



imagine NEWS

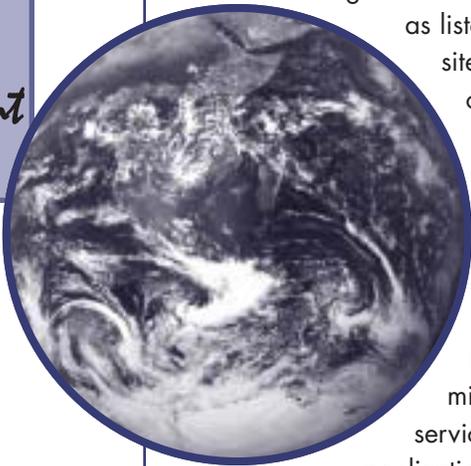
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Intranet Development

City of Southfield

From the President

Member News



Intranet Development with an Eye on the WWW

By Laurie Spencer, Equalization Director and Ernie Cacciaglia, GIS Coordinator - Grand Traverse County

One secret to GIS success is to keep the end goal as a top priority. One of the goals of Grand Traverse County, as listed on the County web site, is to "Expand use of the County web page to provide increased information and make County services accessible to the public (i.e. Board and committee minutes, purchasing services on-line, permit applications)". The Grand Traverse County GIS Division wishes to accomplish similar goals with its GIS web site. That is, to make data available to as many people as easily as possible. This constitutes a balancing act between the need to provide both employees and the public with quick and efficient access to detailed public information and the cost of providing these services. Addressing the issues that are involved in accomplishing that task are the main items that Grand Traverse County has grappled with and fall under the headings: economics, functionality, and privacy.

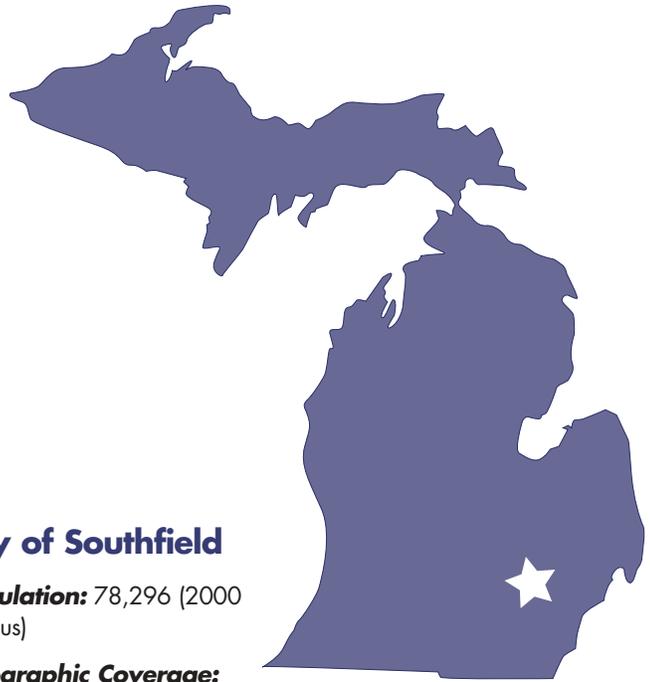
ECONOMICS

In times of budget shortfalls, having public information on the Internet and intranets means quicker service, fewer time-consuming phone calls, and reduced document requests, which is a far better alternative to providing GIS software and hardware to already "stretched" staff. Not to mention the difficulty of finding a parking spot in the county parking lot! GIS is a technology that reduces redundant operations in the organization resulting in efficient workflows and lowered costs.

Grand Traverse County currently has what is called a Level I Internet web site. A Level I site is defined as a site that simply displays information. Information travels only one way. The information currently available does not include assessment roll information, GIS data, or on-line services. What is desired at the County is a Level II site in which information travels two ways. This will allow residents to conduct transactions such as applying and paying for building permits on-line.

Grand Traverse County is under budget constraints so Ernie Cacciaglia, County GIS Coordinator, rather than an outside consultant is undertaking the GIS intranet

Who's Doing What in GIS and Spatial Technology



City of Southfield

Population: 78,296 (2000 Census)

Geographic Coverage: City of Southfield

Size: 26.6 Square Miles (68.9 km²)

PROJECT SUMMARY

Proof of concept is no longer a phrase used when speaking of the GIS in Southfield. The Southfield GIS Enterprise implementation began in 1998 and has grown to include over 110 users spread across multiple buildings and departments. Although GIS trained personnel fill only two positions, coordinator and technician, our project is supported by personnel from each department throughout Southfield as well as our GIS consultant, Consulting Engineering Associates, Inc. (CEA) of Detroit. Southfield does not have a "GIS Department". GIS activities are routed through the Engineering Department.

Southfield chose to collect and verify information that was to be included in the project data sets. A large part of this effort included locating utility structures using GPS. The survey teams also tagged and inspected each structure. In the end, that effort included the identification of more than 31,500 structures which cost the project approximately \$1,250,000. The City has spent another \$750,000 for application development, software, hardware and support over the past five years. It is estimated that an annual budget of \$100,000 will be required to continue the support and development of GIS in Southfield. This is felt to be a very insignificant sum considering the amount of data that is maintained and the number of GIS users throughout the City.

Commencement of the GIS project relied upon having the data sets that were made available through the Oakland County GIS Utility. The goal has been to create a centralized application and data repository that can be used by every department in the City while providing access to

the public. The availability of up-to-date data, along with our knowledgeable staff allows GIS functions to be incorporated into daily activities and processes. In addition to efficiency, many individuals will tell you that they can perform tasks and analysis that could not be completed prior to GIS. Users of the GIS include Public Safety, Engineering, Planning, Sewer & Water, Streets & Highways, Traffic Engineering, Code Enforcement, Building and Fire.

The Southfield GIS is a result of analyzing functional requirements and developing user applications designed to improve productivity. This assessment included both short and long term GIS application and data requirements. The implementation strategy has evolved as users' needs and capabilities change. Having a professional consultant available who is familiar with current GIS solutions and business practices is invaluable in facilitating and planning. System architecture design is based on user requirements and not limited by hardware and software.

APPLICATIONS SUMMARY

All data is stored in a central Oracle database. Business tables are managed through custom forms, hot syncs and interval departmental database dumps. ArcSDE is the interface for managing the geodatabase in the DBMS. The geodatabase is updated using ArcInfo. Validation rules have been defined so data can be edited through domains, subtypes, geometric networks and topology. Images are stored as blob files in Oracle and managed using a custom Document Management System (DMS).

Data is collected using our LEICA GS50+ GPS unit, as-built plans, cameras, scanners and data entry. All GIS applications were built around the data, which created an efficient and up-to-date system for all departments. For example, when a property owner's name changes in the Assessing Department, the change is seen across all GIS applications reaching hundreds of users. Laptops are updated daily or at the user's discretion by connecting to the network and clicking an update button on the GIS Basic Laptop application. Below is a summary of Southfield's GIS applications:

- **GIS Basic** – Used to retrieve property and utility information and view a map with simple printing and analysis capabilities.
- **GIS Basic Laptop** – Same as GIS Basic but runs on a laptop computer not connected to the network. This is an application using data outside of ArcSDE. Shape files and coverages are exported from ArcSDE as changes are made to feature classes. Laptops are updated with any new information when the laptop is connected to the network and synced up with the server.
- **GIS Advanced** – Same capabilities as GIS Basic plus advanced print settings, analysis, data management, data updating and editing. GIS Advanced uses Visual Basic & ArcView or ArcInfo as the map viewer. Dynamic Data Exchange (DDE) is a relatively simplistic method of Inter-Application Communication (IAC).

WHO'S DOING WHAT continued on page 6

INTRANET DEVELOPMENT *continued from page 1*

web development with plans to move to the Internet. While it is difficult process, it has reaped some rewards. GIS staff has become empowered with the knowledge of the “guts” of the system through their web development involvement. This has expedited fixes and modifications to the program. Some departments have served as program testers and call when there is a problem or to offer suggestions. Because the intranet is being developed internally, staff has been able to troubleshoot, diagnose and repair the problems quickly.

FUNCTIONALITY

In-house development has also helped Grand Traverse County avoid the “Black Box” syndrome. This is defined from Wikipedia, the free encyclopedia, as a system where there is a well defined understanding of the input and output characteristics, but no idea what’s going on inside. Grand Traverse County has tried not to neglect the importance and creativity of end-users in the intranet construction. For instance, the landmark application was originally developed after deployment of a geocoding application in 9-1-1. Once the application was in place, the dispatchers realized that more functionality was needed, as many calls did not originate from an address but from a location such as the “Open Space”. The application was enhanced to incorporate this functionality and is now being implemented in the intranet application. Spatial-data infrastructures depend on participation at local levels, such as counties, townships, drain commissions, health departments, road commissions, gypsy moth coordinators, and schools, and they must be developed to support feedback from these users.

The GIS web application developed is custom built with ArcIMS and ArcSDE working together. Using a Web browser, Microsoft’s Internet Explorer, County employees connect to the intranet server. Custom query interfaces for various GIS layers have been developed with the aid of JavaScript. JavaScript is a scripting language common to most web browsers, which enables operations to be performed on the client computer. This allows a Web page’s interactive elements (buttons, text boxes, etc.) to respond quicker than server-side operations, and to provide useful information to the user such as “The query you have submitted will result in a selection of over 100 items! Please refine your search”.

Functionality from a 9-1-1 application was also added. Landmarks can be selected by City or Township or by use. For example, one can search on all the cemeteries in Acme Township and select from the list or if the name is known a person can simply enter it. (Figure 1)

There are also some limited “drill down” possibilities similar to GIS software. One possible drill down scenario might be to determine the elementary school district, Board of Commissioner district, or the voting precinct of a given address (parcel).



(Figure 1)

Some layers in the web application include 2003 orthophotography, subdivision and condo images, Board of Commissioner districts with photo and contact information, voting precincts, elementary school boundaries with pictures and addresses, township boundaries, parcel ownership with tax related information, subdivision and condo layer, road centerline layer, rivers, lakes, landmarks, and Latitude and Longitude.

Common words and phrases are found in the query dialog screen to provide a clean and logical graphical interface. This was done so as not to intimidate the user by requiring SQL type syntax to query. The disadvantage of this approach is that it limits the type of query that can be made but it has the advantage of a cleaner, friendlier query screen, which is easier to understand by the general public.

Another thought in the development of the GIS web site was the desire to provide a “bridge” to higher GIS functions. It is hoped that eventually some employees will be encouraged to try their hand with more sophisticated GIS software. While most County Departments have at least one licensed copy of ArcView, it is underutilized. Proximity analysis, which shows, for example, how many properties are located within a 5 mile (8.05 km) radius of a school or mailing labels generation for zoning issues are available on the intranet application and these are activities traditionally performed with GIS software. The web site will have the ability to map Latitude and Longitude Coordinates obtained by a handheld GPS unit or other means utilizing three different input types – individual, multiple, or from an imported ASCII file. It will also allow placing points on the map and downloading these coordinates. The web site’s icons have been made to duplicate ArcGIS icons so that they become familiar to users, and if they are encouraged to use GIS software, they will find them recognizable and know what to do with them. The ArcGIS map navigation functions have been duplicated for the same reason. A geocoder will also be incorporated into the web site.

INTRANET DEVELOPMENT *continued on page 5*

From the President

It's amazing to think that IMAGIN's Annual Conference is just around the corner. It seems like we were in Kalamazoo just a few weeks ago! Luckily the Events Committee didn't let any time lapse before planning started, and they have been busy working all this time on putting together another fantastic program for this year's conference. I don't know anyone whose organization hasn't been affected by the current state of Michigan's budget, and IMAGIN Committees have been particularly sensitive to making the conference program worth the investment of your time and money.

I know personally that I gained a great deal of practical knowledge regarding mobile technology at last fall's one day conference co-sponsored with GITA. I was able to take what I learned that day directly back to Kent County and improve the support of a mobile mapping application for our Environmental Health Division of the Health Department. They are now using improved field data collection methods in the Well and Septic application process. Their processes are more informed and efficient both in the office and the field. Just imagine what you can learn in three days at the annual conference.

If you aren't able to get away from the office for the whole conference, Tuesday is planned especially for single day attendees by having all meals provided and lunch and dinner programs included. During the lunch and dinner programs, Quality Awards, Student Paper Competition Awards, Map Gallery Winners and the Jim Living/Woolpert Scholarship will be presented.

Clearly the Annual Conference and other programs sponsored by IMAGIN don't just materialize by themselves. There is an amazing commitment from many people involved behind the scenes to support the IMAGIN organization and the GIS profession. The IMAGIN Board has redoubled their focus on providing as much value to as many people as possible. We have been evaluating what we do and how we do it, trying to make changes where and when we can to keep IMAGIN relevant to its members and current to both technology and economics. Committee members are endlessly creative and resourceful in delivering programs and services to the IMAGIN membership. Most importantly, each IMAGIN member contributes to the organization and profession by reading IMAGINews, providing articles and news for IMAGINews, submitting abstracts for the Conference, sharing maps in the Map Gallery, and applying for IMAGIN Quality Awards.

I look forward to seeing everyone again at this year's Conference in Lansing and catching up with you.

Sharon Vanderbout can be reached at Sharon.Vanderbout@kentcounty.org

IMAGIN Annual Conference

May 3-5, 2004,

Holiday Inn - South/Convention Center, Lansing, Michigan

IMAGIN's 2004 Annual Conference, Geography on the Move: Managing the Change, will soon be here. Join your fellow IMAGIN members for three days of valuable education, professional development, and networking.

Now more than ever, it is extremely important for Michigan's GIS Professionals to effectively and efficiently use technology. And the Events Committee has put together some hard-hitting sessions to help. A full slate of educational sessions has been scheduled.

The conference will kick-off on Monday morning with an invited keynote speaker, Dorothy Albright, GIS Program Manager for the Fire and Aviation Management Division of the US Forest Service in California. Along with her colleagues, she will discuss the use of geospatial technologies for situational awareness and decision-making during one of the worst fire storms in California history. During the 2003 Southern California fire siege, fourteen fires burned over 739,000 acres (2991 km²) destroying 3,631 homes; 1,169 outbuildings; and 36 commercial properties. Twenty-two people lost their lives including one firefighter. A timely and very important presentation that should not be missed!

EDUCATION

Presentations from your peers across the state will showcase an amazing collection of accomplishments in township planning, Internet GIS, emergency management, land usage, document management, and much, much more. Learn about everything from Lidar to GIS in Schools!

This year, 15 comprehensive sessions have been organized to make sure that all of the important topics are covered. Sessions will focus on a number of topics including Utility GIS, Natural Resources, Local Government, Web GIS, Aerial Imagery, Homeland Security, Mobile Mapping, and State/Federal Issues.

WORKSHOPS

Workshops are scheduled on Wednesday morning. Two-hour classes on CAD Conversion, Geodatabases, Cartography, Census Data, and Aerial Photography are certain to provide information you need to help you with your job.

EXHIBITS & NETWORKING

Vendors will be pleased to answer your questions and demonstrate their latest products and services in the Exhibit Hall. Come to the conference with your Technology Wish List and challenge the representatives to meet your needs.

Making connections is an important part of conference attendance. A roundtable topic luncheon has been added to the program on Monday. What better way to connect with fellow members than discussing a topic of interest over lunch? And don't miss the Networking Reception on Monday Night. The theme this year is a "Tailgate Party", so wear your college sweatshirt and join in the fun.

Find out who will receive awards during lunch on Tuesday and later that night you'll enjoy singer/comedian Mike Ridley at the Conference Banquet. Of course, the Door Prize Raffle will round out the evening of camaraderie!

Watch your mail or visit the IMAGIN website (www.imagin.org) for conference details and registration information. See you in Lansing!

INTRANET DEVELOPMENT *continued from page 3*

PRIVACY ISSUES

One of the thoughts of bringing the intranet web site up first is to allow the time to plan for privacy issues. The intranet web site currently allows the ability to search on owner name. This aspect is an uncomfortable one for some County commissioners. With only having the intranet currently available, time has been afforded the commissioners to decide whether or not to allow this ability on the Internet site once it is deployed. Arguments of what should and should not be presented to the general public has not hindered the intranet development process because departments are requesting functionality for the jobs they are currently performing such as the ability to search on address, street, owner name, or parcel code number and display the location. The Construction Code Office uses this functionality to send out inspectors to a job site and to verify that the address on the application is correct. 9-1-1 uses it for a refined look at an emergency location. The Register of Deeds uses it to search on plats. Before this application, the public pulled microfilm and then an employee would have to re-file the microfilm. The ability to search on plats and condos is also beneficial to the Equalization Department. (Figure 2)



(Figure 2)

Most County Department's databases contain spatial components, which can be utilized with the intranet application. This spatial component was not utilized prior to GIS. This has afforded the incremental success and support necessary to move forward to the Internet application.

Final Web Phase

The final step that must be taken by Grand Traverse County to take the intranet to the Internet is to purchase an Internet server and assure the necessary firewalls and other security components are in place. The County is much closer to making that happen with the work that has been done. For the time being, use of the intranet is promoting

ownership: employees and administrators are buying into the GIS concept, which in turn can further expand the County's GIS benefits to include computer maintenance, upgrades, strategic planning, purchasing new aerial photography, successful grant applications and so forth. Employees will not freely champion something that's vague and off in the future. But if it is a tool that they are using they will. Without a doubt, the Internet is the access that taxpayers are requesting – the County sees the need and wants to get the GIS information out to as many people as possible. We hope that customers (taxpayers) can begin to do their work on-line, pay their bills, get their services, change their services, track their billing over the Internet, and apply for their building permit on-line. In the end, perhaps, the County will need to re-engineer workflows to accommodate this easy access by citizens. For instance, an application that allows someone to flag a pothole in their street on a map, which is in turn filled by County employees, is a different process than currently exists. In this way, Grand Traverse County can provide a service and not just data to its citizens. If we can provide value to the taxpayer, a place for GIS will be assured in the County.

For more information, please contact Laurie Spencer at lspencer@co.grand-traverse.mi.us or (231) 922-4774 or Ernie Cacciaglia at ecacciag@co.grand-traverse.mi.us or (231) 922-4771.

From the Nominating/ Governance Committee

The Nominating/Governance Committee is looking for candidates to serve on the IMAGIN Board of Directors. This is an exciting opportunity for members to participate in the leadership of IMAGIN and to set its course for the future. Seven of the fifteen Board seats are open for election, each of which will serve a two-year term. Board meetings are held the first Friday of every other month, along with the Annual Meeting which is held at the Conference. You may nominate yourself or someone else that you believe has leadership qualities. Please submit a few paragraphs listing qualifications, background, and any other information you would like posted in the candidate write-up. Nominations will be accepted until March 26th. If you are interested or would like to nominate someone, please contact Ken Kaiser of the Nominating/Governance Committee at (906)-228-2333 or by email at Kaiser@stsconsultants.com.

WHO'S DOING WHAT *continued from page 2*

- **Document Management System (DMS)** - The application allows users to store, retrieve and manage multiple images. The City demanded a more sophisticated and specific document imaging functionality to be included in GIS. Hotlink and Hyperlink do not have the capabilities to manage hundreds of thousands of documents. Many departments are currently using the DMS to store site plans, building plans, engineering plans, utility inspection sketches, water leads, sanitary leads, outfall pictures, Digipics, historic source maps, etc.

The DMS allows users to:

- Answer questions quickly and efficiently
 - Serve as a disaster recovery solution
 - Reduce response times
 - Enable telephone consulting
 - Scan and store paper documents and plans for printing to scale
 - Link documents to data layers on a map
 - Access and print documents from anywhere
- **Code Enforcement** - The purpose of the application is to facilitate the work of Code Enforcement (CE) in field data collection, violation tracking and creating reports. The CE mobile GIS solution is created using a Workable Application For Flexible Languages and Environments (WAFFLE) approach. The WAFFLE approach allowed the City to take advantage of pre-developed models and structures that have been successfully implemented based on criteria set forth by existing users. By doing so, the costs of implementing this application were significantly reduced. The City now has six officers equipped with laptop computers for use in City vehicles. Their production rate, which includes notices and follow-up, has increased by more than 50%.
 - **Sign Shop Inventory** - The purpose of the application is to facilitate the work of the Sign Shop (SS) employees in the field with sign input, updates, removals, and sign inventory tracking and reporting. The SS mobile GIS solution is created much the same as the Code Enforcement application.
 - **Dispatch** - The purpose of the application is to provide assistance in locating properties, addresses, intersections and other information within the city limits. The GIS application was originally written to supply the Police Department vehicles with property information, aerial photos, Digipics, hydrants and building footprints.
 - **Police Cars** - The purpose of the application is the same as the Dispatch GIS application but has been modified for use on the touch screen computers used by the Department vehicles. Larger buttons and tap-sensitive programming have made use easier in the mobile environment
 - **Internet GIS for Employees** - The purpose of the Internet GIS is to distribute information over the Internet for employees with minimal GIS use requirements and employees working off-site. These users can access GIS data with advanced tools for printing, analysis and creating mailing labels.

Internet GIS for the Public - The purpose of the Internet GIS is to distribute information over the Internet for the public, contractors, etc. Limited tools are available for these users.

DATA SUMMARY

Over 100 map layers have been developed to meet the needs of every user. Pull down menus have been created for easy access to layers. Menus include:

- **Streets** - Street Names, Right of Use, ROW Dimensions, Road Jurisdiction, Speed Limits, Traffic Signals and Intersections
- **Base Map** - Parcel Fabric, Address Number, Sidwell Number, Lot ID, Parcel Dimensions, Lot Lines, Subdivision Boundaries, Trailer Parks, Section Lines
- **Utility** - Water System, Sewer System, Storm System, Detention Basins, Drainage Districts, Outfalls, Sanitary Leads and Utility Poles
- **Topology** - Building Footprints, Spot Elevations, Soils, Edge of Pavement, Hydrography, Wetland & Woodlands and Bridges
- **Boundaries** - Zoning, School Districts, Voting Districts, Subdivision Associations and 2000 Census Data
- **Facility** - Bike Paths, Churches, Schools and Parks
- **Aerial Photo** - 1997, 2000 and 2002

CONCLUSION

Some believe Southfield has one of the most advanced City GIS in the State! Success has been achieved through careful planning and the willing participation of City staff. Without this participation, the integration that is needed to implement a comprehensive GIS would not have been realized. Southfield is in that all-important phase of maintaining the data that has been captured and pulled together to form the true asset of the GIS. Having user-friendly applications has encouraged use on a regular basis.

For more information with regard to Southfield's GIS, please contact Sally Price, GIS Coordinator at s_price@cityofsouthfield.com (248) 796-4814 or Christopher Trout, CEA GIS Manager at trout@consulteng.com. (313) 341-5797 ext. 1243. You can visit our web site at <http://gisweb.cityofsouthfield.com>

Member News

Grand Traverse County has entered into a cost share agreement with the Army Corps of Engineers for Phase II of their Cadastral Framework Project on December 18, 2003. Phase II will complete the local units in the sewer district with the exception of a portion located in Leelanau County.



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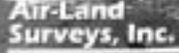
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