

Infrastructure Project Prioritization in Theory and Practice: Examples in Federal U.S. and International Programs

Michael Bennon, Dr. Rajiv Sharma
mbennon@stanford.edu, sharma10@stanford.edu



Global Projects Center
Stanford University based Collaboratory
for Research on Sustainability, Finance,
Governance and Management.

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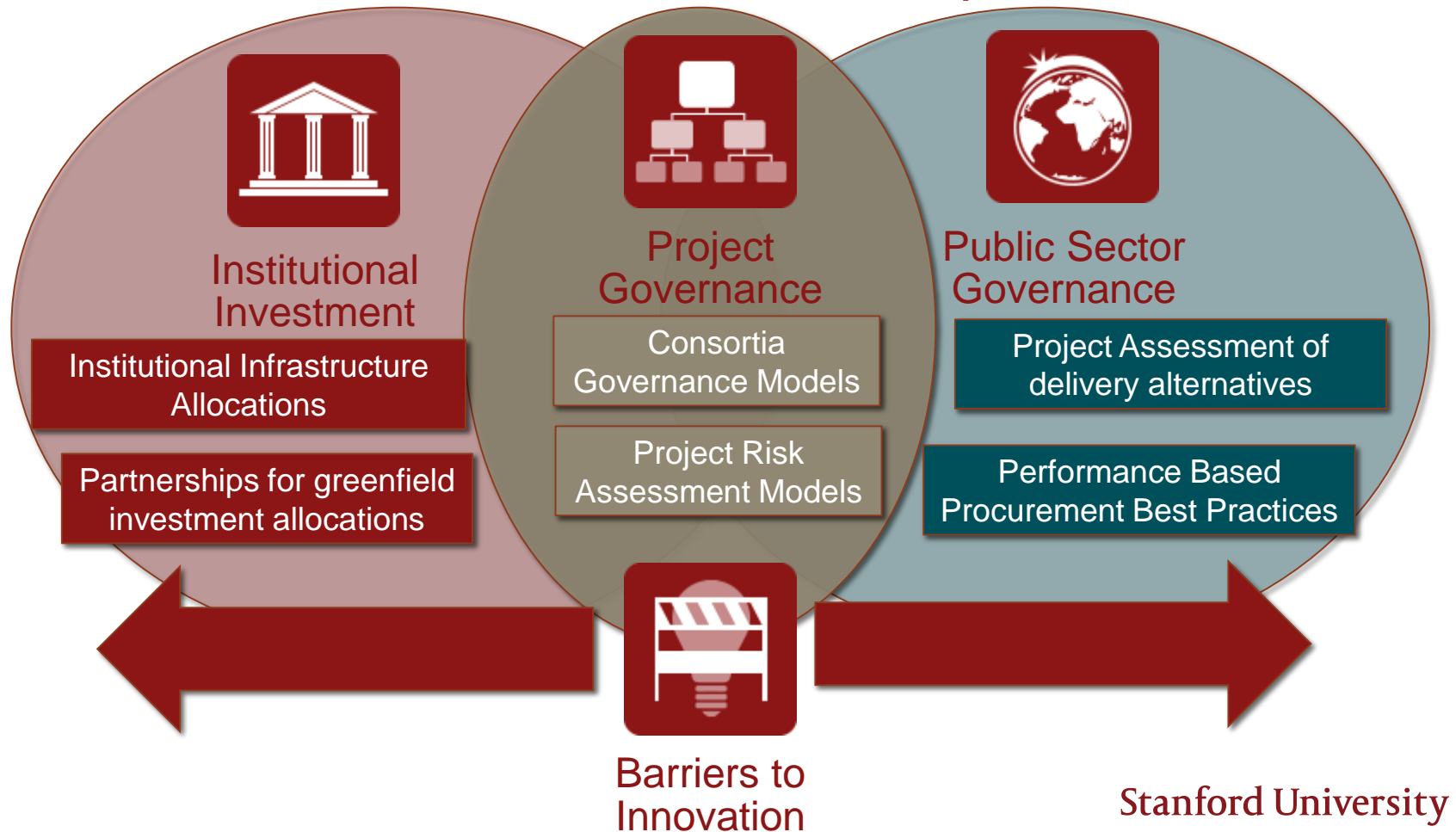
Agenda

1. Introductions
2. Brief Overview of BCA Literature
3. Federal Assessments in Water
4. BCAs in Practice – Cross-Sectoral OMB Policies
5. Federal Assessments in Transportation
6. International Experiences
 - Canada
 - Australia
7. Conclusions and Summary

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The Global Projects Center (GPC) is an interdisciplinary research center at Stanford University that seeks to facilitate understanding of the financing, developing and governance of strategic infrastructure assets.

We conduct research on infrastructure **finance**, **development**, and **investment**



Benefit-Cost Assessment Overview

Benefits

- Consensus best practice
- Naturally cross-sectoral

Disadvantages

- Ex-ante assumption driven
- Increasing scope also increases complexity and decreases transparency
- No upper bound of analysis scope

In Literature

- Political Science – politicization of BCA development
- Infrastructure – Inaccuracy of BCAs ex-post
- Economics – Criticality (and complexity) of Discount Rates

Federal Assessment in the Water Sector

- Current CEQ guidance (2014) specifies BCA development for federal projects across water agencies
- Current “state of practice” largely derived from long history of USACE use of BCA in selecting projects.

USACE Practice Evolution

- Formalized in early 1980’s – one “mandated” account in National Economic Development. Other accounts are Environmental Quality, Other Social Effects, Regional Development.
- Adapted in response to criticism from academia, interest groups, oversight

Key Themes

- Inclusion of other development accounts
- Environmental Quantification
- Updated and external reviews of economic models
- Broadening of scope and interaction between development accounts
- Additional scenario development

OMB v. Water Agency Federal Assessment

- Water sector BCA evolution likely driven by several factors
 - History of use
 - Importance of the analysis – BCAs determine which projects get authorization requests to Congress
- Cross-sectoral Analysis at OMB v. Water Agencies
 - Key point of differentiation in Discount Rate
 - USACE: water discount rate tied to long-term public securities (3.38%)
 - OMB: private sector pre-tax rate of return (7%)
- Divergence of analysis for authorization and budgeting leads to two BCRs for a given federal water project
- Measure of the discrepancy: USACE reported \$97bn “backlog” of projects that have been studied and authorized

Federal Assessments in the Transportation Sector



Key motivations for using BCA in Transport:

- Measure the benefits that are difficult to capitalize - reduced journey times, reduced accident costs, environmental impacts

The types of projects that BCA has generally been used for:

- The potential project expenditure is significant enough to justify spending resources on forecasting, measuring and evaluating the expected benefits and impacts.
- The project motivation is to improve the transportation system's efficiency at serving travel and access-related needs, rather than to meet some legal requirement or social goal.
- Environmental or social impacts that are outside of the transportation system efficiency measurement are either: (a) negligible in magnitude, (b) measurable by CBA or another appropriate method.

Federal Assessments in the Transportation Sector



Not used in isolation when:

- projects might need to be considered in terms of their effectiveness at meeting certain key objectives (air pollution, new jobs, mobility for disadvantaged).
- Projects might need to meet legal requirements
- Projects need to address distributional equity concerns i.e. legal, political or moral desires for fairness.
- Projects motivated by specific economic development goals
- Projects that are merely maintaining, renovating or rehabilitating already-built transportation facilities, where the benefits of such projects have already been illustrated.

Federal Assessments in the Transportation Sector

US Department of Transport Use of CBA

- the main benefits of using BCA is the rigor it brings to assessing particular investments and the impact the investments will have on users and of the transportation system as a whole.
- encouraged states to incorporate the BCA methodology into any relevant planning activities.
- primarily used BCA in appraising applications for grants through the TIGER (Transportation Investment Generating Economic Recovery) or INFRA (Infrastructure for Rebuilding America) discretionary grant programs.
- **DOT Guidelines:**
 - well defined baseline, Demand forecasting for period of 20 years following construction, discounting usually at 7 percent.
 - benefits include value of travel time savings, vehicle operating costs savings, safety benefits, emissions reduction benefits.
 - costs include capital expenditures, operating and maintenance expenditures, residual value and remaining service life.

Federal Assessments in the Transportation Sector



US Department of Transport Use of CBA

- Despite strong emphasis placed on BCA by the DOT, outcome of BCA has been found not to be a strong determining factor in whether a project received a grant by the Federal government.
- Also, despite the DOT encouraging state DOTs to adopt BCA in their project assessment, many States have found it difficult to use:
 - BCA data and modelling needs can strain agency budgets, staff time, and other resources.
 - Requires expertise that States might not possess and presents difficulties for explaining results to stakeholders.
 - specific areas of difficulty include: travel time reliability, applying BCA to operations and maintenance area.

International Comparable Programs

National Infrastructure Prioritization in Canada

- CBA has been adopted in Canada primarily to support regulatory decisions.
- 1999 Canada Govt. Policy – CBA must be carried out for all significant regulatory proposals to assess their potential impacts on the environment, workers, businesses, consumers, and other sectors of society.
- 2007 – new directive was that departments and agencies assess regulatory and non-regulatory options to maximise net benefits to society as a whole.
- Federal Policy in Canada for use of CBA in infrastructure prioritization has been mainly passive.
- Division of powers between federal and provincial levels have been used by the Govt. to take a passive role.
- Decision making around funding has been made at the project level rather than the wider national strategic transport, land-use, context (Bottoms up rather than national scope or strategic importance).
- Transport sector – projects under various funding categories have been approved on basis of ‘shovel-readiness’ and dispersed on a ‘fair share’ basis rather than on CBA.

International Comparable Programs

National Infrastructure Prioritization in Canada

- Investing in Canada program 2015:
 - \$180 bn over 12 years
 - 5 main infrastructure priorities – Public Transit, Green, Social, Trade and Transportation, Rural and Northern Communities
- Federal funding is allocated to the five priority areas through specific funds
- Bilateral agreements are made Federal Govt. (Infrastructure Canada) and fourteen provinces and territories of the country.
- Each agreement gives provinces and territories the flexibility to prioritize projects that meet their needs, including projects that may not have fit into eligible asset categories in previous programs.
- Provinces and territories are responsible for identifying projects and are required to submit a list to Infrastructure Canada for approval.
- Projects are determined eligible based on the requirements set out by the fund that is being used for the potential investment. If the projects meet the definition and requirements, the project will receive the funding.

International Comparable Programs

National Infrastructure Prioritization in Canada

- Investments are generally targeted at meeting public priorities that will strengthen communities and grow the economy.
- Overall, infrastructure prioritization is divulged to Provinces, Territories and Municipalities to conduct their own BCA analysis on required investments.
- No obligation to use the BCA analysis
- Local Governments are not incentivised to use BCA necessarily, particularly if the overall benefits are ambiguous.
- Federal Funding is allocated based on whether projects proposed meet the definitions of projects set forth by the specific funding source.

International Comparable Programs

Infrastructure Australia Prioritization

Process

- Managed by single, cross sectoral infrastructure agency
- All projects with over \$100mm of federal funding
- Developed by local sponsors with significant guidance/templates from IA
- Projects included in Infrastructure Priority List, national infrastructure plans

Methodology

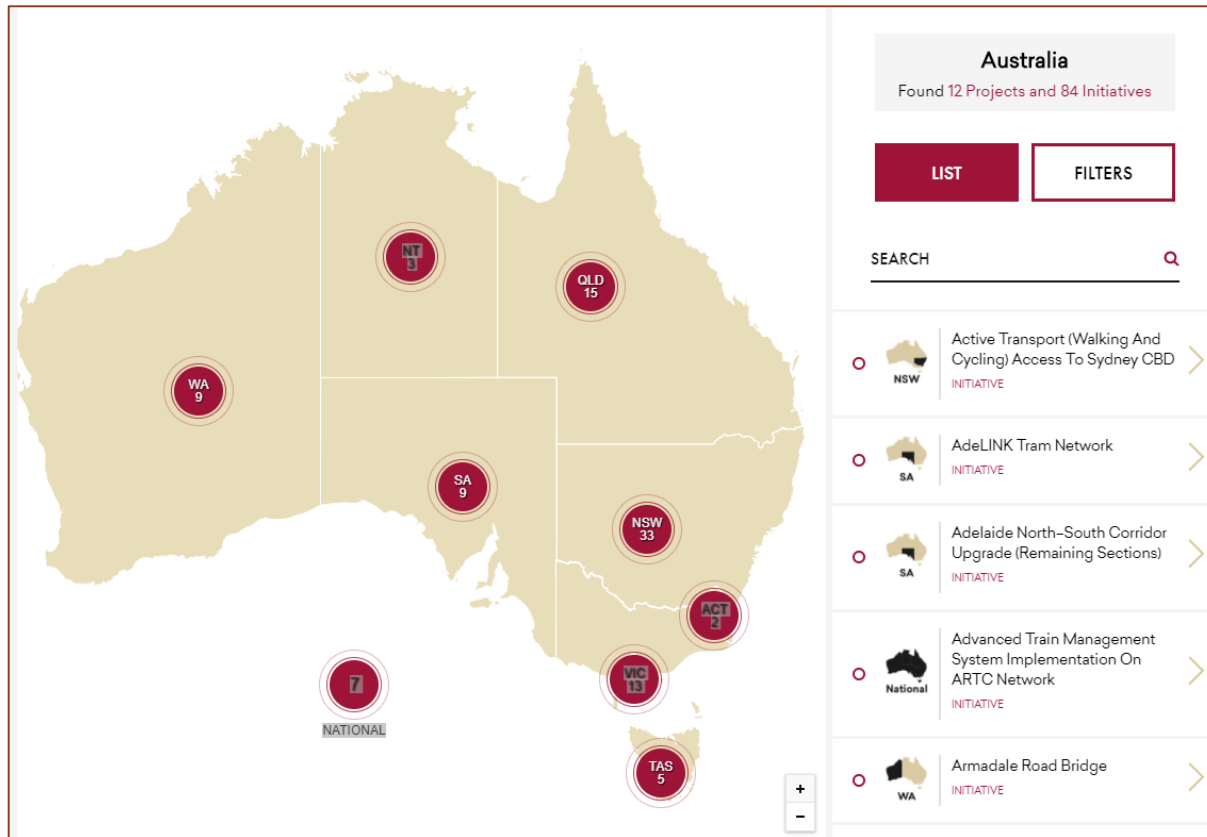
- Three core criteria: Strategic Fit, Deliverability, BCA
- Includes environmental/social quantification and established economic impact models
- Sensitivity Analysis required for discount rates

International Comparable Programs

Infrastructure Australia Prioritization

Application

- Transparent prioritization informs elected officials and public discourse
- Decision making authority largely remains with elected officials



Conclusions

Use of BCA to prioritize between federal infrastructure projects in the U.S. has varied over time and across agencies.

BCA is methodically sounds, but in practice has drawbacks – increasing complexity decreases transparency, increases flexibility and increases transaction costs.

Other signals of the relative local cost/benefit ratios of proposed projects?

- Federal representative support (earmarks)
- “Deliverability” metrics for local project sponsors
- Willingness to pay on the part of local sponsors