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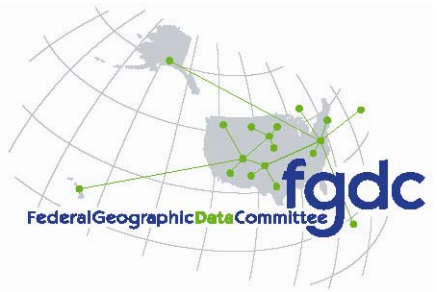

United States Thoroughfare, Landmark, and Postal Address Data Standard

Sponsored by the Urban and Regional Information Systems Association (URISA) and the National Emergency Number Association (NENA)

FGDC Subcommittee for Cultural and Demographic Data

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CONTENTS

Page

1. Part 1: Introduction

1.1 The Need for a Comprehensive Address Data Standard

Addresses are the location identifiers most widely used by the public and by state and local government. 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.

Local governments must record and locate every address within and around their jurisdictions. Local governments must ascertain the location of every address that appears anywhere in their administrative records--every residence, business, public structure, building permit, emergency response site, voter, school child, and public service client, including addresses where no one resides and no mail is received. In many places addresses are also used to identify infrastructure facilities, including bus stops, fire hydrants, utility poles and meters, cell phone towers, manholes, and signs.

To organize, maintain, and provide address records, local address authorities must create master address repositories that replace the numerous isolated, incomplete departmental address data files with one authoritative, integrated geographic address database. The construction of master address repositories is of paramount importance at the local level, because it permits departments to integrate address-related records, and ultimately operations, across department lines. The repository must include, not just the address itself, but its coordinate location, and documentation of where the address record originated and whether it is (or ever was) valid. To check validity and facilitate data maintenance, the repository must record the business rules by which addresses are assigned.

Emergency dispatchers in particular require accurate address locations. Emergency dispatchers must be able to route an emergency vehicle to any address in their response area, under circumstances when minutes matter. For emergency dispatchers, having well documented, standardized address data can mean the difference between life and death.

Many 9-1-1 callers use cellphones, which report the callers' coordinates, but not their addresses. Emergency dispatchers must then infer the address from the coordinates. Translation from the coordinates to addresses is thus of increasing importance for dispatchers and first responders.

The USPS, commercial delivery services, and direct mail firms, before sending anything or attempting delivery, must verify the delivery address by standardizing it and matching it against a standardized master address list. Together they have, over several decades, worked out specifications for standardizing addresses and formatting mailing labels. The specifications are published in USPS Publication 28, "Postal Addressing Standards." The USPS maintains the nationwide master list of mailing addresses. Maintenance is complicated by the general lack of any local authority for address updates.

Government agencies require unambiguous ways to exchange address data among different units of government, both at the local level, e.g., city to city, or city to county, and between different levels of government, e.g., from city or county to regional, state and federal agencies. The need is critical in times of emergency.

Finally, regional, state, and federal agencies (as well as private-sector firms) must aggregate local address files into state and national address lists. These include, most prominently, the USPS ZIP+4 and City State files, and Census Bureau MAF/TIGER files.

A comprehensive address data standard must serve the full range of these needs: postal delivery and census enumeration, local government administration and intergovernmental cooperation, emergency dispatch, the creation and administration of master address repositories by local address authorities, and the aggregation of local records into larger regional, state, and national address databases.

In sponsoring the creation of the United States Thoroughfare, Landmark, and Postal Address Data Standard, the Federal Geographic Data Committee (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 resolve address data modeling and geoprocessing and to create a comprehensive address data standard, thereby helping to make our national spatial data infrastructure truly national.

1.2 Objective

The *United States Thoroughfare, Landmark, and Postal Address Data Standard* has been created to:

- Provide one standard that meets the diverse address data management requirements for local address administration, postal and package delivery, emergency response (and navigation generally), administrative recordkeeping, and address data aggregation.
- Support the use of best practices in address data management.
- Provide a systematic, consistent basis for recording all addresses in the United States.
- Define the elements needed to compose addresses and store them within relational databases and geographic information systems.
- Define the attributes needed for address documentation, mapping, and quality testing, including address ID's, coordinates, and linear reference locations.
- Provide a complete taxonomy (systematic classification) of US addresses that is useful to address data managers.
- Introduce the idea of the address reference system—the formal description of the local address assignment rules, both spatial and non-spatial—and define its elements and attributes, as a basis for address assignment and quality testing.

- Define tests and procedures for address data quality testing, error-trapping, and anomaly identification.
- Support seamless exchange of address information, and foster consistent implementation of this standard, by defining XML models for every address element, attribute, and class, integrated into a single XML Schema Document.
- Offer a migration path from legacy formats to standards-compliant ones.
- Recognize, as a practical matter, that different business purposes and different data sources will require different levels of complexity in address data records, files and repositories.
- Build on USPS Publication 28, the Census Bureau TIGER files, the FGDC Content Standard for Digital Geospatial Metadata, the FGDC's National Spatial Data Infrastructure (NSDI) Framework Data Content Standard, and previous FGDC address standard efforts.

1.3 Benefits

Address data management is central to a broad range of everyday government, non-profit, and business activities, at all levels of government and all scales of enterprise. An address data standard can simplify, strengthen, and streamline these activities by providing common terms, definitions, and data structures to:

- Compile and document address records and address data files.
- Support the creation of master address repositories by address authorities, and aggregation of local repositories into larger address registers.
- Support seamless, unambiguous exchange of address information within and between organizations.
- Reduce duplicate efforts for address data collection, verification, and correction.
- Foster organizational efficiencies by integration of activities that use address data within organizations.
- Make address data more consistent and more easily reusable across projects and disciplines.
- Simplify the development of information system applications that use address data.
- Improve the quality of address data by increasing the number of individuals who find and correct errors

1.4 Scope and Summary

1.4.1 Subject and Area

The *United States Thoroughfare, Landmark, and Postal Address Data Standard* covers thoroughfare, landmark, and postal addresses within the United States, including its outlying territories and possessions.

1.4.2 Structure: One Standard, Four Parts

This standard has been developed in conformance with the FGDC Standards Reference Model for data standards. It provides, in four separate parts, a data content, classification, quality, and exchange standard for thoroughfare, landmark, and postal addresses, and for address reference systems:

- **Data Content** standards provide semantic definitions of a set of objects. In this standard, the content part specifies and defines the data elements that may appear in or describe street, landmark, and postal addresses, and address reference systems.
- **Data Classification** standards provide groups or categories of data that serve an application. In this standard, the classification 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** standards describe 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. In this standard, the Data Quality part specifies tests and measures of address data quality.
- **Data Exchange** standards describe how to produce or consume packages of data, independent of technology and applications, to facilitate moving data between agencies and systems. In this standard, the Data Exchange part provides a complete XML schema description for exchange of address data.

The *United States Thoroughfare, Landmark, and Postal Address Data Standard* is thus one standard, comprised of four parts: Address Data Content, Address Data Classification, Address Data Quality, and Address Data Exchange.

1.4.3 Definition of "Address"

This standard proposes a new definition of "address:"

> *An address specifies a location by reference to a thoroughfare or a landmark; or it specifies a point of postal delivery.*

This definition differentiates addressing from the two other types of spatial referencing systems, coordinate reference systems and linear reference systems. The difference rests, not on what the systems locate, but on what they refer to in order to specify a location. Coordinate reference systems specify location by reference to a grid, spheroid, or geoid (and a datum). Linear reference systems specify location by reference to a route (and a beginning

point). Within the context of this standard, coordinates and linear reference locations are treated as attributes of addresses, or, in the cases of certain postal delivery addresses, as inapplicable. This definition also excludes email and other computer system addresses.

This definition places address occupants and mail recipients (addressees) outside the scope of the standard. Many postal addressing standards include specifications for personal names, business names, and internal distribution points such as mailstops, particularly in the context of specifying formats for mailing labels. However, an addressee may have multiple addresses, and an address may have many occupants. For address data management, address and addressee should be treated as separate entities, and defined by separate standards.

1.4.4 Address Data Classification: A Syntactical Approach

The standard classifies addresses according to their syntax, that is, their address elements and the order in which the elements are arranged. Syntax determines the record structure needed to hold and exchange an address, and often it is all that is known about the addresses in a given file.

Classifying addresses by syntax rather than semantics (i.e., meaning) allows the users of the standard to focus on record structures, and to avoid the need for any assumptions about what kind of feature the address might identify. Classifying addresses by feature can be frustrating or impossible because:

1. Reliable information about an address may be unavailable.
2. Often, one address is used to identify several types of features (e.g., parcel, building, building entrance, utility meter, utility pole, incident location, etc.) at the same location.
3. A set of feature categories may be found to be ambiguous or incomplete when applied to a given address.

The Address Data Classification part of the standard classifies all US addresses into a simple, complete taxonomy of ten US address classes. Consistent with the principles of the General Information Model defined in the FGDC Framework Data Content Standard Base Part, each particular address class is a subclass of an abstract Address Class. The ten address classes are organized into three groups, plus a catch-all general class.

Thoroughfare Classes. Thoroughfare addresses specify a location by reference to a thoroughfare. A thoroughfare is defined as a "road or part of a road or other access route along which a delivery point can be accessed"(UPU Publication S42-4 (sec. 5.2.9)). 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:

1. Numbered Thoroughfare Address ("123 Main Street")
2. Intersection Address ("Fifth Avenue and Main Street")
3. Two Number Address Range ("405-411 West Green Street")
4. Four Number Address Range ("900-962, 901-963 Milton Street")

5. Unnumbered Thoroughfare Address ("Forest Service Road 698")

Landmark Classes. Landmark addresses specify a location by reference to a named landmark. A landmark is a relatively permanent feature of the manmade landscape that has recognizable identity within a particular cultural context" (definition adapted from U.S. Board on Geographic Names, 2003, p. 48).

1. Landmark Address ("Statue of Liberty")
2. Community Address ("123 Urbanizacion Los Olmos")

Postal Delivery Classes. Postal delivery addresses specify points of postal delivery that have no definite relation to the location of the recipient, such as a post office box, rural route box, overseas military address, or general delivery office. The USPS specifies each class in detail in USPS Publication 28.

1. 8. USPSPostal Delivery Box ("PO Box 16953")
2. 9. USPSPostal Delivery Route ("RR 1, Box 100")
3. 10. USPSGeneral Delivery Office ("General Delivery")

General Class. The General Address Class is for files that hold addresses from various classes, and for addresses (such as foreign addresses) that might not fit in any of the thoroughfare, landmark, or postal delivery classes.

1.4.5 Address Data Content: Elements

The Address Data Content part of the standard names and defines the simple and complex data elements needed to construct addresses, and for each one provides, among other information, its name, definition, data type, existing standards (if any), domain of values (if any), examples, and explanatory notes; XML tag, XML model, example, and notes; and data quality measures and notes. The elements are too numerous to list here, but they cover:

- Address numbers and their components
- Street names and their components
- Subaddresses (apartments, offices, suites, etc.) and their components
- Landmark names
- Larger areas (place names, states, ZIP Codes and Zip+4, and country names)
- USPS postal address elements (PO Boxes, rural routes, overseas military addresses, general delivery, etc.)
- USPS address lines (Delivery Line and Last Line, as specified in USPS Publication 28)

1.4.6 Address Data Content: Attributes for Documentation, Mapping and Quality Control

The Address Data Content part of the standard also defines a number of attributes needed for address documentation, mapping, and quality control. For each attribute, the standard provides the same information that is provided for the address elements. Collectively the attributes constitute record-level metadata for each address. The attributes are too numerous to list here completely, but key attributes include:

- A unique identifier for each different address, to serve as a primary key in an address database.
- Geographic coordinates and linear referencing locations.
- Lifecycle status (potential, proposed, active, retired).
- Address Class (in terms of the taxonomy described above).
- Address feature type (the type of feature located by the address, e.g., parcel, building, entrance, subaddress, infrastructure component, etc.).
- Official status (official, alias, unofficial, etc.).
- Related address identifier and type of relation (to relate, say, an alias address to its official address, or a landmark address to its equivalent thoroughfare address, or a parcel address to the tax billing address).
- The address authority responsible for the address, the dataset where it is found, and the dates the address was created and retired.
- Various attributes that describe specific address elements, such as address number parity, address range type, and place name type.

1.4.7 Address Reference System: The Local Framework for Address Assignment

The Address Data Content part of the standard introduces the concept of an address reference system and defines the elements needed to compose, describe, and document it. An address reference system is the framework of local rules, both spatial and non-spatial, by which new addresses are assigned and old ones checked within a specific area. It may include rules for naming streets and for assigning address numbers along them, as well as a boundary defining the area within which the rules apply. The address reference system, in turn, is important to data quality testing.

1.4.8 Address Data Quality: A Complete Suite of Data Quality Tests

The Address Data Quality part of the standard provides a complete suite of data quality tests for all address elements, attributes, and classes. These tests measure how well a given set of address records conforms to this standard and the local address reference system. The tests are developed in terms consistent with the FGDC's "Content Standard

for Digital Geospatial Metadata" (FGDC 1998) and subsequent SDTS and ISO standards of spatial data quality. Each test specification includes the scope, measure, and procedure of the test; an SQL pseudocode script; and parameters for calculating anomalies as a percentage of the data set.

1.4.9 Address Data Exchange: XML Schema Document (XSD), XML, and UML

The Address Data Exchange part of the standard includes an XSD that describes the XML elements, attributes, and classes, and the rules for assembling them. It also includes a UML metamodel. The XSD provides complete, open, standard XML data exchange templates for both monolithic and transactional data exchanges. XML is well-suited for this purpose (and required by FGDC exchange standards), because it supports seamless exchange between different users, while allowing for local variations on either end.

The XSD conforms to the W3C XML Core Working Group "Extensible Markup Language (XML) 1.0" (Third Edition, W3C Recommendation 4 February 2004). Geometry elements are defined and implemented following OGC's "OpenGIS (R) Geography Markup Language (GML)" (Version: 3.1.1). These versions were chosen to provide consistency with the FGDC's Geographic Information Framework Data Content Standard. (See Part 6 for complete references.)

1.4.10 A Data Model, but Not a Database Model

The XSD defines an address data model. It states the rules for combining simple elements into complex elements, for composing addresses from simple and complex elements, and for using attributes to describe addresses and their elements.

However, the standard does not provide a database model with table structures or relationships. The standard does not prescribe one specific design for constructing complex elements from simple elements, or addresses from their complex and simple elements. It does not specify, for example, how to relate address numbers to street names, or compose a master street name list, or geocode addresses, 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. The standard accommodates a range of different design choices in composing, relating, and describing elements and addresses. The best way depends on local circumstances, rules, customs, and anomalies—and therefore cannot be prescribed in a standard. Instead, these choices are left as implementation matters to be decided locally.

1.4.11 A Few Basic Statements on Implementing This Standard

An implementation guide is well beyond the scope of this standard, but a few things can be stated here:

1. The standard does not require parsing every address into its simplest elements, nor does it require creation of a complex, highly-normalized address data base. The standard recognizes and supports different levels of complexity,

from the two-line format prescribed in USPS Publication 28 to a highly-parsed, fully-normalized database.

2. By the same principle, the standard does not require incorporation of every element and attribute. Only the Address ID is required for every address record. From among the others, select only those needed for the purpose at hand, and omit the rest. For example, if none of the addresses in a given area have any Address Number Prefixes, that element may be omitted from the address records for that area. In another example, the two-line USPS Publication 28 address format can be represented, if desired, by only two complex elements—or it can be composed from a more complex array of simple and complex elements.

3. The standard does not require use of most of the address attributes. However, the Address ID is required for every address record, and several other attributes are essential for most purposes.

These choices, and others, will be dictated by the specific purpose for which the standard is applied, and the specific data to which it is applied.

1.4.12 Abbreviations in Addresses

Abbreviations are frequently used in addresses, and in particular the USPS abbreviations for street name directionals and types are widely used. However, this standard recognizes only three specific groups of abbreviations, each of which is unambiguous and used without variation:

1. The two-letter abbreviations for the fifty states; the District of Columbia, US territories, possessions, and minor outlying islands; and USPS-designated overseas military and diplomatic "state" equivalents (AA, AE, AP)(see State Name element). These abbreviations may be used only in the State Name Element. They are prohibited in other elements, including the Street Name Pre Type and Street Name Elements.

2. Nine USPS abbreviations defined for postal delivery purposes and having no direct relation to any location (PO Box, PMB; RR, HC; PSC, CMR; APO, FPO, and DPO) (see USPSPostal Delivery Box and USPSPostal Delivery Route address classes).

3. The two-letter and three-letter Country Name abbreviations specified in ISO 3166-1-alpha-2 and ISO 3166-1-alpha-3 (see Country Name). These abbreviations may be used only in the Country Name element.

No other abbreviations are recognized within the standard, for three reasons:

1. The standard must serve a broad range of purposes, and no set of abbreviations is used for all those purposes. USPS abbreviations, for example, differ from emergency dispatch abbreviations and from other abbreviations in use.

2. Abbreviations can create ambiguity. As an example, consider "N W Jones Tr." Is it "Northwest Jones Tr," "Noble Wimberly Jones Tr," or "North William Jones Tr"? Does Tr stand for Terrace, Trail, or Trace? Abbreviations lose information about the full address, and thereby hamper data quality testing and data exchange. Time saved in data entry is lost in checking ambiguous addresses.

3. Any list of standard abbreviations is bound to be incomplete. A few examples of street types missing from the most recent (2006) USPS list include: Alcove, Close, Connector, Downs, Exchange, and Promenade. In addition many applications such as 911 dispatch require specialized local abbreviations (e.g., "NCap" for North Capitol Street.) Local abbreviations will not be clear to outsiders unless the complete form can be recovered from the master address record.

Therefore addresses should be stored unabbreviated in the master address record, and views or export routines should be used to meet the needs of E-911, mailing addresses, etc. If a link is preserved between the primary record and its recognized alternatives, abbreviations are unambiguously expandable when necessary -- as for instance when address information must be shared between two agencies that use different abbreviation rules.

This standard recognizes all USPS abbreviations and abbreviation rules within the Postal Addressing Profile. Additional profiles can be created if other needs warrant.

1.4.13 No Address Data Presentation Standard is Included

This standard does not specify how address data should be symbolized graphically or geographically. The appropriate representation depends on the purpose of the map creator, so no standard is warranted.

1.4.14 Language and Character Set

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.

1.5 Applicability

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

1.6 Related Standards

This standard incorporates references to 46 other standards and specifications. Part 6 gives complete references to the standards and specifications cited, as well as to other standards and guidelines consulted in writing the standard.

This standard was written to conform to the FGDC *Standards Reference Model* (FGDC 1996). In the terms defined by that model, this standard is a data standard. Specifically, this standard has four parts: a data content standard (Part Two), a data classification standard (Part Three), a data usability standard (Part Four), and a data transfer standard (Part Five). This standard does not include a data symbology or presentation standard.

This standard incorporates by reference, for address data files, the FGDC's *Content Standard for Digital Geospatial Metadata* (CSDGM) (FGDC 1998). This standard extends the CSDGM by providing attributes for record-level address metadata. These attributes overlap to some extent with the CSDGM. If the values of these attributes are the same for all records in an address data file, the information can be omitted from the individual records and provided in the file-level metadata. If the values vary from record to record (e.g., in a file aggregated from multiple sources), the attributes can be included in the record-level metadata.

This standard is consistent with all parts of the FGDC's *Framework Data Content Standard of the National Spatial Data Infrastructure*. In particular, it conforms to all provisions of the Base part of the Framework Standard, which defines the abstract model that underlies and unifies the seven data themes. Appendix I shows this in detail. The address standard can therefore be used in conjunction with all of the National Spatial Data Infrastructure data themes.

USPS Publication 28, *Postal Addressing Standards*, is a foundational work for the Content and Classification Parts of this standard. USPS Publication 28 is the basis for the United States profile of the template and rendition instructions in the Universal Postal Union *International postal address components and templates* (UPU 2008). The *Postal Addressing Profile* establishes the relationship between the FGDC standard and USPS Publication 28. The profile restricts this standard in some ways, and extends it in other ways, to incorporate the specific rules, abbreviations, and scope limitations of USPS Publication 28. Any address record that is standardized as defined within the terms of USPS Publication 28 is also compliant with the Postal Addressing Profile and, if transformed according specific procedures described therein, will conform to this standard.

This standard explicitly incorporates, as the Four Number Address Range class, the TIGER/Line file structure established by the U.S. Census Bureau for street segment address ranges (U.S. Census Bureau 2008).

During the time this standard has been developed, the National Emergency Number Association (NENA) has developed the *Next Generation 9-1-1 (NG9-1-1) Civic Location Data Exchange Format (CLDXF) Standard* to support the exchange of United States civic location address information about 9-1-1 calls. The CLDXF is the United States profile of the Internet Engineering Task Force (IETF) Presence Information Data Format – Location Object (PIDF-LO) civicAddress type. The FGDC and NENA working groups have aligned the two standards as closely as possible within the constraints of their respective purposes. To clarify the relation between the two standards, and to facilitate and standardize the conversion of address records between FGDC conformance and CLDXF conformance, the two committees have written the *Profile Reconciling the FGDC United States Thoroughfare, Landmark, and Postal Address Data Standard* and the *NENA Next Generation 9-1-1 (NG9-1-1) Civic Location Data Exchange Format (CLDXF) Standard.*

The XSD conforms to the W3C XML Core Working Group "Extensible Markup Language (XML) 1.0" (Third Edition, W3C Recommendation 4 February 2004). Geometry elements are defined and implemented following OGC's. "Geography Markup Language (GML) Encoding Standard", Version: 3.2.1.

1.7 Standards Development Procedures

1.7.1 Antecedents

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

1.7.2 The Address Standard Working Group (ASWG)

The FGDC efforts 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. Census Bureau, the convening of an Address Standard Working Group (ASWG) 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 ASWG was chaired by Martha Wells, Carl Anderson, Hilary Perkins, Ed Wells, and Sara Yurman, all representing URISA. The ASWG has worked under the authority of the Census Bureau, which chairs the FGDC Subcommittee on Cultural and Demographic Data (SCDD).

The ASWG prepared a draft standard, which was posted for public comment in August-September of 2005. A second draft was posted for public comment in December 2005 and January 2006. Since then, the ASWG has developed the standard further, by responding to additional comments and conference discussions, drafting additional material, integrating related standards, and preparing the final version for submittal to the FGDC.

1.7.3 Process

Because addresses are created by such decentralized processes, and because the standard must satisfy such a wide range of requirements, the ASWG has sought by a variety of means to make the development process as open and broad-based as possible. This has involved:

Fostering Broad Awareness and Participation. The ASWG has sought by various means to make the geospatial and addressing communities aware of the development of the standard and to involve as many as possible in the effort. The ASWG invited participation from and via professional associations representing geospatial professionals, local government officials, and emergency responders, including the National Association of Counties (NACO), GITA (Geospatial Information Technology Association), the American Association of Geographers (AAG), URISA, NSGIC (National States Geographic Information Council), and NENA (National Emergency Number Association). The draft standard, when posted, was widely announced in the geospatial and standard online media. ASWG members have made numerous presentations on the standard at conferences and meetings. In addition, the ASWG has

regularly briefed various federal groups, especially the FGDC and Census, about progress on the standard.

Using a Wiki Collaborative Website. To encourage wide participation, the ASWG set up an interactive wiki web-site using free and open-source software (TWiki, from http://twiki.org/). Wiki software posts a draft document (in this case, the working draft of the standard) on a server and enables anyone to edit or comment on it via the internet. Comments and changes, once saved, are immediately visible to all. Anyone can add comments and ideas, or join in discussions of various aspects of the standard.

The ASWG wiki site was open to anyone providing a name and a valid email to which to send a password. (The site is password protected only to keep out spam.) Over 400 individuals signed up to view the site, provide comments, enter discussions, and participate in the development of the standard. The wiki site fostered discussion among widely scattered individuals, and proved useful in obtaining information and debating points of concept, practice, and actual address conditions.

Posting Drafts for Public Comment via Webform. The ASWG posted a first draft of the standard two months after starting work, in the summer of 2005. It was posted on the URISA website, with copies available for download, and all comments were submitted via webform so that as many people as possible had access. Over 125 comments were received on this draft. A second draft was posted in December 2005, which received over 180 comments. The Committee made significant revisions to incorporate these comments, and to respond to issues that they raised.

Focusing on Practical Needs and Usefulness. The ASWG's purpose has been to create a standard that will be useful and used. To be useful, the standard must reflect and build on the processes of address creation, management, and use. The standard must be developed by people who understand the local business work flows that utilize addresses in a real-time environment. Therefore the ASWG has sought advice and comment from a wide range of practitioners, including, among others, local government GIS managers, planners, assessors, emergency responders, school district officials, election officials, software developers, data aggregators, postal officials, census geographers, and a newspaper delivery manager, to name a few.

1.8 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. Census Bureau.

1.8.1 Acronyms Used in the Standard

- AIS - Address Information System (USPS)
- ALI - Automatic Location Information
- ANSI - American National Standards Institute
- APO - Army Post Office
- ASWG - Address Standard Working Group

- CASS - Coding Accuracy Support System (USPS)
- CLDXF - Civic Location Data Exchange Format (NENA NG9-1-1 CLDXF)
- CMR - Common Mail Room (USPS)
- CMRA - Commercial Mail Receiving Agency (USPS)
- CRS - Coordinate Reference System
- CSDGM - Content Standard for Digital Geospatial Metadata (FGDC)
- DMM - Domestic Mail Manual (USPS)
- DPO - Diplomatic Post Office (USPS)
- EPSG Dataset - European Petroleum Survey Group Geodetic Parameter Dataset (OGP)
- EPA - Environmental Protection Agency
- ERD - Entity Relationship Diagram
- FGDC - Federal Geographic Data Committee
- FIPS - Federal Information Processing Standard
- FPO - Field Post Office, or Fleet Post Office (USPS)
- GIS - Geographic Information System
- GML - Geography Markup Language (OGC)
- GNIS - Geographic Names Information System (USGS)
- GPS - Global Positioning System
- GZD - Grid Zone Designation (USNG)
- HC - Contract Delivery Service Route (formerly Highway Contract Route, and still abbreviated as HC)(USPS)
- ID or Id - Identifier
- IETF - Internet Engineering Task Force
- INCITS L1- International Committee for Information Technology Standards Technical Committee L1 (Geographic Information Systems) (accredited by ANSI)
- ISO - International Standards Organization
- ITU-T - International Telecommunications Union Telecommunication Standardization Sector
- LRM - Linear Reference Method
- LRS - Linear Reference System
- MAF - Master Address File (Census Bureau)
- MSAG - Master Street Address Guide
- MGRS - Military Grid Reference System (USNG)
- NAD83 - North American Datum of 1983
- NCITS - National Committee for Information Technology Standards
- NENA - National Emergency Number Association
- NFIRS - National Fire Incident Reporting System
- NG9-1-1 - Next-Generation 9-1-1 (NENA)
- NIST - National Institute of Standards and Technology
- NSDI - National Spatial Data Infrastructure (FGDC)
- PIDF-LO - Presence Information Data Format - Location Object (IETF)
- OGC - Open Geospatial Consortium
- OGP - International Association of Oil and Gas Producers (the OGP Geodesy Subcommittee maintains and publishes EPSG Dataset)
- PMB - Private Mail Box (USPS)
- PO Box - Post Office Box (USPS)

- PSC - Postal Service Center (USPS)
- RFC - Request for Comments (IETF)
- RR - Rural Route (USPS)
- SCDD - FGDC Subcommittee on Cultural and Demographic Data
- SDTS - Spatial Data Transfer Standard (FGDC and USGS)
- SWG - FGDC Standards Working Group
- TIGER - Topologically Integrated Geographic Encoding and Referencing System (Census Bureau)
- UML - Unified Modeling Language
- UPU - Universal Postal Union
- URISA - Urban and Regional Information Systems Association
- USGS - United States Geological Survey
- USNG - United States National Grid
- USPS - United States Postal Service
- UTM - Universal Transverse Mercator
- UUID - Universally Unique Identifier
- XML - Extensible Markup Language
- XSD - XML Schema Document
- ZIP Code - Zoning Improvement Plan Code (USPS)

1.8.2 Trademark Acknowledgements