NSW Treasury

An Introduction to the Rapid CBA Tool

Alexander Loong
Bridget Goonetilleke
Advisory Branch, Centre for Economic Evidence

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Acknowledgement of Country

We acknowledge that Aboriginal and Torres Strait Islander peoples are the First Peoples and Traditional Custodians of Australia, and the oldest continuing culture in human history. We pay respect to Elders past and present and commit to respecting the lands we walk on, and the communities we walk with.

Artwork:
Regeneration by Josie Rose

Contents

Background

Division

Centre for Economic Evidence

CEE leads the development and application of economic frameworks to improve the wellbeing of the NSW community and to support strong, evidence-based decision making by Government. We promote and advise on the practice of public economics to advance the effectiveness, efficiency, and equity of government initiatives. We have responsibility for Treasury's investment, wellbeing, and performance budgeting frameworks, as well as First Nations economic wellbeing.

Branch

CEE Advisory

Advisory provides economic advice to government on significant and complex initiatives to inform resource allocation, with a focus on CBA. We support capability building through feedback, provision of tools, sector CBA frameworks or guidance.

Rapid CBA Tool

Accessible on the Treasury Website

Background

What is cost-benefit analysis?

- Social accounting model to assess changes in welfare
- Measures the direct and indirect impacts of some investment/policy based on opportunity cost

When to use CBA?

- In NSW government, required for some business cases
- Helpful to compare between different options
- To assess the merit of proposals
- Ex-post (backwards looking) evaluation of established programs

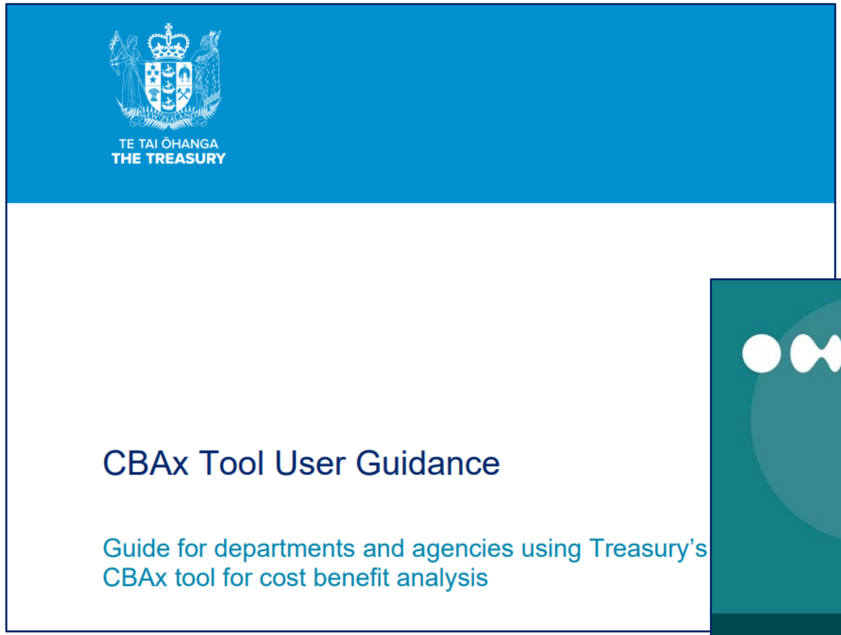
Background

Why build a Rapid CBA Tool?

- Addresses pain points – time and resource constraints
- To support capability building in the sector

Context behind its development:

- Originally was designed for disasters and other emergency responses
- Sources of inspiration – New Zealand's CBAx Tool, DISR water CBA Tool – *ours uses the methods endorsed by Treasury*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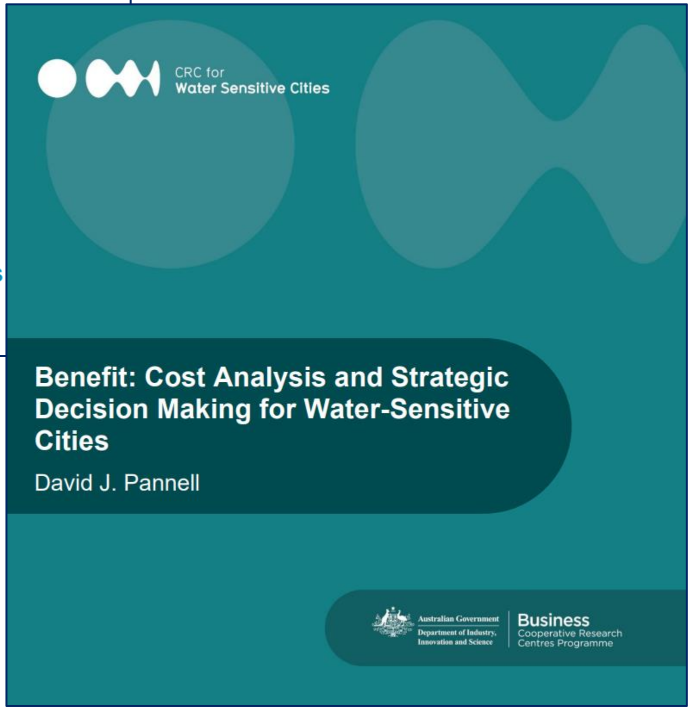
THE TREASURY

CBAx Tool User Guidance

Guide for departments and agencies using Treasury's CBAx tool for cost benefit analysis


CRC for
Water Sensitive Cities

Benefit: Cost Analysis and Strategic Decision Making for Water-Sensitive Cities

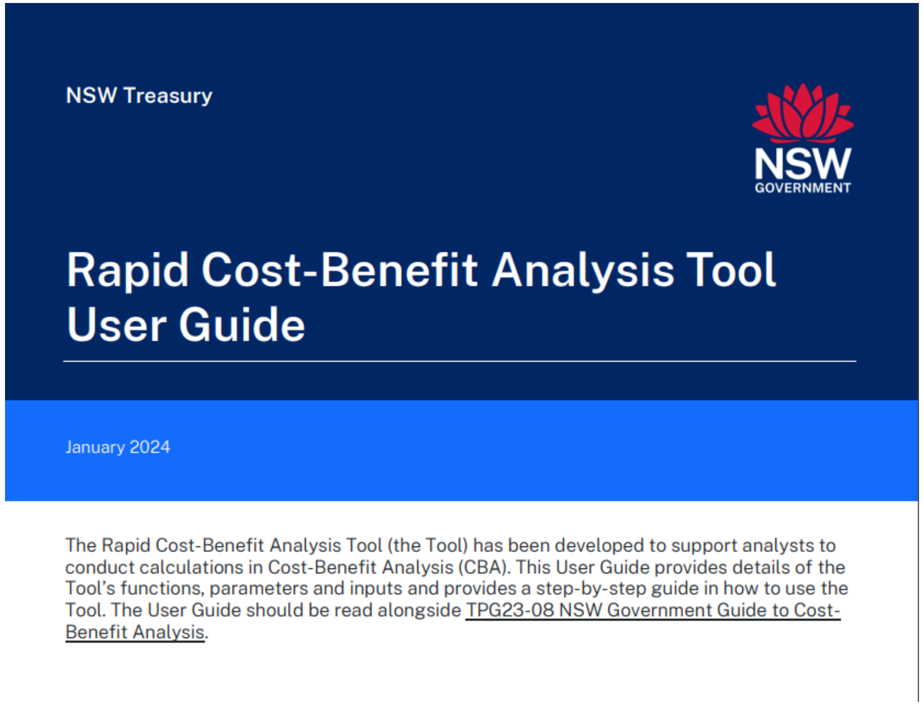
David J. Pannell

Australian Government
Business
Cooperative Research
Centres Programme

Background

What is the Rapid CBA Tool?

- Excel spreadsheet calculator that assists analysts to prepare simple CBAs
- Completes a range of CBA calculations for the user (e.g. discounting, Net Present Value and Benefit Cost Ratio)
- Designed as a generic model so it can be used across programs and sectors
- Requires users to understand CBA ‘thinking’ in advance. Users should have thought about and have defined the problem, base case and options, relevant cost and benefit categories before use
- A user guide was written to help users configure the model



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Rapid Cost-Benefit Analysis Tool
User Guide

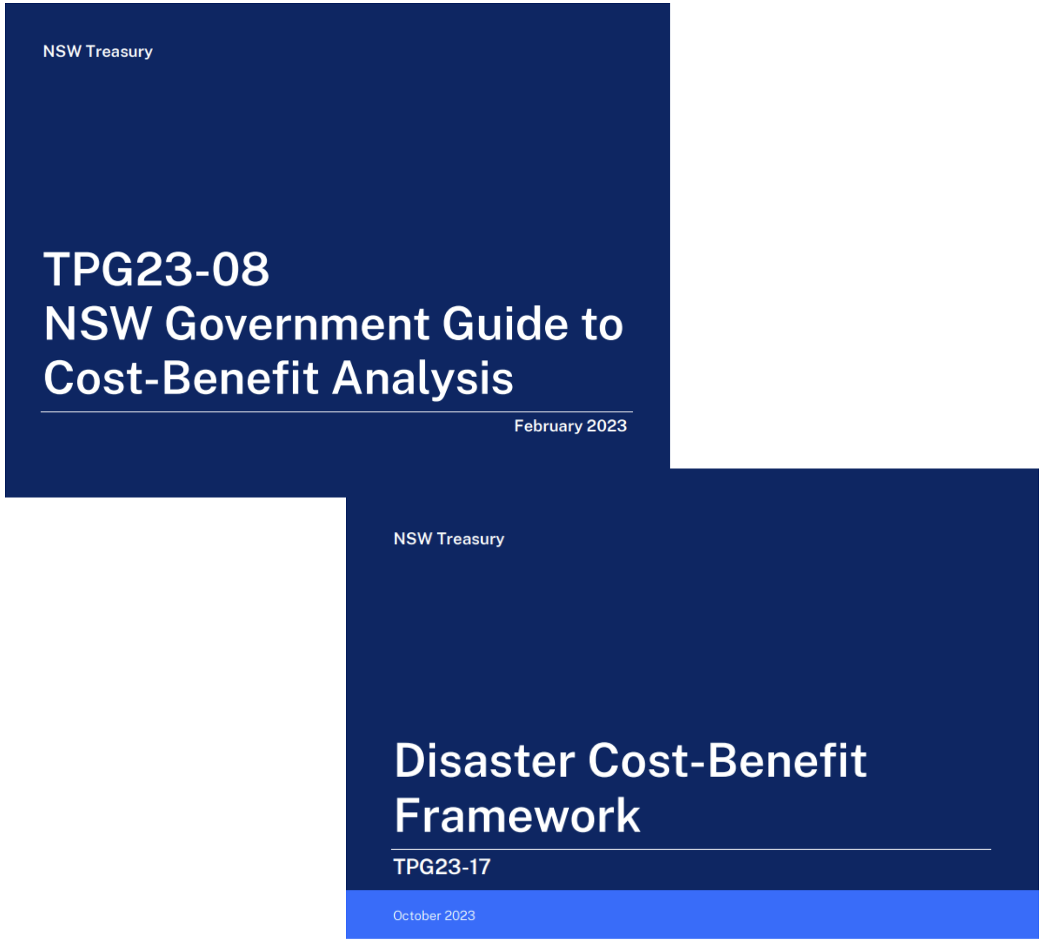
January 2024

The Rapid Cost-Benefit Analysis Tool (the Tool) has been developed to support analysts to conduct calculations in Cost-Benefit Analysis (CBA). This User Guide provides details of the Tool’s functions, parameters and inputs and provides a step-by-step guide in how to use the Tool. The User Guide should be read alongside TPG23-08 NSW Government Guide to Cost-Benefit Analysis.

See also...

The Tool sits alongside a number of other resources from Treasury:

- CBA Guide (TPG 23-08)
- Business Case Guidelines
- Evaluation Guidelines and workbooks
- Disaster CBA Framework and Flood CBA Tool
- Outcome Values Database (available for NSW agencies)
- NSW Common Planning Assumptions
- Lean Business Case Template



Objectives of the Rapid Tool

To promote the use of CBA in general, especially when:

- A CBA may not be required but would be helpful
- A bespoke model is unnecessary
- There are time or resource constraints (including in urgent situations)

When the tool will be useful

- Where initiatives are in the early stage of development, to test certain options and understand their potential
- Where initiatives are below the threshold requirements for a Business Case (i.e. below $10m in value), where thorough analysis has not yet been developed
- For initiatives where it is mandatory to undertake CBA as part of a Business Case (i.e. above $10m in value)
- Applying standardised valuations for general (similar) small-scale programs
- Ex-post evaluation of previous initiatives

Central CBA Discounted Results ($)

Option	NPV	BCR	NPV Rank out of 3	BCR Rank out of 3
Base Case	-$3,000,000		-	-
Option 1	$16,137,714	1.759	1	1
Option 2	-$1,424,964	0.919	3	3
Option 3	$10,402,853	1.611	2	2

Sample results

When to use the Tool

The Tool can assist with testing and iterating Steps 2-4, but relies on the user to conduct these steps outside the model initially

The core function of the Tool assists with Steps 5-7

Step 1: State objectives

Step 2: Define the base case and develop options

Step 3: Identify and describe all costs and benefits

Step 4: Forecast all quantifiable costs and benefits

Step 5: Value quantified costs and benefits

Step 6: Assess net benefit (NPV and BCR) with sensitivity analysis

Step 7: Assess distributional and equity impacts

Step 8: Report results and key findings in executive summary format

Users should start CBA ‘thinking’ prior to using the tool.

In the ‘CBA Process of 8 Steps’, the Tool can assist with Steps 5-7 directly, but relies on the user to conduct steps outside of the Tool.

What the Tool can do

Key outputs from the Tool include:

- Net Present Value and Benefit Cost Ratio of each option with rankings
- Discounted costs and benefits with annual breakdowns
- Distributional analysis
- Sensitivity or scenario analysis (worst and best-case)

The tool is designed to help:

- (primarily) NSW Government agencies
- other interested users such as academics, analysts, or policymakers

What the Tool cannot do

- Policy ideation, development or selection
- Parameter sourcing for valuing costs and benefits
- Staged or multi-step appraisals
- Advanced methods – Monte Carlo, detailed scenario planning, real options analysis
- Identifying stakeholders or broader equity impacts

Other limitations:

- Inputs need to be manually estimated, including forecasts, assumptions and parameters. The quality of the outputs is dependent upon the accuracy of any inputs
- The Tool focuses on CBA results (BCR, NPV) but non-numerical review is needed. Analysis should consider problem definition, outcomes, risks and drivers of investment proposals
- Calculations have been locked by developers so model integrity is maintained

Rapid CBA Tool Overview

CBA Rapid Tool Inputs

Primary inputs
Base year
First year of appraisal period
Appraisal period length
Discount rate
List of options

Cost/Benefit inputs (by option)
Cost/Benefit category
Quantity
Price per unit

Distributional inputs
Stakeholder impact percentage

Sensitivity inputs
Sensitivity tests

Rapid calculation

CBA Rapid Tool Outputs

Report
Discounted costs
Discounted benefits
NPV, BCR results
NPV, BCR option rankings
Distributional results
Sensitivity results

Extended report
Itemised cost and benefit results by option

Things to look out for

Common queries we receive are around:

- How to define the base year and why is this important
  - The base year represents the year to which values are discounted. The first year of spending can be a different year if needed.
- How to model a base case
  - The base case is the counterfactual – there's a difference between do-min and do-nothing
- What do cost and benefit inputs represent
  - Inputs reflect the standalone cost or benefit for both the options and base case. The model then calculates the incremental change (option net of base case) for reporting
- Should I put in real or nominal values
  - Use real values but keep in mind any real escalation for certain costs

Live demonstration

Case Study 1: Harmony Bay Redevelopment Project*

Options definition: In redeveloping a plot of land, government has choice on what infrastructure to build. A sample of options are shown below.

Base case: do-nothing state of the world – the land is left vacant

Option 1: Housing

Option 2: Museum

Option 3: Parkland

*__Note__ these examples are *illustrative* only and not based on a real proposal

Live demonstration

Case Study 1: Harmony Bay Redevelopment Project

	Option 1 – Social Housing	Option 2 - Museum	Option 3 - Parkland
Costs	• Capex • Opex • Opportunity cost of land	• Capex • Opex • Opportunity cost of land	• Capex • Opex • Opportunity cost of land
Benefits	• Consumer Surplus • Avoided homelessness cost • Increased education • Residual value	• Consumer Surplus Direct Use • Consumer Surplus Existence • Increased education • Residual value	• Active transport benefit • Existence value • Open space benefit

Live demonstration

Case Study 2: Niche Sport Program Grants

Options definition: Grants can vary in the size and scope of funding.

Base case: Business as usual for sports providers and government. No grant funding.

Option 1: Single sport grants at $2.5m per year over 3 years for ~ 2,000 junior athletes

Option 2: Multi-sport grants at $5m per year over 5 years ~ 4,000 junior athletes

Live demonstration

Case Study 2: Niche Sport Program Grants

<u>Main costs to government:</u>

Cost of grants

Administrative expenses

<u>Benefits:</u>

Producer surplus for businesses

Use value of participation

Active transport benefits – physical activity

<u>Disbenefit</u>

Crowding out of other sports – displacement of economic activity

Conclusion - Lessons and feedback

Users have been in contact through our mailbox with queries and feedback:

- Takes time for initialisation, and leaving some cells missing can cause errors
- Some confusion over the input of real vs nominal values and how to show escalation
- Easier for ex-ante but less clear for ex-post evaluation
- The interpretation of incremental results

- Audience questions?

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