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
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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

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

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

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

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

*Italicized statements were taken directly from the FGDC Cadastral Data Content Standard*
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
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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
Kansas State GIS Coordinator or Data Access and Support Center (DASC)
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109 SW 9th St., Suite 300  University of Kansas
Topeka, KS  66612-1249  1930 Constant Ave., Campus West
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Facsimile: (785) 296-0878  Telephone: (785) 864-3965 ext. 347
Email: rmiller@fog.kwo.state.ks.us  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 earth\(^1\)

Relative: a measure of the accuracy of individual features on a map when compared to other features on the same map\(^1\)

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

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
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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  Cartographer  U. S. Geological Survey
John Cowan  Senior GIS Consultant  Riley County GIS
Ed Crane  911 Coordinator  ESRI St. Louis Regional Office
Pete Davis  Deputy Director  Division of Property Valuation
Christopher DeYoe  Deputy Director  Sedgwick Co. GIS
Joseph Fritz  Assistant Professor  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
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Stephanie O’Dell  Appraiser  Miami County
Rod Odom  GIS Specialist  Shafer, Kline & Warren, Inc.

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