

Bloomberg

Too Many Public Works Built on Rosy Scenarios: Virginia Postrel

By Virginia Postrel - Jul 8, 2011

“Infrastructure” may be one of the least glamorous words in the English language, but with the right touch the concrete and steel of roads, bridges, tunnels, dams and railroads can look as alluring as a movie star. Witness the sleekly seductive illustrations produced for today’s [California High-Speed Rail Authority](#) or the midcentury pictures of effortlessly flowing superhighways, a genre that reached its apotheosis in [Walt Disney’s “Magic Highway U.S.A.”](#) in 1958.

This glamorizing extends not just to imagery but also to forecasts. Project promoters routinely overstate benefits and understate costs -- and not just a little bit.

“Cost overruns in the order of 50 percent in real terms are common for major infrastructure, and overruns above 100 percent are not uncommon,” [Bent Flyvbjerg](#), a professor of major program management at the University of Oxford’s Said Business School, writes in the [Oxford Review of Economic Policy](#). “Demand and benefit forecasts that are wrong by 20-70 percent compared with actual development are common.”

To draw these conclusions, Flyvbjerg analyzed results from 258 projects in 20 countries over 70 years, the largest such database ever compiled. Like the “stars without makeup” features in celebrity tabloids, his research provides a disillusioning reality check. “It is not the best projects that get implemented, but the projects that look best on paper,” Flyvbjerg writes. “And the projects that look best on paper are the projects with the largest cost underestimates and benefit overestimates, other things being equal.”

Flyvbjerg got curious about forecasts when, as a young professor in [Denmark](#), he watched the Great Belt rail tunnel, connecting [Scandinavia](#) with continental [Europe](#), go “terribly wrong,” with long delays and cost overruns of 120 percent. “I began to wonder not only why that was the case, but also whether it was common or not for that to happen,” he recalls in a telephone conversation. (The tunnel opened in 1997.)

Finding no comprehensive data available, he assembled his own -- and found that the big picture looked very much like the little one. “It’s very common to have cost overruns in big construction projects,” he says. “It’s the norm. It’s not the exception.”

On average, urban and intercity rail projects run over budget by 45 percent, roads by 20 percent,

and bridges and tunnels by 34 percent.

And the averages tell only part of the story. Rail projects are especially prone to cost underestimation. Seventy-five percent run at least 24 percent over projections, while 25 percent go over budget by at least 60 percent, Flyvbjerg finds.

By comparison, 75 percent of roads exceed cost estimates by at least 5 percent, and 25 percent do so by at least 32 percent.

[California](#) Dreaming

Promoters of rail and toll-road projects also tend to substantially overstate future use, making those projects look more appealing to whoever is footing the bill. Rail projects attract only about half the expected passengers, on average, while in new research still in progress, Flyvbjerg finds that toll roads (including road bridges and tunnels) fall 20 percent short. (Non-toll roads also miss their traffic projections, but their errors go in both directions.)

Rail-ridership predictions are especially over-optimistic in the U.S., where the average gap between expectations and reality is 60 percent, compared with 23 percent in Europe. So a back-of-the-envelope calculation would suggest that California High-Speed Rail can expect to carry only 15.6 million passengers a year by 2035, rather than the 39 million projected.

Using the average cost overrun, California should also expect to spend almost \$8 billion, rather than the estimated \$5.5 billion, for the project's first 100-mile (161-kilometer) leg from Borden to Corcoran, the "train to nowhere" in the Central Valley. Raising the estimate by the average overrun, however, means that you still have a 50 percent chance of spending even more.

As the toll roads suggest, overruns aren't unique to government projects. Even privately built chemical-processing plants suffer from similar, though less drastic, underestimates of cost and overestimates of capacity. As many [a Dilbert comic strip](#) has pointed out, salespeople often close a deal by promising more than they can deliver.

So why do these mistakes happen again and again?

Project managers often blame a combination of bad luck, unexpected delays and changes of plan - - the same things that inflate the costs of remodeling your bathroom, only on a grand scale.

It's true that planners change their minds. "They decide to have higher safety standards," Flyvbjerg says, "or higher environmental standards, so the cost of the project goes up. Often you will find that the geology of the project was not well covered. So when you start digging, you find things in the ground that you didn't expect, and the costs go up."

But a smart project manager should anticipate the unanticipated and adjust the budget accordingly. Professionals, after all, generally have far more experience than the average homeowner. They know the sorts of things that can go wrong.

“It’s nothing new that geology is difficult,” Flyvbjerg says. “We know that geology is difficult. No matter. It’s ignored in project after project. Therefore, the problem is not geology itself but the fact that we disregard geology.”

Bias of Optimism

A charitable explanation is that promoters are starry-eyed and suffer from what psychologists call optimism bias. But it’s suspicious that forecasters rarely seem to learn, even over decades of experience. Alas, contractors, local governments and other advocates have strong incentives to underplay costs and exaggerate benefits to sell their services or attract funding.

“Some forecasts are so grossly misrepresented that we need to consider not only firing the forecasters but suing them, too -- perhaps even having a few serve time,” Flyvbjerg writes in his Oxford Review of [Economic Policy](#) article.

Even with his gloomy findings, Flyvbjerg is an optimist. “Things don’t have to be like this,” he says. “It’s not like the weather. It’s a human artifact that we are producing, and hence we can do differently.”

He would like to see better incentives -- punishment for errors, rewards for accuracy -- combined with a requirement that forecasts not only consider the expected characteristics of the specific project but, once that calculation is made, adjust the estimate based [on an “outside view,”](#) reflecting the cost overruns of similar projects. That way, the “unexpected” problems that happen over and over again would be taken into consideration.

Such scrutiny would, of course, make some projects look much less appealing -- which is exactly what has happened in the U.K., where “reference-class forecasting” is now required. “The government stopped a number of projects dead in their tracks when they saw the forecasts,” Flyvbjerg says. “This had never happened before.”

Unfortunately, the world’s biggest infrastructure projects, including the recently opened high-speed rail line between Beijing and [Shanghai](#), are subject to no such checks, or even to scholarly examination. Flyvbjerg has been trying for years to get data on project costs in [China](#), to no avail. “Their data are simply not reliable,” he says. He quotes an unidentified Chinese colleague who said, “If the party says there’s no cost overrun, there’s no cost overrun.”

No wonder promoters look so longingly at China. There, infrastructure glamour is the law.

(Virginia Postrel writes about commerce and culture, innovation, economics and public policy. She is the author of “The Future and Its Enemies” and “The Substance of Style,” and is writing a book on glamour. The opinions expressed are her own.)

For more [Bloomberg View columns](#).

To contact the author of this column: Virginia Postrel in [Los Angeles](#) at ypostrel@bloomberg.net.

To contact the editor responsible for this column: Mary Duenwald mduenwald@bloomberg.net.

©2011 BLOOMBERG L.P. ALL RIGHTS RESERVED.