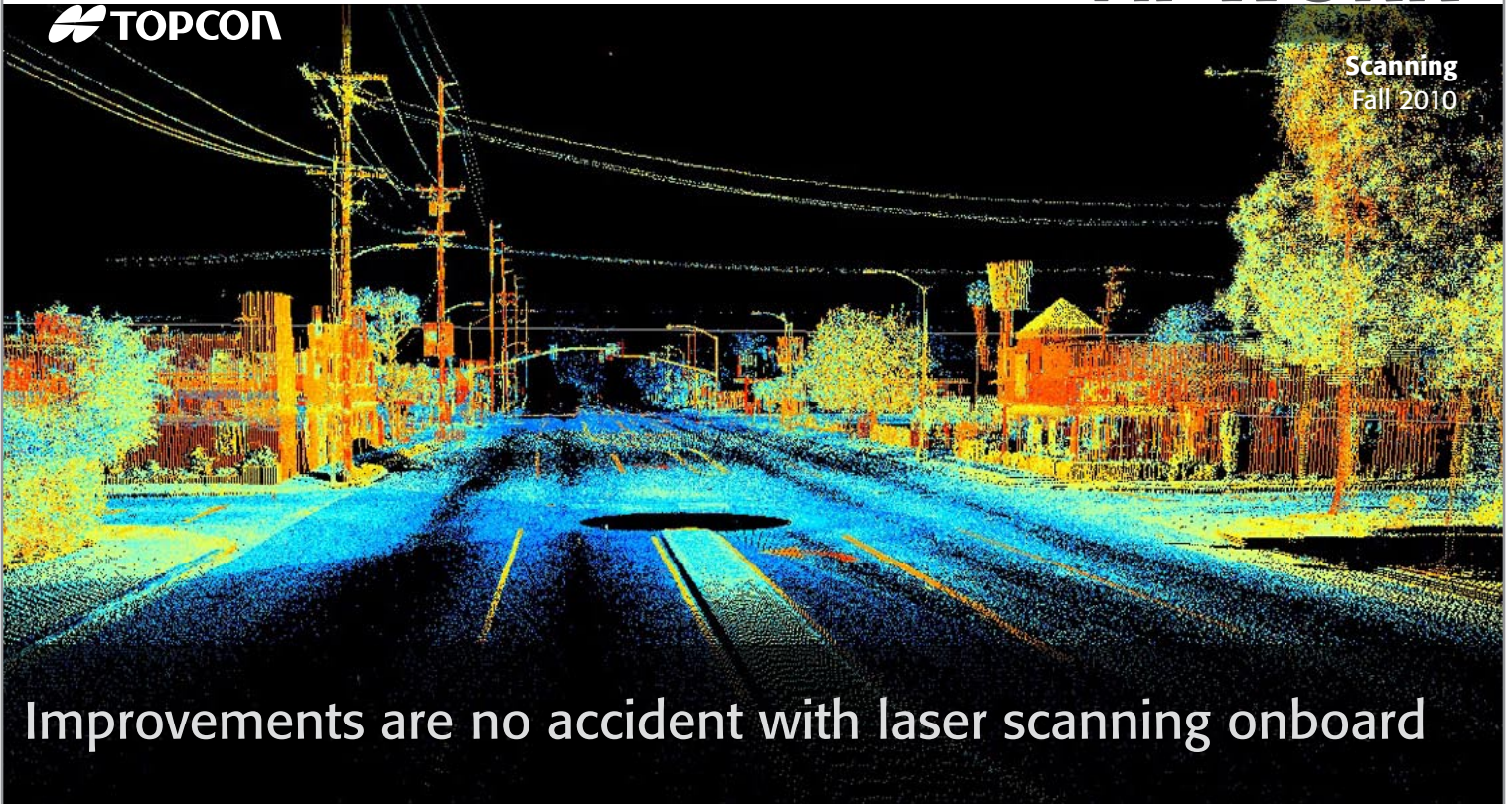




Scanning  
Fall 2010



## Improvements are no accident with laser scanning onboard

**F**orensic engineering is the ability to reconstruct an accident or mechanical failure to determine its likely cause. It is also the specialty of Momentum Engineering Corporation (MEC) of Torrance, Calif. which, for years, relied upon traditional surveying techniques (specifically, a total station and prism pole) to gather its critical on-scene data, then used that data to reconstruct a particular event or scenario. Looking to improve that effort by eliminating many of its limitations, the company recently added a GLS-1000 laser scanner from Topcon Positioning Systems. The result of doing so has been a streamlined info gathering process, a reduction in the need for re-shoots at the scene, and an unimagined level of detail which, itself, offers a host of benefits.

### Proof is in the Points

The limitations of the station/pole approach referred to above are many according to Edward Fatzinger, MEC's co-owner.

"First, you are limited to shooting things at grade; no overhead measurements can

be easily taken," he says. "Second, use of a prism pole and total station demands that two people be onsite which, for a company like ours, is not the best use of resources. Third, we had to be selective with our shots yet still shoot enough points to get an accurate representation. Fourth, detailed info from a heavy-trafficked site means repeated shots with the prism pole. It was not uncommon for us to be at a site for the better part of a day dodging traffic; that's neither time-effective nor safe."

Working through Lewis & Lewis, their southern California Topcon dealer, MEC took delivery of a Topcon GLS-1000 laser scanner, a unit which emits a laser beam that captures data at 3,000 points per second at a range of 500 ft. (150m) to a typical surface; with more reflective surfaces, that range is extended to 1100 ft. (330m). The end result is a point cloud that can then be rendered into a 3-D image using a secondary CAD program.

"Now, even in heavy traffic, we simply set up the scanner, let it do its thing, bring it back to the office and begin the post-

**Company:** Momentum Engineering Corp.

**Location:** Torrance, California

**Project Scope:** Implementation of new laser scanner into forensic engineering operation.

**Topcon Products:**  
GLS-1000 Laser Scanner

**Topcon Dealer:**  
Lewis & Lewis, Inc.  
Ventura, California  
[www.lewis-lewis.net](http://www.lewis-lewis.net)

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# AT WORK

## Improvements are no accident with laser scanning onboard

'Having this tool at our disposal has definitely given us a competitive edge. A lot of smaller firms probably can't justify the capital investment but, because of the volume of work we do, the detail that we need, and the results we've gotten, we definitely can.'

- Edward Fatzinger, co-owner, Momentum Engineering Corporation.

*Continued from page 1*

processing that will eventually give us our reconstruction."

To further enhance onsite safety and efficiency, the GLS-1000 offers built-in wireless capability and USB 2.0 connectivity, meaning MEC staff can collect images and scanning data on a laptop from a nearby car.

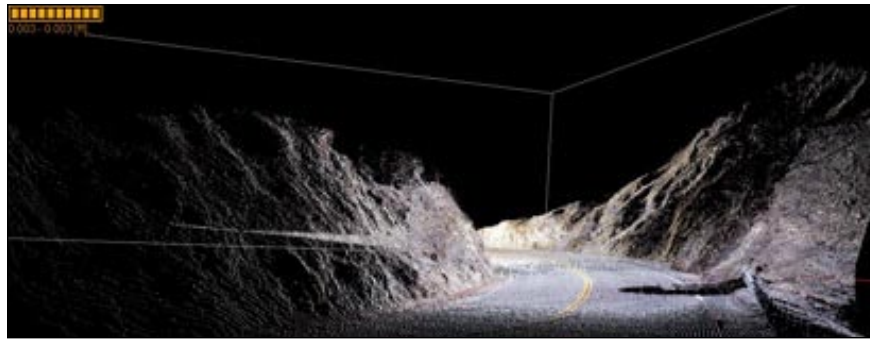
### No Return Visits

Having to return to a scene to reshoot something that might have been initially overlooked is another issue that has plagued users of traditional surveying techniques.

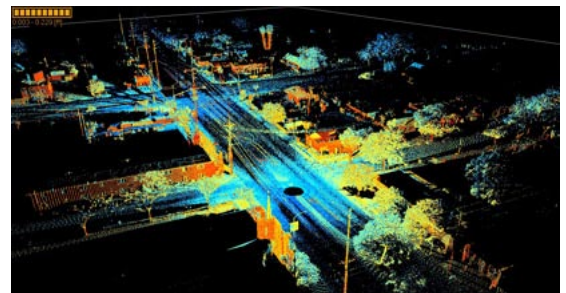
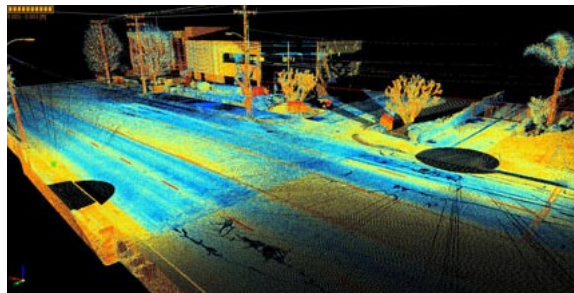
"That has been essentially eliminated with the laser scanner," says Fatzinger. "Simply put, the scanner gets everything. So in the past, if, during the course of our work, we realized that we missed a utility pole or the location of a guardrail, we would have to go back and re-shoot those items. With the scanner, we know it's already in our data; we just have to pull up the file and redraw it. That's a really nice timesaver for us."

In addition to scanning and modeling a crash scene itself, if the vehicle involved is available, MEC will generally look at it as well, document it, scan it and determine the amount of crush that is present.

"We will do a series of scans of the car to model it," he says, "then



Top: Laser scanning captures the curvature in the mountainous roadway of Angeles Crest Highway in California



Bottom left and right: With the 3D model created, Momentum can easily change the point of view, allowing a different look at the scene and identifying possible obstructions.

compare that model to an exemplar we also have on file and see how much crush occurred. Once we have the car and the scene modeled, we bring it into a collision simulation program we use called 'PC Crash,' start moving cars around, colliding them and asking: 'what are the speeds, what was its position at impact, at rest, how did it get there, was it steered there? etc.'" He adds that scanning a car using the GLS-1000—shooting about a million points on each side—can be done in about ten minutes.

"Having this tool at our disposal has definitely given us a competitive edge," says Fatzinger. "A lot of smaller firms probably can't justify the capital investment but, because of the volume of work we do, the detail that we need, and the results we've gotten, we definitely can."

To read other Topcon At Work stories go to [www.topconatwork.com](http://www.topconatwork.com)

## Topcon's GLS-1500

Topcon's GLS-1000 has been upgraded to the new GLS-1500 so data can be collected even faster than before.

- 30,000 precise points per second.
- Precise Scan Technology for industry-leading clean point cloud data
- Lens array optics technology to maintain distance accuracy from 1-150 meters
- Additional ranging past 330 meters
- Onboard scan control software stores scan data and images to a standard SD card for easy download
- Eye-safe and invisible Class 1 laser.

