Building an Enterprise GIS for the Newest City in Georgia

Brookhaven, Georgia
April 21, 2014

ABSTRACT
Brookhaven, GA the State’s newest city, needed a plan to meet their new citizens’ demands for improved safety and services. The City’s new GIS department took the lead and developed an accurate dependable ESRI driven environment to support all of the City’s software systems and Public Safety coverage models. This remarkable effort was performed with minimal staff in an astounding 12 month window.

Mike Edelson – Sr GIS Analyst
# Table of Contents

Section A. System ................................................................................................................................. 2  
Section B. Jurisdiction .......................................................................................................................... 5  
Section C. System Design ..................................................................................................................... 6  
  2013 GIS Milestones .......................................................................................................................... 11  
Section D. Implementation ................................................................................................................... 12  
Section E. Organizational Impact ......................................................................................................... 16  
Section F. System Resources ............................................................................................................... 19  
User Testimonial Letters ...................................................................................................................... 21
Section A. System

1. **Name of system and ESIG™ category**
   City of Brookhaven GIS Department application ESIG Award category for Enterprise Systems

2. **A letter from the executive administrator authorizing submission of the system application**

To: ESIG Award Coordinator
From: Marie Garrett, City Manager
Subject: Executive Authorization of URISA ESIG Submittal
Date: April 17, 2014

Dear Sir/Madam,

Re: Authorization for the Submission of the URISA’s ESIG™ Award Application, The City of Brookhaven GIS: Building an Enterprise GIS for the Newest City in the State of Georgia

On behalf of the City of Brookhaven, Georgia I am pleased to authorize the Submission of Building an Enterprise GIS for the Newest City in the State of Georgia for the URISA ESIG Award in the Enterprise System Category.

The City’s new GIS department has delivered exceptional service and developed systems critical for execution of duties for every department within the City. From the Police to our Parks, our Community Development to our Public Works all of our departments depend on the integrated systems and centralized data system developed by our GIS team. The City staff and our citizens use this information on a daily basis. The access and ease of use of the systems deployed by our GIS staff has been a benefit to all of us. Our interactive GIS website, Brookhaven’s GIS Windows, allows the citizens and business community to access the same data that our city staff and elected officials use to make critical decisions regarding our City. This is largely due to the tight integration of our departmental systems and the accessibility of our data – all built upon the enterprise GIS at the heart of our City systems.

The result of this effort by our GIS team is a cleaner, safer, well-managed City that is a great place to live and work.

Sincerely,

[Signature]

200 Ashford Center North, Suite 150 Atlanta, Georgia 30338
Phone: (404) 637-0500  www.brookhaven ga.gov
3. Summary

In December 2012, a group of concerned citizens finally realized a long sought goal of establishing the new City of Brookhaven. The City of Brookhaven, GA, was incorporated on December 17, 2012. The driving force for the establishment of this new community included the following goals and objectives:

1. An increase in responsiveness and accountability from local government leaders
2. An increase in representation and more “voice” in local government decisions
3. Higher levels of and more equally applied government services
4. Increased Public Safety and higher police presence in the local area

Given the citizen’s mandates for increased services and representation the newly elected City Management and City Council had to figure out how to deliver on these requirements. The answer was simple but the solution was complex:

- Build a new City government
- Staff it with proactive professionals
- Provide them with the right tools and accurate information so they can execute objectives effectively.

The new GIS department for the City of Brookhaven stepped up and in record time provided the very best information set for the City staff. The following describes how InterDev’s GIS Team for Brookhaven’s GIS, managed and deployed a world class GIS solution for the City, all of its departments, and it’s Citizens in just over one year from the City’s incorporation.

Brookhaven shares its western border with the City of Atlanta and is completely within the I-285 perimeter. As Georgia’s newest city, Brookhaven lies just outside of Atlanta’s urban core. On July 31, 2012, Brookhaven was approved in a referendum to become DeKalb County’s 11th city. Incorporation officially took place on December 17, 2012, on which date municipal operations commenced. With a population of approximately 50,000, it is the largest city in DeKalb County. The new city stretches over 11.5 square miles. Following the example of several other new municipalities in the metro area, Brookhaven’s government model is based on the Public-Private services model. Seven (7) City departments were outsourced to private companies, which provide services under contract to the City and its citizens. At Brookhaven, the contracted departments include Community Development, Public Works, Finance, Courts, Parks, Communications and IT/GIS Services. GIS services are supplied for the City as a part of the Information Services contract by InterDev. City Management and the Brookhaven Police force of 55+ officers are employees of the City of Brookhaven. Contracts for the City’s vendors were announced on December 7, 2012 and
officially awarded on December 17th the first official day of operations for Brookhaven. Prior to the 17th the City did not exist, there were no systems, no phones, no departments, no employees, and no maps or any geospatial information. The efforts to provide services to the new citizens of Brookhaven began with loaner systems, servers, and phone service until the City could begin to officially purchase products and services. A critical component of this accelerated ramp up was the GIS system and environment. Of course, the initial demand for large scale maps of this new City dominated the workload of the IT and GIS team. The real work began with the planning and careful design of how the GIS base layers and addressing would form the core for all systems and services supporting the City and its citizens. Enterprise Requirements Planning (ERP) systems for the City were split between Community Development, Public Works, and Finance. Each system used its own unique database and had its own unique data structure. The common bond for each system would be the centralized addressing provided by the GIS department. Following the established ArcGIS for Local Government Information Model (LGIM) standards for database management, web services, and maps, the GIS and IT teams were able to establish standards and policy for the City’s critical data. This data formed the basis for Community Development, Code Enforcement, Police, and Public Works regardless of the software system utilized by each department or contracted vendor.

One of the driving forces behind the citizen’s quest for cityhood was an increase in the level of law enforcement presence and public safety. County services for police were limited and focused in higher crime areas with minimal coverage in other areas of the City. The new City planned to roll out a brand new police force just three months after incorporation. Critical crime statistics were incorporated into the GIS models and the GIS team worked closely with the Chief of Police and his command staff to develop comprehensive police beats and staffing models. This information was instrumental in the planning and ultimate staffing numbers for the Police Department. This decision toolset was based on the City’s geographical, demographics, and crime stats prepared by the GIS department.

4. Three “user testimonials”
   See Letters following Section F of this document.
Section B. Jurisdiction

1. **Name of jurisdiction:**
   City of Brookhaven, GA

2. **Population served by the organization/agency**
   Population of approximately 50,000. At the time of this publishing the US Census Bureau has not made an official count because the City did not exist during the 2010 Census count.

3. **Annual total budget for jurisdiction**
   Total Annual Budget $17M

4. **Name, title, and address of chief elected and/or appointed official**
   Mayor J. Max Davis
   Phone: 404-637-0710
   Email: jmax.davis@brookhaven.ga.gov

5. **Name, title, address, telephone, FAX, and email for contact person for system**
   Mike Edelson
   Sr GIS Analyst
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   Direct: 404-637-0656
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Section C. System Design

1. **What motivated the system development?**
   City Incorporation in December 2012 drove the need for a comprehensive GIS system. Citizen mandates for a more proactive local government with increased public safety, improved services, and local control over parks and zoning.

2. **What specific service or services was the system intended to improve?**
   Because the City of Brookhaven is brand new, there were no local systems in place and the GIS department had to start from the ground up. The citizens of Brookhaven wanted more local control and higher transparency in their government than the County was offering. It was critical that the GIS was made accessible and usable for the new Brookhaven City Departments, the Police Department, and the citizens in a very short amount of time. One example of this urgency for accurate, reliable data was the short amount of time the Police Department had to build the department. The City had only four months to take over Police operations from the time the Chief of Police was hired to the time of being a fully operational Police Department. An accurate, easy to access GIS was integral to the development of the department in many aspects including crime analysis, staffing, police beat boundaries, and records management. The Police began operations on July 31, 2013 and has been receiving many praises from the community for work they continue to perform.

3. **What, if any, unexpected benefits did you achieve?**
   Brookhaven GIS adopted the established ArcGIS for Local Government Information Model which allowed a very smooth set-up and implementation of the enterprise GIS.
   Brookhaven GIS set up a WebApp tool very quickly using the Flex technology. The WebApp has allowed staff and citizens to create their own maps for various projects. The users have access to multiple interactive layers including: tax parcels, neighborhoods, zoning, contours, hydrology, streets, sidewalks, council districts, schools, and parks.
   The GIS department created a geoprocessing tool that helped the Community Development and Public Works department using an automated system that creates a notification mail out tool. Accurate and improved communications regarding zoning or building changes for the citizens of the City are sent out in a timely manner keeping citizens, business owners, and developers informed.
   The City’s Community Development department chose the asset management program called Meritage for permitting. Meritage is a cloud-base program where the data is stored off-site. This off-site cloud based program has caused issues by adding an additional database of owner names and site addresses. The Master Address list is stored and maintained in the enterprise GIS database.
The unexpected benefit is that based on feedback from Brookhaven GIS, Meritage has decided to move to a more GIS centric architecture; Brookhaven GIS will be working closely with Meritage to help develop this GIS centric environment and prevent database divergence across multiple systems. Another unexpected benefit of being able to implement a fully functional GIS quickly for a start-up city was the increased revenue collected for utility franchise fees. Leading up to the City’s first official day of operations, the City was required to hand over all the addresses in their jurisdiction to local utility companies to verify the correct amount of franchise fees were to be collected. It was vitally important to our new City to receive these fees. Originally, the City handed only information received from the County’s Tax Assessor’s Office, but this data only showed addresses of property owners and not all the addresses of residence in the City. The Brookhaven GIS team quickly realized that potentially thousands of addresses were not submitted to utility companies that would result in millions of dollars of lost revenue for the new City. The Brookhaven GIS Department responded quickly by working closely with the DeKalb County GIS and the US Postal Service to provide the utility companies a more complete list of addresses in the City. This resulted in millions of dollars in extra revenue for the City.

4. What system design problems were encountered?

Our most challenging problem when designing and building the enterprise GIS at Brookhaven has been the inability for all City departments to purchase management software that has the compatibility to connect directly to the City’s master GIS databases. Cloud based permit management software purchased by the Community Development and Code Enforcement Departments have made it difficult to centralized key datasets such as address, ownership, and parcels. The new City choose these cloud based programs because they are affordable, easy to use, and the ease of getting up and running quickly. From an enterprise GIS perspective this software causes a major design challenging. The cloud based software requires a one-time “snapshot” of our centralized database to be exported and then uploaded to the cloud based software. Once the data is uploaded to the cloud, inefficiencies and decentralization of the data has occurred causing a duplication in effort to maintain critical information. The Police Department chose their reporting software that, although, is not cloud based, the reporting system has yet to be integrated with GIS. The Police reporting system uses street address ranges developed in our enterprise GIS, but this data needs to be exported from our GIS then imported on a scheduled basis to maintain accurate road names and address ranges for the department’s Records Management System (RMS) systems. At the City of Brookhaven, the GIS Department understands the needs of these departments to implement these cloud based systems to get this young-startup City running quickly, affordably, and efficiently. Therefore, Brookhaven GIS has implement various workflows and procedures to help keep a centralized database. A few workflows are listed below:

- The Master Address List is maintained by Brookhaven GIS.
- When new or updated data is inputted into the cloud based software by Permit Technicians, City Planners, Inspectors, or other staff, that staff member sends the GIS department that new or updated data. GIS will review the data and then either accept or deny that information to be uploaded into the master database.
- For the highest efficiency, whenever 3rd party software is implemented “snapshot” data requests will come from this Master Address List. This prevents the new system from receiving data from any other database other than the master GIS database. You can think of it as avoiding a database version of the ‘Telephone Game.’
With an eye looking towards the future, the GIS Department has develop the above workflows and processes to allow a smooth transition into a more robust-integrated records management system once those new systems are purchased in the future.

The graphics below shows the current and future state of Brookhaven’s asset management software infrastructure and architecture. The black arrows indicate the flow of data. Double side arrows indicate data is being passed back and forth through the system, with each side of the arrow having the ability to read and write to the database (through proper permissions management.)

You’ll notice that the existing state of our infrastructure architecture is somewhat fragmented and decentralized. Code Enforcement and Community Development are using cloud based permitting software that is causing a decentralization of the data. Given the accelerated timelines and circumstances with standing up a brand new city, having the decentralized structure seems acceptable for the short-term, but is not a viable long-term solution. The future vision of the City’s asset management infrastructure, shown on the second graphic, depicts an internal solution bringing all the asset management programs and critical spatial data (i.e. address, parcel numbers, owner information) together in a centralized GIS database.

The City’s GIS Department anticipates working closely with two of our 3rd party software package providers to provide assistance in those software development teams in developing a product that is GIS centric and does not force our City or others into a decentralized data environment. In our initial assessment with our vendor developer teams we realized that we have three options to pursue this lofty goal:

- Option 1 - 3rd party vendors will develop their software packages that can be directly installed and implemented within the customer’s network, allowing for direct access to the data. This is a good option for the GIS team, but we understand that this option removes the benefits of a cloud based software, which takes away the vendors advantages of implementing and managing the data from their own network.

- Option 2 – The vendor and the City can work together to create a “tunnel” that will seamlessly connect the cloud based software on the vendors network with the GIS data located within the City’s network.

- Option 3 – Develop scripts that will automate processes on both networks that will perform a task, download the data to a central location accessible by both parties, and then automate the data reconciliation on receiving network.
Brookhaven’s Existing Asset Management & GIS Infrastructure

Brookhaven’s Future Vision for Asset Management & GIS Infrastructure

3- Existing and Future Asset Management Software Architecture
At this time, Brookhaven and the vendors have only just begun these conversations, but all parties are excited about moving forward and working together to develop a GIS centric solution that will solve many issues of cloud based software management systems in local government.

5. **What differentiates this system from other similar systems?**

There are several differentiations from our system from other similar systems:

- The unique opportunity to build an enterprise GIS without the common obstacles of antiquated systems, outdated & complex processes, and political maneuvering.
- Brookhaven’s GIS was created with the industry standards developed with Local Government Information Model, the Federal Geographic Data Committee (FGDC) standards for data and metadata, as well as other local standards. Within the boundaries of those standards Brookhaven’s enterprise GIS was developed with the ability to adopt to the many changing landscapes in the cloud computing, GIS technologies, and local government. This ability to maintain high standards and be flexible enough to support the needs and decisions of Brookhaven’s policy makers has differentiated this system from other similar systems.
- The building of Brookhaven’s Enterprise GIS System is notable because of the compressed timeline of its design and implementation.
2013 GIS Milestones

- **January**
  - Began operations
  - City set up account and purchases ESRI ArcGIS Enterprise
  - GIS Department entered into a Joint Venture to purchase aerial photography and LIDAR data with Sandy Springs, Roswell, Alpharetta, and Dunwoody. These are sister cities all located just outside of Atlanta.

- **February**
  - City negotiated with County for access to parcel, tax, and address data

- **April**
  - GIS received parcels, tax digest and addresses from DeKalb County GIS & DeKalb County Tax Collector’s Office
  - Migrated GIS data to the ESRI Local Government Information Model
  - Utility franchise fee addressing verification
  - Installed and implemented ArcSDE 10.1 and ArcServer 10.1

- **May**
  - Internal interactive webmaps using Flex technologies are released for Public Works and Community Development
  - Developed Calls of Service heat maps for Police Department
  - Multifamily Mapping Project – this project developed a database of all 66 apartment complexes located within the City

- **June**
  - Developed Police Beat map
  - Worked with Azteca Systems to implement and configure the CityWorks program for Public Works

- **July**
  - Officially launched the Brookhaven GIS WebApp
  - Presented GIS WebApp at City Council Work Session, Town Hall Meeting at Oglethorpe and orientation police officer training session
  - SunGard/RMS support for data, implementation and configuration

- **September**
  - Street Centerline database cleanup – the purpose of this project was to clean up a street centerline file with a complete database of road names, address ranges, and jurisdiction for the Police Departments records management system.
  - Purchased ESRI Spatial Analyst and 3D Analyst extension further expanded our spatial analysis report and Enterprise GIS Capabilities

- **November**
  - GIS Participated in the 2nd Annual GIS Day Event for DeKalb County, GA GIS. Brookhaven won first prize in the GIS Day Best Map Contest
  - Vendor delivers final aerial photography datasets. Ortho images are added to the Brookhaven WebApp

- **December**
  - Vendor delivers final LIDAR, edge of pavement, and 2’ contour dataset. Data is then integrated into our enterprise GIS
Section D. Implementation

1. What phases did you go through in developing the system?

   Phase 1: Data Collection
   Since the City was brand new it had no existing data. Phase 1 included a large effort to bring together data from many sources. Below is a brief list of sources (this is not an exhaustive list): 
   a. Readily available dataset either downloaded online or requested directly to the associated agency 
      i. Atlanta Regional Commission 
      ii. Metropolitan Atlanta Rapid Transit Authority (MARTA) 
      iii. DeKalb County GIS 
      iv. DeKalb County Board of Education 
      v. DeKalb County Department of Watershed Management 
      vi. DeKalb County Tax Commissioner 
      vii. Georgia Spatial Data Infrastructure – Georgia GIS Clearinghouse 
      viii. Georgia Environmental Protection Division 
      ix. Georgia Legislative and Congressional Reapportionment Office 
      x. United States Geological Survey 
      xi. United State Census Bureau 
      xii. Federal Emergency Management Agency 
   b. Datasets purchased 
      i. LiDAR and Aerial Photography (2013) 
      ii. Contours (2’) and Edge of Pavement 
      iii. Road Infrastructure Data including sidewalks, curb & gutter, signs, and pavement condition 

   Phase 2 - Database Design
   Brookhaven GIS decided to use data model standards developed within the ArcGIS Local Government Information Model (LGIM.) The data model has been a valuable asset to the ability of the Brookhaven GIS Department in getting up and running quickly. Relativity, few modifications were needed to be implemented to get this data model populated with our data. Brookhaven’s database design uses the industry standard versioning workflow. The DEFAULT (or parent database) is the current and published version of the database. Our external and internal interactive maps are connected to the DEFAULT version. A Child version of the database, called QC, is used as a place to provide quality control/quality assurance before being uploaded to the DEFAULT version. Child versions to the QC version include individual analyst versions and versions that connect to 3rd party GIS editing software such as CityWorks. The graphic below describes or versioning workflow.
Phase 3 – Build out and Implementation

In this phase, data was migrated from the various sources collected in Phase 1 and loaded into the DEFAULT version of our data model. Next, a series of Base Maps were created: Zoning Map, City Council Districts, Points of Interest, Street Network, Parks and Recreation, Flood Plains, Zip Codes, etc. These maps are in PDF format and were uploaded to an internal shared drive on the Brookhaven network and made available to the public via the City’s web page.

Once the data was loaded, the versioning environment and web mapping services were created to allow staff, elected officials, residents and the business community easily access to the City GIS data. Tests were then performed to ensure a high level software compatibility, database & web mapping performance, and data integrity. Once the system reached an acceptable level of performance, the webmaps were released to the public. The final step in this phase was to document the data sources, procedures, and processes.
Phase 4 - Training of staff and citizens

Our department strongly believes that the only way to have a successful GIS is to educate the users and decision makers on what GIS can do and how to do it. An incredibly complex and data rich environment is not useful if the users are unable to access or understand the GIS that was created. At Brookhaven, it has been our mission to make every effort to create a powerful, easy to use, and data rich GIS to help citizens and policy makers make difficult and complex decisions. To fulfill this mission, we strongly believe that we must continuously make an effort to educate all the different users in as many ways as feasible. We do this in several ways:

- Internal training of City Staff – GIS performed brown bag training sessions on the Brookhaven WebApp
- Internal training for police force orientation – During the training of new police officers leading up to the creation of the Police Department, a 1 hour training session was given on how to use and integrate the GIS WebApp into their daily routine
- Public meeting presentations for City Council and public – GIS performed multiple training sessions at City Council meetings and Town Hall Meetings.
- Press Releases on new services, data, or products
- One-on-one training and mentoring for City Staff as needed
2. **Were there any modifications to the original system design? Why? What?**

There were no substantial modifications to the original system design. Because Brookhaven is a brand new city, all design and planning work began with a blank slate and an open plan designed around the ArcGIS for Local Government Information Model (LGIM). Small modifications were implemented within the schema of the LGIM to better serve the City departments and processes and procedures that are unique to Brookhaven’s day-to-day operations. These modifications were minor and expected. The complex nature of modeling our community and government processes cannot possibly be captured within one standardized data model. With that being said, the LGIM was critical to the successful launch and relative speed of Brookhaven’s enterprise GIS to be implemented and delivered in a very short amount of time.

![7 - Snapshot of Brookhaven’s Webapp](image-url)
Section E. Organizational Impact

1. **What user community does the system serve and how?**
   The systems put in place serve the entire community including, approximately 50,000 residents, City staff, elected officials, business owners, and land developers.

2. **What are the ultimate decisions/operations/services being affected? If appropriate, provide a few examples including, but not limited to: screen input/output forms, paper products, or other descriptive graphics.**
   Brookhaven’s enterprise GIS has (and continues) to support nearly every department in the City, from the City Council & City Manager Office to the Public Works, Community Development and Parks Departments. A few examples of the affects the enterprise GIS ultimately has on the City’s decisions, operations, and service are:

   - With such a young city, it seem like new asset/record management systems are being implemented monthly. With each new system that is implemented, careful thought has been placed on how to integrate this new system with existing systems. GIS is typically at center of these decision discussions in either workflow or data management.
   - Brookhaven has the honor of taking ownership of what once were County parks, which are now located within the new City borders. GIS has been a crucial tool to help identify property, ownership, and facility inventory.
   - Being such a new City, Brookhaven’s management and elected officials routinely are being interviewed and attending press conferences by local and state media. Large size paper maps have proven time and again to help convey the messages being presented.

3. **What were the quantitative and qualitative impacts of the system?**
   The Brookhaven GIS has had many quantitative and qualitative impact to the brand new City. The use of this data and its publication for the citizens on the web have directly addressed many of the mandates put forth to the City founders and City Management.

   **Quantitative Impacts:**

   - A quick and easy way to provide accurate measures of areas have greatly decreased the efforts and time spent on the multi RFPs the city uses to provide city services. An example of this is maintenance contracts for Right-of-Way lawn & tree maintenance, park maintenance, and ball field maintenance. An accurate measure of area helps give potential contractors the ability to give the best estimate possible in an efficient manner.
   - Our City requires the city staff to notify neighboring property owners when certain administrative processes are occurring on a particular property. These processes include, but are not limited to, property rezoning, variances, ROW abandonment, and other communications. Automated tools such as our Notification Tool located on the Brookhaven GIS WebApp, allows staff members direct access to parcel information to create mail outs for these notifications.
   - The City’s GIS WebApp has decreased call volume for several departments. Zoning information available on the GIS WebApp allows the community to know the zoning categories and begin preliminary planning or discussions before approaching the city with plans and permits.
Since the City is so new, many citizens are still unaware of the official boundaries of the fledging City. This was another reason it was so critical to get the GIS WebApp available to the community as soon as possible. Call volume on the specific question of ‘is my property within the City limits?’ was significantly reduced once the GIS WebApp was released just months after the incorporation of the City.

As mentioned above, in the System Design, Unexpected Benefits section, the ability to make the address list quickly available to the utility companies for franchise fee collection increase revenue millions of dollars over the next several years.

Qualitative impacts:

- Increased access to the city’s data by community and staff decision makers
- Data being used by decision makers are made available through the WebApp
- Brookhaven GIS believes that having more ‘eyes on the data’ means better data. Allowing the community to see the data directly and respond to missing or inaccurate data has been highly beneficial to creating and maintaining a database with the best and most accurate data
- Improved the processing of interactions between city and citizens – no mismatched data between departments
- Increased government transparency

4. What effect has the system had on productivity?
The Brookhaven IS GIS system has had a very positive impact on each and every department and level of management.

Here is a list of departments and a brief example of what productivity was added by the enterprise GIS:

- Office of the Mayor & City Council – Press conference and presentation material
- Office of the City Manager – During the City’s Park Acquisition with the County, GIS performed legal description Coordinate Geometry (COGO) to provide quality control to data being provided by the County and title search company
- Office of the City Clerk – Provided a series of city council district maps to include in a packet provided from the Clerk’s office to candidates running for office
- Office of Tourism – Instead of spending valuable tax payer dollars on expensive 3rd party brochures for tourism, the GIS Department worked closely with the Office of Tourism to produce graphics and data.
- Communications – Provide maps and analysis for conference and press releases
- Community Development Department – Create location maps for each case being presented to City Council, the Planning Commission, and the Zoning Board of Appeals
- Finance - The Finance Department being responsible for valuating city owned property and infrastructure saved hundreds of man-hours by working with the GIS Department to identify asset including roads, curb & gutter, storm water structures, sidewalks, playground sets, buildings, etc.
- Parks & Recreation – The GIS Department embarked on an ambitious goal to map all assets within the parks. Through the hard work of the GIS Departments Intern, our department was able to hand over precious data to a team of consultants hired to create Brookhaven’s first Parks Master Plan. Data sets collected and later handed over to our consultant team includes: playground sets, primary & supporting
structures, ball fields, number of parking spaces, trails, sidewalks, locations of drinking fountains and permanent garbage receptacles, picnic shelters, and others

- **Police Department** – Created and maintained street address ranges for the records management software. Heat maps for crime analysis, and input on creating police beats
- **Public Works** – Maintain datasets and administer a direct connection between department’s asset management/work order system and the centralized GIS system

### 5. What, if any, other impacts has the system had?

While we cannot be sure of the direct impact on the decision; Brookhaven was chosen by Google to be one of just nine communities in the Atlanta metro area to receive Google Fiber. Critical to the decision to move forward is the availability of data regarding City infrastructure, population and demographic information, and efficient public works permitting – all of which have been positively impacted by the systems put in place by the Brookhaven GIS department.

### 6. How did the system change the way business is conducted with and/or service delivered to clients? Give specific examples comparing the old way with the new.

Much of what led the citizen dissatisfaction with the county services has been addressed by the increased efficiencies, responsiveness and improved public safety all of which are supported by the GIS systems built for the City of Brookhaven. The increased service levels provided by Brookhaven’s staff are directly impacted by the accuracy, consistency, and timeliness of the data with which they are working. Building permits, zoning issues, and other City managed code enforcement issues are directly supported with map, analysis, and data verification. Citizen communications and notifications are now timely and accurate with proximity notifications for new building or zoning changes sent out by the department staff without delays or technical problems. Increased public safety has resulted from the Chief’s ability to correctly assign officers and squad coverage to police beats with higher crime incidents. This modeling was developed by the GIS department in cooperation with the Police Command Staff.
Section F. System Resources

1. What are the system’s primary hardware components? Give a brief list or description of the hardware configuration supporting the system.
   - (2) Dell PowerEdge 2600 Server Running Virtual Windows Server Environments via VMWare Vsphere
   - The GIS Virtualize Environment includes:
     - Database Server – ArcSDE, CityWorks and MCT/OSSI
     - Application Server – ArcServer and ArcGIS License Manager
     - Web Server - IIS7, .NET 4.0
     - File Server
   - Storage Solution Dell Powervault
   - Fortinet Fortigate 200B Firewalls
   - Dell Precision T3600 Workstation w/ Windows 7 64-bit
   - (2) Dell UltraSharp U2410 24” Widescreen Monitors
   - Champion Scepter II GIS Data Collector

2. What are the system’s primary software components? Describe the primary software and, if a commercial package, any customizations required for the system.
   - ArcServer 10.1
   - ArcSDE 10.1
   - ArcGIS Extensions 3D Analyst and Spatial Analyst
   - CityWorks
   - MCT/OSSI RMS
   - SQL Server
   - GPS Unit with ArcPad
   - Flex API for ArcGIS Server
   - Windows Server 2012

3. What data does the system work with? List and briefly describe the database(s).
   Brookhaven’s enterprise GIS pulls information from many external sources and stores it locally within a versioned SDE environment. Three (3) SDE databases have been set up for our vector and raster datasets. Our versioned SDE database uses ESRI’s Local Government Information Model as the schema for storing our vector data. A raster database storing all 116 tiles of aerial photography covering the entire City and surrounding areas are optimized by using the *Mosaic Dataset* function in ArcSDE. The *Mosaic Dataset* function allows our analyst to store, manage and view large raster datasets with optimal speed and efficiency. The 3rd SDE database stores our reprojected-mosaic aerial photography (World Geodetic System 84 coordinate system,) this reprojected aerial is primarily used with our ArcServer web applications for optimal performance.
   The SDE databases are used specifically for Base Map datasets that are typically city-wide, are relevant to all of the City, and are relatively static. For project specific task that include very specialized map request or data analysis, the Brookhaven GIS Department uses File Geodatabases. File Geodatabases provide the additional functionality over shapefiles and personal geodatabases that has been engrained into our day to day processes, as well as,
providing an easy transition to upload into our SDE environment should the dataset be upgraded a Base Map dataset.
LIDAR data collected in the 2\textsuperscript{nd} month of the young City’s existence is stored on our File Server.

4. What staff resources were required to implement the system? (i.e., report approximate staff and consultant time as FTE’s)
   - 1.25 FTE GIS Analyst
   - IT System Architect – partial resource as needed

5. Comment on anything unusual about the resources used to develop your system, such as data, software, personnel and financing
   Following the example of several other new municipalities in the metro Atlanta area, Brookhaven’s government model is based on the Public-Private services model. The City contracted with seven firms to run City operations. IT/GIS services were contracted to InterDev, a local Managed IT/Security/GIS firm. The way the contract is constructed allows benefits to all parties. The Contractor can provide incremental resources on an as-needed basis, in addition to the contracted 1 FTE. For example, during the design and implementation phases of the project, the GIS Department was able to reach out within InterDev to subject matter experts in various IT fields including SQL server, security, and network design; all at minimal cost the City. In the past, under the conventional City government models, any outside help in these fields would come at a considerable cost. The innovative concepts of the Public-Private service model and dedication of the entire City to supporting the enterprise GIS has truly made this a unique experience.
User Testimonial Letters

- **Marie Garrett**, City Manager, City of Brookhaven
- **J. Max Davis**, Mayor, City of Brookhaven
- **Gary Yandura**, Chief of Police, City of Brookhaven
- **Susan Canon**, Assistant City Manager and Director of Community Development, City of Brookhaven
- **Richard Meehan**, Director of Public Works, City of Brookhaven
TO: ESIG Award Coordinator  
FROM: Marie Garrett, City Manager  
SUBJECT: Executive Authorization of URISA ESIG Submittal  
DATE: April 17, 2014

Dear Sir/Madam,

Re: Authorization for the Submission of the URISA’s ESIG™ Award Application, The City of Brookhaven GIS: Building an Enterprise GIS for the Newest City in the State of Georgia

On behalf of the City of Brookhaven, Georgia I am pleased to authorize the Submission of Building an Enterprise GIS for the Newest City in the State of Georgia for the URISA ESIG Award in the Enterprise System Category.

The City’s new GIS department has delivered exceptional service and developed systems critical for execution of duties for every department within the City. From the Police to our Parks, our Community Development to our Public Works all of our departments depend on the integrated systems and centralized data system developed by our GIS team. The City staff and our citizens use this information on a daily basis. The access and ease of use of the systems deployed by our GIS staff has been a benefit to all of us. Our interactive GIS webmap, Brookhaven’s GIS WebApp, allows the citizens and business community to access the same data that our city staff and elected officials use to make critical decisions regarding our City. This is largely due to the tight integration of our departmental systems and the accessibility of our data— all built upon the enterprise GIS at the heart of our City systems.

The result of this effort by our GIS team is a cleaner, safer, well managed City that is a great place to live and work.

Sincerely,

[Signature]
TO: ESIG Award Coordinator
FROM: Mayor J. Max Davis
SUBJECT: User Testimonial
DATE: April 17, 2014

When the City of Brookhaven voted to incorporate by referendum on July 31, 2012 citizens were put in motion to launch a city in less than 5 months that was successful, efficient, and innovative. Official incorporation occurred on December 17, 2012, one of the many departments that are fundamentally critical to the success of Brookhaven is our GIS Department.

Our GIS department has built and innovated an application that has been crucial to me and my constituents in understanding the complex nature of our most valued assets such as parks, sidewalks, and creeks. The rapid development and deployment of our enterprise GIS over the first few months of operations were critical to the successful launch of city operations.

Our GIS allows for essential spatial and statistical analytical capabilities that centralize our data and allows our City Manager to present consistent and reliable data during our council meetings, press conferences, and meetings with citizens and our business community.

I proudly commend our GIS department for providing our City with the easy to use Brookhaven GIS WebApp, which allows citizens to access the same information which our Public Works, Community Development, Police and all other departments use to make crucial decisions on a daily basis.

As Mayor of Brookhaven, and being highly interested in maps on a personal level, I place a high value the data, printed maps, and applications the GIS department provides.


Mayor J. Max Davis
TO: ESIG Award Coordinator
FROM: Chief of Police Gary Yandura
SUBJECT: User Testimonial
DATE: April 17, 2014

As Police Chief of the City of Brookhaven, I believe that the GIS Department is an indispensable asset to our city. As a newly incorporated city, Brookhaven and its Police Department have been built from the ground up.

Prior to the launch of our Police Department on July 31, 2012, our GIS team presented the Brookhaven WebApp to our 54 police officers during an intense 2 ½ week training to familiarize themselves with the city and our procedures. The WebApp was instrumental in clearly identifying city limits and other questions of jurisdiction.

The GIS department has been at the crux of the development of our Police Department by constructing maps and data aiding in crime analysis, heat maps, and ultimately assisted in the culmination of Police Beats by using the crime analysis data, natural features like creeks and lakes, emergency call volume, and man-made feature like roads, and development patterns. Several criminal investigations have been aided by the GIS department in the city, by allowing for a spatial trend to be seen and forewarning to be given to officers on-duty.

Our City’s Police Department is using Sunguard’s OSSI/RMS system for incident reporting. Addresses used in this system are pulled from the centralized Master Address database which is maintained by our GIS Department. Officers and I alike are quick to commend the efforts and work done by the Brookhaven GIS Department. Their exceedingly good work has been fundamental in the development and implementation of the Police Department in the City.

Chief of Police Gary Yandura
TO: ESIG Award Coordinator
FROM: Susan Canon, Assistant City Manager/Director of Community Development
SUBJECT: User Testimonial
DATE: April 21, 2014

The City of Brookhaven GIS department has had the difficult task of creating an enterprise GIS that directly supports the Community Development Department’s day-to-day operations, all within the first year of City Operations. The GIS Department has continually provided Community Development needed mapping and data management support. The GIS data is critical every day operation including zoning and planning, inspections, and permitting.

Recently, Community Development purchased Meritage, a cloud based permitting software program that assists in tracking permitting and other workflows. To get this software implemented it was critical that several databases be exported from GIS to the Cloud. These databases include addresses, owner names, and parcel IDs. GIS has done an exceptional job maintaining addresses in GIS while at the same time synchronizing the addresses within the Meritage software.

The Brookhaven GIS WebApp has given the department easy access to the crucial information needed to operate. The ease of access to our land ownership data has been extremely helpful for mail out notification requirements. Each month the department is required to mail notifications to property owners of nearby planning activity. The Notification Tool located on the Brookhaven GIS WebApp has been a critical tool for the department to access the database and create spreadsheets of owners and is then easily integrated into the mail merge tool in Microsoft Excel to create memos and addressed envelopes.

Another example of how GIS has had a direct benefit to the department is the City’s Multi-family Rental Property Inspections Program. These inspections were in response to an ordinance approved by City Council early last year. GIS mapping has been a critical part of the project. Accurate data and maps that clearly state status of inspections has been a critical piece in keeping inspectors organized and efficient and communicating status to City Council.

In essence, the GIS Department excels in supporting Community Development’s day-to-day operations and has proven beneficial for our staff and community.

Susan Canon
The GIS Department has done an exceptional job making the GIS data easily accessible for the Public Works Department. There are several ways that the GIS Department has achieved this:

- Brookhaven's public interactive GIS webapp allows access to many of the City's GIS information.
- An internal version of the GIS WebApp built specifically for the Public Works Department. This internal web map allows my department to share and interpret sensitive critical infrastructure data in a private and protected manner.
- The GIS Department has been a valued team member in the implementation and on-going operations of our work order tracking software called CityWorks. CityWorks allows our assets management and work orders to be seamlessly integrated. Much of the data we see on CityWorks is stored within the GIS.
- Hard copy maps and analysis for reports and presentations.

The GIS Department has been fundamental in developing major initiatives within the Public Works Department such as our road pavement plans, sidewalk construction plan, snow removal plan, and our Storm Water Management Program (SWMP.).

Our internal version of the GIS WebApp has been very useful in developing our Storm Water Management Program. An example of this is how our storm water structures and conveyances are displayed on the map. Structures located on the map in good condition are symbolized in green, fair condition is yellow, and poor condition is red. As the structure's status changes due to maintenance or replacement, the symbolized color is changed real-time to show the new condition. This live link between data and the interactive map allows our Storm Water group to visually assess potential problems with the storm water system in a proactive manner.

Richard Meehan, Public Works Director