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Information Technology – Geographic Information

Framework Data Content Standard

Part 1: Cadastral

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39 **American**

40 **National**

41 **Standard**

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116 # **Contents**

144 # Foreword

145 Geographic information, also known as geospatial information, both underlies and is the subject
146 of much of the political, economic, environmental, and security activities of the United States. In
147 recognition of this, the United States Office of Management and Budget issued Circular A-16
148 (revised 2002), which established the Federal Geographic Data Committee (FGDC) as a
149 coordinating organization.

150 Work on this standard started under the Geospatial One-Stop e-Government initiative. The
151 standard was developed with the support of the member agencies and organizations of the
152 FGDC and aids in fulfilling a primary objective of the National Spatial Data Infrastructure (NSDI),
153 that is, creation of common geographic base data for seven critical data themes. The seven core
154 data themes are considered framework data of critical importance to the spatial data
155 infrastructure.

156 The increasing need to coordinate collection of new data, identify applicability of existing data,
157 and exchange data at the national level led to the submission of this standard to the ANSI
158 process to become an American National Standard. The national standard contained in this
159 document and its parts was sponsored by Technical Committee L1, Geographic Information
160 Systems, of the InterNational Committee for Information Technology Standards (INCITS), an
161 ANSI-accredited standards development organization.

162 As the Geographic Information Framework Data Content Standard was developed using public
163 funds, the U.S. Government will be free to publish and distribute its contents to the public, as
164 provided through the Freedom of Information Act (FOIA), Part 5 United States Code, Section 552,
165 as amended by Public Law No. 104-231, "Electronic Freedom of Information Act Amendments of
166 1996".

167 **Introduction**

168 The primary purpose of this part of the Geographic Information Framework Data Content
169 Standard is to support the exchange of cadastral (real property) data. This part seeks to
170 establish a common baseline for the semantic content of cadastral databases for public agencies
171 and private enterprises. It also seeks to decrease the costs and simplify the exchange of
172 cadastral data among local, Tribal, State, and Federal users and producers. That, in turn,
173 discourages duplicative data collection. Benefits of adopting this part of the standard also include
174 the long-term improvement of the geospatial cadastral data within the community.

175 This part provides a data content and high level Universal Modeling Language (UML) description
176 for cadastral data.

177 Cadastral data are produced and maintained by thousands of organizations across the county.
178 This part provides a profile of that information to support the facilitation of exchange which has
179 been defined as the information necessary for the navigation to and discovery of cadastral
180 information from the many providers.

181 Cadastral data are defined as the geographic extent of the past, current, and future rights and
182 interests in real property including the spatial information necessary to describe that geographic
183 extent. Rights and interests are the benefits or enjoyment in real property that can be conveyed,
184 transferred, or otherwise allocated to another for economic remuneration. Rights and interests
185 are recorded in land record documents. The spatial information necessary to describe rights and
186 interests includes surveys and legal description frameworks such as the Public Land Survey
187 System, as well as parcel-by-parcel surveys and descriptions.

188 The Cadastral Data Content Standard (FGDC-STD-003), upon which this part is based, is
189 intended to support the automation and integration of publicly available land records information.
190 The Cadastral Data Content Standard is intended to be useable by all levels of government and
191 the private sector. That standard contains the standardization of the definition of entities and
192 objects related to cadastral information including survey measurements, transactions related to
193 interests in land, general property descriptions, and boundary and corner evidence data. Any or
194 all of these applications are intended to be supported by the standard.

195 The intended geographic scope of the Cadastral Data Content Standard and this profile of that
196 standard is all fifty States of the United States including all onshore cadastral as well as marine
197 cadastral information. Applicability of this part of the Framework Data Content Standard in other
198 geographic areas and business processes, such as the Insular Areas of the United States has not
199 been determined.

200

201 **Framework Data Content Standard – Cadastral**

202 **1 Scope, purpose, and application**

203 The Geographic Information Framework Data Content Standard, Part 5: Cadastral part provides
204 the information necessary to identify the existence of parcel-level cadastral information and the
205 source of that information. The geospatial metadata provided in conformance to this part will
206 include the contact, distribution, and access requirements for the cadastral data. Additional
207 information on the content of the full parcel or cadastral data sets, its accuracy, and its spatial
208 projection, is also provided with the metadata.

209 This part of the standard is not intended to support homeland security, citizen query and access,
210 real estate records, or other application-based information. The Cadastral part includes only the
211 minimum data necessary to facilitate locating the existence of parcel-level information and
212 identifying the source. These data, along with the appropriate metadata, will provide the
213 information describing how and where to get the data needed to support applications.

214 The purpose of this standard part is to facilitate the exchange of cadastral (real property) data.
215 The Cadastral part is one of seven themes presently included in the National Spatial Data
216 Infrastructure (NSDI).

217 Data complying with the FGDC's Cadastral Data Content Standard (FGDC-STD-003) would be
218 necessary to locate a parcel by site address and to display the assessed value of property. The
219 Cadastral part is a profile of the FGDC Cadastral Data Content and all of the elements in this
220 profile are included in the full content standard. The Cadastral part profile supports the discovery
221 of and the navigation to cadastral information. Associated metadata will identify the providers of
222 additional cadastral information. The FGDC Subcommittee for Cadastral Data publishes and
223 maintains other cadastral profiles of the Cadastral Data Content Standard based on identified
224 business processes and application needs. These profiles can be found at
225 http://www.nationalcad.org

226 Cadastral data works in harmony with other data sets. For example, to determine whether there
227 is parcel or cadastral information available in a specified city, users will need to navigate to that
228 geography and then verify that the minimum core parcel information and its metadata have been
229 made available for that area.

230 The Cadastral part can be implemented using a variety of software packages and is designed to
231 accommodate data encoded without geometry as well as to support the exchange of data
232 encoded in a variety of GIS formats.

233 **2 Normative references**

234 Annex A lists normative references applicable only to the Cadastral part. Annex A of the Base
235 Document (Part 0) lists normative references applicable to two or more parts of the standard.
236 Annex D of the Base Document lists informative references applicable to all of the parts.

237 **3 Maintenance authority**

238 **3.1   Level of responsibility**

239 The FGDC is the responsible organization for coordinating work on all parts of the Geographic
240 Information Framework Data Content Standard. The Subcommittee for Cadastral Data, working
241 with the FGDC, is directly responsible for development and maintenance of the Geographic
242 Information Framework Data Content Standard, Part 1: Cadastral. The United States Department
243 of the Interior - Bureau of Land Management - Geographic Sciences Team currently leads the
244 Federal Geographic Data Committee, Subcommittee on Cadastral Data.

245 The FGDC shall be the sole organization responsible for direct coordination with the InterNational
246 Committee for Information Technology Standards (INCITS) concerning any maintenance or any
247 other requirements mandated by INCITS or ANSI.

248 **3.2   Contact information**

249   Address questions concerning this part of the standard to:

250   Federal Geographic Data Committee Secretariat
251   c/o U.S. Geological Survey
252   590 National Center
253   Reston, Virginia 20192 USA

254   Telephone: (703) 648-5514
255   Facsimile: (703) 648-5755
256   Internet (electronic mail): gdc@fgdc.gov
257   WWW Home Page: http://fgdc.gov

258   Or

259   Bob Ader, BLM Cadastral Survey
260   MS CO955
261   2850 Youngfield Street
262   Lakewood, Colorado 80215

263   Telephone: (303) 239-3817
264   Facsimile: (303) 239-3815
265   Internet (electronic mail): bob_ader@blm.gov
266   World Wide Web: http://www.nationalcad.org

267   **4 Terms and definitions**

268   Definitions applicable to the Cadastral part are listed below. More general terms and definitions
269   can be found in the Base Document (Part 0). Users are advised to consult that part for a
270   complete set of definitions.

271   **4.1**
272   **owner type**

273   classification of the ownership for the primary surface interest

274   **4.2**
275   **parcel identifier**

276   **primary** permanent identifier for the parcel defined by the jurisdiction referenced in the **source**
277   **identifier**

278   **4.3**
279   **parcel map**

280   collection of **parcel polygons**, usually from a single source

281   **4.4**
282   **parcel point**

283   point feature within the **parcel polygon** that can be used to attach related information

284   NOTE   The parcel point provides a general reference for locating a parcel. Parcel points can be
285   provided when parcel polygons are not available or they can be provided as a supplementary geographic
286   representation.

287   **4.5**
288   **parcel polygon**

289   geographic extent of the parcel, as depicted using an area feature

290   NOTE   The parcel polygon is a closed polygon.

291 **4.6**
292 **primary**

293 Boolean (True or False) that indicates whether the **parcel identifier** and the source for that
294 **parcel identifier** are the primary identifier and primary source

295 NOTE   If the primary is True then the parcel identifier and the source identifier are primary. If the
296 primary is False then the parcel identifier and the source of that parcel identifier are secondary or alternative.
297 There can be multiple alternative parcel identifiers and associate source identifiers but there can only be one
298 primary parcel identifier and associate source for any parcel feature.

299 **4.7**
300 **source identifier**

301 permanent identifier for the agency, organization, or jurisdiction that assigns and maintains the
302 **parcel identifier**; that is to say, namespace

303 NOTE   The source should identify itself using the appropriate jurisdiction Federal Information
304 Processing System (FIPS) code where possible.

305 ## 5 Requirements

306 ### 5.1   Application schema

307 The Cadastral part extends the basic Framework Data Content Standard UML model by adding
308 five part-specific classes, as shown in Figure 1. The primary class for the Cadastral part is the
309 Parcel. These classes define the Cadastral part referenced in the Base Document. The five
310 Cadastral part classes are described below.

311 #### 5.1.1   Parcel class

312 The Parcel class is the main class to convey cadastral information. It is stereotyped as a
313 <<Feature>> and as such has identity and geometry properties.

314 #### 5.1.2   OwnerType class

315 The OwnerType class is a code list of valid values that classify the owner type. This is not the
316 ownership type, but rather is the classification of the owner.

317 #### 5.1.3   ParcelSource class

318 The ParcelSource class groups elements regarding each parcel and its source information.

319 #### 5.1.4   ParcelGeometry class

320 This class represents a choice between a centroid or polygon representation of the parcel.

321 #### 5.1.5   ParcelCollection class

322 These features were introduced for conformance with the other Geographic Information
323 Framework Data Content Standard parts and as such are not a part of the Cadastral part. These
324 represent a super type of data collection with metadata. They are a set of features that occur
325 within the context of a container object known as a "feature collection". This is a convention used
326 to delimit a group of features of a given type and common schema.
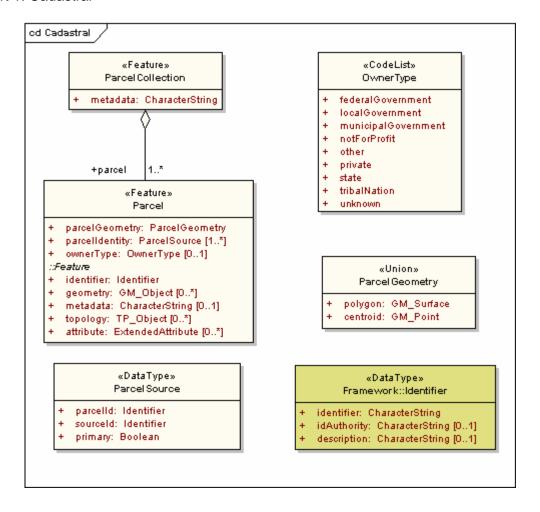
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Figure 1 – Cadastral UML model

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332 The class shown in green or gray is an inherited class and is shown for convenience. The tan or
333 light gray classes are the Cadastral theme classes and are described below.

334 **5.2 Data dictionary**

335

336 **Table 1 – Data dictionary for cadastral**

Line	Name/Role Name	Definition	Obligation/ Condition	Maximum Occurrence	Data Type	Domain
1	ParcelCollection				<<Feature>>	Lines 2-3
2	metadata	Information that describes this information transfer represented as a URL or as a block of text	M	1	CharacterString	Unrestricted
3	Role name: parcel	Links ParcellCollection to the Parcel that belongs to the ParcelCollection	M	*	Parcel	Unrestricted
4	Parcel				<<Feature>>	Lines 5-12
5	parcelGeometry	Centroid or polygon representation of parcel location	M	1	<<Union>> ParcelGeometry	GM_Polygon or GM_Point
6	parcelIdentity	Parcel identifier	M	*	<<DataType>> ParcelSource	CharacterString and Boolean
7	ownerType	Classification of the ownership for the primary surface interest	O	1	<<CodeList>> OwnerType	Unrestricted
8	Framework::Feature::identifier	Feature identifier for the Parcel	M	1	<<DataType>> Framework::Identifier	Unrestricted
9	Framework::Feature::geometry	Shape and geolocation of a feature	O	*	<<Type>> GM_Object	Defined in ISO 19107
10	Framework::Feature::metadata	Structured or unstructured metadata as defined by the community of practice	O	1	CharacterString	May be text or structured metadata fragment
11	Framework::Feature::topology	Connectivity of the participating elements	O	*	<<Interface>> TP_Object	Defined in ISO 19107
12	Framework::Feature::attribute	Producer-defined attribute for inclusion in transfer	O	*	<<DataType>> Framework::	Unrestricted

Line	Name/Role Name	Definition	Obligation/ Condition	Maximum Occurrence	Data Type	Domain
					ExtendedAttribute	
13	ParcelSource	Group of parcel source information that is maintained together			<<DataType>>	Lines 14-16
14	parcelId	Unique identifier for the parcel	M	1	<<DataType>> Framework::Identifier	Framework::Identifier
15	sourceId	The linkage to the agency or organization that assigned the parceled	M	1	<<DataType>> Framework:Identifier	Framework::Identifier
16	primary	Designation that the current record describes the primary parcel	M	1	Boolean	True or False
17	ParcelGeometry	Choice of centroid or polygon representation of the parcel			<<Union>>	Lines 18-19
18	polygon		M	1	<<Type>> GM_Surface	Unrestricted
19	centroid		M	1	<<Type>> GM_Point	Unrestricted

337 **5.3 Code list**

338 OwnerType is a CodeList of the parcel owner's administrative designation.

339

340 **Table 2 – CodeList for OwnerType**

Name	Definition
federalGovernment	The United States federal government and its agencies and departments
localGovernment	A county, parish, or borough government
municipalGovernment	A municipality of government
notForProfit	A not for profit organization which is also exempt from real estate taxes
other	Any other organization
private	A private firm, for profit organization, or an individual or group of individuals
state	A State government or the city of Washington DC
tribalNation	An American Indian Tribe or nation
unknown	The type of ownership is not known

341

342 **Annex A**
343 **(normative)**
344 **Normative references**

345 This annex lists normative standards that support only this part of the Framework Data Content
346 Standard. Annex A of the Base Document (Part 0) lists normative references applicable to two or
347 more parts of the standard.

348 ANSI and ISO standards may be purchased through the ANSI eStandards Store at
349 http://webstore.ansi.org/ansidocstore/default.asp, accessed October 2006.

350 ANSI NCITS 353:2001, Spatial data standard for facilities, infrastructure, and environment

351 FGDC-STD-003-2003, Cadastral data content standard, Version 1.3,
352 http://www.fgdc.gov/standards/projects/FGDC-standards-
353 projects/cadastral/?searchterm=cadastral%20data%20content%20standard, accessed October
354 2006

355   **Annex B**
356   **(informative)**
357   **Sample diagram**

358   The diagram below shows four parcel polygons each with a centroid and a related table that
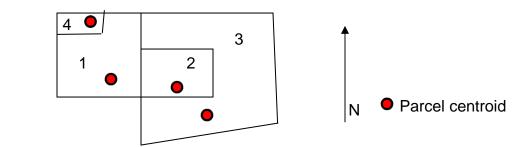359   contains attributes for those features.

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368   **Figure B.1 – Four parcel polygons with centroids and ParcelIDs**

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370   The table below contains attributes for the features in the figure above.

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372   **Table B.1 – ParcelIDs related to a ParcelSource and OwnerType**

ParcelID	ParcelSource	OwnerType
1	39-063	TribalNation
2	39-063	LocalGovernment
3	39-063	Private
4	39-063	Private

373

374 **Annex C**
375 **(informative)**
376 **Additional resources**

377 The FGDC Subcommittee for Cadastral Data in partnership with Federal agencies, Tribes, State
378 and local governments and agencies, and the private sector maintains reference information and
379 educational materials in support of the profile described in this document as well as profiles
380 serving many other business processes and applications. If an organization needs additional
381 attributes or has implementation questions there are profiles for various business cases on the
382 nationalcad site.   This   information   is   freely   available   and   can   be   found   at
383 http://www.nationalcad.org.   Other information related to implementation, jurisdictions serving
384 cadastral information, and ongoing projects can be found at this site.

385 ANSI and ISO standards may be purchased through the ANSI eStandards Store at
386 http://webstore.ansi.org/ansidocstore/default.asp, accessed October 2006.

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