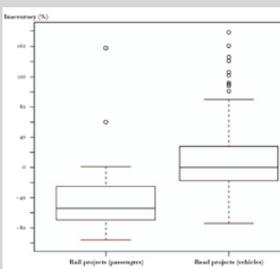
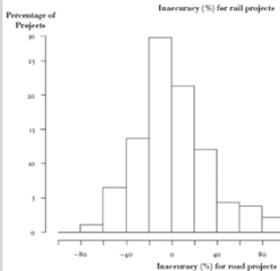
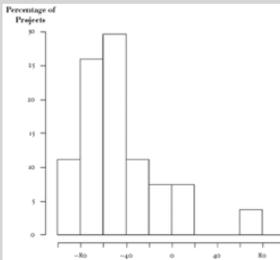


How (In)accurate Are Demand Forecasts in Public Works Projects?

The Case of Transportation

Bent Flyvbjerg, Mette K. Skarris Holm, and Soren L. Buhl



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THE CASE FOR PLANNERCIDE

Forecasts shoddy for roads, mendacious for transit - Flyvbjerg

Analysis of traffic forecasts and actual first year traffic at 210 international road and rail projects concludes that the road forecasts are inaccurate with about half out by over 20%, but not seriously biased up or down. Transit ridership forecasts, by contrast, are grossly inaccurate, heavily biased upward, and clearly manipulated by special interests. The average error of transit ridership is +106%. Recent projects show no improvement over earlier ones. The study by Bent Flyvbjerg, Mette Holm and Soren Buhl (FHB) two planners and a mathematician at Aalborg University in Denmark is published in the Spring 2005 edition of the Journal of the American Planning Association - www.planning.org/japa/pdf/JAPAFlyvbjerg05.pdf

FHB say there is a "massive problem with inflated rail passenger forecasts." 90% are inflated and almost three-quarters overpredict traffic by more than two-thirds. Actual rail passenger traffic in the sample of 27 new rail projects was 49% of forecast traffic.

183 road projects were examined (170 roads, 10 bridges, 3 tunnels) and on average traffic was 9.5% higher than forecast. There was no split done between toll and non-toll roads. But for the sample which included both:

- * half of the forecasts were out by at least 20%
- * a quarter of the forecasts were out by 40% or more
- * 13% were out by 60%

The corresponding error rates for rail passenger forecasts were 84%, 72% and 40%.

"We see that the risk is substantial that road traffic forecasts are wrong by a large margin, but the risk is more balanced than for rail passenger forecasts. Testing the difference between rail and road, we find at a very high level of statistical significance that rail passenger forecasts are less accurate and more inflated than road vehicle forecasts," they write.

"Any traffic forecast is done in the context of uncertainty about many of the key inputs and drivers of the projection demographics, economic factors, technology, and differences between the assumed and actual operating service plans that are implemented... Simple uncertainty would account for the type of inaccuracy we find with road traffic forecasts, with a fairly even distribution of high and low forecasts. Simple uncertainty does not seem to account for the outcome of rail travel forecasts, however. Such forecasts are overestimated too consistently for an interpretation in terms of simple uncertainty to be statistically plausible. We conclude that the traffic estimates used in decision making for rail infrastructure development are highly, systematically, and significantly misleading (inflated)."

FHB say one problem in road forecasts is "assumption drag" - assuming recent trends will continue. Road forecasts though not as bad are getting somewhat worse than they were, mostly in the direction recently of underestimating traffic. Forecasts for rail are not improving.

"Rail passenger forecasts are as inaccurate - that is, inflated - today as they were 30 years ago. Road vehicle forecasts even appear to have become more inaccurate over time, with large underestimations towards the end of the 30-year period studied. If techniques and skills for arriving at accurate traffic forecasts have improved over time, our data do not show it."

Rail forecasts appear to be the subject of "strategic misrepresentation." Exaggerated forecasts pay off for project managers and promoters, FHB say, so they deliberately promote them. In addition "a strong political or ideological desire to see passengers shifted from road to rail" may contribute to the strategy of misrepresentation. (p138) Forecasts become part of political rhetoric of politicians trying to publicize their program.

Reasons for error

FHB did a survey asking those involved why the projects had not met forecast. In the case of rail they frequently pleaded an inability to gain acceptance of realistic numbers that run counter to "idealistic policies." (p139) Fully 25% of those involved in rail projects said the forecasts did not work out because they were "deliberately slanted." 29% said wrong trip distribution was the problem. For roads, trip generation and failure in the land use modeling were the two leading sources of error.

"Rail forecasts are systematically and significantly overestimated to a degree that indicates intent and not error on the part of rail forecasters and promoters. The stated causes, with 'deliberately slanted forecasts' as the second to largest category, corroborate this interpretation, which corresponds with findings by (others). Road forecasts are also often inaccurate, but they are substantially more balanced than rail forecasts, which indicates a higher degree of fair play in road traffic forecasting."

"This is not to say that road traffic forecasts are never politically manipulated. It is to say, however, that this appears to happen less often and less systematically for road than for rail projects. It is also not to say that road projects generally have a stronger justification than rail projects - just that they have less biased forecasts."

Some planners do want good forecasts, others are opportunists

FHB say planners are divided into two groups, those who want good forecasts but don't get them, and planners who just want high rail forecasts, and do get them. (p140) For those who want better guidance in order to size the project correctly they suggest reference class forecasting - a second view based on the performance of similar projects.

FHB say a major source of error is insider enthusiasm, and the best check is bringing in outsiders without an emotional or personal stake in the project. Simple forecasts based on averaging the experience of roughly similar projects turns out to be "much more accurate" than internally based forecasts built on intricate data and calculation generated within the project being forecast.

"The traditional way to think about a complex project is to focus on the project itself and its details, to bring to bear what one knows about it, paying special attention to its unique or unusual features, trying to predict the events that will influence its future. The thought of going out and gathering simple statistics about related cases seldom enters a planner's mind."

But those simple reference case statistics, FHB say, will do better than the more expensive and complex internally-based forecasting.

A focus on the inside details "is the road to inaccuracy," they say. (p142)

The Dark Side of planning

Very often planners are a large part of the problem however, FHB write. Accurate forecasts do not serve their purposes because they are more interested in using numbers to promote the project, what FHB call the "dark side" of forecasting.

"Forecasting is here mainly another kind of rent-seeking behavior, resulting in a make-believe world of misrepresentation that makes it extremely difficult to decide which projects deserve undertaking and which do not." (p142)

Incentives need to be changed:

- * higher levels of government should not offer grants for a specific mode such as rail or road
- * forecasts should be peer-reviewed and, where government money is involved, reviewed by independent auditors
- * forecasts should be benchmarked against comparables
- * forecasts should be subject to public scrutiny
- * forecasters should be held accountable and be forced to defend their forecasts against peer critique

* projects with inflated net benefits should be stopped

* professional and sometimes criminal penalties must be enforced against forecasters who consistently or wilfully misforecast

* forecasters should share responsibility for financial failure from poor forecasts.

"Malpractice in planning should be taken as seriously as it is in other professions. Failure to do this amounts to not taking the profession of planning seriously."

FHB say wherever possible government projects should be made contingent on investors for at least one-third of the capital.

"Private lenders, shareholders, and stock market analysts would produce their own forecasts or would critically monitor existing ones. If they were wrong about the forecasts, they and their organizations would be hurt. The result would be more realistic forecasts and reduced risk."

Full government financing of major transport projects should be avoided, they write.

Grain of salt may not be enough

"We conclude that the patronage estimates used by planners of rail infrastructure development are highly, systematically, and significantly misleading (inflated). This results in large benefit shortfalls for rail projects. For road projects the problem of misleading forecasts is less severe and less one sided than for rail. But even for roads, for half the projects the difference between actual and forecasted traffic is more than +/-20%. On this background, planners and decision makers are well advised to take with a grain of salt any traffic forecast that does not explicitly take into account the uncertainty of predicting future traffic. For rail passenger forecasts, a grain of salt may not be enough." TOLLROADSnews 2005-04-14

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