



Fast and accurate asset mapping on the go

by Christine L. Grah

Widespread collection of water assets has traditionally been difficult and dangerous, with unreliable results. The newest generation of mobile mapping is changing that. Monroe County (MI, USA) 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.

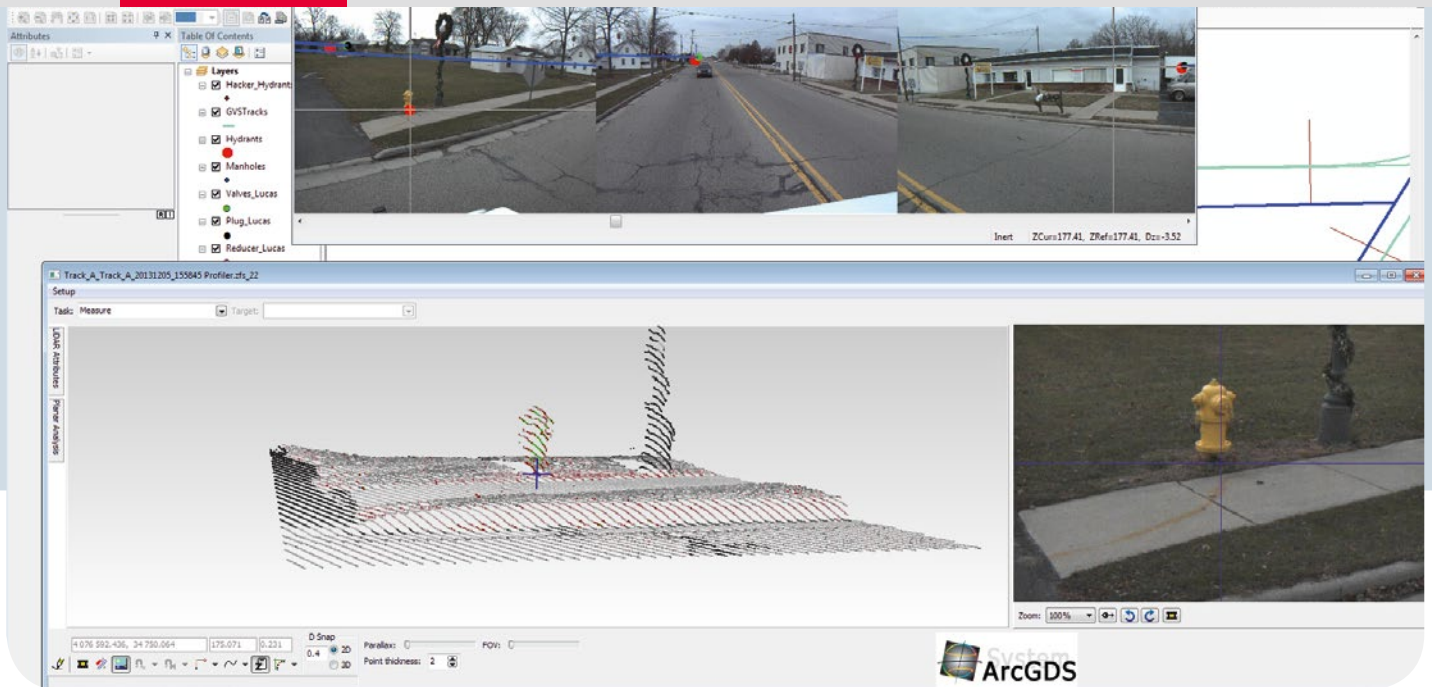
"A typical project requires multiple crews working near vehicle traffic for extended periods of time," says David Thompson "It's dangerous and expensive." In 2013, the county embarked on a project to

create a GIS base map of the entire South County Water System, which consists of approximately 220 miles of water mains. The project would be handled by Spicer Group Inc., the county's engineering services firm based in Michigan.

The beginning with LiDAR

In 2008, the firm purchased a Leica HDS3000 and has been providing laser scanning services ever since. Spicer Group has since upgraded and now uses a Leica ScanStation P20 for scanning highways, bridges, industrial plants and confined spaces. By 2012, the firm 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 mapping platform, a Leica Pegasus:One. The compact, highly flexible mobile





■ The ArcGDS interface used within ArcGIS simplifies the identification and extraction of features.

mapping solution provides full 360 degree coverage at 2 cm absolute accuracy with low noise levels while driving at posted roadway speeds, while also combining imagery and accurate, easy to manage LiDAR data into one GIS-enabled platform.

Capturing assets faster with Mobile Mapping

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 South County Water System geodatabase. "This solution enables us to quickly capture all assets of interest for the initial pass when making our base map. At the same time, we can also capture 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 also allows 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 75 to 100 cm (30 to 40 in) of snowfall each year. With the South County

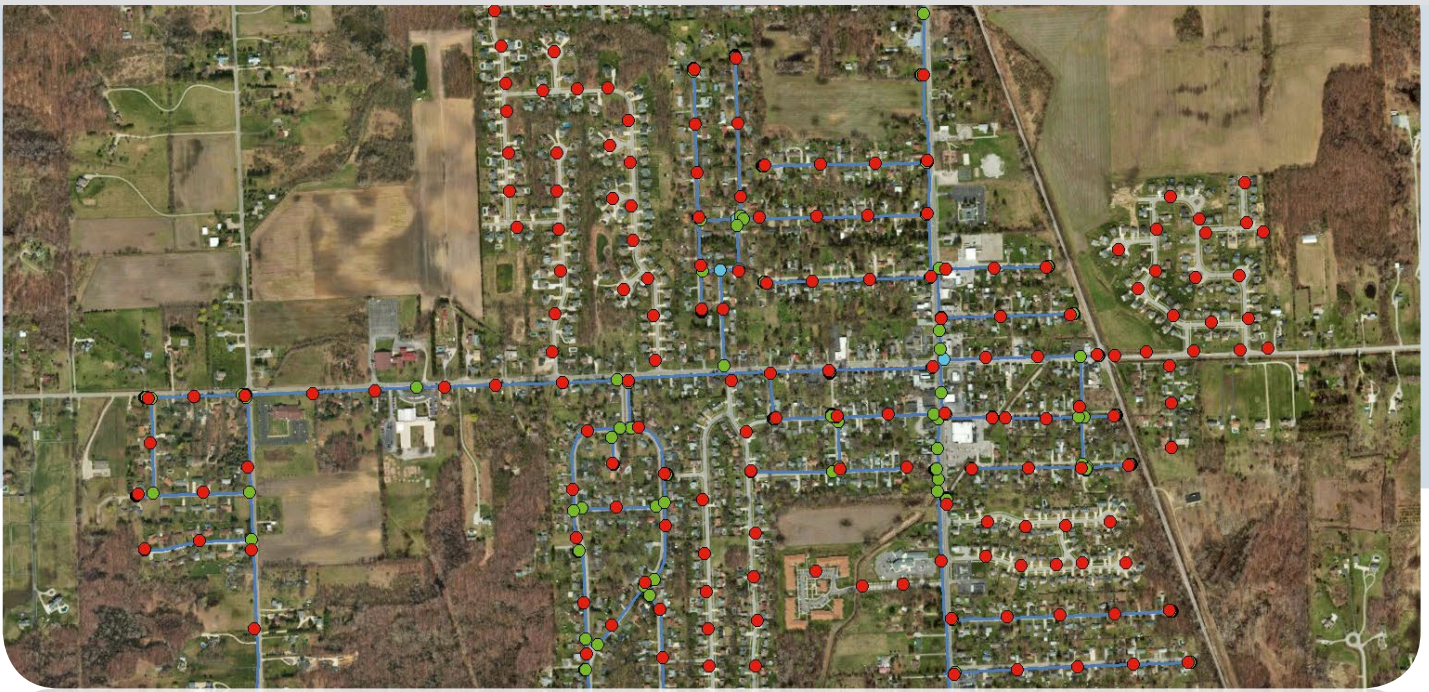
Water System project beginning in late November, Spicer Group knew they would have to work quickly to collect all of the assets before they were hidden by snow.

On the first day, the crew collected billions of points of data on 145 kilometres (90 miles) of the system. "That was really impressive," Thompson says. "Previously, 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."

High speed data processing

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 proof in itself of their internal resources and also of the intuitiveness and ease-of-use 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 colourise



■ Water lines, hydrants and valves inside a small community in the South County Water System.

the LiDAR data within the same one-to-one time frame. "It's incredible," says Barden. "Eight hours of data can be processed and coloured 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 2014, 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 recognised 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 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 2D 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.

For more information about Spicer Group Inc., visit www.spicergroup.com.



Find out why the Spicer Group decided on Pegasus:One:

http://www.leica-geosystems.com/spicer_video

