



INFRASTRUCTURE, SAFETY,
AND ENVIRONMENT

***Explaining and Controlling “Optimism
Bias” in Public Investment Projects***

Presented at WORLD BANK TRANSPORT WEEK

March 2009

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Boston Central Artery: The “Big Dig”

- **Original cost estimate: \$2.6 billion**
- **Actual Cost to Complete: \$16 billion - \$17 billion**
- **Original completion date: 1998**
- **Actual completion date: 2007 - 2008**



San Francisco Bay Bridge

- **Replacing eastern span because of seismic problems revealed by Loma Prieta Earthquake**
- **Cost estimate of \$1.6 billion in 2001 for the largest component contract**
- **Bids opened in 2004; a single bid was received for \$5.4 billion**



Miami Subway

- **Forecast daily riders:** 202,000
- **Actual daily riders:** 36,700
- **Forecast capital cost:** \$1.1 b
- **Actual capital cost:** \$1.3 b
- **Forecast annual oper cost:** \$29.4 m
- **Actual annual oper cost:** \$37.9 m

All costs in 1988 dollars

Miami Subway - Continued

- **Forecast total cost per passenger: \$2.41**
- **Actual total cost per passenger: \$16.73**
- **Actual nearly SEVEN TIMES estimate**
- **Forecast subsidy per rider @ \$1.50 fare: \$0.91**
- **Actual subsidy per rider @ \$1.50 fare: \$15.23**

Amazing but True

- **Consulting firm that did the forecasts for Miami was later hired to do them for Los Angeles subway because of a “track record of success”**
- **What is the measure of success?**

Washington Public Power Supply (WPPS)

- **Forecasts of large power demand growth**
- **Largest default of a public utility in 1984**
- **Built several nuclear power plants; four under construction**
- **Conservation reduced demand for power**
- **Failed to pay \$2.5 billion in bonds**

Not Isolated Cases

- **Found to happen all over the world (Flyvbjerg, Bruzelius & Rothengatter studied 200 projects)**
- **86% had substantial cost overruns – averaging 28%**
- **Cost underestimation in 20 countries**
- **Record steady over 70 years despite modern forecasting methods**
- **Channel Tunnel recent example**

Explanations for “Optimism Bias”

- **Technical shortcomings – usually as accounted for by “auditors” – inadequate data, errors in estimating certain critical quantities**
- **Explanations related to “institutional settings” in which the forecasts are made – including “strategic misrepresentation”**



Forecasts Needed to . . .

- . . . allow systematic comparison of alternatives:
benefit/cost analysis based on forecasts**
- . . . support financial planning: bonds, loans**
- . . . guide public policymaking**

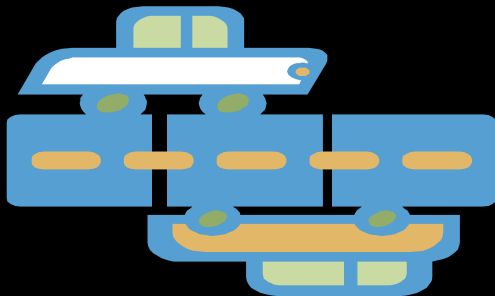
***There is reason to think that some
purposes are being served by forecasts
that are optimistic***

Cannot Happen by Accident

- **Of 35 public transit projects I have studied in the U.S., 33 overestimated patronage and 28 underestimated costs**
- **Random errors or honest mistakes would be more evenly distributed . . . there would be more underestimates of patronage and more overestimates of cost**

Difference Between Highways and Transit in the USA

- Highway funds distributed by formula
- Transit funds discretionary or prescribed by Congress
- Highway cost overruns less frequent and less dramatic
- Forecasting models are same for both modes



Forecasts Have Salience but Cannot be Verified

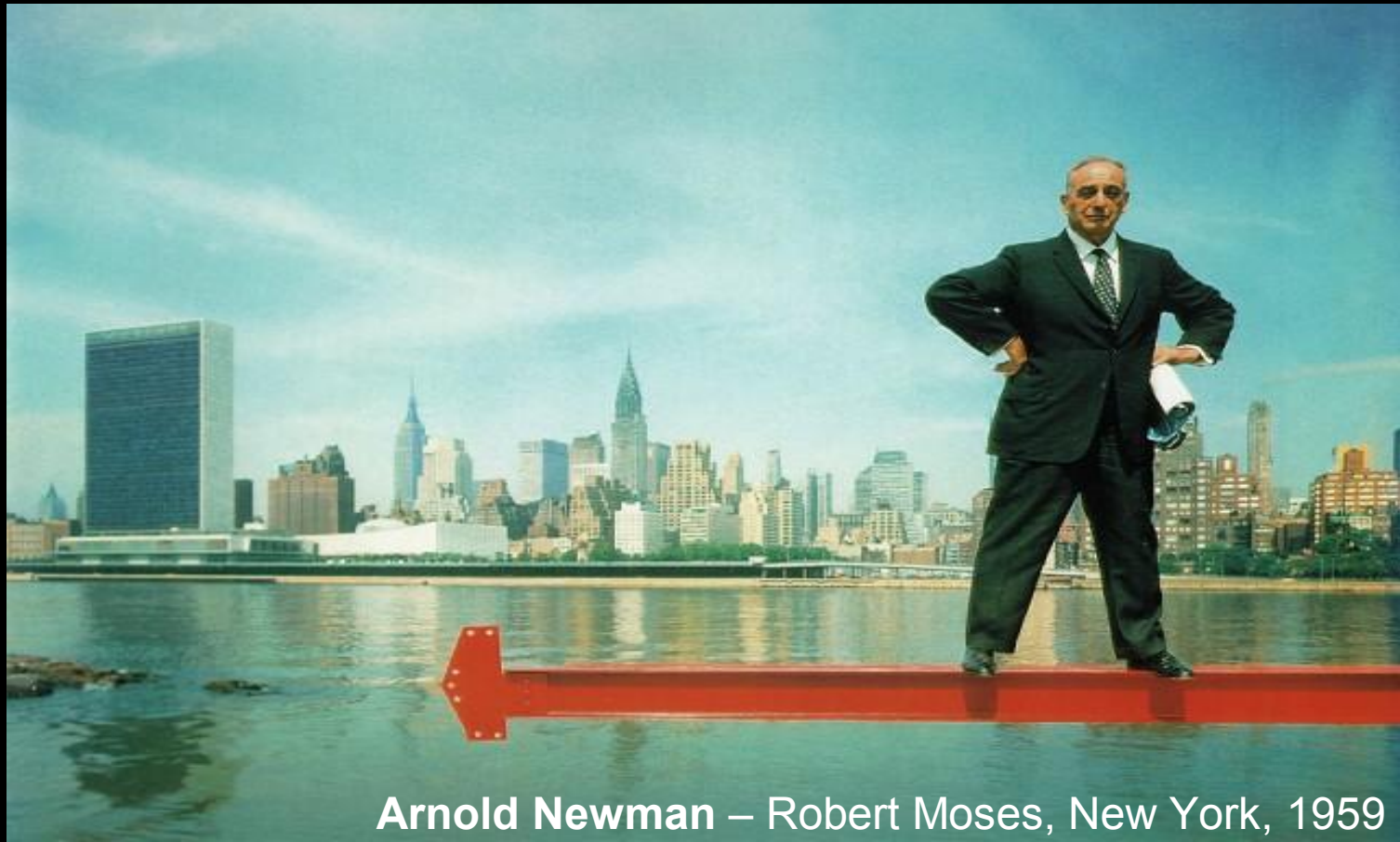
- **Forecast cannot be verified if project is not built**
- **If purpose of forecast is to justify the project the cost overrun or patronage result is irrelevant because it happens **AFTER** the project is built**
- **Forecasts needed to justify actions undertaken for political reasons**
- **The issue of “many hands” absolves any individual of “responsibility”**

Assumptions Critical to All Forecasts

- **Ascher quotation....**
- **As methods improve, assumptions are still needed**
- **We teach methods in universities, but cannot teach students how to make wise assumptions**
- **It is difficult or impossible to hold someone liable for making assumptions that in retrospect seem to have been incorrect**

Robert Moses Was the Master

- Master builder & master politician
- Quotation from Robert Caro's biography, **THE POWER BROKER**



Arnold Newman – Robert Moses, New York, 1959

Cases from My Own Research

- **Scott in large southern city**
- **Rebecca in smaller western city**
- **President of consulting firm**



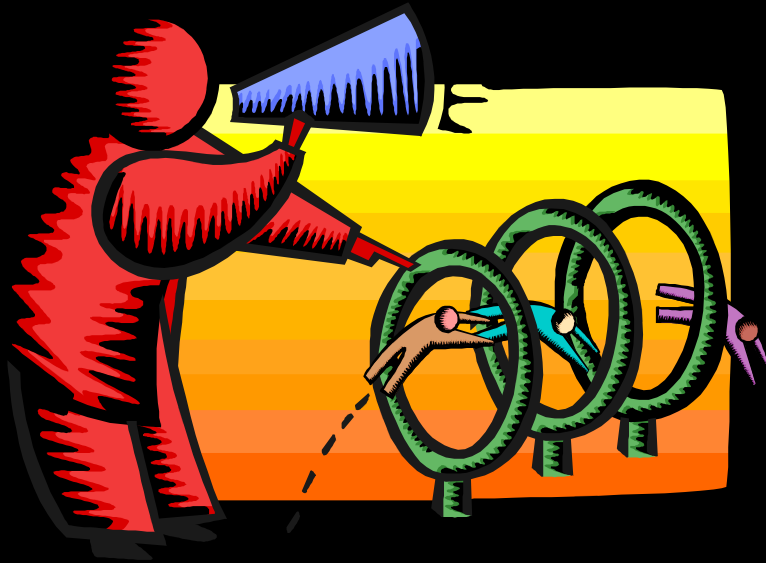
Can anything be done?

- **Only if there is a political consensus that something SHOULD be done; in many cases political leaders are well aware of the problem and use forecasts as political levers**
- **Peer review of forecasts is now done in quite a few countries**
- **Independent audits**
- **Require publication and discussion of assumptions**
- **Hold forecasters accountable: penalties?
Much more difficult**

Dramatic Progress in Last Decade

- **Federal Transit Administration requires publication of assumptions and reviews and critiques them; makes public their critique of an applicant's forecasts; examines accuracy of previous forecasts made by same agency and consultants**
- **Reference Class Forecasting is being used to an increasing extent by lending institutions**

Thank you!



Now it's time for your
comments, questions,
and opinions . . .



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