PROJECT: Victoria Police Use Trimble Juno SC Handhelds to Speed Assessment of Damage Caused by Bush Fires

PROJECT DATE: December 2009

Saturday, February 7, 2009 will forever be known as Black Saturday in the state of Victoria, Australia. In the midst of a 10-year drought, a record-breaking heat wave descended upon the state, with temperatures exceeding 45 °C (110-120 °F), breaking all-time record highs in some cities.

Under these severe weather conditions, fallen power lines, lightning strikes, and tossed cigarette butts sparked multiple fires across Victoria, which were fanned by gale-force winds blowing in excess of 120 kph (75 mph), carrying fires across the state. The fires—some of which burned for 29 days—destroyed 2,029 homes and killed 173 people, making this the deadliest natural disaster in Australian history.

As the flaming front tore through the state, hundreds of residents who stayed to defend their homes, or who waited too long to evacuate, perished in the first 10 hours. By the end of the day, entire towns and communities had ceased to exist.

In the throes of the disaster, Victoria Police (VicPol) began the daunting task of assessing the damage and number of fatalities. However, as the number of people missing and unaccounted for began to increase in areas where familiar landmarks such as street signs, mailboxes, and homes were reduced to smoldering rubble, it became clear that existing procedures wouldn’t work.

“It was clear almost immediately that we would need to call in reinforcements to help with our effort, and that we would need to find a more sophisticated way of locating and recording our findings,” said Acting Senior Sergeant, Greg Barras with VicPol. “Assistance was requested from the Australian Capital Territory Emergency Services Agency, which deployed its newly formed Mapping and Planning Support (MAPS) team to help us.”

The MAPS team consists of government and private-sector professionals who specialize in Geographic Information Systems (GIS) and volunteer to respond to disaster management operations. The MAPS unit is the only organization in Australia created specifically to play this important role.

Together with consultants from ESRI, software developers from Maptel, and handheld computers donated by Trimble Navigation Ltd., the expanded team began compiling a sophisticated technology solution that would meet the state’s needs for assessing the damage quickly and efficiently under extreme conditions.

The team loaded ArcPad 8 mobile GIS software from ESRI onto Trimble® Juno™ SC handheld computers with integrated Global Positioning System (GPS) capabilities and a built-in 3.5G cellular modem for high-speed internet connectivity worldwide. Maptel developers quickly developed a custom ArcPad applet that would enable crews to access VicPol’s standard damage assessment form in a digital format automatically linked to parcel data on the Trimble Juno SC handhelds.

“When we first began our damage assessment efforts, we sent teams of police out with binders of paper forms to fill out, but our paper process was time consuming, error prone, and inefficient. The Trimble Juno SC handheld was used by our field crews and it was found to be more than suitable for the task. We were able to enter and update information electronically, and then use the internal 3.5G modem to send and receive data in real time to and from the rescue coordination centre while still in the field.”

To protect themselves from hazardous chemicals, asbestos, and smoldering flames, field workers donned full protective suits, rubber boots, gloves, helmets and respirators. Once outfitted with the protective gear, they scoured the devastated region using the Trimble Juno SC handhelds to navigate to the correct parcel of land requiring investigation. As each team began its shift, the workers moved through the wreckage, accessing the ArcPad software to provide parcel data about each location.

Using the custom applet, the field workers relied primarily on the Trimble Juno SC

PROJECT HIGHLIGHTS

- Juno SC handhelds used to efficiently and quickly complete electronic damage assessment forms
- Data exchanged in real time with rescue coordination centre using built-in 3.5G cellular modem
- Customized ArcPad application from Maptel used to update thousands of GIS records
- Project completed in one third the time of manual, paper-based system
handhelds’ touch screen to activate drop-down menus to quickly and easily enter attribute data such as GPS location, what types of building were found, their condition, and whether a body was found. A text edit function made it easy for workers to enter more detailed notes, such as where heavy equipment would be required to assist with clean up.

Using the Trimble Juno SC handheld’s integrated 3.5G cellular modem field workers could transmit information back to the GIS server in Melbourne with the push of a button and move on to the next location. This allowed for real-time updates on the GIS server, enabling search teams across the entire region to see updates from each property on the Trimble Juno SC handhelds instantaneously.

“As additional bodies were found in areas that had already been searched, a mandate was handed down by the Victoria State Coroner requiring even more detailed searches, particularly in the Kinglake area, where several fires merged and caused the most devastation,” said Greg. “From that point forward, we were required to inspect every possible location where someone could have taken cover—removing fallen materials, searching wells and vehicles, and even bringing in excavators so we could do a comprehensive visual search of each property.”

Using an Internet map viewer, both field and office workers could watch parcels change color as a property’s search was complete and the field officer synched his new data with the GIS server via the real-time connection provided by the Trimble Juno SC handheld’s internal modem. In the command center, officials could see immediately if a parcel had been skipped and could send the nearest team back to complete the search.

VicPol estimates that the real-time GPS mapping and GIS solution enabled search teams to complete the entire project in one third the time it would have taken with the manual, paper-based system.

“The technology solution was unbelievably efficient,” said Greg. “By the time the project was complete, we searched 5,781 properties, conducted 3,352 separate searches on buildings, sheds, vehicles, and water tanks, took 9,600 photos using georeferenced cameras, and sent 1,539 geo-referenced records from the Trimble Juno SC handhelds to the GIS server without a single problem.”

Although the fire caused widespread devastation and tragedy, the technology provided a swift and efficient damage assessment solution. As a next step, the VicPol plan to continue using the Trimble Juno SC handhelds and are looking for new ways to apply the technology for other police duties.

“We’ve just touched the tip of the iceberg when it comes to using mapping and GIS technology,” said Greg. “We’re looking at implementing an enterprise GIS system and have already started using the Trimble Juno SC handhelds in police patrols, investigations, and other daily work. There’s no doubt this technology made our jobs easier following the bushfires, and I’m certain it’ll make our daily operations more efficient, as well.”