

Bundaberg Regional Council Updates GIS With Centimeter Accuracy



PROJECT HIGHLIGHTS

- Trimble technology provides asset mapping with centimeter accuracy
- Bundaberg Regional Council pairs Trimble mapping software with survey hardware for complete solution
- Bundaberg base station sends continuous, real-time data to national GPS network
- Complete Trimble solution used for survey, mapping, GIS & machine control

PROJECT: Bundaberg Regional Council GIS update and maintenance

PROJECT DATE: Ongoing

For years now, local government organizations around the world have been using Global Positioning System (GPS) technology to better manage assets across a geographically dispersed region. Few have gone to the great lengths of the Bundaberg Regional Council, however, to ensure that their data is accurate within one centimeter and allowing GPS signals to be accessed through a national GPS network.

Located in Bundaberg, Australia, the Bundaberg Regional Council is the governing body responsible for maintaining the area's infrastructure. The area comprises approximately 90,000 residents and more than \$1.5 billion AUD worth of assets incorporating roads, stormwater drainage, sewer networks, water and wastewater treatment facilities, waste management sites, and municipal buildings. The council is determined to make its Geographic Information System (GIS) as accurate and useful as possible.

"We developed our GIS nearly 20 years ago, and since then had made few changes to the technology we were using. In fact, until recently, our GIS software was the oldest software in use by the council," said Steve Bowden, GIS coordinator at Bundaberg Regional Council. "We knew our GIS needed to be updated and that the technology available had matured significantly. From the outset, we decided that if we were going to update our processes, we were going to do it right and implement a system others can benefit from, too."

The council is in the process of collecting spatially accurate data on hundreds of thousands of assets both above ground and underground, including sewer pipelines, manholes, fire hydrants, valves, and other critical assets. With an accurate

database of council assets, field workers will be able to more efficiently maintain the existing infrastructure and plan for new construction.

"We aren't making a distinction between data collected for survey and data collected for mapping," said Bowden. "Having centimeter-accurate data in the GIS also means that relevant, useful data now flows seamlessly from survey to construction and is even accessible from the field. Now, civil designers can access accurate data from the GIS and complete designs from the office without an extra trip to the field. Our goal was to collect the most accurate data possible one time, store it, and re-use it many times."

As a first step, Bowden and Dwayne Honor, manager of design at Bundaberg Regional Council, contacted Ultimate Positioning, the largest independent distributor of survey, laser, and GPS systems in Australia, for advice.

"A lot of people don't realize that there are big differences between the options available when it comes to GPS technology," said Simon Best, national product manager for mapping and GIS at Ultimate Positioning. "Bundaberg wanted high accuracy GIS that would make asset management workflow more efficient, but also eventually be useful for road design and construction, machine control and other internal uses, as well as be of value for the national GPS network."

The Bundaberg Regional Council began by establishing a first-of-its-kind local government partnership with Geoscience Australia, the government entity that manages the Australia Regional GPS Network (ARGN) and oversees the country's spatial data infrastructure, to establish a permanent base station at the

THE EQUIPMENT USED ON THIS PROJECT INCLUDES

- Trimble R8 receivers
- Trimble S6 robotic/reflectorless total station
- Trimble TSC2 rugged handheld computers
- Trimark 3 radios.
- TerraSync software
- Trimble Survey Controller software

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Bundaberg airport. It was important to council that the network be established so that the entire community could benefit.

After extensive evaluation of the solutions available, the council purchased a Trimble® NetR5™ multi-channel, multi-frequency Global Navigation Satellite System (GNSS) receiver which it uses as a permanent base station, ensuring highly accurate and reliable positioning data.

The council also selected three Trimble R8 receivers (one as a mobile base), a Trimble S6 robotic/reflectorless total station for integrated GPS and conventional surveying, three Trimble TSC2™ rugged handheld computers, and three Trimark 3 radios.

Now, using the new system, field workers are able to collect data about the council's assets using the survey equipment in the field and the NetR5 and R8 reference receivers to produce Real Time Kinematic (RTK) corrections with centimeter accuracy.

The S6 Total Station is operated with a TSC2 running Survey Controller software. The Council's asset section uses TerraSync™ software with the R8 receiver to capture field asset locations while the remaining TSC2 handheld is normally running Survey Controller software with the R8 receiver for RTK GPS surveying.

Not only is the Trimble equipment being used for RTK surveying, but the NetR5 base station also sends continuous, real-time data to Geoscience Australia for inclusion in the Australian Regional GPS network (ARGN). This assists in scientific research pertaining to crustal dynamics and continental drift, meteorology, improved orbits for GPS satellites, and more.

"We're already seeing a lot of benefits from our high accuracy data in the GIS system, but we think we've really just touched the tip of the iceberg," said Honor. "The Trimble equipment is truly scalable, flexible and easy to use, and



we're already working on plans for more ways to use it."

In the future, Honor and Bowden would like to overcome staffing shortages with single-person operations and the efficient delivery of survey-accurate data from the field to the office, as well as use the information for machine control, road construction and the digital submission of as constructed data to the Bundaberg Regional Council.

"It's great that we've been able to find one vendor that can provide everything we need for capturing data, from survey to mapping to GIS and machine control without having to rely on third party hardware or software suppliers," said Bowden. "Response from the council has been great, and there's some friendly competition between departments and workers for who gets to use the equipment each day, which shows us that we've made the right decisions."

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