Spicer Group uses its Leica Pegasus:One mobile mapping solution to serve a national client base, with a focus on both engineering-grade surveys and municipal asset inventory/management.

Fast & Accurate Asset Mapping

Monroe County (Mich.) Drain Commissioner David Thompson has managed a number of water asset collection projects in his 20 years of experience in the Drain Commissioner's Office. One aspect that has always bothered him is safety; many water assets are located in or near busy roadways, making field workers vulnerable. "A typical project requires multiple crews working near vehicle traffic for extended periods of time," he says. "It's dangerous and expensive."

In 2013, the county embarked on a project to create a GIS basemap of the

entire South County Water System—approximately 220 miles of water main. The project would be handled by the county's engineering services firm, Saginaw, Mich.-based Spicer Group Inc. The 70-year-old firm had been providing laser scanning services since 2008, when the company purchased a Leica HDS3000. The firm has since upgraded and now uses a Leica ScanStation P20 for scanning highways, bridges, industrial plants and confined spaces.

By 2012, Spicer Group had begun investing in mobile mapping capabilities by acquiring new software and by

training staff to allow the firm to process mobile mapping datasets, and in September 2013, the company purchased its own system, the Leica Pegasus:One. The compact, highly flexible system provides full 360 degree coverage at 2 cm absolute accuracy with low noise while driving at posted roadway speeds, and it also combines the ease of use of imagery with the accuracy of LiDAR.

Eric S. Barden, PS, Geospatial Lead and partner at Spicer Group, saw mobile mapping with the Leica Pegasus:One as the ideal way to collect assets for the

BY CHRISTINE L. **GRAHL**
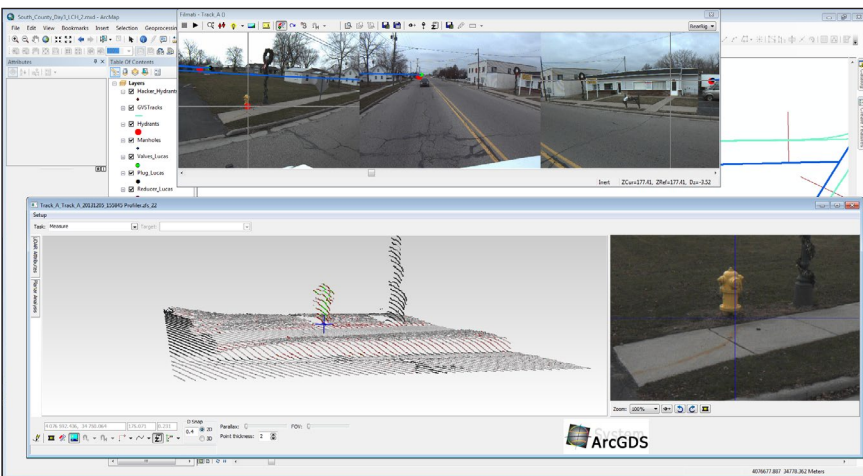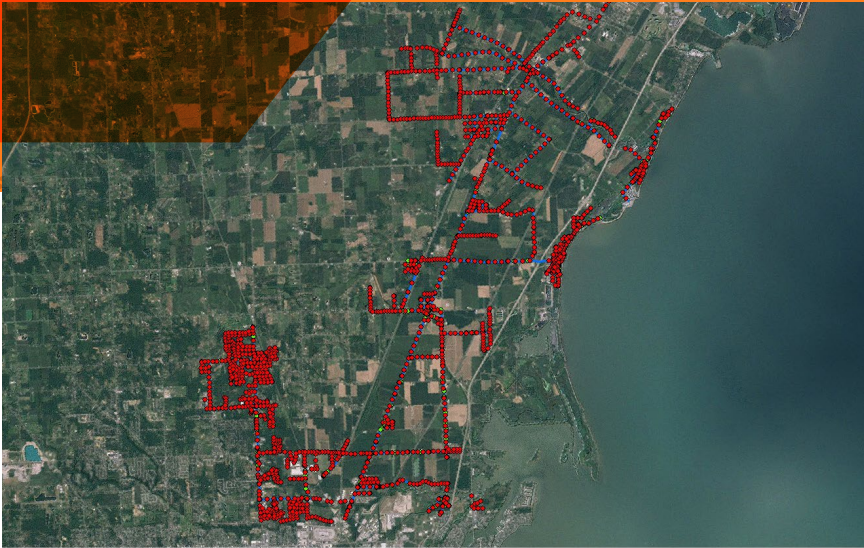
Top: This aerial image shows all of the water features extracted within the South County Water System boundary. **Bottom:** The ArcGDS interface within ArcGIS simplifies the identification and extraction of features.

South County Water System geodatabase. "This solution would enable us to quickly capture all the assets of interest for the initial pass base mapping while at the same time capturing survey-grade data on the entire network that could be used to support future engineering projects without mobilizing survey crews," Barden says. "The ability to access Esri ArcGIS desktop directly through the Pegasus:One software, ArcGDS, would also allow us to give the South County Water System the actual dataset, which they could then use within the Esri platform to view the data and mine additional assets. Even more importantly, mobile mapping would keep survey crews out of harm's way."

These benefits were enough to convince Thompson. "With mobile mapping, the crews would be safer and could work faster," he says. "I didn't see any downside."

A Quick Turnaround

Southeast Michigan averages 30 to 40 inches of snowfall each year. With the South County Water System project beginning in late November, Spicer Group knew they would have to work quickly to collect all of the assets before they were hidden by snow.

On the first day, the crew collected billions of points of data on 90 miles of the system. "That was really impressive," Thompson says. "In the past, covering

that much ground would have taken several weeks and would have required a lot of people out in traffic. It was a significant improvement in safety and efficiency."

Collecting the assets over the entire network took just under four days. But the real benefit was in the processing of the data. Traditionally, one day of mobile mapping data collection could require as much as six or seven days of processing in the office. With the Leica Pegasus:One, Spicer Group was experiencing a one-to-one ratio of field and office time. "Spicer Group has done a tremendous job of efficiently implementing the Leica Pegasus: One mobile mapping solution into their project workflow," says Bradley Adams, Leica Geosystems' mobile mapping manager. "They progressed from purchase through training and profitable projects in less than a month, which is a testament to their internal resources and the ease and intuitiveness of the Pegasus solution."

An improvement in the software allowing configurable multi-core use shortly after Spicer Group purchased the system enabled the firm to colorize the LiDAR data within the same one to one time frame. "It's incredible," says Barden. "Eight hours of data can be processed and colorized in less than eight hours of time. We were able to turn this project around much faster than the client anticipated."

Adding Value with Data

By January, Spicer Group had extracted more than 4,000 water assets from the dataset and added them to an Esri geodatabase. When they presented the data to the South County Water System board, officials immediately recognized
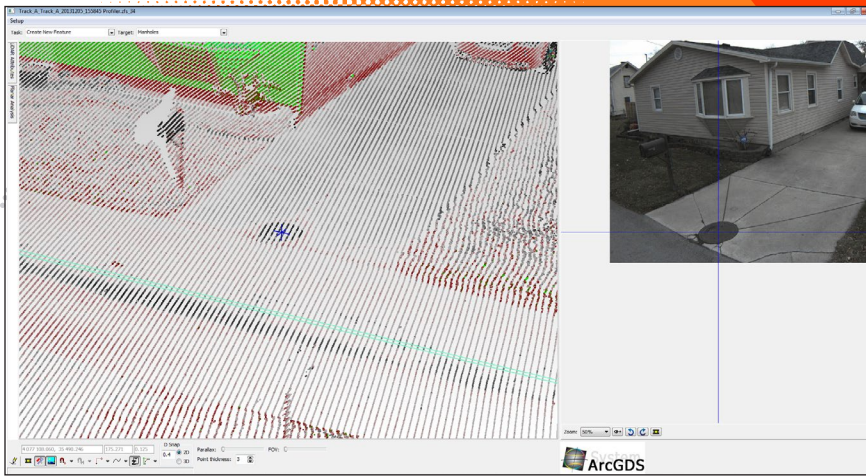
The combination of LiDAR and imagery in ArcGDS simplifies the feature extraction process.

the value. "They saw uses for the data that we never even thought of," says Spicer Group Project Manager Phil Westmoreland.

For example, providing the data to the local fire department through a free Google Street View style interface will make it easier for the department to locate hydrants near a fire and relay that information to the field. "It's really about having easy access to valuable information," Westmoreland says. "The more people you can get involved from the community or from a water authority like that, the more valuable the data becomes. Their eyes light up as they start thinking about what they do every day and how they could apply the data."

Unlike two-dimensional paper maps that quickly become outdated, the South County Water System's 3D geodatabase will be a living map that will continue to grow and add value over time as more information is added.

"Adopting mobile mapping and having this dataset really puts them ahead of the game," Westmoreland says. "It allows them to showcase what's possible."

It also provides an example of how the expectations of municipalities are changing as technology empowers them to improve efficiency and safety.

"This project has changed my outlook on how asset collection should be accomplished," says Thompson.

"Ultimately, we have to move forward with technology and be innovative. We have to be efficient and cost-effective so we can make the best use of taxpayer resources. Mobile mapping is one way to do that."

Related: Listen to the podcast interview with Eric Barden at www.hxgnnews.com.

Christine Grahl is content marketing manager for Leica Geosystems. For more information about Spicer Group Inc., visit www.spicergroup.com. To learn more about mobile mapping solutions, visit www.leica-geosystems.us.
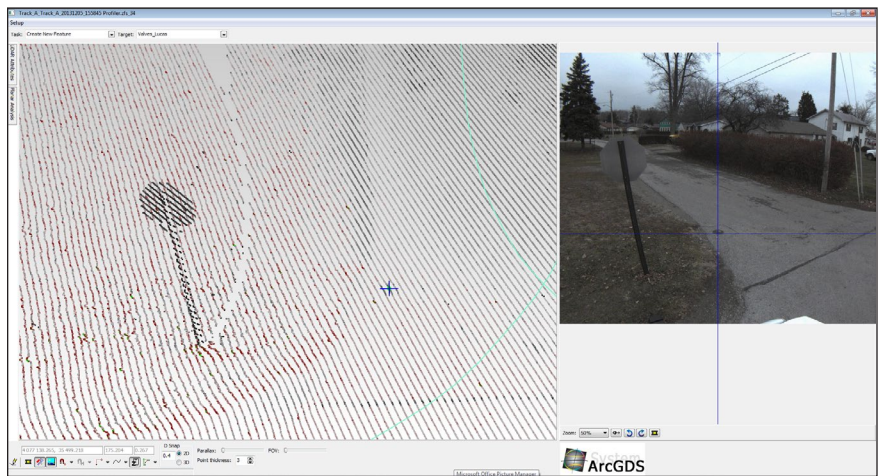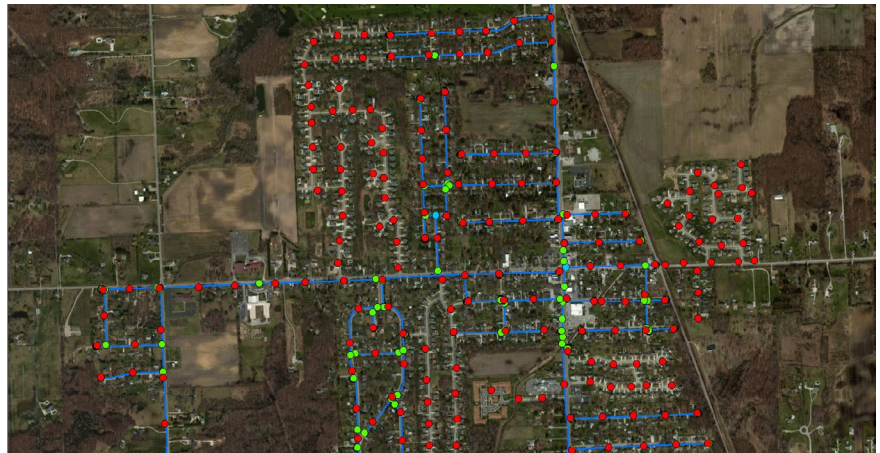
This image shows water lines, hydrants and valves inside a small community in the South County Water System