



# Accuracy, Confidence and Productivity in Remote Locations

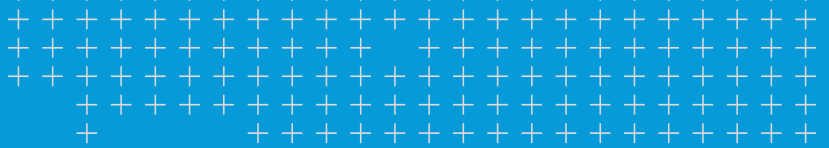


A U.S. surveyor gains efficiency in precise real-time surveys over large areas.

Trimble RTX produces fast, accurate results in situations not suitable for RTK or VRS.

## Solution

- ▶ Trimble® CenterPoint® RTX Positioning Service
- ▶ Trimble R10 GNSS Receiver
- ▶ Trimble TSC3 Controller
- ▶ Trimble Access™ Software



# overview

Since 1998, John Hamilton's company Terrasurv has specialized in precision measurement. His performance has given him a reputation as a thorough surveyor dedicated to providing the highest level of service and accuracy. Much of Hamilton's work involves large-area projects providing ground control for aerial imaging and lidar. While these applications were traditionally done using static GNSS methods, Hamilton has turned to real-time positioning for nearly all of his GNSS surveys.



Location  
NORTH  
AMERICA

Hamilton's work has taken him throughout North America (he's surveyed in all 50 states) and to five continents. His primary concern is accuracy and having the confidence that his fieldwork is correct. Because return visits are expensive, especially on large or remote projects, he takes steps to be sure he has sufficient information to produce the required results. "Before we started doing real-time surveys we would do static networks and there was always a tinge of doubt," Hamilton explained. "We needed to stay on a point an extra amount of time to make sure that we had enough data to be sure of good results, and even that didn't always work. Sometimes we'd have to go back to the site. Real-time positioning gives an indication about the accuracy we're getting. It gives us more confidence that we've got what we needed. I used to do exclusively static observation—now it's become quite infrequent."

Terrasurv's projects often cover broad areas where it's not feasible to set up their own base station every 15-20 kilometers. "That's where the RTX comes in," Hamilton said. "We used to set a base and survey off of it. At the end of the day, or halfway through the day, we'd need to go back and pick up the base and move it to a new location. So the RTX technology just really saved us a lot of time."

## PUTTING RTX INTO ACTION

To illustrate the benefits of RTX, Hamilton described a pair of recent projects in South Dakota. He was contracted to establish ground control for an aerial lidar project supporting the US Geological Survey's 3D Elevation Program (USGS 3DEP). For the first project, Hamilton used RTK GNSS; setting up and managing his own base stations and using cellular connections to transmit corrections from the base to his RTK rover. In areas where cellular service wasn't available, he reverted to static occupation and post-processing.

Adjacent the first site, Terrasurv's second project in South Dakota covered 14,500 square miles. There were just 15 existing control stations in the area. Hamilton's task was to establish more than 600 points to serve as ground control and checkpoints for the lidar-based mapping.

Knowing that there would be large areas without cellular service, Hamilton decided to do the entire project using CenterPoint RTX. He followed his existing procedures, which included observing each point twice and reinitializing between observations. The short initialization time of CenterPoint RTX Fast—less than one minute over much of North America—enables Hamilton to move quickly and still collect redundant measurements.



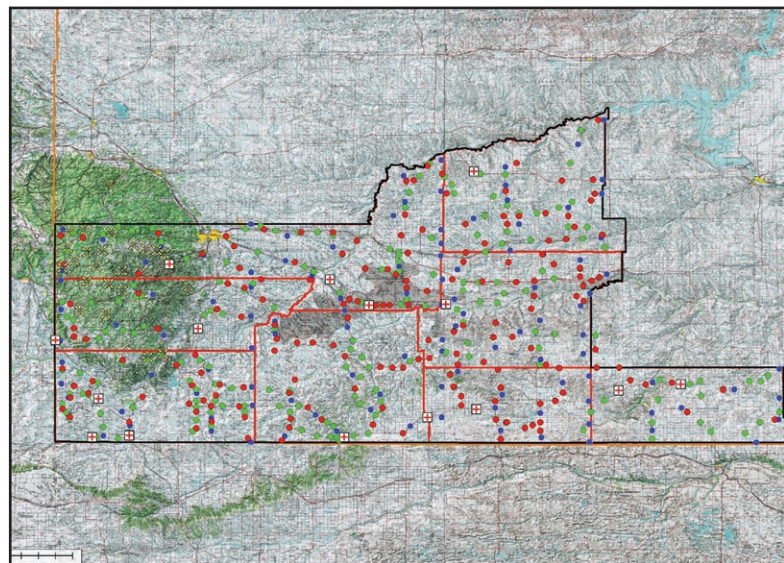
## CONFIDENCE IN RESULTS

By including the existing control in his survey, Hamilton was able to compare the RTX results to published coordinates. It confirmed that the accuracy displayed by Trimble Access software on his Trimble TSC3 controller was correct and well within project specifications; both in the horizontal and vertical components.

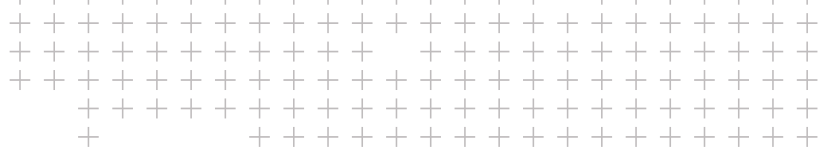
Terrasurv has used CenterPoint RTX on numerous other projects, including control for aerial mapping in Ontario, North Dakota, and 15,000 square miles in Texas where RTK or VRS were not suitable. "We use a number of different VRS networks around the country," he said. "RTX is used on really large projects that are in remote areas probably 10 percent of the time. Just having that flexibility pays for the subscription cost."

"With CenterPoint RTX we don't need to worry about the RTK base station. It's a huge time saver as well as giving us more confidence in what we're getting."

— John Hamilton, President, Terrasurv Inc.



*With poor cellular coverage and sparse geodetic control, a large project in South Dakota was an ideal application for CenterPoint RTX.*



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+49-6142-2100-140 Fax

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