



**COOK COUNTY GOVERNMENT**  
**GEOGRAPHICAL INFORMATION SYSTEMS**  
**STRATEGIC PLAN**



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## **INTRODUCTION**

A geographic information system (GIS) is a repository of map data and related information that uses software to link computer maps with associated tabular data enabling users to quickly access, analyze, process, and make decisions in a way that improves operational efficiency and service delivery. For Cook County, GIS is a core technology that touches numerous business processes, systems, data, and other applications. As such, it is an integral part of the computing infrastructure that contributes to the overall success of the County's service delivery and operations.

## **PURPOSE**

The purpose of this document is to assist Cook County with setting priorities for GIS data and application development in addition to documenting a technological architecture to support departmental and enterprise business needs.

This is a collaborative effort and “*contextual assessment*” with the objective of working with departments to document workflows that meet *existing* and *future* needs. This contextual assessment is a starting point designed to facilitate a dialogue among stakeholders and collectively discover how the application of GIS technology to business needs can be discovered.

The plan is a dynamic conceptual design which is the starting point for capturing the relationship between the application of technology and its relationship to a business need. It takes into consideration the definition of business need, discussion of the system-data-application requirements to meet the business need and the establishment of rules, procedures and standards for the creation, maintenance and sharing of system.

- o *Create a Vision for the System.*

At its core, the conceptual design defines the broad vision for GIS at Cook County. Stakeholders (those who support the incorporation of GIS into their business processes) define the system and what it intends to accomplish through its development (needs to meet a need).

- o *Define a Cooperative Model.*

This is important since it reflects the common interests and opportunities within the Cook County stakeholders for GIS development, access and management that have been identified.

- o *Describe System Components.*

Components and sub-components of the GIS system are identified and described. These components make up the basis for implementation plan activities and investments.

## **GOAL OF STRATEGIC PLAN**

The goal of this strategic plan is to be able to document and provide input on such tasks as:

- Project Planning
- System Design
- Data Acquisition
- Application prioritization and development
- Installation and Implementation of Data
- HW/SW Acquisition
- Operation and Maintenance of the System
- Staffing
- Training
- Others

## **HISTORY**

Cook County has a history with GIS dating back to 1987 with the automation of the Cook County Highway Department's road base. Other departments such as the Cook County Zoning Board of Appeals, the Cook County Clerk's Elections Department, and the Cook County Planning & Development were using GIS to accomplish project-specific tasks.

In the mid-1990s an initiative began to automate the Cook County parcel layer in conjunction with an office automation project at the Cook County Assessor's Office. For over three years specifications were discussed that would culminate in an RFP that was released and awarded in 1998. By 2004, a comprehensive parcel, planimetric, and imagery data repository was completed along with a parcel maintenance application that mirrored the work flow of the Cook County Clerk's and the Cook County Assessor's offices.

In addition, a memorandum-of-understanding was established with the City of Chicago that allowed dynamic access and use of the Cook County GIS data assets. The County has also allowed all constituent municipalities the ability to receive, free of charge, all data pertinent to their geography.

For the past three years, significant upgrades have been made to the infrastructure to allow and promote the use of the GIS. This includes enhanced servers, networking environment and desktop machines.

## **EXECUTIVE SUPPORT**

The success of the Enterprise GIS is widely based on many factors including the active support of Cook County executives and the availability of appropriate staff. Cook County has established a GIS Land Information Group which assist in developing the GIS architecture and the future vision of the enterprise GIS. The County has a vision for future policy and administrative issues pertaining to the management of this Cook County asset. This group takes the necessary steps to insure the success of GIS in Cook County by using the ideas and collaborative efforts of the entire organization. The Land Information Group lends itself as a

strong voice in the adoption of infrastructure design and appropriate GIS policies. It is the unifying body of the organization and speaks through a cross-departmental focus group. Additionally, to ensure the success of GIS, Cook County has developed a GIS Program Division in the Department of Office Technology. This entity under the direction of an individual GIS Manager is responsible for overseeing the county-wide GIS automation and implementation project. It also works towards the maintenance, training, application development and software distribution of a unified Cook County GIS enterprise.

### **GIS VISION FOR COOK COUNTY**

Cook County GIS has become an important part of many departments' business operations. Geospatial information plays a critical role in the delivery of constituent services. Through 2005, these services have primarily focused on the creation and maintenance of the Land Base, or those data specific to documenting features on the Earth. This includes cadastral, or property information, along with aerial imagery forms the base of most spatial databases and inquiries.

Another focus has been on departmental database creation to meet the individual business needs. For example, the Cook County Highway Department maintains all road and right-of-way data within its jurisdiction for use in capital improvement, planning and maps. The Cook County Clerk maintains base data pertaining to parcel maintenance and the election process.

Since GIS has become integrated with so many business functions, it is now viewed as part of the Cook County Enterprise or the holistic view of all applications, infrastructure, data, processes and procedures that are managed centrally by the Bureau of Information Technology and Automation. To continue to leverage this department's expertise, the development of GIS systems and application need to conform to the standard and vision of BITA.

The GIS strategic plan acknowledges these standards and they have been implemented in existing GIS applications. BITA has determined that the GIS must consider and support the following in application development:

- A web of loosely-coupled, heterogeneous GIS nodes
- An ad-hoc combination of information maintained in separate systems
- Information and logic distributed across many nodes and different architectures
- Complex, dynamic information models
- Large, complex data sets
- Open, standards-based architectures
- Standard development environments and applications

In essence, the geographic information system must match the information management approach consistent with advanced enterprise IT.

## **CURRENT ENTERPRISE ENVIRONMENT**

The characteristics of the current GIS environment are summarized below.

The GIS operates in a highly decentralized environment with centralized coordination and authority enabling individual departments to work autonomously and independently in using the technology to meet their business needs.

The County GIS environment is predominantly comprised of software products from Environmental Systems Research Institute, Inc. (ESRI) and includes software tools such as ArcGIS (ArcInfo, ArcView) ArcIMS, ArcSDE and selected extension products.

There are over 100 different GIS data layers currently being maintained by GIS staff in eleven (11) departments. Advances in GIS have been made within those departments with greater resources and designated staff to focus on GIS applications and data.

## **PROCESS FOR IDENTIFYING GOALS AND OBJECTIVES**

An interactive process has been employed to discover existing and future departmental GIS needs. This process allows for the documentation and prioritization of these needs including data, application, infrastructure, policies and staff. Generally, the process is as follows:

1. Identify Business Objectives (usually performed by GIS Manager). A successful implementation depends on a clear understanding of the organization's business needs which must be met by the Enterprise GIS. If the business needs are not met, the entire implementation is at risk. This includes:

Problem Statement: (e.g., field personnel do not have access to current customer profile data, or Divisions management are spending too much time gathering sales data before meetings, etc.).

Describe the current business process (e.g., field personnel currently must make a request to database services who in turn download the most recent data, etc.).

State the Business Objective (e.g., provide efficient access to latest spatial data to departmental management, etc.).

2. Identify GIS Application(s) to meet Business Objectives. After the Business Objectives for the organization have been defined, it is necessary to identify how many and what kind of applications are necessary to meet them. In some cases, it may be necessary to replace an existing application with newer technology. It is not necessary to determine the exact details of the application at this point, but it is important to know what type of applications are required by enterprise users. These tasks can be performed by internal staff or external resources. This includes:

Describe the expected business benefit from implementing a computer application. (e.g., estimate that users could save 2.5 hours per week by accessing market share data via the internet, or division management could be better prepared for meetings, etc.).

Identify intended audience for the application(s) (e.g., Departmental leads, field personnel, etc.).

Define existing procedures and document workflow.

Define the Use Case Scenarios for the proposed system.

3. Define Application Requirements for each application identified. Once the necessary applications have been identified, it is necessary to define the specifications for each application. The application can be specified by first defining the requirements in five categories including: functional or user operation, data, output, interface and system requirements. The specification is completed when these requirements are met by an overall system design and documented. Among the possible tasks are:

Define the Functional Requirements of the application(s).

Determine the Data Requirements.

Define the Interface Requirements.

Define the Output Requirements.

Determine System Requirements.

Document all Application Requirements.

4. Determine Database Readiness. After the GIS data requirements have been identified, an assessment of “readiness” of the data to meet these requirements must be conducted. This assessment should not only address the completeness and accuracy of the data, but also the usefulness of the data to meet the Enterprise GIS Business Objectives. In addition, a decision must be made as to whether any data conversion or translation is necessary to meet the overall System Design. Considerations include:

Assess the database to determine if the data requirements are met.

Prepare the Logical Database Design to support the data requirements.

Document the Logical and Physical Database Design.

5. Determine Organization Readiness. Organizational Readiness is the preparation of the organization to implement the goals within the Enterprise GIS. This can mean changing current work processes, documenting roles and responsibilities, and training to hone the skills of staff. The implementation plan should address organizational issues that impact the Enterprise GIS success. An understanding of the following are critical:

Identify Users for each application

Assess users skill levels and identify training needs

Identify internal support staff and mechanism

6. Determine System Infrastructure Readiness. A system design is necessary to the strategic plan. This aspect addresses system architecture concerns such as the size and number of data servers, application servers, end-user desktops, and the expected network traffic or capacity. This step may require some server sizing and possibly purchase considerations. Essential data include:

Determine Hardware requirements to support GIS applications and procedures.  
Define Software requirements to support application deployment including licensing.  
Determine electrical, network and communication requirements to support application deployment.

### **STAFFING**

An outgrowth of the foregoing assessment must include any determinants in support of the identification of existing and, if necessary, external resources to accomplish the Business Objectives. An assessment will generate recommendations for staffing and these must be evaluated with cautious respect to the distinctive methods and variables associated with the organizational hiring process, much of which functions independently of the GIS assessment process.

### **APPLICATION DEVELOPMENT PROJECTS**

The Cook County Department of Office Technology will maintain and update on a yearly basis the list of GIS application development projects. In conjunction with the Land Information Group, prioritization of the GIS projects will be discussed and projects recommended for future development.

### **STRATEGIC INITIATIVES**

Since the beginning of 2006, an effort has been made to discover each individual department's GIS needs (data, software, applications and support). Each individual department was contacted for input via a "site assessment" that was conducted by the Cook County GIS Manager and the ESRI GIS advisor. The process has identified a number of GIS projects to be prioritized over the next three years. The following list, not in priority order, reflect the GIS initiatives to be performed over the next three years:

- Enhancement to the Parcel Management Application
- GIS Portal Development
- Enhancements to the Executive Information System
- Enhancement of Project Management and Snowplow Applications
- Health/Epidemiological/Incident Web Application
- Mobile GIS Application Development
- Computer-aided Appraisal Integration with GIS
- Integration of forest preserve environment into geospatial workflows of the Cook County enterprise GIS environment
- Updating of Metadata standards
- Assessment judicial and legal divisions GIS needs
- Development of sketching tool for division tracking
- Implementation of oblique and ground imagery project
- Integration of topographic data as a drainage planning tool

**TIME PERIOD FOR STRATEGIC POLICY**

This GIS Strategic Plan document has been adapted into a living plan to guide Cook County GIS technology initiatives. This current strategic plan has been created to continue the guidance of GIS efforts for the period of May 1, 2006 to April 30, 2009. However, since this is a living document, the strategic plan may be amended under the direction of Cook County Government.