



Design by Deception

THE POLITICS OF MEGAPROJECT APPROVAL, *by* BENT FLYVBERG

Some years ago, I was threatened by a high-ranking government official as I was beginning research on cost overruns in large construction projects. He told me in no uncertain terms that if I came up with results that reflected badly on his government and its projects, he would personally make sure my research funds dried up. I told him that he had just demonstrated that the research must be done and was likely to produce interesting results. The results are now being published and if the official walks his talk, I am not likely to receive another research grant from his government.

THE MACHIAVELLIAN FORMULA FOR PROJECT APPROVAL

Which large projects get built? My research associates and I found it isn't necessarily the best ones, but instead those for which proponents best succeed in designing—deliberately or not—a fantasy world of underestimated costs, overestimated revenues, overvalued local development effects, and underestimated environmental impacts. Project approval in most cases depended on these factors.

Our survey, the first and largest of its kind, looked at 300 projects in twenty countries.¹ Working from his observation that “Princes who have achieved great things have been those . . . who have known how to trick men with their cunning, and who, in the end, have overcome those abiding by honest

principles,” Machiavelli seems to have been chief architect on these projects.² Many project proponents don't hesitate to use this approach, even if it means misleading lawmakers, the public, and the media about the true costs and benefits of projects. The result is an inverted Darwinism—an unhealthy “survival of the unfittest”—for large public works and other construction projects.

During project implementation, when fact overcomes fiction, the consequences are huge cost overruns, delays, missing revenues, crippling debt, and, to add insult to injury, often also negative environmental and social impacts. The misplaced investments, overspending, and financial problems are of Enron- and WorldCom-scandal magnitude, though much less transparent and harder to fix.

COST OVERRUNS, BENEFIT SHORTFALLS

The recent \$4 billion cost overrun for the Pentagon spy satellite program and the over \$5 billion overrun on the International Space Station are typical of defense and aerospace projects. But the problem is not limited to those programs. Examples from transport, the main focus of our study, include Boston's Big Dig, otherwise known as the Central Artery/Tunnel Project, which went 275% or \$11 billion over budget in constant dollars.³ Actual costs for Denver's \$5 billion

International Airport were close to 200% higher than estimated costs. The overrun on the new span of the San Francisco-Oakland Bay Bridge is currently \$2.5 billion, or more than 100% over budget. The Los Angeles subway and many other urban rail projects worldwide have had similar overruns. The Chunnel between the U.K. and France came in 80% over budget for construction and 140% over for financing. At the initial public offering, Eurotunnel, the private owner of the tunnel, lured investors by telling them that 10% "would be a reasonable allowance for the possible impact of unforeseen circumstances on construction costs."⁴ Anybody familiar with the risks involved in projects of this kind would have known this to be deceptive underestimation aimed at selling shares in the tunnel.

Our studies show that transportation projects, public buildings, power plants, dams, water projects, sports stadiums, oil and gas extraction projects, information technology systems, aerospace projects, and weapons systems follow a general pattern of cost underestimation and overrun.⁵ Many such projects end up financial disasters. Unfortunately, the consequences are not always only financial, as is illustrated by the NASA space shuttle. Here, the cooking of budgets to make this under-performing project look good on paper has been linked with shortchanged safety upgrades related to the deaths of seven astronauts aboard the Columbia shuttle in 2003.

As for benefit shortfalls, consider Bangkok's US\$2 billion Skytrain, a two-track elevated urban rail system that looks like a prop from *Blade Runner* and is designed to service some of the most densely populated areas from the air. The first time you try to ride the train, you may wonder why the cars stop far down the track from you. The explanation is that the system is greatly oversized, with station platforms too long for its shortened trains. Many trains and cars sit in the garage. Why? Because actual traffic turned out to be less than half that forecast.⁶ Every effort has been made to market and promote the train, but the project company has ended up in financial trouble. Even though urban rail is probably a good idea for a dense, congested, and air-polluted city like Bangkok, overinvesting in idle capacity is hardly the best way to use resources, especially in a developing nation in which capital for investment is particularly scarce. Such benefit shortfalls are common and have also haunted the Channel tunnel, the Los Angeles subway, and Denver's International Airport.

The list of projects designed with cost overruns and/or benefit shortfalls seems endless. In North America: the F/A-22 fighter aircraft; FBI's Trilogy information system; Ontario's Pickering nuclear plant; subways in numerous cities, including Miami and Mexico City; convention centers in Houston, Los Angeles, and other cities; the Animas-La Plata water project; the Sacramento regional sewer system renewal; the Quebec Olympic stadium; Toronto's Sky Dome;

the Washington Public Power Supply System; and the Iraq reconstruction effort. In Europe: the Eurofighter military jet, the new British Library, the Millennium Dome, the Nimrod maritime patrol plane, the U.K. West Coast rail upgrade and the related Railtrack fiscal collapse, the Astute attack submarine, the Humber Bridge, the Tyne metro system, the Scottish parliament building, the French Paris Nord TGV, the Berlin-Hamburg maglev train, Hanover's Expo 2000, Russia's Sakhalin-1 oil and gas project, Norway's Gardermø airport, the Øresund Bridge between Sweden and Denmark, the Great Belt rail tunnel linking Scandinavia with continental Europe, and the Copenhagen Metro. In Australasia: Sydney's Olympic stadiums, Japan's Joetsu Shinkansen high-speed rail line, India's Sardar Sarovar dams, the Surat-Manor tollway project, Calcutta's metro, and Malaysia's Pergau dam.⁷ I could go on.

Job creation and other local economic benefits invariably used by proponents to justify the billions spent on such projects often do not materialize or are so weak that they can't be measured outside of the temporary jobs generated by construction itself, which may be substantial, but the benefits of which end the day the last construction worker leaves the site. Even for a giant project like the Channel tunnel, which is several times the size of most megaprojects, studies show that five years after the tunnel's opening it had had very few and very small impacts on the wider economy. Additionally, it was difficult to identify any major urban or regional developments associated with it, and potential impacts on the directly affected regions were found to be mainly negative.⁸ Studies of other projects corroborate these findings: the much-publicized positive economic and regional development effects of large construction projects are mostly nonexistent, marginal, or even negative.⁹ This does not mean that transportation hubs and highways exits do not affect the location of development. But the net effect on economic development, if it exists, is difficult to measure.

In developing nations, large dams are the classical example of under-performing projects with negative social and environmental impacts often not outweighed by positive development impacts.¹⁰ The Sardar Sarovar and Maheshwar dams in India are particularly well-known because of author Arundhati Roy's vivid descriptions in *The Cost of Living* and *The Algebra of Infinite Justice* of the human suffering resulting from these projects.¹¹ Many other examples exist, including the Three Gorges Dam in China and the Pergau Dam in Malaysia. A number of case studies of smaller but still large urban infrastructure and services projects in Pakistan, Bangladesh, India, and Ethiopia show similar results: pre-project social impact analysis cannot be trusted, the poor are not considered, and hundreds of thousands of livelihoods are disrupted or lost with no immediate prospect for reemployment.¹² This does not mean that such projects should not be undertaken. It does mean, however, that projects should have

much more realistic predictions of costs and impacts before decisions are made and much better practices of participation with and compensation for those negatively effected.

Every large construction project does not follow the pattern of understated costs and overstated benefits, needless to say. But most do. Nine times out of ten, in the projects we studied, costs begin to soar after projects have been approved, leaving taxpayers or investors to pick up bills of hundreds of millions of dollars. Cost overruns of 50% are common. Overruns above 100% are not uncommon.¹³ Of a sample of forty projects for which it was possible to estab-

delusion about costs and benefits weren't involved. The Brooklyn Bridge, for instance, had a cost overrun of 100%, the *Sydney Opera House* of 1,400%. Had the true costs been known, these architectural wonders may not have been built. Delusion is necessary for action—and for exquisite design—according to this argument.

Michael Teitz and Andrejs Skaburskis follow this line of reasoning when they ask of the *Sydney Opera House*, for which promoters gave a deceptively low budget to ensure political acceptance, "Did people really think that the *Sydney Opera House* would come in on budget? Or did we all agree to

WHICH LARGE PROJECTS GET BUILT? THOSE FOR WHICH PROPONENTS BEST SUCCEED IN DESIGNING—DELIBERATELY OR NOT—A FANTASY WORLD OF UNDERESTIMATED COSTS, OVERESTIMATED REVENUES, OVERVALUED LOCAL DEVELOPMENT EFFECTS, AND UNDERESTIMATED ENVIRONMENTAL IMPACTS.

lish reliable data on both costs and revenues, only one project had costs that had been overestimated and revenues that had been underestimated by more than 20%, whereas the opposite was true for thirty-four projects: for each costs were underestimated and benefits overestimated by more than 20%. Only five of the forty projects had actual costs and revenues less than 20% different from forecasted costs and revenues. For rail projects, for example, half of all projects have cost overruns of 45% or more, measured in constant dollars. When this is combined with lack of traveler use, which for half of all rail projects is more than 50% lower than forecasted, it becomes clear why so many projects have financial problems.

THE MASTER BUILDER WHO DIDN'T BUILD

Some argue that almost no projects, including our most treasured ones, would ever be undertaken if some form of

Denver International Airport, Denver, Colorado, ca. 1995. Photo, Dave G. Houser/Corbis.



accept the deception and engage in wishful thinking in order to make something that we really wanted happen? . . . [D]o Australians really regret those dramatic sails in the harbour? Or would they have regretted more the decision that would most reasonably have been based on a fair prediction of costs?"¹⁴ The logic is seductive, yet precarious. I have the highest appreciation of the *Sydney Opera House* and especially for its architect, Jørn Utzon, who is an honorary professor at Aalborg University, where I work. Such appreciation is easy when you live in the childhood hometown of the man, next door to the *Utzon Center*, and close to several of the few Utzon designs that have been built.

It seems to me, however, that one does Utzon and other architects a disservice if one indicates that their work could be built only through deception or wishful thinking, while similarly iconic and complex designs did not require this, for instance Frank Gehry's *Guggenheim Bilbao Museum*, which was built on time and budget and makes a lot more money than projected.¹⁵ What would explain this difference? And how would we distinguish, when planning such treasures, between those that in order to happen need deception and those that don't? And all this doesn't take into consideration the fact that in most nations deliberate deception about publicly funded projects is considered unethical and is illegal.

What's more, the real loss in the *Sydney Opera House* project is not the huge cost overrun in itself. It is that the overrun and the controversy it created kept Utzon from building more masterpieces. In a meeting held in support of Utzon at Sydney Town Hall in March 1966—six weeks before the controversy made Utzon leave Sydney and the *Opera House*—the Viennese-born Australian architect Harry Seidler said, "If Mr. Utzon leaves, a crime will have been committed against future generations of Australians. . . ." ¹⁶ Seidler was more right than he could imagine, except the crime would not be limited to future generations of

Australians. After winning the Pritzker Prize in 2003, Utzon is again widely acclaimed, even in Australia. But he was not able to build for decades. Instead of having a whole *oeuvre* to enjoy—like those of Frank Lloyd Wright and Gehry—we have just one main building. Utzon was thirty-eight when he won the competition for the *Opera House*—how would the work of the mature master have enriched our lives? We'll never know. That's the high price Sydney has imposed by its incompetence in building the *Opera House*. And even if the *Opera House* may be an extreme case, and other famous architects got more commissions after going over budget, Sydney drives home an important point: cost underestimation is disruptive, sometimes in drastic and unexpected ways.

For these reasons, we should be wary of promoting the argument that deception and delusion are good because they make things happen, including great design. Many viable projects exist—in public buildings, transport, energy, sports, and tourism—that haven't required deception: in addition to the *Bilbao Guggenheim*, for the *Pompidou Center*, the *Empire State Building*, and the *Eiffel Tower*, cost projections were reliable.

THE GUGGENHEIM BILBAO MUSEUM AND THE SYDNEY OPERA HOUSE COMPARED

Frank Gehry has a reputation for building on time and budget, even for large, complex, and innovative structures. I asked Gehry how he and his associates do it. Gehry explained that the first step is to ensure that what he calls the "organization of the artist" prevails during construction.¹⁷ According to Gehry, the goal is to prevent political and business interests from interfering with design and thus to arrive at an outcome as close as possible to the original design drawings. Gehry explains:

One of the great failings in these public projects is public clients, that is, clients that are involved with politics and business interests. These clients often eliminate good architecture because they don't understand it, and they're wary of it, and they're unable to imagine that somebody who looks like an artist could possibly be responsible. There's a tendency to marginalize and treat the creative people like women are treated, 'sweetie, us big business guys know how to do this, just give us the design and we'll take it from there.' That is the worst thing that can happen. It requires the organization of the artist to prevail so that the end product is as close as possible to the object of desire that both the client and architect have come to agree on.

Once the design has been agreed on and the organization of the artist-architect set up, the next step in building on time and budget is to get a realistic cost estimate and control it. Gehry explains the difficulty of this:

Building costs are not as controllable as people make them sound. . . . You might have a project that you believe is budgeted properly and has been assessed by other responsible assessors to be within budget, a change in the market throws it all out of whack right in the middle of your process, so there is no guarantee, ever. The only way to control these things is to not proceed with the building until you have all the drawings complete, you have everything the way you want it, you've done your due diligence on cost analysis. Then it's a negotiation from there on with contractors and sub-contractors to keep them within your budget.

Finally, technology and continuing relationships with the individual building trades are important ingredients in keeping within budgets, says Gehry. He and his associates have pioneered the use of digital design models that greatly facilitate production of the data needed for arriving at accurate budgets. Here, Gehry also argues that construction should not start until it has been established that a project is indeed within the client's budget:

In our practice we don't allow the client to start construction until we are sure we are doing a building that's within their budget and meets their requirements. We use all the technology available to us to quantify in a most precise way the elements of the building. This fact alone allows us to demystify for the construction people the elements of the building so there's not a lot of guessing. When there's guessing, money is added. We found that precision in documentation and continuing

Richard Rogers Partnership, *The Millennium Dome*, Greenwich, England, March 1999. photo, John Van Hasselt/Corbis SYGMA.



relationships with the individual building trades is a necessary process to keep buildings within the limits of the client's budget.

This explains how the *Guggenheim Bilbao Museum* was built on time and budget. Compare this with what happened in Sydney. Point by point the approach was exactly opposite.

In Sydney, the original budget of seven million Australian dollars was not a real but a political budget. The Labour government of New South Wales, the main proponent of the *Opera House*, wanted the project approved and construction started before elections in March 1959—this would reduce the risk of the *Opera House* being stopped in case Labour lost the elections.¹⁸ A lowballed budget and a fast-track startup were means to this end. The premier, Joe Cahill, had made the *Opera House* his personal priority, but he was seriously ill and running out of time. According to Bob Carr, New South Wales premier since 1995, Cahill told his people, "I want you to go down to Bennelong Point [the location of the *Opera House* site] and make such progress that no one who succeeds me can stop this going through to completion."¹⁹ Construction started before either drawings or funds were fully available. If one principal cause is identified for the troubles that beset the *Opera House*, this is it. Eventually the *Opera House* would cost 102 million Australian dollars, not including 45 million dollars allocated in 2002 in part to bring the building more in agreement with Utzon's original designs. Kim Utzon explains in lieu of his father, who prefers to remain out of the public eye:²⁰ "It was a political decision to publicize a low budget for the building, which was expected to gain approval in the political system, but which very quickly was exceeded. So even if the cost overrun turned out to be 1,400% in relation to the publicized budget, this budget was an eighth of the real budget for the building. So the real cost overrun is only 100%. The rest was politics."

Second, what Gehry calls the "organization of the artist" was not implemented in Sydney. The political and business interests that Gehry says must be kept at arm's length from design got deeply involved. The political trick played with the falsely low initial budget kept haunting construction as an endless series of cost overruns that were not all real overruns but logical consequences of cost underestimation. After the Sydney Opera House Act was approved in 1960 with the provision that every 10% increase in the budget would require the Act to be amended by Parliament, the *Opera House* became a political football. Every overrun now set off an increasingly menacing debate about the emerging structure in Sydney Harbor. The architect inevitably became a target. He was said to have "lousy taste," and his design was called "something that is crawling out of the ocean with nothing good in mind" and "copulating white turtles."²¹ When even the government of New South Wales began to attack Utzon

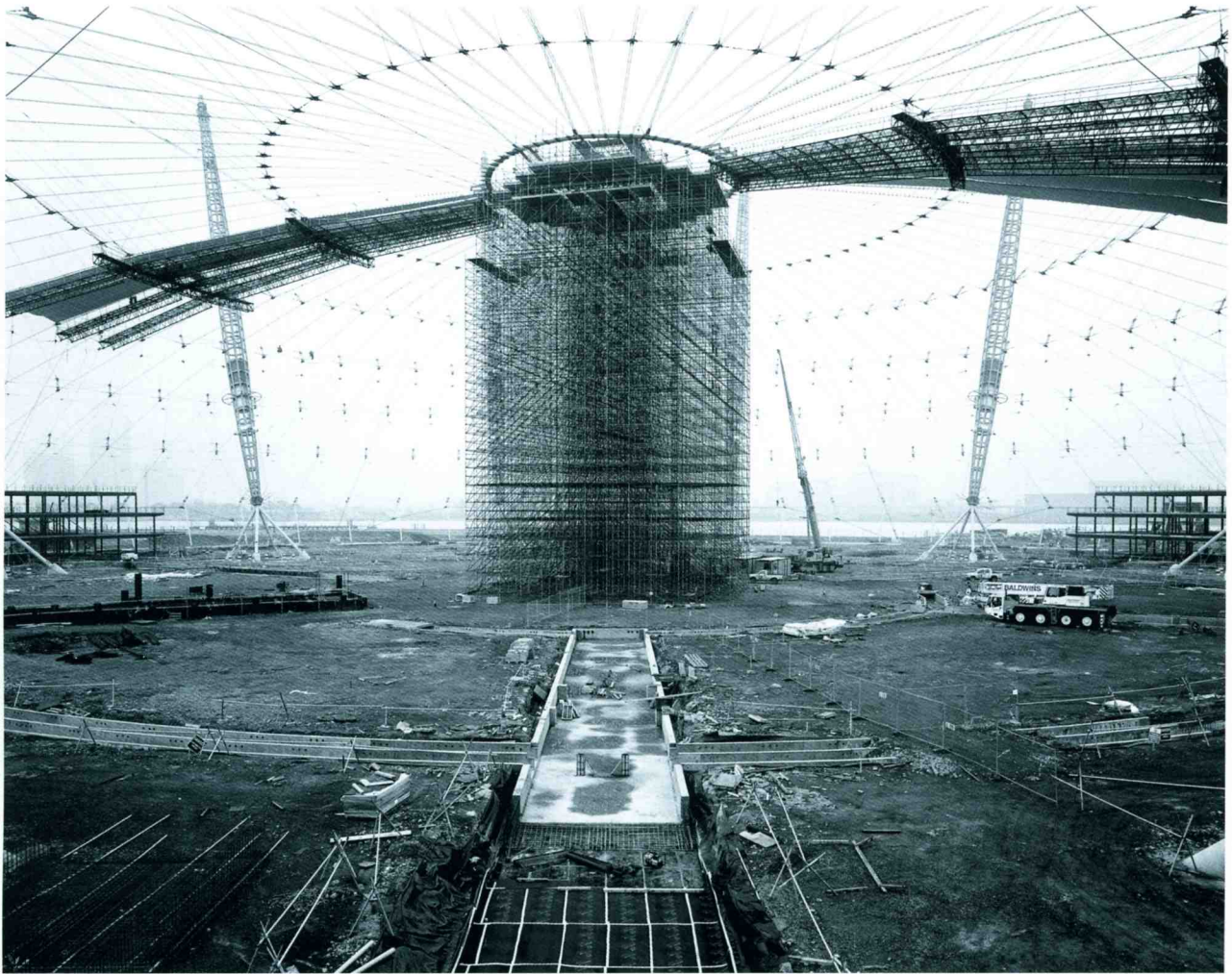


EMBT RMJM, *The Scottish Parliament*, Interior, Edinburgh, Scotland, 2004. © Roland Halbe/Artur/VIEW.

and stopped paying his fees and claims, the debate began to look to Utzon like a campaign to drive him off the project. In April 1966, he secretly left Australia with his family, swearing never to return. Not only was Sydney not able to keep the organization of the artist in place, it was unable to keep the artist. Kim Utzon explains:

They were a few years from completing the building [when Jørn Utzon left]; the detailed drawings and plans were all completed and major parts had been built. Much of it was then torn out of the house again in order to change things. For instance a full revolving stage and a full rigging loft delivered from Germany were removed. They also dynamited part of the structure in order to create space for more seats, from which, by the way, you cannot see the stage. So many errors were made, and one of them was to change architects halfway through construction. The main cause of the change of architects was the falsely low and political initial budget and the cost overruns it created. But then the change of architects produced its own overruns.

The evidence supports Kim Utzon's claims. Large cost increases took place after Utzon left.²² And contemporary architectural critics have pointed out that due to the changes



Richard Rogers Partnership, *The Millennium Dome*, Greenwich, England, 1999. Mark Power/Magnum Photos.

in the original design, the building's interior is no match for the exterior. What's worse, although the building works well for rock concerts, movie performances, conventions, and chamber orchestras, because of the changes it is unsuited for classical operas.²³ This would seem to be a major drawback for an opera house, and in a postscript to this amazing story in 2001, thirty-five years after he left Australia, Jørn Utzon was invited back to help restore the building and secure its future more in accordance with his original designs. Utzon accepted the invitation.

Finally, in the late 1950s and early 1960s Utzon did not have access to the design technology and computing power available to Gehry in the 1990s. Consequently, Utzon and his engineers had great difficulty finding a practical way of building the curved concrete shell vaults. Nothing worked until, after several years of experimentation, the team hit upon the now famous "orange peel" simplification. The surfaces of the shells were defined as triangular patches of different sizes on the surface of a single sphere, like pieces

of an orange peel. This allowed exact calculation and the use of prefabricated repeating elements, reducing costs to more acceptable levels.²⁴ Even so, the years of experimentation translated into years of delay, which again translated into cost overruns.

Gehry's initial sketches and models for the *Guggenheim Bilbao Museum* were, if anything, more daring in their use of free-form curved surfaces than Utzon's. But now accurate modeling was no longer a problem. Gehry's office employed Catia, an advanced CAD system mostly used, until then, in aerospace and automobile design.²⁵ Whereas Utzon had been forced to rely on painstakingly handmade drawings and models in his explorations of structure, Gehry could employ visualization software to create, almost instantly, whatever views he needed. He could also use rapid prototyping tools to produce physical models automatically. But most important, the digital model provided the data needed for the "precision in documentation" Gehry says is crucial for estimating and controlling costs correctly and thus keeping what he



Mott MacDonald, Bridge to Chek Lap Kok Airport Project, Lantau Island, Hong Kong, ca. June 1996. Photo, Michael Yamashita/Corbis.

calls “good architecture” at arm’s length from controversy and political debate.

In sum, by enforcing “the organization of the artist,” by accurate budgeting and cost control, and by using advanced computing technology, Bilbao gained a building that works as an art museum, as a work of art in its own right, as a business, as a much-needed development vehicle for the Basque region, and as a source of inspiration for lovers of good architecture and good city and regional planning everywhere. Sydney, by doing the opposite on all counts, got an opera house unsuited for opera. The part of the building that Utzon got to finish—the outside—is as iconic, to be sure, as the museum in Bilbao. The shells in Sydney Harbor have placed Australia on the global map like nothing else. But given the costs involved—the destruction of the career and *oeuvre* of an undisputed master of 20th-century architecture—Sydney provides a lesson in what not to do.

THE LYING GAME

Proponents of the *Sydney Opera House* intentionally deceived lawmakers, the public, and the media when they lowballed the budget to get the project started. But is such behavior really common for large projects? And is Frank Gehry’s approach, as described above, the exception? Such questions are rarely asked. Maybe because in an uncomfortable number of cases the answer is “Yes.” Our data show that the conventional explanations—the inherent difficulty of forecasting, inadequate data, inappropriate forecasting models—do not explain forecasting outcomes well. The outcomes are too biased, with nine out of ten cost forecasts being cost underestimates. The conventional explanations could be upheld only if outcomes were more normally distributed around a figure for error closer to zero. With an unusually high level of statistical significance, this is not the pattern that outcomes follow. Even more remarkably, for more than seventy years, cost overruns have stayed large and mainly constant—they

are highly predictable.²⁶ But cost forecasters keep ignoring this, even though it could be used to make their forecasts much more accurate.²⁷ The situation is similar for forecasts of benefits.

Either the people who forecast are incredibly incompetent, which is unlikely, or they are incredibly optimistic, which is more common but still does not adequately explain the data. Again, many forecasters deliberately manipulate costs and benefits to help projects get approved. This best explains the data and has been further verified through interviews with forecasters and planners conducted by both my own research teams and by others.²⁸ For reasons of space, I include but one example of a planner explaining the mechanism of cost underestimation in an interview, "You will often as a planner know the real costs [of projects]. You know that the budget is too low, but it is difficult to pass such a message to the counselors [politicians] and the private actors. They know that high costs reduce the chances of national funding."²⁹ In comparison, it is hard to imagine a society that would allow medical doctors to make the same predictable "errors" decade after decade in diagnosing and treating patients. This would be blatant malpractice. So it is in planning and design.

But what's most disturbing is not deceptive individual project estimates, it's the massive extent to which rent-seeking behavior by stakeholders has hijacked and replaced the pursuit of public good in this important and expensive policy area and the high costs this behavior imposes on society. Deceptive cost-benefit analyses keeps critical scrutiny (by lawmakers, the public, and the media), accountability, and good governance at bay until it's too late, that is, until the sunk costs for a project are so high that its point of no return has been reached and construction must be completed. Thus, there are few half-built bridges and tunnels in the world, although there are many that function poorly.

Public planning—to deserve its name—presupposes a notion of public good. When this notion is hijacked, planning itself is hijacked. Instead we get one of the most undermining misfits of democracy: the public institution used for private gain. Any society that wants to remain one will have to prevent such hijacking and restore the vital distinction between public good and private interest. The same may be said of planning: The public good, as defined by law, is planning's *raison d'être*.

But the whole structure of incentives for planning major projects is geared towards keeping deception going. Each project is a multimillion- and often even multibillion-dollar business, and when it goes forward, many people profit—architects, engineers, contractors, consultants, bankers, landowners, construction workers, lawyers, and developers. In addition, politicians with a "monument complex" gain satisfaction and get to cut ribbons, administrators get larger budgets, and cities get investments and infrastructures that might

otherwise go elsewhere. Stakeholders may have an interest in letting a project go ahead even if it is not especially useful from a public point of view.

Corruption also plays a role. According to Transparency International, the frequency and size of bribes are higher in construction and public works than in any other economic sector. This holds true in both developed and developing nations. On a scale from zero to ten, with zero indicating the highest possible level of corruption, construction and public works scored 1.3.³⁰ The problem is amplified by the scale of construction expenditures, which are estimated at U.S. \$3,200 billion per year worldwide.³¹ Transparency International emphasizes that the majority of those who engage in corrupt practices do not do so because they wish to, but because they feel compelled to by the modus operandi of the construction industry and the political environment. In many contexts, bribes are expected and needed to get projects built.

Finally, the incentive to propose new projects has grown stronger over time for the simple reason that taxes have gradually increased over the past several decades in most nations, in both absolute terms and as a share of GDP, despite all the rhetoric about privatization and lean government.³² This

THE KEY PRINCIPLE IS THAT THE COST OF MAKING A WRONG FORECAST SHOULD FALL ON THOSE MAKING THE FORECAST, A PRINCIPLE OFTEN VIOLATED TODAY.

is the so-called "honey-pot" effect. Major public works projects are effective in extracting honey from the pot.

Undoubtedly, many project proponents believe that their projects will benefit society and that, consequently, they are warranted in cooking up costs and benefits—just as executives at Enron and WorldCom believed they were justified in cooking the books for the good of the company. The ends justify the means, or so the players reason. Together with the strong incentives to propose and build projects, this means that something more insidious than simple, individual deception may be at play: a whole culture of covert deceit.

As was pointed out in an editorial in *Access Magazine*, few of the players involved are likely to think of themselves as dishonest or corrupt.³³ It might seem odd that low-cost, high-benefit forecasts miraculously and repeatedly fit clients' and forecasters' silent wishes. But their wishes may not be questioned. Rather it is taken for granted by politicians, stakeholders, and the media that the proposed highway, concert hall, bridge, stadium, dam, or rail line is the correct answer to the problem, and cost-benefit estimates somehow come out just right. Like patriotism, forecasters' conviction requires no rationale and brooks no serious doubt. Projects follow



Gruen Associates and Pei Cobb Freed, *Los Angeles Convention Center, West Tower*, 1996. Photo, Royalty-Free/Corbis.

under their own momentum. As in any other culture in which critical voices are suppressed, eventually the dominant players begin to believe in their own deceptions, reinforcing their feeling of being justified.

REFORM, PLEASE

As should be clear, the planning and implementation of major construction projects stand in need of reform. Fortunately, help is coming. The conventional consensus that deception and even corruption are acceptable ways of getting projects started is under attack, as will be apparent from the examples below. This is in part because democratic governance is generally getting stronger around the world. The Enron scandal and its successors have triggered a war on corporate deception that is spilling over into government with the same objective: to curb huge financial waste. Although progress is slow, democratic governance is gaining a foothold even in major project development. The conventional consensus is

also under attack for the practical reason that megaprojects are becoming so large in relation to national economies that cost overruns and benefit shortfalls from even a single project may destabilize the finances of a whole country or region. This happened when the billion-dollar cost overrun of the 2004 Athens Olympics affected the credit rating of Greece. It was also the case when Hong Kong's new \$20 billion Chek Lap Kok airport opened in 1998. Lawmakers and governments begin to see that national fiscal distress is too high a price to pay for the megaprojects lying game and that reform is needed.

In 2003 the Treasury of the United Kingdom required, for the first time, that all ministries develop and implement procedures for large public projects that will curb what it calls—with true British civility—“optimism bias.” Funding will be unavailable for projects that do not take into account this bias, and methods have been developed for how to do this.³⁴ In the Netherlands in 2004, the Parliament Committee on Infrastructure Projects for the first time conducted extensive public hearings to identify measures that will limit the

misinformation about large infrastructure projects given to the Parliament, public, and media. In Boston, the government sued to recoup funds from contractor overcharges for the Big Dig related to cost overruns. More governments and parliaments are likely to follow the lead of the U.K., the Netherlands, and Boston in coming years. It's too early to tell whether the measures they implement will ultimately be effective. It seems unlikely, however, that the forces that have triggered the measures will be reversed.

The key weapons in the war on deception is accountability and critical questioning. The professional expertise of planners, architects, engineers, economists, and administrators is certainly indispensable to constructing the buildings and infrastructures that make society work. Our studies show, however, that the claims about costs and benefits made by these groups usually cannot be trusted and should be carefully examined by independent specialists and organizations. The same holds for claims made by project-promoting politicians and officials. Institutional checks and balances—including financial, professional, or even criminal penalties for consistent and unjustifiable biases in claims and estimates of costs and benefits—should be developed and employed. Elsewhere, my research group and I have shown in detail how this may be done.³⁵ The key principle is that the cost of making a wrong forecast should fall on those making the forecast, a principle often violated today.

Many of the public-private partnerships currently emerging in large construction projects contain more and better checks and balances than previous institutional setups, as has been demonstrated by the U.K. National Audit Office.³⁶ This is a step in the right direction but should be no cause for repose. The lying game has long historical roots and is deeply ingrained in professional and institutional practices. It would be naive to think it is easily toppled. Given the stakes involved—saving taxpayers from billions of dollars of waste, protecting citizens' trust in democracy and the rule of law, avoiding the destruction of great design and great designers—this shouldn't deter us from trying.

NOTES

1. Bent Flyvbjerg, Nils Bruzelius, and Werner Rothengatter, *Megaprojects and Risk: An Anatomy of Ambition* (Cambridge University Press, 2003); Bent Flyvbjerg, Mette K. Skamris Holm, and Søren L. Buhl, "Underestimating Costs in Public Works Projects: Error or Lie?" *Journal of the American Planning Association*, Summer 2002, 279–295; "What Causes Cost Overrun in Transport Infrastructure Projects?" *Transport Reviews*, January 2004, 3–18.
2. Niccolò Machiavelli, *The Prince*, translated with an introduction by George Bull (Harmondsworth: Penguin, 1984 [1532]), 99.
3. For this and other figures of cost overruns, see *Megaprojects and Risk*.
4. Quoted from "Under Water Over Budget," *The Economist*, October 7, 1989, 37–38.
5. *Megaprojects and Risk*, 18–19. Bent Flyvbjerg, Mette K. Skamris Holm, and Søren L. Buhl, "Underestimating Costs in Public Works Projects: Error or Lie?" 279–295.
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