INFORMATION PAPER

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

GENERAL

A geographic information system (GIS) is a computer-based application that combines geographic (map) data with tabular (database) data in a manner that permits spatial analysis and information management. Information management functions include data input, storage, retrieval, manipulation, reporting, and display of information.

By utilizing GIS technology, the Mobile District seeks to manage its large spatial data sets and streamline planning and operations activities. Demands for timely and accurate geospatial data throughout the District are considerable. GIS's can aid in day-to-day operations and assist in decision-making processes.

A GIS can be used to model "real world" systems as well as operations and business processes. These systems and processes are dynamic, and a GIS must be capable of representing those dynamics in some way. The system must also allow for progressive changes that let GIS users do things more efficiently and economically.

BACKGROUND

Within the Mobile District, various forms of geospatial data have been created and are being manipulated, used and maintained. The District's first exposure to GIS technology occurred in the early 1980's as part of the Tennessee-Tombigbee Corridor Study. A multilayer database of the 4-state, 51-county Corridor Study area was created and maintained on computers both in the District office and on board a mobile classroom which travelled around the study area. This data was used for demonstration purposes.

In the nearly 20 years since the Corridor Study was completed, GIS technology has become a relatively common tool in the Mobile District. It is or has been used in four divisions: Planning and Environmental, Engineering, Operations and Real Estate. Various offices of these organizations have developed individualized GIS projects to integrate project data, creating geospatial data sets throughout the District.

The value of GIS support in individual projects or activities has shown that these dispersed data sets, if managed as a centrally available strategic resource, will strengthen the District's

ability to accomplish its missions. Toward this end, the Spatial Data Branch in Operations Division has been designated as Mobile's focal point for GIS activities. The GIS unit of this branch works with the technical divisions and with the Information Management (IM) Office to provide technical support and implementation procedures to offices throughout the District.

PROJECT-BASED OR CORPORATE GIS?

A corporate (or district-wide) GIS implementation is a logical way for utilizing the vast amounts of data collected, maintained and processed in the Mobile District. The corporate approach works well when it is desirable to have many users doing similar tasks and sharing one common database. This database would be a repository where all information for all projects resides. Users are given access to this data on an as-needed basis. The corporate GIS is the long-term solution for Mobile. However, in the short- to mid-term (1-3 years), the District gains more by using the project-based approach.

The project-based approach utilizes the existing networking capabilities and geospatial data within the District during implementation. This approach enables us to develop a district-wide GIS by incrementally building a repository of geographic data. Once input into a functioning GIS protocol, the data can be easily accessed, exchanged and maintained by the District. This type of implementation strategy will provide individual projects with full-function GIS capabilities and begin establishing an archive base for a corporate GIS.

As more projects provide geospatial data for the District, the corporate GIS evolves. The physical database may be structured to allow portions of the database to reside on file servers distributed across the District's wide area network (WAN). To users of the GIS applications, however, the system will be seamless.

A district GIS will maintain separation of project-based data within individual Divisions, establish a common database, and establish a GIS data distribution protocol. A data distribution protocol defines the process of moving data from one Divisional office to another as projects progress. Distribution of data into the District repository also requires procedures for updating the data as well as accessibility (security) procedures.

POTENTIALS FOR GIS TECHNOLOGY

The entire District will benefit from a corporate GIS although the amount of benefit varies among organizations. Overall, the establishment of a corporate GIS would significantly streamline the collection and use of valuable mission-related data in the Mobile District. Even offices which may not see the value of a GIS could eventually use the technology for research and document control. The ability of a GIS to be easily queried would speed up the response time for addressing internal and external customer information requests.