

Proposal to Add “Obligation/Condition” and “Maximum Occurrences” Descriptors to All FGDC Address Data Item Descriptions

A. SUMMARY

This white paper proposes to revise each element and attribute description in the Content part of the address standard by adding two additional descriptors:

1. Obligation/Condition – whether the item is mandatory, conditional, or optional
2. Maximum Occurrences – the minimum and maximum number of times the item may occur in an address record.

B. CURRENT STANDARD

To ensure compatibility with other NSDI data themes, the FGDC address standard conforms to the FGDC *Geographic Information Framework Data Content Standard* for the NSDI.

Framework Data Content Standard Part 0: Base Part, Section 7.4. sets forth, for the data themes, specific conformance requirements as to definitions of terms and abbreviations.

Section 7.4.1.1 specifies that that data item definitions shall include six descriptors: Name, definition, data type, domain of values, Obligation/Condition, and Maximum Occurrence.

Within the FGDC Address Standard Content Part, all data item descriptions include the first four descriptors.

The last two, Obligation/Condition and Maximum Occurrence, are not stated in the Content part. They are given in the Exchange Part, within the XML model (Exchange Part).

C. REASONS FOR RECOMMENDING REVISION

Adding conditionality rules and min-max occurrence rules to the item descriptions will bring the item descriptions into explicit compliance with the Framework Standard. Stating the rules within the Content Part will facilitate consistent use of the standard.

D. TOWARDS A SOLUTION

All conditionality rules and min-max occurrence rules have been compiled into the accompanying table. Note that for all data elements, and many attributes, the rules are conditional, depending on the class of address. Complete Street Names, for example, are:

- MANDATORY (one only) for Numbered Thoroughfare addresses
- MANDATORY (two or more) for Intersection addresses
- PROHIBITED (none allowed) for Landmark addresses

E. STEPS TO COMPLETION

1. Reformat each data item description to include two new items: “M/C/O” and “Min-Max Occurs”. (Abbreviations are recommended to fit within the existing column widths in the document.)

2. For each data item, copy the relevant information from the table into data element description.

F. SOURCES AND BACKGROUND INFORMATION

(All from FGDC Address Standard Appendix I, pp. 503, 505-506, and 517-518)

FGDC Address Standard Appendix I.1.2 [p. 503]

1.2 The Framework Standard and the Address Standard.

The Framework Standard *“provides interrelated thematic standards in seven data areas: cadastral, digital orthoimagery, elevation, geodetic control, governmental unit boundaries and other geographic area boundaries, hydrography, and transportation.”* The seven core themes *“are considered framework data of critical importance to the spatial data infrastructure of the Nation... The standard is divided into eight parts, one for each of the seven data themes and a base document containing information common to two or more themes.”* (Framework Standard Base Part, Introduction and Sec. 1.1)

Address data are used in conjunction with several of the framework themes, most notably cadastral data, and transportation data. Addresses and transportation features (especially road networks) are so closely related that their standards are interdependent. Street names form an integral part of thoroughfare addresses, and street segments and their network geometry form the basis for Address Reference Systems and their components. In addition, addresses are used by the public to identify cadastral parcels and specify their locations. Finally, addressed features have elevations; and place names within addresses are often determined by governmental boundaries.

FGDC Address Standard [pp. 505-506]

2.1 Part 0: Base

2.1.1 Scope of Part 0: Base.

The Base Part provides *“A high-level view of the seven framework data themes[,] [a]n overall integrating Unified Modeling Language (UML) model that is supplemented by detail in the part for each data theme, [and] [t]erminology and other information common to two or more themes”* (Part 0, Sec 1.2).

The Base Part defines the abstract model that underlies and unifies the seven data themes. It sets forth, for the data themes, specific conformance requirements as to definitions of terms and abbreviations, UML model notation, data dictionary content and formatting, element and attribute naming, incorporation of metadata and record identifiers, and conformance to ISO reference standards and the abstract framework data model.

FGDC Address Standard [p 511]: 3. Conformance of the Address Standard to Framework Standard Part Zero Base Part

The Framework Standard Base Part defines the abstract model that underlies and unifies the framework seven data themes. It sets forth, for the data themes, specific conformance requirements as to definitions of terms and abbreviations, UML model notation, data dictionary content and formatting, element and attribute naming, incorporation of metadata and record identifiers, and conformance to ISO reference standards and the abstract framework data model.

FGDC Address Standard [p.515]

Framework Base Part Section 7.4.1 requires that:

*The entities and elements within the data dictionary are defined by **six attributes** based on those specified in ISO/IEC 11179-3 for the description of data element concepts, that is, data elements without representation.”*

Four of the six attributes are explicitly specified in the element and attribute descriptions in the Content part of the address standard: Name, definition, data type, and domain of values.

Two of the six are provided in the XML model, but they are not stated explicitly in the Content part: Obligation/Condition, and Maximum Occurrence

FGDC Address Standard [pp. 517-518]: 3.7.4.4 Conformance to Base Part Subsection 7.4.4: Obligation/Condition

Framework Base Part Section 7.4.4 reads in full: “7.4.4.1 General

“Used only in rows that contain elements, Obligation/Condition is a descriptor indicating whether the element shall always be populated (that is, contain a value or values) or sometimes will be populated for every instance of its owning entity. If the element is a role name, then the obligation/condition shall apply to the element indicated by the Data Type. This descriptor may have the following values: M (mandatory), C (conditional), or O (optional).

“7.4.4.2 Mandatory (M)

“Mandatory (M) indicates that the entity or element shall be populated.

“7.4.4.3 Conditional (C) “Conditional (C) specifies an electronically manageable condition under which at least one entity or element is mandatory. “Conditional” is used for one of the three following possibilities:

- *Expressing a choice between two or more options. At least one option is mandatory and must be populated*
- *Populating an entity or element if another element has been populated*

- *Populating an element if a specific value for another element has been populated.*

“To facilitate reading by humans, the specific value is used in plain text (for example, “C/not defined by encoding?”). However, the code shall be used to verify the condition in electronic user interface,

“If the answer to the condition is positive, then the entity or the element shall be populated.

“7.4.4.4 Optional (O)

“The entity or the element may be populated. Optional (O) entities and optional elements have been defined to provide a guide to those looking to fully document their data. (Use of this common set of defined elements will help promote interoperability among framework data users and producers.) Optional entities may have mandatory elements. If the optional entity is used, the mandatory elements shall be used. If an optional entity is not used, the elements contained within that entity (including mandatory elements) will also not be used. “

FGDC Address Standard [p518]; 3.7.4.5 Conformance to Base Part Subsection 7.4.5: Maximum occurrence

Framework Base Part Section 7.4.5 reads in full: *“7.4.5: Maximum occurrence Used only in rows that contain elements, maximum occurrence specifies the maximum number of instances the element may have. Single occurrences are shown by “1”; unconstrained number of instances are represented by an asterisk “*”. Fixed number occurrences, other than one, are allowed and will be represented by the corresponding number (that is, “2”, “3” ...and so on). If the element is a role name, then the maximum occurrence shall apply to the element indicated by the Data Type.”*