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Out with the old: Why embracing new ideas can transform construction's poor delivery habits



Bruce Grewcock

Chairman and CEO,
Kiewit Corporation

Construction lags behind other industries in its ability to manage complex projects, but two new approaches will help close the gap.

Cost overruns and schedule delays are inherent risks in large-scale projects across industries, but construction is particularly susceptible to these issues. A 2017 McKinsey Global Institute [report on construction productivity](#) found that nine out of ten infrastructure megaprojects face cost overruns that add, on average, 70 percent to the original budget. The research also indicated the industry does a poor job of completing projects on time, with 61 percent exceeding the original schedule.

The reasons behind these problems are as complicated as the types of projects being constructed today. Certainly, contractors are being asked to build highly complex projects, work in increasingly difficult environments, and operate with much higher levels of public scrutiny. However, old habits die hard, and the construction industry remains slow to embrace new ideas that might help it break out of this recurring problem—particularly when it comes to managing risk.

Owners and their legal advisers often focus on transferring project risk rather than identifying the most suitable party to carry specific elements of that risk, mitigating the risk or eliminating it altogether. Add to this the fact that we are now seeing the use of stricter contracts that push more and more risk onto builders. This practice can result in too little effort being put into identifying risks up front in the design phase, where, of course, many scheduling and budget problems can originate.

But construction's problems are not entirely at the feet of clients. Across the contracting community, stakeholders are still reluctant to embrace new ideas. Yet the reality is that in today's complex world of project delivery, the old-school contracting systems and approaches no longer work—and they haven't for some time. Two approaches—new contract models and technologies that support better decision making—can enable owners and contractors to make better decisions, reduce risk, and ultimately work more efficiently.

A new breed of collaboration contracts

A magnitude of problems can arise in complex infrastructure projects that follow a design-bid-build approach. Take Boston's Big Dig—one of the most public megaprojects that went sideways, taking a decade longer than expected to build as its budget ballooned from \$2.6 billion to a jaw-dropping \$14.8 billion (not including interest). Many factors, such as inflation and environmental review processes, contributed to the cost overruns and schedule delays, but one could argue that a project of such stature and complexity would have benefited from the greater involvement of contractors throughout the process—and particularly during the design phase.

To address this issue, a new breed of collaborative contracts such as the Construction Manager/General Contractor (CM/GC) structure—which shares many of the same characteristics and is often used interchangeably with the Construction Manager at Risk (CMAR) model—seeks to assess and deal with risk at the outset. Unlike a traditional design-bid-build contract, these models actively manage risk by engaging the contractor during the design phase to help spot problems before they happen, increasing the likelihood of bringing projects in on time and on budget.

Many construction projects are enjoying success with these models. At Kiewit, we have successfully delivered hundreds of projects over the past decade using these more flexible contract models when working across the transportation, building, and water and wastewater markets. Even with that documented success, clients are often unaware of or slow to embrace more flexible models with which they have no experience.

One example of success is the recent Fast Fix 8 bridge rehabilitation project in Nashville, Tennessee. Kiewit worked closely with the client and designer from the beginning to demolish and replace eight bridges within a series of 58-hour weekend windows. This early engagement led to the development of innovative solutions such as short-term road closures and round-the-clock work crews that ultimately brought the project in seven months ahead of schedule. Similarly, in Minnesota, use of the CM/GC model and early engagement of the contractor in the Highway 53 Relocation project, currently underway, has enabled the project team to reduce risk-related costs from \$40 million to \$6 million by the time the design was 90 percent complete. Identifying and anticipating risks prior to construction prevents unexpected cost increases which can blindside the client.

In the energy markets, the use of an Early Contractor Involvement (ECI) collaboration model featuring a pre-FEED and FEED (front-end engineering design) phase has achieved similar successes. In short, regardless of the sector, the earlier contractors are engaged, the better a project's risk profile for clients and everyone involved.

Technology and tools

The use of modern contract models is just one element in the journey toward greater risk awareness. Another solution to address cost and schedule overruns is literally at our fingertips: new technology and tools that track and organize data, enabling parties to make better business decisions, resulting in a positive impact on cost and schedule. For example, nearly a decade ago Kiewit recognized that the traditional way of running our business was not an option. We needed more connected, innovative technologies to support risk management and decision making—so we built them, investing heavily in the development and implementation of a new technology platform that would impact every aspect of our business.

Today, we're assigning new roles and deploying tools that measure data from estimating, scheduling, cost control, planning, safety, environmental, equipment management,

procurement, document control, and so much more. These fully integrated tools have helped us win bids, eliminate project losses, and make more data-driven decisions throughout the lifecycle of projects across our markets. Through greater visibility, our stakeholders, engineers, and project managers are empowered to manage risk more effectively, monitor progress, and communicate project success in real time.

The power of this technology can be seen, for example, at the Paradise Combined Cycle project in Kentucky, where we're integrating real-time data from six different mobile and web-based applications to assess progress from the estimating stage forward. By analyzing future resource requirements, we can make more informed decisions about work sequencing and scheduling.

We've seen the impact that these tools can have across our business and consequently on the industry as a whole. Our InEight business is helping to bring this suite of technology to market for the benefit of the wider industry—from our clients to joint-venture partners. With effective technology solutions, the entire industry can win through increased innovation, speed and accuracy.



To navigate risk and the root causes of cost and schedule overruns, owners, engineers, and builders have to evolve with the times. Modern solutions such as flexible, collaborative contract models and innovative technology are paving the way to overcome these common challenges.

The industry must embrace these new ideas. When we resist change, we overlook solutions and set our companies—our industry—up for failure. And that's a risk I'm sure none of us wants to take. 

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