



Getting started with BIM for civil engineering

A guide to your first project



Piloting your BIM practice

Moving to BIM can seem daunting, but by breaking it down to the scale of a single project, you can familiarize your team with the elements of a successful BIM practice without disrupting current workflows.

This guide is designed to support the planning and deployment of an integrated BIM pilot, while identifying the critical components for a more fully realized BIM practice.

What is BIM?

BIM (Building Information Modeling) is a holistic process for creating and managing information for a built asset. BIM integrates structured, multi-disciplinary data to produce an intelligent 3D digital model of a project across its life cycle.

BIM is used for creating and managing data during the design, construction, and operations process. BIM integrates multi-disciplinary data to create detailed digital representations that are managed in an open cloud platform for real-time collaboration. Using BIM gives you greater visibility, better decision-making, more sustainable options, and cost savings on AEC projects.

The power of BIM is how it allows architects, engineers, and contractors to collaborate on coordinated models, giving everyone better insight into how their work fits into the overall project and ultimately helping them to work more efficiently.

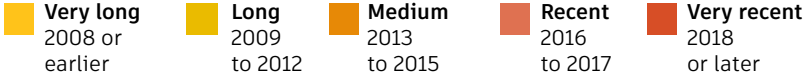
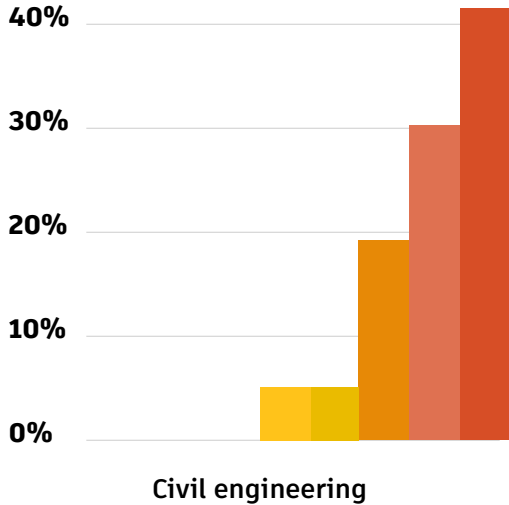


BIM is the new normal

As Civil Engineering firms discover the benefits of BIM, they are integrating it into an ever-growing share of their projects.

BIM adoption curve

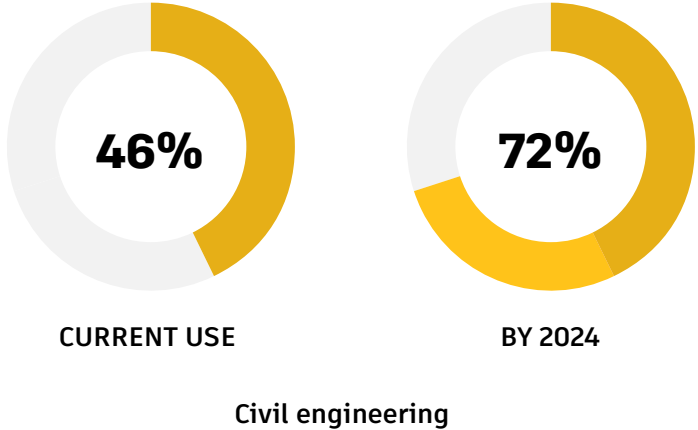
BIM is rapidly becoming standard practice throughout the industry, and engineering firms are embracing BIM at record levels.



BIM implementation levels

BIM-enabled firms are implementing BIM practices in a growing portion of projects.

BIM USAGE ON 50% OR MORE OF PROJECTS



*Source: Report: "Accelerating Digital Transformation Through BIM," Dodge Data and Analytics

BIM is reshaping industry practice worldwide

A recent report from Dodge Data and Analytics showed an industry in transition. Not only is BIM adoption on the rise, but the benefits of BIM use are also changing how firms approach their work.

Accelerating digital transformation through BIM

Take a closer look at BIM adoption trends and forecasts in the regions that matter most to your firm.

Regional focus reports



A framework for implementing a BIM pilot project

Collaboration is at the heart of any BIM practice. So it's no surprise that successful BIM implementation will affect every part of your business.

Simply put, you can't task your IT or R&D team with implementing BIM and expect success. However, these same teams, when backed by the business's leadership team and supported by experts who are knowledgeable on BIM implementation, can initiate BIM adoption with pilot projects, measure their results, and realize benefits that can later be scaled company-wide.

No matter how big your project is, single discipline or multi-discipline, there is a BIM implementation workflow that you can benefit from. The implementation framework presented here is based on an organizational transformation that starts with executive vision and sponsorship and is carried out by an organization's leaders and its project workforce. The framework is based on three essential strategies, each integral to the performance of the others:



BIM vision

When it comes to implementing BIM, success starts with a clear vision from the top.

This vision, articulated by the executive leadership team, should identify your goals for adopting BIM, your anticipated benefits, the principle elements of your transformation, and a description of the stages of your evolution. This statement will work as the organizing narrative for your BIM transformation.

Since BIM is a methodology that will affect many aspects of your business, every BIM implementation plan is unique. The good news is that you won't be starting from scratch. There are a number of excellent published guides to help you create a plan that will work for your firm.



Considerations for creating an effective BIM vision

Be inspirational and aspirational

Your vision must be far-reaching and sufficiently aspirational to unite the various elements of your organization. If you roll out a BIM pilot as a technology implementation exercise, it will not have the momentum needed to sustain progress.

Educate

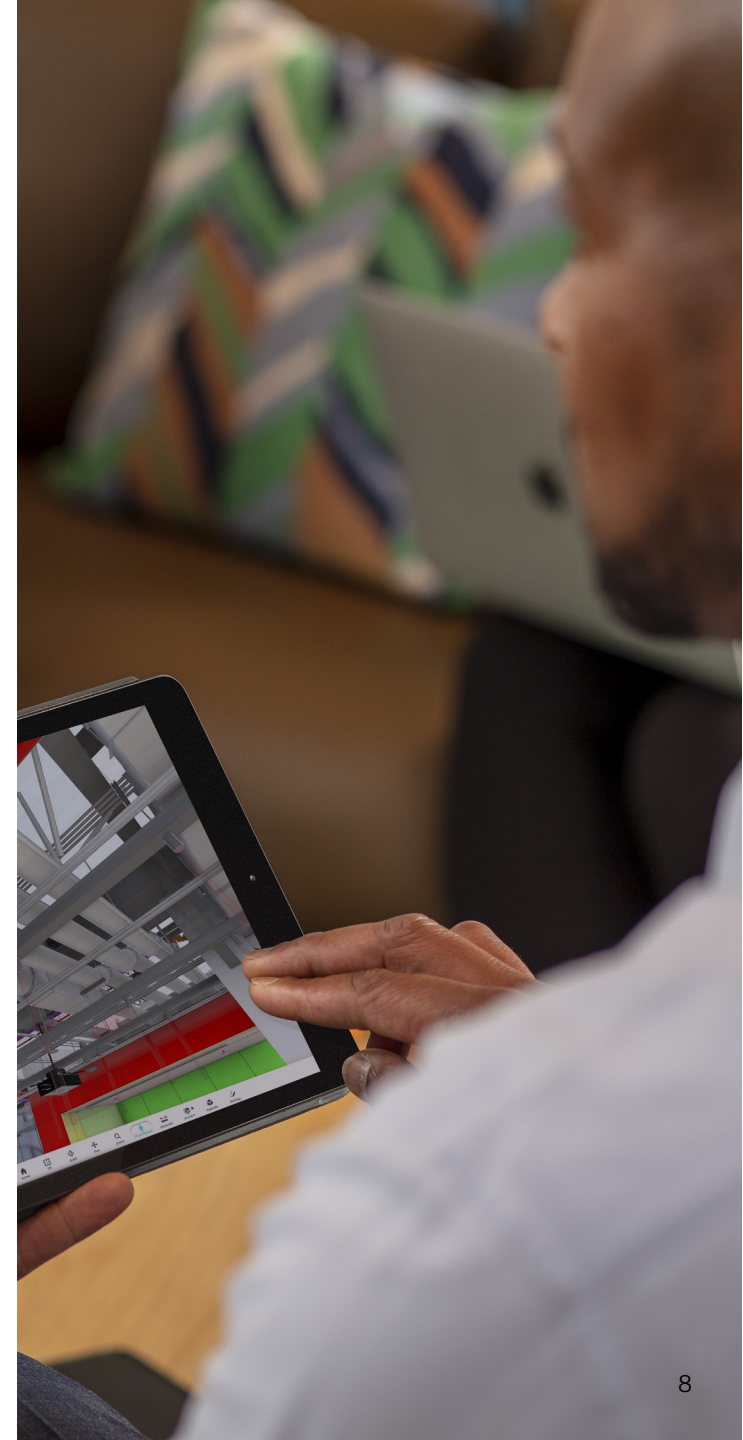
You will need to get executive leadership educated on BIM and consider its impact in setting corporate strategies. A good way to begin is to establish a relationship with a trusted advisor who has had success with BIM pilot implementation.

Define the five Ws

The who, what, where, when, and why will give each part of the organization the factual details of the BIM vision it needs. Some of the questions will be complex to answer and may require executive leadership to take risks.

Set milestone accomplishments

Staggering starts and creating milestones will help the organization overcome what might feel like a monumental task. Meeting those milestones also helps to create short-term “wins” that can generate energy and drive the momentum of the effort toward the vision end-state.



Driven BIM leadership

The BIM leadership team must ensure that the BIM vision is translated into actionable tactics to produce the desired outcomes and performance in line with an organization's strategic objectives.

Managing lasting, sustainable change in any organization can be difficult and requires creative strategies tailored to your organization's culture and particularities. Here are some tactics for:

Managing change associated with BIM implementation initiative



1. Bridging the gap

Action Executives and BIM leadership must take action that's accompanied with bottom-up approaches, such as assessments, education, and change validation through monitoring of milestones.

2. High-profile communication

A high-profile communication plan demonstrates to all stakeholders the organization's commitment to BIM, brings energy into the transformation, and bridges the gap from executive theorizing to a daily reality.

3. Training and education

Adoption of BIM technology requires new skill sets and new ways of working. Proper investment in training ensures you have the right people on the right project.

4. Contracts and legal considerations

BIM tools and their associated processes can impact the contractual relationship between owners and their delivery partners. BIM-enabled collaboration is a significant change to traditional processes, which should be addressed up-front with project stakeholders.

5. Compliance, auditing, and quality control

Project reviews permit BIM leadership teams to evaluate lead measures and the effectiveness of BIM technology, standards, and processes in a pilot project. BIM leadership can catch errors, improve standards and processes, and replicate best practices.

6. Measuring BIM maturity

BIM leadership will determine key indicators to measure the organization's progress toward the goals and milestones laid out in the vision. One useful set of measures for BIM can be BIM maturity, which measures an organization's capability to perform BIM within the organization and on projects.

Getting started with your BIM pilot project

With the groundwork done, it's time to pick a pilot project, like completing a fictitious project or competition, re-doing a recent project as a comparison, or starting a new live project for a client. All options are valid and will depend on the acceptable level of risk and manpower available to undertake your current work.

You should include measurement at all key stages of your pilot to really understand how BIM has improved the design and/or construction process. You should also document the positive benefits to each stakeholder in the process to calculate any return on investment.

Firms find that the more BIM projects they complete—and the faster and better they complete them—the higher return they get. Just like moving from drawing boards to 2D CAD, moving to BIM may initially lead to some drop in productivity while the system is mastered. To assist with this, the initial pilot project team should not work on traditional 2D CAD projects and BIM projects simultaneously, as it could be counterproductive to learning the new system.

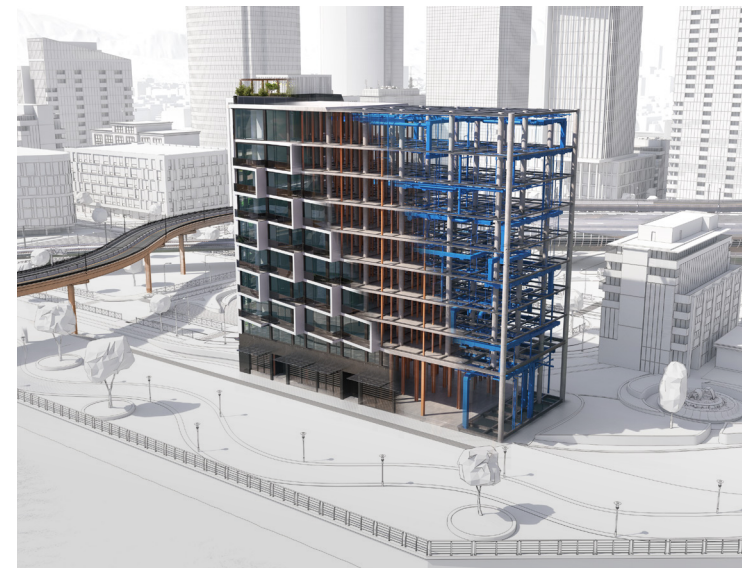
Getting started with your BIM pilot project, cont'd

If a live project is an option, ideally you will select a client who embraces new technology and has an understanding of the by-products and downstream benefits of BIM, such as facilities management and a clearer understanding of the original design intent.

Resistance to change is only human, but so is our ongoing need to make advances in the way we work. Moving to BIM requires the positive support of management and key staff, setting expectations at the start of the process, formulating a roadmap, and ensuring the appropriate level of training for employees.

By starting small, building confidence, and increasing core capabilities and experience, the transition to BIM will accelerate with each new project.

Learn more about BIM workflows for your industry.





Autodesk and the Autodesk logo are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product offerings, specifications, and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document. ©2022 Autodesk, Inc. All rights reserved.