

Mapping Parcels –The Need for Speed

Wake County, North Carolina, is growing at a rate of over 91 people a day. The geospatial data that the GIS Division maintains is a critical tool for managing and monitoring that growth. Increased efficiency through advanced technology tools enables the Division's small team of mappers to keep the data current.

High Parcel Volume, Multiple Layers

Wake County is one of the fastest-growing counties in North Carolina. According to Anne Payne, Database Administrator for the County's GIS Division: "Wake County's growing at a rate of over 91 people a day. We are a very high-growth area, and so [the geospatial data that the GIS Division maintains] has been a very critical tool for us to manage and monitor that growth. We map between 700 and 1,200 parcels a month."

When the County began its digital mapping project in 1987, approximately 150,000 parcels were mapped. That number has grown to about 325,000 parcels today. Wake County began applying geographic information systems (GIS) technology to its mapping processes in 1989.

Anne Payne continues: "We're also part of something called Research Triangle Park, which could be described as the Silicon Valley of North Carolina. So we have a technologically savvy populace that has very high expectations of technology, even in their government. In order to meet some of those needs, we've been given the resources to develop a rich database and have built some good applications on it."

Helping Wake County to provide high-quality government services to its burgeoning population is the long-standing tradition of collaboration with the County's principal municipality, the City of Raleigh. Together, the County and Raleigh maintain more than 100 GIS data layers.

The collaboration between Wake County and Raleigh has netted citizens Web-based access to a tremendous amount of information. For example, the jointly maintained iMAPS site is an online mapping service that allows users to interact with data from both jurisdictions to create Web-based maps, choosing the data layers to display for the mapped area specified. The user can create maps that include such data layers as property dimensions, major roads, parcels, ZIP code boundaries, and more.

Charles Friddle, the Wake County GIS Director, created the GIS agency in the mid 1980s, having come from the Planning Department. He explains: "Our philosophy has been, 'Let's not delay the project by trying to get everyone to come on board before building the foundation. Let's get a good foundation built; then as people see the value, they'll more readily come on board, and it won't slow the project down.'" A good example of this approach is that Wake County paid for the development of the parcel base. Soon after that, the City of Raleigh, the town of Cary, and the town of Fuquay-Varina began to use and build additional data layers upon the parcel base. Friddle says: "They were able to hit the ground running quicker, based on our efforts. We did it with an eye for what we understood would be an overall use of the system."

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WAKE COUNTY AT A GLANCE

- Fastest-growing county—91 people a day
- Part of Research Triangle Park (The "Silicon Valley of North Carolina")
- Map 700 - 1,200 parcels each month
- Began initial mapping project in 1987
- Introduced GIS technology in 1989
- Implemented FARRAGUT ParcelSync in 2005
- Collaborates with City of Raleigh to maintain more than 100 GIS data layers

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The County GIS Division manages various data layers, regardless of the jurisdiction in which a particular feature falls. The property layer is one, as are a number of administrative districts. The Division developed the zoning maps for all the municipalities, because the Assessor wanted them as an aid for property valuation. These maps were then turned over to the municipalities. Friddle comments: “This goes back to the idea that we knew there was certain base information that other jurisdictions would build on. And we knew that there were other layers that the towns would eventually create. Or if we needed a data layer, we’d step up and do it.”

When the County GIS Division decided to add street centerlines to their data set, they approached the Raleigh GIS Department and developed a joint database design. Raleigh created the street centerlines within its city limits, and the County created the remaining centerlines. The jurisdictions then merged the two databases, and the County has maintained the data since.

The Need For Speed

Handling Wake County’s high volume of parcels falls to the five mappers of the GIS Division’s Property Mapping team, along with their Supervisor, Eric John. The Property Mapping team maintains 11 data layers, including the parcel layer, the coordinate geometry (“COGO”) layer, seven annotation layers, the corporate limits (town boundaries) layer, and others. In addition to his managerial duties and assisting with the parcel mapping, John conducts quality control to ensure that

the GIS database is in sync with the computer-aided mass appraisal (CAMA) system used in the Revenue Office. Wake County’s CAMA system is the NCACC Collaborative Property Tax System (NCPTS) from Intelligent Information Systems (IIS).

Given the size of the Property Mapping team and the magnitude of their workload, the group has to work quickly and efficiently. One software application that helps is FARRAGUT ParcelSync. ParcelSync provides integration and streamlines database synchronization between the GIS and CAMA systems. Working as an extension to the group’s ESRI ArcMap™ product, the application serves as a step-by-step, task-oriented tool for editing parcels.

ParcelSync currently delivers advantages such as version control, which enables multiple mappers to work within the parcel layer simultaneously. ParcelSync also allows mappers to print reports about changes made to parcels. These reports replace hand-written property cards; they are used to transmit changes to the Revenue Department for entry into the CAMA system. As discussed below, a more automated integration of the two systems will be implemented soon.

History Of The Life Of A Parcel

Eric John cites another advantage of using ParcelSync: “Now we have a history of the life of a parcel. What happened to the parcel fabric a year ago?” As Anne Payne explains: “I think the GIS world as a whole has just very recently begun to recognize the importance of the history of a parcel. In the past, we thought as long as we know what’s there today, that’s all we care about. We’ve realized that what came before is important, and it can be important for a lot of reasons—a lot of historic research goes on in the environmental area, questions about zoning or property lines, or what a land configuration looked like as of a certain date, that kind of thing.”

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Charles Friddle | GIS Director, Wake County, NC

ParcelSync maintains the parcel history through its factory and warehouse concept of data management. The factory is a dedicated editing database that only the property mappers use, and the warehouse is optimized for viewing both current and historic data. When a mapper commits a change made in the factory, the data affected—in both its “before” and “after” states—is pushed into the warehouse. Therefore, both current and historic data are reflected in the warehouse.

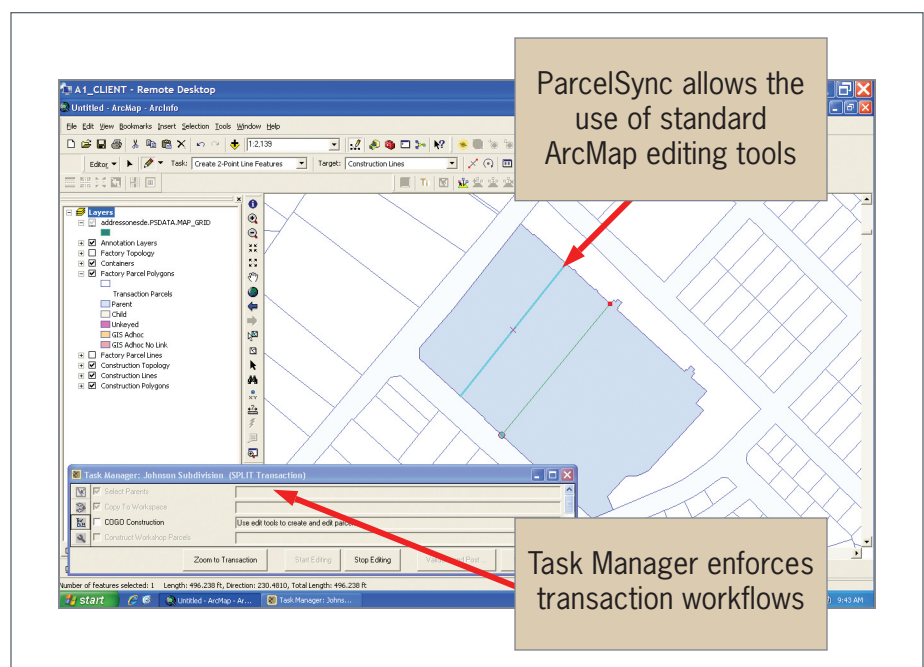
This database structure also allows various departments to see different views of a parcel, depending on the needs of the individual department. Let’s say, for example, that a farmer has 10 rural acres he wants to subdivide for sale as 20 half-acre lots. He files a subdivision plat with the Register of Deeds for the 20 lots, but he’s done no improvements. The Wake County Commissioners would not want the farmer’s 10 acres to be taxed at a residential rate until he has begun improvements. For taxation purposes, therefore, the Revenue Department needs to view the property as a 10-acre parcel.

The flexibility of ParcelSync’s factory and warehouse design allows the Revenue Department to choose when they wish to view the parcel as an improved subdivision. The subdivision view is active for everyone else’s purposes as soon as the GIS Division maps it. This means the Inspections Division can issue building permits on the individual parcels, and EMS can dispatch paramedics if an accident occurs during construction.

Wake County was instrumental in defining the requirements for much of ParcelSync’s current functionality. Database Administrator Anne Payne and Property Mapping Supervisor Eric John have been closely involved in identifying the County’s business processes that the ParcelSync implementation would

support. Payne says: “We worked with FARRAGUT and determined a way that we could maintain our data and preserve the history and hierarchy of parcels as they were subdivided. We’d maintain a history so that we could trace the evolution of our parcel fabric.” Payne and John also worked to address implementation issues such as data conversion and integration with the GIS.

The parcel-mapping tool Wake County used before ParcelSync operated in the older ESRI environment. When the County began to



prepare for a major ESRI upgrade to Version 8, they started working with FARRAGUT. Payne says, “We decided it would be best to move to a different product to get where we wanted to, faster. That’s when ParcelSync came about. When the ArcGIS 8 product came out, there were so many new database and functionality features available that we wanted to take advantage of, and ParcelSync was written to take advantage of those features.”

GIS And CAMA Integration Ahead

While Wake County GIS is already reaping many of the benefits ParcelSync offers, significant productivity improvements lie ahead when the product is fully integrated with the Revenue Department’s CAMA system. This integration will provide real-time synchronization between the GIS and CAMA databases. The County is looking

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forward to a seamless interaction between property mapping and the Revenue CAMA function; data across both functions will be consistent.

Anne Payne says: “As Database Administrator, I try to keep [GIS] out of the attribute business—we try not to maintain a lot of non-graphic data on our side about parcels; we consider that to be the Revenue Department’s business. We may maintain the same information in a polygon form. After the integration, when the mapper hits that commit button to finalize a transaction, individual parcel data will flow into the CAMA system. ParcelSync will also, at that moment, query other layers to identify attributes that the Revenue system might be interested in. For example, it will look at the city limit layer and send a city limit code to Revenue; it will look at the zoning layer and send a zoning code to Revenue. They’ll use that as attribute information for assessment. We’re talking about a completely automated update [to the CAMA system].”

Automating the handoff of parcel information will eliminate manual steps in the GIS Division’s workflow. In pre-ParcelSync days, Wake County GIS produced a handwritten packet of information for each parcel mapped, to communicate the changes to the Revenue Department. As Anne Payne describes the situation, “There were two people keying long numbers in two different databases. The chance for error was great—on both ends.” While GIS staff members still have to send or hand-carry envelopes to the Revenue Department, at least they can print out the information from ParcelSync. The finalization of the CAMA integration has been on hold, pending the completion of the Revenue Department’s current revaluation project. When the integration is complete, the time-consuming tasks of conveying parcel changes to the Revenue Department, ensuring that the GIS and CAMA databases are in sync, and managing the paperwork generated in the old process will no longer be needed. According to GIS Director Charles Friddle, “We’re anxious to get to the point where we just eliminate the paperwork back and forth between the offices.”

Plans For The Future

The GIS Division will realize substantial productivity gains once the CAMA integration is in place and the rhythm of the resulting new processes is established. At this point, Charles

Friddle’s team plans to re-examine present definitions of currency—the yardstick for how quickly a parcel must be mapped after a specified event occurs.

Friddle explains: “As it is now, we don’t have agreement on what constitutes current parcel information. The Revenue Department thinks that a couple of days after the building permit is issued or the first lot sold, the parcel should be mapped, and the GIS and CAMA databases updated. Currency to a Planner may be X amount of time after a plat is recorded, or it could be X number of days after it’s approved, before it’s recorded. It would be premature to have those discussions until we understand what we can do—how much efficiency are we going to recognize.”

Other process changes the Division is considering include pre-recording mapping and digital submission of subdivision plats. Anne Payne says, “Most of what we get that’s recorded was developed on computers. Then we map it from a hard-copy document. The next generation of that is to cut out the hard-copy document altogether and have digital submission.”

The map-based data the GIS Division maintains has become essential to the other Wake County jurisdictions and departments. Anne Payne describes the phenomenon: “At some point, you become a tool instead of just a resource. And as people work [the data produced by the County GIS Division] into their everyday work, you become necessary. That’s what they say to us now: ‘We can’t work without you.’”

Zoning cases provide an example of the pervasive reliance on the data the County GIS Division produces. Local municipalities, developers, and the Planning Department use the County’s property base to present and consider these cases.

As Wake County continues to grow, stakeholders’ reliance on GIS data will increase. Ensuring that this data is kept up to date and accurate will increasingly rely on the answer to Charles Friddle’s question: “How can we continue to improve the processes that we’re involved in?” This is the central question in planning for Wake County’s GIS future.