The Strategic Plan of the

Johnson County, Kansas,

Automated Information Mapping System (AIMS)

July 15, 2002

The AIMS Strategic Plan is intended to be a document to reference when assessing AIMS strategies and to act as a guide for the continuing development and direction of AIMS business. This strategic plan is not intended to be a comprehensive guide to all of AIMS functions; it is, rather, a snapshot of current strategic direction. AIMS has invested a great deal in the development of spatial data in support of County, jurisdictional, and commercial enterprises over the past several years. Many of the goals outlined when AIMS was founded have come to fruition. Throughout this process, AIMS has been a leader in GIS at the local and national level. To continue to take advantage of the County's investment in GIS and data, this strategic plan was developed to provide an overview for stakeholders and to act as a guide for AIMS staff in planning future developments of GIS in the enterprise. AIMS intends to periodically update this plan in order to keep it current with emerging strategies.

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I NTRODUCTION

Since its inception, AIMS has gone beyond the initial objective of providing Geographic Information System (GIS) support for reappraisal of real estate values (which was mandated by the State of Kansas in 1985). Additional GIS initiatives included a multi-user database design to encourage data sharing, defining and promoting the system for enterprise use, and the inclusion of County management, departments, cities, and businesses for on-going support of the program.

There were three primary reasons for initiating these broader GIS objectives. First, AIMS was to eliminate the inefficiency of redundant spatial records (e.g., maps) and realize the higher productivity made possible by automation of previously manual procedures. Second, AIMS was to draw upon new "outside" sources of information (e.g., city building permit records, water district underground line work) to enhance the system. Third, AIMS was to explore opportunities for revenue generation through map sales and by licensing access to GIS data.

Over time, significant strides have been made in achieving these objectives. AIMS has developed into a trusted advisor regarding spatial information to County departments and end-users conducting work in Johnson County. AIMS is also a model of local government GIS implementation.

Because of the nature of services provided, AIMS is tightly integrated with the various County departments that manage land records, infrastructure, and information technology. Continuous interaction with these departments is critical to identifying and implementing GIS solutions that improve the effectiveness of Johnson County government.
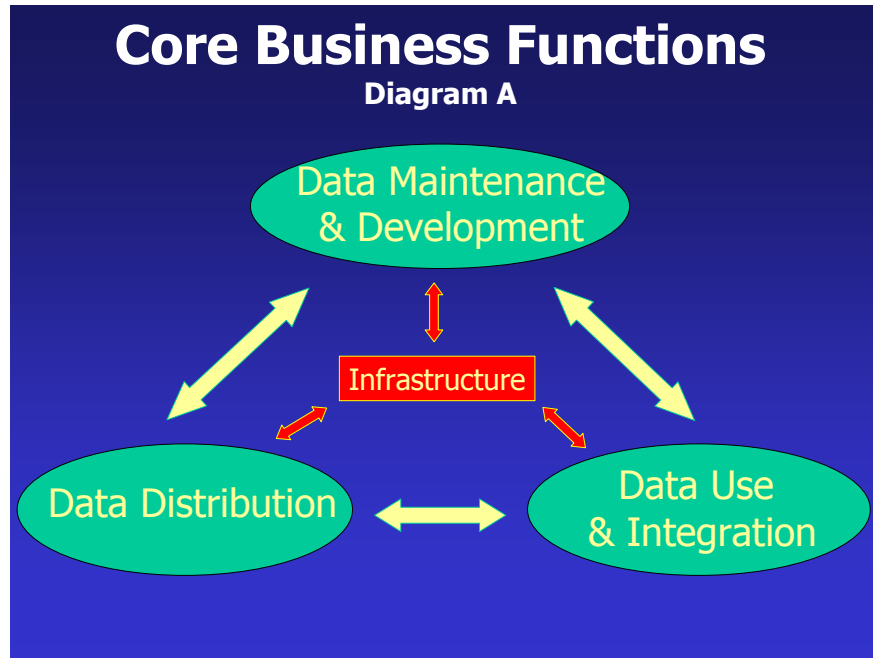
CURRENT BUSINESS MISSION

The **mission** of AIMS is to provide open, efficient, and enterprise access to spatial data at a reasonable cost to aid stakeholders in making more efficient and effective decisions. Ultimately, these decisions add value to the quality of life that our stakeholders have come to expect. To accomplish this mission, AIMS applies sound GIS principles with quality spatial data and effective distribution technologies to put AIMS services at the disposal of our stakeholders.

These **stakeholders** include those groups or individuals that are affected by AIMS' actions or resources. The AIMS stakeholders are not just internal County departments but they expand to local and national users that rely on our service, resources, and leadership. The primary stakeholders include, but are not limited to, local municipal governments, Johnson County citizens, local utilities, internal County departments, and public and private entities having an interest in the spatial data relating to Johnson County. The AIMS stakeholder base is a dynamic group that is continuously evolving in response to the services that AIMS offers (see Appendix A).

The following **service elements** are critical to the operation and success of AIMS:

➢ AIMS serves as a repository of spatial data about Johnson County. Spatial information is obtained from a variety of sources including databases, spreadsheets, images, and documents that record information about the natural environment of Johnson County (e.g., vegetation, hydrography, soils) and the human interaction with that environment (e.g., street network, land ownership, municipal boundaries). Once the information is collected, it is processed, referenced, and stored in a manner that allows and encourages distribution.

➢ Distribution of AIMS information and knowledge takes place in many forms and represents the second basic component of AIMS operation. Hardcopy and digital maps represent the most common form of distribution. Maps are generated for numerous County departments, emergency services, schools, utilities, private businesses, municipalities, and the citizenry for general reference and decision-making. AIMS also partners with a variety of organizations through formal license agreements that encourage the exchange and enhancement of spatial information. AIMS capitalizes on these relationships to broaden an already comprehensive GIS while creating a moderate revenue stream. A less formal approach is used to collaborate, coordinate, and communicate GIS developments within the County.

➢ A third service element is the development and implementation of applications that allow retrieval, analysis, and map/report generation of spatially tied data. These applications encourage use of spatial information about Johnson County to make informed decisions and to use County resources more efficiently. Examples of such applications include Mapit (map generation), Parcel Viewer (land-base map viewer), JCLR (web-based land record data viewer), internet mapping applications, and remote data gathering and assessment tools. Application development is fast becoming the most prominent service element in the AIMS operation.

AIMS' **core business functions** are conceptually organized and best defined by four components (see Diagram A). AIMS believes these four components are vital to the success of any GIS. The failure of one component will lead to the demise of another and will result in a failed system.

Data Maintenance

Data that is accurate, current, and easily maintained is the lifeblood of a GIS. AIMS employs multiple approaches to data maintenance. De-centralized (a.k.a., distributed maintenance) is the preferred approach. Under the de-centralized model, individual stakeholders are encouraged to take an active role in the enterprise GIS by taking a vested interest in the spatial information they rely upon to perform their business function. AIMS staff also maintains numerous spatial layers and databases within the GIS. Whenever possible, AIMS will develop or assist in the development of applications that enhance or embed the maintenance process. Through automation, currency and accuracy of the dataset is augmented. Finally, to maintain and develop new datasets, AIMS encourages and relies on data reciprocation from licensed partners, occasionally contracts for data acquisition from vendors, and seeks out entities that possess additional relevant spatial information to enhance the GIS.

Data Distribution

A successful GIS is one that makes data easily accessible. Innovative distribution techniques and the delivery of data in a variety of formats is the foundation to the expansion of AIMS services. AIMS tries to broaden the user base by licensing spatial data to other GIS operations and end-users.   Data licensing promotes sharing

of similar data stores, encourages standardization of data, eliminates redundant data gathering and compilation, and reduces the cost to implement and sustain a GIS. The advent of Internet mapping is becoming the optimal solution for spatial data delivery. Because it is available anywhere and at anytime, Internet mapping reaches previously untapped audiences and makes data distribution more efficient and effective.

Data Use

A crucial component to the success of a GIS is the application and interpretation of geographic data to address real-world needs. This component is often quite difficult to achieve, but yields the greatest return on investment. The goal of increasing data use is to encourage the application of GIS to make better decisions and processes more efficient. To accomplish this objective it is necessary to develop tools that use spatial data to promote an enterprise-wide GIS. These tools include the development and implementation of applications that allow retrieval, analysis, and map/report generation of spatial data. Development of these tools requires that developers comprehend the needs of the customer. The more transparent these systems are, the more likely they are to be integrated seamlessly into the work processes of stakeholders. Use of the data through effective means will promote the GIS, encourage the sharing of data, and expand the user base and awareness.

Infrastructure

As with any organization, a GIS has fundamental requirements that support the development and longevity of the system. Currency, reliability, and diversity of hardware and software are essential to the support of data maintenance, distribution, and use within the GIS. GIS professionals who use hardware and software must have a broad range of technical and professional skills. The knowledge base of an AIMS GIS professional includes experience in information technology (e.g., computer programming, internet development, systems administration), land records, and GIS concepts (see Appendix B). Also important to the infrastructure is advocacy of GIS by the County's management. With appropriate knowledge of GIS and its use in the County, support will continue and the implementation of GIS will prosper.

VALUES AND PHILOSOPHIES

This section sets forth the fundamental set of ideas and beliefs by which AIMS operates. To convey these organizational values and philosophies, we address ten issues of strategic importance to AIMS.

1. **The Use of Technology**

   It is AIMS' philosophy regarding technology to continue to be proactive and progressive, but also cautious. AIMS has unique technological needs and should continue to explore new technologies as they become available to assure the best possible service to our stakeholders. It is also our responsibility to provide solutions that are fiscally responsible and feasible.

   In the past AIMS has always been a leader in evaluating new technology, primarily due to the nature of the GIS business. The sheer volume of data and the processing power required to assimilate that data has necessitated that AIMS take the lead in new and innovative technologies to distribute that data. It is understood that our customers and partners look to AIMS to lead the way in evaluating new technology.

2. **Funding of the AIMS Operation**

   AIMS strives to produce a high return on the financial resources invested in its operation. As technology enables more efficient dissemination of AIMS data and services, AIMS will accelerate its trend toward becoming more financially self-sufficient. AIMS endeavors to reallocate a portion of expenses that in the past supported our infrastructure of databases, hardware, software, and expertise, to enhancing and expanding our services.

   Return on investment can be measured in a variety of ways, including AIMS ability to provide cost-saving measures across functional boundaries, revenue generated from sales of AIMS products and services, and by impacting economic development and the delivery of public services within Johnson County.

3. **Role of AIMS and GIS …**

   a. **… within Johnson County Government**

      First and foremost, AIMS provides GIS services in support of County government operations. AIMS also believes GIS can be capitalized upon to create partnerships with - and promote cooperation among - County agencies, thereby creating an environment of open exchange that is beneficial to all. AIMS strives to serve Johnson County as a coordinator and mentor of GIS activities.

      Because spatial information transcends departmental boundaries, GIS by its very nature is an integrative technology – crossing department lines to bring together common functions revolving around spatial information. Forming partnerships around the creation, flow, and use of spatial data creates a sense of common purpose among County agencies and strengthens the GIS enterprise by distributing knowledge and expertise. AIMS' other responsibilities also serve to

strengthen the system. As a coordinator, AIMS tries to reduce redundant efforts and increase efficiency by synchronizing the spatial data functions among departments. As mentor and educator, AIMS shares its own expertise and experience, provides GIS training, and provides a forum for the exchange of ideas and solutions.

b. **… to the Citizens, Businesses, and Municipalities of Johnson County**

AIMS believes it is our role to provide spatial information in an easily accessible and understood format. In order to perform that role, AIMS must first listen and respond to the needs of its stakeholders. Second, AIMS has a duty to be proactive in marketing and advertising its GIS services through outreach and educational efforts. Third, AIMS should attempt to foresee the data needs of the user community as well as promote the adoption of improved geographic technology.

c. **… beyond Johnson County**

There are two main philosophies guiding AIMS in its interactions outside Johnson County. First, AIMS recognizes and strives to serve the many government agencies, businesses, and individuals residing outside the County who depend on our services and data. We acknowledge a special responsibility to the metropolitan Kansas City region to actively participate in developing a regional geographic base. Second, AIMS endeavors to serve and learn from the larger GIS community through data-sharing, general communication with others, and by participating in professional conferences and events.

4. **Data Sharing**

AIMS' philosophy on sharing data within Johnson County government is to foster an environment where data is available without undue restrictions for those who rely on it to conduct their business. AIMS believes that spatial data within Johnson County should not be bound by any departmental or political barriers.

Equally important as the sharing of data when developing an enterprise-wide resource is the contribution of data back to the system. Many of the cities and public utilities maintain data valuable to the County as a whole. Examples of valuable datasets include, but are not limited to, utility lines, addresses, zoning, etc.

5. **Data Integrity**

AIMS strives to provide the most accurate and current data feasible. While it is recognized that there are situations where 100% accuracy is not efficiently attainable, AIMS makes every effort to identify and correct data inaccuracies in its own data sources as well as notify proper custodians when AIMS is not the primary data steward.

6. **Service Delivery**

With the ever-increasing use of GIS data and applications, AIMS will provide data and services that are available 24 hours a day, 7 days a week, 365 days a year. AIMS will not only provide fault tolerant and redundant hardware systems and

applications, but will also provide innovative solutions with regards to data replication and disaster recovery.

7. **Customer Service**

AIMS believes in an accessible, personal, respectful, and proactive approach to customer service. AIMS evaluates requests and services based upon the impact it has on both the satisfaction of the customer and the return on the County's investment. AIMS balances accessibility of data and services, the necessity to remain current with changes in technology, and providing personal attention to meet the needs of the customer. As customer expectations change, AIMS strives to be flexible, genuine, and responsive.

8. **Standards**

It is AIMS belief that adherence to standards is crucial towards the achievement of a seamless, enterprise GIS. It is also AIMS belief that stakeholders play a participative role in developing and implementing common standards. This benefits the entire AIMS system and GIS in Johnson County by integrating common AIMS and GIS practices and principles across the AIMS user base.

These standards include areas such as data sharing, hardware and software development, database design, cartographic design, and data archiving.

9. **Service Boundaries**

AIMS believes that implementing comprehensive, enterprise-wide solutions requires that it also implement a variety of technologies beyond GIS to meet the needs of the customer. It is also a philosophy of AIMS that datasets will be developed only to meet a specific stakeholder need.

The primary duty of AIMS is to collect and maintain spatial data about Johnson County, but it also has an obligation to turn that data into useful information by providing comprehensive solutions. Providing these solutions sometimes requires that AIMS move beyond the traditional boundaries of GIS to operate in other areas of information technology.

10. **Organizational Environment**

It is AIMS' philosophy to provide a rich, fulfilling organizational environment designed to balance employee productivity with professional growth and development. AIMS most valuable asset is its employees. Establishing an environment where staff members are encouraged to develop and diversify professionally contributes to a stable, productive program that is highly qualified at providing comprehensive solutions. Also important to promoting this philosophy is fostering teamwork, communication, and self-management to the benefit of AIMS.

STRATEGIC DIRECTION: GOALS AND RECOMMENDATIONS

The broad long-term **goals** of AIMS listed below emanate from the organizational **values and philosophies** set forth in the previous section. Specific **recommendations** are laid out for each goal and serve as a road map for attaining that goal. Goals and recommendations are grouped by core business function.

DATA MAINTENANCE

Goal 1. Ensure that AIMS data is accurate.

Recommendation 1.1 Establish and enforce standards for spatial accuracy for each dataset. Make spatial accuracy conform to established or acceptable levels through editing or replacement of the dataset.

Recommendation 1.2 Establish and enforce standards for attribute accuracy and completeness for each dataset.

Recommendation 1.3 Implement quality control (QC) procedures for each dataset. Wherever possible, the QC procedure should be built into the data-maintenance process for continual monitoring of spatial and attribute accuracy.

Goal 2. Ensure that AIMS data is current.

Recommendation 2.1 Establish and enforce standards of currency for each dataset based on the use of the data, available funding, and workload required to maintain currency.

Goal 3. Continue to acquire relevant datasets.

Recommendation 3.1 Work to identify and provide new datasets that benefit the County and AIMS data partners.

Recommendation 3.2 Take advantage of reciprocation agreements to obtain new or updated data.

Recommendation 3.3 Encourage the use of a document imaging system and integrate the data into the enterprise GIS.

Goal 4. Increase the efficiency of the County workflows that support or produce AIMS data.

Recommendation 4.1 Evaluate the workflow procedures that produce and maintain spatial and tabular data used by AIMS and identify redundant efforts, inefficient procedures, and manual procedures that adversely effect data quality.

Recommendation 4.2 Maximize automation of the processes identified above.

Goal 5. Ensure that AIMS data and data-maintenance procedures are properly documented.

Recommendation 5.1 Encourage organizations who maintain AIMS data to create and maintain metadata (documentation regarding data).

Recommendation 5.2 Continue to update and distribute metadata.
Recommendation 5.3 Diagram data maintenance procedures.

Goal 6. Decentralize data maintenance.
Recommendation 6.1 Encourage the organizations who benefit from the data to take an active role in maintenance, and to develop a vested interest in the data.

DATA DISTRIBUTION

Goal 7. Maximize automation of data distribution.
Recommendation 7.1 Continue efforts to make data continuously available through the Internet.
Recommendation 7.2 Increase the number of datasets available through the AIMS Internet map service.
Recommendation 7.3 Continue to enhance Internet map service functionality as technology changes.

Goal 8. Increase data distribution by streamlining the data-licensing process.
Recommendation 8.1 Reduce the time required to obtain a data license.

Goal 9. Ensure that AIMS data is (GIS) software independent.
Recommendation 9.1 Continue to offer data in a variety of industry-standard formats.
Recommendation 9.2 Evaluate and implement appropriate new spatial data transfer standards.

Goal 10. Ensure consistency in data distribution and pricing policies.
Recommendation 10.1 Make all pricing and distribution policies consistent with current County fiscal policy.

DATA USE

Goal 11.   Maximize the use-potential of the data distributed by AIMS.
Recommendation 11.1 Develop applications and tools that simplify data viewing and analysis for the end-user, and distribute these with the data.
Recommendation 11.2 Increase efforts to integrate existing data and processes into an enterprise-wide GIS.

Goal 12.   Increase the use of GIS and AIMS data in the County's decision-making processes.
Recommendation 12.1 Continue to develop partnerships with other departments.
Recommendation 12.2 Evaluate department workflows to identify situations where

GIS can increase the comprehension or effective use of information.

Recommendation 12.3   Continue to evaluate and implement new technologies that support GIS integration.

Goal 13.   *Raise the level of GIS awareness within the County.*

Recommendation 13.1   Continue educational and promotional efforts such as GIS Day and the AIMS Coordinators meetings.

INFRASTRUCTURE

Goal 14.   *Maximize the return-on-investment the County makes in AIMS annually.*

Recommendation 14.1   Make a concerted effort to increase revenue by developing new products and services, and by expanding the customer base.

Recommendation 14.2   Document hard and soft revenue generated by AIMS services and products.

Goal 15.   *Enhance the efficiency of AIMS' technological infrastructure.*

Recommendation 15.1   Continue efforts to improve the availability of the AIMS' infrastructure and supporting ITS system components.

Recommendation 15.2   Apply appropriate n-tier distribution and deployment strategies.

Recommendation 15.3   Continue efforts to increase bandwidth by reducing technical and organizational obstacles.

Recommendation 15.4   Research and implement wireless technologies and mobile GIS where it benefits AIMS and its customers.

Goal 16.   *Develop standards and make them available to AIMS partners to enhance interoperability.*

Recommendation 16.1   Document AIMS' standards and preferences regarding software architecture, development environments, RDBMS, and supporting applications.

Recommendation 16.2   Implement cartographic standards to promote consistency in design, symbology, annotation, and legends among all AIMS products.

Recommendation 16.3   Implement database standards for spatial and non-spatial data, and identify and document best practices.

Recommendation 16.4   Implement standards for a homogeneous hardware environment that enables easy and efficient system administration.

Recommendation 16.5   Implement coding standards that facilitate the maintainability of applications.

Recommendation 16.6   Conduct periodic reviews to ensure enforcement of standards.

Goal 17. Enhance the efficiency of AIMS' human infrastructure.
    Recommendation 17.1 Minimize staff turnover.
    Recommendation 17.2 Encourage professional growth and job satisfaction.
    Recommendation 17.3 Continue to develop the skill sets of staff by making funding available for professional development. Make an effort to identify the career goals of staff and tailor training to assist in meeting those goals.
    Recommendation 17.4 Strive to fill open positions by recruiting people with a broad variety of skills, including customer service, project management, and systems analysis skills in addition to the assumed GIS, programming, and database skills.
    Recommendation 17.5 Develop interns to fill positions within AIMS by providing experience beyond Mapper-of-the-Day duties.
    Recommendation 17.6 Promote teamwork and communication.
    Recommendation 17.7 Facilitate a flexible work environment while maintaining personal accountability.

Goal 18. Ensure that the application infrastructure of AIMS is properly documented and maintained.
    Recommendation 18.1 Document all maintenance, distribution, and use applications through external documents and internal code comments.
    Recommendation 18.2 Continue use of code control software to record and manage changes to applications.

Goal 19. Enhance the efficiency of infrastructure management.
    Recommendation 19.1 Increase use of database technologies to track, manage, and analyze AIMS's infrastructure.

Appendix A: Examples of AIMS Stakeholders

Citizens of Johnson County

Johnson County Government
- Land Records: Clerk, Appraisers Office, Planning & Codes, Register of Deeds
- Infrastructure: Public Works, Wastewater
- Health Services: Human Services and Aging, Environmental
- Emergency: MED-ACT, ECC, Emergency Management
- Law Enforcement & Judicial: Sheriff
- Community Services: Park and Recreation, Library
- Other: Election Office, ITS

Municipal Governments in Johnson County
- Overland Park, Lenexa, Shawnee, Olathe, Leawood, Prairie Village, Merriam, Mission, Mission Hills, Spring Hill, De Soto, Gardner, Westwood

School Districts in Johnson County
- Blue Valley, Olathe, De Soto

Private Businesses Doing Business in Johnson County
- Engineering: HNTB, Black and Veatch, Landplan Engineering, Phelps Engineering, Shafer, Kline and Warren, Olsson Associates
- Real Estate: Fishman & Co. Realtors, Cohen-Esrey, Phoenix Land and Title, Shaner Appraisal, National Flood Research, Premier Bank
- Legal: Polsinelli, Shalton and Welte
- Construction: Burge Fence, Signature Landscape, Decks By Design, Outdoor Environment, Bazin Excavating

Utilities Doing Business in Johnson County
- Water One, KCPL, Kansas Gas, Williams Pipeline, Western Resources

Telecommunications Industry Doing Business in Johnson County
- American Tower, Sprint, Comcast, Time Warner Cable

Economic Development Organizations in Johnson County
- County Economic Research Institute (CERI), Olathe Chamber of Commerce,

Federal Government
- Federal Emergency Management Agency (FEMA), U.S. Census Bureau

State Government
- Kansas Data Access and Support Center (DASC)

Governments in KC Metro and Region
- Wyandotte County, Jackson County, Mid-America Regional Council (MARC)

Human Service Organizations Operating in Johnson County
- United Community Services of Johnson County

Miscellaneous
- Blue Valley Recreation Commission, Deffenbaugh Industries, MidAmerica GIS Consortium (MAGIC)

The Knowledge Base of an AIMS GIS Professional

April 25, 2002

Note: Parenthetical items are intended as examples, not as comprehensive lists.

Database
- RDBMS Concepts (Constraints, Indexes, Views, Triggers, Referential Integrity)
- DB Design/Modeling (Normalization)
- ANSI SQL (DDL, DML)
- DB Administration (Tuning, Security, Backup/Recovery)
- Microsoft SQL Server 2000

ArcSDE
GeoDB
UML

Programming
- Concepts/Techniques (algorithms, structured code, cohesion, coupling)
- Database Programming (ADO, DED)
- Object Oriented Programming
- Visual Basic
- Deployment (InstallShield)

MapObjects
ArcObjects
AML
Avenue
VBA

System Administration
- System Maintenance & Monitoring
- Storage Administration
- Planning
- Hardware, Network, Software Installation
- Security
- Backup/Archive/Restore

Web/Internet
- HTML, XHTML,
- Java Script, VB Script
- ASP
- XML

MapObjects IMS
ArcIMS

GIS
- Analysis Techniques (Overlay, Buffer, Surface Modeling - TIN, Grid, Clipping, Networking)
- Software (Workstation ArcInfo, ArcView 3.2, ArcMap, ArcCatalog, ArcToolbox, ArcPad)

Cartography
- Map Communication
- Design Principles (data classification, visual hierarchy, color)
- Map Symoblization
- Map Projections
- Thematic Map Types (Choropleth, Isarithmic)

Core Skills

Geographic Data
- Collection Techniques (GPS, COGO, Remote Sensing, Aerial Photo, Address Match.)
- Data Models (Raster, Vector, TIN, Coverage, Shapefile)
- Editing (Registration, Rubber Sheeting, Edgematching, Snapping)

Applied GIS
- Environmental (Impact)
- Emer. Mgmt/Pub. Safety (Homeland Defense, Crime Analysis)
- Transportation (Routing)
- Utility Industries (Asset Mgmt.)
- Business (Site Selection)

Project Leadership
- Concepts/Techniques (work breakdown, milestones, deliverables, estimating, gantt)
- Organizational Skills
- Written and Oral Communciation
- Microsoft Project

Systems Analysis
- Interviewing
- Data Flow Diagrams
- Physical & Logical Modeling
- Re-engineering Processes
- Software Architecture & Design

Professional
- Customer-Service Orientation
- Motivation, Initiative
- Work independently & in a team
- Problem Solving/Info Seeking Skills
- Communication & Leadership
- Personal Accountability & Integrity

County Government
- Land Records (Tax, Appraisal, Cadastral)
- Infrastructure (Transportation, Public Works, Wastewater, Stormwater)
- Community Services (Public Health, Parks, Corrections, Emergency Management)
- Planning (Development, Zoning, Code Enforcement)