

Guide to Economic Evaluation and Ex-post CBA for TfNSW Evaluation Programs

For all TfNSW division and agencies

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Economic Advisory
Finance and Investment Division



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1. Introduction

1.1. Context

In February 2023, NSW Treasury published the Policy and Guidelines: Evaluation (TPG22-22). Transport's [BRM & Evaluation Guidelines](#) outlines the evaluation components: process, outcome, benefit realisation and economic. . An Economic Evaluation is used to identify and report key economic, social, environmental, and cultural impacts of an initiative. Economic Evaluation can be in different forms and undertaken using different methods including cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA). Amongst them, an ex-post CBA is the most rigorous method preferred for TfNSW evaluation programs.

The idea of evaluating the effectiveness of an initiative has existed in various shapes or forms. An Economic Evaluation is perceived to be technically challenging and resource heavy with higher data requirements and its use has been limited in TfNSW evaluation programs.

With the implementation of TPG22-22, there is an increased focus on Evaluations as part of the Evidence Bank cabinet submission with a risk-based approach.

1.2. Nominated projects or programs in the Evaluation Schedule

Under NSW Treasury TPG22-22, TfNSW is required to nominate initiatives annually in the Evaluation Schedule, which is jointly managed between TfNSW and the NSW Treasury.

While all projects / programs nominated in the annual evaluation schedule require an economic evaluation, not all of them are suitable for an ex-post CBA. Experience in project evaluation over the past 10-years indicates that highway bypass, expressway, Metro, Light Rail, Bus Rapid Transit (BRT) and active transport projects are highly suitable for ex-post CBA, while maintenance programs, contract management and grant programs are generally unsuitable for a full ex-post CBA.

The projects / programs nominated in the annual Evaluation Schedule will be assessed on their suitability for an ex-post CBA. All projects / programs nominated in the annual evaluation schedule require an economic evaluation, not all of them are suitable for an ex-post CBA.

1.3. Purpose of this guide

This guide applies to all projects / programs nominated in the annual Evaluation Schedule from 2023/24 and onwards. It sets out the requirements, process for managing an Economic Evaluation and high-level guidance for an ex-post CBA.

This guide aims to uplift the ex-post CBA as required in the TPG22-22, Transport BREM Guidelines, and the NSW Treasury Evidence Bank. The objective is to undertake an ex-post CBA for all suitable projects / programs nominated in the Evaluation Schedule. Economic Advisory in FID will partner with TfNSW Divisions and project teams to achieve this objective. Generally, the lack of economic evaluation has been identified as an area for improvement and increasing capability through lessons learnt.

2. Managing an economic evaluation

2.1. Engagement with the Economic advisory team

As part of the FID Economics, Benefits and Evaluation team, both BREM and Economic Advisory work closely together. Table 1 provides the role of Economic Advisory at different stages of an economic evaluation.

Table 1 Role of FID Economic Advisory at various stages of the evaluation

Workstream	RACI	Role of Economic Advisory
Nominate project / program in Evaluation Schedule	Informed	Receive the list projects / programs to be evaluated
Is an ex-post CBA required for a nominated project / program in the Evaluation Schedule?	Responsible	Collaborate with TfNSW Divisions, decide whether an ex-post CBA is required. It is acknowledged that not all projects are suitable for ex-post CBA
If Yes to the above, what level of ex-post CBA is required?	Responsible	Collaborate with TfNSW Divisions, determine the level of analysis for an ex-post CBA – standard, simplified or rapid
Develop ex-post CBA	Consulted	Agree with the project team on data need, data collection strategy. Provide technical advice and solve problems
Quality assurance of ex-post CBA	Accountable	Review and provide ex-post CBA concurrence report
Lessons learnt	Consulted & informed	Take part in the review and contribute to lessons learnt from the evaluation

While Divisions and the project teams are accountable for development of an ex-post CBA, FID Economic Advisory will partner with Divisions to advise the suitability of an ex-post CBA and the level of analysis required. Economic Advisory will review all ex-post CBAs and provide an economic concurrence report after our review.

2.2. Level of analysis of an ex-post CBA

There is a general perception that undertaking an ex-post CBA is complex, requiring a significant amount of actual data and is resource intensive. However, an ex-post CBA is scalable and can be designed with an appropriate level of complexity tailored to the size, priority, and risk of the initiative.

The comprehensiveness of ex-post CBAs can be categorised into three levels. Table 2 sets out the levels of analysis in the design of ex-post CBAs and the required items at each level.

Table 2 Level of analysis of an ex-post CBA

Required items	Level of analysis of an ex-post CBA		
	Standard	Simplified	Rapid
	Tier 1	Tier 2	Tiers 3-4
Development and delivery cost review	✓	✓	✓
Update BCR and NPV and comparison with the FBC	✓	✓	✓
Routine data collection (E.g., traffic, speed, congestion)	✓	✓	
Additional traffic/transport study and research	✓		
Re-estimate of quantitative benefits	✓ (All)	✓ (All)	✓ (Core)
Investigate unintended impact	✓		
Road/transport system performance review (E.g., Congestion, efficiency, crowding, reliability and productivity)	✓		
Review qualitative benefits	✓	✓	✓
Lessons learnt	✓	✓	✓
Reporting requirement	Full report + CBA model	Simplified report + CBA model	Summary report + CBA model

2.2.1. Standard ex-post CBA

This approach is more relevant to Tier 1 initiatives and may be extended to a few selected Tier 2 initiatives. A standard review of project cost, scope, risk management, traffic estimation, actual benefits. Additional research and studies should be undertaken to fully evaluate the impact, including those which may not have been captured in the ex-ante CBA. Key features of a standard ex-post CBA include:

- **Review of project outturn capital costs** compared to the original budget approved as part of the Final Business Case. This would include an assessment of any scope changes or variations and quantitative analysis on the operating costs since its implementation.
- **Review of the economic framework and assumptions.** Some examples of the assumptions include underlying assumptions such as land use forecast, demand growth, or uptake trend of electric vehicles etc.
- **Estimate all quantifiable benefits from the ex-ante CBA** where an approach exists. Additional traffic / transport research and modelling should be undertaken to form the basis of the estimation. Qualitative assessment of quantified benefits should only apply to benefits that cannot be estimated such as Wider Economic Benefits, reliability impacts, or residual value. A standard analysis aims to verify at least 85% of the total benefits identified in the Gate 2 Final Business Case. The remaining 15% or less of the total benefits can be qualitatively assessed if the available data constrains a quantitative approach.
- **Investigate and capture unintended impacts.** Beyond the costs and benefits identified at the ex-ante stage, the initiative may lead to unintended impacts. The cost, benefit or disbenefit of these unintended outcomes should also be quantified where practical. Additional research may be justified should the unintended impact be significant.
- **Determine the catchment area.** For an urban road project, it is important to clearly identify the project catchment area. The catchment area can be the area of

microsimulation traffic modelling or can be defined to include any roads where traffic volume between the Base Case and the Project Case has changed by a pre-defined threshold (e.g., 10% and above). Traffic volume, speed and VKT on each route in the catchment area should be considered and presented. In most cases, the majority of benefits will be generated in the catchment area but in some cases the geographical scope may need to be tailored or expanded, such as including major alternate routes to understand network redistribution effects. The benefits between the catchment area and the balance of road network should be separated in the report.

- **A full report and ex-post CBA model** should be produced for a standard ex-post CBA. The ex-post CBA should be rebased to the year of the analysis and use the latest economic parameter values.

2.2.2. Simplified ex-post CBA

This review is suitable for Tier 2 projects. Tier 3 or 4 projects may also undertake a simplified review if there is a strong case and an appropriate budget. A simplified ex-post CBA focuses on cost, traffic impacts and quantifiable benefits. Key features of a simplified ex-post CBA include:

- **Review of project outturn capital costs** compared to the original budget approved as part of the Final Business Case. This would include an assessment of any scope changes or variations and quantitative analysis on the operating costs since its implementation.
- **Review of the economic framework and assumptions.** Some examples of the assumptions include underlying assumptions such as land use forecast, demand growth, or uptake trend of electric vehicles etc.
- **Estimate all quantifiable benefits from the ex-ante CBA** where an approach exists. In a road project, a re-run of traffic modelling is generally not required. The reviewers should use the data from benefit monitoring and any existing data sources (e.g., classified counts, Google data, Safe-t-Cam data etc.). Qualitative assessment of quantified benefits should only apply to benefits that cannot be estimated such as Wider Economic Benefits, reliability impacts, or residual value. A simplified analysis aims to verify at least 70% of the benefits identified in the Gate 2 Final Business Case. The remaining 30% or less of the total benefits can be assessed using less rigorous approaches such as interpolation, extrapolation, or estimated from assumptions derived from a similar project.
- **Limit geographical scope.** In a road project, the geographical scope of the simplified ex-post CBA should be limited as appropriate to the project.
- **A review report (of 5-10 pages) and ex-post CBA model** should be produced from a simplified ex-post CBA. The ex-post CBA should be rebased to the year of the analysis and use the latest economic parameter values.

2.2.3. Rapid ex-post CBA

This review is suitable for Tier 3 or 4 projects. It focuses on updating cost and core quantified benefits only. Key features of a rapid ex-post CBA include:

- **Brief description of capital cost spending**, scope changes and a qualitative review of operating costs since implementation
- **Estimate key quantifiable benefits.** For a road project, will generally include Value of Travel Time Savings, Vehicle Operating Cost (VOC) savings, Road Crash Reduction and Environmental Externalities. These benefits normally constitute around 60-90% of the project's total benefit. If there are other significant benefits, they should also be estimated. For example, an active transport project can generate high health benefits; this should be established as one of the key benefits and estimated. A rapid ex-post CBA should estimate benefits only if data is readily available, and benefits that are not estimated can undergo a qualitative assessment. Similar to the simplified ex-post CBA, a re-run of traffic modelling is not required, and evaluators should use the data from

benefit monitoring and any existing data sources. A rapid analysis aims to verify at least 50% of total benefits identified in the Gate 2 Final Business Case. The remaining 50% or less of the total benefits can be assessed using less rigorous approaches such as interpolation, extrapolation, or estimated from assumptions derived from a similar project.

- **Limit geographical scope.** In a road project, the geographical scope of the rapid ex-post CBA should be limited as appropriate to the project.
- **A high-level summary report and an ex-post CBA model** should be produced from a rapid ex-post CBA. The ex-post CBA should be rebased to the year of the analysis and use the latest economic parameter values.

2.3. Developing an effective ex-post CBA

The following principles underpin an effective ex-post CBA assessment.

- **Informative:** While an ex-post CBA should demonstrate whether the initiative is value for money, it should also inform lessons learnt, improve future decision making and identify opportunities for future ex-ante CBAs. It should not be viewed only as a compliance exercise. The analysis should draw on actual data and revised forecasts, compare them to the ex-ante CBA and explore factors that may have impacted the results. Any observed divergence from the ex-ante CBA should be explained.
- **Scalable:** The effort expended on ex-post CBA should be proportional to the scale and complexity of the project. The Tier-based classification set out in Table 2 provides an indication of the project scale. Ex-post CBAs of Tier 1 projects should undertake a full review of all costs and benefits along with any unintended impact, whereas for Tier 2-4 projects, it can be simplified to focus on benefits that the initiative had brought to the community, which were established in the ex-ante stage.
- **Cost-effective:** The cost of an ex-post CBA draws on the evaluation budget and where practical, costs should be minimised. The evaluation and benefits monitoring may be designed to collect data specific to the initiative. However, existing artefacts, such as the ex-ante CBA model, databases, and other asset intelligence information, should also be utilised as much as possible.
- **Agile:** A key purpose of an ex-post CBA is to determine what worked and what did not work. The ex-post CBA can be done as a 'quick-and-dirty' or 'roughly-right' exercise and will therefore not be perfect. Undertaking an ex-post CBA is not always a one-off exercise after implementation completes; prior to that, the BCR may go through updates during implementation. The most common cases for a BCR update are cost and scope changes. During these updates, the ex-post CBA framework may also be established with data, trends and logic from benefits monitoring. An agile approach can identify issues early and allow quick updates to be made during the ex-post appraisal making ex-post CBA a less challenging and resource intensive exercise.

TfNSW aims for a practical ex-post CBA approach that is informative (if the intended project benefits have been achieved), scalable (the CBA model is flexible and can adapt from a rapid analysis to a full analysis), cost effective (the analysis is proportionate to the project size and data does not need to be 100% complete to be useful), and agile (robust analysis to provide answers that are roughly-right instead of precisely-wrong).

3. Resource and support

3.1. Other relevant guides

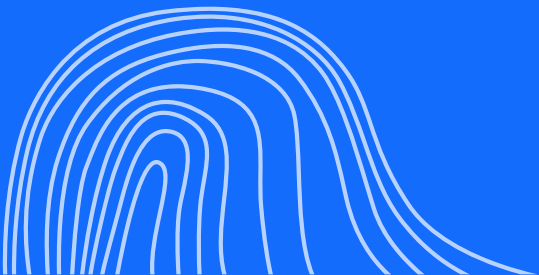
In addition to this guide, economic evaluators may find the following resources useful:

- **Technical Note: Ex-post Cost-Benefit Analysis.** Published as part of TPG22-22 by NSW Treasury, this technical note provides high level technical guidance and considerations on how to undertake an ex-post CBA. This technical note can be obtained online via the NSW Treasury website.
- **Post Completion Review User Guide.** Aimed at road projects, this guide includes further discussion around the quantification of benefits and performance assessments in an ex-post CBA setting. This document is available upon request from the Economic Advisory team and is for internal use only.
- **TfNSW Cost Benefit Analysis Guide Ecosystem.** This comprehensive suite of guidance sets out the principles, concepts, parameters, methodologies and procedures when undertaking a CBA for transport initiatives. The fundamentals between an ex-post CBA and ex-ante CBA are similar, and this suite will provide useful guidance adaptable to an ex-post CBA. The suite is available on the [Economic Advisory SharePoint](#).

3.2. Contact Economic Advisory for support

The Economic Advisory team leads the implementation of ex-post CBA for economic evaluation in the Transport cluster. For any queries or discussion relating to ex-post CBAs, please direct your queries to:

- [Matthew Jones \(Director Economics, Benefits and Evaluation\)](#)
- [Baojin Wang \(Senior Manager Economic Advisory\)](#)
- [Economic Advisory Team](#)



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