



Energy,
Environment
and Climate Action



Adaptive Community Assets

April 2023

Acknowledgement of Country



Agenda

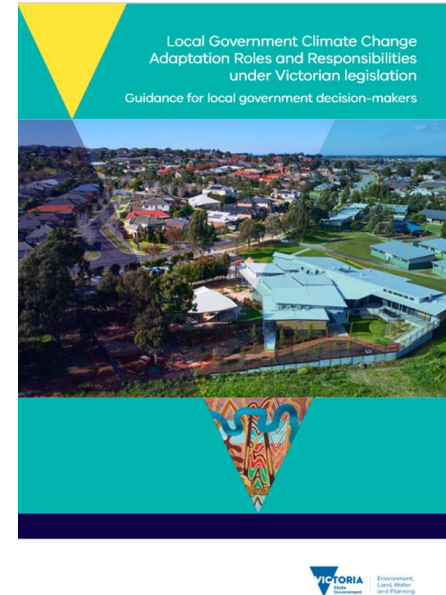
- › Introduction
- › Presentation from Natural Capital Economics (30min)
- › Q&A until close

House keeping:

- › Please keep your mic on mute
- › Put questions in the chat

Context

- › Under the Local Government Act 2020 and Climate Change Act 2017, councils have a ‘duty of care’ to manage foreseeable risks. The Victorian Government’s legal review of the obligations of councils identified that failure to act on known risks may leave councils open to claims of negligence.
- › Councils are required to develop Assets Management plans and are seeking to address legal obligations and risks.
- › Melbourne councils are dealing with climate impacts on and risks to their assets **now**.



What's the business case?

Mitigation

- ✓ Current operating costs
- ✓ Forecast operating costs
- ✓ Costs of upgrade
- ✓ Return on investment
- ✓ Measurement & verification



Adaptation

- › Which risks are increasing?
- › What are the likely cost impacts?
- › What adaptation options do I have?
- › Annual avoided damages?
- › Decision making and uncertainty?



Objectives

- › To develop a clearer understanding of the costs and benefits of different climate change adaptation options for community assets and infrastructure owned and managed by local governments across Greater Melbourne
- › Develop the evidence base to inform decision making and advocacy for funding support

Phase 1

June – Nov 2021

Establish cost benefit analysis framework & collect financial data

Phase 2

May 2022 – Feb 2023

Collect spatial data & develop the 'base case' for the CBA

Next Phase

TBC

Undertake economic modelling of adaptation options

Adaptive Community Assets

A project undertaken for the Eastern Alliance for
Greenhouse Action

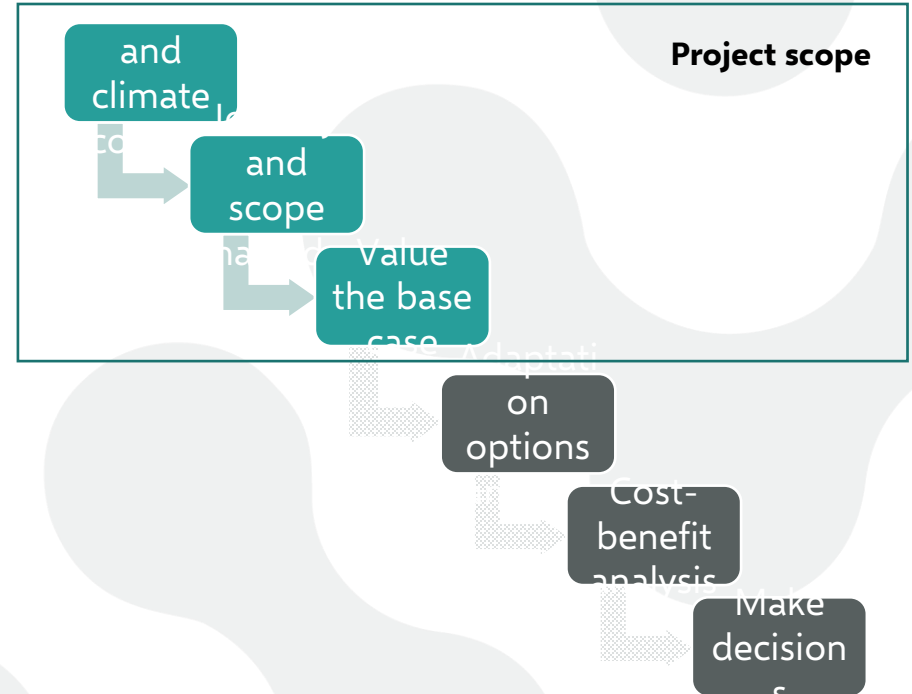
5 April 2023



Natural Capital
Economics

Project overview

- A “first pass” assessment of the value of damages from climate hazards to council assets across Greater Melbourne (base case)
- Draws on a cost-benefit analysis framework (from phase 1)
- Results provide evidence of the ‘do nothing differently’ scenario against which adaptation initiatives can be assessed against



[Costs and benefits of climate change adaptation options for community assets framework](#)

Project overview

- Project's focus is direct damage damages to council assets (i.e. physical damage to assets)
- Excludes indirect tangible impacts (e.g. loss of services) and intangible impacts (e.g. mental and physical health)
- Excludes damages to private assets.

Project scope

Climate hazards

- Bushfires
- Coastal flooding
- Heatwaves
- Inland flooding
- Severe storms (qualitatively)

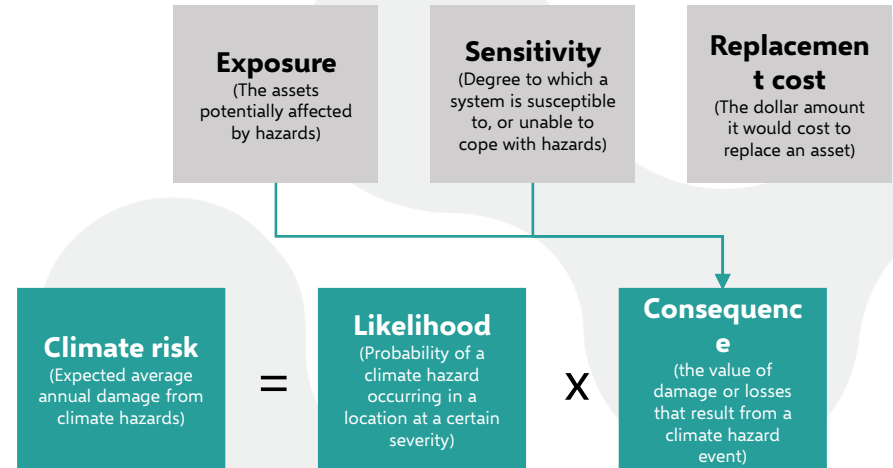
Direct
tangible
risk

Community asset

- Buildings
- Roads
- Drainage
- Natural assets
- Built assets in open space

Project approach (framework)

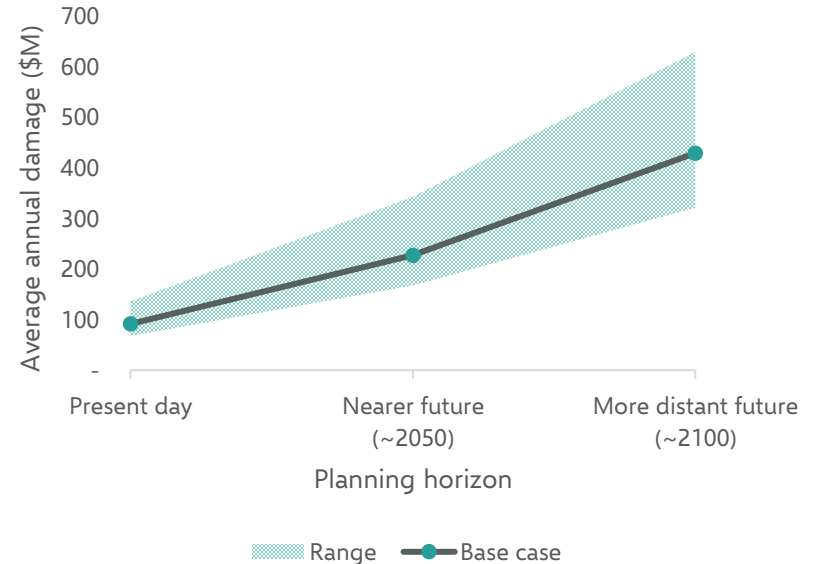
- Risk based approach (likelihood X consequence)
- Damages are quantified in terms of average annual damages (AADs)
- This approach is effectively the same as how the insurance sector value risk



Results

- AADs are calculated for present day, nearer future (~2050), more distant future (~2100)
- Estimate are presented across a range of plausible outcomes
- AADs are estimated to be \$90-\$120 million in present day, \$210-\$300 million in the nearer future, and \$400-\$540 million in the more distant future

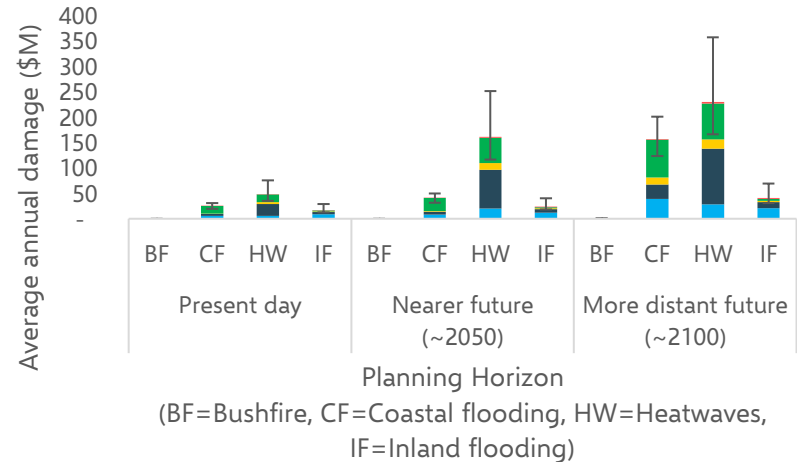
Base case damages from climate hazards to community assets in Greater Melbourne



Results

- Heatwaves have highest AADs, followed by coastal and then inland flooding
- AADs from bushfires is less significant
- AADs are highest for road assets, followed by natural assets and then building assets.
- AADs to built assets in open space are less significant

Base case AADs from climate hazards to community assets in Greater Melbourne



- Buildings
- Roads
- Drainage
- Natural assets
- Built assets in open space

Results

- Results show significant increases in AADs through time
- AADs increase as hazards become more frequent and as more assets become exposed
- Coastal flooding a factor for 'outlier' councils
- Results consider impact of larger events

Base case AAD from climate hazards across each planning horizon for each asset class (mid estimates)

Asset type	Average annual damage (\$000)			% change in AAD from present day	
	Present day	Nearer future (~2050)	More distant future (~2100)	Nearer future (~2050)	More distant future (~2100)
Buildings	20,464	40,828	89,064	100%	335%
Roads	31,900	89,497	149,687	181%	369%
Drainage	5,713	16,200	35,180	184%	516%
Natural assets	31,903	77,404	148,675	143%	366%
Built assets in open space	1,709	3,526	6,701	106%	292%

Project outputs

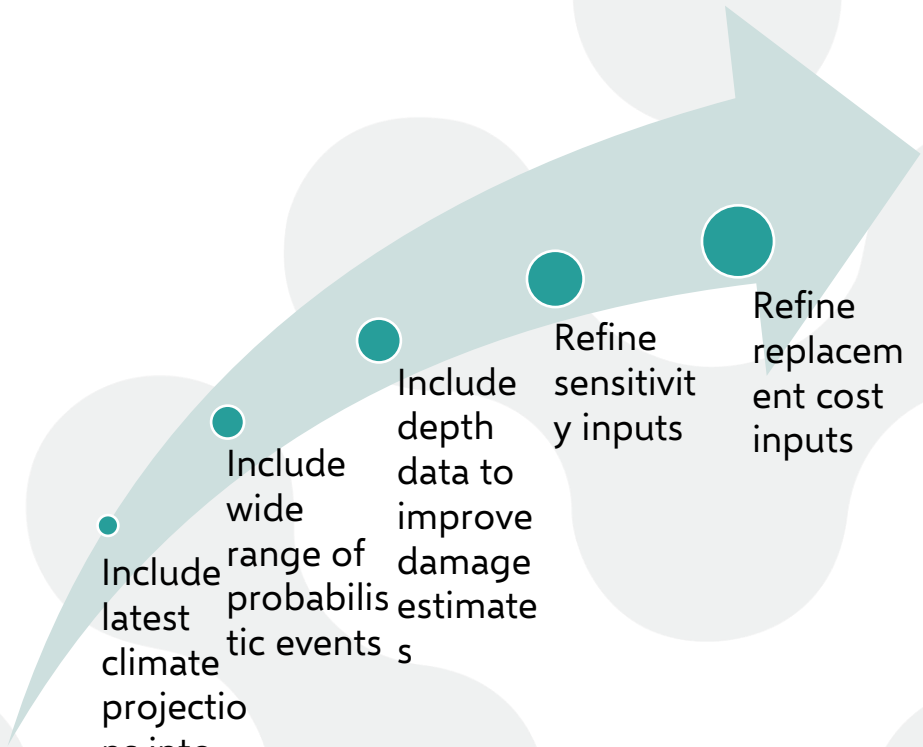
- Results highlight the need for action (i.e. adaptation) to reduce financial impact
- Project outputs include:
 - Report with 1 page appendix for each councils
 - Presentations slides
 - Excel dashboard
 - GIS layers
- Outputs available on the [EAGA website](https://www.eaga.co.uk/)
- CBA framework (phase 1) shows how results can be used

Excel dashboard



Project approach (Opportunities for improvement)

- Project relied on existing datasets. Creates opportunities for improvement
- Refinement will enable the development of more robust business cases
- Sensitivity analysis showed road inputs as being a key contributor to the variance in results
- Sense check included comparisons with SECCCA's [Asset Vulnerability Assessment](#) and work by Infrastructure Victoria



Include latest climate projections into hazard extents

Include wide range of probabilistic events

Include depth data to improve damage estimates

Refine sensitivity inputs

Refine replacement cost inputs

Recommended next steps

- Refine base case estimates of damage
- Include indirect tangible and intangible impacts in future
- Undertake cost-benefit analysis of adaptation options
- Consider climate in long term financial plans
- Consider climate change in asset management

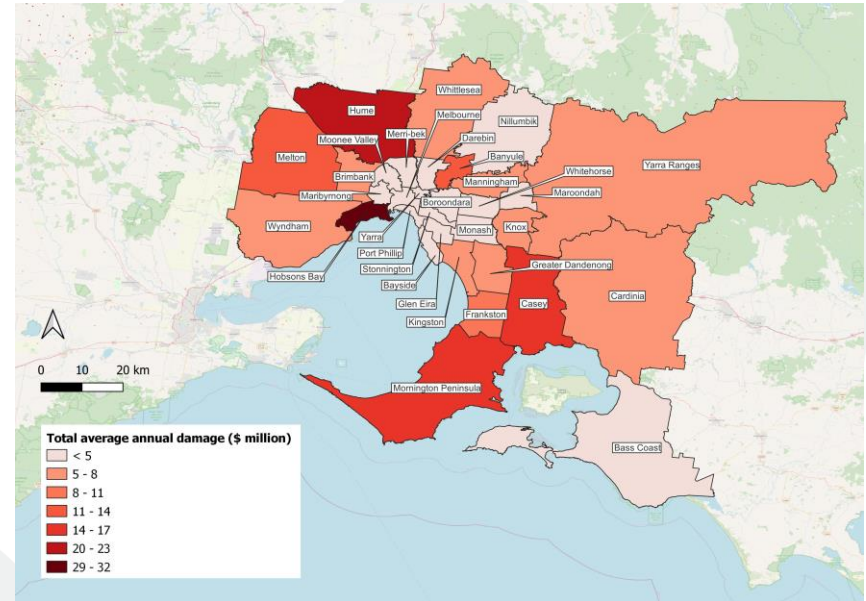
Potential adaptation options for climate hazards

Adaptation action	Heatwaves	Coastal flooding	Inland flooding	Bushfires
Reduce hazard severity	Use vegetation for shade and evaporative cooling	Rehabilitate coastal vegetation	Install on-site detention systems to reduce peak flows	Conduct hazard reduction burning
Reduce asset sensitivity	Use more heat resistant material	Raise building floor/road heights	Use removable fixtures and fittings	Treat timber with fire-retardant chemicals
Reduce asset exposure	Not applicable	Build mitigation structures (e.g. sea walls)	Increase drainage capacity	Relocate assets

Key takeaways from this presentation

- We have used a risk based approach to estimating damages
- Results highlight potential for significant increase in costs to council and the need for action
- There are a opportunities for improvement in results
- Resources are available to assist with understanding local impacts and next steps
- Results aim to support decision making

AAD estimates from climate hazards to council assets in the nearer future



Q&A

- If we run out of time, we will respond to question in writing and circulate to attendees
- Further questions can be directed to Scott McKenry (Scott.McKenry@maroondah.vic.gov.au)



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