

**KANSAS INFORMATION RESOURCES COUNCIL**  
**INFORMATION TECHNOLOGY POLICY #5120 REVISION #0**

1.0 TITLE: Kansas Geographic Information Systems Cadastral Standard

1.1 EFFECTIVE DATE: June 1, 1998

1.2 TYPE OF ACTION: New

2.0 PURPOSE: To establish a policy concerning a standard for Kansas GIS cadastral data.

3.0 ORGANIZATIONS AFFECTED: All state agencies, boards, commissions, and Regents institutions.

4.0 REFERENCES:

4.1 K.S.A. 75-4741 authorizes the Kansas Information Resource Council to approve policies for the management of the state's information resources.

4.2 *EXECUTIVE ORDER #95-180 directs the Kansas GIS Policy Board to develop and maintain policies, standards, guidelines, and strategies which emphasize cooperation and coordination among agencies, organizations, and government entities developing and implementing GIS technology in order to maximize the cost effectiveness of GIS and their value to the state.*

5.0 DEFINITIONS/BACKGROUND:

5.1 DEFINITIONS

5.1.1 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.

5.1.2 **Federal Geographic Data Committee** was established by Office of Management and Budget Circular A-16. The Federal Geographic Data Committee promotes the coordinated development, use, sharing, and dissemination of geographic, or geospatial, data.

5.1.3 **GIS Databases** are defined as those databases that are designed and

developed for use with GIS software. These include all databases with locational, or geospatial, components that may be used to link tabular data to location specific points, lines, and polygons.

5.1.4 **The Kansas GIS Standards Task Force** is a group of GIS professionals formed to promote the development, adoption, and implementation of GIS standards among the Kansas GIS community.

5.1.5 **Kansas GIS Community** is defined as the growing community of users of GIS technology in Kansas. This community includes users at all levels of government, academic institutions, and public and private organizations throughout Kansas.

5.1.6 **Kansas GIS Data Access and Support Center** is the GIS data repository and distribution center for the Kansas GIS Policy Board.

5.1.7 **Kansas GIS Policy Board** is established by Executive Order #95-180 to coordinate the development, implementation, and management of GIS technology in Kansas's government. The Kansas GIS Policy Board is a standing committee of the Kansas Information Resources Council.

5.1.8 *Content Standards for Geospatial Metadata* is the GIS database documentation standard developed by the Federal Geographic Data Committee.

5.1.9 The **Kansas GIS Cadastral Standards Working Group** is a Standards Task Force sub-committee formed to develop a cadastral standard in the state.

## 5.2 BACKGROUND

5.2.1 The mission of the Kansas GIS Standards Task Force is to develop GIS standards. Membership includes representatives from the Kansas GIS Policy Board, the Boards Technical Advisory Committee, the Kansas Association of Mappers, the Kansas Association of Counties, the League of Municipalities, the County Clerks Association, the County Appraisers Association, the County Highway Association, the County Planning and Zoning Association, the Government Information Sciences Association, and other public and private sector organizations.

5.2.2 The Kansas GIS Standards Task Force has sponsored multiple Forums where the Kansas GIS community has been invited to participate and assist in the

development of GIS Standards. The GIS Cadastral Standard integrates with existing standards as much as possible.

## 6.0 POLICY:

6.1 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.

6.2 The Kansas Information Resource Council delegates authority for the implementation and maintenance of this Policy to the Kansas GIS Policy Board.

## 7.0 PROCEDURES:

7.1 This Policy is effective as of June 1, 1998.

7.2 The standard is defined in the attachment, "Kansas GIS Cadastral Standards ", August 1997, a report from the Kansas GIS Standards Working Group.

## 8.0 RESPONSIBILITIES:

8.1 Heads of agencies, boards, commissions, departments and Regents Institutions will establish procedures for their organization's compliance with the requirements of this policy.

8.2 The Kansas GIS Policy Board and its Technical Advisory Committee are responsible for the maintenance of this policy.

## 9.0 CANCELLATION: None

## 10.0 CONTACT PERSON: State GIS Coordinator, 785-296-0877

**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  
Ellen Long, KM - GIS Division Manager, Mid-Kan Blueline, Inc.  
Scott McBride - Director, Sedgwick County GIS  
Debra Moses - Publishing Supervisor, Sedgwick County GIS  
Mark Niehaus, CKA, KM - Appraiser, Graham County  
Rod Odom, KM - GIS Specialist, Shafer, Kline & Warren, Inc.  
David Oliver - PRISM Administrator, NRCS, FSA, Osage County Appraiser's Office  
Rodney Sanders - Project Manager, M. J. Harden & Associates, Inc.  
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  
Telephone: (703) 648-5514  
Facsimile: (703) 648-5755  
Electronic Mail: [gdc@usgs.gov](mailto:gdc@usgs.gov)  
Anonymous FTP: [www.fgdc.gov/pub/cadastral](http://www.fgdc.gov/pub/cadastral)  
Home page: [www.fgdc.gov](http://www.fgdc.gov)

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

#### Kansas GIS Metadata Standard

Kansas State GIS Coordinator or  
Richard D. Miller  
109 SW 9th St., Suite 300  
Topeka, KS 66612-1249  
Telephone: (785) 296-0877  
Facsimile: (785) 296-0878  
Email: [rmiller@fog.kwo.state.ks.us](mailto:rmiller@fog.kwo.state.ks.us)

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](mailto: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 earth<sup>1</sup>

Relative: a measure of the accuracy of individual features on a map when compared to other features on the same map<sup>1</sup>

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

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<sup>1</sup> 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

## Appendix C

### Kansas GIS Cadastral Working Group

Dennis Albers	Cartographer	Douglas Co. Appraiser's Office
Jack Baines	Appraiser	Clay County
Stan Baska	GIS Tech	Sedgwick Co. GIS
Kevin Beakey	Cartographer	McPherson Co. Appraiser's Office
Sharon Bradford	Cart./Dep. Appraiser	Graham Co. Appraiser's Office
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		
Greg Godwin		Johnson Co. Water District #1
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
Rocky Kuzali	City Hall W & S Dept.	City of Wichita
LeRoy LeLand	Appraiser	Harper County
Ellen Long	GIS Division Mgr.	Mid-Kan Blueline, Inc.
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
Rod Odom	GIS Specialist	Shafer, Kline & Warren, Inc.

David Oliver	PRISM Administrator	Osage Co./NRCS/FSA
William Olsen		Sedgwick Co. GIS
Jim Parker	Information Res. Mgr.	KS Dept. of Admin.-DISC
Patricia Rector	Land Information Mgr.	Sedgwick Co. Clerk's Office
John Rogers		Sedgwick Co. GIS
Rodney Sanders	Project Manager	M.J. Harden Associates, Inc.
Terri Schlange R E	Clerk	Lyon Co. Appraiser's Office
Pamela Schneider	Cartographer	Lyon Co. Appraiser's Office
Ed Schwartz	GIS/GPS Coordinator	Morton County
Cy Smith	GIS Manager	City of Olathe
Lloyd Stulken		KS Dept. of Agriculture
Ron Swisher		Division of Property Valuation
Scott Tabb	Cartographer	Division of Property Valuation
Steve Thompson	Associate Professor	KSU-Salina
David Thornton	Appraiser	Wilson County
Sharon Walrod	Mapping Supervisor	Coffey Co. Appraiser's Office
Ken Wilkerson		
Lori Wilkerson		City of Wichita Data Center-GIS
Susan Williams	Cartographer	Division of Property Valuation
Bettejane Wooding	Cartographer	Barton Co. Appraiser's Office
Gina Rae Yost	Cart./GIS Coordinator	Russell County
Mark Young		



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