



Leica Geosystems' Geoff Jacobs had plenty to smile about as he kicked off the annual user conference for HDS (laser scanning).

Leica's HDS Conference Encourages New Scanning Companies

In past issues of this magazine, I have been intemperate in my praise of laser scanning's potential to remake surveying, engineering and, indeed, all of infrastructure. Or was I? Because the continued rapid growth—in adoption and in technology maturation—of this game-changing technology suggests that I was merely assessing accurately the overwhelming need for this particular technology at this point in human development. Ain't I smart?

Creating the Future

I believe that laser scanning will continue to grow, even in a tough economy. Here's why: plenty of industries are turning to laser scanning *in an attempt to save money*. Consider, for example, manufacturing and chemical plants of all kinds. Refurbishment is desperately needed to stay competitive, but refurbishment is expensive in itself. Also, refurbishment tends to take existing plants out of commission for months at a time, because surveying complex plant environments for as-built

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Juergen Dold, president of the Geospatial Solutions Division, walks past one of several instrument display areas.

information and designing additions to fit existing plant structure without clashes or interference has typically been laboriously slow, inaccurate work. Therefore, plants shut down when as-built surveying is happening, and shut down again during construction as onsite measurements reveal the need for new design or change orders to accommodate survey mistakes. Scanning addresses this challenge at both ends. Surveyors who have adopted scanning technology are, quite literally, doing more work in a day than they could do previously in a month or more—and they're gathering *more* information, and it's *more* accurate. And because the point clouds gathered can be quickly converted to accurate 3D models, the plant designers can also work in 3D and do virtual clash and interference detection checked against an accurate model; this has been shown over and over to reduce plant closure times by months.

So from a plant owner's point of view, it's pretty hard to spend too much on laser scanning. Even if your bid is 'crazy' by most standards, it's unlikely to amount to even a fraction of the cost of shutting down a plant for a few days.

Similarly, forensic scanning is becoming indispensable for a different reason: the quality of the information. Once an attorney has used unimpeachable scanned evidence to demonstrate, say, that his client could not possibly have seen the school bus he hit, due to a new, city-approved billboard, and this evidence is presented as a video intelligible to even the least technical members of a jury, the bar for evidence has been raised forevermore, and other attorneys have no choice except to catch up. Again, in a world where millions of dollars change hands based on the quality of evidence and how it's presented, it is really very difficult to spend too much on laser scanning.

So the attendees (there were 400 this year, twice as many as in 2007) at Leica's 6th annual HDS (High Definition Surveying) User Conference didn't need to be convinced that laser scanning was a viable new technology that would bulk up their bottom line—in most cases, they'd already had that realization and were at the conference looking for two things: nuts and information on the use of scanners, and ideas for extending their already successful business models. There was plenty of both. And of course, some users were there to evangelize: of the more than 40 speakers, most were daily users of Leica scanners, and many of those spoke about the methods they'd used to get started in this field, and how they were increasing the use of scanners in their regions and in their own businesses. As conference organizer Geoff Jacobs said several times, the purpose of the conference was to "help our users be more successful," and in this it was surely successful.

Spreading the Word

Chris Zmijewski is a principle of Stantec Consulting, a 9,000-employee consulting firm with five practice areas, and he's been integrating laser scanning into Stantec's culture. "We've been able to do major laser scanning projects in most offices," he says, "and we do whatever it takes. Sometimes we rent machines, and of course we own some. The hard part, really, is convincing engineers that this technology will fit their budget and give the right deliverables." To address those concerns, Zmijewski conducts workshops and sessions with small groups in all the offices, but he's finding that simply doing a project is the best way to get engineers interested. "We give them a little bit and they come back for more."

Many firms have designated traveling scanning crews, concentrating expertise in just a few hands. Zmijewski is doing the opposite, and when he gets a project from a new office he makes a point of training staff from that office in field and office techniques. This creates experts and evangelists throughout the organization. He finds that a lot of resistance is due to apprehension about the office work, but that's changing; "Once the points are imported, it's just AutoCAD," he says, "and we're getting pretty good at working with AutoCAD models."

Zmijewski has learned a few things along the way. On occasion, he's 'oversurveyed'; that is, he's gathered far



Stantec's Chris Zmijewski explains how his company quickly took advantage of laser scanning in many of their offices.

more data than was actually needed. But also, on occasion, the oversurveying was used to convince the client that they needed more than they asked for, and the scanning data actually created more work for Stantec. The firm is also getting more sophisticated about the use of models. Rather than creating fully realized models of large projects, 'lighter' models, often just plain surfaces, are used where possible, leaving visualization and full detail for the components of a project that really need it. This saves time and reduces the data footprint of work.

Of the HDS Conference, Zmijewski says, "For me, it started here." And surely there were a few of his listeners who will be saying the same thing.

Succeeding as a Smaller Company

On the other end of the scale, or at least near the other end of the scale, is The RLS Group, LLC, of Chattanooga, a 14-person firm that has been scanning since 2006, and now bases their business on high definition surveying. RLS recently landed a huge contract with the U.S. Post Office. It seems that new mail sorting systems are being installed in postal centers around the country, and as-built surveys are needed to analyze potential clashes and interference, and to determine optimum layout of the new equipment. These are huge facilities, 60-70,000 square feet, and they're nearly as complex as manufacturing plants. That's a big job, right? Well, using a Leica

ScanStation 2, RLS is able to do the field work on a center in just twelve hours, and process to usable models in just four days—there were some low whistles in the audience when RLS's Shane Loyd hit us with those figures.

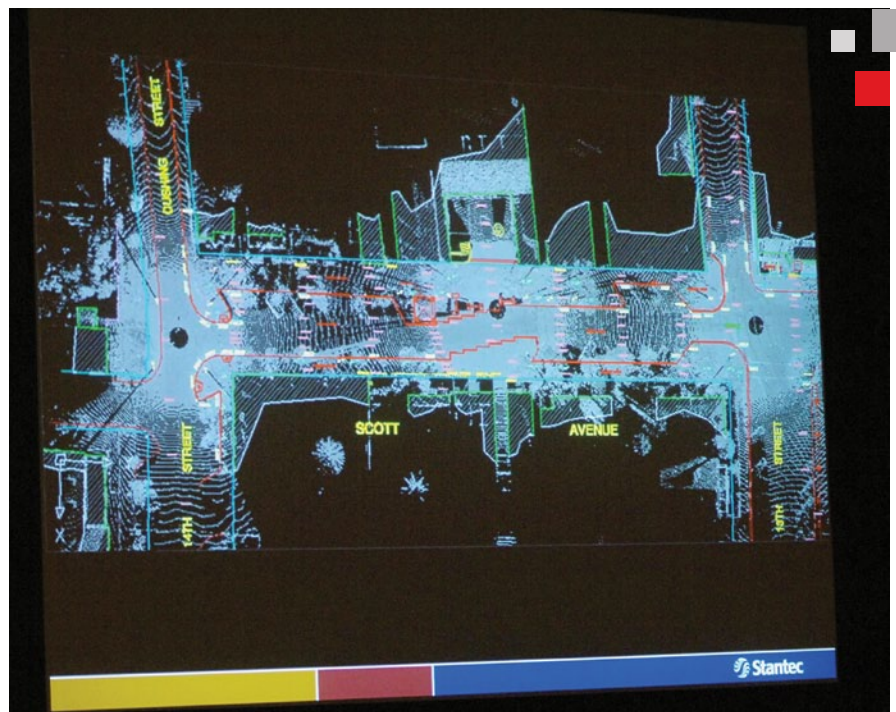
The models are then used to create 2D schematics, to analyze for interferences, and to virtually remove equipment that is being replaced and objects like carts and people that were in the facility during the

scan—there were movable objects around because postal center work never stopped during the scan. Interestingly, makers of the new sorting systems provided models of their equipment, and these models could be imported directly into the RLS Group's models. Flythroughs were also created, but not for use by engineers. Instead, flythroughs and simple models have proven to be a good tool for involving technical people in the design process; the line operator who's been on the job for 20 years may not be able to read a plan, but he can look at a model and tell you when a conveyor belt is in the wrong place, and this is valuable input.

Loyd says that RLS was able to quickly redefine their business as a scanning business after adopting the technology in 2006, and that the volume of work is high. "With an open mind and a willingness to get out of the comfort zone, there are massive opportunities in this market," he says.

A Full Conference

Zmijewski and Loyd were merely the first two speakers of the first morning's first session—in all, the HDS side of the conference (an airborne remote sensing conference ran concurrently) presented more than 40 talks on subjects as general as "Marketing HDS Internally & Externally" and as focused as "Forensic Case-winning Use of HDS With Aerial



Topographic surveys are a common type of first project for each Stantec office.



Leica's Tim Woodruff shows two international attendees some software tips.


Imagery for Forest Fire Investigations." One especially atypical and very interesting presentation was by John Brenkus of Base Productions, the producer of "Crime 360," the number one crime show on the A&E Network. Base collaborates with Leica to bring scanning technology to

police departments around the country. Leica trains forensic technicians to scan crime scenes, and the models produced are used for scene analysis, and to create courtroom displays. In addition to being good TV, the scanning is turning out to be good police work—in one area

profiled, crime solve rates went up, and overall crime declined, suggesting that knowledge of force's new tool was a deterrent to would be criminals. Officers also report that having 3D displays and flythroughs in the courtroom is a big help with juries and helps negate the so called "CSI effect," which is the phenomena of juries expecting the same whiz-bang technology they see on TV to appear in the courtroom. Now, instead of being disappointed, they're actually seeing some very high-tech police work.

"Game changing" is an overused cliché in today's business market, but perhaps because so many areas of business, and indeed of daily life, are being remade by the existence of technology that could only be found in science fiction a few years ago. That surveying as a profession will also change is inescapably true. That any particular surveyor will also change is, of course, up to the surveyor. *AS*

Angus Stocking worked for 17 years as a land surveyor in several different states. Now as a professional writer he specializes in surveying and related topics.




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