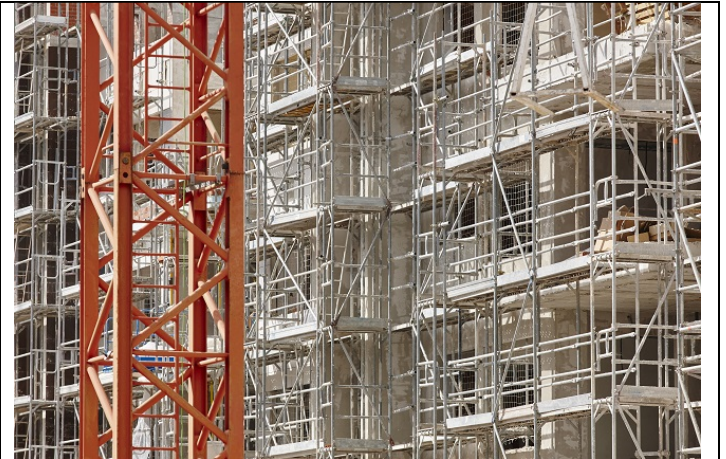


# Why Mega Construction Projects Fail – and Keys to Solutions

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*I know of cases involving consultants who advised losing bidders on major high-profile infrastructure projects. In a number of cases they were gob-smacked by the size of the bid tendered by the winner and not surprised when the winning tenderer subsequently experienced financial problems.*

*- Allan Davies, Principal, Pollard Davies Consulting*

***Too often the public hears about projects that go over budget and over schedule. But that's not what happens on every project. What can we learn from the projects that succeed?***

As part of the University of Ottawa Heart Institute revitalization project, Larry St. Pierre, owner of Federal Electric Ltd., was proud that his electrical contracting

services were delivered on time and on budget.

St. Pierre noted that one of the keys to success was partnering with IBEW 586 electricians, which Federal Electric Ltd. does as a member of [the Electrical Contractors Association of Ontario](#).

"I know they'll do it safely, and do it right the first time," says St. Pierre, [who has been working with the IBEW for over 37 years](#).

But it's more common to hear about delays and cost overruns on large projects.

No company or public official wants to be blamed for projects that exceed their budgets or schedules. Taxpayers, rightly concerned about how their money is spent, certainly react to news like this with wrath.

The sad truth is construction project failures happen on a very regular basis all around the world. It's the subject of research by academics and is commented on in major project management journals. In 2014, for example, a study by Bent Flyvbjerg from the Said Business School at Oxford University found that **nine out of ten megaprojects** (budgeted at \$1 billion or more) go over budget.<sup>1</sup> [The Lean Construction Institute](#) estimates that 70% of all construction projects are late or over budget.

## What's Going Wrong?

Mega projects are complex, and there can be many reasons for failure. Energy-related projects, for example, can face problems like [public opposition to siting, to the project itself, or the side effects of climate change](#).

But when it comes to factors that are more controllable by project owners and managers, a number of key themes emerge from the research.

*Governments, too, deserve to take much of the criticism for creating a model that enabled the group with the most optimistic forecasts to win the project bids.*

*– Matt O'Sullivan, the Age*

## 1. Optimistic Predictions (Unintentional – or Otherwise)

We all know that hindsight is 20/20, but project management is not a new discipline. Fact checking assumptions and numbers should be essential, and there are a number of techniques that can be used to flesh out the full project scope in the face of the usual types of unknowns. But these processes are not always followed, even on megaprojects.

Henrik Lando of Copenhagen Business School, for example, cites public sector projects that are started before the design has been completed as a major trouble signal.<sup>2</sup>

Optimistic – or completely invented – data can also be an issue.

Consultants for the Clem Jones (AKA Clem7) toll tunnel in Brisbane, Australia, made traffic predictions that proved to be 60% – 75% over the numbers needed to provide financial compensation for the project to investors in the public-private partnership. [Allan Davies, of Pollard Davies Consulting, points out that traffic predictions were actually much higher](#) than those for New York City's Midtown Tunnel, even though NYC has four times Brisbane's population.

So what happened? **It turned out the numbers were a workback from the amount promised to investors.** "Put simply, the traffic forecasts here were made to fit the financial models," [says Matt O'Sullivan in this article](#).

## 2. Lack of Consequences for Contractors Who Don't Meet Commitments – or Who Intentionally Underbid

The consultants from the Clem7 disaster were paid hefty bonuses totalling about \$50 million AUD. Effectively, they were rewarded for underbidding twice: once when they won the project, and a second time when they were paid the bonuses.

The problem is not unique to toll roads or public-private partnerships – intentional underbidding is used to secure contracts around the world in most delivery models.

In his article, Alan Davies says, "I know of cases involving consultants who advised losing bidders on major high-profile infrastructure projects. In a number of cases they were gob-smacked by the size of the bid tendered by the winner and not surprised when the winning tenderer subsequently experienced financial problems."<sup>3</sup>

[The authors of this article note](#) that the Flyvbjerg report mentions this as well. "Flyvbjerg argues that project managers competing for funding massage the data until they come under the limit of what is deemed affordable; stating the real cost, he writes, would make a project unpalatable. From the outset, such projects are on a fast track to failure."

Matt O'Sullivan, commenting on Clem7, said "governments, too, deserve to take much of the criticism for creating a model that enabled the group with the most optimistic forecasts to win the project bids."<sup>4</sup>

## 3. Engaging in the "Break-Fix" Model of Project Management

The "break-fix model" (a term coined by Dr. Patrick O'Connell) refers to what Flyvbjerg describes as the main delivery method for megaprojects.

Flyvbjerg says, "...Megaproject planners and managers – and their organizations – do not know how to deliver successful megaprojects, or do not have the incentives to do so, and therefore such projects tend to "break" sooner or later, for instance when reality catches up with optimistic, or manipulated, estimates of schedule, costs, or benefits; and delays, cost overruns, etc. follow.

Projects are then often paused and reorganized – sometimes also refinanced – in an attempt to “fix” problems and deliver some version of the initially planned project with a semblance of success.”

The process of bid shopping, or aggressively searching for contractors who will undercut other contractors quotes, is a smaller version of the break-fix model. Because a blind eye is turned to how the contractor achieves the lower price, [the door is left open for substandard materials, methods, and results](#). When repairs to substandard work are required, costs are often increased due to the need for a second round of excavation, demolition, and/or reconstruction afterwards. This doesn't include additional risks to worker and public safety caused by the substandard work.

*As a result, everyone was more effective and efficient and we were able to meet the schedule with fewer challenges.*

*– Johannes Ziebarth, Ziebarth Electrical Contractors Ltd.*

## Learning from Successes as Well as Failures

From the many case studies done on megaproject failures, experts have identified a host of deficiencies including:

- The need for fully scoped projects with clear requirements and contracts that pinpoint responsibility.
- The need for a full risk identification process.
- The need for contractors to assume responsibility for risk factors under their control.

Thankfully, new tools and processes have started to emerge in the past couple of years.

When it comes to megaprojects, for example, [the UK has had a decade-long string of successes with a host of lessons to convey](#). According to Professor Andrew Davies of University College London's Bartlett Faculty of the Built Environment, the key is the emergence of a flexible megaproject delivery model, a process proven with the construction of Heathrow Terminal 5, completed in 2008.

“Over the past decade or so, the UK has transformed the way megaprojects are delivered, moving away from a world of fixed-price contracts, risk transfer, lowest-cost tendering and adversarial relationships,” [he says in this article](#).

## Using New Technology and Processes to Eliminate Unknowns

Taking advantage of software systems like building information modelling (BIM) can dramatically reduce project unknowns.

Johannes Ziebarth, President and CEO of Ziebarth Electrical Contractors Ltd., is an ECA of Ottawa member. His company [wired Ottawa's new Science and Technology Museum](#).

“All of the skilled trades were involved in the planning and everything we needed to install was 3D modelled,” says Ziebarth. “That allowed us to alleviate many of the issues that can cause conflict and change orders on a job. As a result, everyone was more effective and efficient and we were able to meet the schedule with fewer challenges.”

Using lean construction management processes also played a key role, as did working with highly-trained IBEW electricians.

## Saving Money by Spending Wisely

Megaprojects costing billions and even trillions of dollars each are a fact of modern life. So are the positive optics of cost cutting for procurement teams, politicians and the public.

Clearly however, chasing the lowest cost without understanding the implications for project schedules and risk management often leads to greater spending in the long run.

<https://www.poweringcommunities.ca/stories/why-mega-projects-fail-construction-solutions/>

Or, in common sense terms, it's better to just do it right the first time.

### **References**

1. *The Flyvbjerg study, "What you should know about megaprojects and why: An overview" was published in Project Management Journal Vol 45 #2, in 2014*
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### **Photos**

- *Both photos are stock photography. No reference to specific projects is intended.*