The Shortlist Handbook

Maribyrnong River catchment flood mitigation study

June 2026

Handbook at a glance

About this document – what you need to know

This handbook is part of Phase 3 of Melbourne Water's Maribyrnong River flood mitigation study. This study will identify and assess long-term, sustainable flood mitigation options for the lower Maribyrnong River catchment. Here is where things stand:

What we know: A shortlist of flood mitigation options has been developed and assessed using technical analysis and community feedback from Phases 1 and 2. This handbook explains those options and how they can work together.

What is still being considered: No preferred approach has been selected. The combinations of options presented here are illustrative; they show how options can work together, not what has been decided. Importantly, many of the options would be challenging to implement in the short term.

What you can influence: Your feedback in Phase 3 will directly shape which options are recommended. We want to understand which combinations the community prefers, and why, including the trade-offs people are willing to accept.

What happens next: Community and stakeholder feedback will be combined with technical assessments to recommend a preferred approach at the end of the study. Further steps, including business cases, environmental assessments and planning approvals, will follow before any work can begins.

Executive summary

Together with the community, Melbourne Water is exploring long term options to help reduce flood risk for the lower Maribyrnong River catchment. 'Flood risk' refers to the overall level of risk that is posed by the chance of a flood, combined with the potential consequences of a flood.

Flooding is a natural part of the environment, and while Melbourne Water works to reduce its impacts, it cannot be completely prevented, particularly in complex urban areas.

At the same time, we must consider historic urbanisation and future climate change when we think about flood events. This became real for many people during the 2022 flood event, with severe impacts on people and environment including damage to homes, communities and ecosystems. This study is about learning from those experiences and planning carefully for future floods.

It is important to be clear about what flood mitigation can and cannot achieve. The options in this study can meaningfully reduce flood risk for the lower Maribyrnong catchment, but they cannot eliminate it entirely. Many of the options would be challenging to implement and cannot be actioned in the short term. Even with the most effective combination of measures in place, some level of residual flood risk will remain. This is true of flood mitigation everywhere and being transparent about it is essential to making good long-term decisions together.

The study forms part of the work needed to identify, develop and implement flood mitigation options that will help to reduce flood risk over the long term in the lower Maribyrnong River catchment, while also reflecting community values as much as possible.

In Phases 1 and 2 of the Maribyrnong River flood mitigation study (the study), we asked for feedback from community members and stakeholders about what is important to them and what they value within their local environments and communities. This feedback helped inform the study's 'Evaluation Criteria.' We also heard from community members and stakeholders about some of the flood mitigation options they would like to see explored as part of the study.

In Phase 3 of the study, Melbourne Water is engaging with stakeholders and community members about the shortlist of flood mitigation options. Since Phase 2 of the study, our team of experienced flood mitigation specialists have refined the long-list of

mitigation options into the shortlist using a range of technical assessments including the updated Evaluation Criteria. Once shortlisted, each option underwent a detailed evaluation using a Decision Framework to identify different combinations of flood mitigation options that work effectively together.

As part of Phase 3 of the study, we are calling on the community to join us in exploring the combination of options derived from the shortlist. This handbook provides an overview of the shortlist and key information about the mitigation options.

For more information about the Study and to view some frequently asked questions and fact sheets relating to the study, please visit the Let's Talk website: Melbourne Water - Let's Talk

About the handbook

This handbook contains the shortlist of long-term flood mitigation options for the study and serves as a central source of information for the community.

It is important to note that this document reflects our current understanding of the available options. We have gathered information about the options through additional technical work and stakeholder and community engagement to further refine the shortlist of mitigation options using several technical assessments alongside community feedback.

Constraints and limitations to consider

It is important to note that there will be many competing factors when assessing mitigation options and trade-offs will likely be required when making decisions.

We need to consider existing historical and contextual constraints, for example, the existing geographic features of the catchment. The study also needs to consider the relevant technical, economic, social and environmental factors. Many of the shortlist options have constraints and impacts documented in this handbook. Whilst a detailed assessment of these constraints and impacts has not been included in this Phase 3, in some options they are considered significant, and these impacts will need to be scoped and evaluated in more detail.

Constraints can also emerge after a preferred option is selected, including funding limitations, planning and approval requirements, environmental and heritage considerations, land ownership issues and potential impacts on local communities. As a result, it is not practical to pursue an option where significant or multiple constraints exist that are unlikely to be resolved or mitigated. However, over time some of these constraints and limitations may change, influencing decision-making, and creating new opportunities or introducing additional constraints that are not evident today.

Cost and benefit trade-offs are a central part of this study, and it is important to explain how we are thinking about them. Not all options that reduce flood risk are equal in cost, and some have significant social and environmental constraints. Not all lower-cost options provide sufficient protection on their own.

Some higher cost options, such as major retarding basins or significant levee infrastructure also have considerable social and environmental impacts. The cost of implementing them needs to be weighed against the impacts of the option itself.

Conversely, some lower-cost options, such as flood warning systems or property-level resilience measures, are valuable and can be delivered sooner, but they do not reduce the likelihood of flooding. They help people respond better; they do not change the flood itself.

Where this handbook presents combinations of options, we have tried to be clear about what each option contributes, what it costs in broad terms, and where trade-offs are required. We will continue to develop this analysis as the study progresses.

The example combination of options presented during phase 3 of the study have been developed to illustrate how a group of mitigation options can work together to reduce flood risk across the lower parts of the catchment. During phase 3, we will be collecting community feedback on how different options can be combined in different ways to achieve varying outcomes and the trade-offs that need to be considered. This feedback will help us understand which options the community prefers and why. This input, alongside technical assessments, will guide the recommendation of a preferred approach at the end of the study.

Once the study is complete, there are still several important steps Melbourne Water and partner agencies will need to take before any work can begin. For example, these steps will include preparing business cases to obtain funding, seeking funding from other agencies, conducting environmental assessments, ground investigations and obtaining planning approvals.

In Phases 1 and 2 we heard frustration in the community about the timeframes associated with planning and delivering potential flood mitigation options projects. Melbourne Water acknowledges this feedback and will pursue flood mitigation options where there is an opportunity to deliver them faster, where appropriate.

We are committed to reporting how decisions have been made to the community including why certain flood mitigation options have been progressed or not.

How to use the handbook

As there are many different types of options we are considering as part of the study, we have grouped them according to their broader category in the handbook, as summarised in the table below.

Shortlisted Structural Flood Mitigation Options		Shortlisted Non-Structural Flood Mitigation Options	
	Levees (including one-way valves)		Property Acquisition and Buy Backs
	Retarding basins		Flood Resilient Homes and Flood Proofing
	Flood relief culverts		Flood Warning Systems
	Multifunctional storage areas		Agency and Community Flood Preparedness

Shortlisted Structural Flood Mitigation Options		Shortlisted Non-Structural Flood Mitigation Options	
	Pier Shielding (or alteration to existing bridges		Evacuation Routes
	Nature-based solutions		Improving and Enhancing Post Flood Support
	Other		Compensation

As you move through the handbook, you will see that flood mitigation options have been marked as '**Progressed**,' '**Pending'** or '**Not Progressed**' (see section on 'Assessment of the shortlist'). This process has been informed by our technical assessments, feedback from community from Phase 2 as well as assessing against the updated Evaluation Criteria. This process has been informed by our technical assessments, feedback from community from Phase 2 as well as using the assessment against the updated Evaluation Criteria. To learn more about this process, please read pages 15 to 18 of the handbook.

Role of different types of options

The study includes both structural and non-structural mitigation options, which play different roles in reducing flood risk.

Structural options (such as retarding basins and levees) can provide significant flood reduction benefits but are complex, costly and take a long time to plan, approve and deliver. Major infrastructure such as retarding basins are not a short-term solution and would realistically only be considered as part of a long-term pathway – several decades into the future. Non-structural options (such as flood warnings, preparedness, planning controls and property level resilience) are typically faster and less costly to implement and can begin reducing risk in the short to medium term.

Both types of options are potentially important and need to be assessed and implemented over time. Larger mitigation options need to be considered following comprehensive environmental, financial and planning feasibility processes – as well as further community consultation - which would be in addition to the work of this study.

Abbreviations in the handbook

This handbook uses abbreviations throughout. The table below outlines the abbreviations and full terms used in the handbook.

Abbreviations	Full term
km	Kilometre
kms	Kilometres
km^2	Square kilometres
km^3	Cubic kilometres
m^3/s	Cubic metres per second

Abbreviations	Full term
m^3	Cubic metres
AEP	Annual exceedance probability
m	Metres
mm	Millimetres
mAHD	Metres Australian Height Datum

Background

This section provides background information about the updated Evaluation Criteria, the shortlist and the processes that were undertaken to develop the shortlist of mitigation options.

About the Updated Evaluation Criteria

The Evaluation Criteria was used to examine the flood mitigation options and to help refine the shortlist.

Based on community feedback, we refined the Evaluation Criteria to improve clarity, consistency, and transparency. The updated criteria feature simpler language, clearer outcome descriptions, and a more consistent scale to make it easier to understand how options are assessed.

We have highlighted some of the changes we have made to the Evaluation Criteria. These include:

- The criteria are now presented vertically to emphasise that no single criterion is more important than another. For example, while safety appears first, it is not ranked higher; all criteria are considered equal in the assessment.
- We've updated the language used to show how mitigation options are assessed. Previously, terms like "**favourable**" and "**unfavourable**" were used. We heard from the community that this could be confusing and may suggest that an option would be ruled out too early if it was labelled "**unfavourable**."
- To make this clearer, we now use a scale from "**very low"** to "**very high"**. This more accurately reflects that each option has a range of impacts and benefits across different areas. Importantly, a lower rating, for example, "**very low**" for environment or heritage) does not mean an option has been removed. All shortlisted options are considered as part of the overall assessment, balancing different factors.
- We have utilised clearer language across the Evaluation Criteria.

- Elements of the Vulnerability Assessment were incorporated into the safety criterion to better reflect how different people may experience flood risk, providing a more nuanced understanding of safety.

- Community members told us they would like to see how many properties are affected at each level of impact. We haven't shown this level of detail, as it could be too fixed and give a false sense of certainty across different scenarios. Instead, we've included the number of properties protected for each mitigation combination to give a clearer picture of the overall benefits.

The updated Evaluation Criteria is shown on the following page.

Criteria	Very low	Low	Medium	High	Very high	Pending (subject to further investigations)
Safety Will this option help slow or reduce floodwaters to reduce the hazard?	May increase flood risk including safety risk and/or creates a serious risk to life.	May create flood risk, including minor injury risk or increased flood vulnerability in some areas.	Does not change flood risk, overall safety outcome and flood vulnerability. improvement.	Improves safety in some locations by reducing flood risk for a small number of people.	Significantly improves safety across the catchment by reducing flood risk. Flood vulnerability decreases across the lower catchment.	There are other options with similar flood risk reduction at a lower cost. These options could be progressed in future subject to further investigations.
Property Will this option help slow or reduce floodwaters to reduce damage to property?	Some properties in the lower catchment experience increased flood damage, that cannot be eliminated by a secondary mitigation option.	Extent of flooding unchanged and no reduction in damage to property.	Locally it provides a small reduction in flood extent for a small number of properties.	Reduces flooding extent and/or flooding damage for many properties, with some benefits for properties in the flood plain.	Widespread reduction in extent of flooding, with benefits most properties in the floodplain.	
Environment & Heritage Will this option help to protect or improve local natural areas, parks, cultural sites or places that matter to the community?	Serious and long-lasting damage to the environment, heritage sites, or community access to and use of natural spaces.	Ongoing moderate, local damage to environmental or heritage values, or community access to and use of natural spaces.	Small or local impacts that can be fixed or managed.	Helps protect environmental or cultural values and improved access to and use of natural areas.	Uses nature-based solutions that reduce flooding and greatly enhanced access to and use of natural areas.	

Criteria	Very low	Low	Medium	High	Very high	Pending (subject to further investigations)
Value for money Are the benefits expected from this option likely to exceed the cost of implementing it?	The costs are expected to be much higher than the benefits.	This option would be very expensive ($$$$) and wouldn't reduce flood risk in the long term to justify the expense.	This option would be expensive ($$$) and the longer-term benefits wouldn't match the cost.	This option would reduce flood damage sufficiently to be worth the cost.	This option would greatly reduce flood damage compared to the cost.	
Deliverability Can this option be realistically approved, supported by the community, and constructed?	Not constructable on the proposed site, very strong community opposition, and extremely complex and long planning and approval pathway.	Approval process will take years. The community may strongly oppose. It could be implemented, but this would be complicated, expensive and risky.	Approval process could be challenging. Some people may have concerns. It could be implemented, but this would be moderately complex and risky.	A clear approval path. Little community opposition. It could be built using standard methods with no unusual risks.	A clear approval path. Would be welcomed by the community. It could be implemented using standard methods with no unusual risks.	

The Evaluation Criteria (source: Melbourne Water, 2026).

Legend:

$$$$ - very expensive
$$$ - very high cost
$$ - moderate cost
$ - low cost

Use of the Updated Evaluation Criteria

In Phases 1 and 2 of the study, we heard that protecting the safety of people and property are the most important things to you. We also heard that the community might be willing to tolerate temporary impacts to recreation if it means reducing flood risk to homes or infrastructure.

This feedback and other key insights gathered in Phases 1 and 2 of the study has been given an increased 'weight' within the Evaluation Criteria to reflect what we heard from the community. This is also reflected in the updated Evaluation Criteria.

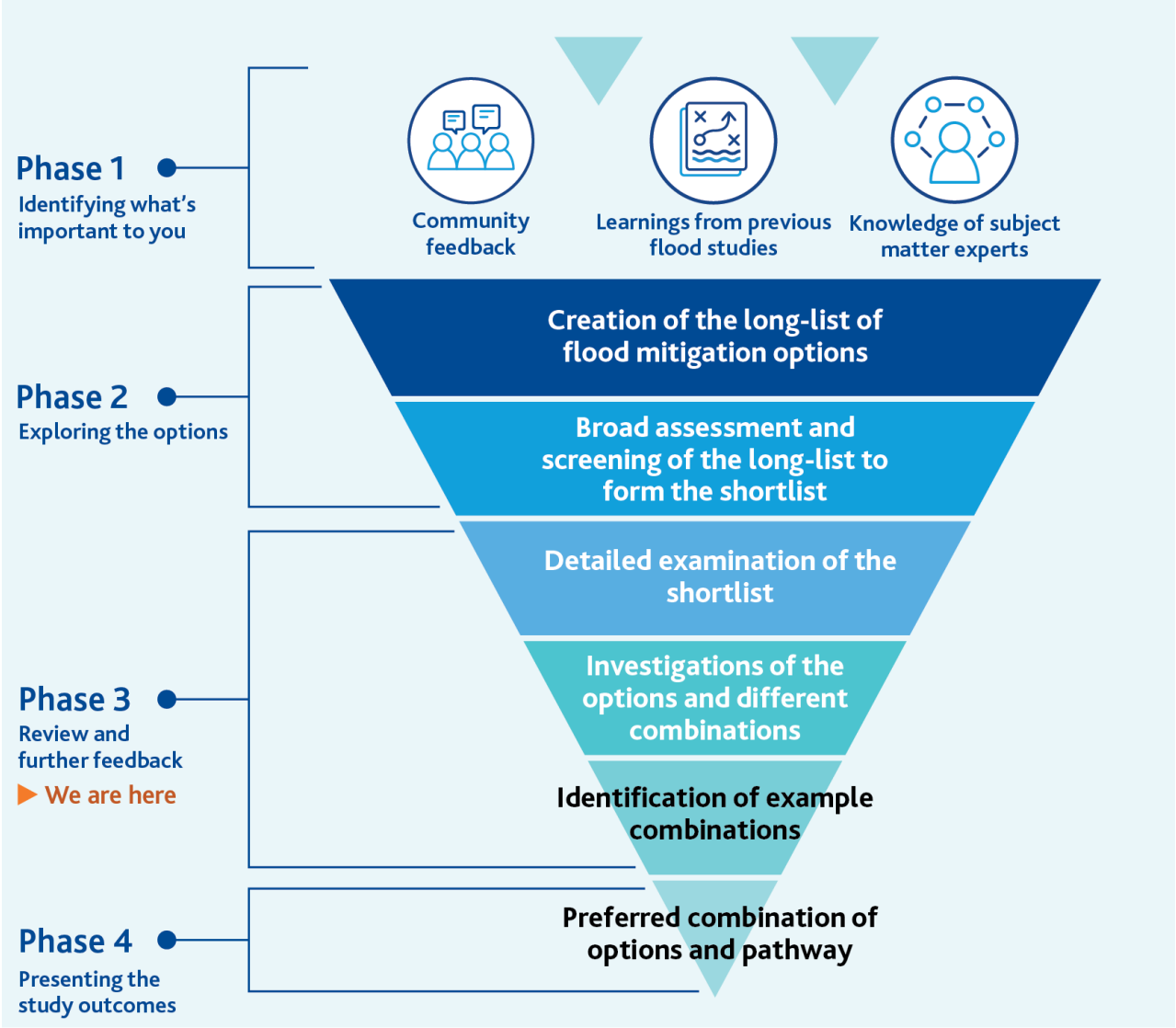
After we updated the Evaluation Criteria it was refined into a series of metrics that were used in the Decision Framework. The metrics were used to help assess the individual mitigation options and the different scenarios.

The Evaluation Criteria and metrics developed from it, were used to assess the scenarios of combined flood mitigation options in more detail as part of the broader assessments undertaken within the Decision Framework.

As we progress through the study, we have used the updated Evaluation Criteria and other assessment tools to look at the flood mitigation options in increasing levels of detail:

- Completed a broad assessment of the options at the long-list stage (in Phase 2)
- Progressed through to a closer examination during the shortlisting of options (which is where we are now)
- Conducted detailed investigations into the shortlist and the different combinations of options (which is where we are now)

These investigations are highly detailed which includes the use of the Evaluation Criteria and supported by other assessments, including a cost-benefit analysis.



Graphic representing the phases of the Maribyrnong River catchment flood mitigation study (source: Melbourne Water, 2026).

The shortlisting process

The shortlisting process included assessing the options individually on how they performed during a simulated flood event using a computer model. We also assessed how they performed in combination with other mitigation options.

Alongside these technical assessments, we considered community feedback. This ensured we only carried forward options that were effective, feasible, and aligned with community priorities.

Three main input inputs were used to refine the shortlist:

- **Flood risk reduction** - our specialists assessed each option to understand the extent they could reduce flooding in the lower catchment using computer modelling.

- **Community feedback** – consultation from Phases 1 and 2 informed decision-making including by identifying community-supported options, areas of concern and key priorities.

- **Early feasibility checks** - how feasible and practical each option is, assessing things like the ability to construct, cost and the time it would take to implement. We recognise that a more comprehensive feasibility assessment will be required for some options before they progress any further.

The **Evaluation Criteria** was used during the shortlisting process. The Criteria helped the Project team prioritise options which aligned with key metrics, such as property and safety, which had been informed by community feedback.

As part of these initial assessments, some mitigation options were removed from the shortlist because they were found to provide limited flood risk reduction, were not cost-effective compared to the benefits achieved or they did not align with community priorities.

For example, a proposed multifunctional storage space at Afton Street Conservation Park did not progress to the shortlist. This was in part based on community feedback that highlighted it was not suitable for the area due to potential impacts to recreational spaces and in part this was based on its relatively small water storage capacity.

Assessment of the shortlist

It is important that we focus our attention on exploring options that are, above all, able to reduce flood risk and are also economically feasible, technically feasible and practical to implement.

The purpose of assessing the shortlist is to help make sure that the options progressed through the next phases of the study have the best chance of reducing flood risk and protecting people's safety and homes in the lower catchment. These are the top community priorities we heard during Phases 1 and 2.

Through the shortlisting process, the study team further refined the shortlist of mitigation options from the screened list shown on the Options Map in Phase 2, which you can view by visiting the Let's Talk website:
http://www.letstalk.melbournewater.com.au/maribyrnong-long-list

Twenty flood mitigation options have been categorised as progressed through the shortlisting process. For transparency, all the options that were not progressed and the rationale for the decisions are provided in this handbook (see pages 26 to 84).

This handbook includes all the options on the shortlist and categorises them based on how they performed in the screening process:

- **Progressed** for further detailed investigations
- **Not progressed** for detailed investigations
- **Pending - subject to further investigation.** There are other options with similar flood risk reduction at a lower cost. These options could be progressed in future subject to further investigations.

Not progressed refers to options that are not progressing further in the study based on a combination of community feedback and early feasibility assessments. Some examples include:

- Tidal barrage along the Maribyrnong – this option would only reduce flood risk for a small portion of the catchment and is not cost effective.
- Sunbury line railway corridor tunnel – this option was found to provide little benefit in terms of reducing flood risk
- Improving and enhancing post flood support and compensation – these options did not progress to the shortlist as they are considered elsewhere and also do not primarily reduce flood risk nor build long term resilience.

Identifying the Flood Mitigation Example Combinations

From the shortlist, using a range of feasibility assessments and the **Decision Framework**, the study team tested thousands of combinations of options.

The selected three example combinations of flood mitigation options represent different levels of flood risk reduction. Two of these examples include a mix of structural and non-structural mitigation options. The third example only includes non-structural options. Because non-structural options do not have a set location they cannot be shown on a map. We will be sharing all three example combinations with the community for feedback. See **Community Feedback** section on page 23 for more information

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 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.

Please see Factsheet –example combinations for further information; Melbourne Water - Let's Talk

Community feedback

In Phase 3, we are seeking feedback on how different options can be combined in different ways to achieve varying outcomes and the trade-offs that need to be considered.

To assist in discussions, we've identified three example combinations of flood mitigation options for the lower Maribyrnong River catchment. Each combination shows as an example of how a group of options can work together to reduce flood risk across the lower parts of the catchment.

To support this, we have created a digital **Flood Mitigation Explorer**. Two of these examples include structural mitigations options and are shown in the Flood Mitigation Explorer. The third example only includes non-structural options. As non-structural options generally do not have a set location as it's not possible to show them on a digital or physical map. We will share all three examples with the community for their consideration.

You can access the **Flood Mitigation Explorer** by visiting the Let's Talk website:

https://letstalk.melbournewater.com.au/maribyrnong-mitigation

We are interested in hearing your views on trade-offs between the different flood mitigation approaches, including cost, level of protection, impacts to amenity and changes to access to your local neighbourhood and the broader catchment.

The study team are highly motivated to make sure the flood mitigation options for the lower Maribyrnong River catchment reflect the interests and values of the community as much as possible, while also reducing flood risk.

Your feedback will help us to understand community preferences in trade-offs and will help influence how we develop the preferred combination of flood mitigation options during Phase 4 of the study.

Next Steps

Once Phase 3 of community feedback is complete, our specialists will recommend a preferred combination of flood mitigation options for the catchment in the final phase of the study.

The next stage will focus on how these mitigation options could be implemented over time as part of an adaptive plan that responds to changing conditions and priorities. An adaptive plan takes a staged and flexible approach. For this study it means continuing to assess options over time and adjusting them as new information, constraints or opportunities emerge, rather than locking in decisions too early.

As part of this process, we may identify that some options cannot be progressed further. If this occurs, we will look to replace them with other shortlisted options to ensure we continue working towards the most effective combination for reducing flood risk. Any alternative options would come from the shortlist already shared with the community during Phase 3.

During Phase 4, details of the preferred combination, what options are included and why will be shared with the community.

How to participate

In addition to the Flood Mitigation Explorer, there will be multiple in-person engagement opportunities for you to provide feedback.

In June and July 2026, we will be hosting community events throughout the catchment to gather community feedback and preference in trade-offs.

To view upcoming events please visit the community events page on the Let's Talk website: Melbourne Water - Let's Talk

Levees

In this study, levees are areas of raised ground that form a physical barrier between flood waters and assets like property or road infrastructure.

Example of a levee, Koo Wee Rup (source: Melbourne Water, 2024).

Example of a levee, Dandenong Creek (source: Melbourne Water, 2020).

While levees can take many forms, they are usually earthen embankments, retaining walls or a combination of both. The exact form depends on the available space and other engineering constraints such as underground or overhead services like gas mains, power lines or masts. Often drains through levees will need one-way valves to stop flood water backing up through the drain and causing flooding. These are considered in this section.

Explainer

To assess the effectiveness the levee options, each levee option was tested using TUFLOW, a detailed computer flood model that simulates how water moves across the catchment. The model covers the lower Maribyrnong area with an area of approximately 20 km^2 and shows flood depth, speed and extent during a 1% AEP event (a large flood event with a 1 in a 100 chance of occurring in a given year), including climate change. This allowed us to compare how each levee option performed.

For years 2030 and 2100, we tested the options to the 0.1% AEP, 1% AEP, 2% AEP, 5% AEP, 10% AEP and 20% AEP scenarios.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
L010	Rivervue Retirement Village	Largely positive feedback from the community. *"This option seems like a good idea to protect properties in the Rivervue site. It is a site specific option but I think it is worthwhile…"*	**Flood Risk Reduction:** • This levee would be around 1km long and based on the modelling results, the Rivervue Levee can be considered in combination with other options such as a retarding basin to offset impacts. • The Rivervue Levee including non-return valves was shown to protect the land directly behind it, including the Rivervue Retirement Village. **Early Feasibility:** • The levee could substantially change views from nearby residential properties, which is an important community consideration. Further site-specific analysis will support design. • The levee is deemed constructable based on early assessments and can provide flood risk protection for the Rivervue Retirement Village. The specific height required will depend on which other mitigation options this is combined with and further design phases if chosen for construction.						**Progressed** as there is a signification reduction in the flood risk. Noting the increase water levels upstream need to be mitigated.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
L020	The Boulevard, Aberfeldie	Generally, the community did not see value in this option. Community expressed concern around the impact to visual amenity.	**Flood Risk Reduction:** • This levee would be around 800m long and 1.8 m high. The modelling also showed that this levee would cause flooding at the Moonee Valley Transfer Station, which is an important piece of infrastructure. • This option may be required to offset impacts from other levees such as the Maribyrnong levee. • If this option were to be progressed, additional protection measures would be needed for the transfer station. **Early Feasibility:** • The levee is deemed constructable based on early assessments and can provide flood risk protection. The specific height required will depend on which other mitigation options this is combined with and further design phases if chosen for construction.						**Progressed** as there is a signification reduction in the flood risk. Noting there are some potential impacts upstream that may need to be mitigated.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
L030	Maribyrnong Township Protection	Did not receive much positive support from the community. Community do not want to lose their connection to the river. *"This doesn't seem like a good option. The levee will create a huge barrier between the river and the community."*	**Flood Risk Reduction:** • This levee would be around 2.8km long and up to 3.6 m high with an average height of 2.6m. • During testing, the levee was shown to provide significant protection to the Maribyrnong township. • However, the modelling also showed that this levee could increase flooding upstream including to other residential properties. The levee would also increase flood water levels upstream and along the northern side of the river. **Early Feasibility:** • Based on early assessments, the levee is deemed constructable and can provide flood risk protection. It will most likely have to be a combination of embankments and levee walls. • The specific height required will depend on which other mitigation options this is combined with and further design phases if chosen for construction. • The levee could substantially alter the access and views from nearby residential properties and access to the river.						**Progressed**. Noting the need to manage impacts on areas close by and also upstream.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
L042	Woods Street, Ascot Vale	This option received mixed feedback.	**Flood Risk Reduction:** • This levee would be around 1.4km long and typical height of 2.4m high. • The modelling results showed that during a 1% AEP flood it the Levee it would protect the Ascot Chase area. • However, the results showed it would also increase flood water levels upstream, although flooding downstream were minimal. **Early Feasibility:** • Some modifications to the existing open channel would be required to construct the levee. • Based on early assessments, the levee is deemed constructable and can provide some flood risk protection. • The specific height required will depend on which other mitigation options this is combined with and further design phases if chosen for construction.						**Progressed**. Noting the increase water levels upstream need to be mitigated.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
L054	Hobsons Road, Kensington	Generally positive feedback. *"I like the benefits the levee could bring and if the levee was immediately planted up so that it became a green and appealing feature, a place to enjoy the river and being outdoors, I think this could mitigate the local visual impact."*	**Flood Risk Reduction:** • This levee would be around 300m long and more than 3.0m high. • When tested the Hobson Road Levee was shown to reduce flood levels for a small part of Kensington. It did not significantly reduce flood levels in other parts of the lower catchment. • The modelling also showed that it would cause new flooding in areas that were previously dry. **Early Feasibility:** • This levee would have to be constructed as a wall, as there is not sufficient available space for an embankment. This increases the construction costs. • The levee provides little flood protection and increases flood levels in some areas.						**Not progressed** as individual option as it increases flood levels. **Progressed** as a combination of levees L054, L060 and L070.

L056	Kensington Banks Protection	Well supported by community. *"Should be shortlisted."* *"Unlike the other Hobsons Road levee, this one is much further in from the river and looks like it will impact the apartment building and commercial buildings along Hobsons Road/the river to the point of possibly (partially) destructing them or them butting up directly against the levee which seems very undesirable..."*	City of Melbourne (COM) has maintained the existing Kensington Banks flood mitigation levee since handover and confirms that its height has remained largely unchanged since its original construction. This is supported by a recent levee level survey by COM which showed existing levee has a height of >3mAHD. Kensington Banks is currently protected by a levee as well as raised roads and building platforms. Kensington Banks Protection L056 investigated raising all of these to increase the level of protection. **Risk Reduction:** • Modelling results showed that the levee around Kensington Banks could reduce flood levels if it could be built high enough (i.e. above 4mAHD). • However, to make this effective all roads would have to be raised by 1m as well, which is not feasible in the short term but could be considered over the coming decades if opportunities to renew roads eventuate. • The results showed the levee would also increase flood levels upstream. • This levee would be most effective when used alongside other flood mitigation options. **Early Feasibility:** • Early feasibility assessments indicate that raising roads would provide only an additional 0.1–0.2 m of flood protection, which is unlikely to significantly reduce flood risk in Kensington Banks.	**Safety**	**Property**	**Environment & heritage**	**Value for Money**	**Deliverability**	**Progressed** noting long term solution and the increased water levels upstream need to be mitigated.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria	Outcome
			• Kensington Banks is constructed so that access ways and roads, together with the buildings along Smithfield Rd, Hobsons Rd, and Kensington Rd, creates a barrier of protection for the low-lying areas behind. To increase protection to a higher elevation than current, each of these access ways and roads would need to be raised, and buildings would need to be modified to withstand high flood levels. • Investigations show it is not feasible to raise the access ways and roads by more than 100-200mm as they are constrained by the surrounding buildings and terrain.		

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
L060	Saltwater River Rail Bridge to Hopetoun Bridge Levee	Mixed feedback received about this option from the community.	**Flood Risk Reduction:** • This levee would be around 800m long and more than 3m high. • The modelling results showed that it would increase flood levels behind the levee itself. • The levee also had limited impact to flood levels upstream or downstream. **Early Feasibility:** • This levee would have to be constructed as a wall, as there is not sufficient available space for an embankment. This increases the construction costs. • The levee provides little flood protection and increases flood levels in some areas.						**Not progressed** as individual option as it increases flood levels. **Progressed** as a combination of levees L054, L060 and L070.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
L070	Sims Street, West Melbourne	Generally positive feedback but we only two comments during consultation. Featured in the small group discussion with the Kensington Association *"Need to retain river path for walking/cycling and avoid introducing safety hazard (drowning etc) or flooding other residential areas."*	**Flood Risk Reduction:** • This levee would be around 400m long and more than 3.3m high. • When tested on its own during a 1% AEP flood event, the modelling showed that it would increase flood levels across large parts of the catchment, particularly around Kensington, the Flemington Racecourse and the Showgrounds. Because of these impacts, it was recommended that this levee not be considered on its own, but only in combination with other levees (such as L054, L056 and L060). • When tested in combination with other levees, the modelling showed that the levee provided protection to Kensington and nearby eastern areas, although upstream water levels still increased. **Early Feasibility:** • This levee would have to be constructed as a wall, as there is not sufficient available space for an embankment. This increases the construction costs. • The levee provides little flood protection and increases flood levels in some areas.						**Not progressed** as individual option as it increases flood levels. **Progressed** as a combination of levees L054, L060 and L070.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
L054 **L060** **L070**	Hobsons Road to Sims Street	This option was created during the development of the shortlist as a combination of three other levee options. As a result, it was presented to community for feedback.	**Flood Risk Reduction:** • When we assessed this group of levees as one continuous levee, we found that it provided protection to Kensington Banks and West Melbourne. Testing also highlighted this levee increased water levels upstream. • This levee would be around 1.4km long and more than 2.0m high. **Early Feasibility:** • This levee would have to be constructed as a wall, as there is not sufficient available space for an embankment. This increases the construction costs. • It is also likely that the levee would need to acquire private land. • The flood protection is limited compared to the associated costs						**Progressed**

Multifunctional storage areas

Multifunctional storage areas are places that can store flood water, while also serving other functions. For example, an oval that is used for sports or recreation that also provides temporary flood water storage.

Example of a multifunctional storage area, Wyndham community raingarden (source: Melbourne Water, 2017)

Explainer

Three options in this category have been tested. We tested all multifunctional storages using TUFLOW, a detailed computer flood model that simulates how water moves across the catchment. The model covers the lower Maribyrnong area with an area of approximately 20 km^2 and shows flood depth, speed and extent during a 1% AEP event (a large flood event with a 1 in a 100 chance of occurring in a given year), including climate change. For years 2030 and 2100, we tested the options to the 0.1% AEP, 1% AEP, 2% AEP, 5% AEP, 10% AEP and 20% AEP scenarios.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
S060	Defence Site Maribyrnong	Overall community feedback was supportive of this option, but there was a strong recognition that the site has considerable contamination that would need to be addressed. *"Contamination would be a big worry."* *"If this site can also be improved to support flora and fauna, will help decontaminate and use a wasted area, it is a very appealing option."*	**Flood Risk Reduction:** • A multifunctional storage at the Defence Site Maribyrnong was estimated to have a storage capacity of 673,300m^3. • When we tested the effectiveness of this option at 1% AEP it was shown to decrease water levels upstream and downstream from the site. • However, it was also shown to increase water levels at the adjacent Afton Street Conservation Park. **Early Feasibility:** • This site would have to cleaned from pollution and hazardous material before it could be used as a flood storage area. The cost of remediating (removing contamination) the site would be highly expensive and likely to be a long-term activity. • In addition, the area would require modification of the terrain to increase the storage capacity. These works involve considerable costs. • If the design and land use of the site is changed in the future, it is recommended that storage volume is incorporated as it has shown to decrease water levels upstream of the site.						**Progressed**, noting site constraints, such as contamination, need to be further assessed. The cost of remediating (removing contamination) the site would be highly expensive and likely to be a long-term activity.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
S070	Afton Street Conservation Park	Community feedback about this option highlighted there were several concerns about using as a multifunctional storage because of the potential impacts to recreation, local amenity and the environment. *"The potential increase in downstream levels is concerning if they impact residential areas."* *"I love this park and would hate to see it concreted over. The ONLY way this could be considered appropriate is if the park is fully reinstated and that there is no or an absolute minimum of concrete/hard surfaces... They are heat sinks locally worsening the impacts of climate change, they are unappealing as recreation areas so are underpopulated creating an unsafe and grungy feeling, they are terrible habitat for plants and animals..."*	**Flood Risk Reduction:** • A multifunctional storage at the Afton Street Park (S070) would have a storage capacity of 117,500m^3. • When we tested the impact of having potential multifunctional storage at Afton Street Park we found that in a 1% AEP event, it decreases water levels upstream. • However, it was also shown to increase waters levels close to Afton Street. • Considering the modelling results, and the strong community views expressed in Phase 2, it was recommended this option was not progressed. **Early Feasibility:** • The area would require lowering of the terrain to increase the storage capacity. It has also shown to increase water levels in surrounding areas and thus construction would be complex to ensure that would not be the case.						**Not progressed** as it increases flood levels near Afton Street.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
S0110	Fairbairn Park	Community feedback revealed there are concerns about using it as a multifunctional storage due to impacts to community access and the park. *"This area is well used so it would be a drastic change, the recreation facilities need to be kept or improved for me to support this option."* *"Community impacts in relation to sporting clubs using the park. Concerns around the impacts to the park after holding water (smell, mud, water for months, very slow drainage). In 2022, the water needed to be pumped out."*	**Flood Risk Reduction:** • The proposed multifunctional storage at Fairburn Park (S0110) was estimated to have a storage capacity of 161,750 m^3. • When we assessed the multifunctional storage at Fairburn Park we found that it decreased water levels upstream from Fairbairn Park. • However, it was also found to increase water levels around Fairbairn Park and Ascot Chase. • Due to the increased water levels in other areas, it was not recommended to be progressed. **Early Feasibility:** • The area would require modification of the terrain to increase the storage capacity. It has also shown to increase water levels in surrounding areas and thus construction would be complex to ensure that would not be the case.						**Not progressed** as it increases flood levels in Ascot Chase.

Retarding basins

Retarding basins are structures designed to temporarily store flood water during a flood event to alleviate the impacts of a flood downstream.

Example of a retarding basin, Moonee Ponds Creek (source: Jacobs).

Example of a retarding basin, Williams Landing (source: Melbourne Water, 2016).

Explainer

In total, thirteen retarding basin options have been assessed in the shortlisting process. Of these thirteen options, three options; Arundel (RB70), Wildwood (RB65), and Konagaderra (RB60) are categorised as 'primary sites', meaning they can reduce flood risk on their own. The remaining options are flagged as 'secondary sites', meaning they must be combined with other mitigation options to significantly reduce flood risk.

Retarding basins, especially the primary sites are large-scale and high complexity structural options. Their implementation involves lengthy and challenging approvals processes, including consideration of cultural values, environmental impacts and ground conditions.

Early planning and environment assessments undertaken by the Study show that all retarding basin sites are in rural areas that are likely to contain important habitats for native plants and wildlife, in addition to impacts to freehold land parcels. This creates significant environmental constraints, and additional investigations and approvals required under the Commonwealth's *Environment Protection and Biodiversity Conservation Act* 1999 and the Victorian *Environmental Effect Act* 1978.

Previous studies also indicate there are many areas of Cultural sensitivity within the catchment. Further investigations are required to understand the possible impacts on these sensitive sites from mitigation options like retarding basins. Consideration of Traditional Custodians' views and impact on cultural values must be included in any future investigation.

These environmental and Cultural Heritage planning requirements will potentially affect feasibility, timelines, and costs. Whilst a detailed assessment of these impacts has not been included in this Phase 3, they are considered significant, and these impacts should be scoped and evaluated in more detail.

Complex structural options such as retarding basins could take 20+ years to implement. It is important to note, that once this study is complete, there are still several important steps Melbourne Water and partner agencies will need to take before any work can begin. These steps would include preparing business cases to obtain funding, seeking funding from other agencies, feasibility investigations, conducting environmental assessments, ground investigations, and obtaining planning approvals.

We tested how each retarding basin would perform during a 1% AEP flood event. This is a large flood with a 1-in-100 chance of occurring in any given year. We used RORB, a computer modelling tool which helps estimate how much water flows through rivers and creeks, and how fast during flooding events.

We assessed all the retarding basins by using the flow rate at the Keilor Gauge during an 1% AEP flood event as a base case. We then modelled the same flood event with the retarding basin to see if there was a change in the flow rate at the same Keilor Gauge. For years 2030 and 2100, we tested the options to the 0.1% AEP, 1% AEP, 2% AEP, 5% AEP, 10% AEP and 20% AEP scenarios.

Primary sites

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
RB60	Konagaderra	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative	**Flood Risk Reduction:** • As a primary site, when assessed on its own, the Konagaderra retarding basin (RB60) reduced peak flood flows by about 10%. This level of reduction means Konagaderra performs well as a standalone option, as it is able to make a noticeable difference to flood levels by itself. • Konagaderra also continued to significantly reduce flood flows when assessed both on its own and alongside other retarding basins. **Early Feasibility:**						**Progressed** as a long term solution. Noting it is a large-scale and high complexity structural option that involves complex approvals, including cultural heritage and environmental

		environmental impacts or potential problems related to interference with existing land use.	• When we compared the preliminary cost to build Konagaderra with the flood reduction it provides, it was found to be cost-effective. • Early planning and environmental assessments indicate that up to 26 freehold parcels could be impacted. This does increase the possibility of a complex landowner engagement process. • Initial assessments indicate that primary regarding basins like Konagaderra may impact environmental and cultural heritage features. This includes the presence of significant fauna such as platypus, grayling and growling grass frogs in the waterways, as well as significant cultural values and sites. • Further investigations are required to understand the extent of these impacts, which may influence design, approvals, and delivery.						impact considerations.
RB65	Wildwood	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the	**Flood Risk Reduction:** • As a primary site, when assessed on its own, the Wildwood Retarding Basin reduced peak flood flows by around 20%. This is a significant reduction, meaning Wildwood can work effectively as a standalone flood mitigation option. • When different combinations of retarding basins were tested together, Wildwood was one of three locations (along with Konagaderra and Arundel) that consistently showed strong reductions in peak flows when combined with other basins.	**Safety**	**Property**	**Environment & heritage**	**Value for Money**	**Deliverability**	**Progressed** as a long term solution. Noting it is a large-scale and high complexity structural option that involve complex approvals, including cultural heritage and environmental

		possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Early Feasibility:** • When we compared the preliminary cost to build Wildwood with the flood reduction it provides, it was found to be cost-effective. • Early planning and environmental assessments indicate that up to 39 freehold parcels could be impacted or changes to existing land access arrangements. A high number of landowners are anticipated to be impacted. • These early assessments identified an existing quarry located within the proposed located for Wildwood. This adds significant land use constrains with the environmental impacts of this requiring further investigation. • Initial assessments indicate that primary regarding basins like Wildwood may impact environmental and cultural heritage features. This includes the presence of significant fauna such as platypus, grayling and growling grass frogs in the waterways, as well as significant cultural values and sites. • Further investigations are required to understand the extent of these impacts, which may influence design, approvals, and delivery.						impact considerations
RB70	Arundel	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about	**Flood Risk Reduction:** • As a primary site, when assessed on its own, this option reduced peak flood flows by about 30%. This is a significant reduction, meaning Arundel can work effectively as a standalone flood mitigation option.	**Safety**	**Property**	**Environment &**	**Value for Money**	**Deliverability**	**Progressed** as a long term solution. Noting it is a large-scale and high

		their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use. *"I believe this is one of the best options as it addresses the flood impact on its own."* *"Unsure why this is still being considered as an option. History of floods (i.e. 1975) in the lower catchment, people built on a floodplain. Flood environmentally sensitive areas like Organ Pipes National Park."*	• Arundel was the largest Retarding Basin assessed as part of the study. It captures runoff from the largest upstream area and is located further downstream than the other basins. These factors contribute to its strong impact on flood flows. • Of all the individual basins tested, Arundel had the greatest effect on reducing flows at the Keilor Gauge. • Arundel was previously investigated as a dam that permanently held and stored water but did not progress due to potential impacts on the Organ Pipes National Park and nearby cultural heritage sites. The current proposal considers an online retarding basin. This would allow the river to flow as it does today under normal conditions. The basin would only temporarily hold back water during major flood events. **Early Feasibility:** • Combinations that included Arundel were shown to deliver the most cost-efficient reductions in flood flows – when comparing preliminary construction costs. • There is the potential for impacts on significant environmental and cultural values. This includes the presence of significant fauna such as platypus, greyling and growling grass frogs in the waterways, as well as significant cultural values and sites, including the Murrup Tamboore Cultural Heritage area downstream.						complexity structural option that involves complex approvals, including cultural heritage and environmental impact considerations

			• Previous work has also shown that during a flood event, Arundel would increase water levels (in the order of 1m) in an already flooded Organ Pipes National Park. • Early planning and environmental assessments indicate that up to 44 freehold parcels could be impacted or changes to existing land access arrangements. This increases the likelihood of a complex landowner engagement process. • If this option is combined with Wildwood or Konagaderra there will be opportunities for Arundel to be smaller than previous options.						

Secondary sites

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
RB15	Clarkefield	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Flood Risk Reduction:** • On its own, the Clarkfield Retarding Basin only reduced the peak flood by a very lower percentage (less 5%). This means Clarkfield does little to help reduce flood risk. • As it is small in size and located far upstream in the Maribyrnong Catchment, it is more likely to be useful during smaller, more frequent flood events, rather than larger flood events. For this reason, Clarkfield has been identified as a secondary option, meaning it would only be considered alongside larger or more effective retarding basins if needed at a later stage. • When assessed together with other retarding basins, the Clarkfield retarding basin did not significantly contribute to reduce peak flow levels at the Keilor Gauge. **Early Feasibility:** • The preliminary cost of building Clarkfield when compared to its ability to reduce flood levels was shown to be very cost inefficient. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process.						**Not progressed** as it does little to help reduce flood levels in the lower part of the catchment.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
RB20	Sunbury	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use. *"Storage assets like this will be required just to handle the urban growth in the area"*	**Flood Risk Reduction:** • When we tested Sunbury retarding basin on its own, it was shown to reduce peak flows by less than 10%. While this is a meaningful contribution, this option is relatively expensive to construct and other options provide larger reductions at lower costs. • When we tested it in combination with other retarding basins, we found the Sunbury retarding basin did not noticeably reduce the flow of flood water at Keilor Gauge. In other words, when part of a combination of flood mitigation options, its impact was minimal. **Early Feasibility:** • The preliminary cost of building the Sunbury retarding basin we found it was very high when compared to the small reduction in flood levels its provided. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process.						**Not progressed** as the it is not cost-effective and was shown to do little to reduce the flood risk.

RB25	Willow Flat	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use. *"This seems like a great option but we may need several of these across the catchment to help reduce flood risk in the lower parts of the catchment."*	**Flood Risk Reduction:** • On its own, the Willow Flat retarding basin reduced the peak flow by a very low amount (less than 2%). This is a relatively small reduction and does little to help reduce flood risk in the lower catchment. • When assessed in combination with other retarding basins, Willow Flat does little to help reduce peak flows at the Keilor Gauge, indicating limited benefit during major flood events. **Early Feasibility:** • Like Clarkfield, Willow Flat has a small storage capacity and is located a long way upstream. Because of these aspects, it is more likely to be effective during smaller, more frequent flood events, rather than large floods. • Given its location in Boyd Creek, this storage could potentially reduce flooding locally near Darraweit Guim, but this has not been considered further in this study. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process. • The preliminary construction costs indicate that Willow Flat is moderately cost-effective, despite delivering a relatively low reduction in peak flows.	**Safety**	**Property**	**Environment & heritage**	**Value for Money**	**Deliverability**	**Pending - subject to further investigation,** but it could be an alternative option if Wildwood or Konagaderra cannot be progressed.

RB30	Lancefield	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use. *"This storage is required just to manage the urban growth in the area."*	**Flood Risk Reduction:** • When assessed individually, the Lancefield retarding basin (RB30) was found to only reduced the peak flow rate by a very small percentage (less than 1%). This indicates that Lancefield would do little to help reduce the flood risk during a large flood event. • When Lancefield was tested in combination with other retarding basins, there was a limited impact on peak flows levels at the Keilor Gauge. **Early Feasibility:** • Smaller retarding basins such as Lancefield are expected to have a greater impact during smaller flood events, as they have relatively small storage volumes and are located far upstream in the catchment. • Given its location in Deep Creek, this storage could potentially reduce flooding locally near Darraweit Guim, but this has not been considered further in this study. • The preliminary construction costs indicate that Lancefield is moderately cost-effective, despite delivering a relatively low reduction in peak flows. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process.	**Safety**	**Property**	**Environment & heritage**	**Value for Money**	**Resilience**	**Pending - subject to further investigation,** as an alternative with best-value for money.

RB35	View Hill	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Flood Risk Reduction:** • When tested individually in a modelled 1% AEP flood event, the View Hill retarding basin (RB35) reduced peak flows by a very small amount. These results indicate it does little to help reduce the flood risk during large flood events. • When View Hill was tested in combination with other retarding basins, there was similarly minimal changes on peak flows at the Keilor Gauge. **Early Feasibility:** • View Hill has shown to have little impact of flooding in the lower catchment. This means, construction of this retarding basin would not be feasible as an option for protection of the lower catchment. • The preliminary construction costs indicate that View Hill is moderately cost-effective, despite delivering a relatively low reduction in peak flows. • Given its location in Deep Creek, this storage could potentially reduce flooding locally near Darraweit Guim, but this has not been considered further in this study. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process.	**Safety**	**Property**	**Environment & heritage**	**Value for Money**	**Deliverability**	**Pending - subject to further investigation,** as an alternative with best-value for money.

RB40	Donovans Creek	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Flood Risk Reduction:** • When tested individually the Donovans retarding basin (RB40) reduced peak flows during a flood event by a very low percentage (less than 1%). This result suggests, its impact during a large flood event would be very minimal. • When Donovans Creek retarding basin was assessed together with other retarding basins, it was found on average to provide a modest reduction in peak flow rates. **Early Feasibility:** • Retarding basins such as Donovans or Lancefield which are smaller retarding basins are expected to have a greater impact during smaller flooding events, as they have relatively small storage volumes and are located far upstream in the catchment. • The preliminary cost for building Donovans is not shown to be cost-effective when considering the small reduction in flood risk provided. • Given its location in Deep Creek, this storage could potentially reduce flooding locally near Darraweit Guim, but this has not been considered further in this study. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process.	**Safety**	**Property**	**Environment & heritage**	**Value for Money**	**Deliverability**	**Not progressed** as it has minimal impact on reducing flood levels in the lower part of the catchment.

RB45	Darraweit D2	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Flood Risk Reduction:** • When we evaluated the Darraweit D2 retarding basin, we found it had a limited effect on peak flows at the Keilor Gauge, reducing the peak flow by less than 1%. This indicates that it does little to reduce the flood risk. • When assessed alongside other retarding basins, the Darraweit D2 retarding basin provided a small average reduction in peak flows. **Early Feasibility:** • Darraweit D2 individually was also shown not be cost-effective when comparing the preliminary construction costs with the reduction in peak flows. • Smaller retarding basins like Darraweit D2 are expected to have a greater influence during smaller flood events, as they have relatively small storage volumes and are located far upstream in the catchment. • Given its location in Deep Creek, this storage could potentially reduce flooding locally near Darraweit Guim, but this has not been considered further in this study. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process.	**Safety**	**Property**	**Environment & heritage**	**Value for Money**	**Deliverability**	**Pending - subject to further investigation,** as an alternative for Konagaderra.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
RB50	Darraweit D1	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Flood Risk Reduction:** • On its own, the Darraweit D1 retarding basin was shown to reduce the peak flood by only 0.5%. This means it does little to reduce the flood risk. • When assessed alongside other retarding basins, the Darraweit D1 retarding basin provided a little average reduction in peak flows. **Early Feasibility:** • Additionally, Darraweit D1 retarding basin was not cost-effective when we compared the preliminary construction costs with its ability to reduce peak flows. • Darraweit D1, like the other smaller retarding basin are expected to have greater influence during smaller flood events, as they have relative low storage volume and are located in the upper part of the catchment. • Given its location in Deep Creek, this storage could potentially reduce flooding locally near Darraweit Guim, but this has not been considered further in this study.						**Not progressed** as part of this study as it does not reduce flood levels in the lower part of the catchment.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
RB55	Beveridge West	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Flood Risk Reduction:** • When considered on its own, the Beveridge West option reduced peak flood levels by about 5%. This result indicates that on its own it would do little to reduce the flood risk. • Similar to Donovan's Creek, Darraweit D1 and Darraweit D2, when we assessed Beveridge West in combination with other retarding basins it had little impact on reducing the peak flows at the Keilor Gauge. **Early Feasibility:** • Beveridge West has shown to have an impact on flood risk, but given its higher catchment location than Konagaderra, Wildwood, and Arundel, it provides less reduction. This option could be used if one of the larger basins was unfeasible. • Beveridge West individually was also shown to be moderately cost-effective despite the relatively small reduction in flood risk provided. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process.						**Pending - subject to further investigation** Could be an alternative option if Wildwood or Konagaderra cannot be progressed.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
RB62	Deep Creek Retarding Basin	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Flood Risk Reduction and Early Feasibility:** • When we assessed the Deep Creek Retarding Basin it was shown to cover the same tributaries that was covered by Konagaderra Retarding Basin (RB60) and Wildwood Retarding Basin (RB65). Therefore, Konagaderra and Wildwood were prioritised and progressed over. • Deep Creek Retarding Basin was considered not cost-effective when comparing the preliminary construction cost against reduction in flood risk.						**Not progressed**, as the Konagaderra and Wildwood retarding basins capture the same tributaries and these are more cost-effective options.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
RB80	Diggers Rest Retarding Basin (formerly Jackson Creek)	In Phase 2 more broadly, feedback about the retarding basin options highlighted that many members of the community were generally positive about their potential and that they would like to see them be further investigated as part of the study. Much of the feedback received also raised concerns about the possibility of negative environmental impacts or potential problems related to interference with existing land use.	**Flood Risk Reduction:** • When tested individually, the Diggers Rest Retarding Basin demonstrated a 10% reduction in peak flow rates. • The Diggers Rest Retarding Basin was identified as the most effective retarding basin ay reducing flows generated solely from Jackson Creek. • When assessed in combination with the Wildwood Retarding Basin, Diggers Rest produced a significant reduction in flows and could be considered a viable alternative to the Arundel. **Early Feasibility:** • Diggers Rest was shown to be effective at reducing flood levels downstream but was not as cost efficient as other retarding basin options when we compared preliminary construction costs. • Environmental impacts could likely be offset via natural measures and careful consideration in the design process.						**Pending - subject to further investigation** While shown to be effective at reducing flood levels downstream, it was not as cost efficient as other retarding basin options. However, it could be an alternative option if Arundel is unable to be progressed further.

Pier Shielding or alterations to existing bridges

Pier shielding or alterations to existing bridges refers to making changes to features of existing bridges within the catchment area to improve the flow of water.

Example of a river bridge, the Maribyrnong River (source: Melbourne Water, 2016).

Explainer

To assess the effectiveness of alterations to existing bridges, each option was tested using TUFLOW, a detailed computer flood model that simulates how water moves across the catchment. The model covers the lower Maribyrnong area with an area of approximately 20 km^2 and shows flood depth, speed and extent during a 1% AEP event (a large flood event with a 1 in a 100 chance of occurring in a given year), including climate change. This allowed us to compare how each option performed.

For years 2030 and 2100, we tested the options to the 0.1% AEP, 1% AEP, 2% AEP, 5% AEP, 10% AEP and 20% AEP scenarios.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
Br10	Pier Shielding on Raleigh Road Bridge	Mixed feedback. But seen as complementary to other measures.	**Flood Risk Reduction:** • When we tested Pier shielding at Raleigh Road Bridge (Br10) the result showed a small reduction in flood levels upstream. **Early Feasibility:** • Based on early assessments, altering the bridge piers to improve flood conveyance is possible.						**Progressed**. It was recommended that this mitigation option should be considered if, and when, the bridge is being altered in the future.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
Br20	Pier Shielding on Angliss Stock Bridge	Mixed feedback received, with this option seen as complementary to other measures. *"This seems like a post flood mitigation and doesn't help prevent flooding in housing areas, it seems like a good idea however not a priority over more meaningful mitigations, however it seems obvious to do this at some point to all the bridges in the area."*	**Flood Risk Reduction:** • Pier Shielding at Angliss Stock Bridge (Br20) was shown to have limited flood level reduction when we modelled a 1% AEP flood event. **Early Feasibility:** • Based on early assessments, altering the bridge piers to improve flood conveyance is possible, but the benefits in terms of flood reduction is minimal compared to the associated costs.						**Not progressed** as it was not shown effectively reduce flood levels.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
Br30	Pier Shielding on Kensington Rail Bridge	Mixed feedback received, with this option seen as complementary to other measures. *"What does it look like?"*	**Flood Risk Reduction:** • Pier shielding at Kensington Rail Bridge (Br30) was shown to have limited flood level reduction when we modelled a 1% AEP flood event. **Early Feasibility:** • Based on early assessments, altering the bridge piers to improve flood conveyance is possible, but the benefits in terms of flood reduction is minimal compared to the associated costs.						**Not progressed** as it is a very expensive option with minimal impact to flood levels. It was recommended that this mitigation option should be considered if, and when, the bridge is being altered in the future.

Ref.	Option	Phase 2 Community Feedback	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
Br40	Pier Shielding on Dynon Road Bridge and Hopetoun Bridge	Mixed feedback received, with this option seen as complementary to other measures.	**Flood Risk Reduction:** • We assessed the impact of pier shielding at Dynon Road Bridge. Similar to Kensington Rail bridge we found there was minimal reduction in water level during a flood event, but there was a reduction in flood levels around Kensington. **Early Feasibility:** • Based on early assessments, altering the bridge piers to improve flood conveyance is possible, but the benefits in terms of flood reduction is minimal compared to the associated costs.						**Not progressed** as it was not shown effectively reduce flood levels. This option could be considered given there is some benefit to Kensington Banks.

Flood relief culverts

Flood relief culverts are structures built on the floodplain to allow flood water to flow through barriers such as embankments or other obstructions. By providing a pathway for water to flow downstream, culverts can help reduce the flood levels upstream of the embankment or obstruction.

Example of a culvert pipe (source: Melbourne Water, 2013)

Example of flood relief culverts, Farnsworth Avenue, Footscray (source: Jacobs)

Explainer

To assess the effectiveness of flood relief culverts, each option were tested using TUFLOW, a detailed computer flood model that simulates how water moves across the catchment.

The model covers the lower Maribyrnong area of approximately 20 km^2 and shows flood depth, speed and extent during a 1% AEP event (a large flood event with a 1-in-100 chance of occurring in a given year), including climate change.

We then re-ran the same event after modifying existing culverts or adding new ones, allowing us to compare changes in water levels upstream and downstream.

For years 2030 and 2100, we tested the options to the 0.1% AEP, 1% AEP, 2% AEP, 5% AEP, 10% AEP and 20% AEP scenarios.

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
Cu20	Heavenly Queen Temple Culverts	This option received positive feedback, but also community members expressed concern about the potential impact of this option on nearby areas of importance, such as the Buddhist temple and the wetland. Community members requested further information. *"I support Option Cu20 because even modest reductions in peak flood levels (e.g., 50mm) are significant for Kensington Banks. In 2022, our street was within 300mm of overtopping; a 50mm reduction could be the difference between containment and inundation."*	Assume 12 additional box culverts of 5 metres x 3.29 metres **Flood Risk Reduction:** • The result demonstrated the additional culverts reduced water levels by approximately 100mm near Kensington Banks. • However, the results also showed there was an increase in water levels immediate downstream from Heavenly Queen Temple. **Early Feasibility:** • This mitigation option involves considerable construction costs as the culvert would cross under three railway lines. • Construction would be complex and need to consider the impact on the Heavenly Queen Temple, railway and surrounding areas.						**Progressed** as there was a reduction in flood levels upstream. Noting the increase in water levels downstream will need to be assessed further.

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
Cu22	Heavenly Queen Temple, Culvert Deepening	This option received positive feedback, but also community members expressed concern about the potential impact of this option on nearby. *"This option should be investigated further."* *"As residents of Kensington Banks we believe this option should be considered. Culverts should be deepened as suggested and other storage and release channels developed in this area."*	To understand the impact of changing the culverts at Heavenly Queen Temple, we tested it by deepening the culverts by 1 metre. **Flood Risk Reduction:** • When we tested deepening of the culverts we found there was no substantial difference. **Early Feasibility:** • This mitigation options involves considerable construction costs as the culvert crosses under three railway lines. • Construction would be complex and need to consider the impact on the Heavenly Queen Temple, railway and surrounding areas.						**Not progressed** as it was found to be ineffective at reducing flood risk.

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
Cu50	Canning Street Bridge Culverts	This option received lone piece of feedback from community, but it strongly indicated support. *"Just do it."*	**Flood Risk Reduction:** • The results from the modelling showed there a reduction in water levels by approximately 50-100mm upstream. • We also found the additional culverts increased water levels immediate downstream of the Canning Street Bridge. **Early Feasibility:** • This mitigation options is considered constructable, but the impact on Canning Street and surrounding areas should be considered further.						**Progressed** as there was a reduction in upstream flood levels. The increased water levels downstream will need to be assessed further.

Nature-based solutions

Nature-based solutions involve mimicking natural processes to reduce flood risk, while also providing a beneficial outcome for the environment or communities. For example, wetlands restoration is the reconnecting of wetlands and billabongs to create more storage for flood water, with the additional benefit of enhancing biodiversity.

Example of a nature-based solution, Kennedy Creek wetlands (source: Melbourne Water, 2013).

Explainer

To assess these nature-based options, we used RORB, a computer modelling tool that estimates how water moves through rivers and creeks during flood events. We established a baseline scenario using flow rates recorded at the Keilor Gauge for a 1% AEP event. That is, a flood event with a 1 in 100 chance of occurring in any given year.

Natural Measures (NBS1): Are measures that increase the ability of the catchment to absorb water by increasing forestation or adapting agricultural practices. These solutions need to be assessed differently to structural options, as they were not tied to specific, defined locations. Instead, our approach focused on evaluating the magnitude of impact these measures could have across the catchment.

From the baseline established above, we tested how increasing infiltration across the catchment would influence peak flows to represent the improved water absorption.

Reconnection of Billabongs (NBS3): The reconnection of billabongs are distributed throughout the catchment and we have investigated one of the largest areas to understand the benefits. From the baseline established above, we tested how increasing reconnection of billabongs would influence peak flows to represent the improved water absorption.

Leaky Dams (NBS4): Leaky dams are distributed through the catchment and are different to centralised structural options, as they are not tied to specific, defined locations. Instead, our approach focused on evaluating the magnitude of impact across the catchment.

As there are no defined set of locations for leaky dams, we used existing farm dams across the catchment as a proxy to represent distributed small-scale storages. This was considered to be an overestimate of the potential for leaky dams in the catchment. These dams were incorporated into the RORB model and assessed against the same baseline scenario established above and evaluated their combined effect on peak flows.

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NBS1	Natural Measure	Overall, this option received very positive feedback. *"This should be done to complement other larger more impactful mitigations as part of a system of solutions."* *"This is the most attractive option of all because it can probably proceed by agreement and negotiation and the appeal of a lot of little things rather than one big thing is undeniable."*	**Flood Risk Reduction and early feasibility:** • We modelled a range of infiltration increases across the catchment including 5%, 10%, and 20% increases across the entire upper catchment which resulted in minimal change to peak flow rates at the Keilor Gauge. • We also modelled larger increases of 100%, 200%, and 300% began to show some reduction in peak flow rates. These are not considered realistic given the nature of the soils in the catchment. • Achieving a meaningful reduction in flow at Keilor would require a substantial increase in infiltration across the upper catchment. Given the scale of the area and the difficulty of converting land cover to highly permeable surfaces, this is unlikely to be practical.						**Progressed**, recommend to consider in later stages due to their environmental benefits.

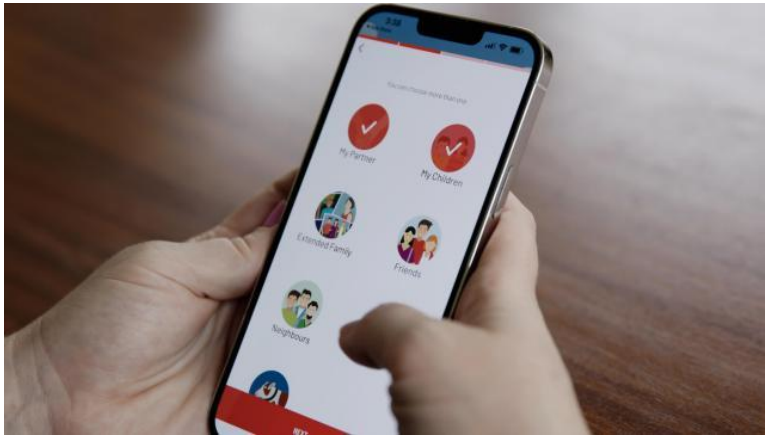
Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NBS3	Reconnection of Billabongs	We received overall positive feedback about this mitigation option. *"I love the idea of reconnecting billabongs and nature-based solutions in general.* *"They may be costly but the multiplier of that money is enormous... Please implement as many of these - in and outside of the city - as possible."* *"It will impact land use and amenity, but positively, creating reconnected and rejuvenated natural areas - like the billabongs on the Yarra."*	**Flood Risk Reduction:** • To understand the impact of a billabong on reducing the flood risk we identified possible location for a billabong. We used the Lancefield Retarding Basin (RB30) to test the effectiveness of using the storge in a billabong to mitigate flooding. We found it made little impact to reducing the peak flows – less than 1%. **Early Feasibility:** • This option did not make a significant contribution to reducing flooding in the lower catchment, as this requires substantial storage volumes. However, these options could contribute to reducing flooding in the upper catchment and would also have environmental and social benefits.						**Progressed**, recommend to consider in later stages due to their environmental benefits.

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NBS4	Leaky Dams	Overall community feedback highlight support, but community members also expressed concern there need to be a lot of them. *"I can't see how this will work. You'd need 1000s of these across the catchment. It will be too hard to manage."*	**Flood Risk Reduction:** • The modelling found these distributed storages resulted in only minor reductions in peak flow rate. • Another consideration was also the use of smaller identified upstream storages (e.g. Lancefield). However, these also showed to have minimal impact of flooding in the lower catchment. **Early Feasibility:** • Hundreds to thousands of leaky dams are required to impact flooding in the lower catchment (if assumed same size as the farm dams). Construction of this many leaky dams is not considered feasible. • In the future, at a larger scale it may be effective locally to reduce flood risk. However, it will not reduce the flood risk in the lower catchment.						**Progressed**, recommend to consider in later stages due to their environmental benefits. For example, in connection with retarding basins.

Non-structural

Non-structural refers to options that do not require a physical asset to directly manage flooding. For example, changes to planning schemes or flood warning systems.

Example of a non-structural option, community education (source: Melbourne Water, 2022).



Example of a non-structural option, flood preparedness (source: Melbourne Water 2024).

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NS10	Property Acquisition and Buy-Backs	Mixed feedback received on this mitigation option. Some community members were supportive of this option, whereas others were not supportive of using taxpayer money in this way. *"Don't like the idea of using taxpayer money to buy back properties that residents knowingly bought in a floodplain."*	• Some community feedback asked that we assess this option for properties remaining at risk from flooding in the very low-lying area of Maribyrnong Township. **Flood Risk Reduction:** • By removing properties in flood prone areas, the risk of damage associated with flooding is reduced, but flooding would still occur in the area and people would no longer have the option to live in their area of choice. **Early Feasibility:** • This option was found to be not feasible when compared to other mitigation options that could be implemented.						**Not progressed:** Based on analysis, it is not considered feasible in the Maribyrnong catchment.

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NS15	Flood Resilient Homes and Flood Proofing	Community feedback showed there were concerns about this option and its impact on land use, or it being too expensive to be feasible. *"This is far too expensive to be feasible."* *"I think this should be done as part of changes to the building regulations -all new properties in identified flood-prone areas should demonstrate flood resilience and flood proofing."*	**Explainer:** • Existing home and properties are modified to withstand flooding and ensure damage are less, when a flood occurs. **Flood Risk Reduction:** • Making properties more flood resilient is highly effective in reducing flood damage to a property. • It does not prevent flooding of an area. **Early Feasibility:** • This mitigation would have to be implemented on a property-by-property basis. The associated costs and feasibility would depend on the implemented method used.						**Progressed**

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NS20	Flood Warning Systems	Despite limited feedback received on this mitigation option it was largely supportive. "*There is a desperate need for an improved warning system - complete with Critical Alerts which sound at night and whenever do not disturb or other features are turned on. This is something VicEmergency app doesn't have and which is a real problem. Don't waste money on a study saying this is needed. We already know that. Just build it already.*"	**Explainer:** • Flood Warning will always be required and as a result this Study includes an option to invest to improve it. **Flood Risk Reduction:** • By improving flood warning, people safety is improved and the damage associated with flood events are decreased as there is more time to prepare for flooding. **Early Feasibility:** • Improving flood warning is deemed feasible. Locations for additional rainfall and streamflow gauges have been identified and there are emerging flood warning technologies such as SWIFT2 developed by CSIRO and Bureau of Meteorology could be deployed in the Maribyrnong catchment.						**Progressed**

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NS25	Improving and Enhancing Post Flood Support	Limited feedback received.	**Flood Risk Reduction:** • Improving and enhancing post-flood support does not directly reduce flood probability or flood levels. • Improving post-flood support helps to mainly reduce the vulnerability component. For example, support programs can help communities rebuild using more flood-resilient materials and install property flood resilience measures (NS15) and improve emergency preparedness (NS60) which have been covered elsewhere. **Early Feasibility:** • These support programs to help communities rebuild have been progressed, these include using more flood-resilient materials and install property flood resilience measures (NS15) and improve emergency preparedness (NS60).						**Not progressed** – see NS15 and NS60

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NS26	Compensation	Limited feedback received	**Flood Risk Reduction:** • Compensation does not directly reduce flood probability or flood levels. **Early Feasibility:** • Support programs to help communities rebuild have been progressed, these include using more flood-resilient materials and install property flood resilience measures (NS15) and improve emergency preparedness (NS60).						**Not progressed**

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NS60	Agency and Community Flood Preparedness	Limited feedback received *"This should be part of it but puts the onus on community rather than the authorities who were responsible for managing the response."*	**Explainer:** • Preparedness, and Awareness Raising, will always be required, this Study includes an option continue to invest and continuously update this. **Flood Risk Reduction:** • Education around flooding, will not directly prevent flooding, but it is likely to reduce the damage associated with flood events, as people and organisation will know what to do in a flood event. **Early Feasibility:** • Education and awareness training is generally considered inexpensive compared to the potential benefits.						**Progressed**

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment & heritage	Value for Money	Deliverability	
NS80	Evacuation Routes	Limited feedback received	**Explainer:** • Evacuation routes are important and need to be considered in the wider context of all hazards that Emergency Responders deal with at Council, State and Federal level (i.e. flood, fire, chemical spills and other hazards). **Flood Risk Reduction:** • Evacuation routes, including education and awareness training around flooding will not directly prevent flooding, but it is likely to reduce the damage associated with flood events, as people and organisation will know what to do in a flood event. **Early Feasibility:** • Education and awareness training on evacuation routes is generally considered inexpensive compared to the potential benefits.						**Progressed**. for further investigation.

Other

In the context of the study, other refers to miscellaneous options that do not fall into one of the previously mentioned categories.

Example of an option that would fall in the 'Other' category, Thames Barrier, UK (source: Jacobs, 2025).

Ref.	Option	Community Feedback from Phase 2	Summary	Evaluation Criteria					Outcome
				Safety	Property	Environment &	Value for Money	Deliverability	
At10	Tidal Barrage Along Maribyrnong	Community feedback was overall not supported, but also limited feedback was received. *"This is not a good option."* *"It's hard to see how this option would help prevent flooding caused by upstream water levels. It also seems like an expensive option."*	**Flood Risk Reduction and early feasibility:** Further investigations of this option highlighted it was highly expensive based on the costs of similar project elsewhere.						**Not progressed**
At60	Sunbury Line Railway Corridor Underpass Tunnel	No feedback received.	There is limited information available to assess the performance of this flood mitigation option in detail. **Flood Risk Reduction and Early Feasibility:** Considering the size of the catchment and the very large volumes of water during flood events in the Maribyrnong, a substantial storage area would be needed to make a difference. Due to these factors, this mitigation option is not expected to significantly reduce flood risk in the lower catchment.						**Not progressed** Investigations found there was little reduction in flood flows.

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 study, view current and upcoming engagement opportunities and sign up to receive project updates: Melbourne Water - Let's Talk