

## **Title: Web-GIS Integration in Gwinnett County – A Multi-Faceted Approach**

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**Abstract:** Gwinnett County, Georgia, is implementing a comprehensive Web-GIS solution for County staff. The County is located 30 miles northeast of Atlanta, Georgia and has a population of approximately 700,000. The County's website is <http://www.gwinnettcounty.com>.

Eight departments in Gwinnett County are making use of the Web-GIS solution, which is powered by Orion's OnPoint. They include Transportation, Public Utilities, Financial Services, Support Services, Police Services, Fire and Emergency Services, Planning and Development, and Community Services.

Gwinnett County's GIS team, with the assistance of their integration consultant AMEC, conducted detailed interviews with each department. Key components of these interviews will be discussed in the paper.

Gwinnett County has undertaken a systematic and detailed approach to Web-GIS implementation. Web-GIS will be used in many different ways, from printing basemaps to selecting buffers, to connecting to spatial and non-spatial data sources. In this way, Gwinnett County will leverage the full power of Web-GIS.

### **Introduction**

Located 30 miles northeast of Atlanta, Georgia, Gwinnett County has been one of America's fastest growing counties for over 20 years. With a budget of \$1.4 billion, this County, once known for being a rural and agricultural center, is now a vibrant blend of both rural and urban, combining the best of both worlds.

Gwinnett's GIS serves a population of over 700,000, on more than 240,000 tax parcels located along 2,300 miles of road. In the spring of 2004, as the County planned to upgrade to ArcGIS 8x/9x, they realized that many ArcView 3.2 users mainly viewed and queried data, as opposed to editing it. With the extensive user-retraining that would be necessary to move all of these users to ArcCatalog/ArcMap, the County decided to create an easy-to-use web-based GIS for these "query-only" users. This decision would reduce stress on the employee and reduce the cost to the County for licenses and retraining.

Going with a web-based GIS product promised a number of benefits to Gwinnett. Because it is a web application, there would be no need to visit each desktop to install software furthermore, all the data is embedded in the browser during

configuration, so the users do not need to locate the datasets from the various sources. Data from four spatial and tabular databases is accessed and integrated through the browser as well as ESRI Shapefiles.

While easy to learn and use, the browser is flexible and powerful enough to create customized maps, and being a web-based product, it is available to any County employee with access to a computer with Internet Explorer. This increases the usage and return on investment for the data capture and system infrastructure.

In addition to the ease of use for the user community, there was a requirement for ease of management and extension of the browser capabilities by the GIS team. This is achieved through the administrative tool that allows for the complete configuration of the system functions and data access by the County GIS Administrators. The strength of the administrative tool is that the Browser was structured to provide a generic interface for any user and departmental based interfaces designed to provide specific functions and data access based on the users' department.

In order for the website to be a fully functioning GIS, all the layers available (both geodatabase and shapefiles) have been added to the site. With the ability to turn layers on and off and to change the symbology, each user can create a custom view.

Search functions have been configured for many fields, and are customized for each departmental tab. For the General/Guest tab, the most common searches are available, such as Parcel Identifier, Property Owner, Subdivision Name, and Street Address. For each department, functions more specific to the business of the department were developed. For example, on the Transportation tab, a Survey Monument search is available and under the Utility tab, users can search for Water and Sewer Pump stations and Treatment Plants.

By joining data from the Tax Assessor and Building Permit databases through the Parcel identifier, the user is able to query a property and see information about the residential and commercial structures as well as building permits issued. Several departments plan to use this function to determine where development may occur and plan infrastructure accordingly.

Future uses include creating mailing labels for transportation maintenance notices by using buffers to select sets of land parcels and exporting their property owner and address information to a notification list. Also, a template for printing maps and location information for storm water service requests is planned.

## **Implementation**

While the GIS Team had defined system requirements to initiate the project, these were not of sufficient detail to design and develop the browser. Workshops were held for each of the eight participating departments. These workshops focused on the business activities of the department and the information required supporting these activities.

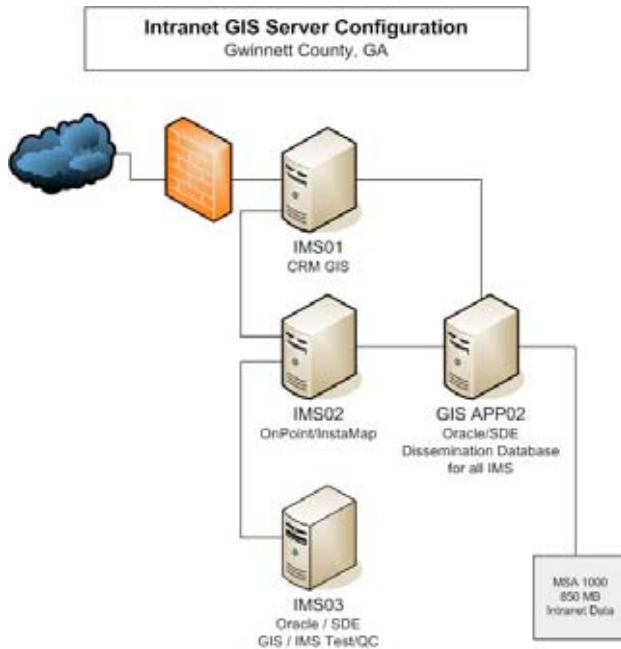
Using the results of the workshops, a requirements document was created that defined the functional, informational and operational requirements of each department. These requirements were inserted into a requirements traceability matrix with the functional/informational requirements on the Y axis and the departments along the X axis. The cells of the matrix contain the reference number to the specific documented requirement that this function addresses. This matrix served two purposes; it clearly indicates which functions relate to each department and allows for the recognition and grouping of common functions. It also ensures that all requirements have been translated into a function to be delivered by the system.

Due to the extent of the defined requirements it was determined that not all could be delivered within the initial project timeframe. As a result the approach of phased delivery of functionality was adopted. Once again the matrix was used to set the priorities for development by allowing for the identification of the most utilized functions and ensuring departments had relevant functionality delivered in the first stage.

With the functions defined, the development effort focused on the preparation of the databases and configuring the application. Once the configuration was complete, testing was performed using the matrix to assist in defining the test cases.

## **Technical Architecture and Performance**

At Gwinnett County, GIS is centrally supported from within the Information Technology Services Division, utilizing all the expertise in ITS, such as networking, server maintenance and database administration. Gwinnett County GIS decided to serve the intranet data from a data warehouse, to separate the dissemination database from the production database, thus allowing query-only tuning and reduced down-time. A server with Oracle ArcSDE is used, with all the data housed in a mass storage array. Replication software is used to synchronize the warehouse with the production database.

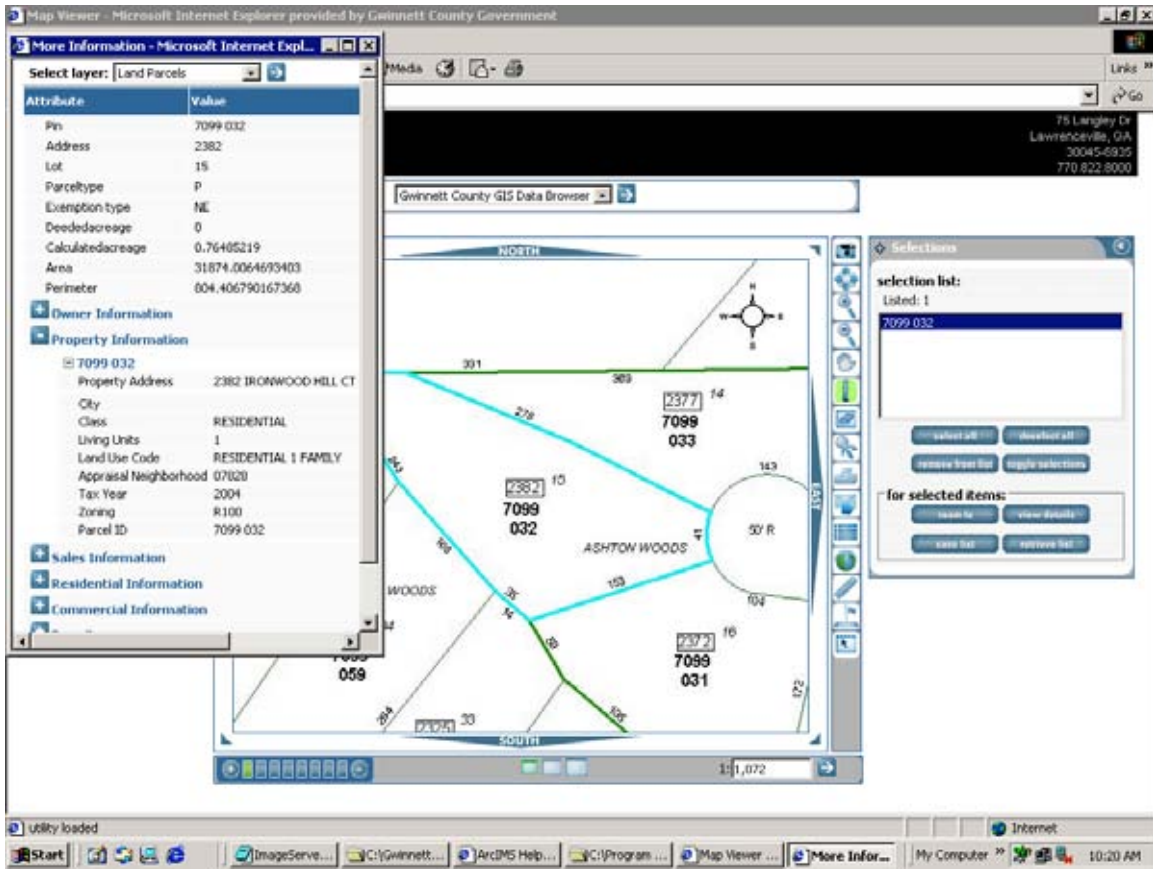


## Users within Gwinnett County

While the GIS system is available to all County employees (a number exceeding 3,000), it is currently used by approximately 100 core users. This number is expected to increase significantly as staff becomes more familiar with the system, and training and marketing initiatives continue. Eight departments in Gwinnett County will make use of the Web-GIS solution including Transportation, Public Utilities, Financial Services, Support Services, Police Services, Fire and Emergency Services, Planning and Development, and Community Services.

## Case Study – Finance Department - Public-Access Kiosks

The Department of Finance has integrated the GIS system into their public access kiosks. Title searchers can find a parcel by searching by identification number or address or by selecting a location on a map. Once found, they can determine the road frontage, acreage and ownership parcels. In this view, an ArcMap Image service displays GDB annotation.



## Case Study – Finance Department – Front Counter & Public Access Kiosks

Previously, with a customized ArcView 3.2 project, the front counter staff would prepare and print a standard planimetric/topographic map or property map. This took a significant amount of time and would sometimes result in the wrong area being printed, since the customer could not easily see and manipulate the view. Now, with the Data Browser, citizens can customize their own view and send the map to the printer behind the counter, and then pay for the map.

InstaMapApp - Microsoft Internet Explorer provided by Gwinnett County Government

Address: <http://gis.gwinnettcountry.com/InstaMap/webpages/SelectPrintGrids.aspx>

**gwinnettcountry**  
government

75 Langley Dr  
Lawrenceville, GA  
30045-0999  
770 822 8000

Selected Map Series: **Property Map**

Available Tiles  
show all tiles 5/9

Add to Selection

Selected Tiles  
7-99

Remove from Selection

Output Format  
select output format  
Export to PDF

Go

Help  
This is the Tile Selection Screen, where you pick the tile(s) you want to create maps for. Click on the map display to add or remove tiles from your list. You can also add or remove tiles by selecting from the lists above. Before you finish with this screen, choose the output format / device from the list provided.

zoom 44 previous

clear selection zoom to selection

Done Internet

[http://jacims02/masoutput/Property\\_Map\\_7-99.pdf](http://jacims02/masoutput/Property_Map_7-99.pdf) - Microsoft Internet Explorer provided by Gwinnett County Government

File Edit Go To Favorites Help

GWINNETT COUNTY, GEORGIA  
PROPERTY MAP

Legend

- Property Line
- Right-of-Way
- Utility Line
- Water
- Other

GIS Department  
75 Langley Dr  
Lawrenceville, GA 30045-0999  
770 822 8000

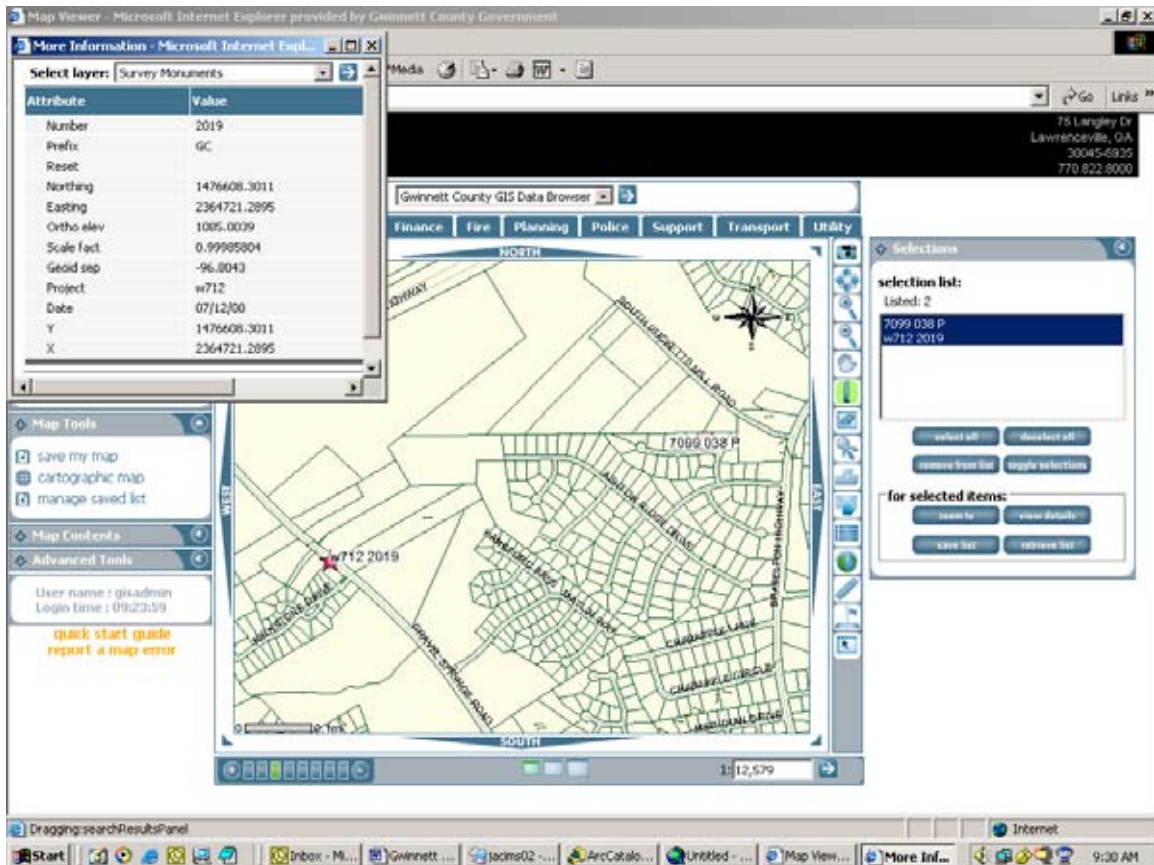
[Dist\_LL]

30% 1 of 1

Done Unknown Zone

## Case Study – Department of Transportation – Survey Monument Lookup

Previously, the Department of Transportation sold books of survey monuments to developers. With the Data Browser, a developer is now able to search for a parcel that they are surveying and find the nearest monuments, and also see the pertinent information, such as coordinates and order to name a few.



## Case Study – Fire Department – Battalion Chiefs

To better locate incidents at apartment buildings, the fire station staff can search for a street, add points with labels for each apartment complex and print a letter-size map to put in each fire truck. Eventually, these points can be added to a geodataset.



## Conclusion

While the web browser is currently available through the Intranet, Gwinnett plans to obtain approval from elected officials to provide Internet access with limited functionality in the near future. They had the opportunity to showcase the new data browser at the 5<sup>th</sup> "Annual County Open House" attended by over 2,500 citizens. The County impressed attendees by searching for their property addresses and displaying features such as aerial photos of their home. The overall response was very positive. Shortly after the site was announced, County employees who have never used GIS before are making use of the system. One such employee remarked "This is a powerful tool that we will use. Even being able to find the correct subdivision or the right street is a big help!"

While very happy with their GIS implementation Gwinnett County GIS continues to upgrade services with new aerial photography and base map revisions, expanded hardware resources, and user friendly interface software. Future plans for Gwinnett County GIS include the use of satellites for real-time day-to-day operations and expanded public access.

## Acknowledgements

The Gwinnett County GIS Department would like to acknowledge the tremendous efforts of all departments within the County that are using the web-



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