

Cobb County DOT Plans Bus Routes...

Using GPS/GIS Technology



Urban and Municipal

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Like many counties coping with tremendous growth, Cobb County, located northwest of Atlanta, Georgia, USA, must face numerous traffic and commuting issues, which slow travel on the county's network of more than 2,000 miles of sprawling roadway. In 1989, the Cobb County Department of Transportation (DOT) recognized the growing demands on the infrastructure of one of the largest counties in the metropolitan Atlanta area and created Cobb Community Transit (CCT) with the goals of providing bus service to residents, minimizing air pollution, and reducing traffic congestion.

The County's public transportation system is important to the nearly 3 million passengers who ride CCT buses each year. In south Cobb County, which has a high concentration of low-income residents, there was significant growth and development as well as a substantial increase in job availability in recent years. To finance new transit services that would provide better connections between low-income communities and job opportunities, Cobb DOT used federal and state grant funds to implement two new bus routes to serve the affected area, also identified as an area with a transportation service gap. Cobb DOT had to inventory the transit system showing new and existing bus stops along the route as well as the relationship of the routes to local businesses and residential areas.

The agency used Leica's GS50 GPS data collection systems to track the location of the bus stops

and map the business centers, shopping centers, and daycares to be served on the proposed new bus route. Analysts were able to quickly gather data from 30 bus stops in less than two hours. The data was stored on a PCMCIA card, which was transferred from the GS50 to a DOT office PC. Back in the office, using Leica Geosystems' GIS Data PRO™ office software, analysts transferred Shapefiles of bus stop locations into ESRI's ArcView GIS software.

The GPS data was overlaid onto an accurate aerial photo within the GIS of the Cobb County DOT. The aerial

image, taken by a private contractor, included 0.5-foot pixel resolution color digital ortho photos and planimetric data that included roads and hydrology coverages. While the actual bus stops could not be seen in the photo due to its resolution, the points were correct, meaning the bus stops were depicted on the correct (right) side of the streets and on the correct street corners. Previously, the Cobb County DOT had its bus routes in the transit system's routing application, but those points were about 200 feet off the mark, which was not accurate enough for maps and reports.

Once all the data was transferred into ArcView, the maps outlining the location of current bus stops were created. The maps were used in several ways including for meeting various transportation planning and program requirements. For example, under Title 6 of the Civil Rights Act, periodically, CCT is required to demonstrate that it serves minority and non-minority populations equitably. The County included the information in its report to the Federal Transit Administration to demonstrate compliance with these requirements.

Bus Route 30, in addition to serving the southern part of the County, now serves as a connecting point between CCT and Metropolitan Atlanta Rapid Transit Authority (MARTA), Atlanta's bus and rail transportation system. The route provides Cobb County residents with public transportation access to jobs in Atlanta, and vice versa.



Adam Sukenick, a laboratory technician for the Cobb County Water System and Lynn Biggs, a transportation analyst for the Cobb DOT, using Leica Geosystems' GS50 to collect bus stop location data.

Leica
Geosystems



A screen shot showing how the GS50 collected bus stop data lines up with the County's digital ortho photo (0.5-foot pixel resolution)

From this pilot GPS project, Cobb County DOT has found that obtaining precision data with the GS50 was significantly easier than with previously tried methods. In the past, the DOT tried collecting data from orthophotos and by using geocoding techniques – both techniques proved to be too difficult because the bus stop locations were difficult to pinpoint or location addresses were difficult to match in their network.

Plans are underway to map all of CCT's 700 bus stops and bus shelters. The information gathered will help them create a map of all bus stops, which will be easier to use than spreadsheets, the system Cobb County currently uses. This project will also serve as basic inventory and maintenance, providing accurate data for future analysis. Cobb County DOT further plans to place all bus stop and

bus shelter locations on its ESRI Route Map application, currently under development for its Web site, to help residents find the bus stop closest to their homes. With the GS50's field editable Codelist functionality, technicians will also collect such attributes as Shelter Type or Shelter Amenities (including Bench, Garbage Can, and Advertising). Cobb County DOT will incorporate its data into ESRI's ArcGIS software, and the CCT will maintain this GIS database.

Cobb County is considered to be a progressive county in Georgia. Cobb County has its own GIS Department that was formed about two years ago. Each department within Cobb County has its own GIS personnel at their disposal. Through this approach, the County can efficiently use GPS/GIS methods to better its operation systems.

"The Cobb DOT can use GPS/GIS for several things- a sign inventory of county roads, for instance. Field personnel can navigate back to previously collected signs and perform maintenance on them," said Ed Biggs, GIS Manager, Cobb County. "We have at least 50,000 signs in Cobb County that need to be inventoried. Within the [Cobb County] Water System, there is a need to map manholes, sewer systems, rain gauges, and other items. It is only a matter of time before new users for the GPS/GIS unit are discovered, and information comes together, and then is disseminated as needed, which is the whole point of GIS- sharing data, ideas, and information."



Cobb County Transit (CCT) is the agency responsible for providing public transportation to citizens in this Metro Atlanta County. Above is one of the many bus stop signs that can be found throughout the County.

To learn more, call 1-866-LEICAGIS or visit www.gis.leica-geosystems.com

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