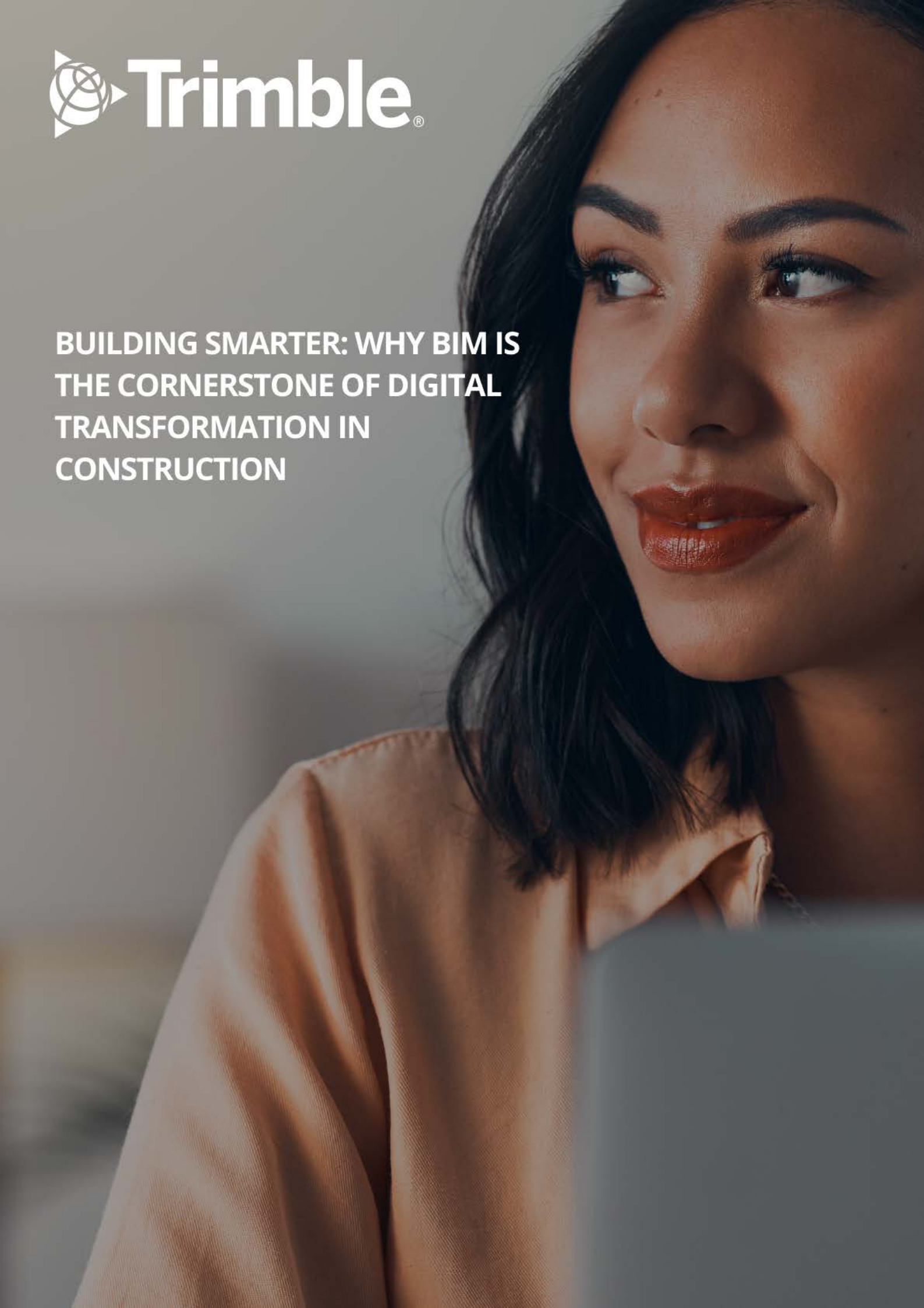
Trimble®

BUILDING SMARTER: WHY BIM IS THE CORNERSTONE OF DIGITAL TRANSFORMATION IN CONSTRUCTION



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Rethinking how we build

The construction industry is at a tipping point. While global output hit approximately $13 trillion in 2023—about 7% of total global gross output—it remains plagued by slow-moving productivity. From 2000 to 2022, construction labor productivity improved by just 10% in total, averaging a sluggish 0.4% annual growth. Between 2020 and 2022, it actually declined by 8%[1].

The world can't afford this stagnation much longer. Global demand is accelerating, and by 2040, the industry is expected to grow by 70%. If productivity doesn't catch up, we're staring down the barrel of a $40 trillion output shortfall[2].

One of the most promising levers for addressing this challenge is Building Information Modeling (BIM). But to unlock its full potential, we need to reframe how we think about BIM—not just as software, but as a way of working smarter together.

The $1.6 trillion opportunity

Boosting construction productivity through BIM workflows could contribute to unlocking $1.6 trillion in value by 20403.

1. The productivity imperative

Productivity in construction is not a nice-to-have; it's a must. Despite the scale and significance of the industry, inefficiencies persist at almost every level—miscommunication between trades, poor coordination between design and construction teams, and outdated processes on-site.

These gaps result in chronic delays, cost overruns, and rework that erode margins and trust. Digital workflows, especially BIM, offer a proven path forward.

Over 50% of construction projects experience delays, with the most common scenario being a **21–30%** extension of the schedule[4].

2. Why BIM, and why now?

At its best, BIM isn't just a digital 3D model—it's a shared language. It creates a common environment for teams to collaborate, reduce misunderstandings, and make faster, better-informed decisions.

McKinsey's research confirms that using BIM as part of an integrated digital workflow can increase labor productivity by 14–15% and reduce project costs by 4–6%[5].

BIM Powers

- Integrated design & real-time calculation
- Reusable, data-rich models
- Automated, connected workflows
- Model alignment across project phases
- Standards-based implementation

3. BIM in practice: How it shows up across disciplines

Structural

BIM automates steel and precast detailing, reducing field errors and improving build accuracy. It enhances constructability through model-driven workflows that support layout automation and precise fabrication, even for highly complex geometries.

MEP

BIM allows early detection of clashes and enables virtual walkthroughs before anything is built. It also integrates energy modeling and duct planning, reducing costly surprises in the field.

Civil / Infrastructure

By combining BIM with geospatial data and reality capture, teams can streamline earthworks, alignment planning, and construction sequencing. These capabilities improve coordination with stakeholders, enhance visualisation, and support faster decision-making during design and construction.

An estimated **69%** of construction projects **exceed budget**, and nearly **90% miss their original schedule**, according to industry analysis[6].

4. Who benefits from BIM workflows?

BIM managers and coordinators

BIM managers are organizational leads who set up BIM execution plans, manage model versions, and ensure data integrity (e.g., IFC exports). They train project teams on workflows and client-specific requirements, maintain internal standards, and enable cross-disciplinary collaboration—extending well beyond just overseeing the CDE.

Engineers and designers

These professionals author models with accuracy and compliance in mind—balancing constructability, regulatory requirements, and stakeholder input. Structural and civil teams benefit from tools like issue tracking and AR/VR reviews, while MEP designers focus on coordination throughout the planning process to ensure smooth integration with other disciplines.

Project managers and field supervisors

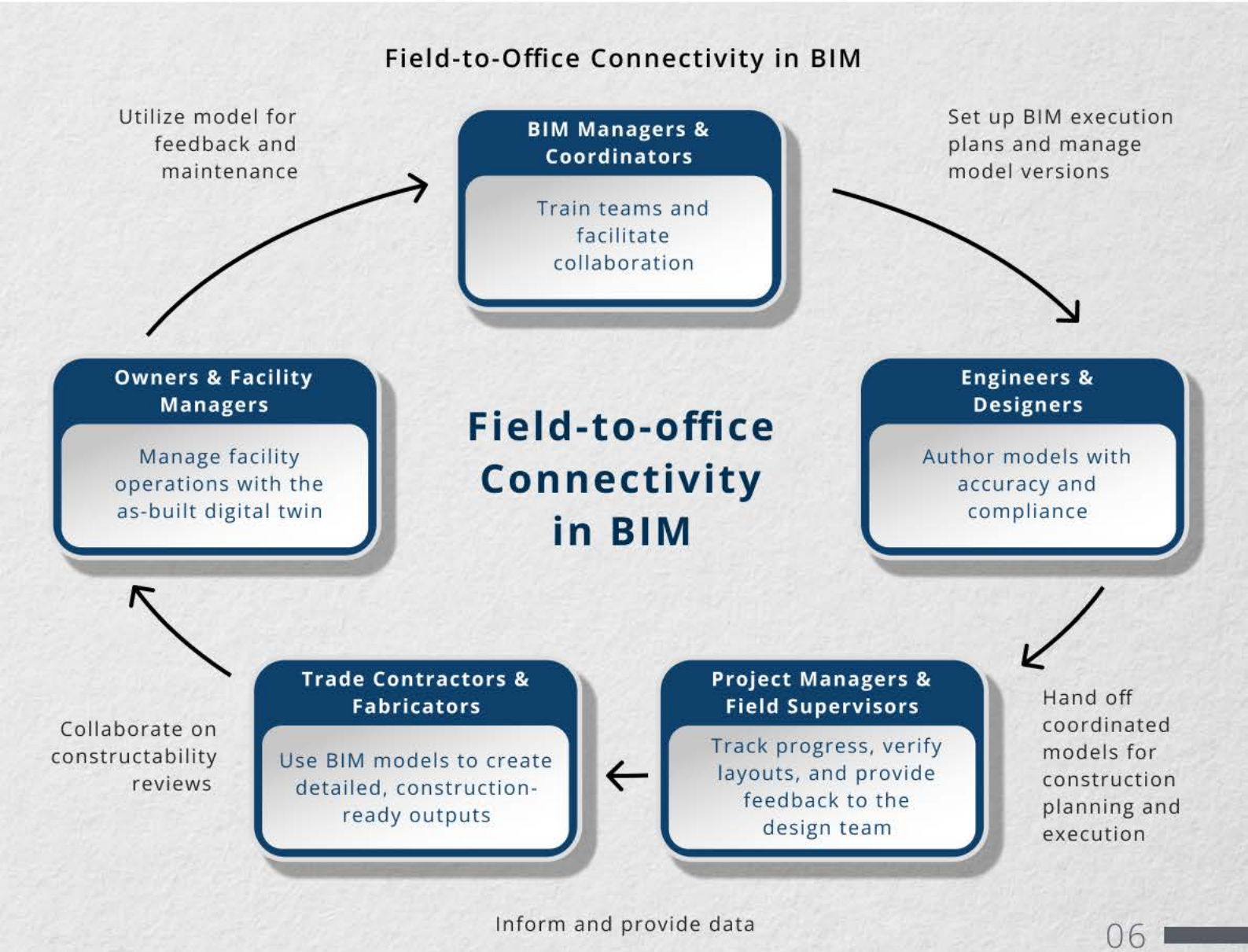
They rely on coordinated models to plan and manage construction activities, resolve issues, and ensure quality on-site. BIM workflows enable them to track progress, verify layout accuracy, and provide timely feedback to the design team, closing the loop between the field and office.

Trade contractors and fabricators

These professionals translate design models into detailed, construction-ready outputs. They generate shop drawings, perform coordination and technical calculations, and ensure that systems meet code and manufacturer requirements. BIM supports this work by enabling accurate modeling, streamlined collaboration, and—where applicable—prefabrication for more efficient installation.

Owners and facility managers

During construction, they use BIM dashboards to monitor progress, commissioning status, and open issues. Post-handover, the as-built model becomes a living digital twin to support operations and maintenance.



5. The value of BIM: what the data says

Cost savings

Inefficiencies in construction contribute 1–3% in annual cost escalation beyond standard inflation. BIM-enabled workflows reduce this by minimising rework, shortening timelines, and improving planning[7].

Productivity gains

Industry-wide, digital transformation initiatives that include BIM have delivered 14–15% improvements in labor productivity[8]. As the construction sector faces ongoing labor shortages, BIM helps teams do more with less—reducing delays and improving output per worker. In fact, 80% of firms using BIM report improved efficiency in resource-constrained environments[9].

Risk mitigation

Poor alignment between design and execution is one of construction's costliest flaws. BIM closes that loop with real-time visibility, automated clash detection, and streamlined communication between the field and office. Updates made by any stakeholder are reflected in the model instantly, helping all teams stay aligned and avoid costly missteps.

BIM ROI: **Up to 476% when rework is prevented**

A structured case study found that BIM-driven design review reduced rework, resulting in a 167.8% return on investment. Including broader benefits—like schedule adherence, quality, and efficiency—the integrated ROI climbed to 476%[10].

6. What it takes to make BIM work

Let's be clear: implementing BIM isn't just a technology change—it's an organisational shift.

Teams must align on workflows, roles, contracts, and data environments. Leaders need to support BIM not just with tools, but with incentives and training. According to McKinsey, the greatest productivity gains occur when BIM is embedded into four areas: design, procurement, execution, and feedback loops[11].

5 keys to effective BIM adoption

1. Start with preconstruction alignment and define goals
2. Invest in cloud-based collaboration tools
3. Develop internal processes and train teams
4. Empower field teams with mobile access
5. Measure what matters—then optimise

7. From theory to practice: case studies

As construction teams around the world adopt BIM, measurable improvements in efficiency, coordination, and quality are becoming more evident. The following case studies highlight how engineering firms are using model-based workflows to deliver complex projects with precision, even under demanding constraints.

Coordinating Complex Systems in Healthcare

Kalt+Halbeisen – Aarau Cantonal Hospital

Kalt+Halbeisen coordinated all building technology for the new Aarau Cantonal Hospital—a technically complex, high-precision healthcare facility. The team transitioned from 2D plans to a fully integrated 3D BIM model, enabling detailed coordination, version control, and efficient collaboration across trades.

By automating calculations, exchanging data via open standards (IFC), and integrating design with execution, the project minimised delays, reduced rework, and upheld the hospital's strict quality requirements. While the case study does not include a direct quote, the project exemplifies the value of BIM in large-scale, multidisciplinary construction.

Enhancing Accuracy and Efficiency in MEP Design

CBG Consultants – Multi-Sector Projects

CBG Consultants adopted Trimble's electrical and mechanical design solutions to unify workflows and improve design fidelity across sectors like healthcare, education, and residential. By using the integrated design and calculation tools with rich manufacturer data, the team reduced manual effort, improved accuracy, and boosted productivity.

Additional tools—like isometric node-solving for mechanical connections—streamlined detailing and eliminated the need to cross-check designs in multiple systems, saving time and reducing errors.

> The packages have made our MEP design work easier and more productive, and the support from the Trimble team has been excellent.
>
> **Adam Grant** | Associate, CBG Consultants

8. Strategic recommendations and next steps

To prepare for what's next, construction firms need to:

- Make BIM the cornerstone of digital transformation
- Aim for 15% productivity and 4–6% cost savings over time
- Build digital infrastructure: CDEs, model coordination tools, field access
- Set up internal processes and training to leverage the power of BIM
- Embed feedback loops that learn from each project to improve the next

This isn't about adopting a tool. It's about changing the way we work—together.

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About Trimble

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For more information about Trimble (SASDAQ:TRMB) visit construction.trimble.com.