American National Standard
for Information Technology

Geographic Information Framework
Data Content Standard
(Part NNN)
Governmental Unit Boundary Data Exchange Standard

Secretariat
INFORMATION TECHNOLOGY INDUSTRY COUNCIL
Approved
MONTH/YEAR
Draft
September/2003

American National Standards Institute

Contents

Forward (This is not part of American National Standard [designation])

The primary purpose of this standard is to support the exchange of governmental unit and other legal entity boundary data. This standard seeks to establish a common content of governmental unit and other legal entity boundary datasets. It seeks to decrease the costs of acquiring and exchanging governmental unit and other legal entity boundary data for Federal, Tribal, State and local users and creators through a common means of describing the data content. Other benefits of adopting this standard include facilitation in maintenance of governmental unit boundaries.

This standard has been developed to fulfill one of the objectives of the National Spatial Data Infrastructure (NSDI), i.e., to create common geographic base data for seven critical data themes. These core themes are considered framework data, of critical importance to the geographic information infrastructure. The Geospatial One-Stop initiative, a Federal e-government initiative, is designed, in part, to expedite the creation of the seven framework layers.

This standard is being developed by L1, Geographic Information, subcommittee of the InterNational Committee for Information Technology Standards (INCITS) under the auspices of the American National Standards Institute (ANSI). INCITS L1 standards are drafted in accordance with the rules given in the *ANSI Style Manual* for preparation of proposed American National Standards.

This standard contains eleven annexes, three of which are normative, eight of which are informative.

Committee

1 Scope

The purpose of the Geographic Information Framework Data Content Standards-Governmental Unit Boundary Exchange Standard is to establish the content requirements for the collection and interchange of governmental unit (GU) and other legal entity boundary data and to facilitate the maintenance and use of that information.

This standard identifies and defines terminology, encoding scheme, and the data components required for describing the governmental unit or other legal entity and its boundary, along with the metadata needed for boundary data exchange. This standard is applicable to all generally recognized governmental units and other legal entities, organization-recognized governmental units, and other geographic areas.

For the purposes of this standard, a governmental unit is defined as follows:

> A legally bounded geographic entity that has the authority of a government. A legal government is one established under Federal, Tribal, State or local law with the authority to elect or appoint officials and raise revenues through taxes.[1]

In addition, this standard accommodates other legal entities and adopts the ANSI X3.31 (FIPS Publication 55-3) description for such entities. This standard defines a legal entity as follows:

> A geographic unit with legally defined boundaries established under Federal, State, Tribal, or local law as a governmental unit or as an area for the administration of a governmental function.

This standard also applies to entities that are statistically equivalent to a legal entity for data reporting purposes, e.g., incorporated places that are independent of counties and serve as equivalent to a county. Governmental units and other legal entities recognized by this standard are defined in Annex C (normative). Principles described in this standard may be extended to other geographic entities to facilitate the exchange of boundary data, such as those listed in Annex E (informative).

This standard specifies the content and its organization necessary for the successful interchange of governmental unit or other legal entity boundary data. This standard does not specify a particular structure for interchange of boundary data. Further, data producers and users may structure governmental unit or other legal entity boundary data in any format for their internal use.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ANSI X3.31-1988, *Information Systems-Codes-Structure for the Identification of the Counties and County Equivalents for the United States and its Outlying and Associated Areas for Information Interchange*

[1] ANSI X3.31 (Federal Information Processing Standard (FIPS) Publication 55-3) defines a governmental unit as, "A legally bounded geographic entity that has the ability to have elected or appointed officials and raise revenues through taxes."

ANSI X3.47-1988, *Information Systems-Codes-Structure and Data Requirements for the Identification of Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States and Its Outlying and Associated Areas for Information Interchange*

ANSI NCITS 320-1998, *Information Technology-Spatial Data Transfer*

FGDC-STD-003-1999 *Cadastral Data Content Standard for the National Spatial Data Infrastructure*

FGDC-STD-001-1998 *Content Standard for Digital Geospatial Metadata (Version 2.0)*

FIPS 55-3 *Codes for Named Populated Places, primary County Divisions, and Other Locational Entities of the United States, Puerto Rico, and the Outlying Areas*

FIPS 6-4 *Counties and Equivalent Entities of the United States, Its Possessions, and Associated Areas*

ISO 19107 *Geographic Information - Spatial Schema (DIS)*

ISO 19109 *Geographic Information-Rules for Application Schema (DIS)*

ISO 19112 *Geographic Information-Spatial Referencing by Geographic Identifiers (DIS)*

3 Definitions and abbreviations

3.1 Definitions

3.1.1 areal – a term specifying that an object is two-dimensional

3.1.2 boundary – set that represents the limit of an entity (e.g., the line that marks the limit of a geographic entity)

NOTE: A boundary may or may not follow a visible feature and may or may not be visibly marked.

3.1.3 bounded – entity with one or more connected boundaries

NOTE: In ISO 19107 bounded is "contained within a continuous delimiting line or an ordered set of line segments". Applicable at the type or instance level

3.1.4 coextensive with – one-to-one relationship between two or more geographic entities or features

NOTE: Applicable at the instance level

3.1.5 coincident – a portion or portions of an entity that shares the same location with one or more entities

3.1.6 composed of – entity contains subentities that are contained completely within the entity and are the extent of the entity

NOTE: Applicable at the type or instance level

3.1.7 composes – subentities are completely contained within an entity

NOTE: Composes assumes a geographic entity is contained entirely within, or encompassed by, another. Applicable at the type or instance level

3.1.8 contains nested – entity contains subentities that are contained completely within the entity

NOTE: A nesting relationship implies one geographic entity must be totally within another.
Applicable at the instance level

EXAMPLE: State of Delaware contains nested three counties.

3.1.9 contains only nested – entity contains subentities that are contained completely within the entity and are the extent of the entity

EXAMPLE: State of Delaware contains only nested three counties.

3.1.10 contiguous – entities share a common point or portion of a boundary

3.1.11 functional status – the administrative or legal activities associated with performing the legally prescribed functions of a governmental unit or legal entity; the administrative or legal entity is either functioning or non-functioning, is either active or inactive

3.1.12 governmental unit – a legally bounded geographic entity that has the authority of a government

NOTE: A legal government is one established under Federal, Tribal, State or local law with the authority to elect or appoint officials and raise revenues through taxes.

EXAMPLES: Examples of legal governments include: the United States, State of Iowa, Uinta County, Chester township, and Phillipsburg city.

3.1.13 government unit boundary description component – element for identifying and storing discrete units of information on governmental unit boundaries

3.1.14 instance – single representation of a feature type

EXAMPLE: Corporate boundary of Augusta, Georgia

3.1.15 legal area – a geographic area whose boundaries, name, origin, and legal/statistical area description result from charters, laws, treaties, or other administrative or governmental action

NOTE: The term legal area encompasses both governmental units and legal entities, and refers to both for descriptive purposes

3.1.16 legal entity – a geographic unit with legally defined boundaries established under Federal, State, Tribal, or local law as a governmental unit or as an area for the administration of a governmental function

EXAMPLES: Examples of legally bounded administrative areas (legal entities) include: congressional districts and state legislative districts, voting precincts, city wards, refuse collection zones, school attendance areas.

3.1.17 maintenance relationship – common areal information that must be maintained between one or more geographic entities or features

NOTE: Applicable at the type and instance level

3.1.18 nests within – one or more subentities are contained completely within an entity

NOTE: Applicable at the instance level

EXAMPLE: Counties nest within States.

3.1.19 non-bounded – entity lacking one or more connected boundaries

NOTE: Non-bounded is the absence of being bounded.
Applicable at the type or instance level

3.1.20 topological relationship – spatial condition or characteristic required for creating and maintaining the internal topology of a database (or file)

3.1.21 type – representation of a class of real world occurrences with common characteristics

3.2 Abbreviations

3.2.1 ANSI – American National Standards Institute

3.2.2 DIS – Draft International Standard

3.2.3 FIPS PUB – Federal Information Processing Standards Publication

3.2.4 FGDC – Federal Geographic Data Committee

3.2.5 GU – governmental unit

3.2.6 INCITS – InterNational Committee for Information Technology Standards

3.2.7 NCITS – National Committee for Information Technology Standards

3.2.8 SDTS – *Spatial Data Transfer Standard* (FIPS-PUB-173-1992)

4 Standards development

The FGDC Subcommittee on Cultural and Demographic Data, sponsor of the Geographic Information Framework Data Content Standards-Governmental Unit Boundary Exchange Standard, initiated the development of the Governmental Unit Boundary Data Content Standard pursuant to the Office of Management and Budget (OMB) Circular A-16 that specifies governmental unit boundaries as one of the seven data themes that constitute the National Spatial Data Infrastructure (NSDI). Development commenced with the submittal of the "Proposal for a National Spatial Data Infrastructures Project" to the FGDC Standards Working Group in November 1997. The proposal was accepted by the FGDC, and completed Public Review in April 1998 with favorable comments. The first version of the working draft was completed in February 1999. In August 2002, the FGDC determined that the development of the suite of seven data theme standards of the NSDI would continue under the auspices of INCITS L1. Thus, the review and affirmation of the Governmental Unit Boundary Exchange Standard will be through ANSI process.

5 Overview of governmental unit and other legal entity boundary data content

The purpose of this standard is to establish the content requirements for the collection and interchange of governmental unit and other legal entity boundary data. To fully describe the governmental unit or other legal entity boundary information, one must include references, governmental unit type information, governmental unit instance information, and governmental unit boundary instance coordinate information.

5.1 References

When describing governmental unit or other legal entity boundaries, the dataset must be documented by FGDC-compliant metadata in accordance with FGDC-STD-001-1998 *Content Standards for Digital Geospatial Metadata (Version 2.0).* Annexes to this National Standard describe the necessary reference documentation. This reference metadata requires, for example, citation, project parameters, and data quality. In addition, one can record other documents referenced in documenting the boundary.

5.2 Type information

GU type information describes the general category, or type, of GU or other legal entity being documented, e.g., county. This section of governmental unit or other legal entity documentation includes GU type name, GU definition, coding system, if any, and relationship information to other GU type entities.

5.3 Instance information

GU instance relays specific information and coordinate data about the individual GU being described. This includes the instance name, instance relationships, and coordinates.

6 Governmental unit and other legal entity identification and relationship information

The exchange of governmental unit boundary information requires that each governmental unit be unambiguously identified and that the relationship of that governmental unit to other governmental units be clearly indicated.

6.1 Information

Information about governmental units and other legal entities is presented at two levels: the type level (pertaining to categories of governmental units or other legal entities), and the instance level (pertaining to single occurrences of a governmental unit or other legal entity).

6.2 Identification

Identification information is essential for describing governmental unit and other legal entity boundaries. Identification information is applicable at both the type level and the Instance level. Examples of identification information at the type level are type name and type definition. Examples of identification information at the instance level are instance name and legal area description.

6.3 Relationships

Equally important for describing governmental units and other legal entities is knowledge of their relationships to other entities. Relationships between governmental units are topologic relationships and maintenance relationships.

6.3.1 Topologic relationships

Topologic relationships describe how a governmental unit relates to its neighbors, or how it fits within a hierarchy. Topologic relationships identified in this standard are contiguous, composed of, composes. Topologic relationships are applicable at the type level and instance level. They may include relationships required for the internal topology of a database.

6.3.2 Maintenance relationships

Maintenance relationships, if they exist for governmental units or other legal entities, provide the dependencies of common areal information between one or more governmental units or other legal entity boundaries and geographic area features of which they consist. Maintenance relationships are applicable at the type level and instance level. Maintenance relationships describe the dependencies between one governmental unit and another. This standard recognizes four maintenance relationships: coextensive with, contains nested, nests within, and contains only nested. An example of a maintenance relationship is “Arlington County coextensive with Arlington Minor Civil Division coextensive with Arlington Census Designated Place.” Coincidental relationships or relationships which do not require maintenance are excluded.

The following are the recognized maintenance relationships, their properties, and the required maintenance.

6.3.2.1 Coextensive with

When there exists a one-to-one relationship between two or more geographic entities or features, this is expressed as a "coextensive with" relationship.

Property: If A is coextensive with B, then B is coextensive with A.
Maintenance: If A is coextensive with B, then any change to A results in an equal change to B.
Note 1: The coextensive with relationship is equally valid for a chain of valid relationships. If A is coextensive with B and B is coextensive with C, then A is coextensive with C. For example, if county A is coextensive with metropolitan area B and metropolitan area B is coextensive with school district C, then county A is coextensive with school district C.
Note 2: This relationship is expressed only when entities share the same bounded extent, or have a one-to-one relationship.

6.3.2.2 Contains nested

When there exists a relationship where one geographic entity or feature contains subentities that are contained completely within the entity, this is expressed as a "contains nested" relationship.

Note1: The owner may have one or more contains nested entities or features and each entity or feature that is a member has a "nests within" relationship.
Property: If A contains nested B and C, then B nests within A and C nests within A.
Maintenance: If A contains nested B and C, then any change to A results in an equal change to B or C or both if the change occurs at a shared boundary.
Note 2: For example, state A contains nested counties B and C, in that counties B and C are completely within the boundary of state A. State A also contains nested county D, and therefore counties B and C do not exhaust the state entity. The contains only nested relationship described in section 6.3.2.4 is a subset of contains nested.

6.3.2.3 Nests within

When there exists a relationship where one or more subentities are contained completely within an entity, this is expressed as a "nests within" relationship.

Property: If B nests within A, then A contains nested B and may contain at least one other entity of the same type feature.
Maintenance: If B nests within A, then any areal expansion to B along a shared boundary with A results in an equal change to A.
Note1: Although it is true that B nests within A and B expands outward along a shared boundary with A, then A must expand outward. However, it is not necessarily true in the reverse; if B contracts, A may or may not contract. A nests within relationship makes no statement about the properties of A in relationship to B. In some circumstances, entity C may expand into the area of contraction or a wholly new entity D may be created.
Note 2: For example, voting districts nest within a county.

6.3.2.4 Contains only nested

When there exists a relationship where an entity contains subentities that are contained completely within the entity and are the extent of the entity, this is expressed as a "contains only nested" relationship.

Property: If B nests within A, then A contains nested B and contains at least one other entity of the same type feature.
Maintenance: If B nests within A, then any areal change to B adding territory from or deleting territory to another feature that does not nest within A, results in an equal change to A.
Note 1: The contains only nested relationship is a more restrictive subset of the contains nested relationship and implies complete coverage of the nesting object.
Note 2: For example, a city may legally only exist in a single township but not completely cover the township. Any boundary change to the city where the city shares a boundary with the township requires a boundary change to

the township, but boundary changes to the city internal to the township will not affect the township boundary. A change to the township boundary only requires a change to the city boundary if the change is along a shared boundary segment and would result in placing a part of the city outside the township (a diminishing of the township). A contains only relationship exists for all townships in a county. Any change to the county boundary requires a change to one or more township boundaries and any change to a township boundary along a shared boundary segment with the county requires a change to the county boundary. This is a simple contains only nested relationship.

7 Data content of governmental unit and other legal entity boundaries

7.1 Description of a governmental unit

There are many variations to the definition of a governmental unit. Because of these variations, geographic entities recognized as governmental units by one organization may not be acknowledged as GUs by other organizations. Section 1.0 of this National Standard contains the definition of a governmental unit. The requirements to be compliant with this standard depend upon whether or not the entity being described fits the definition of a governmental unit.

Annex C (normative) provides specific definitions of governmental units and other legal entities that are applicable to this standard. The table is included in this standard for informational purposes to aid organizations in identifying their governmental units and other legal entities and should not be considered an exhaustive listing of governmental units and other legal entities.

Annex E (informative) provides an additional list of other entities for which this standard can be applied to facilitate the exchange of boundary information.

7.2 Governmental unit and other legal entity boundary dataset element characteristics

Annex A (normative) provides the data model for governmental unit data exchange. The UML model encompasses all mandatory components used to identify, describe, and store the information required for exchanging governmental unit and other legal entity boundary information. Annex B (normative) provides the UML object all entity and attribute definitions, domains, obligations/conditions, maximum occurrences, and data types for elements depicted in the Governmental Unit boundary UML model. Annex J (informative) provides a description of the UML notations used in the Governmental Unit boundary UML model.

Annex D (informative) provides examples of the information that would be communicated when exchanging governmental unit boundary information in accordance with the UML data model in Annex A (normative). The examples describe the Delaware State boundary as a curve set and the three Delaware counties as a polygon set. FGDC compliant metadata is also provided.

Governmental unit boundary dataset description components are depicted in informative annexes as a graphic illustration in Annex G (informative) and with more detail as a table in Annex H (informative). In these annexes, the governmental unit boundary dataset is composed of three types of components: reference component, type information component, and instance component. Each of the major sections contains subsections, some of which may be further subdivided.

7.2.1 Governmental unit boundary dataset description characteristics

Annex B (normative), Annex D (informative), and Annex H (informative) provide perspectives that describe the information necessary to exchange governmental unit information. This governmental unit boundary information is described in terms of the governmental unit boundary dataset description components. Governmental unit boundary dataset description components are defined by six characteristics:

7.2.1.1 Component name

Component name is the label assigned to the governmental unit boundary dataset description component.

7.2.1.2 Component definition

Component definition is the governmental unit boundary dataset description component definition.

7.2.1.3 Component domain

Component domain is the specification of the set of distinct values for each governmental unit boundary dataset description component.

7.2.1.4 Obligation/condition (O/C)

Obligation/condition is the descriptor assigned to a governmental unit boundary dataset description component that indicates the necessity of its inclusion in boundary information exchange. The obligation determines whether the component shall always be present (contain values), or be present according to established conditions. The descriptor may have the following values:

Mandatory (M) The governmental unit boundary dataset description component shall be present in all cases, i.e., is required.

Conditional (C) The governmental unit boundary dataset description component shall be present if the condition(s) assigned to the component is met.

Optional (O) The governmental unit boundary dataset description component may be present or not. Optional governmental unit boundary dataset description components have been defined to provide a means to those seeking to more fully document their Governmental Unit Boundary exchange file.

7.2.1.5 Maximum occurrences (MO)

Maximum occurrences is the number of instances a governmental unit boundary dataset description component may have.

7.2.1.6 Data type

Data type is the set of distinct values for representing governmental unit boundary dataset description components (for example: text, integer number, real number, or date).

8 Governmental unit boundary file metadata requirement

This standard is compliant with the FGDC Content Standard for Digital Geospatial Metadata (Version 2.0). The numbers preceding the metadata elements indicate the location of the definition within the metadata standard. This section is an overview of the mandatory metadata elements in the metadata standard. Annex F (informative) specifies the information necessary when providing metadata for the exchange of governmental unit boundary information.

The following metadata elements are relevant compound elements and mandatory elements. An explanatory statement follows each element.

1 Identification Information – Basic information about the data set.
1.1 Citation – Information to be used to reference the data set.
1.2 Description – A characterization of the data set, including its intended use and limitations.
1.3 Time Period of Content – Time period(s) for which the data set corresponds to the currentness reference.
1.4 Status – The state of and maintenance of information for the data set.

1.5 Spatial Domain – The geographic areal domain of the data set.
1.6 Keywords – Words or phrases summarizing an aspect of the data set.
1.7 Access Constraints – Restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data set.
1.8 Use Constraints – Restrictions and legal prerequisites for using the data set after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the data set.
2 Data Quality Information – A general assessment of the quality of the data set.
3 Spatial Data Organization Information – The mechanism used to represent spatial information in the data set
4 Spatial Reference Information – The description of the reference frame for, and the means to encode, coordinates in the data set.
5 Entity and Attribute Information – Details about the information content of the data set, including the entity types, their attributes, and the domains from which attribute values may be assigned.
6 Distribution Information – Information about the distributor of and options for obtaining the data set
7 Metadata Reference Information – Information on the currentness of the metadata information, and the responsible party.
7.1 Metadata Date – The date that the metadata were created or last updated.
7.4 Metadata Contact – The party responsible for the metadata information.
7.5 Metadata Standard Name – The name of the metadata standard used to document the data set.
7.6 Metadata Standard Version – Identification of the version of the metadata standard used to document the data set.

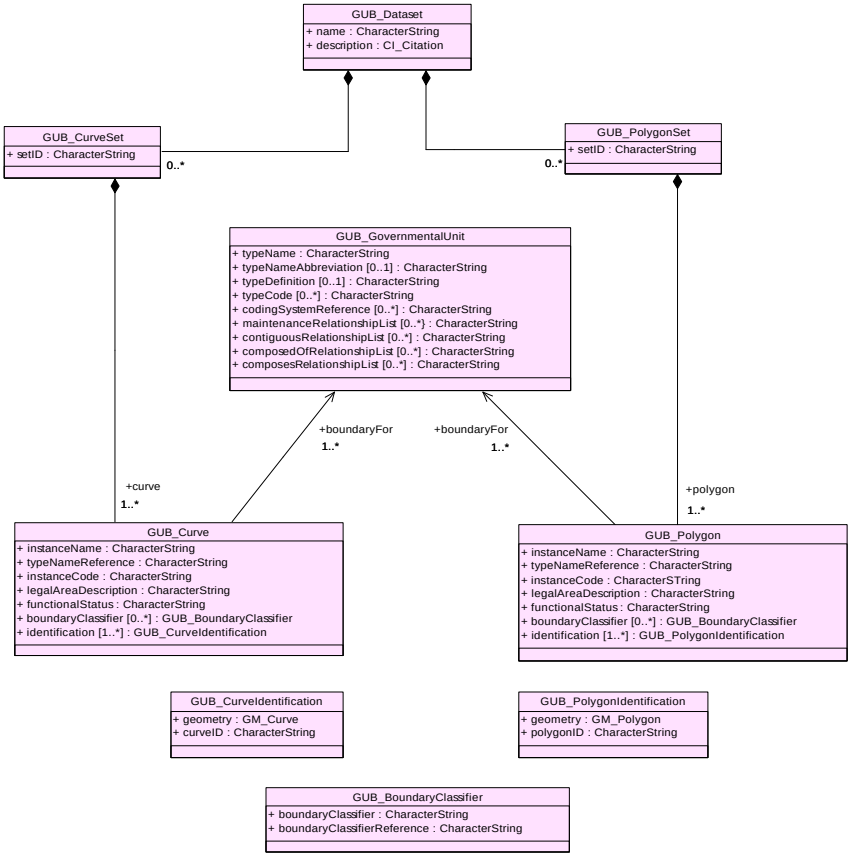
9 Maintenance authority

The U.S. Census Bureau on behalf of the U.S. Department of Commerce is the designated maintenance authority for the Geographic Information Framework Data Content Standard-Governmental Unit Boundary Data Exchange Standard. Address any questions to Chief, Geography Division, U.S. Census Bureau.

Annex A
(normative)

Governmental unit boundary UML model

Annex A (normative) provides the data model for governmental unit data exchange. The information required for exchanging governmental unit and other legal entity boundary data is described in the following abstract object model in Unified Modeling Language (UML). Annex B (normative) provides the definitions, domains, obligation/condition, maximum occurrence, and data type for each object and attribute depicted in the governmental unit boundary UML model. This model is a tool to aid in understanding the elements necessary for boundary data exchange.



Technical note:

The attribute "description" in GUB_Dataset inherits characteristics from CI_Citation in ISO 19115 – Geographic Information – Metadata.

The attribute “geometry” in GUB_CurveIdentification and GUB_PolygonIdentification inherits characteristics from GM_Curve in ISO 19107 – Geographic Information – Spatial Schema.

Annex B
(normative)

Governmental unit boundary UML object description

Annex B (normative) provides all entity and attribute definitions, domains, obligations/conditions, maximum occurrences and data types for elements depicted in the governmental unit boundary UML model. In other words, this table provides reference information about the objects and attributes in Annex A (normative). Definitions for the terminology describing the characteristics of the data are provided in 7.2.1.

To implement Annex B, follow the UML diagram in Annex A and use the following table as a reference for these objects and attributes. Follow the line numbers in sequence and consult the obligation/condition (O/C) to determine if the component is mandatory (M), conditional (C) and its conditions are met, or if it is optional (O). Once it is determined that the component is required for governmental unit boundary documentation through its definition and obligation/condition, refer to the domain which describes the valid values that can be assigned to the data element. If the component is a compound element, the line will be shaded, the domain will specify the appropriate lines for the component, and the data type will specify 'class'. For data elements, the characteristic data type describes the kind of value to be provided, e.g., integer, real, text. The maximum occurrence (MO) will specify if the element shall only be recorded one time (1) or if the element is repeatable from one to many times (*).

B.1 GUB_Dataset

Line #	Name	Definition	O/C	MO	Data Type	Domain
1	GUB_Dataset	Set of GU type, instance, and boundary information to be exchanged.	M	1	Class	Lines 2-5
2	RN GUB_CurveSet	Composition association between GUB_CurveSet and GUB_Dataset	C/ if the boundary consists of a set of curves	0..*	Association	GUB_CurveSet
3	RN GUB_PolygonSet	Composition association between GUB_PolygonSet and GUB_Dataset	C/ if the boundary consists of a set of polygons	0..*	Association	GUB_PolygonSet
4	name	Identification of the dataset	M	1	CharacterString	Free text
5	description	Description of the dataset	M	1	CharacterString	CI_Citation

B.1.1 GUB_CurveSet

Line #	Name	Definition	Obligation	MO	Data Type	Domain
6	GUB_CurveSet	Set of curves that define the GU boundary being described	C/ if the boundary consists of one or more curves	1	Class	Lines 7-8
7	RN GUB_Curve	Composition association between GUB_Curve and GUB_CurveSet	M	1..*	Association	GUB_Curve
8	setID	Unique identification of the curve set	M	1	CharacterString/Integer	Free text, free number

B.1.1.1 GUB_Curve

Line #	Name	Definition	Obligation	MO	Data Type	Domain
9	GUB_Curve	Set of coordinates with no repetition that define a curve	C/ if the boundary consists of one or more curves	0..*	Class	Lines 10-18
10	RN GUB_GovernmentalUnit	"boundaryFor" association between GUB_Curve and GUB_GovernmentalUnit	M	1..*	Association	GUB_GovernmentalUnit
11	instanceName	Identification of the single representation of the feature type, or specific GU described	M	1	CharacterString	Free Text
12	typeNameReference	Reference to the GU type name	M	1	CharacterString	Free text
13	instanceCode	Specific code which identifies the GU instance being described	C/ if an instance code exists	0..1	CharacterString/Integer	Free text, free number
14	codingSystemReference	GU type code reference	C /if a type code exists	0..*	CharacterString/Integer	Free text
15	legalAreaDescription	Description of the legal area, a geographic area whose boundaries, name, origin, and legal/statistical area description result from charters, laws, treaties, or other administrative or governmental action	C/ if legal area description is known	0..1	CharacterString	Free text
16	functionalStatus	Administrative or legal activities associated with performing the legally prescribed functions of a governmental unit or legal entity	C/ if functional status is known	0..1	CharacterString	nonfunctioning, active, inactive
17	boundaryClassifier	Description of the status of the boundary	C/ if one or more boundary classifiers exist	0..*	Class	GUB_BoundaryClassifier
18	identification	Specific identifier assigned to the feature	M	1..*	Class	GUB_CurveIdentification

B.1.1.1.1 GUB_GovernmentalUnit

Line #	Name	Definition	Obligation	MO	Data Type	Domain
19	GUB_GovernmentalUnit	The GU being documented	M	1..*	Class	Lines 20-28
20	typeName	The designated name for the type of GU whose data are being described	M	1	CharacterString	Annex C, free text
21	typeNameAbbreviation	The abbreviated name for the type of GU whose data are being described	C/ if an abbreviation exists for GU Type Name	0..1	CharacterString	Free text
22	typeDefinition	Definition of the type of GU whose data are being described	C/ if the type definition is known	0..1	CharacterString	Annex C, free text
23	typeCode	The specific code which identifies the GU being described	C/ if a type code exists	0..*	CharacterString/ Integer	Free number
24	codingSystemReference	GU type code reference	M	1..*	CharacterString/ Integer	FIPS code, free text, free number

25	maintenanceRelationshipList	List of common areal information between one or more GUs or legal entities and geographic area features for the GU type being described	C/ if one or more maintenance relationships exist	0..*	CharacterString	Free text
26	contiguousRelationshipList	List of GUs or feature objects that share a common point or portion of a boundary	C/ if one or more contiguous relationships exist	0..*	CharacterString	Free text
27	composedOfRelationshipList	List of GU or feature object that contains subentities that are completely contained within and are the extent of the entity	C/ if one or more composed of relationships exist	0..*	CharacterString	Free text
28	composesRelationshipList	List of GU subentities that are completely contained within an entity	C/ if one or more composes relationships exist	0..*	CharacterString	Free text

B.1.1.1.1.1 GUB_CurveIdentification

Line #	Name	Definition	Obligation	MO	Data Type	Domain
29	GUB_CurveIdentification	Specific identifier assigned to the GU boundary curve	M	1..*	Class	Lines 30-31
30	geometry	The shape and geo-location of a feature	M	1	Class	GM_Curve
31	curveID	Specific identifier assigned to the GU boundary curve	M	1..*	CharacterString/Integer	Free text, free number

B.1.1.1.1.1 GUB_BoundaryClassifier

Line #	Name	Definition	Obligation	MO	Data Type	Domain
32	GUB_BoundaryClassifier	Description of the status of the boundary	C/ if one or more boundary classifiers exist	0..*	Class	Lines 33-34
33	boundaryClassifier	A term or phrase which describes the status of the boundary	M	1..*	CharacterString	Free text
34	boundaryClassifierReference	Reference which defines the term or terms used in the boundary classifier	M	1..*	CharacterString	Free text

B.1.2 GUB_PolygonSet

Line #	Name	Definition	Obligation	MO	Data Type	Domain
35	GUB_PolygonSet	Set of one or more polygons that define a GU boundary being described.	C/ if the boundary consists of one or more polygons	1	Class	Lines 36-37
36	RN GUB_Polygon	Composition association between GUB_Polygon and GUB_PolygonSet	M	1	Association	GUB_Polygon
37	setID	Unique identification of the polygon set	M	1	CharacterString/Integer	Free text

B.1.2.1 GUB_Polygon

Line #	Name	Definition	Obligation	MO	Data Type	Domain
38	GUB_Polygon	A surface patch that is defined by a set of boundary curves and an underlying surface to which these curves adhere	C/ if the boundary consists of one or more polygons	1..*	Class	Lines 39-47
39	RN GUB_GovernmentalUnit	"boundaryFor" association between GUB_Polygon and GUB_GovernmentalUnit	M	1..*	Association	GUB_GovernmentalUnit
40	instanceName	Identification of the single representation of the feature type, or specific GU described	M	1	CharacterString	Free text
41	typeNameReference	Reference to the GU type name	M	1	CharacterString	Free text
42	instanceCode	Specific code which identifies the GU instance being described	C/ if an instance code exists	0..1	CharacterString/Integer	Free text/free number
43	codingSystemReference	GU type code reference	C/ if a type code exists	0..*	CharacterString/Integer	Free text
44	legalAreaDescription	Description of the legal area, a geographic area whose boundaries, name, origin, and legal/statistical area description result from charters, laws, treaties, or other administrative or governmental action	C/ if legal area description is known	0..1	CharacterString	Free text
45	functionalStatus	Administrative or legal activities associated with performing the legally prescribed functions of a governmental unit or legal entity	C/ if functional status is known	0..1	CharacterString	nonfunctioning, active, inactive
46	boundaryClassifier	Description of the status of the boundary	C/ if one or more boundary classifiers exist	0..*	Class	GUB_BoundaryClassifier
47	identification	Specific identifier assigned to the feature	M	1..*	Class	GUB_PolygonIdentification

B.1.2.1.1 GUB_PolygonIdentification

Line #	Name	Definition	Obligation	MO	Data Type	Domain
48	GUB_PolygonIdentification	Specific identifier assigned to the GU boundary polygon	M	1..*	Class	Lines 48-50
49	geometry	Shape and geo-location of a feature	M	1	Class	GM_Polygon
50	polygonID	Specific identifier assigned to the GU boundary polygon	M	1..*	CharacterString/Integer	Free text/free number

Annex C
(normative)

Governmental unit and other legal entity definitions

Annex C (normative) provides definitions of legal governmental units and other legal areas that are generally recognized.

C.1 Alaska Native Regional Corporation (ANRC)

Corporate entity established to conduct both business and nonprofit affairs of Alaska Native pursuant to the Alaska Native Claims Settlement Act of 1972 (Public Law 92-203). Twelve ANRCs are geographic entities that cover most of the State of Alaska (the Annette Islands Reserve–an American Indian reservation–is excluded from any ANRC). (A thirteenth ANRC represents Alaska Natives who do not live in Alaska and do not identify with any of the 12 corporations).
Entity type: Legal

C.2 Alaska Native Village

Alaska Native Village is defined in section 3 of Public Law 92-203 to mean any tribe, band, clan, group, village, community, or association in Alaska listed in section 11 and 16 in this Act, or which meets the requirements of this Act, and which the Secretary *of the Interior* determines was, on the 1970 census enumeration date (as shown by the census or other evidence satisfactory to the Secretary, who shall make findings of fact in each instance), composed of twenty-five or more Natives.
Entity type: Legal

C.3 American Indian Reservation

Federal American Indian reservations are areas that have been set aside by the United States for the use of tribes. The exterior boundaries of which are more particularly defined in the final Tribal treaties, agreements, executive orders, Federal statutes, secretarial orders, or judicial determinations. These entities are known as colonies, communities, pueblos, rancherias, ranches, reservations, reserves, villages, Indian communities, and Indian villages. The Bureau of Indian Affairs maintains a list of Federally recognized Tribal governments. Some State governments have established reservations for tribes recognized by the State.
Entity Type: GU

C.4 American Indian Tribal Subdivision

American Indian Tribal Subdivisions are administrative subdivisions of Federally recognized American Indian reservations, off-reservation trust lands, or Oklahoma Tribal statistical areas (OTSAs), known as areas, chapters, communities, or districts. These entities are internal units of self-government or administration that serve social, cultural, and/or economic purposes for the American Indians on the reservations, off-reservation trust lands or OTSAs.
Entity Type: Legal

C.5 American Indian Trust Land

Trust lands are areas for which the United States holds title in trust for the benefit of a tribe (Tribal trust land) or for an individual Indian (individual trust land.) Trust lands can be alienated or encumbered only by the owner with the approval of the Secretary of the Interior or his/her authorized representative. Trust lands may be located on or off of a reservation.
Entity Type: GU (either alone or in combination with an associated American Indian Reservation)

C.6 Borough

Boroughs are legally established geographic entities in Alaska, minor civil divisions in each of the five counties that comprise the City of New York, and a type of incorporated place in Connecticut, New Jersey, and Pennsylvania.
Entity Type: Legal

C.7 City

A type of incorporated place in 49 States and the District of Columbia
Entity Type: GU

C.8 Congressional District

Congressional Districts (CDs) are the 435 areas from which people are elected to the U.S. House of Representatives. After the apportionment of congressional seats among the States, based on census population counts, each State is responsible for establishing CDs for the purpose of electing representatives. Each CD is to be as equal in population to all other CDs in the State as practical.
Entity Type: Legal

C.9 Consolidated City

A consolidated government is a unit of local government for which the functions of an incorporated place and its county or minor civil division (MCD) have merged. The legal aspects of this action may result in both the primary incorporated place and the county or MCD continuing to exist as legal entities, even though the county or MCD performs few or no governmental functions and has few or no elected officials. Where this occurs, and where one or more other incorporated places in the county or MCD continue to function as separate governments, even though they have been included in the consolidated government, the primary incorporated place is referred to as a consolidated city.
Entity Type: GU

C.10 County or equivalent legal entity

The primary legal divisions of most States are termed “counties.” In Louisiana, these divisions are known as parishes. In Alaska, which has no counties, the statistically equivalent entities are census areas, city and boroughs (as in Juneau City and Borough), a municipality (Anchorage), and organized boroughs. In four States (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places that are independent of any county organization and thus constitute primary divisions of their States; these incorporated places are known as “independent cities”. The District of Columbia has no primary division. In American Samoa, the primary divisions are districts and islands. In the Northern Mariana Islands, the primary subdivision is municipalities. In Puerto Rico, the primary subdivision is municipios. In the Virgin Islands, the principal islands of St. Croix, St. John, and St. Thomas are the division. Guam has no primary divisions.
Entity Type: GU

C.11 County Subdivision

County subdivisions are the primary divisions of counties and statistically equivalent entities for data presentation purposes. They include census county divisions, census subareas, minor civil divisions (MCDs), unorganized territories, and incorporated places that are independent of any MCD. In Puerto Rico, Barrio and Barrio-Pueblo are legal subdivisions of a municipio.
Entity Type: Legal

C.12 Hawaiian Home Land

Hawaiian Home Lands are areas held in trust for native Hawaiians by the State of Hawaii, pursuant to the Hawaiian Homes Commission Act of 1920, as amended.
Entity Type: Legal

C.13 Incorporated Place

Incorporated places are legally established in each State, under the laws of their respective States. Some examples are cities, boroughs, city and borough, municipalities, towns, and villages. In four States (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places known as "independent cities" that are primary subdivisions of a State and legally not part of any county.
Entity Type: GU and legal

C.14 Minor Civil Division

Minor civil divisions (MCDs) are the primary governmental or administrative divisions of a county in many States (parish in Louisiana). They represent many different kinds of legal entities with a wide variety of governmental and/or administrative functions. Some examples of MCDs are assessment districts, charter townships, gores, grants, locations, magisterial districts, road districts, and townships.
Entity Type: GU and Legal

C.15 Municipality

Municipalities are legally established entities in Alaska and the Northern Mariana Islands.
Entity Type: Legal

C.16 Sub-Minor Civil Division

Sub-Minor Civil Divisions (Sub-MCDs) are second-order subdivision of counties and equivalent entities, for example, subbarios in Puerto Rico.
Entity Type: Legal

C.17 Special District

Special district governments are independent, special-purpose governmental units (other than school district governments) that exist as separate entities with substantial administrative and fiscal independence from general-purpose local governments. Special district governments provide specific services that are not being supplied by existing general purpose governments. Most perform a single function, but in some instances, their enabling legislation allows them to provide several, usually related, types of services.
Entity Type: Legal

C.18 States and equivalent entities

States are the primary governmental divisions of the United States. The District of Columbia is treated as a statistical equivalent of a State. Some Federal agencies also treat a number of entities that are not legal divisions of the United States as statistically equivalent to a State: American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and the Virgin Islands of the United States.
Entity Type: GU

C.19 State Legislative District

State Legislative Districts (SLDs) are the areas from which members are elected to State legislatures. The SLDs embody the upper (senate) and lower (house) chambers of the State legislature.
Entity Type: Legal

C.20 Subbario

Subbarrios are legal subdivisions of Barrio and Barrio-Pueblo. Subbarrios in 23 municipios are the primary legal subdivisons of the barrio-pueblo and some barrios. There are no geographic entities in the United States equivalent to the subbarrio.
Entity Type: Legal

C.21 Town

A type of functioning minor civil division found in the New England States, New York, and Wisconsin; a type of incorporated place in 30 States and the Virgin Islands of the United States.
Entity Type: GU

C.22 Village

A type of incorporated place in 20 States and American Samoa.
Entity Type: GU

Annex D
(informative)

Governmental unit boundary encoding example

Annex D (informative) provides examples of the information that would be communicated when exchanging governmental unit boundary information in accordance with the UML data model in Annex A (normative). Example D.1 documents how one could exchange Delaware State boundary information as a set of curves and example D.2 documents a similar exchange, but for the three Delaware counties as a set of polygons. FGDC compliant metadata applicable for both examples D.1 and D.2 is provided in D.3. The metadata in D.3 is entered only one time because it is the same for both examples. The examples and metadata are presented as flat ASCII files. Spaces between lines are for readability only.

NOTE: This annex is for illustrative purposes only; the actual encoding of governmental unit boundary information depends upon the application.

D.1 Delaware State curve example

This is an example of encoding a single entity whose boundary is defined by a series of curve segments. For this example, the coastline is considered the State boundary.

GUB_Dataset:
name: Example_curve.txt
description: Example of how to encode a boundary of a single entity defined by a series of curve segments.

GUB_CurveSet:
setID: DelawareState19950830

GUB_GovernmentalUnit:
typeName: State
typeNameAbbreviation: ST
typeDefinition: States are the primary governmental divisions of the United States. The District of Columbia is treated as a statistical equivalent of a State. Some Federal agencies also treat a number of entities that are not legal divisions of the United States as statistically equivalent to a State: American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and the Virgin Islands of the United States.
codingSystemReference: FIPS State Code
contiguousRelationshipList[5]:
curve segment 1 and Maryland State Boundary
curve segment 2 and Maryland State Boundary
curve segment 3 and Atlantic Ocean
curve segment 4 and Delaware Bay
curve segment 5 and Pennsylvania State Boundary

GUB_Curve:
geometry [3]:
startPoint: -75.79, 39.72
intermediatePoint [2]:
-75.76, 39.30
-75.72, 38.83
endPoint: -75.70, 38.46
instanceName: Delaware
typeNameReference: State
curveID: 1

instanceCode: 10
codingSystemReference: FIPS State Code
functionalStatus: active

GUB_Curve:
geometry [3]:
startPoint: -75.70, 38.46
endPoint: -75.04, 38.45
instanceName: Delaware
typeNameReference: State
curveID: 2
instanceCode: 10
codingSystemReference: FIPS State Code
functionalStatus: active

GUB_Curve:
geometry [3]:
startPoint: -75.04, 38.45
endPoint: -75.08, 38.80
instanceName: Delaware
typeNameReference: State
curveID: 3
instanceCode: 10
codingSystemReference: FIPS State Code
functionalStatus: active

GUB_Curve:
geometry [3]:
startPoint: -75.08, 38.80
intermediatePoint[10]:
-75.19, 38.81
-75.31, 38.94
-75.32, 39.01
-75.40, 39.07
-75.40, 39.25
-75.52, 39.36
-75.59, 39.46
-75.56, 39.57
-75.61, 39.61
-75.48, 39.72
endPoint: -75.41, 39.79
instanceName: Delaware
typeNameReference: State
curveID: 4
instanceCode: 10
codingSystemReference: FIPS State Code
functionalStatus: active

GUB_Curve:
geometry [3]:
startPoint: -75.41, 39.79
intermediatePoint[4]:
-75.48, 39.82
-75.58, 39.40
-75.66, 39.83
-75.73, 39.78

endPoint: -75.79, 39.72
instanceName: Delaware
typeNameReference: State
curveID: 5
instanceCode: 10
codingSystemReference: FIPS State Code
functionalStatus: active

D.2 Delaware counties polygon example

This is an example of encoding multiple entities whose boundaries are defined by polygons. For this example, the coastline is the county boundary.

GUB_Dataset:
name: Example_polygon.txt
description: Example of how to encode a boundary of multiple entities defined by polygons.

GUB_PolygonSet:
setID: DelawareCounties19950830

GUB_GovernmentalUnit:
typeName: County
typeNameAbbreviation: CO
typeDefinition: The primary legal divisions of most States are termed “counties.” In Louisiana, these divisions are known as parishes. In Alaska, which has no counties, the statistically equivalent entities are census areas, city and boroughs (as in Juneau City and Borough), a municipality (Anchorage), and organized boroughs. In four States (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places that are independent of any county organization and thus constitute primary divisions of their States; these incorporated places are known as “independent cities”. The District of Columbia has no primary division. In American Samoa, the primary divisions are districts and islands. In the Northern Mariana Islands, the primary subdivision is municipalities. In Puerto Rico, the primary subdivision is municipios. In the Virgin Islands, the principal islands of St. Croix, St. John, and St. Thomas are the division. Guam has no primary divisions.
codingSystemReference: FIPS State and County Code
maintenanceRelationshipList[1]:
Nests within State of Delaware
contiguousRelationshipList[5]:
County boundary and Delaware River
County boundary and Pennsylvania State boundary
County boundary and Delaware Bay
County boundary and Kent county boundary
County boundary and Maryland State boundary

GUB_Polygon:
geometry [3]:
startPoint: -75.79, 39.72
intermediatePoint[15]:
-75.76, 39.30
-75.70, 39.30
-75.66, 39.29
-75.61, 39.31
-75.56, 39.34
-75.52, 39.36
-75.59, 39.46
-75.56, 39.57

-75.61, 39.61
-75.48, 39.72
-75.41, 39.79
-75.48, 39.82
-75.58, 39.40
-75.66, 39.83
-75.73, 39.78
endPoint: -75.79, 39.72
instanceName: New Castle
typeNameReference: County
polygonID: N
instanceCode: 10003
codingSystemReference: FIPS State and County Code
functionalStatus: active

GUB_GovernmentalUnit:
typeName: County
typeNameAbbreviation: CO
typeDefinition: Same as guPolygonID: N
codingSystemReference: FIPS State and County Code
maintenanceRelationshipList[1]:
Nests within the State of Delaware
contiguousRelationshipList[4]:
County boundary and Maryland State boundary
County boundary and New Castle county boundary
County boundary and Delaware Bay
County boundary and Sussex county boundary

GUB_Polygon:
geometry [3]:
startPoint: -75.76, 39.30
intermediatePoint[11]:
-75.72, 38.83
-75.62, 38.83
-75.52, 38.86
-75.45, 38.91
-75.40, 38.93
-75.39, 38.95
-75.31, 38.94
-75.32, 39.01
-75.40, 39.07
-75.40, 39.25
-75.52, 39.36
endPoint: : -75.76, 39.30
instanceName: Kent
typeNameReference: County
polygonID: K
instanceCode: 10001
codingSystemReference: FIPS State and County Code
functionalStatus: active

GUB_GovernmentalUnit:
typeName: County
typeNameAbbreviation: CO
typeDefinition: Same as guPolygonID: N
codingSystemReference: FIPS State and County Code

maintenanceRelationshipList[1]:
Nests within the State of Delaware
contiguousRelationshipList[4]:
County boundary and Maryland State boundary
County boundary and Kent county boundary
County boundary and Delaware Bay
County boundary and Atlantic Ocean

GUB_Polygon:
geometry [3]:
startPoint: -75.72, 38.83
intermediatePoint[10]:
-75.70, 38.46
-75.04, 38.45
-75.08, 38.80
-75.19, 38.81
-75.31, 38.94
-75.39, 38.95
-75.40, 38.93
-75.45, 38.91
-75.52, 38.86
-75.62, 38.83
endPoint: -75.72, 38.83
instanceName: Sussex
typeNameReference: County
polygonID: S
instanceCode: 10005
codingSystemReference: FIPS State and County Code
functionalStatus: active

NOTE: This annex is for illustrative purposes only; the actual encoding of governmental unit boundary information depends upon the application.

D.3 Example metadata

```
Identification_Information:
  Citation:
    Citation_Information:
      Originator: Bureau of Transportation Statistics (comp.)
      Publication_Date: 1997
      Title: 104th Congressional District Boundaries
      Publication_Information:
        Publication_Place: Washington, DC
        Publisher: Bureau Transportation Statistics
  Description:
    Abstract: The 104th Congressional District Boundaries database is a geographic database of political
boundaries of the 104th Congressional districts.
    Purpose: The data provide users with information about the locations of congressional districts,
primarily for national planning applications.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 1995
    Currentness_Reference: publication date
  Status:
    Progress: Complete
```

Maintenance_and_Update_Frequency: Annually
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -75.66, 39.83
East_Bounding_Coordinate: -75.00, 38.80
North_Bounding_Coordinate: -75.66, 39.83
South_Bounding_Coordinate: -75.79, 39.72
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: area
Theme_Keyword: background
Theme_Keyword: polygon
Theme_Keyword: boundary
Theme_Keyword: congressional district
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: United States
Access_Constraints: None
Use_Constraints: None. Acknowledgement of the Bureau of Transportation Statistics National Transportation Atlas Database would be appreciated in products derived from these data.
Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: No Information
Logical_Consistency_Report: No Information
Completeness_Report: No Information
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Census Bureau
Publication_Date: 1994
Title: TIGER Extract - Thinned Boundary Files
Type_of_Source_Media: Online
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1994
Source_Currentness_Reference: publication date
Source_Citation_Abbreviation: TIGER
Source_Contribution: Spatial information for the 104th Congressional District boundaries.
Process_Step:
Process_Description: Individual files for the Congressional Districts in Alaska, Hawaii, Puerto Rico, and the 48 contiguous States were merged into a single data set.
Process_Date: 1995
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 0.000464
Longitude_Resolution: 0.000464
Geographic_Coordinate_Units: Decimal Degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum 83
Ellipsoid_Name: Geodetic Reference System 80
Entity_and_Attribute_Information:
Detailed_Description:

Entity_Type:
Entity_Type_Label: CD104.ARE
Entity_Type_Definition: Polygon Attribute Table.
Entity_Type_Definition_Source: U.S. Census Bureau
Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: BTS Product Distribution Center
Contact_Address:
Address_Type: mailing and physical address
Address: 400 Seventh Street, SW
City: Washington
State_or_Province: District of Columbia
Postal_Code: 20590
Contact_Voice_Telephone: (202) 366 DATA
Contact_Facsimile_Telephone: (202) 366 3640
Distribution_Liability: No information
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: BTS (Bureau of Transportation Statistics standard format for spatial data)
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: http://www.bts.gov/gis/ntatlas/background.html
Fees: No information
Metadata_Reference_Information:
Metadata_Date: 19950830
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Bureau of Transportation Statistics
Contact_Address:
Address_Type: mailing and physical address
Address: 400 Seventh Street, SW
City: Washington
State_or_Province: District of Columbia
Postal_Code: 20590
Contact_Voice_Telephone: (202) 366 3282
Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998

Annex E
(informative)

Use of standard with other entities

While this standard provides a standardized way to communicate boundary information for governmental units and other specified legal entities, it may be used to communicate boundary information about other geographic entities. Annex E (informative) provides a non-exhaustive list of other geographic entities for which this standard may be used:

Local legislative district

Tribal legislative district

Voting district/polling district

School district

Special local district

Federally defined or owned, and managed land (National Park Service areas, Bureau of Land Management areas, National Forest Service areas)

State owned and managed land (State parks, State game lands, legally defined traffic zones)

Locally owned and managed land (local parks, municipal land fills)

Tribal owned and managed land

Federally regulated or programmatic administration area (empowerment/enterprise zones, off-shore mineral rights, community block grant areas, qualified neighborhood areas qualifying for funding under some statute or regulation)

Annex F
(informative)

Governmental unit boundary file metadata requirement

Annex F (informative) describes the metadata information necessary to document a governmental unit or other legal entity boundary dataset for exchange. Annex F is a subset of relevant FGDC *Content Standard for Digital Geospatial Metadata (Version 2.0)* metadata elements, maintaining all mandatory elements. Definitions for the terminology describing the characteristics of the data are the same as those defined for in Annex B (normative), provided in 7.21. This table is to be read in the same manner as that of Annex B.

Line #	Name	Definition	Obligation	MO	Data Type	Domain
1	Identification Information	Basic information about the data set	M	1	Compound	Lines 1.1-1.9
1.1	Citation	Information to be used to reference the data set	M	1	Compound	Line 8.0
1.2	Description	A characterization of the data set, including its intended use and limitations	M	1	Compound	Lines 1.2.1-1.2.2
1.2.1	Abstract	A brief narrative summary of the data set	M	1	Text	Free text
1.2.2	Purpose	A summary of the intentions with which the data set was developed	M	1	Text	Free text
1.3	Time Period Content	Time period(s) for which the data set corresponds to the currentness reference	M	1	Compound	Line 9.0
1.3.1	Currentness Reference	The basis on which the time period of content information is determined	M	1	Text	"ground condition" " publication date" Free text
1.4	Status	The state of and maintenance information for the data set	M	1	Compound	Lines 1.4.1-1.4.2
1.4.1	Progress	The state of the data set	M	1	Text	"complete" "in work" "planned"
1.4.2	Maintenance and Update Frequency	The frequency with which changes and additions are made to the data set after the initial data set is completed	M	1	Text	"continually" "daily" "weekly" "monthly" "annually" "unknown" "as needed" "irregular" "none planned" Free text

Line #	Name	Definition	Obligation	MO	Data Type	Domain
1.5	Spatial Domain	The geographic areal domain of the data set	M	1	Compound	Lines 1.5.1-1.5.1.4
1.5.1	Bounding Coordinates	The limits of coverage of a data set expressed by latitude and longitude values in the order western-most, eastern-most, northern-most, and southern-most. For data sets that include a complete band of latitude around the earth, the West Bounding Coordinate shall be assigned the value -180.0, and the East Bounding Coordinate shall be assigned the value 180.0	M	1	Compound	Lines 1.5.1.1-1.5.1.4
1.5.1.1	West Bounding Coordinate	Western-most coordinate of the limit of coverage expressed in longitude	M	1	Real	-180.0<=West Bounding Coordinate<=180.0
1.5.1.2	East Bounding Coordinate	Eastern-most coordinate of the limit of coverage expressed in longitude	M	1	Real	-180.0<=East Bounding Coordinate<=180.0
1.5.1.3	North Bounding Coordinate	Northern-most coordinate of the limit of coverage expressed in latitude	M	1	Real	-90.0<=North Bounding Coordinate<=90.0; North Bounding Coordinate<=South Bounding Coordinate
1.5.1.4	South Bounding Coordinate	Southern-most coordinate of the limit of coverage expressed in latitude	M	1	Real	-90.0<=South Bounding Coordinate<=90.0; South Bounding Coordinate<=North Bounding Coordinate
1.6	Keywords	Words or phrases summarizing an aspect of the data set	M	1	Compound	Lines 1.6.1-1.6.2.2
1.6.1	Theme	Subjects covered by the data set (for a list of commonly used thesauri, see Part IV: Subject/index term sources in Network Development and MARC Standards Office, 1988, US MARC code list for realtors, sources, and description conventions: Washington, Library of Congress)	M	N	Compound	Lines 1.6.1.1-1.6.1.2
1.6.1.1	Theme Keyword Thesaurus	Reference to a formally registered thesaurus or a similar authoritative source of theme keywords	M	1	Text	"None" Free text
1.6.1.2	Theme Keyword	Common-use word or phrase used to describe the subject of the data set	M	N	Text	Free text
1.6.2.1	Place Keyword Thesaurus	Reference to a formally registered thesaurus or a similar authoritative source of theme place keywords	M	1	Text	"None" "Geographic Names Information System" Free text
1.6.2.2	Place Keyword	The geographic name of a location covered by a data set	M	N	Text	Free text

Line #	Name	Definition	Obligation	MO	Data Type	Domain
1.7	Access Constraints	Restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data set	M	1	Text	"None" Free text
1.8	Use Constraints	Restrictions and legal prerequisites for using the data set after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the data set	M	1	Text	"None" Free text
1.9	Point of Contact	Contact information for an individual or organization that is knowledgeable about the data set	O	1	Compound	Line 10.0
2	Data Quality Information	A general assessment of the quality of the data set (Recommendations on information to be reported and tests to be performed are found in "Spatial Data Quality" which is chapter 3 of part 1 in Department of Commerce, 1992, Spatial Data Transfer Standard)	C - when data quality information is available for the data set	1	Compound	Lines 2.1-2.5.2.3
2.1	Attribute Accuracy	An assessment of the accuracy of the identification of entities and assignment of attribute values in the data set	C - when attribute accuracy quality information is available for the data set	1	Compound	Line 2.1.1
2.1.1	Attribute Accuracy Report	An explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the tests used	M	1	Text	Free text
2.2	Logical Consistency Report	An explanation of the fidelity of relationships in the data set and tests used	M	1	Text	Free text
2.3	Completeness Report	Information about omissions, selection criteria, generalization, definitions used, and other rules used to derive the data set	M	1	Text	Free text
2.4	Positional Accuracy	An assessment of the accuracy of the positions of spatial objects	C - when positional accuracy quality information is available for the data set	1	Compound	Lines 2.4.1-2.4.2.1

Line #	Name	Definition	Obligation	MO	Data Type	Domain
2.4.1	Horizontal Positional Accuracy	An estimate of accuracy of the horizontal positions of the spatial objects	C - when horizontal positional accuracy quality information is available for the data set	1	Compound	Line 2.4.1.1
2.4.1.1	Horizontal Positional Accuracy Report	An explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used	M	1	Text	Free text
2.4.2	Vertical Positional Accuracy	An estimate of accuracy of the vertical positions in the data set	C - when vertical positional accuracy quality information is available for the data set	1	Compound	Line 2.4.2.1
2.4.2.1	Vertical Positional Accuracy Report	An explanation of the accuracy of the vertical coordinate measurements and a description of the tests used	M	1	Text	Free text
2.5	Lineage	Information about the events, parameters, and source data which constructed the data set, and information about the responsible parties	M	1	Compound	Lines 2.5.1-2.5.2.3
2.5.1	Source Information	List of sources and a short discussion of the information contributed by each	C - if source information is known and relevant to the quality	N	Compound	Lines 2.5.1-2.5.1.6
2.5.1.1	Source Citation	Reference for a sources data set	M	1	Compound	Line 8.0
2.5.1.3	Type of Source Media	The medium of the source data set	M	1	Text	"paper" "stable-base material" "microfiche" "microfilm" "audiocassette" "chart" " filmstrip" "transparency" "videocassette" "videodisc" "videotape" "physical model" "computer program" "disc" "cartridge tape" "magnetic tape" "online" "CD-ROM" "electronic b
2.5.1.4	Source Time Period of Content	Time period(s) for which the source data set corresponds to the ground	M	1	Compound	Lines 2.5.1.4.1, 9.0
2.5.1.4.1	Source Currentness Reference	The basis on which the source time period of content information of the data is determined	M	1	Text	"ground condition" "publication date" Free text

Line #	Name	Definition	Obligation	MO	Data Type	Domain
3.3.1.1	SDTS Point and Vector Object Type	Name of point and vector spatial objects used to locate zero-, one- and two-dimensional spatial locations in the data set	M	1	Text	(The domain is from "Spatial Data Concepts," which is Chapter 2 of Part 1 in Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washingotn, Department of Commerce, National Institute of Standands and Technology): "Point" "Entity point" "Label point" "Area point" "Node, planar graph" "Node, network" "String" "Link" "Complete chain" "Area chain" "Network chain, planar graph" "Network chain, nonplanar graph" "Circular arc, three point center" "Elliptical arc" "Uniform B-spline" "Piecewise Bezier" "Ring with mixed composition" "Ring composed of strings" "Ring composed of chains" "Ring composed of arcs" "G-polygon" "GT-polygon composed of rings" "GT-polygon composed of chains" "Void polygon composed of rings" "Void polygon composed of chains"
3.3.1.2	Point and Vector Object Count	The total number of the point or vector object type occurring in the data set	O	1	Integer	Point and Vector Object Count > 0
3.3.2	VPF Terms Description	Point and vector object information using the terminology and concepts from Department of Defense, 1992, Vector Product Format (MIL-STD-600006): Philadelphia, Department of Defense, Defense Printing Service Detachment Office. (Note that this reference to the VPF is used ONLY to provide a set of terminology for the point and vector objects.)	M	1	Compound	Lines 3.3.2.1-3.3.2.2.1
3.3.2.1	VPF Topology Level	The completeness of the topology carried by the data set	M	1	Text	0 <= VPF Topology Level <= 3
3.3.2.2	VPF Point and Vector Object Information	Information about VPF point and vector objects	M	N	Compound	Line 3.3.2.2.1
3.3.2.2.1	VPF Point and Vector Object Type	Name of point and vector spatial objects used to locate zero-, one- and two-dimensional spatial locations in the data set	M	1	Text	(The domain is from Department of Defense, 1992, Vector Product Format (MIL-STD-600006): Philadelphia, Department of Defense, Defense Printing Service Detachment Office): "Node" "Edge" "Face" "Text"

Line #	Name	Definition	Obligation	MO	Data Type	Domain
4	Spatial Reference Information	The description of the reference frame for, and the means to encode, coordinates in the data set	C - if the reference frame of coordinates and/or coordinate encoding means is known	1	Compound	Lines 4.1-4.2.2.4
4.1	Horizontal Coordinate System Definition	The reference frame or system from which linear or angular quantities are measured and assigned to the position that a point occupies	C - if the reference frame of horizontal coordinates and/or the horizontal coordinate encoding means is known	1	Compound	Lines 4.1.1-4.1.4.4
4.1.1 OR 4.1.2 OR 4.1.3			M (one option must be selected)			Lines 4.1.1.1-4.1.1.3 OR 4.1.2.1-4.1.2.4.4 OR 4.1.3.1-4.1.3.2
4.1.1	Geographic	The quantities of latitude and longitude which define the position of a point on the Earth's surface with respect to a reference spheroid	M	1	Compound	Lines 4.1.1.1-4.1.1.3
4.1.1.1	Latitude Resolution	The minimum difference between two adjacent latitude values expressed in Geographic Coordinate Units of measure	M	1	Real	Latitude Resolution > 0.0
4.1.1.2	Longitude Resolution	The minimum difference between two adjacent longitude values expressed in Geographic Coordinate Units of measure	M	1	Real	Longitude Resolution > 0.0
4.1.1.3	Geographic Coordinate Units	Units of measure used for the latitude and longitude values	M	1	Text	"decimal degrees" "decimal minutes" decimal seconds" "degrees and decimal minutes" "degrees, minutes, and decimal seconds" "radians" "grads"
4.1.2	Planar	The quantities of distances, or distances and angles, which define the position of a point on a reference plane to which the surface of the Earth has been projected	M	N	Compound	Lines 4.1.2.1-4.1.2.1.1
4.1.2.1 OR 4.1.2.2 OR 4.1.2.3			M (one option must be selected)			Lines 4.1.2.1.1 OR 4.1.2.2.1 OR 4.1.2.3.1-4.1.2.4.4
4.1.2.1	Map Projection	The systematic representation of all or part of the surface of the Earth on a plane or developable surface	M	1	Compound	Lines 4.1.2.1.1

Line #	Name	Definition	Obligation	MO	Data Type	Domain
4.1.2.1.1	Map Projection Name	Name of the map projection	M	1	Text	"Albers Conical Equal Area" "Azimuthal Equidistant" "Equidistant Conic" "Equirectangular" "General Vertical Near-Sided Perspective" "Gnomonic" "Lampert Azimuthal Equal Area" "Lambert Conformal Conic" "Mercator" "Modified Stereographic for Alaska" "Miller
4.1.2.2	Grid Coordinate System	A plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection so that geographic positions can be readily transformed to and from plane coordinates	M	1	Compound	Line 4.1.2.2.1
4.1.2.2.1	Grid Coordinate System Name	Name of the grid coordinate system	M	1	Text	"Universal Transverse Mercator" "State Plane Coordinate System 1927" "State Plane Coordinate System 1983" "ARC Coordinate System" "other grid system"
4.1.2.3	Local Planar	Any right-handed planar coordinate system of which the z-axis coincides with a plumb line through the origin that locally is aligned with the surface of the Earth	M	1	Compound	Lines 4.1.2.3.1-4.1.2.3.2
4.1.2.3.1	Local Planar Description	A description of the local planar system	M	1	Text	Free text
4.1.2.3.2	Local Planar Georeference Information	A description of the information provided to register the local planar system to the Earth (e.g., control points, satellite ephemeral data, inertial navigation data)	M	1	Text	Free text
4.1.2.4	Planar Coordinate Information	Information about the coordinate system developed on the planar surface	M	1	Compound	Lines 4.1.2.4.1
4.1.2.4.1	Planar Coordinate Encoding Method	The means used to represent horizontal positions	M	1	Text	"coordinate pair" "distance and bearing" "row and column"
4.1.2.4.2 OR 4.1.2.4.3			M (one option must be selected)			Lines 4.1.2.4.2.1-4.1.2.4.2.2 OR 4.1.2.4.3.1-4.1.2.4.3.5
4.1.2.4.2	Coordinate Representation	The method of encoding the position of a point by measuring its distance from perpendicular reference axes (the "coordinate pair" and "row and column" methods)	M	1	Compound	Lines 4.1.2.4.2.1-4.1.2.4.2.2
4.1.2.4.2.1	Abscissa Resolution	The (nominal) minimum distance between the "x" or column values of two adjacent points, expressed in Planar Distance Units of measure	M	1	Real	Abscissa Resolution> 0.0
4.1.2.4.2.2	Ordinate Resolution	The (nominal) minimum distance between the "y" or row values of two adjacent points, expressed in Planar Distance Units of measure	M	1	Real	Ordinate Resolution > 0.0
4.1.2.4.3	Distance and Bearing Representation	A method of encoding the position of a point by measuring its distance and direction (azimuth angle) from another point	M	1	Compound	Lines 4.1.2.4.3.1-4.1.2.4.3.5

Line #	Name	Definition	Obligation	MO	Data Type	Domain
4.1.2.4.3.1	Distance Resolution	The minimum distance measurable between two points, expressed Planar Distance Units of measure	M	1	Real	Distance Resolution > 0.0
4.1.2.4.3.2	Bearing Resolution	The minimum angle measurable between two points, expressed in Bearing Units of measure	M	1	Real	Bearing Resolution > 0.0
4.1.2.4.3.3	Bearing Units	Units of measure used for angles	M	1	Text	"Decimal degrees" "Decimal minutes" " Decimal Seconds" "Degrees and decimal minutes" "Degrees, minutes, and decimal seconds" "Radians" "Grads"
4.1.2.4.3.4	Bearing Reference Direction	Direction from which the bearing is measured	M	1	Text	"North" "South"
4.1.2.4.3.5	Bearing Reference Meridian	Axis from which the bearing is measured	M	1	Text	"Assumed" "Grid" "Magnetic" "Astronomic" "Geodetic"
4.1.2.4.4	Planar Distance Units	Units of measure used for distances	M	1	Text	"meters" "international feet" "survey feet" Free text
4.1.3	Local	A description of any coordinate system that is not aligned with the surface of the Earth	M	1	Compound	Lines 4.1.3.1-4.1.3.2
4.1.3.1	Local Description	A description of the coordinate system and its orientation to the surface of the Earth	M	1	Text	Free text
4.1.3.2	Local Georeference Information	A description of the information provided to register the local system to the Earth (e.g., control points, satellite ephemeral data, inertial navigation data)	M	1	Text	Free text
4.1.4	Geodetic Model	Parameters for the shape of the earth	C - if the geodetic model for the coordinates in the dataset is known	1	Compound	Lines 4.1.4 - 4.1.4.4
4.1.4.1	Horizontal Datum Name	The identification given to the reference system used for defining the coordinates of points	C - if the horizontal datum for the coordinates in the dataset is known	1	Text	"North American Datum of 1927" "North American Datum of 1983" Free text
4.1.4.2	Ellipsoid Name	Identification given to established representations of the Earth's shape	M	1	Text	"Clarke 1866" "Geodetic Reference System 80" Free text
4.1.4.3	Semi-Major Axis	Radius of the equatorial axis of the ellipsoid	M	1	Real	Semi-major Axis > 0.0

Line #	Name	Definition	Obligation	MO	Data Type	Domain
4.1.4.4	Denominator of Flattening Ratio	The denominator of the ratio of the difference between the equatorial and polar radii of the ellipsoid when the numerator is set to 1	M	1	Real	Denominator of Flattening > 0.0
4.2	Vertical Coordinate System Definition	The reference frame or system from which vertical distances (altitude or depths) are measured	C - if vertical reference frame or system for the coordinates in the dataset is known	1	Compound	Lines 4.2.1-4.2.2.4
4.2.1	Altitude System Definition	The reference frame or system from which altitudes (elevations) are measured. The term "altitude" is used instead of the common term "elevation" to conform to the terminology in Federal Information Processing Standards 70-1 and 173	C - if altitude reference frame or system for the coordinates is known	1	Compound	Lines 4.2.1.1-4.2.1.4
4.2.1.1	Altitude Datum Name	The identification given to the surface taken as the surface of reference from which altitudes are measured	M	1	Text	"National Geodetic Vertical Datum of 1929" "North American Vertical Datum of 1988" Free text
4.2.1.2	Altitude Resolution	The minimum distance possible between two adjacent altitude values, expressed in Altitude Distance Units of measure	M	N	Real	Altitude Resolution > 0.0
4.2.1.3	Altitude Distance Units	Units in which altitudes are recorded	M	1	Text	"meters" "feet" Free text
4.2.1.4	Altitude Encoding Method	The means used to encode the altitudes	M	1	Text	"Explicit elevation coordinate included with horizontal coordinates" "Implicit coordinate" "Attribute values"
4.2.2	Depth System Definition	The reference frame or system from which depths are measured	C - if depth reference frame or system for the coordinates is known	1	Compound	Lines 4.2.2.1-4.2.2.4
5.1.1.2	Entity Type Definition	The description of the entity type	M	1	Text	Free text
5.1.1.3	Entity Type Definition Source	The authority of the definition	M	1	Text	Free text

Line #	Name	Definition	Obligation	MO	Data Type	Domain
4.2.2.1	Depth Datum Name	The identification given to surface of reference from which depths are measured	M	1	Text	"Local surface" "Chart datum; datum for sounding reduction" "Lowest astronomical tide" "Highest astronomical tide" "Mean low water" "Mean high water" "Mean sea level" "Land survey datum" "Mean low water springs" "Mean high water springs" "Mean low water neap" "Mean high water neap" "Mean lower low water" "Mean lower low water springs" "Mean higher high water" "Mean higher low water" "Mean lower hight water" "Spring tide" "Tropic lower low water" "Neap tide" "High water" "Higher high water" "Low water" "Low-water datum" "Lowest low water" "Lower low water" "Lowest normal low water" "Mean tide level" "Indiann sproing low water" "High-water full and charge" "Low-water full and charge" "Columbia River datum" "Gulf Coast low water daturm" "Equatorial springs low water" "Approximate lowest astronomical tide" "No correction" free text
4.2.2.2	Depth Resolution	The minimum distance possible between two adjacent depth values, expressed in Depth Distance Units of measure	M	N	Real	Depth Resolution > 0.0
4.2.2.3	Depth Distance Units	Units in which depths are recorded	M	1	Text	"meters" "feet" Free text
4.2.2.4	Depth Encoding Method	The means used to encode depths	M	1	Text	"Explicit depth coordinate included with horizontal coordinates" "Implicit coordinate" "Attribute values"
5	Entity and Attribute Information	Details about the information content of the data set, including the entity types, their attributes, and the domains from which attribute values may be assigned	C - if entity type, entity attribute, and attribute value domains are used in the data set	1	Compound	Lines 5.1-5.2.2
5.1 AND/OR 5.2			M (one option must be selected)		Compound	Lines 5.1.1-5.1.1.3 AND/OR 5.2.1-5.2.2
5.1	Detailed Description	Description of the entities, attributes, attribute values, and related characteristics encoded in the data set	M	N	Compound	Lines 5.1.1-5.1.1.3
5.1.1	Entity Type	The definition and description of a set into which similar entity instances are classified	M	1	Compound	Lines 5.1.1.1-5.1.1.3
5.1.1.1	Entity Type Label	The name of the entity	M	1	Text	Free text
5.1.1.2	Entity Type Definition	The description of the entity type	M	1	Text	Free text

Line #	Name	Definition	Obligation	MO	Data Type	Domain
5.1.1.3	Entity Type Definition Source	The authority of the definition	M	1	Text	Free text
5.2	Overview Description	Summary of, and citation to detailed description of, the information content of the data set	M	N	Compound	Lines 5.2.1-5.2.2
5.2.1	Entity and Attribute Overview	Detailed summary of the information contained in a data set	M	1	Text	Free text
5.2.2	Entity and Attribute Detail Citation	Reference to the complete description of the entity types, attributes, and attribute values for the data set	M	N	Text	Free text
6	Distribution Information	Information about the distributor of and options for obtaining the data set	C - if information about data set distribution is available or known	N	Compound	Lines 6.1-6.4.3
6.1	Distributor	The party from whom the data set may be obtained	M	1	Compound	Line 10.0
6.3	Distribution Liability	Statement of the liability assumed by the distributor	M	1	Text	Free text
6.4	Standard Order Process	The common ways in which the data set may be obtained or received, and related instructions and fee information	C - if order process exists and is known	N	Compound	Lines 6.4.2-6.4.3
6.4.1 OR 6.4.2			M (one option must be selected)		Compound	Lines 6.4.1 OR 6.4.2.2.1.1.1.1
6.4.1	Non-Digital Form	The description of options for obtaining the data set on non-computer-compatible media	M	1	Text	Free text
6.4.2	Digital Form	The description of options for obtaining the data set on computer-compatible media	M	N	Text	Free text
6.4.2.1	Digital Transfer Information	Description of the form of the data to be distributed	M	1	Compound	Line 6.4.2.1.1
6.4.2.1.1	Format Name	The name of the data transfer format	M	1	Text	"ARCE" "ARCG" "ASCII" "BIL" "BIP" "BSQ" "CDF" "CFF" "COORD" "DEM" "DFAD" "DGN" "DIGEST" "DLG" "DTED" "DWG" "DX90" "DXF" "ERDAS" "GRASS" "HDF" "IGDS" "IGES" "MOSS" "netCDF" "NITF" "RPF" "RVC" "FVG" "SDTS" "SIF" "SLF" TIFF" "TGRLN' "VPT" Free text
6.4.2.2	Digital Transfer Option	The means and media by which a data set is obtained from the distributor	M	N	Compound	Lines 6.4.2.2.1-6.4.2.2.1.1.1.1
6.4.2.2.1	Online Option	Information required to directly obtain the data set electronically	M	1	Compound	Lines 6.4.2.2.1.1-6.4.2.2.1.1.1.1
6.4.2.2.1.1	Computer Contact Information	Instructions for establishing communications with the distribution computer	M	N	Compound	Lines 6.4.2.2.1.1.1-6.4.2.2.1.1.1.1
6.4.2.2.1.1.1	Network Address	The electronic address from which the data set can be obtained from the distribution computer.	M	1	Compound	Line 6.4.2.2.1.1.1.1
6.4.2.2.1.1.1.1	Network Resource Name	The name of the file or service from which the data set can be obtained	M	N	Text	Free text

Line #	Name	Definition	Obligation	MO	Data Type	Domain
6.4.3	Fees	The fees and terms for retrieving the data set	M	1	Text	Free text
7	Metadata Reference Information	Information on the currentness of the metadata information, and the responsible party	M	1	Compound	Lines 7.1-7.6
7.1	Metadata Date	The date that the metadata were created or last updated	M	1	Date	free date
7.2	Metadata Review Date	The date of the latest review of the metadata entry	O	1	Date	free date; Metadata Future Review Date later than Metadata Date
7.4	Metadata Contact	The party responsible for the metadata information	M	1	Compound	Line 10.0
7.5	Metadata Standard Name	The name of the metadata standard used to document the data set	M	1	Text	"FGDC Content Standard for Digital Geospatial Metadata" Free text
7.6	Metadata Standard Version	Identification of the version of the metadata standard used to document the data set	M	1	Text	Free text
8	Citation Information	The recommended reference to be used for the data set (Note: this section provides a means of stating the citation of a data set, and is used by other sections of the metadata standard. This section is never used alone.)	M	1	Compound	Lines 8.1-8.10
8.1	Originator	The name of the organization or individual that developed the data set. If the name of editors or compilers are provided, the name must be followed by "(ed.)" or "(comp.)" respectively	M	N	Text	"Unknown" Free text
8.2	Publication Date	The date when the data set is published or otherwise made available for release	M	1	Date	"Unknown" "Unpublished material" free date
8.4	Title	The name by which the data set is known	M	1	Text	Free text
8.8	Publication Information	Publication details for published data sets	C if the data set is published	1	Compound	Lines 8.81-8.82
8.8.1	Publication Place	the name of the city (and state or province, and country, if needed to identify the city) where the data set was published or released	M	1	Text	Free text
8.8.2	Publisher	the name of the individual or organization that published the data set	M	1	Text	Free text
8.10	Online Linkage	The name of an online computer resource that contains the data set. Entries should follow the Uniform Resource Locator convention of the Internet	O	1	Text	Free text
9	Time Period Information	Information about the date and time of an event. (Note: this section provides a means of stating temporal information, and is used by other sections of the metadata standard. This section is never used alone.)	M	1	Compound	Lines 9.1-9.3.3
9.1 OR 9.2 OR 9.3			M (one option must be selected)			Lines 9.1.1 OR 9.1-9.1.1 OR 9.3.1-9.3.3

Line #	Name	Definition	Obligation	MO	Data Type	Domain
9.1	Single Date/Time	Means of encoding a single date and time	M	1	Compound	Line 9.1.1
9.1.1	Calendar Date	The year (and optionally month, or month and day)	M	1	Date	"Unknown" free date
9.2	Multiple Dates/Times	Means of encoding multiple individual dates and times	M	N	Compound	Lines 9.1-9.1.1
9.3	Range of Dates/Times	Means of encoding a range of dates and times	M	1	Compound	Lines 9.3.1-9.3.3
9.3.1	Beginning Date	The first year (and optionally month, or month and day) of the event	M	1	Date	"Unknown" free date
9.3.3	Ending Date	The last year (and optionally month, or month and day) for the event	M	1	Date	"Unknown" free date
10	Contact Information	Identity of, and means to communicate with, person(s) and organization(s) associated with the data set (Note: this section provides a means of identifying individuals and organizations, and is used by other sections of the metadata standard. This section is never used alone.)	M	1	Compound	Lines 10.1-10.8
10.1 OR 10.2			M (one option must be selected)			Lines 10.1.1-10.1.2 OR 10.1.2
10.1	Contact Person Primary	The person, and the affiliation of the person, associated with the data set. Used in cases where the association of the person to the data set is more significant than the association of the organization to the data set.	M	1	Compound	Lines 10.1.1-10.1.2
10.1.1	Contact Person	The name of the individual to which the contact type applies	M	1	Text	Free text
10.1.2	Contact Organization	The name of the organization to which the contact type applies	O	1	Text	Free text
10.2	Contact Organization Primary	The organization, and the member of the organization, associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set	M	1	Compound	Line 10.1.2
10.1.2	Contact Organization	The name of the organization to which the contact type applies	M	1	Text	Free text
10.1.1	Contact Person	The name of the individual to which the contact type applies	O	1	Text	Free text

Line #	Name	Definition	Obligation	MO	Data Type	Domain
10.3	Contact Position	The title of the individual	O	1	Text	Free text
10.4	Contact Address	The address for the organization or individual	M	N	Compound	Lines 10.4.1-10.4.6
10.4.1	Address Type	The information provided by the address	M	1	Text	"mailing" "physical" "mailing and physical", Free text
10.4.2	Address	An address line for the address	C - if the contact address is mailing type	N	Text	Free text
10.4.3	City	The city of the address	M	1	Text	Free text
10.4.4	State or Province	The State or province of the address	M	1	Text	Free text
10.4.5	Postal Code	The ZIP or other postal code of the address	M	1	Text	Free text
10.4.6	Country	The country of the address	O	1	Text	Free text
10.5	Contact Voice Telephone	The telephone number by which individuals can speak to the organization or individual	M	N	Text	Free text
10.7	Contact Facsimile Telephone	The telephone number of a facsimile machine of the organization or individual	O	N	Text	Free text
10.8	Contact Electronic Mail Address	The address of the electronic mailbox of the organization or individual	O	N	Text	Free text

Annex G
(informative)

Diagram of governmental unit boundary dataset description characteristics

Annex G (informative) is a graphic depiction of the organization and hierarchy of data elements and compound elements that define the information content for a governmental unit boundary. All compound elements are described by data elements; data elements are the primitive items of data.

Governmental unit boundary data description characteristic components, or GU Information, are presented in three sections: References, GU Type Information and GU Instance Information. Subsections within each section contain the compound elements and data elements, each of which have six distinct characteristics as defined in 7.2.1: name, definition, domain values, obligation/condition, maximum occurrence and data type.

This annex illustrates the GU Information nonspecifically, by name, obligation, and maximum occurrence. The format for governmental unit description begins with the most generalized compound element and moves inward towards the more specific data elements. Both compound elements and data elements may be excluded if the obligation/condition is optional, or the conditions specified for the element are not met. Annex G is to be used in conjunction with Annex H (informative), the tabular depiction of the governmental unit boundary dataset description characteristic components. The numbers in the lower right corner of the data element depiction refers to its line number in Annex H. Repeatable refers to the possible multiple occurrence of the element, described as maximum occurrence in Annex H.

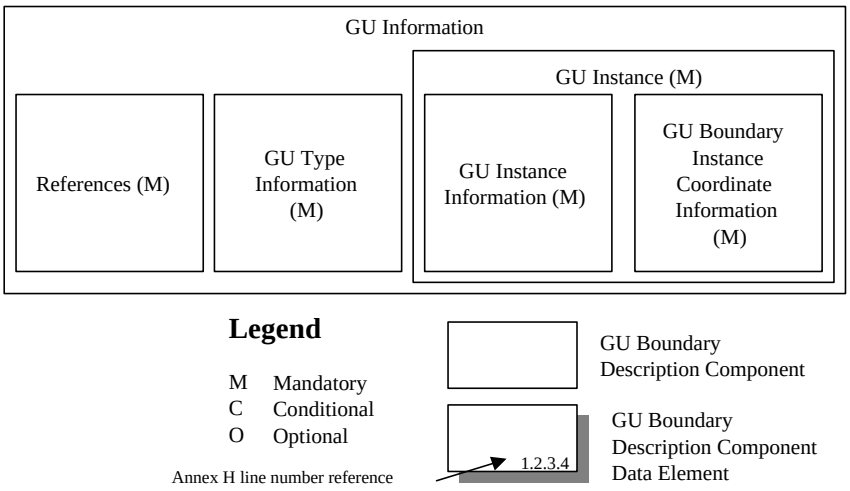


Figure G.1

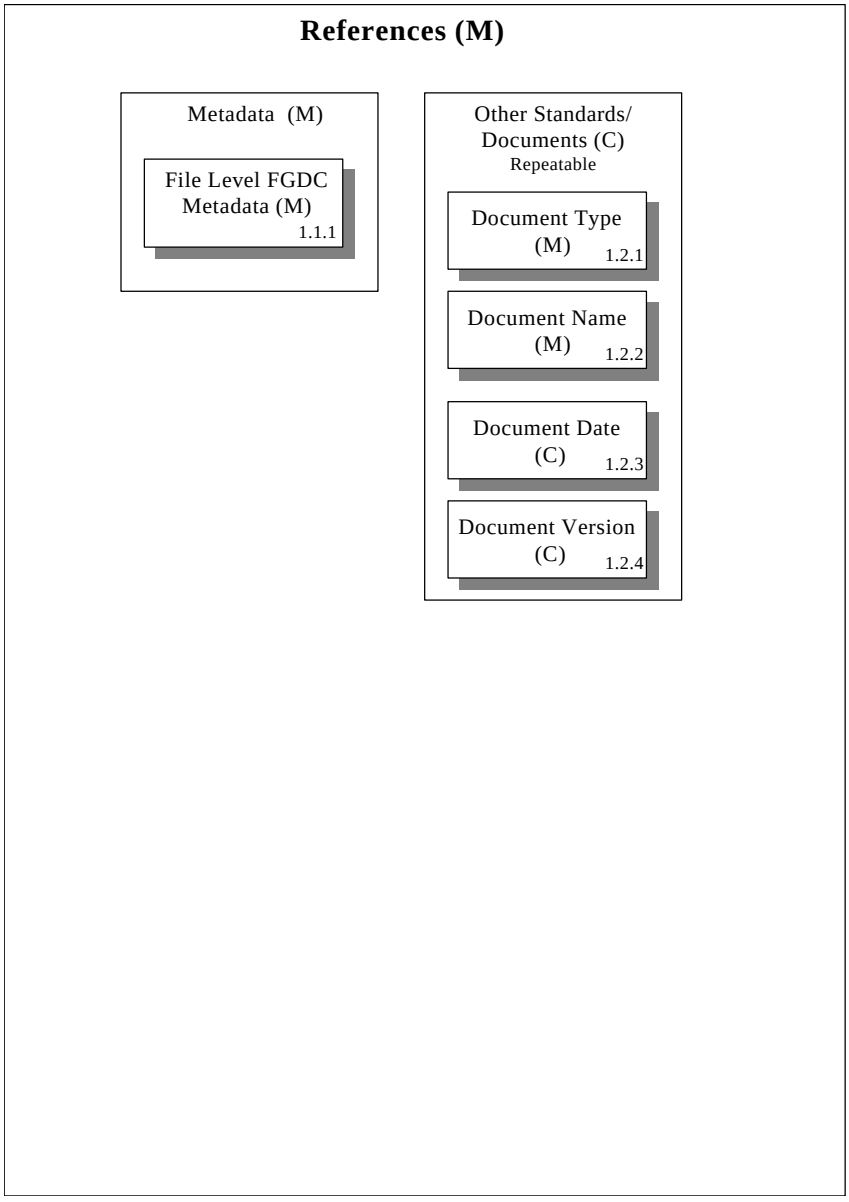

References (M)
Metadata (M)
File Level FGDC Metadata (M)
1.1.1
Other Standards/ Documents (C)
Repeatable
Document Type (M)
1.2.1
Document Name (M)
1.2.2
Document Date (C)
1.2.3
Document Version (C)
1.2.4

Figure G.2

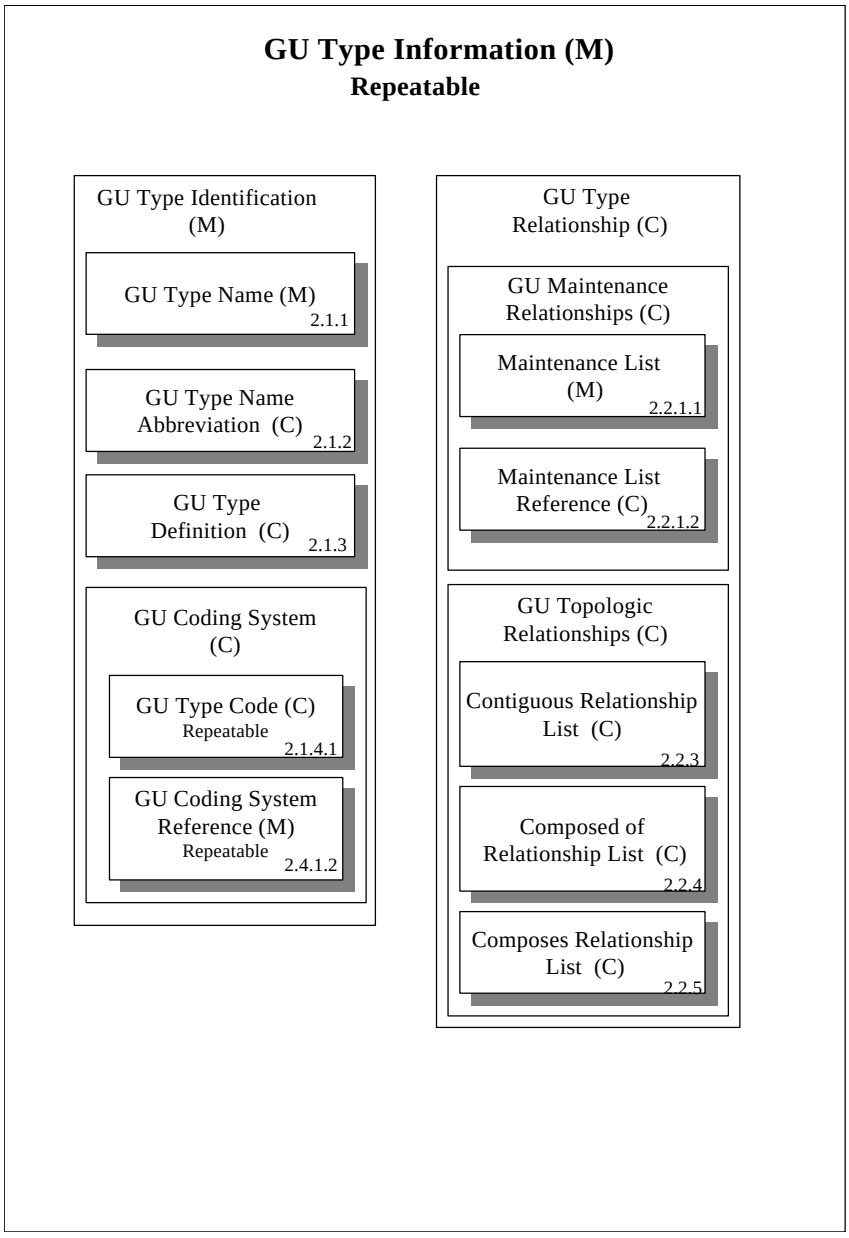

GU Type Information (M)
Repeatable
GU Type Identification (M)
GU Type Name (M)
2.1.1
GU Type Name Abbreviation (C)
2.1.2
GU Type Definition (C)
2.1.3
GU Coding System (C)
GU Type Code (C)
Repeatable
2.1.4.1
GU Coding System Reference (M)
Repeatable
2.4.1.2
GU Type Relationship (C)
GU Maintenance Relationships (C)
Maintenance List (M)
2.2.1.1
Maintenance List Reference (C)
2.2.1.2
GU Topologic Relationships (C)
Contiguous Relationship List (C)
2.2.3
Composed of Relationship List (C)
2.2.4
Composes Relationship List (C)
2.2.5

Figure G.3

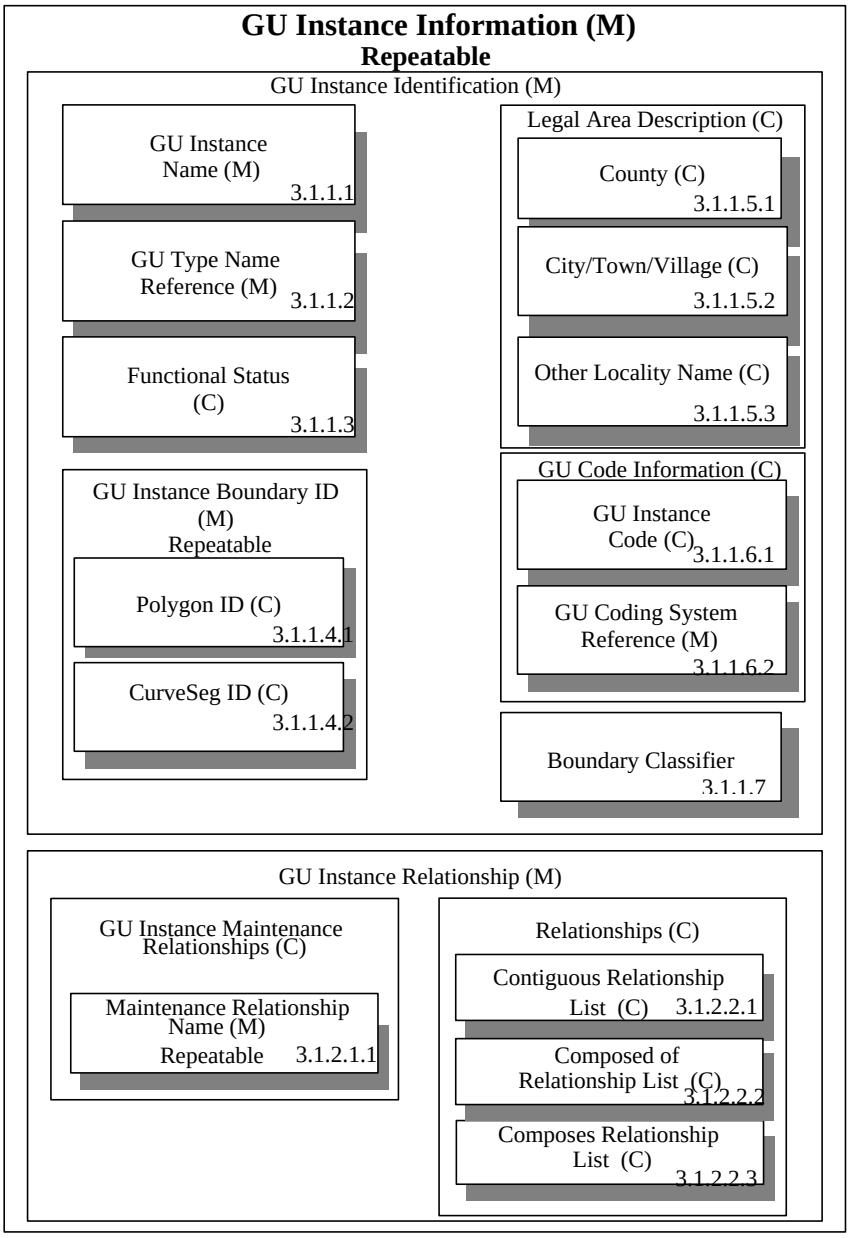
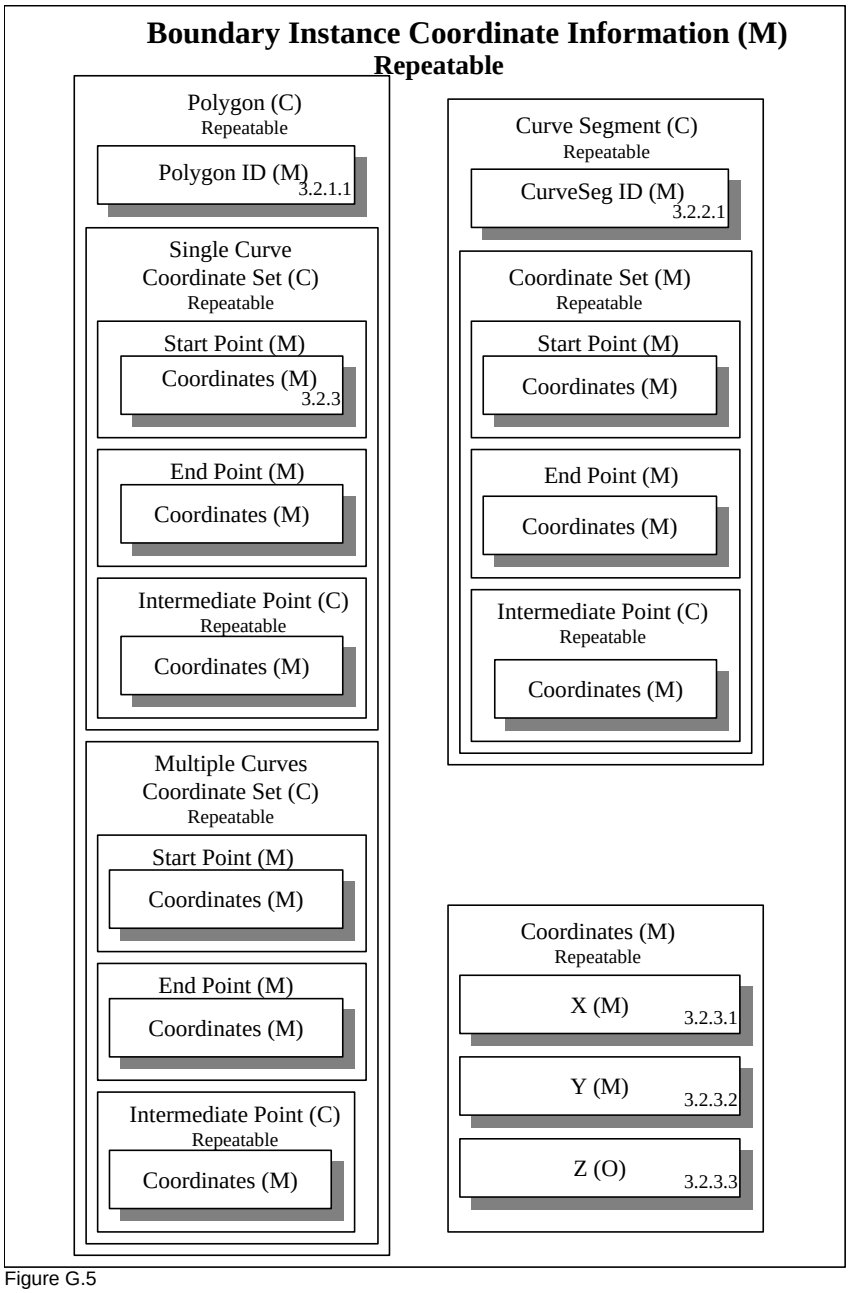

GU Instance Information (M)
Repeatable
GU Instance Identification (M)
GU Instance Name (M) 3.1.1.1
GU Type Name Reference (M) 3.1.1.2
Functional Status (C) 3.1.1.3
GU Instance Boundary ID (M) Repeatable
Polygon ID (C) 3.1.1.4.1
CurveSeg ID (C) 3.1.1.4.2
Legal Area Description (C)
County (C) 3.1.1.5.1
City/Town/Village (C) 3.1.1.5.2
Other Locality Name (C) 3.1.1.5.3
GU Code Information (C)
GU Instance Code (C) 3.1.1.6.1
GU Coding System Reference (M) 3.1.1.6.2
Boundary Classifier 3.1.1.7
GU Instance Relationship (M)
GU Instance Maintenance Relationships (C)
Maintenance Relationship Name (M) Repeatable 3.1.2.1.1
Relationships (C)
Contiguous Relationship List (C) 3.1.2.2.1
Composed of Relationship List (C) 3.1.2.2.2
Composes Relationship List (C) 3.1.2.2.3

Figure G.4


Boundary Instance Coordinate Information (M)
Repeatable
Polygon (C)
Repeatable
Polygon ID (M)
3.2.1.1
Single Curve
Coordinate Set (C)
Repeatable
Start Point (M)
Coordinates (M)
3.2.3
End Point (M)
Coordinates (M)
Intermediate Point (C)
Repeatable
Coordinates (M)
Multiple Curves
Coordinate Set (C)
Repeatable
Start Point (M)
Coordinates (M)
End Point (M)
Coordinates (M)
Intermediate Point (C)
Repeatable
Coordinates (M)
Curve Segment (C)
Repeatable
CurveSeg ID (M)
3.2.2.1
Coordinate Set (M)
Repeatable
Start Point (M)
Coordinates (M)
End Point (M)
Coordinates (M)
Intermediate Point (C)
Repeatable
Coordinates (M)
Coordinates (M)
Repeatable
X (M)
3.2.3.1
Y (M)
3.2.3.2
Z (O)
3.2.3.3
Figure G.5

Annex H
(informative)

Table of governmental unit boundary dataset description characteristics

Annex H (informative) describes the requisite information necessary to exchange governmental unit and other legal entity boundary data. Definitions for the terminology describing the characteristics of the data are provided in 7.2.1.

To implement Annex H, one shall follow the line numbers in sequence and consult the obligation/condition (O/C) to determine if the component is mandatory (M), conditional (C) and its conditions are met, or if it is optional (O). Once it is determined that the component is required for governmental unit boundary documentation through its definition and obligation/condition, refer to the domain which describes the valid values that can be assigned to the data element. If the component is a compound element, the domain will specify the lines of data elements to include. If the component is a compound element, the line will be shaded, the domain will specify the appropriate lines for the component, and the data type will specify 'compound'. For data elements the characteristic data type describes the kind of value to be provided, e.g. integer, real, text. The maximum occurrence (MO) will specify if the element shall only be recorded one time (1) or if the element is repeatable from one to many times (N).

Line #	Name	Definition/Content	Domain	O/C	MO	Data Type
1	References	Relevant documentation to the GU dataset	Lines 1.1 - 1.2.4	M	1	Compound
1.1	Metadata	Documentation that describes the content, quality, condition, and other characteristics of data	Line 1.1.1	M	1	Compound
1.1.1	File Level FGDC Metadata	Metadata information for the GU dataset as determined in the Standard	Annex D	M	1	Text/Real
1.2	Other Standards/ Documents	Standards and other relevant documents referenced when documenting the GU dataset	Lines 1.2.1 - 1.2.5	C- if other standards or documents are used in GU boundary documentation	N	Compound
1.2.1	Document Type	Description of the type of document referenced	Standard, Document, Free Text	M	1	Text
1.2.2	Document Name	Name of document referenced	Free Text	M	1	Text
1.2.3	Document Date	Date of document referenced	Free Date	C - if date is known	1	Real
1.2.4	Document Version	Version number of document referenced	Free text	C - if version is known	1	Text
2	GU Type Information	Information describing the type of GU whose data are being described	Lines 1.1 - 1.3.1	M	1	Compound

2.1	GU Type Identification	Specific identification information describing the type of GU whose data are being described	Lines 1.1.1 -1.1.4	M	1	Compound
2.1.1	GU Type Name	The designated name for the type of GU whose data are being described	Terms in Section 4.1.1, Annex E, Annex F, Free Text	M	1	Text
2.1.2	GU Type Name Abbreviation	The abbreviated name for the type of GU whose data are being described	Free Text	C - if an abbreviation exists for GU Type Name	1	Text
2.1.3	GU Type Definition	Definition of the type of GU whose data are being described	Definitions in Section 4.1.1, Annex E, Free Text	C - if the GU Type Name and GU Type Definition are known	1	Text
2.1.4	GU Coding System	The coding system which identifies the GU being described	Lines 2.1.4.1 - 2.1.4.2	C - if a coding system exists	1	Compound
2.1.4.1	GU Type Code	The specific code which identifies the GU being described	Free Number	C - if a type code exists	N	Text/Real
2.1.4.2	GU Coding System Reference	GU Type Code reference documentation	FIPS Code, Free Text, Free Number	M	1	Text/Real
2.2	GU Type Relationship	Information describing one or more relationships the GU being described shares with other GUs	Lines 2.2.1 - 2.2.2.3	C - if one or more type relationships exist	1	Compound
2.2.1	GU Maintenance Relationships	Common areal information between one or more GUs or legal entities and geographic area features	Lines 2.2.1.1 - 2.2.1.2	C - if one or more maintenance relationships exist for the GU being documented	N	Compound
2.2.1.1	Maintenance List	List of maintenance relationships for the GU type being described	Free Text	C - if a maintenance list exists	N	Text
2.2.1.2	Maintenance List Reference	The maintenance relationship list reference document	Free Text	M	N	Text
2.2.2	GU Topologic Relationships	Conditional or characteristic relationships that apply to GUs and legal entities	Lines 2.2.2.1 - 2.2.2.3	C - if one or more topologic relationships exist for the GU being documented	1	Compound
2.2.2.1	Contiguous Relationship List	List of GUs or feature objects that are either adjacent to one another, touch at a common point, or share a boundary	Free Text	C - if one or more contiguous relationships exist	N	Text
2.2.2.2	Composed of Relationship List	List of GUs or feature objects that constitute the GU being documented	Free Text	C - if one or more composed of relationships exist	N	Text

2.2.2.3	Composes Relationship List	List of GUs of which the GU being documented always forms a part	Free Text	C - if one or more composes relationships exist	N	Text
3	GU Instance	Single representation of a GU feature	Lines 3.1 - 3.2.3.3	M	N	Compound
3.1	GU Instance Information	Information describing the single representation of the feature type, or specific GU documented	Lines 3.1.1 - 3.2.2.3	M	N	Compound
3.1.1	GU Instance Identification	Identification of the single representation of the feature type, or specific GU described	Lines 3.1.1.1 - 3.1.6.2	M	1	Compound
3.1.1.1	GU Instance Name	Name of the GU instance	Free Text	M	1	Text
3.1.1.2	GU Type Name Reference	Reference to the GU type name	Line 2.1.1	M	1	Text
3.1.1.3	Functional Status	Administrative or legal activities associated with performing the legally prescribed functions of a governmental unit or legal entity	nonfunctioning, active, inactive	C - if functional status is known	1	Text
3.1.1.4	GU Instance Boundary ID	Specific identifier assigned to a GU boundary instance	Lines 3.1.1.4.1 - 3.1.4.2	M	1	Compound
3.1.1.4.1	Polygon ID	Unique identifier assigned to the boundary polygon	Free text, Free number	C - if boundary is expressed as a polygon	1	Text/Real
3.1.1.4.2	CurveSegID	Unique identifier assigned to the boundary curve segment	Free text, Free number	C - if boundary is expressed as curve segments	1	Text/Real
3.1.1.5	Legal Area Description	Description of the legal area, a geographic area whose boundaries, name, origin, and legal/statistical area description result from charters, laws, treaties, or other administrative or governmental action	Free text	C - if legal area description is known	1	Text
3.1.1.5.1	County	County as defined in Annex E	Free text	C - if the GU being documented is a county	1	Text
3.1.1.5.2	City/ Town/ Village	City, Town, and Village, as defined in Annex E	Free text	C - if the GU being documented is a city, town, or village	1	Text
3.1.1.5.3	Other Locality Name	Those locations that are not County, City, Town, or Village, as defined in Annex E or other locality name	Free text	C - if the GU being described is not a county, city, town, or village	1	Text
3.1.1.6	GU Code Information	Information describing GU Type Code and GU Instance Code	Lines 3.1.1.6.1 - 3.1.1.6.2	C- if a GU code exists	1	Compound

3.1.1.6.1	GU Instance Code	Specific code which identifies the GU instance being described	Free text, Free number	C - if an instance code exists	1	Text/Real
3.1.1.6.2	GU Coding System Reference	GU Type Code reference	Line 2.1.4.2	M	1	Compound
3.1.1.7	Boundary Classifier	A term or phrase which describes the status of the boundary	Free text	C - if one or more boundary classifiers exist	N	Text
3.1.2	GU Instance Relationship	Information about one or more relationships the GU being described shares with other GUs	Lines 3.1.2.1 - 3.1.2.2.3	M	N	Compound
3.1.2.1	GU Instance Maintenance Relationships	Common areal information between the described GU entity and geographic area features	Lines 3.1.2.1.1 - 3.1.2.2.3	C - if one or more maintenance relationships exist	N	Compound
3.1.2.1.1	Maintenance Relationship Name	Name of the referenced maintenance relationship	Free Text	M	N	Text
3.1.2.2	GU Topologic Relationships	Conditional or characteristic relationships that apply to the specific GUs being described	Lines 3.1.2.2.1-3.1.2.2.3	C - if one or more topological relationships exist	N	Compound
3.1.2.2.1	Contiguous Relationship List	List of GUs or feature objects that share a common point or portion of a boundary	Line 2.2.2.1, free text	C - if one or more contiguous relationships exist	N	Text
3.1.2.2.2	Composed of Relationship List	List of GUs or feature objects that contains subentities that are completely within and are the extent of the entity	Line 2.2.2.2, free text	C - if one or more composed of relationships exist	N	Text
3.1.2.2.3	Composes Relationship List	List of GU subentities that are completely contained within an entity	Line 2.2.2.3, free text	C - if one or more composes relationships exist	N	Text
3.2	Boundary Instance Coordinate Information	Information describing the specific GU boundary being described	Lines 3.2.1-3.2.3.3	M	N	Compound
3.2.1	Polygon	Set of line segments that define a GU boundary being described	Lines 3.2.1.1-3.2.1.3	C-if the delineation of the GU boundary file consists of polygons	N	Compound
3.2.1.1	Polygon ID	Identification for the polygon	Free Text, Free Number	M	1	Text/Real
3.2.1.2	Single Curve Coordinate Set	Set of coordinates with no repetition that define a curve	Lines 3.2.1.2.1 - 3.2.1.2.3.1	C - if the polygon consists of a single curve	N	Compound
3.2.1.2.1	Start Point	First point of a curve	Line 3.2.1.2.1.1	M	1	Compound
3.2.1.2.1.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.2.2	End Point	Last point of a curve	Line 3.2.1.2.2.1	M	1	Compound

3.2.1.2.2.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.2.3	Intermediate Point	Point on a curve	Line 3.2.1.2.3.1	C - if one or more intermediate points exist	N	Compound
3.2.1.2.3.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.3	Multiple Curves Coordinate Set	Collection of coordinates with no repetition that define more than one curve	Lines 3.2.1.3.1 - 3.2.1.3.3.1	C-if the polygon consists of multiple curves	N	Compound
3.2.1.3.1	Start Point	First point of a curve	Line 3.2.1.3.1.1	M	1	Compound
3.2.1.3.1.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.3.2	End Point	Last point of a curve	Line 3.2.1.3.2.1	M	1	Compound
3.2.1.3.2.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.1.3.3	Intermediate Point	Point on a curve	Line 3.2.1.3.3.1	C - if one or more intermediate points exist	N	Compound
3.2.1.3.3.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.2	Curve Segment	Homogenous segment of a curve	Lines 3.2.2.1 - 3.2.2.2.3.1	C - if the GU consists of curve segments	N	Compound
3.2.2.1	CurveSegID	Identification of the curve segment	Free Text, Free Number	M	1	Text/Real
3.2.2.2	Curve Segment Coordinate Set	Sequences of numbers designating the positions of points	Lines 3.2.1.2.1 - 3.2.2.2.3.1	M	N	Real
3.2.2.2.1	Start Point	First point of a curve	Line 3.2.2.2.1.1	M	1	Compound
3.2.2.2.1.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.2.2.2	End Point	Last point of a curve	Line 3.2.2.2.2.1	M	1	Compound
3.2.2.2.2.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.2.2.3	Intermediate Point	Point on a curve	Line 3.2.2.2.3.1	C - if one or more intermediate points exist	N	Compound
3.2.2.2.3.1	Coordinates	Sequence of numbers designating the position of a point	Line 3.2.3	M	1	Compound
3.2.3	Coordinates	Sequence of numbers designating the position of a point	Lines 3.2.3.1-3.2.3.3	M	N	Compound
3.2.3.1	X	Latitude Coordinate	Free Number	M	1	Real

3.2.3.2	Y	Longitude Coordinate	Free Number	M	1	Real
3.2.3.3	Z	Altitude Coordinate	Free Number	O	1	Real

Annex I
(informative)

Referenced publications

U.S. Government. Office of Management and Budget. *Circular A-16*. 2002.

Annex J

(informative)

UML Notations

J.1 UML notations

The diagram that appears in Annex A (normative) of this standard is presented using the Unified Modeling Language (UML) static structure diagram with the ISO Interface Definition Language (IDL) basic type definitions and the UML Object Constraint Language (OCL) as the conceptual schema language. The UML notations used in this standard are described in Figures J.1 and J.2.

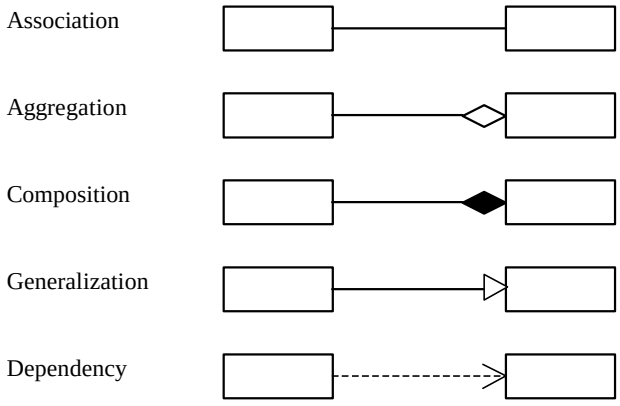


Figure J.1

J.2 UML model relationships

J.2.1 Associations

An association is used to describe a relationship between two or more classes. UML defines three different types of relationships, called association, aggregation and composition. The three types have different semantics. An ordinary association shall be used to represent a general relationship between two classes. The aggregation and composition associations shall be used to create part-whole relationships between two classes. The direction of an association must be specified. If the direction is not specified, it is assumed to be a two-way association. If one-way associations are intended, the direction of the association can be marked by an arrow at the end of the line.
An aggregation association is a relationship between two classes in which one of the classes plays the role of container and the other plays the role of a containee.

A composition association is a strong aggregation. In a composition association, if a container object is deleted, then all of its containee objects are deleted as well. The composition association shall be used when the objects representing the parts of a container object cannot exist without the container object.

J.2.2 Generalization

A generalization is a relationship between a superclass and the subclasses that may be substituted for it. The super-class is the generalized class, while the subclasses are specified classes.

J.2.3 Instantiation / Dependency

A dependency relationship shows that the client class depends on the supplier class/interface to provide certain services, such as:

— Client class accesses a value (constant or variable) defined in the supplier class/interface;

— Operations of the client class invoke operations of the supplier class/interface;

— Operations of the client class have signatures whose return class or arguments are instances of the supplier class/interface.

An instantiated relationship represents the act of substituting actual values for the parameters of a parameterized class or parameterized class utility to create a specialized version of the more general item.

J.2.4 Roles

If an association is navigable in a particular direction, the model shall supply a “role name” that is appropriate for the role of the target object in relation to the source object. Thus in a two-way association, two role names will be supplied.

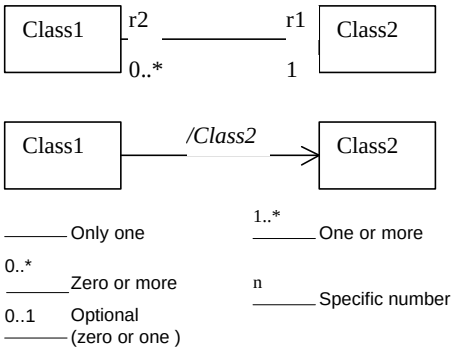


Figure J.2

Figure J.2 represents how role names and cardinalities are expressed in UML diagrams. The role name “r1”’ is Class1’s relationship to Class2. The role name “r2” is Class2’s relationship to Class1. The cardinalities show that “zero or many” Class1s are related to “exactly one” Class2.
Figure J.2 also shows how derived classes will be expressed. The diagram indicates that Class1 is a derived class of Class2. Any attributes and aggregates of Class1 are also derived from Class2.

J.3 UML model stereotypes

A UML stereotype is an extension mechanism for existing UML concepts. It is a model element that is used to classify (or mark) other UML elements so that they in some respect behave as if they were instances of new virtual or pseudo metamodel classes whose form is based on existing base metamodel classes. Stereotypes augment the classification mechanisms on the basis of the built-in UML metamodel class hierarchy. Below are brief descriptions of the stereotypes used in this Standard:

a) <<DataType>> descriptor of a set of values that lack identity (independent existence and the possibility of side effects). Data types include primitive predefined types and user-definable types. A DataType is thus a class with few or no operations whose primary purpose is to hold the abstract state of another class.

b) <<CodeList>> used to describe a more open enumeration. <<CodeList>> is a flexible enumeration. Code lists are useful for expressing a long list of potential values. If the elements of the list are completely known, an enumeration should be used; if the only likely values of the elements are known, a code list should be used.

c) <<Abstract>> class (or other classifier) that cannot be directly instantiated. UML notation for this to show the name in italics.

d) <<Package>> cluster of logically related components, containing sub-packages.

e) <<Leaf>> package that contains definitions, without any sub-packages.