

FOR LAS VEGAS FATAL CRASH UNIT, A GAMBLE ON GPS SYSTEMS TO SPEED SCENE MAPPING PAYS OFF

By BOB GALVIN

Last year was a bad one for the Las Vegas Metro Police Department. Three officers were killed in separate traffic collisions. Of course, careful investigations were conducted as such incidents get plenty of internal and external scrutiny.

However, Bill Redfair, the lead detective in the department's Fatal Crash Investigation Detail, expected that the investigations would proceed smoothly since his unit was using two Sokkia SRX series total stations with robotic technology.



Detective Bill Redfair using the Sokkia Robotic Total Station to take measurements at the scene of a fatal traffic crash.

"I can say that from using the robotic total stations on those (fatal crash scenes), that gave us the confidence that the evidence would stand up to scrutiny in court," said Detective Redfair, who has been a member of the police department's fatal crash investigation detail for 14 years. Not only was the investigation of the officers' deaths positive, but the robotic total stations dramatically streamlined mapping of the crash scenes.

"We cleared the scene much faster (compared with using older Nikon total stations), and were able to use our resources more efficiently," Detective Redfair continued.

The Sokkia SRX series are fully tracking and auto-pointing robotic total stations, with on-demand target reacquisition and reflectorless EDM. These total stations come with the company's patented RED-tech EX technology which gives users greater speed, accuracy and range of crash scene measurements.

Among the most prized benefits of using robotic total stations is that they allow the operator to control the instrument from a distance via remote control. This eliminates the need for an assistant officer as the total station's operator holds the reflector and operates the total station from the observed point.

The Sokkia SRX units are still in use today at Las Vegas Metropolitan Police Department (LVMPD), joining two Nikon total stations that were purchased several years ago.

GPS Devices Join Mapping Tools Arsenal

The LVMPD handles between 30,000 and 40,000 traffic accidents a year. Of these, 200 to 300 crashes are investigated by Detective Redfairn's unit, and just under 100 are fatal crashes. Therefore, the police department's Fatal Crash Investigation Detail gets plenty of use and practice with its total stations. In fact, Detective Redfairn reveals that rarely is there a week that his fellow crash investigation detectives do not use their total stations at least once.



Detective Dennis Magill (ret) using the Sokkia Robotic Total Station as the scene of a fatal motorcycle crash.

Furthermore, the division is notorious for adapting the latest technology to use in crash investigations, which is why it recently added three new Sokkia GRX1 GNSS systems to its equipment arsenal.

Today's GPS systems are the rage among tech-savvy crash investigators and reconstructionists. No wonder. One of the beauties of this new technology is that you do not have to be a reconstructionist to learn it quickly and become proficient. In fact, recalls Detective Redfairn, ABC Surveying

Instruments of Glendale, CA, which sold his department the GPS systems, had only to give some simple operating instructions by phone.

After that, "We were able to quickly set it (the Sokkia GRX1) up in the parking lot and do a diagram," said Detective Redfairn.

The Sokkia GPS system can be used for applications involving Real-time Kinetic (RTK) base or RTK rover, or for a network RTK rover or even as a static receiver, and offers millimeter or centimeter positioning accuracy. Other features include: upgradeable, dual-frequency, 72-channel GPS receiver for the best capture of a satellite signal; integrated antenna, digital UHF radio; high accuracy; SHC250 data collector for faster data collecting and calculations—it has the latest Windows Mobile 6.5 OS, and built-in Blue-tooth connections and minimal cables, meaning faster setup; low power consumption; and even voice messages that notify users when RTX is fixed or lost, eliminating a need for continuous visual checks of the controller display.

Corrections Easily Captured

The LVMPD's Fatal Crash Investigation Detail now uses the Sokkia GPS RTK system as its primary instrument because it is GPS satellite based. Plus, the division has available to it the Las Vegas Valley Water District's GPS network to operate its GRX1 units. This is highly advantageous as the water district's network uses a Differential GPS, which means that fixed, ground-based reference stations are used to broadcast the difference between the positions indicated by the satellite systems and the known fixed positions. The Sokkia GPS systems automatically generate any correction signals.

Multiple Scene Formats

Detective Redfairn says the total stations can do more than merely map a crash scene. “We actually use the total stations to map the crush that occurs in the vehicles themselves,” he said. “And when you’re animating a crash scene, you can show the crush of the vehicle so much more accurately.”

The final result from the quick and efficient mapping technology made possible with the Sokkia RTK systems is a scaled diagram. “But after that, you have so much more (capability) because you have a total station,” Detective Redfairn adds. “Now you’ve got data that you can use in animation, reconstruction of a scene, and simulation.”

Faster Road Re-Openings

Whenever a crash occurs, a primary objective is to map and then clear the scene as quickly as possible. Some states even impose a time limit as to how long a road involved in a crash can be closed. The impact a road closure triggers is immense, including lost commerce revenue, secondary accidents caused by angry motorists, and air pollution from sitting vehicles.



Detective Bill Redfairn using the LVMPD's newest total station-- the Sokkia GRX1 GPS Rover at the scene of a fatal traffic crash.

For these reasons, the LVMPD’s Fatal Crash Investigation Detail has constantly adapted new total station technology to reduce road closure times. For instance, Detective Redfairn said that with his unit’s Nikon total stations, it took between four and five hours to map a fatal accident scene, then re-open roads. When the robotic total stations were acquired, this time frame was reduced to about three hours. “Now, with the GPS systems, it’s taking two hours to two hours and 45 minutes,” Detective Redfairn said.

There will always be pressure to open roads quickly when a crash occurs. While

no one piece of mapping technology equipment is perfect, the better the tools, the quicker the scene can be mapped and cleared.

Says Detective Redfairn: “You have to ask: ‘What’s the most important thing to me (as a crash scene investigator) at the moment? Is it the scene? Is it to get the road open? Is it to do a thorough investigation?’” He argues that these priorities will change from one accident to another. “With this in mind,” Detective Redfairn continues, “You need to buy a piece of technology that’s going to meet every one of these criteria in every given situation because you don’t know until you start (investigating) which of these will be most important.”

No Total Stations Left Behind

Although LVMPD is thrilled with the capabilities offered through its newly acquired Sokkia GRX1 GPS total stations, it's not letting the other total stations it owns collect dust. It is not uncommon some days for all of the Fatal Crash Investigation Detail's total stations to be out working multiple accidents.

"We're glad we went with the GPS systems because we are finding that the GPS RTK systems and the robotic total stations complement each other," Detective Redfairn said. "Neither one of them is the perfect machine, but when you have the two of them together you've almost got the perfect system. Where the GPS can't go because of limitations (GPS units must have open sky since they are satellite-based), the robotic total stations can," the detective added. The Nikon total stations also are still used.

As much as Detective Redfairn rallies around GPS total station technology, he confesses he did not pursue it completely with open arms at first. Why not? Even though GPS was available at the same time the LVMPD was eyeing robotic total station technology, "It was way out of our price range," Detective Redfairn said. Eventually, pricing came down, and when the department put out a bid for purchasing GPS systems, Sokkia won hands down. The department has spent just over \$60,000 for its GPS units.

Detective Redfairn recommends that in cases where a smaller law enforcement agency cannot afford GPS total stations, they might recruit several other small departments in a particular area to share the cost of buying one of these units so they each can use the GPS system.

Aside from the accuracy, performance, ease of use, and quick measurements of the GPS systems, there are two more huge benefits. One of these is increased officer safety since only one officer is needed to operate the device. He can stand several yards away from a busy, and oftentimes dangerous, scene to take measurements.

A second benefit is the short learning curve tied to the Sokkia GRX1 RTK systems. According to Duke Dutch, manager of law enforcement applications for Sokkia's GNSS technology, "Traditionally, as older (traffic investigator) team members leave, the expertise and training needed to operate total station systems would leave with them. With this type of technology, the new members can operate the tool very quickly with very little training."

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