

ATTACHMENT 1

Kansas GIS Cadastral Standards

August 1997

Kansas GIS Cadastral Standards Working Group

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1. Introduction

1.1 Mission and Goals of the Kansas GIS Cadastral Standard

The Kansas GIS Cadastral Standards Working Group adopts the Kansas GIS Vision Statement as follows:

To shape the growth of GIS through open communication, education, and cooperation in order to:

- ! Optimize data accuracy, reliability, and accessibility
- ! Meet the needs of the technical and non-technical user community
- ! Support the decision-making process

The objectives to be achieved as a result of that vision were identified as follows:

- ! Create an attitude of cooperation
- ! Generate something that will build support at home
- ! Identify common interests
- ! Identify areas of need for standardization
- ! Identify obstacles and barriers to data sharing
- ! Avoid duplication in creating data
- ! Establish standardized metadata
- ! Ensure data security
- ! Create flexible standards
- ! Establish guidelines by which standards may be developed
- ! Catalogue existing data
- ! Build a larger community of technical and non-technical users
- ! Develop a geographic data framework for Kansas that is compatible with the concept of the National Geospatial Data Framework

The Kansas GIS Cadastral Standards Working Group also adopts the FGDC Cadastral Data Content Standard Mission Statement as follows:

To provide a standard for the definition and structure for cadastral data which will facilitate data sharing at all levels of government and the private sector and will protect and enhance the investments in cadastral data at all levels of government and the private sector.

1.2 Relationship to Existing Standards

The Kansas GIS Cadastral Standard integrates with existing standards as much as possible. As examples, Kansas Geodata Compatibility Guidelines, Kansas GIS Metadata Standard, FGDC

Cadastral Data Content Standard for the National Spatial Data Infrastructure, Kansas Department of Revenue-Division of Property Valuation Technical Mapping Specifications and other geospatial standards as applicable.

1.3 Description of the Kansas GIS Cadastral Standard

The Kansas GIS Cadastral Standard *forms the basis for automating the legal elements of cadastral data found in public records. The standard defines attributes or elements that are in land ownership related documents.* The cadastral data for all land in Kansas is subject to this standard. *The standard does not limit or filter the information that can be included.*

The rules and specifications for automating cadastral information in the standard depend in part on the information contained in the land ownership records. That is, it is not possible to automate information that is not available, but all information that is available should be able to be automated. For example, if a parcel is described in a deed as Lot 2 of Green Acre Subdivision in Barton County and the bearings and distances around the parcel are not included in the deed, then it is not possible to require perimeter measurements.

Other rules for putting data into the standard are based on data integrity. One type of integrity is that all information must be referenced to a source document. For example, if bearings and distances are included, they must be referenced to a source document. Another type of integrity maintains the relationship among the entities and attributes. For example, an entity that relates a parcel to each of its boundaries must have both a parcel identifier and a boundary identifier.

1.4 Applicability and Intended Use of the Kansas GIS Cadastral Standard

The Kansas GIS Cadastral Standard *is intended to support the automation, integration and sharing of publicly available land records information. It is intended to be useable by all levels of government and the private sector. The standard contains the standardization of entities and objects related to cadastral information including survey measurements, transactions related to interests in land and general property descriptions. Any or all of these cadastral applications are intended to be supported by the standard.*

The standard is not intended to reflect an implementation design. An implementation design requires adapting the structure and form of these definitions to meet application requirements.

1.5 Development Procedures of the Kansas GIS Cadastral Standard

1.5.1 Participants

The members of the Kansas GIS Cadastral Standards Working Group who attended planning meetings are listed below.

Kevin Beakey - Cartographer, McPherson County Appraiser's Office

Sharon Bradford - Cartographer/Deputy Appraiser, Graham County Appraiser's Office
John Cowan, KM - Cartographer, Riley County GIS
Christopher DeYoe - Deputy Director, Sedgwick County GIS
Richard Hager - GIS Coordinator, USDA/NRCS
Tim Hensley, KM - Systems Analyst, Johnson County AIMS
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Ed Schwartz - GIS/GPS Coordinator, Morton County Data Processing & Mapping
Cy Smith - GIS Manager, City of Olathe
Scott Tabb, PKM - Cartographer, Dept. of Revenue Division of Property Valuation
Susan Williams, PKM - Cartographer, Dept. of Revenue Division of Property Valuation
Bettejane Wooding, PKM, CMS - Cartographer, Barton County Appraiser's Office

1.5.2 Comment Opportunities and Reviews

At the August 1996 GIS Standards Forum a cadastral working group was formed. As the cadastral standard developed, through several meetings, draft versions were circulated to 58 working group participants.

At the February 1997 GIS Standards Form, attended by representatives from federal, state, local, private and academic sectors, the Kansas GIS Cadastral Standard was reviewed in detail. The results of the review were incorporated into the standard.

1.6 Maintenance of the Kansas GIS Cadastral Standard

The Kansas GIS Cadastral Standard Working Group recognizes the need for a continuing maintenance process that may result in updates to meet user needs and to integrate with future standards.

2. Body of the Kansas GIS Cadastral Standard

2.1 Technical and Operational Context

2.1.1 Data Environment

- ! Components of a Cadastral GIS
 - Geospatial Software
 - Relational Database Management System (RDBMS)
 - Linkage between geospatial software and RDBMS
 - Graphical link

- ! Definitions

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

Parcel: *A parcel is a single cadastral unit (polygon), which is the spatial extent of the past, present, and future rights and interests in real property, that can be included under one description after consideration of all legal and practical elements. The unit shall include the geographic framework necessary to support the description of the spatial extent.*

- ! Cadastral data sets will contain several layers of geospatial elements. Geospatial elements and their associated attributes must have the ability to be separated by layers.
- ! The local custodian will store, maintain, and make available the cadastral data sets.

2.1.2 Reference Systems

A known reference system must be used and documented in the cadastral metadata and will include, at a minimum, the name of the coordinate system, the datum, the projection and the units of measure. Where possible the most current horizontal and vertical datums should be used.

2.1.3 Geodetic Control/GPS

The highest order of geodetic control obtainable shall be used and documented both graphically and in the metadata. Any other survey points referenced are to be documented. Points established with GPS should be designated.

2.1.4 Integration of Themes

The cadastral data sets shall be developed in a manner that allows them to be integrated with other thematic data sets.

Any known inconsistencies that may be caused by integration should be noted in the metadata.

2.1.5 Encoding

Cadastral data sets should consist of vector data using real world coordinates. The parcel polygon shall be closed with attribute data attached. This may be accomplished through an associated label point or tied directly to the polygon. The points and lines defining the polygon should be encoded such that they can be associated with the resulting polygon.

2.1.6 Resolution

Cadastral data sets may exist at multiple resolutions. The primary resolution should be parcel polygons compiled at scales commensurate with the source materials. The resolution must be documented in the metadata.

2.1.7 Accuracy

The accuracy of the cadastral data set will include absolute accuracy of geospatial data, relative accuracy of geospatial data and attribute data accuracy. All of these must be documented in the metadata.

The absolute accuracy of the geospatial data should comply with the national accuracy standards.

The relative accuracy of the geospatial data should be commensurate with the absolute accuracy.

The accuracy of the attribute data should be documented in terms of completeness, logical consistency, timeliness and lineage.

2.1.8 Edge Matching

Within the cadastral data set all geospatial entities shall edge match. This will apply to the interior of each tile (i.e. map sheet) and to adjoining tiles. The objective is to achieve a seamless set of data.

An effort should be made to edge match adjacent cadastral sets. If a variance exists or it is not known whether one exists, it should be documented in the metadata.

Procedures for edge matching should be in compliance with other standards (i.e. Geodetic Control, Administrative Boundaries, Transportation, etc.). If an adjustment is made in order to achieve edge matching that exceeds the accuracy of the data set; it should be documented in the metadata.

2.1.9 Feature Identification Codes

The custodian of the cadastral data set will maintain the KSCAMA parcel identification number as the unique feature identification for every parcel polygon.

It is understood that all features are assigned a unique identifier by the GIS software. The feature code allows attribute data to be associated with geospatial data.

2.1.10 Attributes

Cadastral attribute data should be associated with the cadastral geospatial data using the KSCAMA number.

The KSCAMA number can also be used to associate other data to the cadastral geospatial and attribute data.

2.1.11 Transactional Updating

Accessibility to changes and updates of the cadastral data set shall be the responsibility of the custodian.

The date of the change of a feature should be included in the attribute data attached to that feature in order to enable true transactional updating.

The metadata should reflect the date of the last update of the cadastral data set.

2.1.12 Records Management

Historical cadastral data, including geospatial and attribute data should be held by the custodian and made available upon request.

2.1.13 Metadata

Detailed metadata of the cadastral data set shall comply with the Kansas GIS Metadata Standard and be maintained by the custodian.

This metadata shall be distributed to the Kansas Data Access and Support Center to be included in the National Geospatial Data Clearinghouse.

2.2 Data Characteristics

2.2.1 Minimum Required Geospatial Elements

- Ownership Boundaries
- Legal Description Boundaries
- Right of Ways
- Geodetic Control
- PLSS

2.2.2 Minimum Required Attribute Elements

- KSCAMA Parcel Identification Number (for every parcel polygon)
- Unique Feature Identification Number (for non parcel geospatial elements)
- Area
- Length
- Perimeter
- X,Y Coordinates
- Metadata

2.2.3 Optional Geospatial Elements

The following are examples of additional elements and are not to be construed as an all-inclusive list.

- Easements
- Set Backs
- Leaseholds
- Annotation
- Administrative Boundaries
- Zoning
- Neighborhoods
- Tax Parcel Boundaries
- Orthophotography

2.2.4 Optional Attribute Elements

The following are examples of additional elements and are not to be construed as an all-inclusive list.

- Owner
- Situs Address
- Census Tract
- Land Use

Appendix A

References

Cadastral Data Content Standard for the National Spatial Data Infrastructure
&
Draft Geospatial Positioning Accuracy Standards
Part 3: National Standard for Spatial Data Accuracy

Federal Geographic Data Committee Secretariat
c/o U.S. Geological Survey
590 National Center
12201 Sunrise Valley Drive
Reston, Virginia 22092
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Electronic Mail: gdc@usgs.gov
Anonymous FTP: www.fgdc.gov/pub/cadastral
Home page: www.fgdc.gov

Several excerpts were taken from this document and incorporated into these standards. They are identified by italics.

Kansas GIS Metadata Standard

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Data Access and Support Center (DASC)
Kansas Geological Survey
University of Kansas
1930 Constant Ave., Campus West
Lawrence, KS 66047-3726
Telephone: (785) 864-3965 ext. 347
Facsimile: (785) 864-5317
Email: dasc@mongogis.kgs.ukans.edu
WWW: <http://gisdasc.kgs.ukans.edu>

Kansas Department of Revenue, Property Valuation Division Technical Mapping Specifications

Kansas Department of Revenue
Property Valuation Division
915 SW Harrison
Topeka, KS 66612
Telephone: (785) 296-2365
Facsimile: (785) 296-2320

Italicized statements were taken directly from the FGDC Cadastral Data Content Standard

Appendix B

Explanation of Terms

Accuracy: Absolute - a measure of the location of features on a map compared to their true position on the face of the earth¹

Relative: a measure of the accuracy of individual features on a map when compared to other features on the same map¹

Attribute: *Attributes are the properties and characteristics of entities*

Custodian: Agency responsible for developing the data

Entity: *A data entity is any object about which the organization chooses to collect data*

Geographical Link: Geospatial element which is associated with attribute data

Geospatial Software: Mapping software with analytical capabilities

KSCAMA #: Is the number used in the Kansas Computer Assisted Mass Appraisal program, developed by the Kansas Dept. of Revenue Division of Property Valuation

KSCAMA #: Cty - Map - Sec . Sh - 1/4 - Blk - Par . Sp - Own
(19 digits) ___ - ___ - ___ . ___ - ___ - ___ - ___ . ___ - ___

Legal Description of Boundaries: Lot, block, subdivision, city, county, state, PLSS

Ownership Parcel Boundaries: From recorded deeds or court cases

PLSS: *Public Land Survey System Descriptions are descriptions for areas of land that follow the pattern of Townships and Ranges established by the federal government in 1785 and its successors*

Situs Address: The proper or original position of a specific location. An element that designates a fixed site, such as the address of a property or building

Tax Parcel Boundaries: Ownership parcels combined or less right of way

Unique Identification Number: Every element is assigned an identification number (PIN) by the computer software

¹ Antenucci, J.C., Brown, K., Crowell, P. L., Kevany, M. J. with Archer, H. Geographic Information Systems A Guide to the Technology. New York: Van Nostrand Reinhold

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Appendix C

Kansas GIS Cadastral Working Group

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Michael Chamberlin	GIS Application Mgr.	Johnson County
John Clark	911 Coordinator	Cherokee County
Pat Clinton	Clerk	Crawford County
Joselyn Collins	Planner	Metro Planning Dept.
Mark Coppersmith		U.S. Geological Survey
John Cowan	Cartographer	Riley County GIS
Ed Crane	Senior GIS Consultant	ESRI St. Louis Regional Office
Pete Davis		Division of Property Valuation
Christopher DeYoe	Deputy Director	Sedgwick Co. GIS
Joseph Fritz		
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Hongmian Gong	Assistant Professor	Dept. of Geosciences-FSU
Richard Hager	GIS Coordinator	USDA/NRCS
Tim Hensley	Systems Analyst	Johnson County AIMS
Paul Hey	GIS Specialist	Foster Design Co.
Wayne Hill	Project Consultant	M. J. Harden Associates, Inc.
Paula Keller	Office Clk/Voter Reg.	Crawford Co. Clerks Office
Dan Kelly	GIS Tech	Sedgwick Co. GIS
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LeRoy LeLand	Appraiser	Harper County
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Mike Mathews	CAMA Mgr.	Reno Co. Appraiser's Office
Scott McBride	Director	Sedgwick Co. GIS
George McCleary, Jr..	Associate Professor	Dept. of Geography-KU
Jerry Mentzer	Appraiser	Woodson County
Rick Miller	State GIS Coordinator	KS Water Office
Debra Moses	Publishing Supervisor	Sedgwick Co. GIS
Mark Niehaus	Appraiser	Graham County
Greg Noland	Mgr. Applications Prg.	Western Resources
Stephanie O'Dell	Appraiser	Miami County
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Patricia Rector	Land Information Mgr.	Sedgwick Co. Clerk's Office
John Rogers		Sedgwick Co. GIS
Rodney Sanders	Project Manager	M.J. Harden Associates, Inc.
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Pamela Schneider	Cartographer	Lyon Co. Appraiser's Office
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Cy Smith	GIS Manager	City of Olathe
Lloyd Stulken		KS Dept. of Agriculture
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