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Company's technology gives maps a makeover

By Kirk Ladendorf

The images that Surveying And Mapping, Inc. captured on East Sixth Street last July are amazing.

Every architectural façade of every building is captured in accurate detail and so is every traffic barrier, every streetlight and every cable supporting traffic lights at the intersections.

The most remarkable thing: The images aren't photographs.

They are the product of LiDAR—shorthand for light detection and ranging—a surveying and scanning technology that captures laser light pulses that reflect off streets, buildings and other surfaces. SAM Inc. has used LiDAR technology since 1998, but it bought a mobile unit in 2009 that has two LiDAR sensors mounted on top of a truck. The technology is similar to radar, but it uses laser pulses rather than radio waves. The advantages of LiDAR are speed, cost and the amount of data that can be collected and converted to highly accurate maps and images.

The Austin company has been willing to invest in cutting-edge technology as a way to do very accurate work in a limited amount of time. CEO Samir "Sam" Hanna said his company has grown in recent years to become one of the largest surveying and mapping companies in this part of the country. It has 430 workers, and many of them are on surveying teams that do field work in more than a dozen states. The company took in \$71 million in revenue last year, up 97 percent from the year before, and it expects to see growth of about 20 percent this year.

Hanna said the company has invested millions of dollars in advanced technology as a way to do better work for

clients quickly and efficiently.

Few other companies in the industry use a mobile LiDAR truck, which Hanna's company bought for about a half million dollars.

Since then, the company has acquired an even more expensive aerial LiDAR unit that can be mounted on a helicopter to survey cross-country projects, such as power lines, that go where there are no roads.

Hanna's company did the LiDAR survey of East Sixth Street last year for the City of Austin, which wanted an accurate street survey as the baseline for expected streetscape improvements that will be funded by a bond package passed by voters several years ago.

Doing the survey with traditional methods would have been long and laborious, involving shutting down parts of the street's traffic for extended periods of time.

With the new technology, SAM Inc. rolled its LiDAR detection truck down Sixth Street at 6 a.m. on a Sunday, slowly traveling down the street while recording reflected laser pulses bouncing off the street and neighboring buildings. Within four hours, the company had acquired all the data—3.7 billion data points in more than 20,000 digital images—that it needed for the city project.

That data was fed into servers back at company headquarters to produce the startling 3-D images of the street as well as the engineering drawings the city needed.

"At the time we did it, the technology was brand new, and nobody had done it before," Hanna said. "We finished the project ahead of schedule because we eliminated almost all the intensive labor



in the field. The end result was that the City of Austin saved money and time, and they got more data than they expected. They were happy."

"The work turned out great," said Mark Schruben, a project manager in the City of Austin Department of Public Works. "They created a digital time capsule of East Sixth Street."

It wasn't just the city that was impressed. So was the engineering community. In April, SAM Inc. and the city together received a national Honor Award from the American Council of Engineering Companies for their work.

After the Sixth Street project, the company won a contract with the Texas Department of Transportation to do a LiDAR scan of all the overpasses along the entire length of Interstate 35 in Texas.

"We have all the tools here that anyone in our business can conceive of," Hanna said. "We are able to sit with a client and figure out what is the most efficient and best way to do the project."

The company, which got its start in 1994 doing real estate development-related surveying, has branched out in recent years to do work for oil and gas pipeline projects, power transmission projects, telecommunication networks, railroads and the Texas Department of Transportation.

When a downturn hit the Texas construction industry in 2007, Hanna gave each of his managers a copy of the book "Who Moved My Cheese?" and told them to start hunting for new business. The company was able to hire talented workers because the economy was slack and, with a good deal of persistence, it landed a 150-mile-long power transmission line project as well as several oil-and-gas pipeline projects.

"People were saying we would not succeed," Hanna said, because the project was power-line difficult and with a short deadline. "We delivered on time

and were very successful. That company turned into a long-term client. We did a lot more projects for them."

"Sam is pretty forward-thinking, and he challenges his people to do new and better things to push their envelope of expertise," said David Jellison, a former Lower Colorado River Authority manager who is a veteran of many power line construction projects. "They are always looking for new and better ways to do their work, and that means applying new technology."

Hanna came to this country as an immigrant from Egypt in 1970 and found work in Austin with a few large engineering companies.



When he got his chance, he started his own company in 1994 to specialize in surveying and mapping, something he thought he could do better than many competitors.

"The key to our success is a commitment to making the most of opportunities by providing the highest quality work for clients on time and on budget," he said. "From the beginning, we've understood the importance of using technology."

Hanna is 64, but he has no plans to slow down.

"I don't play golf," he said. "I have to have something to keep me sharp and keep me busy. We are continuing to grow, and I am having fun." ■

