

## Latest Trends Part 1: User and Market Trends

Geoff Jacobs

**T**oday, many professionals are following the progress of laser scanning technology. Those who haven't yet invested in it are looking for indicators that tell them either to continue to stay on the sidelines or to enter the technology one way or another. Those who've already invested are continually seeking new ways to further improve on what they're doing. This article is the first of a 2-part series detailing the latest trends in high-definition surveying.

### User and Market Trends

Adoption of laser scanning is growing. An independent analyst firm that focuses on the laser scanning industry, SPAR LLC, recently projected 45% industry growth for 2006. Although I think this estimate is high, it's clear in any case that the technology is enjoying rapid uptake. Several factors are driving this:

- Increasing number of applications & projects for which scanning is beneficial and cost-effective
- Increasing financial and related success of users
- Increasing client demand for and acceptance of scanning
- Steady improvements in hardware, software, workflows, and support services that are decreasing project costs and increasing the versatility of scanning tools
- Increasing willingness to invest in scanning to defend existing client relationships from scanning-capable competitors

### Increasing Success of Users

Organizations don't invest in a second of something if things are not



*David Evans and Associates keeps three scanners at three different offices. Today, five offices are capable of processing scans into deliverables. Image courtesy: David Evans and Associates*

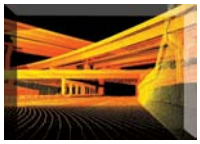
going well with the first investment. One of the most compelling types of evidence of the increasing user success of organizations that have invested in high-definition surveying technology has been the recent dramatic increase in the number of organizations that own more than one scanner. This is analogous to what happened with total stations and GPS systems as these technologies grew: organizations started out with one system and then added additional systems over time. Over the last two years the jump in the number of organizations owning at least two scanners has been nothing short of astonishing. In Leica's case alone, the jump has been more than five hundred percent on a base of multiple-scanner owners that was already solid.

Consider these examples: today, three organizations each have at least 10 laser scanners, with S&C Technologies

weighing in with the current largest fleet at 16 scanners. Many other organizations own several scanners each. These organizations include ones that focus primarily on civil projects, those that focus on plant projects, some that do primarily architectural or heritage applications, and others with diverse service offerings. In some cases, the primary driver for adding more scanners is increased client demand. In many cases, successful, multi-office civil/survey firms are also now tending to spread laser scanning capabilities across their key sites. For all of these organizations, scanning systems are another tool in their toolbox.

### Smarter User Practices & Better Tools

One clear trend is that, in general, many users have become much more skilled not only in their project selection



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and execution, but also in their pricing and marketing practices. Experienced users have refined their estimating skills so that they can bid projects to better ensure both happy clients and happy principals.

## Trends in Pricing

One highly successful trend has emerged on the pricing side. That is to price lump-sum projects at essentially what it would cost to do them conventionally and then execute the projects at a much lower labor cost with scanning. This results in a win-win for both the client and the service provider.

The client wins by receiving “added value service” from the service provider, including:

- Eliminating or reducing road closures
- Availability of additional data that can be quickly processed to meet clients’ future needs
- Higher confidence in the accuracy and completeness of the deliverables
- Faster turnaround of deliverables
- Less disruption to a site’s ongoing activities
- Safer data collection
- Ability to use the same data across multiple disciplines
- Lower construction costs on retrofit projects thanks to better design as-builts
- Shorter retrofit project schedules thanks to better design as-builts

Service providers win in the following ways:

- A project’s significantly higher profits can be applied to paying off the investment in the laser scanning system
- Safer data collection
- Reduction in costly site go-backs
- Higher confidence in the accuracy and completeness of the survey (managers sleep better!)

The net result is that for the same price (or less) to the client for an as-built or topographic survey, the client can receive significant, added value while the service provider can achieve a solid payback on their investment.

If lump-sum pricing is not possible, then a trend has emerged to either price the “field crew plus scanner(s)”

at an appropriately higher hourly rate than a conventional crew or to add a daily, half-day, or hourly fee for the scanning system(s). Specific pricing practices vary depending on the type of application, geography, and the industry being served. Overall, many successful service providers have found that with today’s latest scanning tools and workflows they can effectively achieve the same payback period for their investment in scanning systems as they achieve for their other investments.

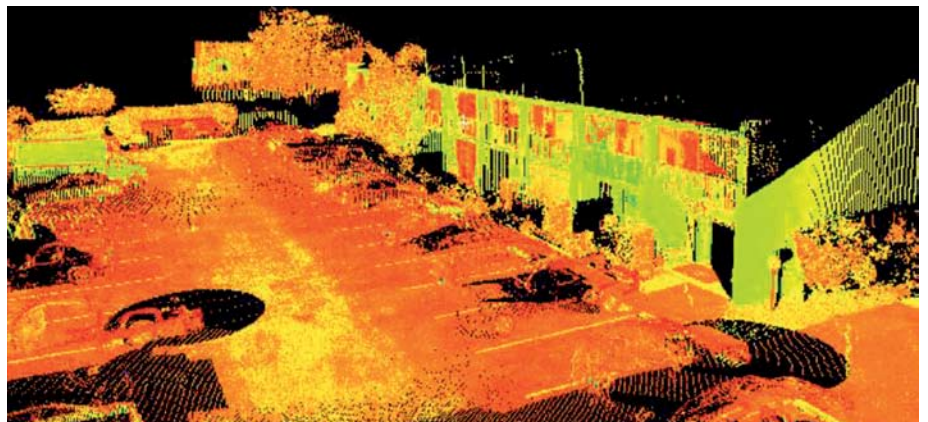
## Trend to Insert Scanning into Everyday Jobs

In the earlier days of high-definition surveying, many organizations looked for or assessed potential jobs

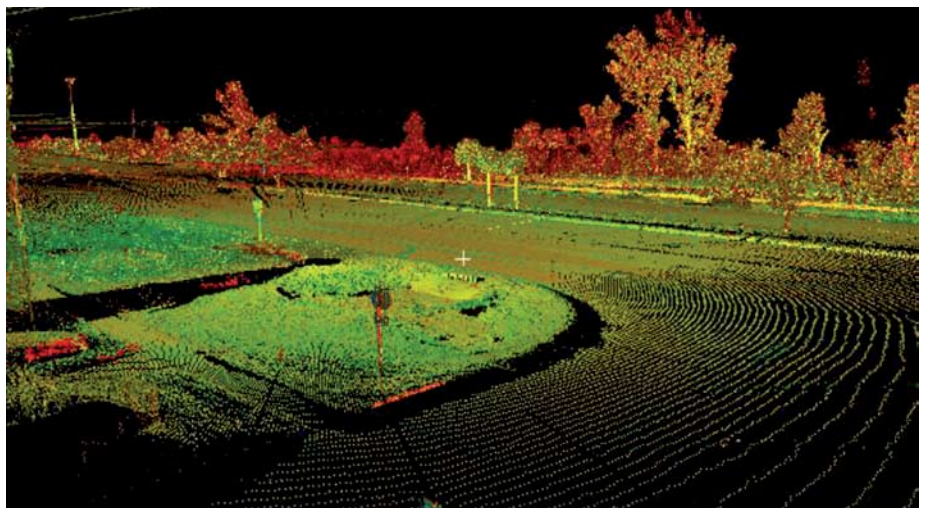
as “scanning jobs.” Many users found that this practice limited the number of projects on which scanning was used. Today, there has been a strong trend to look at incorporating scanning into everyday jobs, even if scanning does not comprise the majority of data collection on the project. In this sense, a scanner is just another tool in the kit.

## “House Painting” Analogy

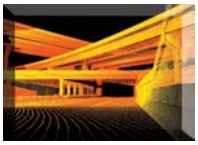
If you’ve ever painted a house or had your house painted, you can probably relate to this analogy. Painters use a variety of tools to paint a house. They’ll use a spray painter, rollers (in various sizes), and brushes (in various sizes). If you look at the efficiency of each of these tools, painters use their



*Caulfield & Wheeler, Inc. has shifted from looking for “scanning projects” to incorporating scanning as part of everyday topographic surveys. Image courtesy: Caulfield & Wheeler, Inc.*



*Many organizations use scanners in open areas whenever possible because of their very high productivity. Image courtesy: Caulfield & Wheeler, Inc.*



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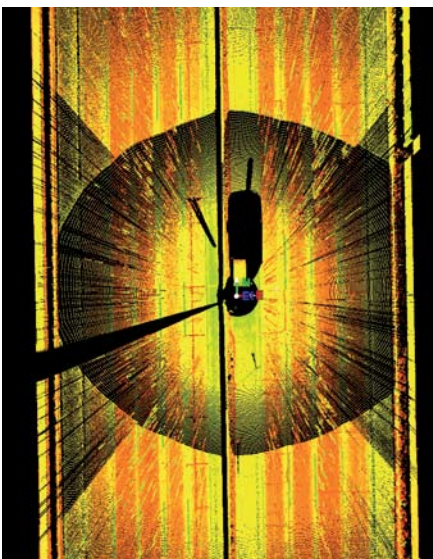
spray painter as much as they can, because it's by far the fastest way to paint. For fine areas or areas that are awkward to reach, they will use their rollers or brushes.

In this analogy, a laser scanner is the surveyor's equivalent of spray painting equipment. Plus, a scanner is robotic—once it's set up and programmed, it “spray paints by itself” without anyone having to stand with it and hold it.

Many successful users tell me that they have basically started to use their scanner as much as they can. This is generally for open areas (*i.e.*, ones without heavy vegetation or lots of parked cars). The trend is to use their conventional tools for everything that the scanner can't “see,” such as buried utilities, terrain under vegetation, property corners, etc. The result is that the trend today is to use scanning in conjunction with other tools on projects, even for small half-day projects, to maximize their overall productivity and to accelerate the payback on their investment.

## Scanning Costs are Decreasing

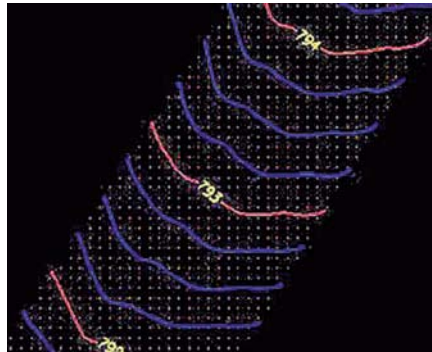
Between ongoing improvements in field and office tools, an increasing level of available support, and an increasing level of user expertise, there's



“Scripting” scanners to automatically scan different areas at different densities can decrease field labor up to 50%. Image courtesy: American Surveying Consultants



Hardware and software advances have reduced the number of scan targets that need to be placed, scanned, and surveyed.



Decreasing office costs to produce deliverables has made scanning cost-effective on more projects. Image courtesy: Mulkey Engineers and Consultants

a clear trend in reduced field and office costs for the high-definition survey portion of projects.

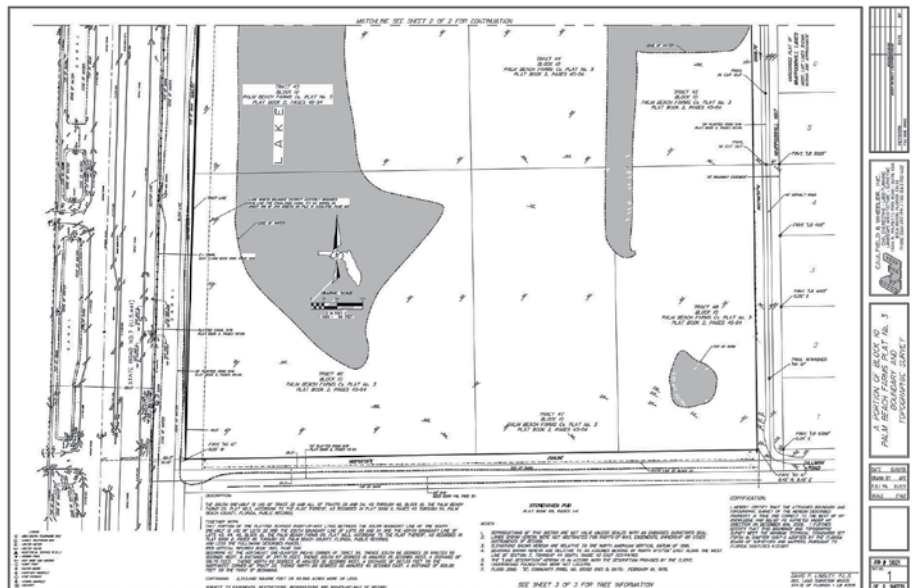
## Field Costs are Decreasing

Many factors determine the actual costs of deploying laser scanning in the field. I won't go into all of these in this article, but the bottom line is that costs are steadily declining due to improving solutions from vendors and increasing skills of users. Some of the most significant productivity gains are coming from:

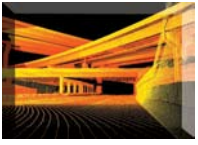
- The ability to use systems robotically via “scripting” or programming a scanner to scan the full field-of-view with varying scan densities automatically—thus leading to smaller field crews
- Having to place, survey, and scan fewer “scan targets”
- Increased scanner speeds, especially from “phase-based” scanners
- The need for fewer instrument set-ups

## Office Costs are Decreasing

Just like field costs, many factors determine actual office processing costs and many of these are trending to cause office costs to also tumble. Increasing user experience is a big factor. Unless an organization does one type of application all the time,



There's a strong trend in automating the processing of point clouds into deliverables. Image courtesy: Caulfield & Wheeler, Inc.



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Scanning is increasingly used in construction QA surveys. Image courtesy: JMR Surveying Group, LLC

users report that applying high-definition surveying on different projects can involve a learning curve for each type of application. As users hammer their way through a variety of applications, they build expertise that can be leveraged the next time that type of application comes up. Over time, successful users tell me that they've cut their office times on the order of fifty percent just from their experience curves.

On the tools side, software is becoming increasingly automated for many specific tasks. This applies to tasks for loading large laser scan data sets, registration (of multiple scanner setups), geo-referencing, data clean-up, processing scan data into deliverables, and report generation. Likewise, laser scan processing software features are

steadily expanding, making it easier to use one module or one software for different types of applications, instead of having to bounce back and forth between different programs with different user interfaces to get the job done. Of course, increasing computer and network capabilities are also reducing the time needed to process large laser scan data sets.

## Increasing Number of Viable Applications

The natural outcome of decreasing project costs and increasing versatility of the tools, is that the number and types of applications for which laser scanning is cost-effective is also increasing. The technology has quickly spread from plant uses to civil and architectural uses as well as heritage, forensic, entertainment, and GIS uses.

Likewise, its use has spread from as-builts primarily intended for design input to regular use in marketing proposals, in the construction and fabrication stages of projects, and also in asset management applications. Today, laser scanning applications are found across-the-board. †

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## Look Ahead at Part 2

Part 2 will continue to look at a couple of additional, key user/market trends: today's general trends in the scanning industry and vendor community and current challenges.