Suffix }
   3. { Address Number* } + { Separator Element } + { Address Number Suffix }
   4. { Address Number Prefix } + { Address Number *}
   5. { Address Number Prefix } + { Separator Element } + { Address Number *}
   6. { Address Number Prefix } + { Address Number *} + { Address Number Suffix }
   7. { Address Number Prefix } + { Separator Element } + { Address Number *} + { Address Number Suffix }
   8. { Address Number Prefix } + { Address Number *} + { Separator Element } + { Address Number Suffix }
   9. { Address Number Prefix } + { Separator Element } + { Address Number *} + { Separator Element } + { Address Number Suffix }
3. { Place Name *}+{ State Name *}+{ Zip Code *}+{ Zip Plus 4 } could be shown as the complex element {PlaceStateZIP}. However, the simple elements are shown separately in each syntax pattern, to emphasize that they should be parsed separately

as simple elements. Because they occur in every address class, and always in the same order, they are not shown in boldface. Boldface is used to emphasize the elements that differentiate the classes.

2.5 Address Classes

2.5.1 Thoroughfare Address Classes

Thoroughfare addresses specify a location by reference to a thoroughfare. A thoroughfare in this context is a linear feature used to travel from or to a specific location, which is designated by a number and the thoroughfare name. A thoroughfare is typically but not always a road — it may be, for example, a walkway, a railroad, or a river. The thoroughfare address classes are:

2.5.1.1 Site Address

Syntax:

{ Complete Address Number * } + { Complete Street Name * } + { Complete Occupancy Identifier } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Examples:

- 123 Main Street Anytown MN 55811
- 123 Main Street Apt 3A Anytown MN 55811
- 123 West Main Street Anytown MN 55811
- 123 A Main Street West Anytown MN 55811
- 123 Avenue A Frypan AK 99401
- 123 Boulevard of the Allies Pittsburgh PA 15222

Notes:

- Special care should be taken with records where the complete address number is 0 (zero). Occasionally zero is issued as a valid address number. More often, the address number is missing or nonexistent, and a null value has been converted to zero. If the address number is nonexistent or missing, the address belongs in the Unnumbered Thoroughfare class.

2.5.1.2 Landmark-Site Address

Syntax:

{ Landmark Name or Community Place Name *} + { Complete Occupancy Identifier } + { Complete Address Number *} + { Complete Street Name *} + { Place Name *} + { State Name *} + { Zip Code *} + { Zip Plus 4 } + { Nation Name }*

Examples:

- The White House, 1600 Pennsylvania Avenue, Washington DC 20001
- Carnegie Mellon University, 3300 Forbes Avenue, Pittsburgh PA 15217
- Urbanizacion Las Gladiolas, 150 Calle A, San Juan PR 00926-3232
- Standard Office Building, Suite 400, 909 Fifth Avenue, Spokane WA 99201

Notes:

1. Strictly speaking, this could be decomposed into two addresses, a thoroughfare address and a landmark address, one an alias of the other. It is recognized as a separate class for two reasons:
   - Á Many address lists, especially business address lists, include both, because the landmark name may be more prominently known but the thoroughfare address is useful for navigation to the site. There is value in linking the landmark name to the thoroughfare address.
   - Á In some cases, notably some Puerto Rican urbanizations, the landmark component is necessary to distinguish repeated addresses in different locations. USPS "Addressing Standards for Puerto Rico and the Virgin Islands" states, "[Urbanization], commonly used in Puerto Rican urban areas, is an important part of the addressing format as it describes the location of a given street. In Puerto Rico, repeated street names and address number ranges can be found within the same ZIP Code (e.g., CALLE 1, CALLE 2, etc.). These streets can have the same house number ranges (e.g.,1-99). In these cases, the urbanization name is the only element that correctly identifies the location of a particular address." (See also USPS Publication 28, Section 29). Example:
     - o Urbanizacion Royal Oak, 123 Calle 1, Bayamon PR 00961-0123
     - o Urbanizacion Hermosillo, 123 Calle 1, Bayamon PR 00961-1212
2. This class includes urbanization addresses if they appear with a thoroughfare name. Without a thoroughfare name, the address would fall in the Community (Urbanization) Address class. See the notes under the Community (Urbanization) Address class (Community Address) for more discussion of urbanization addresses.

2.5.1.3 Intersection Address

Syntax:

{ Complete Street Name *} + { Separator Element *} + { Complete Street Name *} + { Place Name *} + { State Name *} + { Zip Code *} + { Zip Plus 4 } + { Nation Name }

Examples:

- Á Fifth Street and Main Street, Newtown CT 06470
- Á West Fifth Street & Main Street, Newtown CT 06470
- Á P Street && 19th Street && Mill Road, Ellicott City MD 21043
- Á Avenida Rosa y Calle 19, Bayamon PR 00961

Notes:

- Á Intersection addresses are useful for recording events occurring in the street, such as accidents, infrastructure locations, etc.
- Á When referring to a location at one corner of an intersection, the site address for that corner is always preferable to the intersection address
- Á Intersections of more than two streets can be represented as one sequence of three or more street names, or as every pairwise combination of the names.

- Separator values include " and ", " & ", and " && " " + "," - ", and " y " or " con " (Spanish) each having a space before and after.
- Some address parsing software permits the use of ampersands (" & " or " && ") to signify intersection addresses, because the double ampersand does not occur in any street names, and ampersands rarely do. Be wary, though--in many programming languages, ampersands are reserved for other uses, which could complicate data exchange.

2.5.1.4 Two-number Address Range

Syntax:

{ Address Number Range * } + { Complete Street Name * } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Examples:

- 405-411 West Green Street, Flint MI 48502
- 1400-1420 Smith Street, West Monroe, LA 71292
- 13-25 Elm Street, Muncie, IN 47305
- 214-02 - 214-14 1/2 Evergreen Street, New York, NY 11364

Notes:

- Ranges may refer to one structure, several structures, an entire block face (one side of a thoroughfare between two intersections), a block (both sides of the street between two intersections), the entire length of a street. In Master Street Address Guide (MSAG) files, the range refers to the entire length of a street within a given emergency service zone (ESN or ESZ). Use the address range type attribute to specify what kind of range it is.
- Ranges can begin or end with street numbers that have suffixes or prefixes. USPS Publication 28 Appendix E contains instructive notes on the complexities of these address ranges.
- Ranges should not be confused with hyphenated address numbers that denote a single site. A range must be composed of two complete address numbers. Certain areas of New York City, southern California, and Hawaii use hyphens in address numbers. In the example above, "214-02 Evergreen St" would one address, and "214-14 1/2 Evergreen Street" would be a second address, and neither one alone is an address range.

2.5.1.5 Four-number Address Range

Syntax:

{ Complete Address Number *(left low) } + { Complete Address Number *(left high) } + { Complete Address Number (right low) } + { Complete Address Number (right high) }+{ Complete Street Name * } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Examples:

- TIGER file ranges (left low, left high, right low, right high, street name) are the most widely-used example of block ranges

Notes:

- Although they do not necessarily refer to one specific site, block addresses are important for municipal operations (such as snow plow dispatch), emergency dispatch, and geocoding. A block address range may be expressed by four numbers, representing the low and high end of the numeric range for each side of a block. By convention, the first number represents the low end of the numeric range of addresses for the left side, the second number represents the high end of the numeric range of addresses for the left side, the third number represents the low end of the numeric range of addresses for the right side, and the fourth number represents the high end of the numeric range for the right side.
- A block face is defined as one side of a thoroughfare between two intersecting street segments. Generally, but not always, a block face has addresses of a single parity, that is, either odd or even numbers. However, mixed parities do occur in some places. In other cases, where the numeric ranges on opposite sides of the same block are not within the same general range, it is preferable to express the range in terms of the left low-high, right low-high, or to provide individual block face ranges.
- A block range may refer to either a theoretical range (the possible range of addresses along that street segment) or to an actual or used range of addresses. These types (actual or theoretical) are distinguished by the range type attribute.

2.5.1.6 Unnumbered Thoroughfare Address

Syntax:

{ Landmark Name } + { Complete Street Name * } + { Complete Occupancy Identifier } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Example:

- Fagaima Road, Nu'uli, AS 96799

Notes:

- In many areas no address numbers have been assigned, and addresses in those areas often include only the thoroughfare name. This class separates those addresses from addresses that include address numbers or cross-streets.
- This class can also hold addresses with missing address numbers (i.e., incomplete addresses for thoroughfares where address numbers have been issued).
- This class should not be confused with or used for compiling a master complete street name list. The master list should be compiled separately by the local naming authority, and used to verify the names appearing in this (and other) classes of address records.

2.5.2 Landmark Address Classes

Landmark addresses specify a location by reference to a named landmark. A landmark is a named point or area that is prominent enough in the local landscape to be publicly known by that name. The landmark address classes are:

2.5.2.1 Single-Site Landmark Address

Syntax:

{ Landmark Name * }+{ Complete Occupancy Identifier } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Examples:

- Franklin D. Roosevelt Memorial, Washington DC 20004
- Statue of Liberty, New York NY 10004
- Langston Housing Complex, Building 7, Apartment 290, Kansas City KS 66101
- Condominium Garden Hills Plaza, Torre 2, Apartamento 905, Mayaguez PR 00680-1233
- Condominium Del Mar, Apartamento 905, Ponce PR 00731
- Residencial Las Margaritas, Edificio 1, Apartamento 104, San Juan PR 00924

Notes:

- This class includes the "condominium" addresses found in Puerto Rico, where a complex or building is known by name, without reference to a street.

2.5.2.2 Multi-Site Landmark Address

Syntax:

{ Landmark Name * }+{ Complete Occupancy Identifier }+{ Landmark Name * } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Examples:

- Dinkelspiel Auditorium, Stanford University, Stanford, CA 94305
- Statue of Liberty, Liberty Island, New York, NY 1004
- Truth Hall Room 306, Howard University, Washington DC 20059

Notes:

- In this class, two landmark names must be given, one of which is inside the other. In the examples above, Dinkelspiel Auditorium is on the Stanford University campus, the Statue of Liberty is on Liberty Island, and Truth Hall is on the Howard University campus. The multi-site landmark class differs from the single-site landmark class because it requires two names, not one, which requires a different data table structure.

2.5.2.3 Community (Urbanization) Address

Syntax:

{ Complete Address Number * } + { Community Place Name) * } + { Complete Occupancy Identifier } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Examples:

- 1234 Urbanizacion Los Olmos, Ponce PR 00731
- A17 Jardine Fagota, Ponce PR 00731
- B133 Urbanizacion Golden Gate, San Juan PR 00920

Notes:

- This class includes Puerto Rican urbanization addresses where the urbanization name is preceded by a number, and no street name is included. In Puerto Rico, an urbanization denotes an area, sector, or residential development within a geographic area.
- If no number precedes the urbanization name, the address fits in the landmark class.
- If the address includes reference to a thoroughfare, it fits in the Landmark-site class.
- For more information on Puerto Rican addressing conventions, see USPS Publication 28 Section 29, and USPS "Addressing Standards for Puerto Rico and the Virgin Islands."

2.5.3 Postal Delivery Address Classes

Postal delivery addresses specify points of postal delivery which have no definite relation to the location of the recipient, such as post office boxes, rural route boxes, etc. The USPS specifies each type in detail in USPS Publication 28.

2.5.3.1 USPS Postal Delivery Box

Syntax:

{ USPS Box Type * } + { USPS Box ID * } + { Private Mail Box } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Example:

- PO BOX 16943, New Orleans LA 70112
- PO BOX 1890, Kryton TN 38188-1890
- PO BOX G, Gabbs NV 89409
- PO BOX 159753 PMB 3571, Herndon VA 22071-2716

Notes:

- This class is defined in USPS Publication 28, Sections 281-283. The phrase "PO Box" is mandatory as the USPS Box Type.
- USPS Pub 28 Sec. 282: "Post Office Box numbers that are preceded by significant leading zeroes are identified in the ZIP+4 File by a hyphen (-) preceding the box number. Convert the hyphen into a zero on the output mailpiece.
    - ZIP+4 File: PO BOX -0145
    - Mailpiece: PO BOX 00145"
- USPS Pub 28 Sec. 283: "PO Box addresses often appear with the word CALLER, FIRM CALLER, BIN, LOCKBOX, or DRAWER. Change these to PO BOX."
    - Incorrect: DRAWER L
    - Correct: PO BOX L

2.5.3.2 USPS Postal Delivery Route

Syntax:
{ USPS Box Group Type * } + { USPS Box Group ID * } + { USPS Box Type * } + { USPS Box ID * } + { Private Mail Box } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Type 1: Rural Route:
{ "RR" * } + { USPS Box Group ID *} + { "BOX" * } + (USPS Box ID * } + { Private Mail Box } + { Place Name * } + { State Name *} + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Type 2: Highway Contract Route:
{"HC"*} + { USPS Box Group ID * } + {"BOX"*} + (USPS Box ID * } + { Private Mail Box } + { Place Name * } + { State Name *} + { Zip Code *} + { Zip Plus 4 } + { Nation Name }

Type 3: Overseas Military Delivery:
(PSC, CMR, or UNIT): {"PSC" or "CMR" or "UNIT" *} + { USPS Box Group ID * } + {"BOX" *} + (USPS Box ID * } + {"APO" or "FPO" *} + {"AE" or "AP" or "AA" *} + { Zip Code *} + { Zip Plus 4 } + { Nation Name }

Rural Route Address Notes and Examples (per USPS Pub 28 sec. 24):

- USPS Pub 28 Sec. 241: “Print rural route addresses on mailpieces as: RR N BOX NN. Do not use the words RURAL, NUMBER, NO., or the pound sign (#).”
  - RR 2 BOX 152
  - RR 9 BOX 23A
- USPS Pub 28 Sec. 242: “A leading zero before the rural route number is not necessary.”
  - Acceptable: RR03 BOX 98D
  - Preferred: RR 3 BOX 98D
- USPS Pub 28 Sec. 243: “Print hyphens as part of the box number only when they are part of the address in the ZIP+4 File.”
  - RR 4 BOX 19-1A
- USPS Pub 28 Sec. 244: “Change the designations RFD and RD (as a meaning for rural or rural free delivery) to RR.”
  - Incorrect: RFD ROUTE 4 #87A
  - Correct: RR 4 BOX 87A
- USPS Pub 28 Sec. 245: “There should be no additional designations, such as town or street names, on the Delivery Address Line of rural route addresses. Because street names used together with route and box numbers can create potential matching difficulty, mailers are encouraged to use only one style of addressing. If secondary name information is used, however, place it above the Delivery Address Line.”

- Incorrect: RR 2 BOX 18 BRYAN DAIRY RD
- Correct: RR 2 BOX 18

Á USPS Pub 28 Sec. 246: “When applying a ZIP+4 code to a rural address, an exact match is preferred. If a box number is included in the address, the mailpiece must bear the appropriate ZIP+4 code representing the range for that box number. When box number information is not available, the Rural Route base record must be used.”

Highway Contract Route Address Notes and Examples (per USPS Pub 28 sec. 25)

Á USPS Pub 28 Sec. 251: "Print highway contract route addresses on a mailpiece as: HC N BOX NN. Do not use the words HIGHWAY CONTRACT, ROUTE, NUMBER, NO., STAR ROUTE, or the pound sign (#).

- Incorrect: HIGHWAY CONTRACT ROUTE 68 BOX 23A
- Correct: HC 68 BOX 23A"

Á USPS Pub 28 Sec. 252: "A leading zero before the highway contract route number is not needed.

- Acceptable: HC068 BOX 98D
- Preferred: HC 68 BOX 98D"

Á USPS Pub 28 Sec. 253: "Print hyphens as part of the box number only when they are part of the address in the ZIP+4 File.

- HC 68 BOX 19-2B "

Á USPS Pub 28 Sec. 254: "Change the designation STAR ROUTE, which usually refers to highway contract route, to HC.

- Incorrect: STAR ROUTE 68 BOX # 45
- Correct: HC 68 BOX 45"

Á USPS Pub 28 Sec. 255: "There should be no additional designations, such as town or street names, on the Delivery Address Line of highway contract route addresses. Street names used together with route and box numbers can create potential matching difficulty. Mailers are encouraged to use only one style of addressing. If secondary name information is used, however, place it above the Delivery Address Line.

- Incorrect: HC 72 BOX 18 BRYAN DAIRY RD
- Correct: HC 72 BOX 18"

Á USPS Pub 28 Sec. 256: "When applying a ZIP+4 code to a highway contract route address, an exact match is preferred. If a box number is included in the address, the mailpiece must bear the appropriate ZIP+4 code representing the range for that box number. When box number information is not available, the highway contract base record must be used."

Overseas Military PSC, CMR, or UNIT Address Notes and Examples {per USPS Pub 28 sec. 225.1 and 238.1}:

- PSC stands for Postal Service Center. CMR stands for Common Mail Room.
- USPS Pub 28 Sec. 238.1: "The Delivery Address Line for all APO/FPO military mail must be standardized as follows:
    - PSC (CMR OR UNIT) NNNN
    - BOX NNNN
    - **Examples:**
        - CMR 830 BOX 51
        - PSC 1650 BOX 10
        - UNIT 908 BOX 111
- USPS Pub 28 Sec. 225.1 "Overseas military addresses must contain the APO or FPO designation along with a two-character “state” abbreviation of AE, AP, or AA and the ZIP Code or ZIP+4 code.
    - APO AE 09001-5275
    - FPO AP 96606-2783
    - APO AA 34035-4198
- AE is used for armed forces in Europe, the Middle East, Africa, and Canada;
- AP is for the Pacific; and
- AA is the Americas excluding Canada.
    - **Complete Address Examples:**
        - PSC 802 BOX 74 APO AE 09499-0074
        - UNIT 2050 BOX 4190 APO AP 96278-2050

2.5.3.3 USPS General Delivery Address

Syntax:
{ USPS General Delivery Point * } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Type 1: General Delivery:
{"GENERAL DELIVERY" *} + { Place Name * } + { State Name * } + { Zip Code * } + { "9999" } + { Nation Name }

Type 2: Overseas Military Address (Ship's Name):
{ SHIP'S NAME *} + { "APO" or "FPO" * } + { "AE" or "AP" or "AA" *} + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

General Delivery Addresses Note and Example {per USPS Pub 28 sec. 26}

- USPS Pub 28 Sec. 261: “Use the words GENERAL DELIVERY, uppercase preferred, spelled out (no abbreviation), as the Delivery Address Line on the mailpiece. Each record will carry the 9999 add-on code.”

- **Example:**
  - GENERAL DELIVERY
  - TAMPA FL 33602-9999

Overseas Military Addresses Notes and Examples {per USPS Pub 28 sec. 225.1 and 238.1}

- USPS Pub 28 Sec. 238.1: "The Delivery Address Line for all APO/FPO military mail must be standardized as follows:
  - SHIP'S NAME
- **Example:**
  - USS SEA DEVIL SSN-664
- USPS Pub 28 Sec. 225.1 "Overseas military addresses must contain the APO or FPO designation along with a two-character "state" abbreviation of AE, AP, or AA and the ZIP Code or ZIP+4 code.
  - APO AE 09001-5275
  - FPO AP 96606-2783
  - APO AA 34035-4198
- AE is used for armed forces in Europe, the Middle East, Africa, and Canada;
- AP is for the Pacific; and
- AA is the Americas excluding Canada.
- **Complete Example:**
  - USCGC HAMILTON
  - FPO AP 96667-3931

2.5.3.4 A Note on Compound Postal Delivery Addresses

Compound postal delivery addresses combine postal delivery address elements with thoroughfare or landmark addresses. Examples:

- Landmark-Postal Address: Wagon Wheel Ranch, RR1 Box 100
- Street-Postal Address: 1834 Grant Street, PO Box 15
- Landmark-Street-Postal Address: Mega Office Tower, 1 Grand Avenue, PO Box 18343

These potential classes are not recognized in this standard because the USPS strongly discourages them. Within the standard they can be handled two ways:

1. Separate them into their component types, create database records for each, and link the records to show that they refer to the same location.
2. Place the entire address in a general address list

2.5.4 General Address Class

The general address handles all of the above classes, for files in which the various classes are mixed together. The feature address may have any syntax, but city, state, and ZIP are separated from the rest of the address.

2.5.4.1 General Address Types

Syntax:

{ Complete Feature Address * } + { Place Name * } + { State Name * } + { Zip Code * } + { Zip Plus 4 } + { Nation Name }

Example:

A profile (limited subset) would be the USPS Pub 28 standard, in which the "complete feature address" is synonymous with the USPS "delivery line", and "place state ZIP" is synonymous with the USPS "last line", and in which all the USPS rules and domain values apply.

Notes:

- Address files often contain—and need to contain—street, landmark, and postal addresses mixed together. The general address class is intended to handle these kinds of files. Such a class should meet two criteria:

  1. The feature address (i.e. the street, landmark, or postal delivery part of the address, excluding city-state-zip) can be of any type or syntax.
  2. City, state, and ZIP are separated from the feature address. They may be parsed or unparsed as needed.

Part 3: Street Address Data Quality

Introduction

The purpose of this section is to provide a set of methods for applying spatial quality standards to addressing. Data quality refers to the description of how to express the applicability or essence of a data set or data element and include data quality, assessment, accuracy, and reporting or documentation standards.

Quality standards that apply to addressing consist of a series of standards that apply to spatial data generally, as well as a standard from the National Emergency Number Association (NENA). General data quality standards cannot speak to a specific type of database. The NENA standard describes address quality relative to an established Automatic Location Information (ALI) file, as is appropriate for emergency services. It gives an example of describing very specific tests to assess the fitness of a dataset for emergency services. Similarly, the United States Postal Service (USPS) Postal Addressing Standards describe addresses as used for mailing.

There remains a gap in guidance for assessment of quality for addresses themselves, information independent of a specific format or use. Local variations in address data sets is so great that very specific tests, such as those described in the NENA standard, are not applicable to every situation.. A series of more general methods can provide assistance in a variety of situations, working within the framework described by more broadly stated spatial quality standards. . This section seeks to support existing standards, providing content tests for specific address uses and describing ways of testing the quality classifications required for complete metadata.

3.1 Existing Standards and Documents Describing Spatial Data Quality

3.1.1 Objectives of Existing Standards

The existing quality standards present quality considerations in a variety of ways:

- Spatially-oriented standards include information about spatial data quality in a standard with a larger overall purpose: recording metadata or encoding data into a transfer format. These include the Content Standard for Digital Geospatial Metadata (CSDGM), OGC Topic 11 (ISO 19115) and SDTS.
- Spatially-oriented standards address quality directly. Three other standards from the ISO 19000 series, 19113, 19114 and 19138 are in that category.
- The NENA and USPS standards, examples of considering data for specific address uses.

Standard Name	Organization	Purpose (Quoted from document introduction)
Content Standard for Digital Geospatial Metadata (CSDGM)	Federal Geographic Data Committee	Provide a common set of terminology and definitions for the documentation of digital geospatial data (CSDGM, Introduction)
Geographic Information Principles (ISO 19113)	International Standards Organization	Provide principles for describing the quality for geographic data and concepts for handling quality information for geographic data (19113, Introduction)
Geographic information - Quality evaluation procedures	International Standards Organization	Provide guidelines for evaluation procedures of quantitative quality information for geographic data in accordance with the quality principles described in ISO 19113. It also offers guidance on reporting quality information.
OGC Topic 11: Geographic information - Metadata (ISO 19115)	Open Geospatial Consortium, International Standards Organization	Provide a structure for describing digital geographic data.
Geographic information - Data quality measures (ISO 19138)	International Standards Organization	Guide the producer in data quality reporting and the user in the evaluation of the usefulness of a dataset by standardising the components and structures of data quality measures and by defining a register of commonly used data quality measures.
NENA Recommended Data Standards For Local Exchange Carriers, ALI Service Providers & 9-1-1 Jurisdictions (NENA 02-011)	National Emergency Number Association	This document defines the provisioning requirements for E9-1-1 data integrity, content, and call delivery regardless of dial tone provider. It is the goal of these standards to support current and future development consistent with the concept of "One Nation, One Number". It is assumed that Federal, State or Local legislation will supersede these standards.
Spatial Data Transfer Standard aka SDTS (ANSI NCITS 320-1998)	American National Standards Institute	Provides a solution to the problem of spatial (i.e., geographic and cartographic) data transfer from the conceptual level to the details of physical file encoding. Transfer of spatial data involves modeling spatial data concepts, data structures, and logical and physical file structures.
Postal Addressing Standards: Publication 28, November 2000 (Pub28)	United States Postal Service	Our objectives in compiling a universal format for maintaining information in the Address Management System (source for the AIS[1] products) and an output format are twofold: To facilitate customer use of AIS products, in particular, the ZIP+4 and City State files, thereby maximizing matching potential. To optimize the processing capability of automated equipment through improved address quality.

[1] **AIS**: Address Information System

3.1.2 Elements of Address Quality

There is remarkable agreement among the documents on the elements of spatial data quality. Each of the standards that approach that question describe the same five core elements:

- Attribute (Thematic) Accuracy
- Logical Consistency
- Completeness
- Positional Accuracy
- Lineage

Even the names of the elements are essentially identical. CSDGM discusses "Attribute Accuracy", while the same content is described as "Thematic Accuracy" in ISO 19115. ISO 19113 includes temporal accuracy as one of the data quality elements, defined as "accuracy of the temporal attributes and temporal relationships of features" (ISO 19113:2002(E), 5.2.1), and this definition remains constant throughout the ISO series. Temporal attributes are not separated from other types of attributes in the CSDGM, although various types of time period entries are listed throughout the standard.

Quality Elements	**Standards**			
	CSDGM	**ISO 19113**	**OGC Topic 11/ ISO 19115**	**SDTS**
Dataset Purpose	†	•	•	•
Dataset Use	†	•	•	•
Attribute (Thematic) Accuracy	•	•	•	•
Logical Consistency	•	•	•	•
Temporal Accuracy	†	•	•	†
Completeness	•	•	•	•
Positional Accuracy	•	•	•	•
Lineage	•	•	•	•

• Specified by name in the standard.
† Provision made for the information in the standard, but not specified by name.

3.1.3 Uncertainty and addresses

The ability to describe the quality of an address is dependent on the level of uncertainty regarding that address. Common sources of uncertainty are:

- Address source
- Date and conditions of assignment
- Lifecycle status
- Official status

- Agreement with local address schema
- Information about and agreement with ground conditions (posting, street signs, etc.)
- Availability, precision and constancy of coordinate location information

Local address schema provide the most complex conditions of uncertainty. The schema control the assignment of addresses: identification and classification of objects and locations to be addressed, methods for ordering the addresses, spatial distribution of potential addresses, etc. Some jurisdictions use schema that are fairly simple to model, and the addresses in those areas can be tested for conformance. In other jurisdictions there may be multiple schema, the schema may be internally inconsistent, disregarded or may overlap adjoining schema. In these cases the schema themselves and/or their relationship to the assigned addresses can introduce considerable uncertainty.

3.2 About Observing Address Quality

The addresses in a data set are interdependent: the validity of all can be affected by some. Parity, for example, is an important part of address assignment. Even and odd addresses on the same side of the street disrupt normal address usage. While the assignment of each address is important, patterns make the system work.

Similarly, quality control for addresses take both the simple elements and the patterns specified in complex elements and address classifications into account. Simple elements are observed for conformance to data type and/or inclusion in a domain without relationship to each other. Domains may apply to an element everywhere within a given jurisdiction or schema, or be specific to some subset of the data. Elements that are validated by domains specific to a subset will frequently require information from another simple or complex element to complete their validation.

Complex elements and address classifications are indicators of the underlying address schema. Their consistency, and agreement with element- and object-specific domains are indicators of conformance to that schema. Due to the complexity and interdependence of validation and quality control, address data sets are best reviewed in their entirety.

3.3 Testing Address Quality

3.3.1 About the Tests

The quality control tests follow a simple recipe:

1. Compare address data to domains and specifications tailored for local use
2. Identify anomalies

Tests are designed to provide data quality element information as described in OGC Topic 11: Geographic information - Metadata (ISO 19115). The test specification includes:

- Scope: the elements, attributes or classifications to be tested
- Measure: a description of what the test measures.
- Procedure: a description of the test

- Pseudocode Script or Function: an example of the test, in SQL pseudocode. Spatial predicates used in the pseudocode are described in OpenGIS Simple Features Specification for SQL.
- Parameters for calculating anomalies as a percentage of the data set

3.3.2 About Anomalies

Anomalies are at the heart of quality control. Addressing differs from most data in that anomalies are expected, and frequently are a permanent part of the data set. Quality control for most data sets involves eradicating anomalies. It is most often undesirable or politically impossible to do so with addressing. The standard provides for maintaining identified anomalies within the data set, and the quality control techniques reflect that.

3.3.3 Calculating Anomalies as a Percentage of the Data Set

Tests for anomalies measure the data elements that do not conform. Calculating the percentage of conformance, therefore, requires inverting the query: the number found is subtracted from the total number of records before calculating the percentage.

Pseudocode function: Calculating anomalies as % of data set	**Description** The function receives information directly from SQL statements including the standard COUNT aggregator and calculates percentages. **Function** Function Perc Anomalies(count_of_nonconforming_records, count_of_total_records) RETURNS numeric BEGIN SELECT INTO calc_perc ROUND((CAST((count_of_total_records - count_of_nonconforming_records) AS NUMERIC) / (CAST(count_of_total_records AS NUMERIC)) * 100), 2) RETURN(calc_perc) END

Generalized pseudocode example: **Parameters in *italics***	**Query** SELECT Perc Anomalies((*SELECT COUNT(*) FROM Address Collection element = nonconforming_condition*), (*SELECT COUNT(*) FROM Address Collection*)) as percent_conforming_to_condition **Successful result: 100% conforming** percent_conforming_to_condition --- 100.00 **Unsuccessful result: 30% conforming** percent_conforming_to_condition --- 30.00

3.3.4 Notation

The tests are described in pseudocode based on SQL. It uses SQL constructs. Operators used include:

Operator	Description	SQL Example Statement	Statement Result
||	concatenation	SELECT 'a' || 'b';	ab
%	modulo	SELECT 5 % 2;	1

3.3.5 Test Presentation and Contexts

Each test is described as an SQL function or script, in pseudocode, then used in two contexts. The conformance of each record to an established standard is tested individually. Once a dataset has been assembled the percentage of conforming records are calculated.

3.4 Tests for Simple Elements

All simple elements should be checked for conformance to the specified data type, and to any applicable domain.

3.4.1 Testing Data Types of Simple Elements

Measure Name	SimpleElementDataTypeMeasure
Measure Description	This is a brief sketch of a test to check the actual data type for a given field in a given table against the expected data type, and return either "true" (1) or "false" (0). The pseudocode funtion takes three parameters, respectively the table and field name of the field to be checked, and the expected data type ("integer", "text", etc.). The method for extracting the data type for a given element is generalized: it differs between databases. This measure assumes that the data are in a table of some kind: SQL was written to query relational tables. Data types for ASCII values can be checked by trying to load them to a relational table. Data that do not conform to a given field definition they should fail to load.
Report	Logical consistency

Measure Name	SimpleElementDataTypeMeasure
Evaluation Procedure	Test each value in the address collection for its data type. Any elements that do not agree with the specified data type are anomalies.

Pseudocode Example: Testing Records	**Function**
	
	FUNCTION simpleElementDataTypeMeasure(table_name, field_name, test_type)
	RETURNS boolean
	
	BEGIN
	SELECT INTO field_type
	Data Type(Simple Element)
	
	IF (field_type = test_type)
	THEN
	match = 1
	ELSE
	match = 0
	END IF
	
	RETURN(match)
	END
	
	Query
	SELECT simpleElementDataTypeMeasure(table_name, field_name, test_type)
	
	Successful result: data type found agrees with specification
	
	simpleElementDataTypeMeasure
	---------- 	
	t
	
	Unsuccessful result: data type found disagrees with specification
	
	simpleElementDataTypeMeasure
	---------- 	
	f

Pseudocode Example: Testing the Conformance of a Data Set	Not applicable. If the data are in field that conforms to type, all the data in that table conform by definition.

3.4.2 Domains and Sources of Values for Simple Elements

Domains are tested by comparison with source(s) of values. The values supplied by those sources may be represented completely or partially within the domain. Domains for simple elements defined in the content section of this document are listed below grouped by their primary sources of values, and the representation of their primary sources described as always complete or selected as appropriate.

The Content Standard for Digital Geospatial Metadata (CSDGM) classifies domains as enumerated, range, codeset and unrepresentable. The tables below use the CSDGM classifications to describe domains for each element. More than one domain type may be listed for a domain. Unrepresentable domains are not included because they can add uncertainty.

Local domains are also classified as optional or required. Elements must conform to required domains where ever present, and to optional domains where defined.

3.4.2.1 FIPS Publication 5[1]

Element	Additional Source(s) of Values	Primary Source Represented Completely/Selected (C/S)	Type: Codeset, Enumerated or Range (C,E,R)
County		S	E
State		S	E
Municipality Place Name	State government	S	E

3.4.2.2 Local Domains

Element	Additional Source(s) of Values	Mandatory/Optional (M/O)	Primary Source Represented Completely/Selected (C/S)	Type: Codeset, Enumerated or Range (C,E,R)
Address Number Prefix		O	C	C,E,R
Address Number Suffix		O	C	C,E,R
Address Number		O	C	R
Building Type		M	C	E
Community Name		M	C	E
Floor Identifier		O	C	C,E,R
Floor Type		M	C	E
Landmark Name Element		O	C	C,E
Street Name Post-Modifier		O	C	E
Street Name Pre-Modifier		O	C	E
Street Name		M	C	E
Unit ID		O	C	C,E,R

1Use of the FIPS codes is under review, and may need to be updated.

3.4.2.3 Local Post Office

Element	Additional Source(s) of Values	Primary Source Represented Completely/Selected	Type: Codeset, Enumerated or Range (C,E,R)
USPS Box ID		C	E,R
USPS Box Group ID		C	E,R

3.4.2.4 USPS

Element	Additional Source(s) of Values	Primary Source Represented Completely/Selected	Type: Codeset, Enumerated or Range (C,E,R)
Zip Code		S	C
Zip+4 Code		S	C
Nation		S	E

3.4.2.5 USPS Publication 28

Element	Additional Source(s) of Values	Primary Source Represented Completely/Selected	Type: Codeset, Enumerated or Range (C,E,R)
USPS Box Group Type		C	E
Postal Delivery Office		C	E
Private Mail Box (PMB)		C	E,R
Street Post Type	Local data	S	E
Street Pre-directional		C	E
Street Prefix Type	Local data	S	E
Street Post-directional		C	E
USPS Box Type		C	E
USPS City Name		S	E
Unit Type		C	E

3.4.3 Testing Domains of Values

Measure Name	Domain Agreement With Source Measure
Measure Description	Test each domain for agreement with source values.
Report	Attribute (Thematic) Accuracy
Evaluation Procedure	Check each enumerated and codeset domain element against the source of values. Validate low and high range values against reference documents.

Measure Name	Domain Agreement With Source Measure
Pseudocode Example: Testing records	**Description** This script produces a list of simple elements in the address collection that do not conform to a domain. **Query** SELECT Domain As disagreeWithSource FROM Domain LEFT OUTER JOIN Source WHERE Source isnull **Result Without Anomalies** disagreeWithSource ---------- **Anomalies** disagreeWithSource ---------- simple element 1 simple element 2 simple element 3 ....
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Domain.Values)* *FROM Domain* *LEFT OUTER JOIN Source ON Domain.Value = Source.Value* *WHERE Source.Value isnull* • count_of_total_records *SELECT COUNT(Domain.Values)* *FROM Domain* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.4.4 Testing Simple Elements with Tabular Domains of Values

Measure Name	Simple Element Agreement With Tabular Domain Measure
Measure Description	Test each value for a simple element for agreement with the corresponding tabular domain. The query produces a list of simple elements in the address collection that do not conform to a domain.
Report	Attribute (Thematic) Accuracy
Evaluation Procedure	Check the value of each simple element against the tabular domain by which it is constrained.
Pseudocode Example: Testing records	**Query** SELECT Simple Element As disagreeWithDomain FROM Address Collection LEFT OUTER JOIN Domain WHERE Domain isnull **Result Without Anomalies** disagreeWithDomain ---------- **Result With Anomalies** disagreeWithDomain ---------- simple element 1 simple element 2 simple element 3 ....
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Simple Element)* *FROM Address Collection* *LEFT OUTER JOIN Domain ON Simple Element.Field = Domain.Field* *WHERE Domain.Field isnull* • count_of_total_records *SELECT COUNT(Simple Element) FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.4.5 Testing Simple Elements with Spatial Domains of Values

Measure Name	Simple Element Agreement With Spatial Domains Of Values Measure
Measure Description	Test values of some simple elements constrained by domains based on spatial domains: ZIP codes, PLSS descriptions, etc. This is limited to domains that are identified by the simple element alone. Address numbers, for example, cannot be tested against centerline ranges because the street name is only identified in a complex element. The query produces a list of simple elements in the address collection that do not conform to a spatial domain.
Report	Positional Accuracy
Evaluation Procedure	Intersect the addressed spatial object with the corresponding location identified by the codeset.
Pseudocode Example: Testing records	**Query** SELECT Simple Element As notWithinSpatialDomain FROM Address Collection WHERE NOT(INTERSECTS(Simple Element.Geometry, Spatial Domain.Geometry)) **Result Without Anomalies** notWithinSpatialDomain ---------- **Anomalies** notWithinSpatialDomain ---------- simple element 1 simple element 2 simple element 3 ....
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Simple Element)* *FROM Address Collection* *WHERE NOT(INTERSECTS(Simple Element.Geometry, Spatial Domain.Geometry))* • count_of_total_records *SELECT COUNT(Simple Element)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.5 Tests for Complex Elements

Complex elements are patterns describing parts of address classes. Most of them lack independent domains. Relationships between the component parts are described at the level of simple elements. For example, an individual building may have its Floor Type and Floor ID constrained by domains specific to that building. Quality control checks for these elements are limited to testing conformance to the patterns as described. Complete Street Names are the sole exception, the combination of individual elements requiring its own domain for quality control purposes.

3.5.1 Testing Complex Element Patterns

Measure Name	Complex Element Component Sequence Measure
Measure	Test the sequence of values in each complex element for conformance to the pattern for the complex element. The query produces a list of complex elements in the address collection that do not match a sequence of simple elements.
Report	Logical Consistency
Evaluation Procedure	Check each complex element value against the pattern defining it.
Pseudocode Example: Testing records	**Query** SELECT Complex Element As disagreeWithSequence FROM Address Collection WHERE (Simple Element || Simple Element ...) != Complex Element Pattern **Result Without Anomalies** disagreeWithSequence ---------- **Anomalies** disagreeWithSequence ---------- complex element 1 complex element 2 complex element 3 ....

Measure Name	Complex Element Component Sequence Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Complex Element)* *FROM Address Collection* *WHERE (Simple Element || Simple Element ...) != Complex Element Pattern* • count_of_total_records *SELECT COUNT(Complex Element) FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.5.2 Testing the Complete Street Name Tabular Domain

Note that if domains are maintained for Complete Street Name elements at both levels, simple and complex, quality control checks should be run for simple element components before testing the complex element domain.

Measure Name	Complete Street Name Tabular Domain Measure
Measure Description	Test the agreement of each Complete Street Name with the domain.
Report	Attribute (Thematic) Accuracy
Evaluation Procedure	Check the Complete Street Name against a domain of values.
Pseudocode Example: Testing records	**Query** SELECT Complete Street Name As disagreeWithCompleteStreetNameDomain FROM Address Collection LEFT OUTER JOIN Complete Street Name Domain ON Complete Street Name = Complete Street Name Domain.Value WHERE Complete Street Name Domain.Value isnull **Result Without Anomalies** disagreeWithCompleteStreetNameDomain ---------- **Anomalies** disagreeWithCompleteStreetNameDomain ---------- Complete Street Name 1 Complete Street Name 2 Complete Street Name 3 ....

Measure Name	Complete Street Name Tabular Domain Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Complete Street Name)* *FROM Address Collection* *LEFT OUTER JOIN Complete Street Name Domain* *ON Complete Street Name = Complete Street Name Domain Value* *WHERE Complete Street Name Domain Value isnull* • count_of_total_records *SELECT COUNT(Complete Street Name) FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.6 Address Attribute Elements

3.6.1 Location Attributes

3.6.1.1 Address X Coordinate, Address Y Coordinate and Address Longitude, Address Latitude

Completeness

Measure Name	XY Coordinate Completeness Measure
Measure Description	Checks for coordinates pairs with one member missing. The query produces a list of incomplete coordinates.
Report	Logical consistency
Evaluation Procedure	Query for null values.

Measure Name	XY Coordinate Completeness Measure
Pseudocode Example: Testing records	**Query** SELECT Address X Coordinate, Address Y Coordinate FROM Address Collection WHERE Address X Coordinate isnull OR Address Y Coordinate isnull **Result Without Anomalies** Address X Coordinate | Address Y Coordinate ----------+---------- **Anomalies** Address X Coordinate | Address Y Coordinate ----------+---------- x1 | x2 | | y3 .... | ....
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(*)* *FROM Address Collection* *WHERE Address X Coordinate isnull OR Address Y Coordinate isnull* • count_of_total_records *SELECT COUNT(*)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

Conformance to Spatial Domain

Measure Name	XY Coordinate Spatial Measure
Measure Description	Compare the coordinate location of the addressed object with the coordinate attributes. The measure applies to both types of coordinate pairs listed in Part One: Address X Coordinate, Address Y Coordinate and Address Longitude, Address Latitude. The query produces a list of coordinate values in the address collection that do not conform to a spatial domain.
Report	Positional accuracy

Measure Name	XY Coordinate Spatial Measure
Evaluation Procedure	Intersect the addressed spatial object with the coordinate attributes. Note that the spatial referencing system of the addressed spatial objects must match that of the coordinate attributes.
Pseudocode Example: Testing records	**Query** SELECT Address X Coordinate, Address Y Coordinate FROM Address Collection WHERE NOT(EQUALS(Addressed Object.Geometry, Point(Address X Coordinate, Address Y Coordinate))) **Result Without Anomalies** Address X Coordinate | Address Y Coordinate ----------+---------- **Anomalies** Address X Coordinate | Address Y Coordinate ----------+---------- x1 | y1 x2 | y2 x3 | y3 .... | ....
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(*)* *FROM Address Collection* *WHERE NOT(EQUALS(Addressed Object.Geometry, Point(Address X Coordinate, Address Y Coordinate)))* • count_of_total_records *SELECT COUNT(*)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

US National Grid Coordinate

Measure Name	Usng Coordinate Spatial Measure
Measure Description	Test agreement between the location of the addressed object and the area described by the US National Grid Coordinate. This test derives the USNG for a point geometry and compares it to the USNG coordinate
Report	Positional accuracy
Evaluation Procedure	If the derived USNG matches the recorded USNG the comparison is successful.

Measure Name	Usng Coordinate Spatial Measure

Pseudocode Example: Testing records	**Functions**
	--Function: usng.as_usng (public.geometry)
	
	--DROP FUNCTION usng.as_usng (public.geometry);
	
	CREATE OR REPLACE FUNCTION usng.as_usng (public.geometry)
	RETURNS text AS
	DECLARE
	utm_zone INTEGER;
	x_remnant TEXT;
	y_remnant TEXT;
	BEGIN
	
	IF srid($1) between 26901 and 26960 THEN
	utm_zone = srid($1) - 26900;
	ELSE IF srid($1) between 32701 and 32760 THEN
	utm_zone = srid($1) - 32700
	ELSE
	raise EXCEPTION "% is not in a UTM projection",$1;
	return null;
	END IF;
	END IF;
	
	IF X($1) < 100000 THEN
	RAISE EXCEPTION "Try projecting this point % to the UTM zone to the West of this one", $1;
	END IF;
	IF X($1) > 900000 THEN
	RAISE EXCEPTION "Try projecting this point % to the UTM zone to the East of this one", $1;
	END IF;
	IF Y($1) < 0 THEN
	RAISE EXCEPTION "Try projecting this point % to the UTM zone of the other hemisphere", $1;
	END IF;
	IF Y($1) > 9000000 THEN
	RAISE EXCEPTION "Try projecting this point % to the UTM zone to the East of this one", $1;
	END IF
	
	-- some databases have a nasty habit of adding spaces when using the to_char function
	y_remnant = trim(to_char(floor(round(Y($1))::numeric % 100000.0),"00000"));
	x_remnant = trim(to_char(floor(round(X($1))::numeric % 100000.0),"00000"));
	
	return
	utm_zone::text||usng.get_gzd($1)||usng.get_square($1)||x_remnant||y_remnant;
	END;
	LANGUAGE 'plpgsql' IMMUTABLE STRICT;
	
	----- 	
	-- Function: usng.get_gzd(public.geometry)
	
	-- DROP FUNCTION usng.get_gzd(public.geometry);
	CREATE OR REPLACE FUNCTION usng.get_gzd(public.geometry)
	RETURNS text AS
	DECLARE
	gzd TEXT;
	deg8_gzd TEXT[];
	North_hemi INTEGER;
	block INTEGER;
	BEGIN
	IF srid($1) between 26901 and 26960 THEN
	gzd TEXT;
	North_hemi = 1;
	ELSE IF srid($1) between 32701 and 32760 THEN
	North_hemi = -1;
	ELSE
	raise EXCEPTION "% is not in a UTM projection",$1;
	return null;
	END IF;

Measure Name	Usng Coordinate Spatial Measure

Pseudocode Example: Testing records (continued)	END IF;
	deg8_gzd =
	array["C","D","E","F","G","H","J","K","L","M","N","P","Q","R","S","T","U","V","W","X"];
	-- offset entry by 11 for north hemisphere
	
	block = floor(Y($1)/900000);
	raise INFO "block %", block;
	
	IF North_hemi = 1 THEN
	gzd = deg8_gzd [block+11];
	ELSE
	gzd = deg8_gzd [10-block];
	
	END IF;
	
	return gzd;
	END;'
	LANGUAGE 'plpgsql' IMMUTABLE STRICT;
	
	-------- 	
	-- Function: usng.get_square(public.geometry)
	
	-- DROP FUNCTION usng.get_square(public.geometry);
	
	CREATE OR REPLACE FUNCTION usng.get_square(public.geometry)
	RETURNS text AS
	'DECLARE
	sqr TEXT;
	zone_row TEXT[];
	zone_col TEXT[];
	utm_zone INTEGER;
	s_row INTEGER;
	s_col INTEGER;
	BEGIN
	
	IF srid($1) between 26901 and 26960 THEN
	utm_zone = srid($1) - 26900;
	ELSE IF srid($1) between 32701 and 32760 THEN
	utm_zone = srid($1) - 32700;
	ELSE
	raise EXCEPTION "% is not in a UTM projection",$1;
	return null;
	END IF;
	END IF;
	zone_row =
	array["A","B","C","D","E","F","G","H","J","K","L","M","N","P","Q","R","S","T","U","V","A","B","C","D","E"];
	zone_col =
	array["A","B","C","D","E","F","G","H","J","K","L","M","N","P","Q","R","S","T","U","V","W","X","Y","Z"];
	
	s_row = floor((round(Y($1))::numeric % 2000000.0)/100000);
	s_col = floor(round(X($1))/100000);
	
	raise INFO "initial sqr % %", s_row, s_col;
	
	IF ((utm_zone +1)% 2) = 1 THEN
	s_row = s_row + 5;
	RAISE INFO "UTM Zone is odd";
	END IF;
	s_col = s_col + (((utm_zone-1) % 3) * 8) ;
	raise INFO "sqr % %", s_row, s_col;
	sqr = zone_col[s_col]||zone_row [s_row+1];
	return sqr;
	
	END;'
	LANGUAGE 'plpgsql' IMMUTABLE STRICT;

3.6.2 Non-Location Attributes

3.6.2.1 Address ID

Measure Name	Element Uniqueness Measure
Measure	Test uniqueness of a simple or complex value.
Report	Attribute (Thematic) Accuracy
Evaluation Procedure	Identify unique and duplicate values.
Pseudocode Example: Testing records	**Description** This test returns duplicate elements, and the number of occurrences. **Query** SELECT COUNT(Element), Element FROM Address Collection GROUP BY Element HAVING COUNT(Element) > 1 **Result Without Anomalies** Count | Element ------+----------- **Anomalies** Count | Element ------+----------- 2 | Element 1 2 | Element 2 5 | Element 3 .... | ....

Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Element)* *FROM Address Collection* *WHERE Element* *IN (* *SELECT Element* *FROM Address Collection* *GROUP BY Element* *HAVING COUNT(Element) > 1* *)* • count_of_total_records *SELECT COUNT(*) FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.6.2.2 Address Start Date, Address End Date

Measure Name	Start End Date Order Measure
Measure	Test the logical ordering of the start and end dates.
Report	Temport Accuracy/Attribute (Thematic) Accuracy
Evaluation Procedure	Check the date order for all entries.

Measure Name	Start End Date Order Measure
Pseudocode Example: Testing records	**Description** This query makes a list of the date values where the Address Start Date is before or on the Address End Date. **Query** SELECT Address Start Date, Address End Date FROM Address Collection WHERE Address Start Date >= Address End Date **Result Without Anomalies** Address Start Date | Address End Date ------------------+-------------------- **Anomalies** Address Start Date | Address End Date --------------------+-------------------- 2004-03-25 | 2004-03-24 2004-06-30 | 2004-05-30 2005-08-14 | 2005-06-25 ... | ...
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(*)* *FROM Address Collection* *WHERE Address Start Date >= Address End Date* • count_of_total_records *SELECT COUNT(*)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ------------------ 100.00 **Result With Anomalies** Percent Conforming ------------------ 87.42

3.6.2.3 Address Classification Type

See the tests for Simple Elements.

3.6.2.4 Feature Type

See the tests for Simple Elements. Constrain the entries with a locally created enumerated domain.

3.6.2.5 Address Language

See the tests for Simple Elements. Constrain the entries with a locally created enumerated domain.

3.6.2.6 Address Lifecycle Status

Measure Name	Address Lifecycle Status Date Consistency Measure
Measure Description	Test the agreement of the Address Lifecycle Status with the Address Start Date and Address End Date. This query produces a list of Address I Ds for which the Address Lifecycle Status attributes do not logically agree with the corresponding start and end dates.
Report	Temporal Accuracy/Logical Consistency
Evaluation Procedure	Use Simple Elements checks to validate Address Lifecycle Status entries against the domain. Check logical relationships between the status values and start and end dates.
Pseudocode Example: Testing records	**Query** SELECT Address ID FROM Address Collection WHERE ((Address Lifecycle Status = 'Potential' AND NOT(Address Start Date isnull OR Address End Date isnull)) OR (Address Lifecycle Status = 'Proposed' AND NOT(Address Start Date isnull OR Address End Date isnull)) OR (Address Lifecycle Status = 'Active' AND (Address Start Date isnull OR NOT(Address End Date isnull)) OR (Address Lifecycle Status = 'Posted' AND (Address Start Date isnull OR NOT(Address End Date isnull)) OR (Address Lifecycle Status = 'Retired' AND (Address Start Date } isnull OR { Address End Date } isnull)))

Measure Name	Address Lifecycle Status Date Consistency Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(*)* *FROM Address Collection* *WHERE (* *(Address Lifecycle Status = 'Potential'* *AND NOT(Address Start Date isnull OR Address End Date isnull))* *OR* *(Address Lifecycle Status = 'Proposed'* *AND NOT(Address Start Date isnull OR Address End Date isnull))* *OR* *(Address Lifecycle Status = 'Active'* *AND (Address Start Date isnull OR NOT(Address End Date isnull))* *OR* *(Address Lifecycle Status = 'Posted'* *AND (Address Start Date isnull OR NOT(Address End Date isnull))* *OR* *(Address Lifecycle Status = 'Retired'* *AND (Address Start Date } isnull OR { Address End Date } isnull))* *)* • count_of_total_records *SELECT COUNT(*)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.6.2.7 Official Status

Measure Name	Official Status Address Authority Consistency Measure
Measure Description	Test logical agreement of the Official Status with the Address Authority.
Report	Logical Consistency
Evaluation Procedure	Use Simple Elements checks to validate Official Status entries against the domain. Check logical agreement between the status values and the Address Authority.

Measure Name	Official Status Address Authority Consistency Measure
Pseudocode Example: Testing records	**Description** This query produces a list with Official Status attributes requiring an Address Authority that lack a corresponding entry. **Query** SELECT Address ID FROM Address Collection WHERE (Address Authority isnull AND (Address Official Status = 'Official' OR Address Official Status = 'Alternate Names Established by a Renaming Action of the Naming Authority') OR Official Status = 'Alternate Names Established by a Naming Authority') OR (NOT(Address Authority isnull) AND (Address Official Status = 'Alternate Names Established by Colloquial Use in a Community' OR Address Official Status = 'Unofficial Alternate Names Frequently Encountered' OR Address Official Status = 'Unofficial Alternate Names In Use by an Agency or Entity' OR Address Official Status = 'Posted or Vanity Address' OR Address Official Status = 'Verified Invalid Address') **Result Without Anomalies** addressID --------- **Anomalies** addressID --------- 98 387 598 ....

Measure Name	Official Status Address Authority Consistency Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(*)* *FROM Address Collection* *WHERE* *Address Authority isnull* *AND (* *Official Status = 'Official'* *OR* *Official Status = 'Alternate Names Established by a Renaming Action of the Naming Authority'* *)* *OR* *Official Status = 'Alternate Names Established by a Naming Authority'* • count_of_total_records *SELECT COUNT(*)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.6.2.8 Address Range Type

See the tests for Simple Elements. Constrain the entries with a locally created enumerated domain.

3.6.2.9 Location Description

Measure Name	locationDescriptionFieldCheckMeasure
Measure Description	Field check the location description
Report	Positional Accuracy/Lineage
Evaluation Procedure	Use the Location Description to navigate to the address, checking for discrepancies between the description and ground conditions. It can Note that additional information such as the date the Location Description was collected or last validated and/or the name of the people who collected or entered it can reinforce the lineage of the address.

3.6.2.10 Direct Source

See the tests for Simple Elements. Constrain the entries with a locally created enumerated domain.

Note that like the Location Description the Direct Source contributes qualitatively to the lineage of the address, and to confidence in the Address Collection as a whole.

3.6.2.11 Address Authority

See the tests for Simple Elements. Constrain the entries with a locally created enumerated domain.

3.6.2.12 Addressing Authority Identifier

See the tests for Simple Elements. Constrain the entries with a locally created enumerated domain.

3.7 Tests for Address Classes

3.7.1 Completeness Check for All Classifications

Measure Name	Address Completeness Measure
Measure Description	Completeness: a comparison of the number of addressable objects with the address information recorded. There are a number of circumstances where more than one address is assigned to an addressable object. Addressable objects without addresses, however, are anomalies unless described by a domain of exceptions.
Report	Completeness
Evaluation Procedure	Compare the number of addressable objects with the address information recorded.
Pseudocode Example: Testing records	**Query** SELECT Addressable Objects. Address ID FROM Address Scheme Extent, Addressable Objects WHERE INTERSECTS(Address Scheme Extent.Geometry, Addressable Objects.Geometry) AND Addressable Objects. Address ID isnull **Result Without Anomalies** AdddressID ------ **Anomalies** ID ------ 23 97 186 ....

Measure Name	Address Completeness Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Addressable Objects.ID)* *FROM Scheme Extent, Addressable Objects* *WHERE* *INTERSECTS(Scheme Extent.Geometry, Addressable Objects.Geometry)* *AND* *Addressable Objects.Address ID isnull* • count_of_total_records *SELECT COUNT(*)* *FROM Addressable Objects* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.7.2 Thoroughfare Addresses

Thoroughfare Addresses describe the distribution of addresses along a travelway. The component parts can be validated at the simple or complex element level, or through attribute validation. Quality control for address classes concerns relationships between those components.

3.7.2.1 Address Number Range

Address Number Range elements encoding the address schema, with exceptions noted in local domains as required,

Address Number Range elements are typically recorded as attributes (properties) of street centerlines. Those centerlines are assumed to have the following characteristics:

- The low end of an Address Number Range is associated with the StartPoint of a line.
- The high end of an Address Number Range is associated with the EndPoint of a line.
- Lines associated with addresses do not overlap, except where schemas are intermingled along a linestring.
- Lines do not break except at intersections, dead ends and locations where street names change.
- Address Number Range elements have non-zero values for both low and high address numbers unless described by a domain of exceptions

There may be many local exceptions to these rules for a variety of reasons. Where there are exceptions that are required by address schema or other local condition the quality control checks must be adjusted to reflect those conditions.

3.7.2.2 Check for Address Number Range Completeness

Measure Name	Address Number Range Completeness Measure
Measure Description	Check for a low and high value in each Address Number Range.
Report	Logical Consistency
Evaluation Procedure	Check for a non-zero value for both low and high each range.
Pseudocode Example: Testing records	**Query** SELECT Address Number Range FROM Address Collection WHERE Address Number Range.Low = 0 OR Address Number Range.High = 0
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Address Number Range)* *FROM Address Collection* *WHERE* *Address Number Range.Low = 0* *OR* *Address Number Range.High = 0* • count_of_total_records *SELECT COUNT(Address Number Range)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

Check for Uniqueness Among Block Ranges, Block Face Ranges, Complete Feature Addresses, Landmark Addresses or Postal Service Delivery Addresses

Use the Element Uniqueness Measure

Check for Logical Sequence of Low and High Addresses within Ranges

Measure Name	Low High Address Sequence Measure
Measure Description	Confirm that the value of the low address is less than or equal to the high address.
Report	Logical consistency
EvaluationProcedure	Check the values for each range.
Pseudocode Example: Testing records	SELECT Address Number Range FROM Address Collection WHERE Address Number Range.Low < Address Number Range.High
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT Address Number Range* *FROM Address Collection* *WHERE Address Number Range.Low < Address Number Range.High* • count_of_total_records *SELECT COUNT(Address Number Range)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

Check for Overlapping Ranges

Measure Name	Overlapping Ranges Measure
Measure Description	Check for overlapping ranges with the same Complete Street Name.
Report	Logical Consistency
Evaluation Procedure	Select block ranges or block face ranges with the same Complete Street Name.

Measure Name	Overlapping Ranges Measure
Pseudocode Example: Testing records	**Function** Function Overlapping Ranges Measure(complete_street_name, range_id, range_low, range_high) RETURNS result_id SELECT INTO result_id Block Range.ID FROM Address Collection WHERE Complete Street Name = complete_street_name AND Address Number Range != range_id AND ((range_low BETWEEN Address Number Range.Low AND Address Number Range.High) OR (range_high BETWEEN Address Number Range.Low AND Address Number Range.High)) RETURN(result_id) **Query** select Overlapping Ranges Measure(complete_street_name, range_id, range_low, range_high) **Result Without Anomalies** result_id --------- **Anomalies** result_id --------- 436

Measure Name	Overlapping Ranges Measure
Pseudocode Example: Testing the Conformance of a Data Set	Note that the function below calculates the percentage of conformance on the total set of records. The method of repetitively running the test is left to the user. **Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(result_id)* • count_of_total_records *SELECT COUNT(Address Number Range) FROM Address Collection* **Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

Check spatial sequence of Address Number Range

Measure Name	Address Number Range Sequence Measure
Measure Description	The sequence of numbers where one non-zero Address Number Range meets another.
Report	Logical Consistency
Evaluation Procedure	Check ranges on each side of a common point.

Measure Name	Address Number Range Sequence Measure
Pseudocode Example: Testing records	**Query** SELECT a.CompleteStreetName, a.AddressNumberRange(Low), a.AddressNumberRange(High), b.AddressNumberRange(Low), b.AddressNumberRange(High) FROM Address Collection as a, (SELECT Complete Street Name, Address Number Range(Low), Address Number Range(High) FROM Address Collection) as b WHERE EQUALS(ENDPOINT(a.Geometry), STARTPOINT(b.Geometry)) AND a.AddressNumberRange(Low) >= b.AddressNumberRange(High) AND a.CompleteStreetName = b.CompleteStreetName GROUP BY a.CompleteStreetName, a.AddressNumberRange(Low), a.AddressNumberRange(High), b.AddressNumberRange(Low), b.AddressNumberRange(High) **Result Without Anomalies** street | end_toeft | end_toright | start_fromleft | start_fromright ----------+----------+----------+----------+---------- **Result With Anomalies** street | end_toeft | end_toright | start_fromleft | start_fromright ----------+----------+----------+----------+---------- BIRD DRIVE | 1048 | 1049 | 1048 | 1049 BIRD DRIVE | 1248 | 1249 | 1148 | 1149

Measure Name	Address Number Range Sequence Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(*)* *FROM Address Collection as a,* *(SELECT Complete Street Name,* *Address Number Range(Low),* *Address Number Range(High)* *FROM Address Collection)* *as b* *WHERE EQUALS(ENDPOINT(a.Geometry), STARTPOINT(b.Geometry))* *AND a.AddressNumberRange(Low) >= b.AddressNumberRange(High)* *AND a.CompleteStreetName = b.CompleteStreetName* *GROUP BY a.CompleteStreetName,* *a.AddressNumberRange(Low),* *a.AddressNumberRange(High),* *b.AddressNumberRange(Low),* *b.AddressNumberRange(High)* • count_of_total_records *SELECT COUNT(Address Number Range)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

Check Address Number Range against Address Scheme Origin

Measure Name	Address Origin Address Number Range Measure
Measure Description	Addresses increase moving away from the Address Scheme Origin. Exceptions to these rules are anomalies.
Report	Logical Consistency
Evaluation Procedure	Identify distinces of the geometries having the lowest and highest Address Number Range along a given Complete Street Name. Check for any Complete Street Name where the distance from the Address Scheme Origin to the lowest Address Number Range is great than the distance to the highest Address Number Range.

Measure Name	Address Origin Address Number Range Measure
Pseudocode Example: Testing records	**Query** SELECT a.CompleteStreetName FROM (SELECT street, distance(geom, Address Scheme Origin) as d, FROM Address Collection WHERE Complete Street Name = Selected Complete Street Name ORDER BY Address Number Range(Low) LIMIT 1) as a, (SELECT distance(geom, Address Scheme Origin) as d, FROM Address Collection WHERE Complete Street Name = Selected Complete Street Name ORDER BY Address Number Range(High) DESC LIMIT 1) as b WHERE a.d > b.d **Result Without Anomalies** addressAxisAddressNumberRangeMeasure ---------- **Anomalies** addressAxisAddressNumberRangeMeasure ---------- Complete Street Name 1 Complete Street Name 2 Complete Street Name 3 ....

Measure Name	Address Origin Address Number Range Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT a.CompleteStreetName* *FROM (SELECT street, distance(geom, Address Scheme Origin) as d,* *FROM Address Collection* *WHERE Complete Street Name = Selected Complete Street Name* *ORDER BY Address Number Range(Low)* *LIMIT 1) as a,* *(SELECT distance(geom, Address Scheme Origin) as d,* *FROM Address Collection* *WHERE Complete Street Name = Selected Complete Street Name* *ORDER BY Address Number Range(High) DESC* *LIMIT 1* *) as b* *WHERE a.d > b.d* • count_of_total_records *SELECT COUNT(Address Number Range)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

Check Address Number Range against Address Scheme Axes

Measure Name	Address Axes Address Number Range Measure
Measure Description	Addresses increase moving away from address axes. Check each range for breaks crossing an address axis, with a StartPoint where each segment touching the centerline. Exceptions to these rules are anomalies.
Report	Logical Consistency
Evaluation Procedure	Identify ranges touching address axes. Check for any endpoints or ranges crossing the axes.

Measure Name	Address Axes Address Number Range Measure
Pseudocode Example: Testing records	**Query** SELECT Complete Street Name, Address Number Range FROM Address Collection WHERE Geometry && ANY(SELECT Address Scheme Axes FROM Address Collection) GROUP BY Complete Street Name, Address Number Range HAVING Address Number Range = MIN(Address Number Range **Result Without Anomalies** addressAxisAddressNumberRangeMeasure --- **Anomalies** addressAxisAddressNumberRangeMeasure --- Complete Street Name 1 Complete Street Name 2 Complete Street Name 3 ....
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Complete Street Name)* *FROM Address Collection* *WHERE Geometry && ANY(SELECT Address Scheme Axes FROM Address Collection)* *GROUP BY Complete Street Name, Address Number Range* *HAVING Address Number Range = MIN(Address Number Range* • *count_of_total_records* *_SELECT COUNT(Complete Street Name)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming --- 100.00 **Result With Anomalies** Percent Conforming --- 87.42

Address Number Range Elements

Address Number Range elements establish left and right in addition to the directionality

CHECK CONSISTENCY OF ODD AND EVEN PARITY

Measure Name	Address Number Range Odd Even Parity Consistency Measure
Measure Description	Test agreement of the odd/even status of the numeric value of low and high address numbers. The arithmetic listed in the pseudocode substitutes for a modula operator(%) that may be unfamiliar, and is not always available. An alternate WHERE clause with a modula is: WHERE (Address Number Range.Low % 2) != (Address Number Range.High % 2)
Report	Logical Consistency
Evaluation Procedure	Compare the odd/even status of the numeric value of each address number.
Pseudocode Example: Testing records	**Query** SELECT Address Number Range FROM Address Collection WHERE (Address Number Range.Low - ((Address Number Range.Low / 2) *)) != (Address Number Range.High - ((Address Number Range.Low / 2) *)) **Result Without Anomalies** addressNumberRangeOddEvenParityConsistencyMeasure ---------- **Anomalies** addressNumberRangeOddEvenParityConsistencyMeasure ---------- Address Number Range 1 Address Number Range 2 Address Number Range 3 ....

Measure Name	Address Number Range Odd Even Parity Consistency Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Address Number Range)* *FROM Address Collection* *WHERE (Address Number.Low - ((Address Number.Low / 2) *))* *!= (Address Number.High - ((Address Number.Low / 2) *))* • count_of_total_records *SELECT COUNT(Address Number)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

CHECK CONSISTENCY OF LEFT/RIGHT - ODD/EVEN PARITY

Measure Name	Left Right Odd Even Parity Measure
Measure Description	Test association of odd and even values in each Block Face Range with the left and right side of the thoroughfare.
Report	Logical Consistency
Evaluation Procedure	Check the odd/even status of the numeric value of each address number for consistency with the established local rule for associating address parity with the right or left side of the street when traveling away from the address axis.

Measure Name	Left Right Odd Even Parity Measure
Pseudocode Example: Testing records	**Query** SELECT Address ID FROM Address Collection WHERE Complete Address Number BETWEEN Address Number Range.low AND Address Number Range.high AND Complete Feature Address. Complete Street Name = Address Number Range. Complete Street Name AND ((Address Number Parity = 'odd' AND Address Number Parity.localRule = 'odd addresses on right' AND POINT(Address X Coordinate, Address Y Coordinate) < Geocoded Point Along Address Number Range) OR (Address Number Parity = 'even' AND Address Number Parity.localRule = 'even addresses on right' AND POINT(Address X Coordinate, Address Y Coordinate) << Geocoded Point Along Address Number Range) OR (Address Number Parity = 'odd' AND Address Number Parity.localRule = 'odd addresses on left' AND POINT(Address X Coordinate, Address Y Coordinate) >> Geocoded Point Along Address Number Range) OR (Address Number Parity = 'even' AND Address Number Parity.localRule = 'even addresses on left' AND POINT(Address X Coordinate, Address Y Coordinate) >> Geocoded Point Along Address Number Range)) **Result Without Anomalies** Address ID --------- **Anomalies** Address ID --------- 37 52 96 ...

Measure Name	Left Right Odd Even Parity Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(Address ID)* *FROM Address Collection* *WHERE* *Complete Address Number BETWEEN Address Number Range.low AND Address Number Range.high* *AND* *Complete Feature Address. Complete Street Name = Address Number Range. Complete Street Name* *AND* *(* *(Address Number Parity = 'odd'* *AND* *Address Number Parity.localRule = 'odd addresses on right'* *AND* *POINT(Address X Coordinate, Address Y Coordinate) <<* *Geocoded Point Along Address Number Range* *)* *OR* *(Address Number Parity = 'even'* *AND* *Address Number Parity.localRule = 'even addresses on right'* *AND* *POINT(Address X Coordinate, Address Y Coordinate) <<* *Geocoded Point Along Address Number Range* *)* *OR* *(Address Number Parity = 'odd'* *AND* *Address Number Parity.localRule = 'odd addresses on left'* *AND* *POINT(Address X Coordinate, Address Y Coordinate) >>* *Geocoded Point Along Address Number Range* *)* *OR* *(Address Number Parity = 'even'* *AND* *Address Number Parity.localRule = 'even addresses on left'* *AND* *POINT(Address X Coordinate, Address Y Coordinate) >>* *Geocoded Point Along Address Number Range* *)* *)* • count_of_total_records *SELECT COUNT(*)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.8 Intersection Addresses

3.8.1 Test for valid intersection

Measure Name	Intersection Validity Measure
Measure Description	Check intersection addresses for streets that do not intersect.
Report	Logical Consistency
Evaluation Procedure	Check for the intersection of the geometry
Pseudocode Example: Testing records	**Query** SELECT Intersection Address FROM Address Collection as a, (SELECT Complete Street Name, Geometry FROM Address Collection)as b WHERE TOUCHES(a.Geometry, b.Geometry) AND a.CompleteStreetName = Intersection Address Complete Street Name 1 AND b.CompleteStreetName = Intersection Address Complete Street Name 2 **Result Without Anomalies** Intersection Validity Measure ---------- **Anomalies** Intersection Validity Measure ---------- Intersection Address 1 Intersection Address 2 Intersection Address 3 ....

Measure Name	Intersection Validity Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT Intersection Address* *FROM Address Collection as a,* *(SELECT Complete Street Name, Geometry* *FROM Address Collection)as b* *WHERE TOUCHES(a.Geometry, b.Geometry)* *AND a.CompleteStreetName = Intersection Address Complete Street Name 1* *AND b.CompleteStreetName = Intersection Address Complete Street Name 2* • count_of_total_records *SELECT COUNT(Intersection Address)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42

3.9 Landmark Addresses

3.9.1 Test for conformance to Address Number Range or domain

Measure Name	Situs Address Location Along Address Number Range Measure
Measure Description	Generate lines between addressed locations and the corresponding locations along the matching Address Number Range to check the spatial sequence of Address Number locations. Where there are sequence conflicts lines between those points will cross. This is test is described in 4 parts: 1. A table to hold the results of the test. While not strictly necessary, it is one option for handling the results of the test, and works well across systems. 2. A function to test a single address. The function illustrates how lines are constructed between addressed objects and the location of the corresponding geocoded point, then checked for conflicts. 3. A query to use the function 4. Pseudocode for testing all the addresses in a data set.
Report	Logical Consistency
Evaluation Procedure	Check for addresses having constructed lines that cross others with the same Complete Street Name.

Measure Name	Situs Address Location Along Address Number Range Measure

Pseudocode Example: Testing records	**Result Table**
	CREATE TABLE result_table (
	pkey SERIAL PRIMARY KEY,
	selected_id INTEGER NOT NULL REFERENCES Address Collection,
	crosses_id INTEGER NOT NULL REFERENCES Address Collection,
	geom geometry
	)
	
	Function
	BEGIN
	SELECT INTO addr_line
	GeomFromText(LINESTRING(Address X Coordinate Address Y Coordinate,
	Geocoded X Coordinate Geocoded Y Coordinate)
	flag := 0
	anom := 0
	
	FOR Record Returned IN
	SELECT * FROM Address Collection
	WHERE Address Number = Selected Address Number
	AND Complete Street Name = Selected Complete Street Name
	LOOP
	SELECT INTO addr_test_line
	GeomFromText(LINESTRING(Address X Coordinate Address Y Coordinate,
	Geocoded X Coordinate Geocoded Y Coordinate)
	
	IF (CROSSES (addr_test_line, addr_line)) THEN
	INSERT INTO result_table(selected_id, crosses_id, geom)
	VALUES(Address ID, Returned Row Address ID, addr_test_line)
	IF (flag = 0) THEN
	INSERT INTO result_table(selected_id, geom)
	VALUES (Selected Address ID, addr_line)
	flag := 1
	anom := 1
	END IF
	END IF
	END LOOP
	
	RETURN(anom)
	END
	
	Query
	SELECT add_seq_anom(
	Complete Street Name,
	Address Number Range.Geometry,
	Address Number Range(low),
	Address Number Range(high),
	Address ID,
	(
	SELECT Address Number.Geometry
	FROM Address Collection
	WHERE addnum = Selected Address Number
	),
	Selected Address Number
	)
	
	Testing all the addresses
	FOR Each Name IN
	SELECT Complete Street Name
	FROM Address Collection
	LOOP
	FOR Each Number IN
	SELECT Address Number
	FROM Address Collection
	WHERE Complete Street Name = Selected Complete Street Name
	LOOP
	[Run Query Here]
	END LOOP
	END LOOP

Measure Name	Situs Address Location Along Address Number Range Measure
Pseudocode Example: Testing the Conformance of a Data Set	**Function** Perc Anomalies **Function Parameters** • count_of_nonconforming_records *SELECT COUNT(selected_id)* *FROM result_table* *WHERE crosses_id isnull* • count_of_total_records *SELECT COUNT(Address Number)* *FROM Address Collection* **Result Without Anomalies** Percent Conforming ---------- 100.00 **Result With Anomalies** Percent Conforming ---------- 87.42
Notes	Situs Address Location Along Address Number Range Measure is based on the "fishboning" test developed by Richard Allen of Magic GIS, and is included with his permission.

3.10 Postal Service Delivery Addresses

Postal Service Delivery Addresses are checked for uniqueness, as noted above, and by their associated component parts.

Part 4: Street Address Data Transfer

Introduction

The purpose of this part is three-fold: to provide a template for the XML documents and metadata that will move addresses from place to place, to provide information on preparing data to be packaged, and to provide information on unpackaging received street address data.

Historically, the data format aspect of data exchange has impeded the flow of information. By providing a single and flexible data structure for exchanging street address data, the Address Standard will simplify the implementation of data exchanges, making them more reliable and less likely to need small changes, especially over time. Local data processing systems and applications change over time and frequently data exchange programs and reports must be rewritten along with those changes. Such changes may be as seemingly minor as the renaming of a data element, shortening or extending the length of a field, or the addition or subtraction of a field. When new data sharing partners are identified, a data format for sharing data with that partner must be constructed and implemented by each party. The Address Standard aims to minimize local changes necessary when upgrading computer systems and to provide a structure that can be reused by all data sharing parties without their having to implement something new.

The data sharing benefits of the Address Standard will only be realized when local agencies have implemented both export and import engines to process exchanged street addresses. The initial implementation of these data engines or programs will provide a lasting benefit to implementers in that once created, the agency will never again need to be concerned with creating programs or engines to share data with any new data sharing partners that they identify in the future.

The Address Standard is designed to be flexible enough to fit within current data sharing methods. There are two basic forms of sharing data between parties:

- Monolithic, in which all records are in the exchange package.
- Transactional, in which the exchange package records include commands to add or remove a record from the local copy of all records.

The Standard supports both of these forms, using a slightly modified structure to enable transactional exchanges.

4.1 Structure of a Transfer Package

Required in all packages of address data to be exchanged:

- FGDC Metadata, conforming to the FGDC-STD-001-1998 Content Standard for Digital Geospatial Metadata (version 2.0)
- Address Data, expressed as an XML document conforming to the AddrStd XML Schema.

4.1.1 FGDC Metadata

Provides a common set of terminology and definitions for the documentation of digital geospatial data (CSDGM, Introduction). It is a required part of all Federal standards, and is required of all federally generated geospatial data per Executive Order 12906. The transfer of data always needs to be accompanied by copyright information, use restrictions, contact information, data lineage information, known data defects and a description of the geographic area that the data represents. The **Content Standard for Digital Geospatial Metadata** provides a uniform, consistent and well known way to express those things amongst others.

4.1.2 Address Data

The Address Standard XML schema is a way of packaging address data such that only fields meaningful to the particular data transfer package need to be included. The nature of XML is that only meaningful data is included but the meaning of everything that could be included is documented. Additional natures of XML based data transfer is that it can be extended without breaking existing implementations. Existing implementations will not understand the extensions but by definition will ignore them.

Data is produced by agencies possessing address information and consumed by those receiving the address data. Many agencies will be both producers and consumers at different times. The roles of producer and consumer describe, respectively, the activity at hand when exporting or importing address data.

4.1.3 Exporting Data

A data producer will follow these basic steps while implementing an export engine:

- Construct a logical map of local data fields into the equivalent Address Standard Content and Classification elements.
- Write programs or subroutines to split local fields into the Address Standard elements if necessary.
- Collect support information required by the CSDGM metadata into an accessible place.
- Optionally write programs or subroutines to automate the CSDGM "Data Quality" tests documented in the Data Quality section of this standard.
- Write programs or subroutines to include the CSDGM support data into a complete and valid CSDGM document.

A data producer will follow these basic steps while creating a package of address data:

- Run the Data Quality tests and collect the report into the CSDGM metadata.
- Set the "Publication Date" element of the CSDGM metadata to be the time the package was created.
- Run the data remapping and splitting programs.

- Á Set the "DirectSource" element of the Address Standard to be the producer's id.
- Á Set the "AddressId" and "AuthorityId" elements of the Address Standard for any addresses created by the producer.
- Á Export the data into the Address Standard XML format.
- Á Transfer both the Address Standard XML document and the CSDGM document to another party.

4.1.4 Importing data

A data consumer will follow these basic steps while implementing an export engine:

- Á Construct a logical map of local data fields into the equivalent Address Standard Content and Classification elements.
- Á Write programs or subroutines to combine Address Standard elements into local data fields, if necessary.
- Á Create a place to store the CSDGM data from received packages.
- Á Optionally write programs or subroutines to automate the CSDGM "Data Quality" tests documented in the Data Quality section of this standard on the received data.

A data consumer will follow these basic steps while importing a package of address data:

- Á Receive both the Address Standard XML document and the CSDGM document from another party.
- Á Parse the Address Standard XML document into a working area.
- Á Parse the CSDGM XML document into a working area.
- Á Run the Data Quality tests and compare to the report in the CSDGM metadata received.
- Á Run the data remapping and combining programs.
- Á Import from the working area to the local production database.

When mapping local data fields into the equivalent Address Standard Content and Classification elements, or the reverse, it is important to understand that the Address Standard is set up to allow address producers to directly and unequivocally express the taxonomy of their own addresses. The Content and Classification sections provide a taxonomy to help parse addresses into descriptive elements. For example, when using the Address Standard an address such as:

225 North Avenue Northwest Atlanta GA 30318

An address producer will be able to express that the word **North** is not a Directional prefix but is actually a street name. When expressed by the actual addressing authority, it should be taken as factual and not converted.

Within other agencies, database design requirements might cause it to be stored differently, but they should memorialize the **official** form somewhere within their databases.

It is important, if distributing data received from other address authorities, that their taxonomy or parsing of addresses into elements be maintained and be reproducible.

4.2 The XSD Data Model

4.3.1 General Notes on the XML schema

Content and Classification use the word **element** in a way that slightly conflicts with the use of the word while designing XML document schemes.

- Content and Classification use **element** to describe a taxonomy facet for parsing an address.
- XML Scheme Document (XSD) uses **element** to describe an XML tag.

Some Content and Classification **elements** become XSD elements and others become XSD attributes of other XSD elements.

The Address Standard XSD has been designed by creating a simple type for almost every thing in Content and Classification. The simple data type is a place to describe the form of data that populates the simple type. Many times no attempt to provide an automatable test for correctness of form is given in the XSD. Local implementers may attempt such tests outside the scope of the Address standard.

From the simple types simple elements are created. Simple elements and some simple types cluster into complex elements. Finally elements are gathered into the **global** elements that are the top level XML data types.

4.3.2 Relation of the Address Standard XSD Data Model to the Content and Classification Parts

The following crosswalk chart relates the Content and Classification elements into XSD classes, types, elements and attributes.

Classes	XSD Type Name	Simple or Complex (in XSD terms)	Element or Attribute Name	XSD	Parent XSD class
Site Address	SiteAddress_type	Complex	SiteAddress	Global Element	Global, AddressCollection
Landmark-Site Address	LandmarkSiteAddress_type	Complex	LandmarkSiteAddress	Global Element	Global, AddressCollection
Intersection Address	IntersectionAddress_type	Complex	IntersectionAddress	Global Element	Global, AddressCollection
Two-number Address Range	TwoNumberAddressRange_type	Complex	TwoNumberAddressRange	Global Element	Global, AddressCollection
Four-number Address Range	FourNumberAddressRange_type	Complex	FourNumberAddressRange	Global Element	Global, AddressCollection
Unnumbered Thoroughfare Address	UnnumberedThoroughfareAddress_type	Complex	UnnumberedThoroughfareAddress	Global Element	Global, AddressCollection
Single-Site Landmark Address	SingleSiteLandmarkAddress_type	Complex	SingleSiteLandmarkAddress	Global Element	Global, AddressCollection
Multi-Site Landmark Address	MultiSiteLandmarkAddress_type	Complex	MultiSiteLandmarkAddress	Global Element	Global, AddressCollection
Community (Urbanization) Address	CommunityAddress_type	Complex	CommunityAddress	Global Element	Global, AddressCollection
USPS Postal Delivery Box	USPSPostalDeliveryBox_type	Complex	USPSPostalDeliveryBox	Global Element	Global, AddressCollection
USPS Postal Delivery Route	USPSPostalDeliveryRoute_type	Complex	USPSPostalDeliveryRoute	Global Element	Global, AddressCollection
USPS General Delivery Address	USPSGeneralDeliveryAddress_type	Complex	USPSGeneralDeliveryAddress	Global Element	Global, AddressCollection
General Address	GeneralAddress_type	Complex	GeneralAddress	Global Element	Global, AddressCollection
Address Scheme	AddressScheme_type	Complex	AddressScheme	Global	Global, AddressCollection

Classes	XSD Type Name	Simple or Complex (in XSD terms)	Element or Attribute Name	XSD	Parent XSD class
				Element	
	AddressColection_type	Complex	AddressColection	Global Element	
Complete Address Number	CompleteAddressNumber_type	Complex	CompleteAddressNumber	Element	Various, AddressNumberRange
Address Number Range	AddressNumberRange_type	Complex	AddressNumberRange	Element	TwoNumberAddressRange
	(extends) CompleteAddressNumber_type	Complex	CompleteAddressNumberLeftLow	Element	FourNumberRangeAddress
	(extends) CompleteAddressNumber_type	Complex	CompleteAddressNumberLeftHigh	Element	FourNumberRangeAddress
	(extends) CompleteAddressNumber_type	Complex	CompleteAddressNumberRightLow	Element	FourNumberRangeAddress
	(extends) CompleteAddressNumber_type	Complex	CompleteAddressNumberRightHigh	Element	FourNumberRangeAddress
Address Number Prefix	AddressNumberPrefix_type	Simple	Prefix	Element	CompleteAddressNumber, AddressNumberRange
Address Number	AddressNumber_type	Simple	Number	Element	CompleteAddressNumber, AddressNumberRange
Address Number Suffix	AddressNumberSuffix_type	Simple	Suffix	Element	CompleteAddressNumber, AddressNumberRange
Separator	Separator_type	Simple	Separator	Attribute	CompleteAddressNumber, AddressNumberRange
Complete Street Name	CompleteStreetName_type	Complex	CompleteStreetName	Element	Global objects
Street Name Pre-modifier	StreetNameModifier_type	Simple	PreModifier	Element	CompleteStreetName
Street Name Pre-directional	StreetNameDirectional_type	Simple	PreDirectional	Element	CompleteStreetName
Street Pre-type	StreetNameType_type	Simple	PreType	Element	CompleteStreetName
Street Name	StreetName_type	Simple	StreetName	Element	CompleteStreetName
Street Post-type	StreetNameType_type	Simple	PostType	Element	CompleteStreetName
Street Post-directional	StreetNameDirectional_type	Simple	PostDirectional	Element	CompleteStreetName

Classes	XSD Type Name	Simple or Complex (in XSD terms)	Element or Attribute Name	XSD	Parent XSD class
Street Name Post-modifier	StreetNameModifier_type	Simple	PostModifier	Element	CompleteStreetName
Complete Occupancy Identifier	CompleteOccupancyIdentifier_type	Complex	CompleteOccupancyIdentifier	Element	Global objects
Building Type	BuildingType_type	Simple	BuildingType	Attribute	Building
Building Identifier	BuildingId_type	Simple			Building
Building Element	Building_type	Complex	Building	Element	CompleteOccupancyIdentifier
Floor Type	FloorType_type	Simple	FloorType	Attribute	Floor
Floor Identifier	FloorId_type	Simple			Floor
Floor Element	Floor_type	Complex	Floor	Element	CompleteOccupancyIdentifier
Unit Type	UnitType_type	Simple	UnitType	Attribute	Unit
Unit Identifier	UnitId_type	Simple			Unit
Unit Element	Unit_type	Complex	Unit	Element	CompleteOccupancyIdentifier
Private Mailbox (PMB)	PrivateMailBox_type	Simple	PrivateMailBox	Element	CompleteOccupancyIdentifier
Landmark Name	LandmarkName_type	Simple	LandmarkName	Element	Global objects
Landmark Name	(extends) LandmarkName_type	Complex	LandmarkNameInner	Element	MultiSiteLandmarkAddress
Community (Urbanization) Place Name	CommunityPlaceName_type	Simple	CommunityPlaceName	Element	PlaceName, LandmarkSiteAddress,CommunityAddress
Municipal Jurisdiction	MunicipalJurisdiction_type	Simple	MunicipalJurisdiction	Element	PlaceName
USPS Place Name	USPSPlaceName_type	Simple	USPSPlaceName	Element	PlaceName
County Name	CountyName_type	Simple	CountyName_type	Element	PlaceName
Place Name	PlaceName_type	Complex	PlaceName	Element	Global objects
State	StateName_type	Simple	StateName	Element	Global objects
ZIP Code	ZipCode_type	Simple	ZipCode	Element	Global objects
ZIP+4 Code	ZipPlus4_type	Simple	ZipPlus4	Element	Global objects
Nation	NationName_type	Simple	NationName	Element	Global objects