



imagi NEWS

Who's Doing What in GIS and Spatial Technology

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Muskegon County

Population: 170,200 (2000 Census), 174,401 (2004 estimate by the West Michigan Shoreline Regional Development Commission)

Geographic Coverage: 518 Square Miles (1341.614 km²)

Local Government Coverage: 27 local units of government: 7 cities, 16 townships, 4 villages

Annual Budget: \$70,000 annual GIS development expenditure

Staff: Two: Property Information Analyst, Geographic Information Technician (both part of 22 member Equalization Department)

PROJECT SUMMARY

After several years of foundation building and planning, Muskegon County is beginning to bear the fruits of its labor in GIS development. Building from the transitional CAD (Computer Aided Design) based parcel mapping,

Muskegon County continues to stride forward in their effort to establish a countywide GIS for use throughout all county and local government processes. While this is a huge task, current GIS development processes have established a step-by-step approach in an effort to produce products, minimize large cost expenditures, and focus on building a solid cadastral (parcel) foundation upon which all future projects will be built.

Muskegon County's development of GIS has and continues to be born out of the Equalization Department's parcel mapping efforts. In 1997, the County began converting from hand drawn paper mapping to a CAD system to maintain the parcel mapping. This effort was completed using a general fund budget allocation starting at less than \$1000 for general mapping allocation per year to a current annual GIS and mapping expenditure budget of \$70,000. The conversion to CAD was performed primarily by local engineering firms until 2004. During 2004, additional staffing was allocated to the effort, and all parcel mapping functions were shifted to an internal function of the Equalization Department. Since then, all parcel maintenance and preparation of the CAD files for GIS development have been performed by two staff dedicated to mapping and GIS within the Department.

It is the intention of Muskegon County to develop a fully integrated enterprise GIS that assists all departments, including: Central Dispatch (E-911), Sheriff, Emergency Services, Equalization, Drain Commission, Administration, Public Works, and numerous additional departments. AutoDesk's AutoCAD LT software is being utilized as the primary mapping software until the entire parcel base has been converted to ESRI's ArcGIS software platform.

CURRENT PROGRAMS AND PROJECTS

Muskegon County is currently performing several projects in an effort to establish a base GIS structure upon which all future layers and information will be constructed.

PARCEL CONVERSION

In the fall of 2004, the County contracted with InfoGeographics, Inc. to develop a personal geodatabase cadastral model and begin the conversion of existing CAD-based cadastral mapping into the model. The model was developed through an in-depth process of revising the ESRI parcel data model. Revisions were proposed, adopted, and revised in the model. The consultant then began a pilot conversion project of two townships from CAD into the geodatabase. At the conclusion of the pilot project, it was determined that fair amounts of cleaning and grooming the CAD files were needed. Staff at the County performed this task of further standardizing, cleaning, and preparing the CAD mapping for conversion. These processes are substantially completed, and the last city and township should be completed late summer 2005. During this process, the vendor has continued to perform the CAD to GIS conversion and is expected to complete the initial implementation of the cadastral geodatabase by early fall 2005. As individual local unit conversions have been completed, assessment administration records from BS&A's Equalizer software has been linked and creation of sales study, land value, special assessment, zoning, and additional maps have been created and evaluated in an effort to both perform QA/QC and begin utilizing the GIS capabilities of the property geodatabase.

GPS CORS REFERENCE STATION AND PUBLIC LAND SURVEY SYSTEM FRAMEWORK

The establishment of a CORS (Continually Operating Reference Station) GPS base station by the Muskegon County Road Commission is helping facilitate the development of a centimeterlevel accuracy GIS Public Land Survey System framework. One base station is currently up and running, and a second station is scheduled to be installed during fall 2005. Section corners, quarter corners and centers of section GPS points are being collected and will be utilized along with 2001 digital orthophotography to establish this framework. To date, approximately 60 percent of the corners in the County have been collected, and additional tracts of coverage should be obtained this fall. Where GPS points are missing, standard survey data will be used to supplement and establish the framework. As individual townships and cities have their framework established, the cadastral mapping will be transformed to fit, and the boundaries between units will be seam matched. The framework should be completed by winter 2005/2006.

ROAD CENTERLINE

Central Dispatch (E-911) for Muskegon established a street centerline file in shapefile format in 2000 and 2001. Maintenance performed by staff at Central Dispatch has continued to add new roads, but the positioning of the road centerlines has not been corrected to match the orthophotography and framework grid. To this point, the centerline data had been utilized exclusively for dispatch purposes. Recently, as a result of increased cooperation between the departments, the road centerline file is beginning to see use in additional departments. The increased usage has verified the need to reposition the road centerline file to match the CORS framework and orthophotography. Staff from the Equalization Department and Central Dispatch, in conjunction with InfoGeographics, are establishing initial standards and procedures for the repositioning of the road centerline file, which should begin fall 2005 and be completed by spring 2006.

UPCOMING PROJECTS

WATER/STORM WATER/SANITARY SEWER

A water, storm water, and sanitary sewer geodatabase project is in the initial states of discussion and needs analysis. The County, along with numerous townships and cities, are working together to govern and oversee the rapidly expanding county wastewater system. Several townships and cities have large water and/or sewer projects occurring, and the County is extending its wastewater system to incorporate large areas of development that are currently not served by the system. It has been the general consensus that all of these systems would be greatly benefited by establishing GIS functionality to the design and layout of the systems. Planning will likely continue through the fall, and building of the geodatabase could commence in the winter of 2005/2006.

HYDROLOGY/COUNTY DRAINS

Several projects and discussions are ongoing regarding the creation of a hydrology layer or geodatabase in the overall GIS system. Discussions and previous projects with the County Drain Commission office have concluded that a hydrology and county drain system layer needs to be established. Currently, the process of identifying property owners along a given water feature is a long and arduous task that needs to be streamlined. Therepositioning and QA/QC of the Framework Hydrology from the Michigan Center for Geographic Information (CGI) to the Muskegon County Framework Grid would allow for streamlining of this task and would fulfill the needs of numerous other projects.

DIGITAL ORTHOPHOTOGRAPHY

Previous 1" to 100' (1:1200) and 1" to 200' (1:2400) orthophotography from 2001 photography was obtained in 2004. Utilization of this photography has proved invaluable, and budgetary feasibility of a spring 2006 orthophotography project is being considered. Since the implementation of the 2001 orthophotography, numerous departments and agencies have utilized the functionality and detail to varying degrees, including: County Sheriff, City and Township Police and Fire, Central Dispatch, Emergency Services, County Commission, Public Works, Equalization, local surveyors, and engineering firms.

ArcIMS AND ArcSDE

Preliminary needs assessments are currently underway regarding both internet/intranet web-based mapping functionality and ArcSDE conversion. As Muskegon County is still implementing the initial GIS, additional considerations as to needs, design, and budgetary availability are being considered. It is currently estimated that both the ArcIMS and ArcSDE projects would not begin before the fall of 2006.

LESSONS LEARNED

While most in the GIS profession fully understand the benefits and workings of GIS, local officials, policy makers, and staff find it difficult to understand. The key is education and patience. The development of GIS for Muskegon County has been a somewhat slow process, but that slower pace has allowed for numerous advances. Advances in technology, software, data development have proved very beneficial. The largest benefit, however, has been the ability to work with and educate both the leaders and staff of the county and local units of government on the utilization and benefits of GIS. These efforts have built great consensus throughout the entire county, which can be a difficult task. Building consensus allows for the building of a strong foundation and a data rich environment. While producing and disseminating data its strategically very important, one of the most important lessons learned is that of education and honest answers. Keeping participating local units and departments informed of realistic dates and workloads and openly communicating delays and progress keeps participants on board. An additional challenge has been financial. Without a large dedicated GIS development budget, the County has had to rely on creative ways to get "buy in" and to spread the cost. One of these ways is that every mapping and GIS project actually becomes a partnership between the County and all of its local units of government. The economy of scale is truly realized when all participants partner together for the common good. Many communities in the County would never have the budgets to build GIS on their own, much less have the manpower to utilize it. By partnering with the County, GIS services can be provided and applied in their own community, to everyone's benefit.

As the GIS for Muskegon County is established, we invite you to become part of the MAGIC: the Muskegon Area Geographic Information Consortium.

For more information with regard to Muskegon County's GIS,

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