



Level Up Your BIM Game with Mixed Reality

How to Extend BIM to the
Field and Defeat the
Enemies of Productivity
and Profitability



BuildingPoint

OHIO VALLEY

www.buildingpointohiovalley.com



Trimble



Introduction

Many construction companies have made sizable investments in building information modeling (BIM) and utilizing [BIM databases](#) for 3D content. Teams that use BIM processes are more likely to benefit from reduced project errors, streamlined communication, increased client satisfaction, and higher-quality projects.

But if you aren't bringing your 3D content out of the computer and into the real world, you're limiting your ability to experience all of the [benefits BIM provides](#).

If you aren't using BIM data in the field, you're missing out on the opportunity to provide project stakeholders with:

- **Enhanced 3D design review**
- **True coordination and collaboration**
- **More effective project planning and management**

Being able to clearly visualize project data in both the office and the field is a win for all project stakeholders. Visualization improves the design review process, enables better coordination and collaboration, and facilitates more effective project planning and management.

Yet, many are downgrading BIM models into 2D documents just before actual construction takes place. In doing so, they're creating a distinct disadvantage.

The problems with not using your BIM models in the field can be hard to identify because they're already familiar, including:

- Budget and schedule overruns
- RFIs, rework, and change orders
- Communication breakdowns
- Poor productivity
- Low profitability

These problems, while not new to construction, work against your productivity and profitability and hurt your ability to gain a competitive advantage.

But you can fight back.

You can defeat the enemies of productivity and profitability—and get a leg up on your competition—with extended reality (XR) technologies like [mixed reality](#).



What is XR?

Extended reality, or XR, is an umbrella term used to describe immersive technologies that can merge the physical and virtual worlds. Current XR technologies include:

- Mixed reality (MR)
- Augmented reality (AR)
- Virtual reality (VR)

To learn more about XR technologies and their applications in construction, [watch the video.](#)



How XR Takes You to the Next Level

If you're using BIM, you're already in the game. But making the investment in BIM is only level one. Now, it's time to use it for maximum advantage. Here are three ways that XR technologies can help you get the most out of your BIM investment—and take your game to the next level.

1. Reduce Rework, RFIs, and Change Orders

Challenge: Rework, RFIs, and change orders are more than just an unavoidable part of construction, they can crush your productivity and profitability.

Gamechanger: By making it easier to visualize and validate the design in a real-world environment, XR can help teams catch potential problems sooner and minimize costly issues later.

When specialty contractors and tradespeople are able to visualize their scope of work and see how it interacts with other systems, they plan and perform their jobs more efficiently and accurately. Using 3D models overlaid onto existing structures and systems, they can perform better and faster clash detection—and you can avoid costly hits to your profit margins.

XR helps you minimize rework, RFIs, and change orders by:

- Helping everyone clearly visualize the desired end result
- Making it easier to plan and validate the work to be performed
- Enabling faster identification and resolution of clashes



Rework is estimated to account for 30% of the work performed on construction projects and 12-15% of total costs.

Read the article to discover how XR can help you reduce rework—and so much more.



2. Optimize Prefabrication

Challenge: Prefabrication is a proven way to improve productivity and realize cost savings. But if you lack confidence in the accuracy of the design, you don't want to risk prefabrication of components only to have them not work.

Gamechanger: XR helps teams easily visualize and verify structural elements and ensure the accuracy of the design, so they can realize the productivity improvements and cost savings of prefabricated components.

When you're able to overlay 3D models in their exact location and position, you can more easily verify structural features and feel confident in the accuracy of the design. You avoid the wasted time and materials that come with incorrect fabrications and other mistakes by identifying design problems before construction occurs. Fabricators can even use 3D data and visualization to follow step-by-step sequencing when fabricating components and assemblies at the shop or worksite.

The use of XR helps you increase prefabrication by making it easier to:

- Visualize and understand the design intent
- Ensure accurate placement of structural elements and critical systems
- Enable sequencing to improve fabrication efficiency and accuracy

Watch the video to see how you can use XR for fabrication sequencing.



90% of construction pros improve productivity, quality, and schedule certainty when using prefabricated and modular methods compared to traditional stick-built construction.”

“The transmission of information between designers and contractors and between contractors and subcontractors provides numerous opportunities for gaps in understanding that lead to disrupted expectations... and/or financial losses.”



3. Communicate & Collaborate Between Field & Office

Challenge: Breakdowns in communication between the office and the field are a silent enemy often felt in the form of increased errors, lowered productivity, and a spike in safety incidents.

Gamechanger: XR helps you bring 3D data to the field and make it shareable across teams to bridge the communication gaps and give workers a clear and comprehensive understanding of the project.

XR helps teams both in the office and on the jobsite share a vision of what the actual design looks like in context and how various systems and structures interact with each other. Teams can work together to identify and solve problems quickly and efficiently when project data and information can be shared bi-directionally between the field and the office. Site meetings become far more effective when crews can visualize the work to be performed. Likewise, crews in the field can safely share site updates and work in progress with the office or with other teams at remote locations, ensuring everyone remains on the same page.

XR helps you communicate and collaborate better by:

- Helping all teams visualize the design consistently
- Enabling easier identification and faster resolution of problems
- Facilitating safe, effective collaboration between office and field



Read the article to discover even more ways XR is closing the construction communication gap.

Advance to the Next Level with XR

In the increasingly competitive construction world, it can feel like you're in a constant battle against the enemies of productivity and profitability. To safeguard your position, you need to launch an effective defense against budget and schedule overruns, costly rework, low productivity, and poor communication.

But you're putting your teams at a distinct disadvantage if you're still converting your BIM data into 2D documents for use in the field. Extended reality technologies like mixed and augmented reality bring 3D content off of the screen and into real life where the battles can be won.

When you extend your BIM process with XR, you experience game-changing benefits and gain the power to:

- Visualize the finished design in context and realistic detail
- Identify clashes before they become costly problems
- Easily share information between office and field
- Increase prefabrication to save time and money
- Improve communication among all project stakeholders

To explore more ways construction companies are using XR to uplevel construction outcomes, read the white paper.

Ready to advance to the next level?

Request a no-obligation demo of Trimble's mixed and augmented reality solutions now.

REQUEST A DEMO NOW



TRANSFORMING THE WAY THE WORLD WORKS



Footnotes

¹ Miri, Mohammad; Khaksefidi, Mahsa. "Cost Management in Construction Projects: Rework and Its Effects," Mediterranean Journal of Social Sciences. December 2015.

² Thomas, Eric; Bowman, Jay; Schott, Peter; Snyder, Jay; Spare, Natalie. 2018 Industry Report: Construction Disconnected. FMI/PlanGrid. August 2018.

³ Prefabrication and Modular Construction 2020. Dodge Data & Analytics.

⁴ Anderson, Julian. "The Risks and Rewards of Collaboration in Construction." Design Intelligence. Feb. 14, 2019.