

Fact Sheet 5: Identifying the Flood Mitigation Combinations

Maribyrnong River catchment flood mitigation study – Phase 3

Together with the community, Melbourne Water is exploring **long term flood mitigation options** to help reduce flood risk in the lower Maribyrnong River catchment.

Since Phase 2 of the study, our team of experienced flood mitigation specialists refined the long list of mitigation options into a shortlist using several technical assessments alongside community feedback. This ensured only options that are effective, feasible and aligned with community priorities progressed in the study. You can read about how we developed the shortlist at: www.letstalk.melbournewater.com.au/maribyrnong-mitigation

From the shortlist, our specialist team has identified three example combinations of mitigation options using a range of initial assessments and the Decision Framework. Each example combination demonstrates how different mitigation options can work together in different ways to reduce flood risk, with varying outcomes and trade-offs.

Initial Assessments

Further feasibility assessments of the shortlist of mitigation options were undertaken by the Study team. They checked each option to make sure it was practical, could be delivered, and assessed whether there were major issues that could prevent moving forward.

Factors we considered in the assessment included:

- Site constraints
- Ground conditions
- Servicing requirements
- Increasing flood impacts to others
- Construction access and overall constructability
- Effectiveness of the option in reducing flood risk

This work was supported by early concept designs and preliminary cost estimates.

We also engaged with First Nations representatives and commenced a Cultural heritage desktop review.

The Decision Framework

Following the initial feasibility assessments, we used the Decision Framework to identify how shortlisted mitigation options work together to reduce flood risk across the lower catchment.

What the Decision Framework does

The Decision Framework is an innovative comprehensive and data-driven approach that brings together flood modelling, economic analysis, and community-informed Evaluation Criteria to assess how different mitigation options perform together.

Using a mixture of digital tools and technical assessments, the Decision Framework evaluates mitigation options to determine the most effective, feasible and cost-efficient combinations of mitigation options to reduce flood risk now and into the future.

All options are tested against a year 2100 climate scenario to ensure they address long-term flood risk.

What assessments did the Decision Framework use

Flood modelling

- Utilising a Digital Assessment Tool, we were able to simulate how mitigation options perform under modelled flood conditions.

Cost-benefit analysis

- Looking at mitigation options that are cost-effective and provide long term value for money.

Flood vulnerability

- Looking at how likely people, places and assets are to be affected by flooding
- It considers their exposure, sensitivity and adaptive capacity.

Evaluation criteria

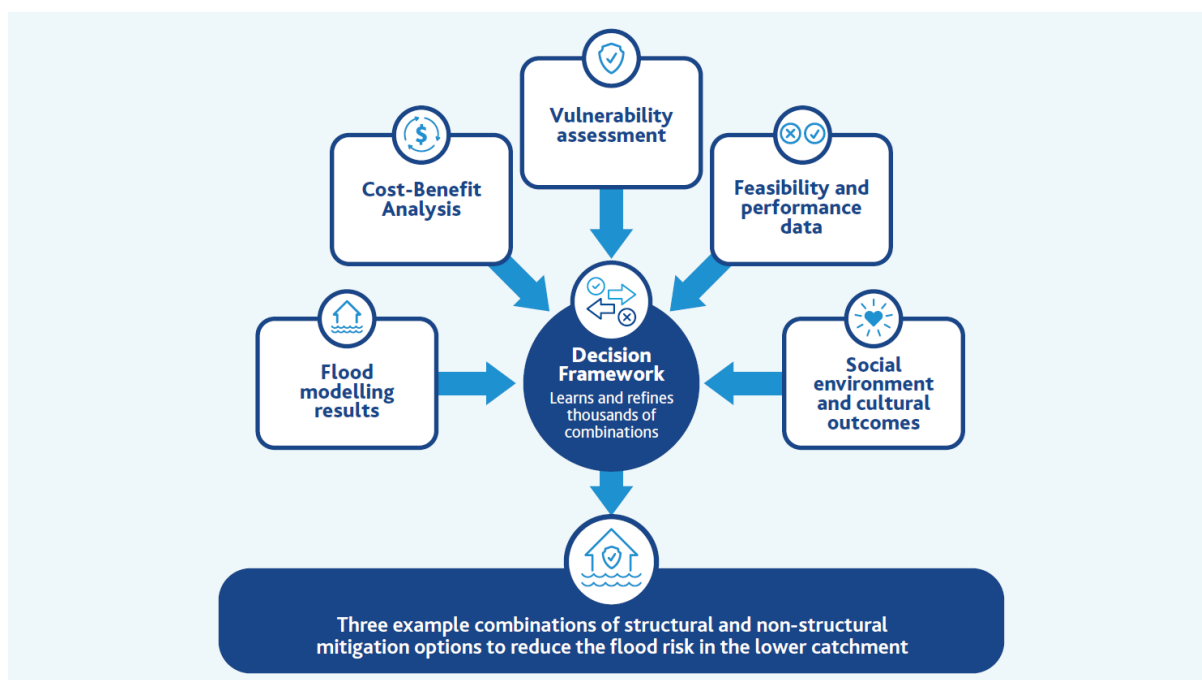
- Assessing the options using a series of metrics which are important to the community, in part developed together with the community. These metrics were used in the cost-benefit analysis and vulnerability assessment.

Reducing flood risk in a large catchment requires a combined approach of mitigation options, as opposed to one singular measure. Approximately 1,000 different combinations of mitigation options were modelled and assessed using this approach. By testing combinations at this scale, the Decision Framework helps identify which combinations of options perform best together across a range of measures.

It's helpful to think of the Decision Framework like picking and coaching a football team. Instead of relying on just one star player to win the match, we know the best results come from the right combination of players working

together such as defenders, midfielders, and forwards. In the same way, reducing flood risk works best through a mix of different options, not just one option.

Just like selecting a team, we tested thousands of different "line-ups" using data, the Evaluation Criteria, modelling and digital tools. The Decision Framework helps us see which combinations perform the best together and then refines them to improve overall performance.



Contact us

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A world leading approach

This approach represents one of the most comprehensive assessments of flood mitigation options undertaken at this scale globally, with thousands of combinations tested using advanced modelling, economic analysis and community-informed criteria.

To date, assessments at this scale—testing this many combinations in a single catchment are unprecedented, providing greater confidence that the combinations identified are robust, evidence-based and capable of reducing flood risk over the long term.

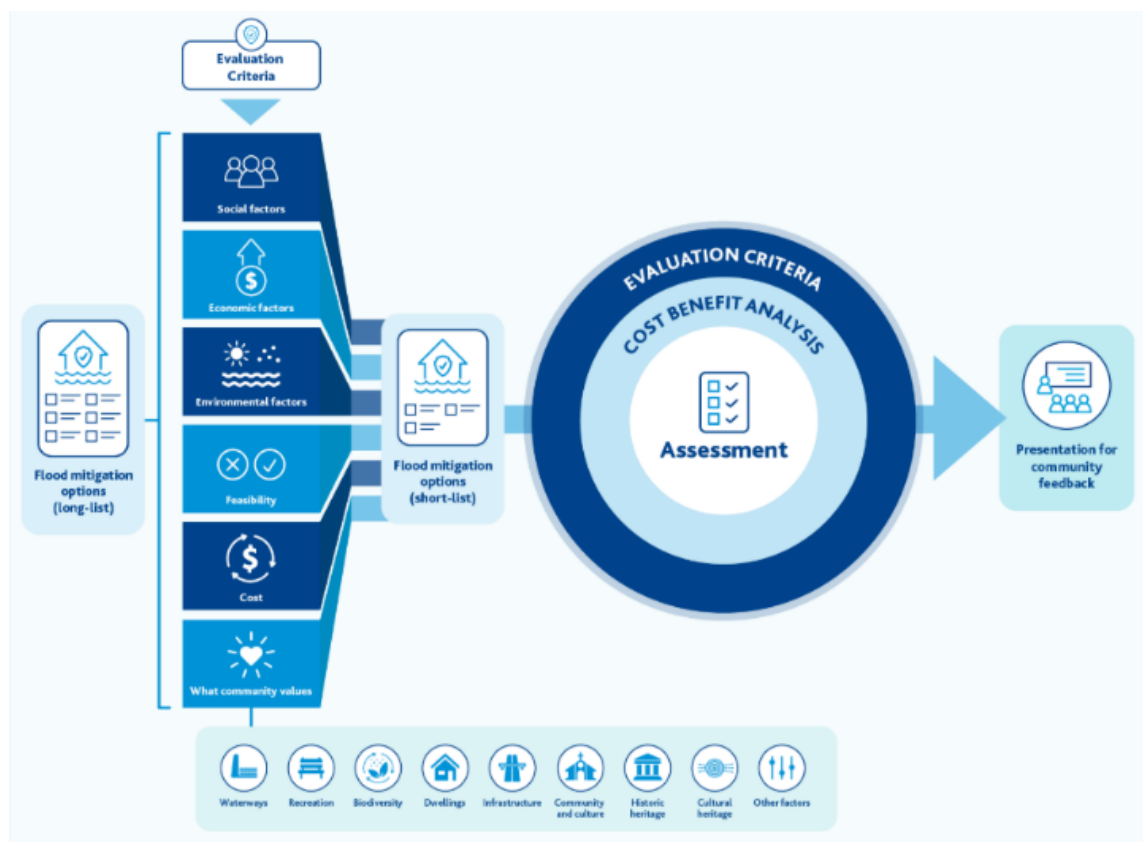
Example mitigation combinations

Three example combinations of mitigation options have been developed for discussion with community and stakeholders in Phase 3.

These combinations are not final and are not being presented for the community to choose between. They are intended to support discussion and feedback.

Each of the three example combinations include a mix of structural and/or non-structural options. Each combination works in different ways and presents different trade-offs. They demonstrate how mitigation options can work together to reduce flood risk and how outcomes may vary depending on the combination and degree of mitigation implemented.

Presenting example combinations with varying levels of flood risk reduction also helps community members and stakeholders understand how different mitigation options can work together, and the trade-offs involved in achieving different levels of protection.



	Example Combination 1	Example Combination 2	Example Combination 3
What's included	- Agency and community flood preparedness (NS60). - Flood resilient homes and Flood Proofing (NS15) - Package B (manual) or Package E (permanent). - Flood warning system improvements (NS20).	- Arundel Retarding Basin (RB70) - Konagaderra Retarding Basin (RB60) - Maribyrnong Township Protection Levee (L030) - Agency and community flood preparedness (NS60) - Flood resilient homes and Flood Proofing (NS15) - Package B (manual).	- Arundel Retarding Basin (RB70) - Konagaderra Retarding Basin (RB60) - Wildwood Retarding Basin (RB65) - Maribyrnong Township Protection Levee (L030) - Rivervue Retirement Levee (L010) - Agency and community flood preparedness (NS60) - Flood resilient homes and Flood Proofing (NS15) - Package E (permanent) - Flood warning system improvements (NS20)
Flood risk reduction	Low level of flood risk reduction	Higher level of flood risk reduction with up to approximately 75% reduction in over-floor flooding	Highest level of flood risk reduction with up to approximately 95% reduction in over-floor flooding
Strengths	- Lower overall cost. - Some of the non-structural mitigation options in this combination may be quicker and more feasible to deliver. - Minimal to no major construction works involved. - Limited impacts to land access or community amenity.	- Fewer major construction works. - Some of the mitigation options in this combination, such as the non-structural options could be implemented quickly. - Lower overall cost. - Reduced flood risk across the lower catchment.	- Higher number of homes protected. - Provides meaningful reduction in flood risk. - Can be staged or expanded in the future. - Includes additional measures such as improvements to the flood warning system.

	Example Combination 1	Example Combination 2	Example Combination 3
	Can be expanded upon in the future.	Can be staged or expanded in the future.	
Things to consider	- Lower costs, but also a limited level of protection. - This example combination does not reduce flood levels, and does not significantly reduce flood risk in the lower catchment. - Individual options in this combination depend on owners or occupiers acting early, which may not always happen in time for a flood event. - Continued community awareness, preparedness, and maintenance are needed to keep these options effective over time. - Unlike structural mitigation options, the improvements may be harder to see, even though they provide important safety and preparedness benefits.	High complex approvals - Retarding basins involve complex approvals, including cultural heritage considerations. - Arundel Retarding Basin has significant environmental and cultural impact to adjacent Organ Pipes National Park. - Higher cost for a high level of flood risk protection. - A high level of investment required. - Structural options like retarding basins and levees may require land acquisition. - May involve changes to current land uses in the upper catchment.	- Overall, a better improvement in protection, but at greatest cost, complexity and time. Most complex approvals - Retarding basins involve complex approvals, including cultural heritage considerations. - Arundel Retarding Basin has significant environmental and cultural impact to adjacent Organ Pipes National Park. - Individual mitigation options have different estimated delivery timelines for example levees could be quicker to implement compared to retarding basins. - A very high level of investment required - Structural options like retarding basins and levees may require land acquisition. - May involve changes to current land uses in the upper catchment.
Estimated time	The estimated delivery timeframe is between 2 and 7 years. However, because this	Following planning and approvals, measures would be implemented progressively over a period of time.	

	Example Combination 1	Example Combination 2	Example Combination 3
	combination includes options that involve property owners or occupiers making changes to their homes, the regulatory and approval requirements are not yet clear, which may affect delivery timeframes.	- For example, non-structural interventions could be implemented in 2 to 5 years, each medium-scale and medium complexity structural options could typically take around 5 to 10 years, while each large-scale and high complexity structural options could take 25+ years - This reflects a staged approach, where additional components can be delivered over time to incrementally deal with the increasing flood risk due to climate change. - Note that Phase 4 of the Study will provide more detail on the pathway to implementation.	
Estimated cost	Between \$120 million - \$200 million	\$0.45 billion - \$1.08 billion	\$0.70 billion - \$1.68 billion

What's next?

To learn more about the example combinations and have your say, 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



www.letstalk.melbournewater.com.au/maribyrnong-river-flood-model/flood-mitigation-study

Speak to the team

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