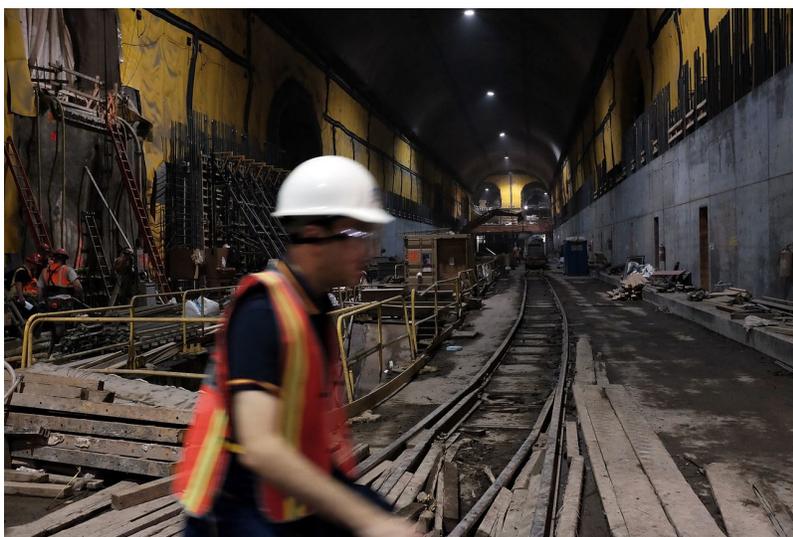


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'How Big Things Get Done' Review: Staying on Track

Why do large infrastructure projects so often go wrong? One culprit is rushed planning, which can generate delays that push up costs.



Boring tunnels for the East Side Access project in New York City.

PHOTO: GETTY IMAGES

By Marc Levinson

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In 2001, when the Federal Transit Administration signed off on plans to route some of the Long Island Rail Road's commuter trains into Grand Central Terminal, the project was expected to cost \$4.3 billion and to be completed by 2009. The final design was approved in 2002, and tunnel boring began five years later. The new Grand Central Madison station finally received its first passenger train from Long Island a couple weeks ago—13 years behind schedule, with a price tag that had tripled.

This extraordinarily costly piece of infrastructure is the sort of project Bent Flyvbjerg has spent his career deconstructing. Mr. Flyvbjerg, an economic geographer at the IT University of Copenhagen, specializes in investigating why megaprojects so frequently go wrong and figuring out how to keep them on track. "How Big Things Get Done," written with the journalist Dan Gardner, distills what he has learned for non-specialists. It's a book that every legislator,

city council member and corporate executive ought to read.

The performance of the more than 16,000 public and private projects in Mr. Flyvbjerg's database indicates that businesses are just as prone as government agencies to misjudge the costs and risks of major investments. Only one in 200 projects was completed on time and on budget and delivered the promised benefits, he reports. What's more, the misjudgments are usually large. Major building projects, Mr. Flyvbjerg finds, have an average cost overrun of 62%. Eighteen percent of information-technology projects have cost overruns above 50%. "Most big projects are not merely at risk of not delivering as promised," Mr. Flyvbjerg writes. "They are at risk of going *disastrously* wrong."

Mr. Flyvbjerg identifies two common flaws in developing large-scale projects: inadequate planning and prolonged execution. Managers and politicians have a bias for action, he says, often treating planning as an annoyance that must be endured before the real work begins. Imposing tight deadlines for completion may end up adding costs and time, because the easiest way to craft a tighter schedule is to short-circuit the planning process. Rushed planning can result in problems that crop up later, generating delays that push up the cost.

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How Big Things Get Done: The Surprising Factors That Determine the Fate of Every Project, From Home Renovations to Space Exploration and Everything in Between

By Bent Flyvbjerg and Dan Gardner

Currency



decision to proceed, moving full speed ahead.

Thorough planning, in Mr. Flyvbjerg's view, should be followed by quick execution: The biggest source of risk, he says, is low-probability events—black swans—that occur after the start of construction or implementation. This is the time when a pandemic, a burst of inflation, a labor dispute or a natural disaster can delay even the best plans and upend cost estimates. The way to mitigate the risk, he says, is to “think slow, act fast,” investigating the project carefully on the front end but then, following the

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HIS improbable exemplar of career project management is Pixar, the computer-animation studio owned by Walt Disney Co. The creation of a Pixar movie begins with a brief outline describing the story. The outline is critiqued by a group of Pixar employees, then refined and refined again. The agreed outline forms the basis for a script, which goes through similar iterations.

The script is then turned into detailed storyboards, roughly 2,700 of them, to make a crude video simulating the eventual movie. The video is then shown to Pixar staff who have no other involvement in the project and whose feedback leads to major revisions. New storyboards are created, and the process is repeated, seven or eight times. This procedure, Mr. Flyvbjerg notes, allows directors the freedom to experiment, but it ensures that every aspect of a film is tested and scrutinized before Pixar commits to the costly animation process and hires actors, creates sound effects and commissions a musical score.

A frequent challenge, Mr. Flyvbjerg says, is that people charged with developing a project fail to learn from other projects. He recommends a procedure he calls “reference-class forecasting”: Planners should determine what category of projects is similar to their own and then consider how such projects have fared in practice. Metrics such as the average cost-per-meter of highway bridges, the average time required for kitchen renovations, or the average benefits of new IT systems can be applied to judge whether a proposed project makes sense. By sweeping away “uniqueness bias,” planners can estimate costs and benefits more realistically.

The best way to bring the costs of large projects under control, Mr. Flyvbjerg says, is to break them into small steps that can be repeated. He points to the Madrid Metro, which built 76 stations and 81 miles of subway lines between 1995 and 2003. Madrid used a single basic station design and engaged multiple boring machines to mine short stretches of tunnel quickly. The goal wasn’t to build a monument but to serve commuters at a reasonable cost.

There is a lesson here for the U.S., where the cost of building infrastructure has reached heart-stopping levels. The final bill for San Francisco’s Central Subway, a 1.7-mile light rail line that fully opened in early January, will be roughly \$1.2 billion per mile. A recent estimate prices the first phase of California’s high-speed rail project, between San Francisco and Anaheim, at \$200 million per mile. While countries around the world are building massive transit and rail systems

While countries around the world are building massive transit and rail systems at a fraction of the U.S. cost, many American officials share the fatalism of a former head of New York's Metropolitan Transportation Authority, who opined: "The cost of construction is what the cost of construction is." Bent Flyvbjerg could not disagree more.

Mr. Levinson's books include "The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger."

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