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Where Infrastructure Estimates Come Up Short

By CARL BIALIK

New Jersey Gov. Chris Christie last week halted work on a rail tunnel to New York, one of the nation's largest public-works projects, citing ballooning expenses.

While there has been considerable disagreement about Mr. Christie's assessment of the price tag, infrastructure experts say cost overruns for major building projects are typical.

"It would be a bit amazing if it didn't have an overrun," says Ed Merrow, president of Independent Project Analysis Inc., an Ashburn, Va., company that advises organizers of large building projects.

In a number of studies, Mr. Merrow and other researchers have demonstrated that budget-busting is the norm for infrastructure work. That might not come as a surprise to Bostonians who watched the cost of the Big Dig balloon, or Denver residents who paid a lot more than expected for a new airport in the 1990s, or to the British and French who watched the budget grow for the Chunnel.

The question is, what causes spending to expand well beyond initial projections? Explanations range from subtle psychological impulses when numbers are involved, to the economic phenomenon known as the winner's curse, to outright lying.

Planners underestimate costs in nearly nine of 10 transportation-infrastructure projects, according to an oft-cited 2002 study of 258 projects by economic geographer Bent Flyvbjerg and two co-authors. Such overruns were a fixture of projects on five continents and over the prior seven decades, and were especially large in rail projects similar to the New Jersey tunnel, which goes by the name Access to the Region's Core, or ARC.

Economists and behavioral scientists say the pattern of budget excess echoes findings in other areas where people allow their best hopes to dominate the planning process. Irrational optimism afflicts even individuals who have experience with a given situation, and should know better. Researchers have linked it to business analysts' earnings forecasts and to students predicting when they will finish assignments. Irrational optimism, for example, is at work when a commuter is consistently late for work because she estimates her travel time based on the assumption that traffic and transit always will run smoothly.

Magne Jørgensen, who has studied persistent underestimates of completion times in software development, says businesses would do well to maintain data on prior forecasts. "Looking forward makes you more optimistic," says Prof. Jørgensen, a research scientist at Simula Research Laboratory in Lysaker, Norway. "Looking backward makes you more realistic."

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Prof. Jørgensen and other researchers say another factor exacerbates the effects of irrational optimism: Projects planned most optimistically will look more attractive to funders than those that are planned realistically. So even if not every planner is optimistic, those who are have the best shot of moving forward, but will have to cope with a form of the winner's curse: the consequences of rosy estimates.

"Optimism is tremendously inspiring," says Dale Griffin, professor of marketing at the University of British Columbia's Sauder School of Business, who has studied irrational optimism. "Accuracy, perhaps not so much."

Prof. Flyvbjerg, who now heads the University of Oxford's BT Centre for Major Programme Management, sees another factor in problems with cost estimates—the political process for project approval. "Government agencies like to justify what they do [with] numbers," he says. And sometimes officials engage in what he calls "strategic misrepresentation" when producing those numbers.

Other researchers have identified similar levels of inadequate monetary estimates but disagree with Prof. Flyvbjerg's explanation. Dr. Merrow has compiled a database of thousands of projects, and finds a similar pattern of cost overruns. This e xtends to the private sector, he says, even though corporate employees who botch a budget might suffer more as a consequence. Among large private-sector projects with some tricky building element, the average cost overrun was 32%.

Dr. Merrow's firm advises clients to increase their forecasts by a factor roughly equal to the typical historical cost overrun of similar projects.

Tom Warne, who has worked on major projects for the Utah and Arizona state transportation departments, points to a specific way the brain processes numerical information. "People remember the lowest number you ever gave them," says Mr. Warne, who is now a transportation consultant. Projects gain momentum once approved, he adds, and people seek to tack on additional elements.

Despite a history of unreliable project estimates, voters shouldn't have to settle for fuzzy numbers, says Neysa C. Pranger, spokeswoman for the Regional Plan Association, a New York nonprofit that supports the New York-New Jersey rail-tunnel project. She suggests estimates could be verified by a third party before work on major projects gets under way. "An independent validator should be established," Ms. Pranger says. "But they'll need to establish a track record."

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