THINK BEYOND TODAY

HOW TO MAKE THE STRATEGIC SHIFT IN THE WAY YOU COMPETE TO WIN AND MANAGE PROJECTS WITH BIM FOR INFRASTRUCTURE
The civil engineering community is increasingly experiencing an industry-wide move to what is referred to by many as civil integrated management (CIM) or, more commonly, building information modeling (BIM).

Many professionals who work on civil infrastructure projects have come to realize that the time to change is here, with advancing technologies offering new opportunities that did not exist in years past. However, it is widely understood that the use of BIM technologies – while essential – is only one component of adopting BIM. A number of other factors, such as people, mindset, and proactive relationship building, also drive a deeper transformation of project delivery. Those factors, in turn, help build a competitive advantage.

BIM itself is not a technology, it is an information-rich, model-centric business process with the power to transform project delivery and add value across the full lifecycle of the infrastructure assets – plan, design, build and manage. Putting BIM processes in place can help you modernize outdated work methods, which can help make you more competitive. BIM implementation, no matter how far along you are, becomes a key component of your business strategy.

By adopting new ways of working strategically, a business that embraced BIM more recently can actually get ahead of firms that have used modeling technology for years but have failed to follow a comprehensive modernization strategy.

An effective strategy helps you:
› Navigate shifts in industry structure and the competitive landscape successfully
› Outperform rivals through more adept project coordination and schedule flexibility
› Spawn business opportunities, such as new service offerings

Think of this document as a guide to each of the factors that contributes to an effective BIM strategy for organizations that manage civil infrastructure projects.
BIM is a process to plan, design, construct, and manage infrastructure that involves creating and using intelligent 3D models. The process begins at the earliest stages of a project with planning. It continues through conceptual design, detailed design, fabrication and construction planning, and construction. The value of this process doesn’t end when design and construction are complete; instead, value is extended through the entire useful life of the asset – all the way to decommissioning.

The data that contributes to the project also drives the process: existing conditions information, design specifications, material details, and more. Project participants use the integrated model as a basis for coordination, reducing the risk of clashes.

Owners visualize the project as it will be, which helps them make better decisions earlier. The construction team sequences their work in a model that links time to the 3D model.

The intelligent models that drive the process help improve communication and quality. Throughout the project, proactive collaboration across the team helps to predict and reduce issues, accelerate the schedule, and identify opportunities to decrease costs.

To successfully implement these new processes, teams have to work a differently than in the past. Plan to collaborate to a greater extent, even in the earliest stages of the project. The process thrives with frequent data sharing because the entire team has more insight into the project as a whole. This insight helps prevent interferences and uncovers opportunities to reduce costs in ways that would be virtually impossible on projects where only CAD-based workflows were used.
To realize the full benefits of a BIM process, you need to embrace change across the organization, and that includes fostering buy-in and training.

Also, you need to define standards and workflows, including how you plan to manage project data. And you need to consider your project execution, including information capture and exchange. To learn more about what other companies have done, read this article: *The Unpaved Road to Better-Faster-Cheaper Civil-Engineering Project Management through BIM.*
Technology is what enables the transformative potential of BIM for the construction industry. Technology enables the creation and use of intelligent 3D models and also connects all project parties and stakeholders. Allowing collaboration and the free-flow of data about what is being designed and how it will be constructed in ways the construction industry has never seen before.

But BIM is more than technology, and it’s certainly not any one specific technology. Think of the software applications that help advance the process as tools. There are BIM tools that support planning and conceptual design, detailed design, collaboration, construction planning and management, and facilities management. These tools extract information and also add to and update the models that drive the process.

What makes BIM technology distinctive? You may think that 3D modeling is the single thing that BIM technology brings to civil infrastructure projects; however, the intelligent data associated with the model is just as important. Technology and functionality that let you work with a 3D image of your project may be visually engaging, but if there is no way to add intelligence to the 3D image, you’re missing out on the benefits of working with model elements that help guide the standards that should be followed.

Objects in an intelligent model ‘know’ how to interact with other objects. Built-in intelligence also lets you easily track materials and quantities.

Many firms use the time they save with BIM to explore more design options. This can then help improve overall project quality. The timesaving you are likely to experience when your team masters BIM tools can drive a number of competitive benefits. For instance, you’ll be better prepared to participate in-and bid on-projects with aggressive schedules. Your ability to explore design alternatives in greater detail can help you with projects where you have demanding clients and complex parameters.
RAILWAY LINE EXPANSION

Shatin to Central Link (SCL) is a 17 km-long railway line expansion undertaken by MTR in Kowloon and Hong Kong Island. Key sections of the line expansion are located in one of the busiest and most built-up commercial areas in the territory, and the project involves the construction of 1.8 km twin railway tunnels and a new underground station, as well as ventilation buildings and shafts.

To design the line expansion and manage project information, the project team adopted a model-based approach. The design team is able to exchange information quickly and reliably with third parties and internally among different design disciplines for design review and analysis, construction planning and simulation, and overall project visualization. This model-based approach is enabling a more transparent workflow, smoother project collaboration, and informed decision making.

Learn more
MINDSET

THINK DIFFERENTLY AND MAXIMIZE OPPORTUNITIES

AFTER COMPLETING A FEW PROJECTS USING BIM, YOU MAY START TO NOTICE THAT YOUR TEAM HAS STARTED TO THINK ABOUT – AND DISCUSS – PROJECTS DIFFERENTLY.

You’ll find that the team begins to look for opportunities to take advantage of newfound abilities to:
› Capture and analyze design concepts easily
› Understand the performance, appearance, and cost of alternatives
› Collaborate and communicate more effectively across the organization

This is a sign of a new mindset. It inspires questions like:
› How can we proactively market BIM as a service?
› How can we support our BIM champions?
› How can we improve the way we collaborate with BIM?
› How can we use BIM to help clients make better decisions more quickly?

The BIM mindset will help you get ahead faster – and win more work in competitive situations. You can foster this way of thinking by communicating that your organization’s leaders have an unwavering commitment to BIM, and by sharing the importance of modernization to your business strategy.
COWI uses a 3D model of existing geographical conditions to plan and visualize a major new highway E16 in Norway. They take advantage of its BIM process when pursuing work.

COWI project director Frode Geir Bjoervik says: “With minimum effort, we create persuasive proposals when bidding on projects. … Prospective clients can see our ideas and how we will present them. It’s helping us win bids.”
KEEP YOUR TALENT EXCITED AND ENGAGED

BIM HELPS CREATE STRATEGIC OPPORTUNITIES FOR YOUR BUSINESS, AND NOWHERE IS THAT TRUER THAN WITH PEOPLE, TALENT MANAGEMENT AND SKILLSETS.

As your team moves to BIM, their overall ability to deliver projects with the integrative approach clients prefer increases. It also builds opportunities for team members to advance into BIM leadership positions.

Just as crucially, you’ll be better positioned to recruit, develop and retain talented people who understand that innovation is the best way to deliver projects today – and who know that modern technology and processes are certain to play a role in the future of project delivery. Some people on your team might resist the shift to BIM. That’s a concern that holds some organizations back from making an unwavering commitment to modernization. But others on your team will emerge as BIM leaders and champions. With your support, they will help guide the rest of the team on the learning paths that lead to success.

Introducing these potential champions to BIM also can help you to retain them; these team members want the excitement of working in closer collaboration using modern technology. Managing talent helps to create a highly responsive, high-performance, sustainable organization that meets its business targets.
BIM is greater than just training, it is a human resources issue – from BIM education to redefining roles.

Learn from those who are establishing BIM transformation best practices.
OPPORTUNITIES

OPEN THE DOOR TO NEW SERVICE OFFERINGS

AFTER YOUR COMPANY COMPLETES ITS FIRST PROJECT WITH BIM, YOU’LL SEE OPPORTUNITIES TO EXPAND YOUR RANGE OF SERVICE OFFERINGS.

Perhaps you now outsource some niche functions that could be completed readily with BIM capabilities and technologies. Or it may be that your clients have asked if you deliver specialty services that BIM enables. And you may decide that your clients would benefit from a richer project model that your team can help maintain over the life of the asset.

Make seizing opportunities to expand the range of services you offer part of your BIM implementation plan.

The sooner you spot an opportunity and train your team to take advantage of it, the sooner you may be likely to see the increased revenue and competitive boost.
CASE STUDY
FULLY AUTOMATED TRANSIT RAIL SYSTEM

Expected to open in 2019, the North West Rail Link will be the first fully automated transit rail system in Australia. SMEC, a professional services firm focused on major infrastructure, is leading the design effort on key portions of the AU$ 8.3 billion project.

Neil Evans, SMEC’s director of strategy and new business, explains why the firm chose a BIM process for the project: “The client wanted to realize the time, cost, and quality benefits you see with a model-based process. SMEC was already on the path to BIM. We see BIM helping us to streamline our workflows and improve efficiency. The North West Rail Link project inspired us to accelerate the pace of our BIM adoption – and BIM is proving to be an invaluable asset on the project.”
CULTIVATE CLOSER TIES WITH CLIENTS

TODAY, BIM DELIVERS SO MANY BENEFITS: AGILE COORDINATION AND PLANNING, REDUCED COSTS AND TIMESAVING, ENHANCED COLLABORATION, AND MORE. YOUR CLIENTS WILL BE EXCITED THAT YOU CAN HELP THEM REALIZE EACH ONE.

But the visualization advantage of BIM is what attracted some of the most enthusiastic praise from practitioners in its early stages. Suddenly, clients who had difficulty interpreting results displayed in 2D design documents could easily and fully understand design intent. The clients appreciated this communication breakthrough, and early adopters of BIM capitalized on it to build better client relationships.

BIM still offers a visualization advantage that can help you strengthen client relationships. That’s especially true on infrastructure projects likely to attract public attention. You’ll be able to help your clients dispel any mystery about what their projects will look like with realistic visualizations and animations.

Defining your BIM strategy can help build closer relationships with your clients. Plan to highlight each of the benefits of BIM in your marketing materials. Also, be sure to demonstrate your ability to use project models to deliver real-time information during reviews and to enhance the lifecycle assets.

WHAT’S THE NEXT STEP IN YOUR BIM STRATEGY?

Whether you’re just beginning your move or you’re well on your way, keep the importance of BIM as a business strategy top of mind. You’ll find a path to competitive advantage in virtually every aspect of BIM. The keys to realizing these advantages are proactively identifying them and planning to maximize them.
In 2011, the Great East Japan Earthquake generated a tsunami that caused catastrophic destruction in the Iwate Prefecture of Japan. The Japanese government initiated a project to rebuild the areas that were swept away by the tsunami on higher ground.

Obayashi, the construction firm leading the project, made proactive- and clear-communication with local residents a priority. The project team relied on intelligent models to help them explain the project to residents. By using 3D models to help communicate, the team reduced the amount of time required to reach consensus and conducted discussions at greater depth. Residents appreciated the clarity offered by the 3D models, and the improved communication helped to win their understanding and support for the project. Watch the video to learn more.