

Fact Sheet 1: Economic evaluation methodology

Maribyrnong River catchment flood mitigation study – Phase 3

This document provides detailed additional information about the economic methodology used across the Maribyrnong River Catchment Flood Mitigation Study and is intended for key stakeholders, industry partners, community groups and technical specialists.

Flood mitigation economics is the structured evaluation of economic, social and environmental impacts of floods translated into dollar terms. This forms the technical basis to help inform decisions makers to select mitigation options that will reduce flood risk in a way that maximises community safety, financial efficacy and long-term resilience. The concepts discussed in this document are technical in nature and have been designed for readers seeking a deeper and more comprehensive understanding of flood mitigation economics.

For community friendly summaries and simpler explanations of the study approach, please visit our project page at: www.letstalk.melbournewater.com.au/maribyrnong-mitigation

Why these matter?

A key goal of the study is to build a strong, defensible technical evidence base that supports investment decisions well beyond the life of this study. The economic evaluation methodology is central to this. It provides the framework for understanding the costs, benefits and risks of the flood mitigation options we will ultimately recommend.

Where we're at now

The Project team have completed the final stages the economic evaluation methodology. The team's efforts focused on confirming the core assumptions that underpin the analysis. These assumptions must be comprehensive enough to capture a wide range of potential outcomes, from best-case to worst-case scenarios.

Developing a through methodology is essential. It is a time-intensive and highly detailed process because:

- It forms the foundation for the Cost-Benefit Analysis (CBA)

- The CBA, in turn, will underpin much of the future business cases put forwarded
- The study looks toward 2100 and beyond, so our approach must be resilient and adaptable

Climate change and future proofing

Climate change is a critical driver in our assumptions. We are taking an adaptive approach to ensure the study remains relevant over coming decades.

Key considerations include:

- Updated climate change guidelines to the Australian Rainfall and Runoff 2019 (v4.2), which may influence final inputs
- Ensuring our methodology supports outcomes that remain robust under varied future climate scenarios
- Approaches designed to future-proof the study's recommendations.

Methodological guardrails and best practice

While certain constraints exist, the study has the advantage of drawing on well-established economic evaluation practice and national and international guidance

Our methodology is informed by:

- **Melbourne Water 2023**, *Monetising Intangible Flood Damages*, Melbourne Water Corporation, Melbourne.
- **Melbourne Water 2023**, *Flood Risk Reduction Economics Tool Guide (Version 2)*, Melbourne Water Corporation, Melbourne.
- **NSW Department of Planning and Environment 2023**, *Flood Risk Management Guideline MM01*, Government of New South Wales, Sydney.
- **NSW Treasury 2023**, *Flood Cost-Benefit Analysis Tool*, Government of New South Wales, Sydney.
- **Queensland Reconstruction Authority 2021**, *Economic Assessment Framework for Flood Management Projects*, Queensland Government, Brisbane.
- **UK Environment Agency 2024**, *Flood and Coastal Erosion Risk Management Appraisal Guidance*, UK Government, London.

These listed sources above provide clear standards for what constitutes robust, defensible, and transparent economic evaluation. Although, it would be ideal to have more locally based data and information this is the best available information for the study.

What is different this time?

Modern economic evaluation methodologies for flood risk management have shifted from simple, static, direct-damage assessments to more dynamic, holistic and integrated approaches. These new methods account for climate change, indirect economic impacts and the co-benefits of nature-based solutions,

providing more comprehensive understanding of the full economic cost of floods.



Direct damages

Direct flood damages to buildings and infrastructure



Indirect damages

Costs as people and businesses respond to direct damages and closures of building and infrastructure



Intangibles

Non-market impacts to households and the environment e.g. mental and physical health, heritage and ecology



Supplementary considerations

Social value quantification and tailor made analyses for the project options

Why experience and leadership thinking is important

Jacobs is an industry leader in flood risk economic evaluations. The study's approach reflects a robust methodology with key features aligned with well-established guidelines, which are integral to supporting future government approvals. These key features are:

Integrated technical and economic modelling – the economics are not just treated as a standalone spreadsheet exercise. They typically integrate:

- Hydrological and hydraulic modelling
- Damage and vulnerability modelling
- Asset condition data
- Climate projections
- Economic appraisal frameworks.

This matters in flood mitigation projects because the economic results are only as credible as the underlying hazard modelling.

Strong public sector Cost-Benefit Analysis capability – Jacobs has experience applying National and State Treasury Guidelines; Infrastructure Australia assessment frameworks; discount rate sensitivity testing;

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disruptive impact analysis; and real options analysis (for uncertainty and staging around timing). This is particularly valuable and important where projects must:

- Secure federal and/or state co-funding;
- Pass formal gateways or assurance reviews; and
- Demonstrate alignment with resilience policy reforms.

These methodologies are typically defensible under audit.

Climate adaption and resilience expertise –

Jacobs is globally recognised in climate resilience and adaption economics. In flood contexts this includes incorporating climate change allowances into economic modelling. It allows them to test performance under future rainfall scenarios and evaluate nature-based solutions. This quantifying avoids impacts and damages over long asset lifecycles.

Experience with complex infrastructure projects – flood mitigation economics involves complex thinking to develop flood mitigation systems, such as:

- Catchment scale prioritisation
- Sequencing multiple projects
- Trade-offs between structural and policy measures
- Interactions with planning controls and overlays.

Jacobs applies system thinking and has the capability to work at a catchment scale, across multi-government levels, and consider infrastructure optimisation to ensure the best outcomes are considered.

Communication and governance strength –

high quality economic methodology is only useful if it is transparent, replicable, easy to understand and clear about its assumptions. The Study's economic approach is supported by:

- Structured methodology reports
- Sensitivity analysis tables
- Clear articulation of assumptions
- Independent review-ready documentation.

This is critical in politically sensitive areas like flood risk and planning controls.

Next Steps

Using the agreed economic evaluation methodology, we have undertaken detailed assessment of the shortlisted flood mitigation options. Each option has been examined individually and in combination with other mitigation option to understand its performance within different potential combinations. We are sharing three example combinations of mitigation options for community feedback.

This feedback will play a critical role in refining our approach. Drawing on these insights, we will identify a combination of mitigation options and present a pathway towards implementation supported by clear justification and evidence-based reasoning.

By grounding our recommendations in a robust and transparent economic evaluation, we will maximise the likelihood of securing future funding approval and progressing efficiently through governance and assurance processes. This will reduce the risk of delays or red tape, helping deliver meaningful flood risk reduction and much needed relief to the community as soon as possible

Speak to the team

If you have any questions, please call 131 722 or email enquiry@melbournewater.com.au

Visit the Let's Talk website to learn more about the project, view current and upcoming engagement opportunities and sign up to receive project updates.

