

Maintaining **Precise Positioning** and **Saving Time** on Remote Pipeline Projects

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A positioning service energizes large pipeline surveying projects and becomes a field crew favorite.

For projects spanning large areas, a Michigan-based engineering and construction firm discovered satellite-delivered corrections could solve the challenge of high-precision global navigation satellite system (GNSS) reliability in remote areas. Atwell, LLC, is a national consulting, engineering, and construction services firm with 33 offices throughout the country and more than 1,000 team members. The company delivers a broad range of strategic and creative solutions to clients in three core markets: oil and gas, power and energy, and real estate and land development.

Atwell provides comprehensive turnkey services, including land and right of way support, engineering, land surveying, environmental compliance and permitting, and project and program management.

Pipeline Construction

Atwell's introduction to Trimble® CenterPoint® RTX, a real-time GNSS positioning service, was during two large-scale linear pipeline projects within remote areas. Even with substantial experience with projects of this scale, the remoteness of some of the projects' sections was proving to be a challenge for Atwell. While they could expect to rely on base stations or network correction methods for most projects, Atwell needed to seek other correction alternatives—and up their efficiency on long-corridor projects.

Atwell performed construction staking and as-built surveys for an approximate 50-mile pipeline. This project spanned a five-month period, with the same “RTX dividend” of an hour or more of time saved each day. However, crews also noticed an additional benefit: rapid response time. On any given day, there could be project managers, right-of-way agents, or inspectors on site, asking for additional survey data. “Inspectors and others started to notice how fast our crews could jump from one place to another and get the shots they requested, without having to do any base setups,” says Jason Jung, PLS, CMS-LiDAR, manager of 3D laser scanning projects at Atwell.

According to Jung they saved time by not having to utilize temporary real-time kinematic (RTK) base stations and driving to and from the base reference points; setting up and tearing down the base; and not having downtime from malfunctioning equipment and battery issues. While they could otherwise progress along a project

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*Jason Jung,
3D Laser Scanning
Project Manager, Atwell*





corridor rapidly, due to the limits of the range of base radios, they might have to do multiple setups of a conventional RTK base station each day. CenterPoint RTX removed this hinderance.

“Trimble RTX completely freed us from the time and hassle of base setups,” says Jung. “You turn it on, and it’s ready to go before you’ve had time to take a sip of coffee. And once our crews got used to it and gained confidence in the results, they have really loved this solution.” Jung estimates they saved at least an hour each day over the span of the project.

Georeferenced Point Clouds & Scanning in 3D

Atwell recently used the Trimble RTX on a 135-mile large-diameter pipeline project that included 19 facilities along the route. Atwell provided as-built services related to the facilities utilizing a Trimble X7 3D laser scanner. The data captured was

used to generate spatially correct site models that included the material traceability necessary to comply with Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations. Crews used Trimble RTX to georeference the point clouds from the scanner to provide the accuracy needed to comply with industry regulations. Each site was referenced with permanent monuments or scribes that all tied into the master control system.

They also used CenterPoint RTX to establish hard check points to meet Atwell’s strenuous QC requirements for ground targets such as those used in unmanned aircraft systems (UAS) control work. To do the daily “in and out” check shots, they used a free app called “BenchMap” to locate nearby survey control marks from the National Geodetic Survey (NGS) database. Most checks were sub-0.08’. The time saved in not having to change base positions, as well as set up and breakdown, were significant time savers along this lengthy project. The precisely registered scans helped speed up PHMSA required inspections and audits, and construction change management field operations.

A Crew Favorite

Atwell’s crews use Trimble R10 GNSS receivers and Trimble Access field software running on Trimble TSC7 controllers, but Jung notes that they have recently upgraded to some Trimble R12i GNSS receivers, “and they are already earning their keep.” He expects to realize even more benefits from CenterPoint RTX coupled with the advanced multi-constellation capabilities of the Trimble ProPoint™ positioning engine in the R12i.

Trimble CenterPoint RTX has not only become a crew favorite, but it is also fast becoming a go-to solution for many Atwell projects. “The speed at which our crews can get up and running with RTX is awesome,” concluded Jung..

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