CMPDD
PROMOTING REGIONAL EXCELLENCE SINCE 1968

Central Mississippi Planning and Development District
1170 Lakeland Drive P.O. Box 4935 Jackson, Mississippi 39296-4935 (601)981-1511 Fax: (601)981-1515

April 12, 2013

Mr. David Overby
Madison County Administrator
125 West North Street
Post Office Box 608
Canton, Mississippi 39046

Dear Mr. Overby:

As per your request and in regard to the presentation that we will be making to the Board of Supervisors Monday night, enclosed please find a brief report outlining our findings and recommendations concerning the implementation of Geographic Information System (GIS) improvements and upgrades. As you know, CMPDD has been working very closely with Kay Kittle this past year to roll out the Madison County Map Viewer accessible through the Madison County website. This product is primarily another technology advancement that is the result of numerous GIS efforts proceeding simultaneously in departments throughout the County. We feel that this is a very meaningful accomplishment that the County should be proud of in terms of improving data management, information sharing, communication and outreach. Although this product has much to offer in its current stage, there are certainly additions and improvements which can be incorporated in order to make this a more valuable and meaningful service.

We appreciate the opportunity to be of assistance to Madison County on this and many other endeavors and we look forward to working with Madison County to continue to provide such services. Please feel free to contact me should you have any questions.

Sincerely,

F. Clarke Holmes
Chief Executive Officer

MADISON COUNTY, MISSISSIPPI

GEOGRAPHIC INFORMATION SYSTEM (GIS) NEEDS ASSESSMENT SUMMARY and IMPLEMENTATION STRATEGY

May, 2013

Prepared By
CMPDD
Central Mississippi Planning &
Development District
1170 Lakeland Dr.
P.O. Box 4935
Jackson, Mississippi 39296-4936
www.cmpdd.org

Table of Contents

INTRODUCTION

A Geographic Information System (GIS) can be generally defined as an organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, analyze, and display all forms of geographically referenced information. GIS can be thought of as an information technology that can be implemented at varied organization levels to meet the needs of multiple users and systems. More importantly in this case, GIS is widely accepted and proven technology essential to delivering a broad spectrum of county government services in a more efficient cost effective manner.

Although traditional printed maps are the most common output of a GIS system, its capabilities are much broader. Today's sophisticated and integrated GIS systems provide technicians, data mangers, emergency responders, policy makers and the general public with a means to take information and relate it to location or geography. The key to a good GIS is the ability to take data layers (streets, addresses, flood plains, parcel data, political boundaries, etc) and overlay the data to get a picture of reality based on known and documented information thereby resulting in improved decision making at all levels of an ever changing societal demand. Additional spin off advantages of these technology advances and implementation at the county level are improved communication and record keeping practices thereby improving governmental efficiency and acceptance.

BACKGROUND

This GIS Needs Assessment Update and Implementation Strategy is the culmination of several preceding GIS data improvement efforts undertaken by Madison County aimed at improving basic framework layers. In recent years Central Mississippi Planning and Development District (CMPDD) has assisted the county with advancing GIS technologies including conversion of AutoCAD parcel data to polygon ArcMap shapfiles, linking landroll data to polygon parcel maps, improving E-911 centerline geometry, improving address range information, updating dispatch terminal maps, and creating structure points. This ongoing countywide GIS implementation program has been a collaboration of departmental, county, regional and state GIS implementation strategies merging datasets from multiple sources with the common goal of enhancing the county data management processes as well as fostering user experience and acceptance.

Currently, Madison County's GIS design and implementation is typified by a traditional phased approach that utilizes industry standard open architecture hardware and software platforms. The County elected to implement the planned GIS around the

Environmental Systems Research Institute (ESRI) suite of GIS software to ensure compatibility with the majority of geospatial data sets currently being developed and maintained throughout the State. Selection of ESRI software also provides the best opportunity for the acquisition of prepackaged third-party applications which may be developed for Madison County in the future. ESRI provides an open development environment that enables users to build and/or customize graphic user interfaces (GUIs), software coding details, output products (maps and reports), and on-screen user instructions. This ensures that the software is capable of meeting the demands placed upon it by its various users both in-house and worldwide.

This phased approach to building a GIS has been employed in order to ensure the implementation of current technology at the most reasonable cost. In an effort to facilitate the needs of multiple departments and distinct user groups that would be supported by the system, a Needs Assessment was performed as the first step in the implementation process. The Needs Assessment laid the foundation for the remainder of the implementation processes by identifying key data layers and functions with the greatest need and highest likelihood to be utilized by its end users.

NEEDS ASSESSMENT

The purpose of the Needs Assessment was to evaluate the state of all GIS related datasets residing as stand-alone databases throughout the various county departments. During this phase of the study CMPDD, looked at functions involving the day-to-day collection of geographic information that could be monitored and shared by multiple departments for numerous uses, (i.e. administrative boundaries, land transactions, parcel splits, building permits, address assignments, centerline creation, voter registration, and road inventory). The findings of this assessment served as the framework for making recommendations aimed at automating and integrating an array of location specific data and functions to improve the County's overall efficiency and cost effectiveness in the provision of services.

Based on the survey of departments it was found that there was a significant amount of GIS related databases that had been developed or are being maintained in different county offices that could be useful to other departments as well as the general public. Some of this information could be used in its current form, whereas other key data sets (i.e. street center-lines, address ranges, and the parcel maps) needed updating and manipulating in order to serve as the key mapping components for the numerous look-up, find and routing applications envisioned to be implemented through this process.

Basic Department Needs

County Administrator's Office – This department, responsible for carrying out the policies adopted by the Board of Supervisors, should have full access and availability to all GIS datasets and applications developed in Madison County. Accurate, reliable and accessible data formatted in easily consumable and understandable GIS applications can be of tremendous benefit to numerous management practices.

Chancery Clerk's Office - This department needed a user friendly "look-up or find" application that links all parcels and subdivisions to deeds and other instruments of record. This office also needed the ability to view overlay zones such as political boundaries, zoning, taxation districts, etc.

Circuit Clerk's Office - This department needed the ability to accurately pinpoint a resident's physical location for numerous court functions, licensing, and elections. This office also needs a voter "look-up or find" system which keeps track of all political boundary overlays to assist in voter roll maintenance and notifications.

GIS – This department serves as support staff to other departments and is able to view and print all county overlay zones including, but not limited to; political boundaries, zoning, emergency service zones (ESN's), garbage collection routes, taxation districts, precincts and polling locations. .

Emergency Management - This office needed assistance updating the road network map (street centerlines). Further, this office needed to develop latitude/longitude location information on all structures in the County. Finally, this office also needed a tracking and maintenance system whereby all new addresses assigned are managed and shared across departments for maintenance of the address range layer and MSAG both of which are vital to updating emergency dispatch systems. This address assignment management system should be made available to all pertinent County departments for update, notification and management requirements aimed at improving overall efficiency of County E-911 services and functions.

Sheriff's Office - This department essentially needed the same dispatch mapping components as Emergency Management since this office serves as the central dispatching entity for the County.

Planning and Zoning Department - This department needed the ability to view numerous overlay zones including, but not limited to: political boundaries,

zoning, flood zones, and taxation districts. The office may also benefit from a mapping application to track and display building permit and inspection activity.

Tax Assessor – This office needed to strengthen its Arc based mapping capabilities and incorporate update procedures into workflow process. This office is now maintaining two sets of parcel maps in both AutoCad and Arc, and has been since 2007. The ownership maps are updated daily and are shared freely with any state, county or city entity. Also, this office also needs to improve the flow of information to the County from municipal governments in regard to location data for new municipal building permits and addressing changes.

Tax Collector - This office needed a user friendly "look-up and find" application to verify resident address and location, primarily for notification of assessment on real estate and personal property. This office also needed the ability to look at overlay zones for political boundaries and special taxation districts.

Road Department - This office needs assistance in incorporating an updated County road network into its road management system. In that regard, road characteristics such as public/private designation, surface type, road width and segment length for every road in the county also needs to be part of the road network. This office could also benefit from being able to view and print aerial imagery, parcel data, and structure locations for use in its day-to-day operations.

RECENT DEVELOPMENTS

During this first phase of the multiyear implementation plan significant strides have been made in the area of information sharing, communication, and data management in Madison County. Most importantly, CMPDD, with the assistance of Kay Little, GIS Administrator, launched a customized web-based application using our virtual server and ArcGIS Server technology. This application, accessible through a seamless link on the official Madison County website, uses state-of-the-art HTML and JavaScript programming language to serve up 26 interactive layers of information for public viewing. With this tablet compatible internet based GIS viewing tool users are able to pick and choose the background map and data layer(s) they wish view from a menu of available information. This service allows accessibility to numerous State and local data layers including political boundaries, fire response areas, flood zones, schools, libraries, parks, voter precincts, subdivisions, zoning, parcels, deeds, and plats among others. In addition, this service has search and identify functionality allowing users to query datasets.

It is anticipated that additional layers and functionality will be added to the viewer as deemed desirable and economically feasible to meet the needs of users. In addition, feedback and metrics capabilities are built in to allow administrators to gauge use and receive recommendations for improvements and upgrades.

RECOMMENDATIONS

Based on discussions held with key officials in Madison County regarding priority needs, data requirements, applications and budget constraints, CMPDD recommends that Madison County continue the incremental or phased approach for implementing and improving GIS capabilities over the next two to three years. This proven evolutionary approach to incorporating GIS into departmental processes and workflows insures gradual acceptance and understanding of how the technology can benefit users both in and outside County government. Furthermore, this systematic and cost effective implementation plan aimed at directing the GIS development process into the future will ensure that priority needs are being met.

CMPDD recommends that priority tasks be broken into additional implementation phases intended to guide the County's GIS efforts in the near future. Each additional phase is designed to accomplish a specific set of goals and to provide a solid foundation for continued progress toward the longer-term objective of integrating common spatial databases into the day-to-day operations of Madison County as well as meet data needs of the public.

Phase 2 Tasks – Continue Viewer Development, Establish Mainframe Interface and Update Centerlines and Address Ranges

During this phase CMPDD will continue to expand and enhance the County GIS Data Viewer with the incorporation of additional layers and functionality aimed at meeting the needs of users. In addition, this phase will involve establishing an export interface to extract data from the County mainframe computer. Madison County should investigate how departmental databases can be linked to georeferenced data layers and visualized within departments and/or shared across departments through an intranet and/or internet environment and implement procedures where beneficial.

Also, following the release and acceptance of the recently commissioned countywide aerial imagery the County should perform a countywide update of the street centerline files and associated address ranges. These updates should then be incorporated into the PSAP (Public Safety Answering Point) dispatch terminals to improve emergency responsiveness. Additionally the County should utilize the new aerial photography to systematically update the georeferenced point file of all pertinent structures in the County delivered

previously. As with the original dataset, these updated points will include attribute information regarding; ownership, geographic coordinates, physical address, mailing address, and parcel ID.

Phase 3 Tasks – Investigate Feasibility of Developing Road Department Automation Procedures and Prepare Cost/Benefit Analysis of Acquiring Georeferenced Photography of All Structures

Along with continued improvements to County GIS Viewer and maintenance of street centerline data, it is recommended that the County take steps towards assessing the desire and feasibility of automating the Road Department's management procedures. Specifically, this office should consider incorporating the updated County street centerline network into its road management and maintenance systems. It is anticipated that this department could benefit from being able to view and print aerial imagery, parcel data, and structure locations for use in their day-to-day operations.

In addition, the County should prepare a cost/benefit analysis of capturing and linking georeferenced photographs of all structures included in the structure point file layer. In the case of gated access to non-visible structures, photographs of entryways could be substituted. Although it is anticipated that this layer of information could be of value to appraisers, emergency responders, and planning and zoning personnel the cost such an endeavor must be thoroughly scrutinized in relation to expected benefits.