



PROJECT: Managing Auckland's Roads With GPS

PROJECT DATE: July 2009

PROJECT HIGHLIGHTS

- Automating data collection and management process saves the Auckland Motorway Alliance 30 hours per week
- Highly productive, yet affordable, Juno SB handheld perfect for government entities
- Software automatically links GPS location to images taken with the handheld's digital camera

In October 2008, the New Zealand Transport Agency formed the Auckland Motorway Alliance (AMA), a compilation of businesses, consultants, and transportation thought leaders tasked with managing Auckland's motorway network. The consultants—chosen, in part, for their technology expertise—felt confident they would be able to implement plans to manage the 186 mile (300 km) long road network more efficiently. They knew implementing Global Positioning System (GPS) technology would play an important role in these plans; what they didn't realize was just how quick, easy, and impactful the new system would be.

The AMA is responsible for operating and maintaining some of the busiest sections of road in New Zealand. Comprised of five companies, the government entity's duties include overseeing highway repairs, environmental management, cleaning graffiti, and clearing trash.

"Our primary focus is on maintaining Auckland's motorway and ensuring that its users are able to reach their destinations safely and quickly," said Trevor Yeoman, asset information manager for the AMA. "Since our budget comes from tax dollars, we try to achieve our goals in the most efficient, cost-effective way possible."

Upon winning the contract, the AMA immediately began an analysis of existing processes, including how the organization collected maintenance data, tracked employees hours, monitored material usage, and more to identify where the most efficiency could be gained. During that evaluation, it was clear that the process for managing vegetation along the motorway was outdated and unnecessarily time-consuming.

"We're very conscientious about the environment and keep close tabs on how the vegetation along a motorway is impacted by the vehicles that travel the roads each day," said Yeoman. "We consider

the vegetation to be one of our assets, and we could see right away that asset management was one place where we could make big improvements, fast."

Yeoman began by approaching Trimble for advice on the best way to replace the existing paper-based system of tracking AMA assets.

"I've worked with Trimble for several years and have had great experiences with their products and services," he said. "I knew they would steer me in the right direction and help with whatever I needed along the way."

Trimble's consultants reviewed the AMA's need for a highly productive, cost-effective GPS receiver for field data collection that could deliver five-meter positioning accuracy. They suggested the Trimble® Juno™ SB handheld, a fully integrated, pocket-sized field computer that provides two- to five-meter accuracy in real-time or after postprocessing.

"The Juno SB handheld has everything we need—it's easy to use, has good GPS accuracy, a camera and a voice recorder, and we have the flexibility to add our own custom software applications in the future," said Yeoman.

Although the AMA needs to more efficiently manage all of its assets, including streetlights, road surfaces, retaining walls, and more, the group chose to begin using its new asset management system for a vegetation study.

The group's predecessors used several different paper forms to collect vegetation data manually. Once the forms were completed in the field, workers in the office had to update the database by hand. The system was time consuming, inaccurate, and prone to human error.

As a first step in automating the vegetation management process, Yeoman used the data dictionary editor in Trimble's

THE EQUIPMENT USED ON THIS PROJECT INCLUDES

- Juno SB handheld
- GPS Pathfinder Office software
- TerraSync software

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Trimble Navigation Limited
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GPS Pathfinder® Office software to set up a data dictionary, add custom attributes, and create drop-down menus to make data collection using Trimble's TerraSync™ software on the Juno SB handheld fast and easy.

"You don't really think about the logic of capturing data electronically until you're actually standing in the field trying to find the right menu or button," said Yeoman. "Our Trimble contacts had some great tips for setting up the attributes and menus to make them as user-friendly as possible."

The AMA's Geographic Information Systems (GIS) team also acquired aerial imaging of the area to be mapped from the local government and created a series of electronic maps dividing the road network into polygons. The maps were then exported as GeoJPG files (spatially referenced JPGs) that can be viewed on the Juno SB handheld.

"Each morning, our two ecologists determine which parcels they'll be working that day, and then head into the field equipped with their Juno SB handhelds," said Yeoman. "They can look at the GeoJPG and see exactly where they're standing, and then they enter data about the vegetation such as species, condition, pests, invasive plants, and more."

At the end of the day, the ecologists return to the office, where they connect the handhelds to a desktop computer and postprocess the data using Trimble GPS Pathfinder Office software. Once checked and corrected, the data can be uploaded to the enterprise GIS or exported in the necessary file format as required.

Once in the GIS, the AMA uses the data for budgeting, planning, workforce management, and more.

"Now, we're confident that the information in the GIS is accurate and up-to-date, so the GIS team can analyze the information and provide reports to a variety of different departments," said Yeoman. "We can accurately plan and budget for areas that need to be re-planted, sprayed, or more closely monitored."



In just a few short months, the payoff from the new system has been substantial. Yeoman estimates that the automated data collection and data management process is saving the AMA more than 30 man-hours per week.

Based on the success of the vegetation management program, the AMA is also planning to use the Juno SB handhelds to collect data about other assets the organization maintains, including streetlights and retaining walls.

"When it comes to collecting data about our retaining walls, the camera feature of the Juno SB handheld is invaluable," said Yeoman. "In general, it's difficult to tie GPS data to an image, but the combination of the Juno SB handheld and TerraSync software makes it easy. Now, we can take up to 15 photos of a wall, transfer them directly into the GIS, and use them to make decisions about wall maintenance."

According to Yeoman, the AMA plans to increase its use of GPS and GIS technology in the coming months and years.

"We have big plans," he said. "We'd like to use our new, automated process to collect and manage data for all of our assets, and eventually we'd like to deploy the Juno SC handhelds with integrated modems in order to deliver jobs to contractors on site wirelessly."

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