



Take the Guesswork out of Earthworks

Trimble Earthworks Solutions

TRANSFORMING THE WAY THE WORLD WORKS



Take the Guesswork out of Earthworks

Work smarter, faster and more profitably with highly productive, integrated and innovative solutions for the complete job site to keep you on track throughout the project lifecycle.



PLAN

Optimize corridor alignments, plan operational schedules and create accurate bids

- ▶ Consider all options
- ▶ Quickly and accurately balance earthworks
- ▶ Plan and easily visualize the order of construction tasks
- ▶ Manage work teams against changing tasks and schedules
- ▶ Understand and quickly forecast the impact of delays and schedule changes
- ▶ Analyze earthworks quantities and material types faster and more precisely

Manage, track and report progress

- ▶ Update current progress dynamically on the operational schedule
- ▶ Create detailed earthworks reports for quantity estimating and takeoff
- ▶ Give project stakeholders visibility into the alignment planning process

MODEL

Create accurate, integrated 3D constructible models quickly and easily

- ▶ Merge multiple data sources into a detailed 3D constructible model for machines and field crews
- ▶ Analyze on-site soil conditions and types to effectively manage earthworks
- ▶ Create optimized mass haul plans to move dirt more efficiently

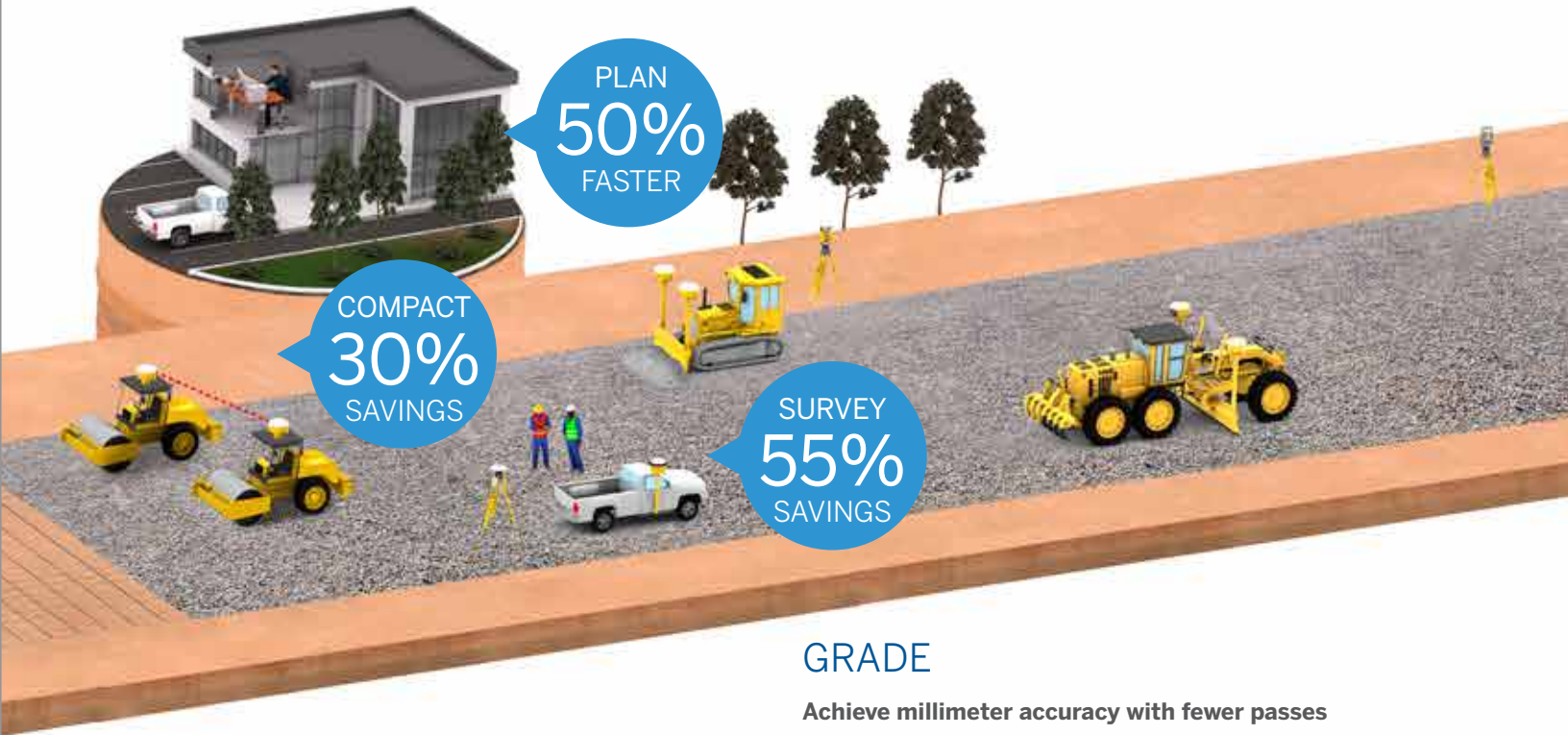
Manage, track and report progress

- ▶ Manage design changes efficiently
- ▶ Connect the office to the field for design management and updates
- ▶ Report as-built construction

SURVEY

Perform a range of measuring and positioning tasks

- ▶ Access correct, current data and communicate work orders wirelessly to avoid rework and delays
- ▶ Eliminate stakes and perform survey tasks to decrease cost and reduce errors
- ▶ Create detailed in-field 3D designs



SURVEY

Manage, track and report progress

- ▶ Empower non-surveyors with real-time site status and visualizations
- ▶ Identify issues before placing expensive material to avoid costly mistakes
- ▶ Perform final as-built checks for accurate documentation and reporting

EXCAVATE

Get to grade faster with less rework

- ▶ Eliminate stakes, excavate more accurately and maximize cycle times to reduce fuel and operator costs
- ▶ Monitor material arriving at or leaving the site
- ▶ Load and track every truck to maximum payload and record load counts accurately
- ▶ Consistently compact lifts for proper water runoff and maintain grade for subgrade surface

Manage, track and report progress

- ▶ Monitor project progress with machines to further reduce dependency on contract surveyors and grade checkers
- ▶ Tie production schedules to optimized mass haul plans
- ▶ Monitor equipment to reduce failures and plan maintenance

GRADE

Achieve millimeter accuracy with fewer passes

- ▶ Reduce over and under cutting
- ▶ Effectively utilize less experienced operators
- ▶ Achieve finished grade accuracy with fewer passes and no manual staking or bluetops

Manage, track and report progress

- ▶ Wirelessly synchronize 3D design data to and from the office to reduce physical visits to the site
- ▶ Measure productivity and monitor material placement in real-time using the machine
- ▶ Connect remotely to the machine from any location for training, support and monitoring

COMPACT

Compact intelligently for a quality surface

- ▶ Share compaction map data wirelessly between compactors to maximize efficiency
- ▶ Detect over- or under-compacted areas or subsurface soft spots
- ▶ Improve compaction efficiency by achieving target pass count more accurately
- ▶ Ensure complete coverage over the entire project area

Manage, track and report progress

- ▶ Create compaction production data for reporting purposes for the entire project area up to finished grade
- ▶ Verify design grade has been maintained post-compaction and prior to paving
- ▶ Document that compaction meets design specification

Connect Your Site for More Profit

Improve efficiency and productivity, while minimizing waste and expense throughout the life of the project with Trimble® Connected Site® solutions for earthworks. Create a 3D constructible model, use it to plan the most cost-effective schedule, and then use the same model to track project progress.

SURVEY THE SITE

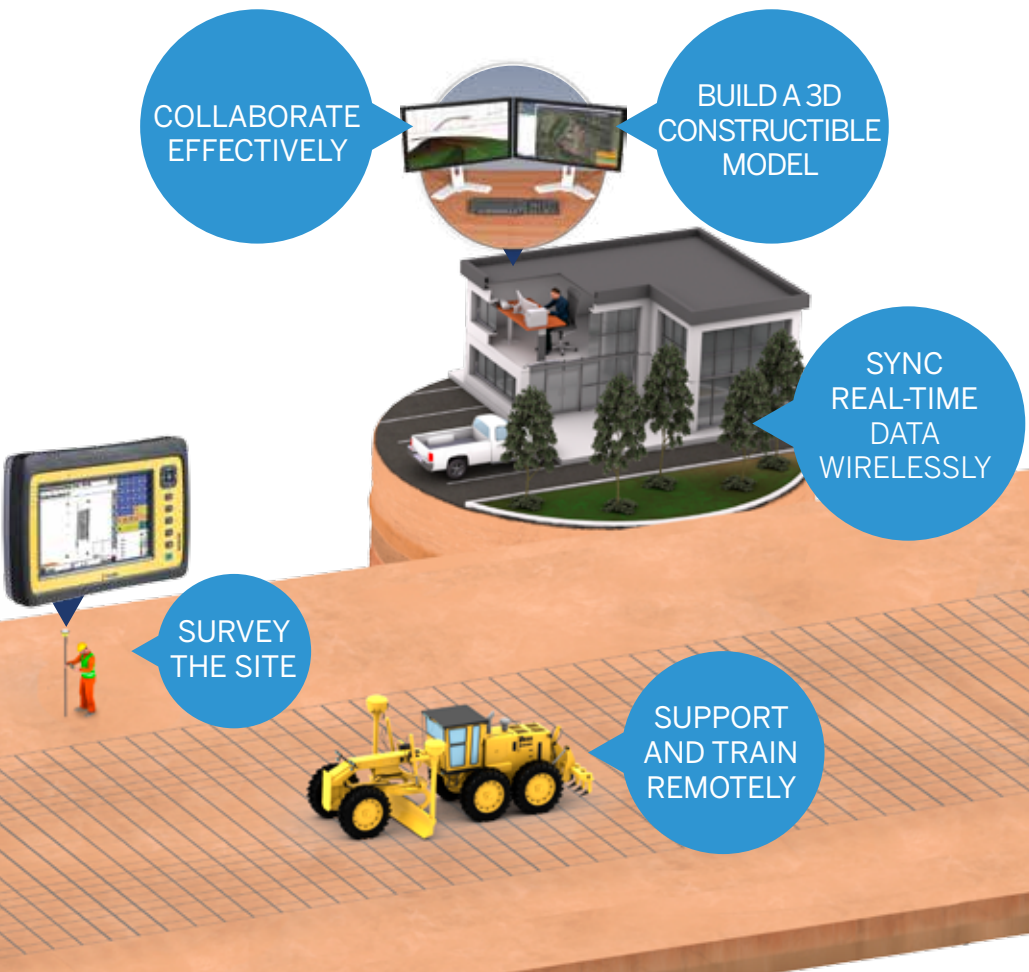
Collect survey, grade check, and as-built data from the field and send it to the office in real-time to build an accurate 3D constructible model for takeoff estimating, data preparation and reporting. Or take advantage of fast and safe aerial data collection with Trimble Unmanned Aircraft Systems (UAS) to replace ground surveys and provide more data at shorter intervals for lower overall cost.

With field software designed specifically for construction workflows and seamless integration with other Trimble software solutions, job site delays and rework are significantly reduced. Easy-to use and learn field software means you spend less time training and preparing data, and more time getting the job done.



BUILD A 3D CONSTRUCTIBLE MODEL

Combining current field conditions from multiple sources with design information provides the foundation for the 3D constructible model. Validate and improve the site operations plan with a 3D constructible model, so you know what to build and where to build it before costly construction begins. Adding intelligence to the model, such as how dirt will be moved, and updating the model with up-to-date field information makes the Trimble 3D constructible model a powerful tool to plan, manage and construct projects.



SYNC REAL-TIME DATA WIRELESSLY

The 3D constructible model is used to automatically sync design files and work orders between the office and the field in real-time so everyone is working with the latest files.

When up-to-date design information can be sent to the field crews or machine operators without leaving the office, you get 100% less drive time, and 100% less rework, 100% of the time.

SUPPORT AND TRAIN REMOTELY

Get real-time technical support for field crew personnel or earthworks machine operators, without the time and cost of waiting for a technician to drive to the construction site. Both the field crews and the support team see the same picture, eliminating costly delays, downtime and drive time.

TRACK AND REPORT PROGRESS

Intelligently combining as constructed information from across the project allows for advanced, near real-time reporting for progress payments. As-built progress can be monitored as the machines move dirt, and QA reporting and stakeout results can be generated. By combining both survey and machine data, contractors get the best overall picture of the current state of the project. In addition, soil compaction operations can be monitored to ensure compaction requirements are being met.

COLLABORATE EFFECTIVELY

All your important files for the whole team are now located and backed up securely in the cloud. Overlay designs and cut/fill maps onto Google Maps or digital imagery, so everyone can see what's happening. Even site inspections and routine site visits are easily recorded and uploaded – including photos.

Proven Productivity All Over the World



"Overall, our complete information workflow has been transformed . . . there's no question that it saves us a ton of time."

Jeremy Craven, *Vice President of Engineering*
Edgerton Contractors, United States



"Trimble helped to produce approximately 5-10% volume savings, which translates into 5-10% operational cost savings"

Stefan Eberhard, *DHZ*
Eberhard Group, Switzerland



"Trimble technology has yielded tangible benefits on this project in terms of 20% cost savings and 20% time savings."

Ben Weiller, *Vice President*
CE Contracting, United States



"(Trimble) has reduced our time for excavation across a range of projects by 25% which means a lot to our bottom line."

Terry Hamilton, *Project Manager*
Taylor Excavating and Wrecking, United States



"We easily achieve a grading rate of 350 square meters per hour with a dozer and 200 meters squared per hour with a finishing excavator. We realized that with the guidance-equipped dozers, we can double the graded surfaces on embankments.

This is a 100% productivity gain!"

Vincent Godon, *Job Site Superintendent*
Fougerolle Ballot Terrassements, France



"I spend half as much time on the job site. Now fewer stakes are needed and the number of elevation checks are reduced. The driver has all the information in the cab and is much more autonomous. We save a significant amount of time."

Remi Larue, *Topography Manager*
Giorgetti Construction, Luxembourg



"Previously it would take about 12 days to achieve the finished grade to the design requirements, and with Trimble grade control it was completed easily in a few hours."

Grader Operator
Hunan Licha Highway Development Company, China



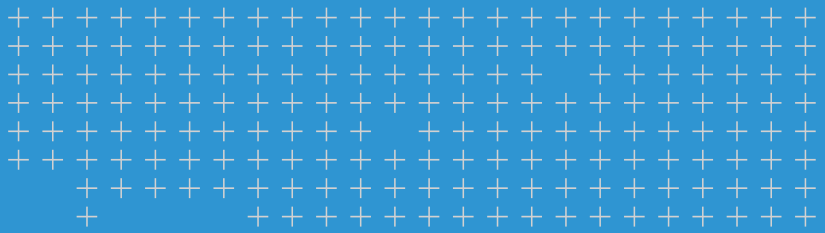
"We were able to reach repeatable accuracy of each graded layer with fewer passes of the grader - as a result we didn't waste time and materials from rework, and we saved fuel and machine run time."

Mark Surtees, *Manager of Survey and Technology*
Thiess, Indonesia



"When you look at the volume of information we collect, share and analyze on a daily basis it just gives us a huge advantage in accuracy and productivity in everything from modeling and earthworks to mass haul."

Will Newall, *Project Manager*
M2PP Project, New Zealand



Trimble: Transforming the Way the World Works

Trimble provides the tools and support to let you integrate planning, design, site positioning, machine control and asset management information throughout the construction life cycle for more efficient operations and higher profits. Contact Trimble or your local dealer today to learn how easy it is to utilize technology that makes significant improvements in project workflow, dramatically increases your production, improves your accuracy and lowers your operating costs.

YOUR SITECH® CIVIL CONSTRUCTION TECHNOLOGY PROVIDER

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