

Climate Adaptation Roadmap for Melbourne's East

A guide for decision makers in the EAGA Councils

APPENDICES



Appendix 1: Evaluation Criteria for Adaptation Response Options

Adaptation response options were assessed against the following evaluation criteria from the Canadian Communities Guidebook for Adaptation to Climate Change.

Table 1: Evaluation criteria for filtering and prioritising adaptation options

Category	Criteria	1 (low)	2 (medium)	3 (high)
Sustainability	Mitigation co-benefits	Result in increased GHG emissions	Would not affect GHG emissions	Would reduce greenhouse gas emissions
	Equity	Benefits to few people	Benefits to many people	Significant benefits to many people
	Implementation Cost	Cost is high relative to cost of inaction	Cost is moderate relative to cost of inaction	Cost is low relative to cost of inaction
Effectiveness	Robustness	Effective for a narrow range of plausible future scenarios	Effective across many plausible future scenarios	Effective across a wide range of plausible future scenarios
Risk and Uncertainty	Urgency	Risks are likely to occur in the longer term	Impacts are likely in the near to mid term	Impacts are already occurring
Opportunity	Ancillary benefits	Will contribute little if not at all to other City goals and programs	Will contribute somewhat to other City goals and programs	Will contribute significantly to other City goals and programs
	No Regret	Will have little or no benefit if climate change impacts do not occur	Will have some benefits regardless of actual climate change impacts	Will result in significant benefits regardless of actual climate change impacts
	Window of Opportunity	There is no window currently	A window of opportunity could be created	A window of opportunity exists to implement
Implementation	Funding Sources	External funding sources are required but have not been identified	External funding sources are required and likely to be secured	Funding is available externally or internally
	Institutional	Implementation requires coordination with, or action by other jurisdictions	Implementation requires external approval	Implementation is within local control

Table 2: Adaptation responses and evaluation ranking (*Climate impact: A= All, D= Drought, H= Heatwave, F= Flooding, B=Bushfire, **)

Adaptation Response	Climate impact*	Number of risks addressed	Evaluation Criteria (Impact 3=High, 2=Medium, 1=Low)											
			Mitigation	Equity	Cost	Robustness	Urgency	Co benefits	No regret	Opportunity	Funding sources	Institutional	Total score	
Conduct a regional building vulnerability assessment and conduct targeted upgrades	A	12	3	2	2	3	3	3	3	3	2	1	3	25
Develop a Greening for a Cool East Strategy	H, F, D	21	3	3	2	2	3	3	3	3	2	1	2	24
Solar rates for low income households	H	5	3	2	3	3	3	3	2	2	2	2	2	24
Work with Emergency Management Victoria to improve heatwave preparation and response	H	14	2	2	3	3	3	3	2	2	3	2	1	23
Understand economic impacts of climatic events on strip shopping precincts and identify opportunities for building resilience	A	13	3	2	2	2	2	3	3	3	2	3	1	24
Work with Distribution Network Service Providers to identify initiatives for improving electricity network reliability and community resilience	A	8	2	2	2	2	2	3	2	3	3	2	1	22
Collectively work with Melbourne Water and water retailers to maximise opportunities for alternative water use including identification of regional stormwater capture and reuse opportunities	F, D	17	2	3	2	2	2	2	3	3	2	1	3	23
Develop a regional adaptation capacity building program to champion adaptation through collaboration	A	6	2	1	3	3	3	3	2	2	2	3	3	24
Seek further funding for the EAGA Biodiversity Monitoring Framework and develop regional responses.	All	6	2	2	2	2	3	3	3	2	3	2	3	25
Understand the regional food network and work together to diversify and promote urban food production	A	4	3	3	3	2	2	1	2	3	2	1	1 ³	21

Appendix 2: Full list of Adaptation Response Options

Adaptation objective	Adaptation measure/action
Improving the resilience of built infrastructure	Conduct a regional council building vulnerability assessment and seek funding for targeted upgrades
	Undertake buildings resilience upgrade in combination with energy efficiency upgrades to leverage financing mechanisms (eg EPCs)
	Research life cycle costs and payback periods of different ESD standards for council buildings
	Continue to advocate through MAV and CASBE for a statewide ESD Policy in the Victorian Planning Provisions
	Identify network of critical council facilities for potential off-grid renewable energy backup supply during heatwaves and other extreme weather events
	Conduct training for staff to increase awareness of energy and water use behaviours in identified council buildings
	Develop a coordinated and consistent ESD policy and guidelines throughout the region for council buildings
	Advocate for council buildings to showcase best practice sustainable design
	Develop asset monitoring framework to enable collection of data to establish trends in degradation of assets as a result of climate change
	Review current council asset management plans, maintenance programs and asset registers to ensure they support robust and effective long term adaptation to climate change
	Develop a regional asset managers and engineering adaptation network leveraging from the participants in the roadmap regional workshop to share best practice case studies, excursions and regional forums
	Develop infrastructure and climate change adaptation guidelines for developers, planners, decision makers in the east (ref: City of Greater Geelong)
	Work with state government to develop guidelines for standard procedures for asset condition assessment
	Develop procurement guidelines to encourage suppliers to consider and tender against climate adaptation objectives (ref UKCIP)
	Develop cool roof research project looking at large roof to volume ratios and that could be painted with reflective white paints
Work with DNSPs to identify regional energy initiatives for improving energy resilience and alleviating energy poverty for	

	vulnerable people
	Develop a regional eastern urban forest/green infrastructure strategy, identifying thermal hotspots, common standards, shared learnings and solutions etc. (ref: Greening the West, City of Melbourne urban forest strategy)
Reduce regional urban heat island effect	Work with regional stakeholders to pilot more heat tolerant, permeable and reflective bitumen/pavement materials
	Conduct regional shade audit for targeted green infrastructure and shading initiatives
	Review existing development controls for heat island effect, seeking to ensure new developments do not exacerbate heatwaves
	Review/prepare design guidelines for street furniture, shelters and awnings
	Promote green infrastructure and shade structures in new council recreational facilities
	Community education campaign on broad values of street trees
	Amend existing council procurement requirements to reflect urban design principles that consider extended heatwaves
	Work with research institutions (eg. Monash/Swinburne Universities) to map thermal hotspots and social vulnerability
	Conduct regional economic analysis of heatwave impacts in Melbournes east, focussing on strip shopping precincts
	Work with strip shopping businesses to create a business ESD scheme/revolving energy fund for increasing resilience of strip shopping to extreme weather events and heatwaves
Improving the adaptive capacity of the local economy	Develop an eastern adaptation network with government agencies, businesses and other stakeholders (ref. Inner Melbourne Network)
	Develop a business climate toolkit and self assessment checklist for engaging SMEs in the region to build understanding of adaptation (ref: Sefton Council, UK)
	Design criteria for new transport infrastructure to consider projected climate impacts and guidance for asset managers to incorporate when installing new road or bridge infrastructure
Improving the resilience of transport infrastructure	Undertake a cost benefit analysis of new road building technology and additives, taking into consideration changes to the asset life of roads.
	Work with community to develop community flood response plans
	Work with regional bodies such as SES and other councils to develop maps which identify roads susceptible to flooding, the location of vulnerable populations and alternative routes to reach these vulnerable populations and other key areas in the case of road closure.

	Regional downscaled modelling of climate change and associated hydrological projections
Improved regional water management	Identify regional opportunities for expansion of stormwater harvesting and reuse
	Collaborate between councils to identify regional water harvesting/grey water projects
	Develop standard guidelines for irrigation management and water availability strategies
	Promote warm season and drought tolerant grass species in sporting grounds and reserves
	Promote household water energy efficiency and demand management in conjunction with Yarra Valley Water
	Work with Melbourne Water to integrate climate change risk responses into the regional floodplain management strategy
	Model using remote sensing pervious and impervious surfaces across the region, and develop strategy for improving the ratio through WSUD
	Develop standardised reporting system for blocked drains
	Upgrade sports facilities with more water efficient surfaces and share learnings such as the "sustainable sportsground initiative" at Knox
	Promote WSUD at plan making and development assessment stages and minimise hard surfaces such as pavements
	Undertake an assessment of alternative water quality techniques that can be installed in council owned water catchments to increase turbidity and limit algae growth (eg. Solar powered bee or SunMixer ³)
	Engage with water quality consultants to adapt monitoring systems for increased extreme heat
Consider provisions for movement of biodiversity within a regional urban forest strategy	
Improved environmental management & biodiversity conservation	Develop a procurement project for regional sharing arrangements of arborists after major storm events
	Promotion of increased mowing heights and mulching during periods of low water availability
	Provisions for increased regular maintenance of parks and reserves within council budgets and management plans
	Seek further funding for reporting and analysis of data associated with the EAGA Monitoring Biodiversity Monitoring Framework.
	Develop a community support strategy for biodiversity in extreme weather events such as fire and heatwaves
	Work together particularly along waterways to manage the increase in weeds as a result of climate change

	<p>Assist species relocation and/or regeneration Protect migration corridors (e.g. coordinate with other levels of government and private landowners to ensure high connectivity)</p> <p>Develop and invest in seed/gene banks for region</p> <p>Development of state wide material and education for CALD groups around energy efficiency, heatwave preparedness and sustainability. Collating information from all councils to develop clear messages and save resources.</p>
<p>Build community adaptive capacity and protecting the vulnerable</p>	<p>Statewide capacity building program for HACC Staff to engage with vulnerable communities on energy efficiency and heatwave preparedness</p> <p>A common strategy approach to deliver meals on wheels during red code days (eg. Councils sharing resources to hire services for delivery of meals on wheels, service trucks etc.</p> <p>Regional solar rates project for facilitating renewable energy uptake on low income households</p> <p>Development of a regional heatwave response action plan</p> <p>Development of a regional heatwave alert system (ref: City of Melb)</p> <p>Review OH&S policies to develop contingencies for accessing vulnerable people in extreme weather and extreme heat days</p> <p>Extend the Are you Ready campaign to the EAGA region to build community capacity</p> <p>Community education package on storm preparation (eg. clearing gutters and drains)</p> <p>Encourage scheduling of council events to avoid hottest part of day</p> <p>Identify and develop register of vulnerable households to heatwave and storm events</p> <p>Waive/reduce user fees for swimming pools and increase opening hours of council facilities in extreme heat days</p> <p>Engage with primary care providers to ensure climate change is considered in the service delivery planning</p> <p>Development of regional heatwave refuges identifying designated council cooling facilities</p> <p>Improved standardised emergency communications to CALD community and extreme weather (including fire) education programs</p>
<p>Improving emergency preparedness and response</p>	<p>Conduct regional emergency preparation exercises consider multiple widespread events</p> <p>Advocate for more funding to emergency service agencies in line with increasing extreme events as a result of climate change</p>

	Resource (personnel, plant) and information sharing
	Build a training program for CEOs to build capacity and champion adaptation through collaboration (eg. establish MoU)
Building organisational adaptive capacity	Develop adaptation resources/tools and regional events for sharing of knowledge, consolidating best practice case studies
	Investigate potential liability and insurance issues in relation to climate change and council decision making (particularly land use planning)
	Continue to review key council policies and plans to consider climate change projections
	Build staff capacity across EAGA councils through service area based workshops and online resources
	Review departmental budgets in light of climate change, and monitor impacts of extreme weather events on service delivery and financial sustainability
	Consider contingency funding to extend to adaptation activities in annual budgeting processes
	Review business continuity plans for climate change projections
	Review financial planning procedures to include monitoring of increased costs as a result of climate change
	Review of insurance options for better management of assets from natural disasters (ref: ALGA and ICA review)
	Develop a climate change adaptation staff communications and training program
	Consider investment opportunities and payback periods when considering long term climate change actions
	Research on the potential financial impacts of climate change on existing land use planning and estimate costs of inaction versus costs of adaptation
	Review and update planning policies to incorporate best available climate projections
	Continue to work with MAV to seek further clarification around roles and responsibilities for local government and state government around adaptation and legal liability issues
Work with regional health providers to develop public health education and heatwaves (safer food production and storage etc.)	
Enhancing regional health and safety	Develop a regional extreme weather event guideline relevant to food safety
	Develop with other authorities a regional environmental health strategy for long term management of vector and water borne diseases as a result of climate change
	Review climate risk assessment and update health and wellbeing plans

	Promote linkages between aged friendly cities and climate change adaptation objectives
	Regional waste to food project involving redirecting organic waste to be used as compost for local food systems
Planning for food security in a hotter drier region	Assessment of regional waste streams and waste to energy feasibility study
	Identify land holdings for redirected use to local agriculture and community food such as YVW and MW
	Develop a planning tool with specific checklists and guidelines to help land use planners make better decisions around climate impacts
Improving planning decision making	Councils to adopt BESS as a planning tool to help think of adaptation in planning decisions
	Provide training for planners to understand latest climate change projections as it relates to land use planning