



Infrastructure Decision Making and Cost Containment

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Cost Overruns and Delays: A Problem that Unites the Nation



News / GTA

Union Station reno tab increases \$80 million

The city needs to do a better job on renovation planning after the Union Station makeover rose by \$80 million, a budget committee member says.

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Laval's Place Bell arena to cost \$50M more in overruns

Mayor Marc Demers blames former mayor Gilles Vaillancourt for hiding true costs from taxpayers

CBC News Posted: Mar 16, 2014 2:11 PM ET | Last Updated: Mar 16, 2014 2:11 PM ET



An illustration of the arena planned for Laval. (Radio-Canada)

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PUBLIC FUNDS
Energy minister apologizes for cost overruns and delays of BC Hydro IT update

JUSTINE HUNTER
VICTORIA — The Globe and Mail
Published Thursday, May 14, 2015 3:00AM EDT
Last updated Friday, May 15, 2015 12:04PM EDT

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June 4, 2015

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CP | By Steve Rennie, The Canadian Press
Posted: 11/01/2012 1:58 pm EDT | Updated: 01/23/2014 8:58 pm EST

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Business Tax Season

More cost overruns for Horizon oilsands project

CBC News Posted: Feb 12, 2009 11:04 AM ET | Last updated: Feb 12, 2009 11:21 AM ET

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Canadian Natural Resources warned Tuesday that cold weather could boost the cost of Phase 1 of its Horizon oilsands project in northern Alberta by up to \$1.9 billion.

In its quarterly report on the huge project, Canadian Natural said if there are no improvements in productivity during the remainder of the construction period, the cost estimate for the first phase would need to be increased by 28 per cent — an extra

BloombergBusiness News Markets Insights Video

Bombardier Investors Losing Faith After Jet Delays

by Frederic Tomesco

February 3, 2015 — 12:01 AM EST | Updated on February 3, 2015 — 4:41 PM EST

Cost Overruns and delays are a Global Challenge

THE HINDU

Online edition of India's National Newspaper
Monday, Jun 18, 2007

Delayed projects and cost overruns

Feasibility studies and acquisition of land hold the key; political factors complicate the projects' schedule

'There has to be a timetable in place for land acquisition, handing over possession of land, payment of costs and completion of various phases of the project.'

Photo: K. Murali Kumar



HITS ROADBLOCK: A view of the outer peripheral road connecting Mysore Road and Kanakapura Road, being constructed by Nandi Infrastructure Corridor Enterprise Limited (NICE) as part of Bangalore-Mysore Infrastructure Corridor (BMIC) project.

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Why do costs over-run?

Analysis
By Brian Wheeler
Political reporter, BBC News

The 2012 Olympics is the latest big government project whose budget has soared higher than originally forecast.

So why do ministers appear to keep getting their sums wrong?

Are they trying to pull the wool over taxpayers' eyes with unrealistically low estimates, as their opponents claim?

Or is there something in the DNA of big infrastructure projects which means costs



The Dome became a test of political virility

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NOVA SCOTIA *Island of possibilities*

US | Tue Jan 27, 2015 5:57pm EST Related: U.S.

Washington state bill would scrap delayed Seattle tunnel project

SEATTLE | BY VICTORIA CAVALIERE

Two Washington state lawmakers have introduced a bill to scrap a \$3.1 billion roadway overhaul and expressway tunnel excavation in Seattle, branding the project a failure beset by cost overruns, construction mishaps and delays.

The project to replace an aging waterfront freeway in downtown Seattle has been stalled since December 2013, when the world's largest earth-boring machine, nicknamed Bertha, became stuck underground after drilling just one-tenth of a planned tunnel route.

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Edinburgh's tram system opens - £375m over budget and three years late

Edinburgh people cheer as first service leaves city's Gyle shopping centre amid admissions project had been a 'shambles'

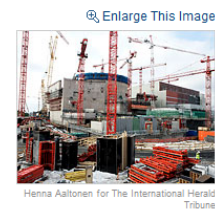


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In Finland, Nuclear Renaissance Runs Into Trouble

By JAMES KANTER
Published: May 28, 2009

OLKILUOTO, Finland — As the Obama administration tries to steer America toward cleaner sources of energy, it would do well to consider the cautionary tale of this new-generation nuclear reactor site.



Henna Aaltonen for The International Herald Tribune

After four years of construction and thousands of recorded defects and

The massive power plant under construction on muddy terrain on this Finnish island was supposed to be the showpiece of a nuclear renaissance. The most powerful reactor ever built, its modular design was supposed to make it faster and cheaper to build. And it was supposed to be safer, too.

But things have not gone as planned.

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Why are overruns an important policy topic?

- Waste of money and can put project viability at risk
- Embarrassing and costly for all involved
- At a time of immense interest in spending on infrastructure, persistent overruns risk losing public support for this initiative



TransLink has been repeatedly called wasteful by the 'left' side, but the numbers question that assertion. (CBC)

The Persistence of Cost Overruns: Transport Sector Example

BENT FLYVBJERG, METTE SKAMRIS HOLM, AND SØREN BUHL

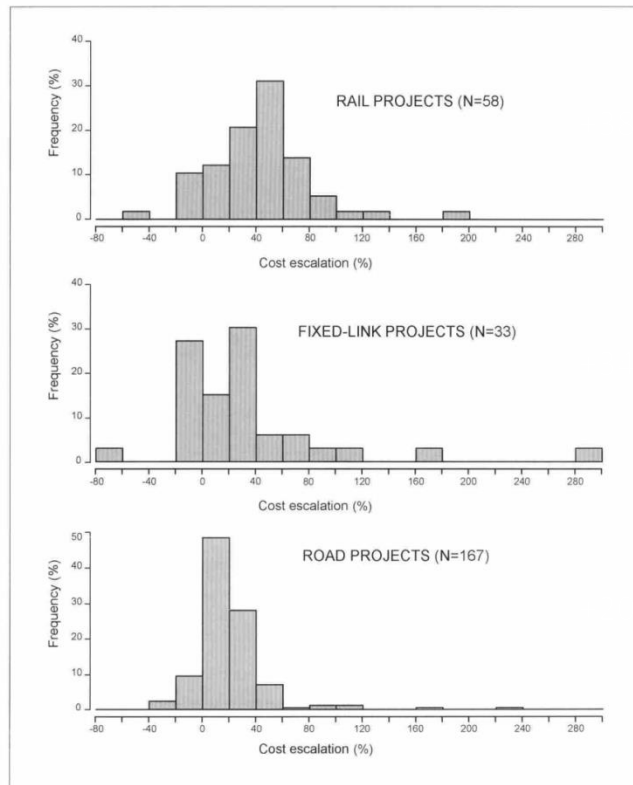


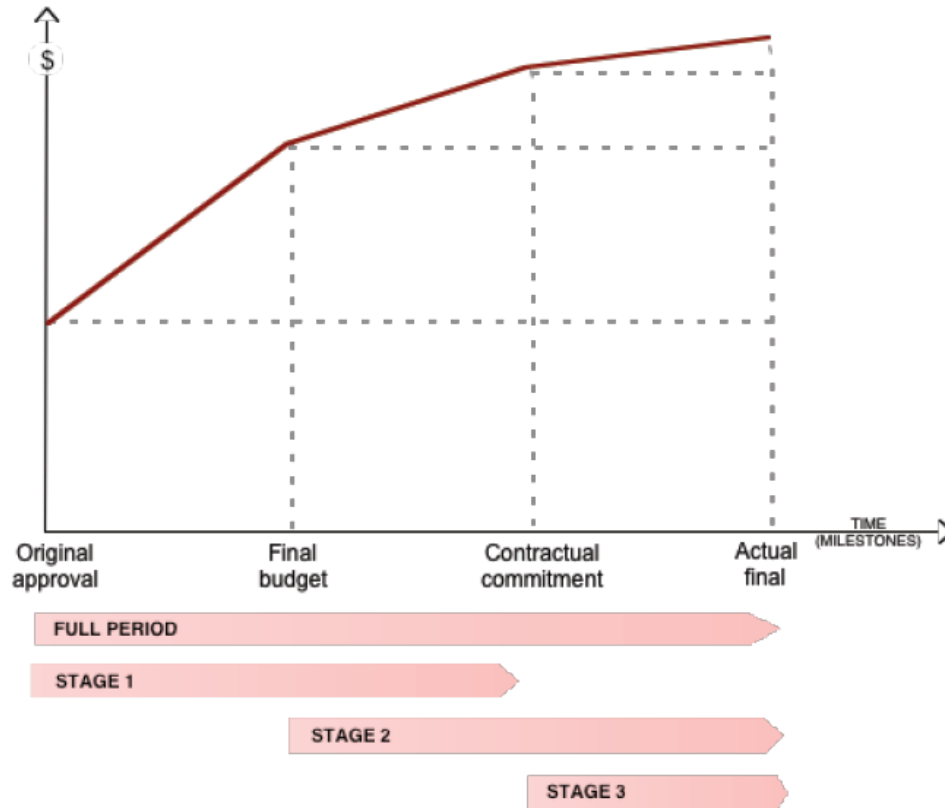
FIGURE 2. Inaccuracy of cost estimates in rail, fixed-link, and road projects (fixed prices).

Cost Overrun by the numbers

- 9/10 projects experience a cost overrun
- Average size of cost overrun for all project types is 28%
- Average overrun for transit projects is 45%
- Average overrun for bridges or tunnel fixed links are 34%
- Average overruns of roads is 20%
- Pattern unchanged for 70 years that data is available

When do Overruns Occur in the Planning Process?

COST OVER-RUNS BY STAGES AND MILESTONES

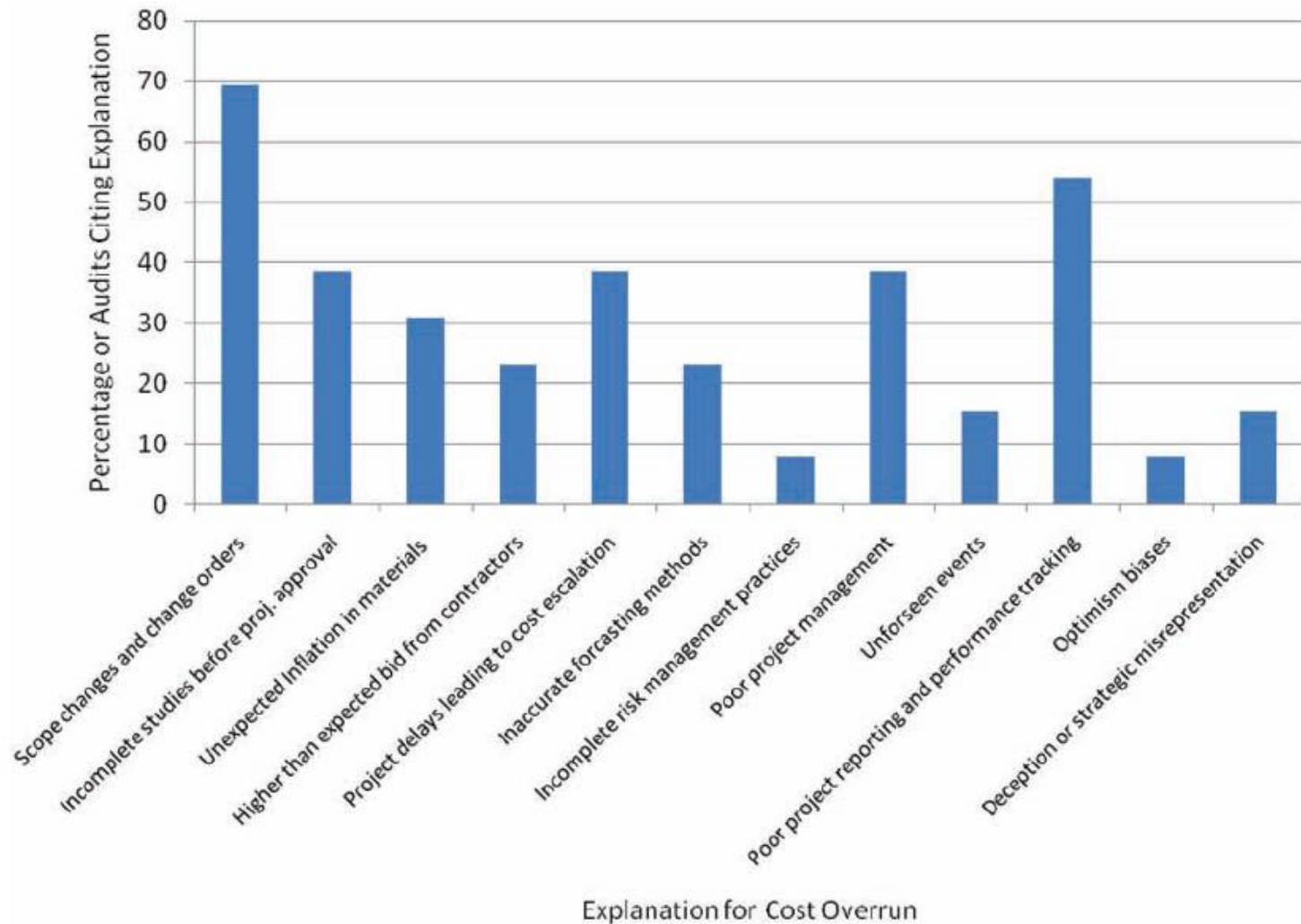


Source: ACG/University of Melbourne

Why do Overruns Occur?

- **Technical difficulties** forecasting uncertain futures, scope changes or delivering complex projects
 - Likely not only explanation because we would expect prevalence of overruns to decline over time as project managers become more skilled
- **Social-Psychological forces** lead individuals and organizations to accentuate the positive when forecasting the future
 - Optimism biases – once identified can devise strategies to account for
- **Political-economic forces** where few parties have an interest in avoiding unrealistic expectations
 - Public sector to get projects approved in context of competition for scarce funding
 - Private sector low bid to win job, then search for change orders

Academics and Auditors



Current Strategies to Reduce Cost Overruns

- Reference Class Forecasting (Flyvbjerg, 2007; Lovallo and Khanneman, 2003)
- Optimism Uplifts (Flyvbjerg, 2004)
 - Technical approaches to achieve more accurate forecasts if problem is a technical one
- Develop new models of partnership, which transfers responsibility for design, construction, financing and operation of public services to the private sector;
 - Seek to transfer risk to private sector, who have a financial incentive to be more realistic in their forecasts

What is needed is to create institutional cultures that reward accurate forecasting and construction management, while de-legitimizing the practice of being overly optimistic to get projects started

Favoured Strategy to Control Infrastructure Cost Overruns in Canada: PPPs On-time and On-Budget

- **Ontario:** A study commissioned by Infrastructure Ontario found that of 30 projects delivered since 2007 by the agency, 29 were completed below budget and 22 were conducted on time
- **British Columbia:** “All B.C. public private partnerships (PPPs) to date have been delivered on time and on budget.”
(CEO Partnerships BC, 2009)



The screenshot shows the top of a news article on The Globe and Mail website. The masthead is red with the text 'THE GLOBE AND MAIL' and a small red maple leaf icon. To the right is a search bar with the text 'Search: | News & Quotes | Jobs' and a placeholder 'Q- Enter a term, stock symbol or company name'. Below the masthead is a navigation bar with links: Home, News, Opinion, Business, Investing, Sports, Life, Arts, and Tr. Under 'News' are sub-links: National, Politics, British Columbia, Alberta, Toronto, World, and Video. Below this is a banner for 'Try Globe Unlimited - 1 month for just 99¢' with icons for a computer, smartphone, and tablet, and the text 'And get unl all your dev'. The article title is 'Wynne defends public-private partnerships for infrastructure projects' by 'ADRIAN MORROW'. The byline says 'TORONTO — The Globe and Mail' and the publication date is 'Published Wednesday, Dec. 10, 2014 9:33PM EST'. Below the title is a photo of Kathleen Wynne speaking at a podium. The article text begins with 'Premier Kathleen Wynne is defending Ontario's use of public-private partnerships, saying the government "does not have the capacity" to build new schools, bridges and light-rail lines itself.' There are 12 comments and social media sharing icons for Twitter (28), Facebook (11), and LinkedIn (17).

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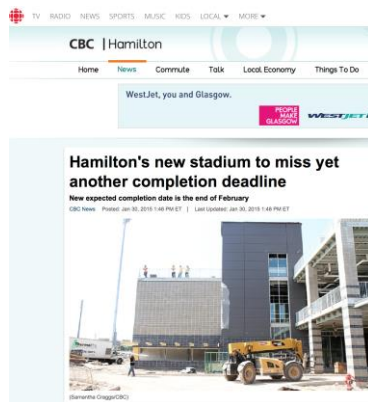
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Wynne defends public-private partnerships for infrastructure projects
ADRIAN MORROW
TORONTO — The Globe and Mail
Published Wednesday, Dec. 10, 2014 9:33PM EST
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Premier Kathleen Wynne is defending Ontario's use of public-private partnerships, saying the government "does not have the capacity" to build new schools, bridges and light-rail lines itself.

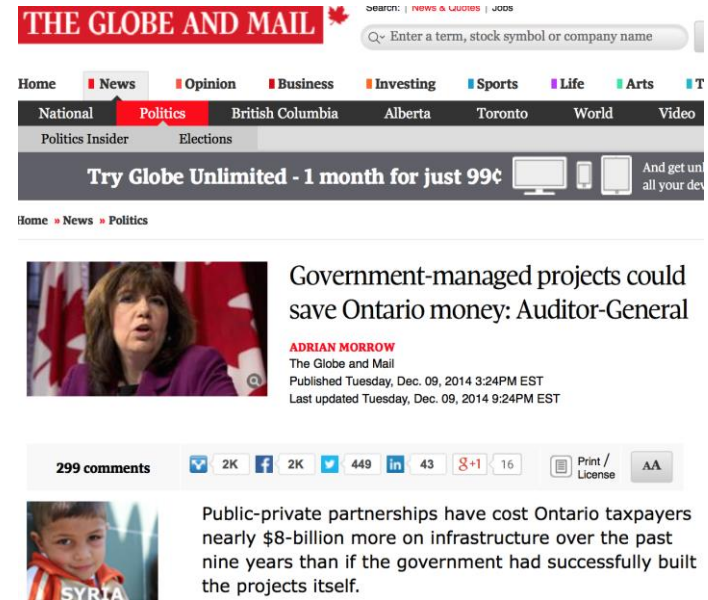
On-Time and On-Budget?



Project	Decision Point budget	PPP Final Contracted Price
Abbotsford Hospital and Cancer Centre	\$211,000,000	\$355,000,000
Canada Line	\$1,550,000,000	\$2,000,000,000
Golden Ears Bridge	\$600,000,000	\$808,000,000
Sea-to-Sky Highway Project	\$600,000,000	\$789,000,000
William Bennett Bridge	\$100,000,000	\$144,000,000

PPPs On-time, On-budget, at what cost?

- Edwards et al. (2004), concluded that in the UK, the Highways Agency **paid a 25% premium** on construction cost on its first four PPP road projects. This was to ensure that they were built “on time and to budget”



The screenshot shows the top of a news article on The Globe and Mail website. The header includes the site's name, a search bar, and navigation links for various sections like News, Opinion, Business, etc. The article title is 'Government-managed projects could save Ontario money: Auditor-General' by Adrian Morrow, dated December 9, 2014. Below the title, there are social media sharing icons and a comment count of 299. A small image of a child is visible on the left side of the article text.

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Government-managed projects could save Ontario money: Auditor-General
ADRIAN MORROW
The Globe and Mail
Published Tuesday, Dec. 09, 2014 3:24PM EST
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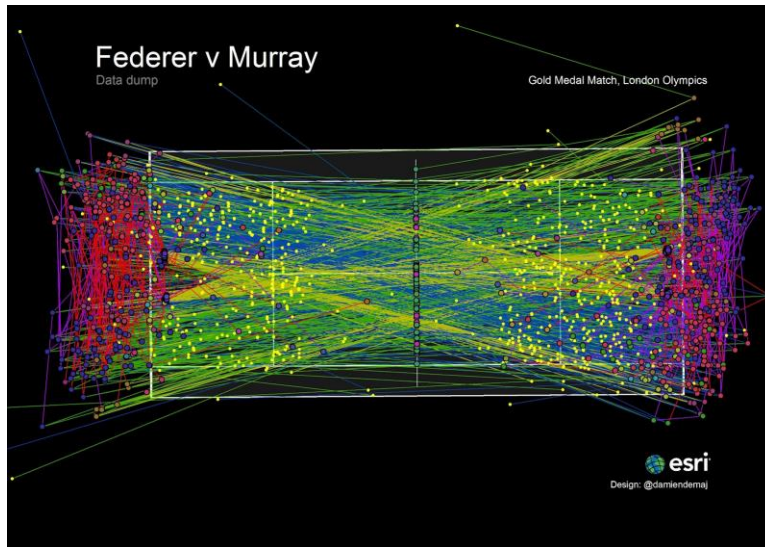
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Public-private partnerships have cost Ontario taxpayers nearly \$8-billion more on infrastructure over the past nine years than if the government had successfully built the projects itself.

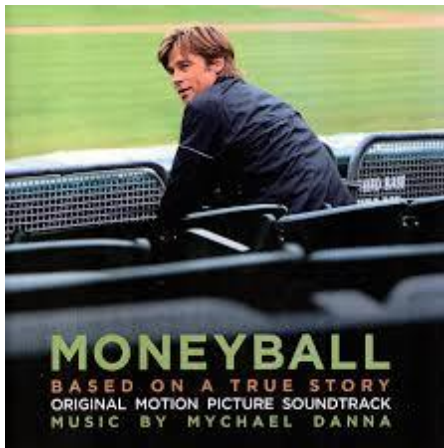
“While projects managed by the private sector for the most part were delivered on time and cost about the same as their contracts specified, according to Infrastructure Ontario’s estimates, the tangible costs are still almost \$8 billion higher than **if the public sector had been able to contract out the projects to the private sector and oversee their successful delivery.**”

Auditor

Infrastructure Procurement Analytics?



- Estimated and actual construction cost per unit
- Penalties for non-performance
- Change orders
- Post-construction performance
- Asset class performance
- Performance variations by firms and project managers



An Idea whose time has come?



WWW.IPPR.ORG

Benchmarking and the Bottom Line: A proposal to improve infrastructure value for money in Britain

A submission to ippr's Britain's Got Brains competition

by Matti Siemiatycki

October 2008

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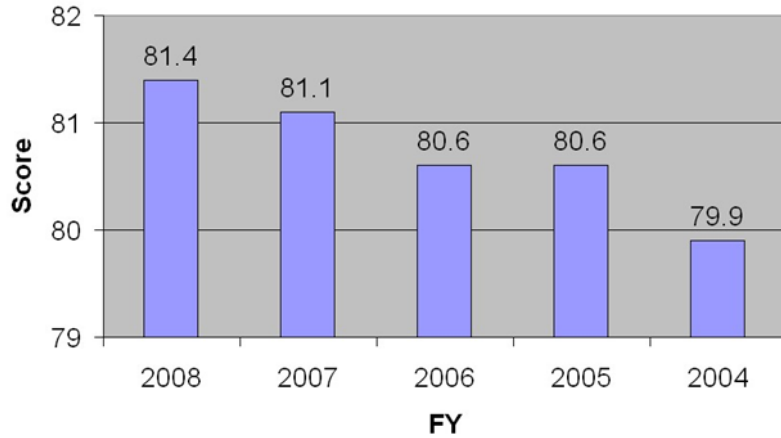
2008 Institute for Public Policy Research -
Britain's Got Brains Competition Winner

- In this context, can overruns be reduced through the development of benchmarks based on post project reviews,
 - Level of construction/Delivery cost overrun
 - Punctuality of project completion
 - Ongoing quality of building
- Benchmarked data **linked with procurement systems** that make it easier for companies with good records to obtain future contracts, while encouraging others to improve their performance
- Develop predictive models to understand factors that elevate risk of overruns

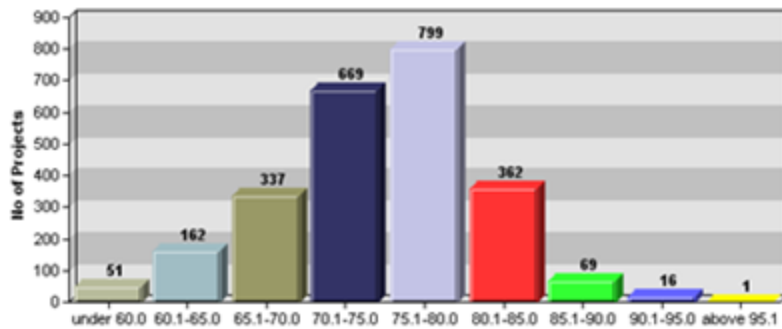
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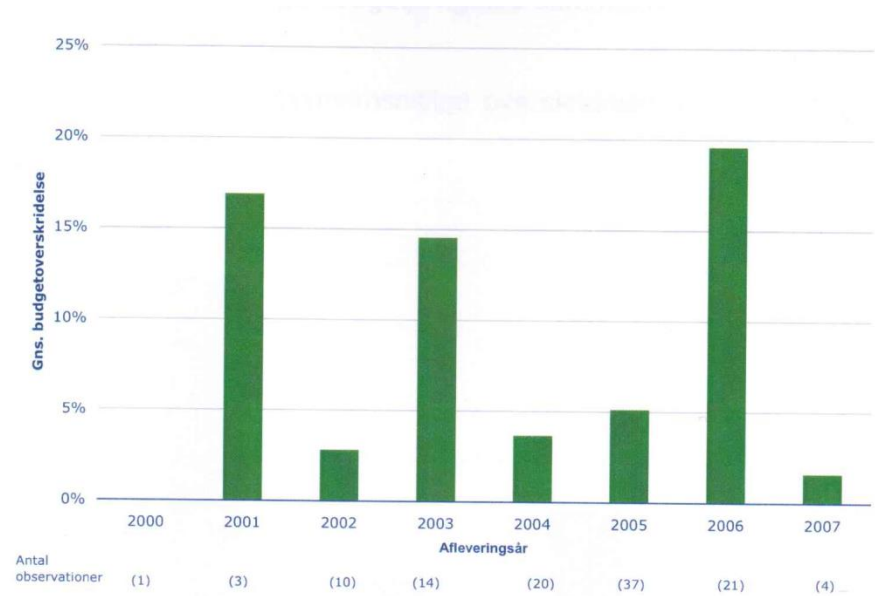


Distribution Chart of Conquas Scores From 1986 To 2009



Calculate Scores from FY: 1986 To FY: 2009 submit

Overruns on Danish Construction projects by year



Why is analytics not happening more in Canadian Infrastructure Procurement?

- Lack of data availability and sharing
- Concerns about accuracy and reliability of the measures – will it actually improve performance?
- Reputational risk - fear of being made to look bad with actual data on past performance
- Pushback from contractors
- Cost of system

Conclusions

- Use data to measure and improve performance by tying it to future procurement
- Become an intelligent buyer of infrastructure
 - Contracting support and skill building
 - Measure cost per unit, not just cost overruns
- PPPs – focus on construction risk, but recognize that risk transfer comes at a cost