

Fact Sheet 3: Cost-Benefit Analysis: How we compare options and assess flood mitigation solutions

Maribyrnong River catchment flood mitigation study – Phase 3

This document provides detailed supplementary information intended for key stakeholders, industry partners, community groups and technical specialists.

Cost-benefits analysis is a structured evaluation of how to invest in reducing flood risk in a way that maximises community safety, financial efficacy and long-term resilience. The concepts discussed are technical in nature and are 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

What is a Cost-Benefit Analysis?

A Cost-Benefit Analysis (CBA) helps determine whether a mitigation option provides more benefit than it costs, both now and into the future. It is the main tool used to compare a 'do nothing' approach (business as usual) against different mitigation options.

Why Melbourne Water uses a Cost-Benefit Analysis

To help determine which flood mitigation options deliver the greatest community value, Melbourne Water uses a Cost-Benefit Analysis (CBA). This ensures that any recommended project:

- reduces risk to people, homes, businesses and essential infrastructure
- delivers long-term value to the community
- uses public funds responsibly and transparently.

A strong Cost-Benefit Analysis is essential to building a robust business case for investment.

How a Cost-Benefit Analysis works?

Estimate the benefits

For flood mitigation projects, benefits mostly arise from avoided flood damage, including:

- reduced damage to homes and buildings
- lower business disruption and economic loss
- fewer road closures and reduced transport delays
- lower emergency response and recovery costs.

These benefits are grounded in the Average Annual Damages (AAD) calculations developed earlier in the study.

Estimate the costs

The Cost-Benefit Analysis considers the full lifecycle costs of a mitigation option, including:

- design and planning
- construction and implementation
- operations and maintenance
- project management, approvals and compliance.

These costs are estimated consistently with Victorian Government economic evaluation guidelines.

Compare costs and benefits over time

Most mitigation projects are designed to last for decades.

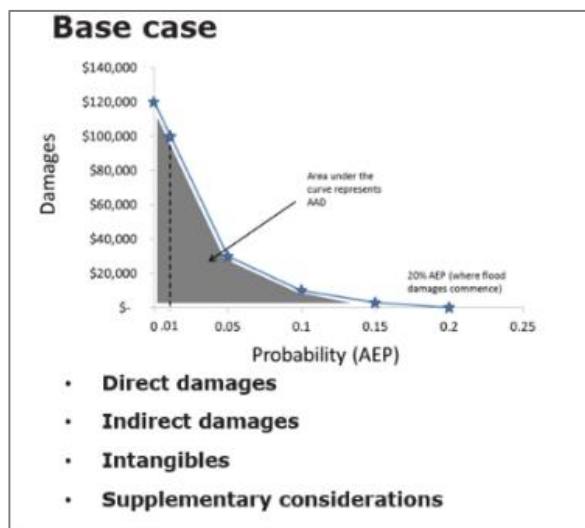
To compare costs and benefits fairly over long timeframes, the Cost-Benefit Analysis uses discounting, which converts future values into today's dollars.

Key results explained

Net Present Value (NPV)

NPV shows whether a project delivers a net economic gain.

- $NPV > 0$ = The total benefits exceed the total costs
- $NPV < 0$ = The project costs more than it returns.

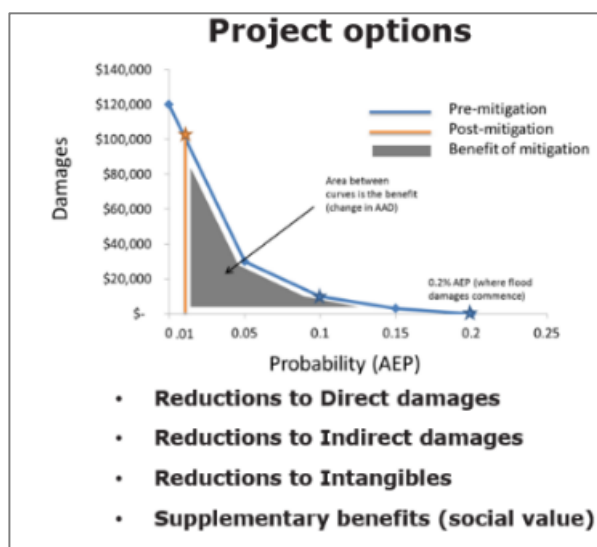


Benefit Cost Ratio (BCR)

BCR indicates the value received per dollar spent.

- $BCR > 1$ = Benefits outweigh the costs
- $BCR < 1$ = Benefits do not justify the costs

Government funding decisions often rely heavily on NPV and BCR.



Climate change and uncertainty

Climate change

The Cost-Benefit Analysis compares current flood risk with future projected conditions, considering:

- changing rainfall patterns
- sea level rise
- increased intensity of storm events
- long-term climate variability.

These variables are used to test how options perform under future conditions, informing their long-term effectiveness and suitability.

Sensitivity Testing

Because future conditions can vary, the Cost-Benefit Analysis stress-tests key assumptions, including:

- higher or lower construction costs
- different discount rates
- changes in future flood behaviour.

This tests whether the preferred options remain economically justified and effective when key assumptions affecting costs, benefits and risk are varied.

Social and community considerations

Flooding affects far more than just assets and infrastructure.

The Cost-Benefit Analysis considers broader community impacts - sometimes referred to as social value, such as:

- mental health impacts and stress
- disruption to community facilities
- impacts on daily routines, recreation and community function
- effects on local wellbeing, safety and cohesion.

Even when these factors cannot be fully expressed in dollars, their importance is recognised in the evaluation.

Contact us

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How do we ensure the economic assessment is robust?

To make the flood related economic assessment fair, accurate, and defensible, we will:

- follow all Victorian Government economic evaluation rules
- use official flood guidelines from Department of Energy, Environment and Climate Action (DEECA)
- Apply trusted, well-established economic methods used nationally established economic methods used nationally
- Draw on recognised tools and studies, such as:
 - Melbourne Water's Flood Risk Reduction Economics Tool Manual
 - NSW flood damage datasets and methodologies
- Incorporate local insights, including council clean-up and recovery cost data.

This combination of best-practice methodology and local evidence strengthens the credibility of our results.

Considering real-world constraints

While the Cost-Benefit Analysis is a key decision-making tool, not every theoretically beneficial option can be delivered.

The study must also consider:

- the natural geography of the area
- technical feasibility and safety
- economic, environmental and social limitations
- land use and operational constraints.

Some options may not be viable because they cannot be built safely, would cause unacceptable impacts, or are not feasible within the landscape.

Next steps

Once the methodology and modelling are completed, the Cost-Benefit Analysis will be applied to different mitigation options.

Melbourne Water will:

- share the results with the community
- explain how each option performs
- invite feedback to support informed, transparent decision making.

Your input will play an important role in shaping the final recommendations.

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.



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