

Mecklenburg County, North Carolina

North Carolina GIS on the Internet

(2001—Enterprise System)

System Summary

Mecklenburg County's geographic information system (GIS) Internet applications at <http://www.maps.co.mecklenburg.nc.us> solve two major community issues: accessibility to information and compliance with North Carolina Public Records Law. Never before has public information been so accessible. Information that was once confined to file cabinets is now at the fingertips of anyone with access to the Internet. Previously, a significant amount of time and familiarity with county operations and locations of county departments was needed to acquire information. The county is knocking down the walls of government and enabling citizens to conduct research and transactions via the Internet at times and places of their choosing, avoiding the hassles of driving and parking as well as the constraints of normal business hours. Mecklenburg County's GIS Internet applications have reduced the volume of telephone calls to many Mecklenburg County and city of Charlotte departments. Citizens can answer their own questions via the GIS Internet applications. Routine questions that have been reduced dramatically include:

- What is the assessed value of my property?
- How much did my neighbor pay for his house?
- Where can I find vacant land to locate a new business?
- Where do I vote?
- Who are my representatives?
- What parks are within three miles of my house?
- How do I find a park from my home?
- What school is my child assigned to?
- Where are the high-crime areas in the community?
- Is my house in a flood zone?

The GIS Internet applications have improved the efficiency and effectiveness of Mecklenburg County's information services as well as provided services previously unavailable without Internet technology. The county's efforts have resulted in Mecklenburg County being viewed as a well-governed community by its citizens.

The major objective of the GIS on the Internet project was to provide quality GIS applications and new services to the public over the Internet. These applications provide the best possible service to the public by making government services available 24 hours a day from home or office. This service reduces the number of citizens visiting county offices by providing dynamic access to current information—the same information citizens would receive if they visited county offices. The systems also provide easy-to-use, point-and-click user interfaces.

Of all the GIS applications, the GIS Real Estate System probably offers the greatest benefits to the public. The system is immensely beneficial during periods of peak public involvement, such as property-tax revaluation or the annual mailing of tax bills. The system allows taxpayers, lawyers, appraisers, land developers, etc., to remain in their offices and obtain the same information for which they previously had to stand in line at county departments. The system also allows agencies such as the Planning Commission and Environmental Health to extract real estate information based on a radius area and download the data digitally for property notification purposes. Taxpayers can compare their property values to other properties in their area and present compelling logic that can be used in appealing high values. Realtors® use this system to locate properties, view current tax information, assist in determining how to price new real estate sales, and obtain school assignments. Lawyers, paralegals, and surveyors use the system to perform real estate research relative to property transfers. Land developers use the system to locate potential new development projects.

Student Assignment Express is used by Charlotte-Mecklenburg schools to publicize its student assignment decisions and to provide students, parents, teachers, and school administrators accurate information about where the school assignment boundaries are and answers the very popular question, "What school district am I in?"

Voter Information Express was developed for the Board of Elections to publicize precincts and precinct locations. Politicians and voters alike can obtain current information about where to vote and what political representatives serve any given citizen address.

Community Crime Mapping System provides the public with maps showing the intensity and location of criminal activities and detailed reports of the nature of these crimes. With this information, the public can discover where it is safe to live, work, and shop. This application provides a vital link between the Charlotte-Mecklenburg police department and the community.

The Flood Zone Application allows users to view, query, and analyze Federal Emergency Management Agency (FEMA), Floodplain Land Use Map (FLUM), and Surface Water Improvement Management (SWIM) stream buffers. Citizens living in the flood-endangered areas of the county can obtain detailed reports, photographs, and floodplain certificates from this application.

Citizen Help Map is a very helpful application for locating public buildings or political districts, displaying 10 different political districts and 13 different types of facilities. Searches can be performed by address, street intersection, a specific facility, or a facility near an address. Facilities, once displayed on the map, can then be identified.

The Park Facility Locator and Map & Go are general-use applications for the public at large. The Park Facility Locator quickly helps locate nearby parks and/or facilities. Map & Go plots and maps driving directions between any two addresses in Mecklenburg County as well as in the United States.

Mecklenburg County has experienced overwhelming acceptance by the public and an insatiable demand for this information. The Web site continues to record a growing demand, rising steadily each month since its implementation. The site averages more than three million hits a month. This Web site receives more queries than any other Web site supported by Mecklenburg County.

Motivation for System Development

The major objective of the project is to provide quality GIS applications and new services to the public over the Internet. This goal provides the best possible service to the public by making government services available 24 hours a day from home or office. This service reduces the number of citizens needing to visit county offices by providing dynamic access to current information—the same information they would obtain by visiting Mecklenburg County's offices in person. The system also provides an easy-to-use, point-and-click user interface.

System Benefits Achieved

Mecklenburg County experienced overwhelming acceptance by the public and an insatiable demand for this information. Our Web site continues to record a growing demand, rising steadily each month since its implementation. The GIS Server is now averaging more than 110,000 hits per day. This Web site contin-

ues to receive more queries than any other Web page supported by Mecklenburg County. This growth in popularity of the site shows how useful and helpful the site is to the public.

System Design Issues Encountered and Overcome

Getting departments to keep their data layers up-to-date in the GIS presents challenges. Pressure from internal and external agencies usually forces maintenance to be a priority for data custodians. Sharing data was another initial difficulty. It was difficult for departments to give up exclusive ownership of certain data layers. The sharing of this data, however, provides a long-term advantage that eventually outweighs any short-term difficulties. Mecklenburg County is now in the phase where the sheer success of the project has created its own momentum for excellence.

What Differentiates This System from Other Similar Systems?

This system is unique in three very special ways:

1. Improved service to the public

The Internet applications provide unique benefits to the citizens of Mecklenburg. The GIS on the Internet applications provide current and helpful information to the public as discussed in detail previously. These services combine the power of our GIS with the accessibility of the Internet. Never before has such dynamic information been so accessible to the public and so easily used in so many different ways. Some of the information available through GIS on the Internet would be almost impossible to obtain in any other way. In other cases, the information might be available, but the public would have to find out where it is kept and how to access it, and this might be difficult for someone unfamiliar with the workings of local government. GIS on the Internet has removed these barriers and taken millions of dollars worth of complex computer files and made them easily accessible to the public.

2. Better intergovernmental cooperation and coordination

Mecklenburg County's GIS is the result of a partnership between the various county and city departments. The Mecklenburg County Land Records Management department provides the management and technical oversight for GIS. Each department maintains its own unique data layers. This has fostered a high degree of cooperation between county and city departments that probably would not have occurred without GIS. By combining our resources, Mecklenburg County provides an enterprise-wide decision-making tool (GIS) for our internal departments and the public. The GIS on the Internet has caused these major departments to share their computer data in a common format that can be used by other county agencies. It has eliminated redundancy and duplication of effort. Each agency is now responsible for the

information that is unique to its department. The result is an integrated solution that serves the needs of Mecklenburg County and its citizens.

3. Unparalleled delivery of tax information on the Internet

The GIS Real Estate System delivers an unparalleled amount of tax information over the Internet. By far, the most sought-after information in GIS on the Internet is real estate information. This application provides tax maps, owner information, and tax values over the Internet. It also provides the tools required to perform comparative-sales-analysis searches. These tools can be used by every homeowner, every homebuyer, every Realtor, every real estate attorney, every land developer, and anyone who wants to challenge assessments on property values.

Not only is this information accessible to anyone with a low-end home computer and an Internet browser, the application is easy to use and runs quickly, unlike many GIS applications that require expensive state-of-the-art computer resources.

System Hardware, Software, and Data

Hardware:

- Operating Software: NT 4.0 Web Server Running IIS 4.0
- Internet Server: Compaq Proliant 3000 with a single 300 MHz Pentium processor and 320 MB of memory with mirrored 9 GB hard drives.
- GIS Server: Four Pentium Pro 200 MHz processors with 740 MB of memory and six 9 GB RAID-5 hard drives.

Software:

- Operating Software: NT 4.0 Web Server Running IIS 4.0.
- Developer Software: ESRI MapObjects, ESRI MapObjects IMS, Microsoft Visual Basic, HTML, Microsoft Active Server Pages, JavaScript, VBScript, and ESRI RouteMAP IMS.

User Software:

- Any Internet browser such as Netscape or Internet Explorer.

Data:

Most of the data provided in the GIS on the Internet applications resides on the GIS server in the form of ESRI shapefiles. Each department using GIS is responsible for keeping its data current. Some application data is kept in Microsoft Access databases. In the case of the GIS Real Estate System, the tabular information provided on the Internet is a small subset of data from the main-frame tax files. Ownership and value information are downloaded from the tax files weekly to refresh the GIS data.

In brief, the data files of the GIS on the Internet include:

- GIS Real Estate System: detailed tax maps, ownership information, appraisal information, and tax values.
- Student Assignment Express: current maps of all elementary, middle, and high school assignment boundaries and data files describing each school.
- Park Facility Locator: maps can be generated showing the location of all park facilities and data files describing the facilities located at each park.
- Citizen Help Map: can plot any of 10 different political districts and 13 different types of public buildings as well as provide tools to search the county for these services.
- Voter Information Express: maps showing the location of each polling location and each precinct's boundaries, the boundaries of all political districts, cross-references of any county address to all political districts, and data files of currently elected officials serving in each political district.
- Community Crime Mapping: maps showing locations of reported incidents. This data is accurate to the block number but not to the actual street address. Revealing the actual street address would violate privacy issues.

The data layers available in the detailed tax maps include:

- Tax parcel boundaries and dimensions
- County and municipal boundaries
- Highways, roads, streets, and proposed interstate corridors
- Railroad rights-of-way
- Utility rights-of-way
- Bodies of water, streams, and watersheds
- 100-year FEMA floodplains
- Building outlines
- Color aerial photography
- GPS stations
- Tax office land-use (actual land-use) color coding of properties
- Ten-foot contours

Where Are We Now?/Future Directions

Mecklenburg County's GIS program has continued to enhance and expand its delivery of GIS services via the Web. Since 2001, the county's GIS suite of Internet applications has grown from 6 to 14. Mecklenburg County has continued to experience an overwhelming acceptance by the public and an insatiable demand for GIS information. The county's GIS Web site continues to record a growing demand, rising steadily each month since its implementation. Today, the site averages more than 150,000 visitors per month. This Web site receives more queries than any other Web site supported by Mecklenburg County.

Since 2001, new GIS Internet applications have been introduced, such as Address Information Center (AIC). AIC provides one-stop shopping for basic information about an address. It gathers GIS information from nearly a dozen sources

and conveniently presents it within a single application. The system provides an easy-to-use interface and reports commonly requested GIS information at a glance, with links to specific applications for more advanced users or those requiring more details and functionality. Voter Information and School Assignment Express, formerly stand-alone online applications, have been incorporated into the AIC. Other GIS Internet applications implemented since 2001 are: 1) E-Mapper, a services-mapping locator replacing Citizen Help Map; 2) Map and Go, a routing application similar to MapQuest; 3) Flood Zone, a FEMA flood-mapping application; 4) Recycling Center Locator; 5) Surface Water GIS; 6) Healthy Communities GIS; 7) Well Information System; and 8) POLARIS, the county's most dominant GIS Internet application.

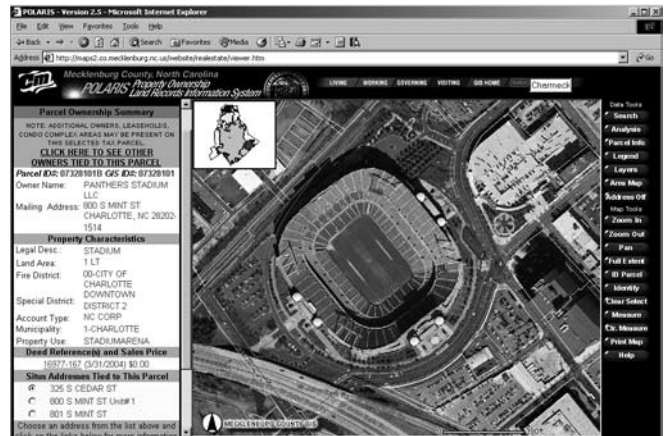
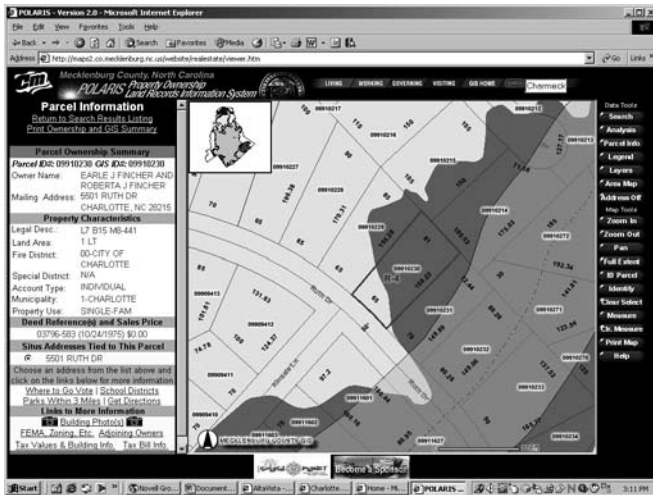
Since receiving the 2001 ESIG award, one of Mecklenburg County's most notable GIS Internet applications went through a significant change. The GIS Real Estate System was the most heavily accessed application of all the county's GIS Internet applications, averaging more than 65,000 visitors per month. In the spring of 2003, a more sophisticated and robust GIS Internet application was rolled out to the public, replacing the old system. The new GIS Internet application was named POLARIS, Property Ownership Land Records Information System. This new GIS Internet application was developed using ESRI's new Internet product called ArcIMS. POLARIS was a tremendous success with the users of the previous GIS Real Estate System because the real estate, commercial development, and legal communities were asked to provide critical input into its requirements and design. Because of this community participation, the application was awarded the 2003 NACO award in its first year of deployment and won the 2004 Prestigious Blue Diamond Award in the category of Best Corporate Use of Internet Technology given by the Charlotte, North Carolina, Chamber of Commerce. In its

particular award category, POLARIS beat out Duke Energy, a major electrical corporation, and Bank of America, the second largest banking corporation in the United States.

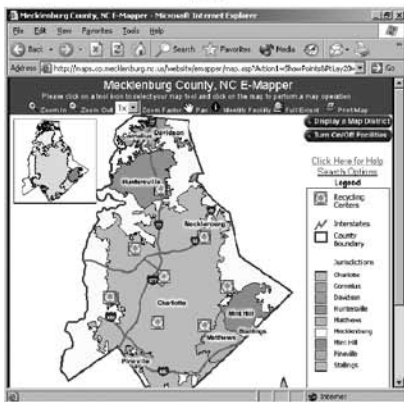
In the winter of 2006, Mecklenburg County plans to implement a new GIS Internet application, currently being called the Charlotte-Mecklenburg Economic Development Mapping Analyzer, through a partnership with the Charlotte, North Carolina, Chamber of Commerce. This new GIS application is being developed to entice large out-of-state companies to consider Charlotte-Mecklenburg as the place to relocate, and to provide local businesses with a Web site analysis tool to help them with their own business growth needs. Demographic information, available commercial real estate sites, large vacant tracts of land, building permit information identifying large growth areas, and location analysis tools will be the primary information and functions within the new GIS Internet application.

Mecklenburg County's GIS suite of Internet applications has changed significantly since 2001. With the deployment of the ESRI Internet mapping product called ArcIMS, in 2003 the GIS Application Development Team decided to upgrade all Internet-based GIS applications from MapObjects IMS to ArcIMS. The ArcIMS ActiveX Connector was adopted to upgrade all existing GIS Internet applications and to be used to develop new Internet GIS applications. Today, in 2005, Web development and Internet mapping technology has significantly changed, with Mecklenburg County's GIS program keeping pace. Today, most of the GIS Internet applications have been upgraded to Microsoft's .NET framework, utilizing ASP.NET, ADO.NET, and ArcIMS map services accessible via Web services. With the consistent changing and improvements in GIS and Web technology, the future of Mecklenburg County's GIS on the Internet will continue to shine brighter.

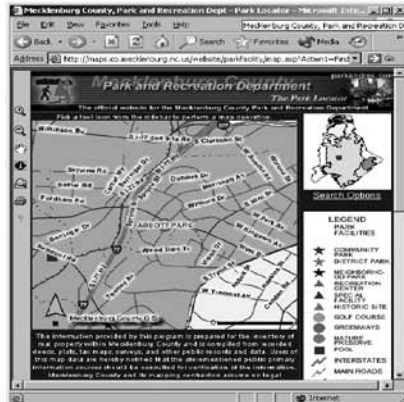
Examples of System Images and Screen Shots



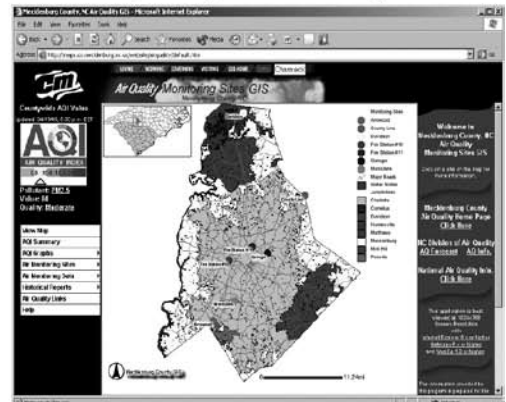
E-Mapper



Park Locator



Air-Quality Monitoring Sites



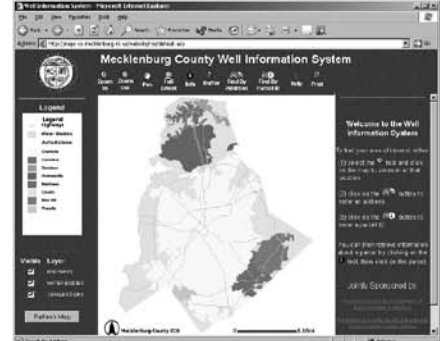
Floodzone Application



Surface Water GIS



Well Information System



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