



# **Victorian Adaptation Action Plans**

City of Melbourne Submission

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## **RE: VICTORIAN ADAPTATION ACTION PLANS**

Thank you for the opportunity to provide feedback on the Victorian Government's Draft Adaptation Action Plans. We commend the Victorian Government for its commitment to building a climate-resilient Victoria through the development of system specific Adaptation Action Plans.

The submission is based on endorsed Council policy and made by the management of City of Melbourne. Please note that Councillors have not had opportunity to consider the Adaptation Action Plans given the short time frame for submission.

We recognise adaptation planning across these systems is essential to prepare Victoria for the impacts of climate change. City of Melbourne's response has been compiled into one submission based on advice received from the Department of Environment, Land, Water and Planning Climate Change Policy Division; we ask that the Climate Change Policy Division forward on to the relevant AAP owners/departments.

Our key recommendations are:

1. That the action plans encourage working in partnership across all levels of government to build a climate-resilient Victoria
2. The speed of the actions should be prioritised with clear, measurable targets – urgent action is required
3. The actions need to be socially inclusive and equitable
4. Financial support is required for implementation – clear financial pathways and support need to be identified
5. Actions should recognise and identify opportunities for cross system collaboration to address interdependencies and cascading consequences
6. Energy system adaptation should be included.

If you would like to further discuss any aspect of this submission, please contact Vicki Barmby, Manager Climate Adapted and Water Sensitive City at [vicki.barmby@melbourne.vic.gov.au](mailto:vicki.barmby@melbourne.vic.gov.au)

Thank you again for the opportunity to provide this feedback. We look forward to continuing to work with you on the development and delivery of this work.

Yours sincerely,

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CoM reference: DM14844426

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## 1. Introduction

The City of Melbourne's Climate Change Adaptation Strategy Refresh, Climate Change Mitigation Strategy and Response to the Climate and Biodiversity Emergency 2020 collectively outline the organisation's priorities for achieving zero net emissions by 2040 and adapting our city to the impacts of climate change.

### Climate Change Adaptation Strategy Refresh 2017

The City of Melbourne Climate Change Adaptation Strategy (CCAS) outlines how the city will deliver, partner and advocate for effective adaptation through five strategic adaptation goals:

1. enhance the natural environment and green spaces of our municipality
2. shape our built form and urban renewal areas to withstand future climate change impacts
3. strengthen the resilience of our inclusive, family friendly and culturally diverse community
4. protect and enhance our diverse economy
5. continue to build the organisation's adaptation capabilities and expertise.

### Response to the Climate and Biodiversity Emergency 2020

On 16 July 2019, Council declared a Climate and Biodiversity Emergency. In making this decision, Council recognised the serious risk to the people of Melbourne and Australia from climate change.

The climate emergency declaration acknowledges more needs to be done by all levels of government to accelerate climate action. The Victorian Government has committed to reducing greenhouse gas emissions consistent with the Paris Climate Agreement goal of "limiting global warming to less than 2 degrees above pre-industrial levels and taking efforts to limit warming to 1.5 degrees above preindustrial levels."

### Summary of submission

We urge the Victorian Government to increase its ambition to address the impacts of climate change in partnership with all levels government.

We recognise that responding to climate change means adapting Victoria's built, natural, social and economic systems. To build our climate resilience we need:

- adequate planning provisions, tools and guidance
- design, build and retrofit buildings and infrastructure to be climate-resilient
- collaboration across systems to address vulnerabilities that arise from system interdependencies
- financial support for implementation of adaptation actions.

This submission is structured in the following way:

- Providing comments on the adaptation plans as a whole
- Comments on individual plans.

## 2. Adaptation Action Plan general feedback

The feedback centres around six key points:

1. Working in partnership across all levels of government is required to build a climate-resilient Victoria
2. The speed of action should be prioritised with clear, measurable targets
3. Adaptation actions must also be socially inclusive and equitable
4. Financial support is required for implementation
5. Cross system collaboration is needed to address interdependencies and cascading consequences onto other systems and the community
6. Energy system adaptation.

### 2.1. Working in partnership with all levels of government

All levels of government, agencies and private developers have a role to play in ensuring a climate-resilient future for Victoria. Strong collaborative structures and programs that are supported by long term funding are needed to support adaptation measures. Table 1 provides examples of cross government collaborative structures to build upon.

### 2.2. Action on adaptation is urgently required with clear, measurable targets

Urgent action is required to adapt to the impacts of climate change. Delays in acting will have economic, social and environmental impacts, while acting now presents enormous opportunities to build resilience of the community, generate jobs, boost economic productivity, and position Victoria as a leader in adaptation. Targets and indicators should be included to measure progress and identify gaps.

### 2.3. Adaptation actions must also be socially inclusive and equitable

Actions need to be managed to ensure the benefits are shared equitably and costs are not unduly borne by vulnerable communities. Working with those who are disproportionately impacted by climate change is essential to maintain and improve social cohesion.

### 2.4. Financial support is required for implementation

The Victorian Government will need to show leadership to increase adaptive capacity and resilience across all sectors. The Adaptation Action Plans must be backed by secure, long term funding and holistic financial analysis frameworks.

### 2.5. Addressing cross system interdependencies

Infrastructure networks – including transport, energy, waste and water service sectors with critical interdependencies – are at risk of failure from climate change impacts. We need to understand the extent of interdependencies and climate-related risks faced to adapt these systems.

An action identified through our Climate Change Adaptation Strategy Refresh was to complete an interdependency study for the city's assets and services. The City of Melbourne recently completed a pilot project called City Engine: Integrated Urban Systems Heat Vulnerability Analysis. This project was undertaken in partnership with the Department of Environment, Land, Water and Planning, to map interdependencies across different urban systems, define the vulnerabilities to heat, and determine the flow on effects to city users, while simultaneously developing an approach to map interdependencies and vulnerabilities to a range of climate change impacts. The key findings from the analysis are outlined in Appendix 1.

This is an early and evolving piece of work, however, we would encourage the consideration of the following recommendations:

1. to improve communications resilience by undertaking an assessment and options analysis of alternative communication methods
2. to improve electricity resilience and develop understanding of electricity outage impacts
3. to improve road network resilience through undertaking scenario planning to identify road network vulnerabilities.

## **2.6. Energy system adaptation should be included**

The Victorian *Climate Change Act 2017* does not include the Energy System as a key system that should be prepared for the impacts of climate change. Given the vulnerability of the electricity system to climate stresses a national cross government collaborative approach should be outlined.

The key vulnerability that needs to be managed is the nexus between the Communications system and the Energy (electricity) system:

- both systems have highly vulnerable components and are heavily relied upon by other systems (e.g. Banking and Finance and Health)
- each system relies on the other in order to function effectively
- both systems are inherently linked to many of the flow-on effects identified throughout the analysis, due to society's reliance on electronic processes and mobile devices

Managing the vulnerabilities within and between these two urban systems will be critical to ensure holistic systems resilience.

### 3. Adaptation Action Plans – Individual Plan feedback

#### 3.1 Built Environment

With cities and urban areas set to increase in population by approximately 40% by 2050, impacts of climate change will only be more pressing if more ambitious adaptation implemented now.

Seventy five percent of the City of Melbourne is privately owned and managed meaning that planning scheme policies and standards are critical to achieving adaptation outcomes in the private realm. The building regulations and planning scheme need to be updated to ensure that private developers are helping to reduce impacts of climate change.

Key challenges and opportunities for the City of Melbourne relating to the built environment our outlined in Table 1.

**Table 1. City of Melbourne’s built environment opportunities and challenges**

<i>Opportunity/Challenge</i>	<i>Comments</i>
Urban renewal planning	<p>Urban Renewal planning and frameworks need to:</p> <ul style="list-style-type: none"> <li>• secure strong climate change outcomes through the precinct vision</li> <li>• Create opportunities for flood mitigation, integrated water management, urban forest, parks and open spaces</li> </ul>
Melbourne Planning Scheme Amendment C376: Sustainable Building Design	<p>Amendment C376 will deliver on our commitment under the Climate Change and Biodiversity Emergency declaration in the built environment            Include a range of environmentally sustainable design standards across several categories including:</p> <ul style="list-style-type: none"> <li>• energy standards</li> <li>• sustainable transport</li> <li>• waste resource and recovery</li> <li>• urban ecology</li> <li>• urban heat island</li> <li>• integrated water management.</li> </ul> <p>It is evidence-based and has a strong strategic foundation of extensive research, analysis and strategies by City of Melbourne</p> <p>Includes mandatory provision of on-lot green infrastructure for all new developments and retrofits over a certain size</p> <p>To support this we have developed the Melbourne Green Factor tool, an Australian-first online platform for the use of developers, designers, decision makers and the community. The Green Factor tool:</p> <ul style="list-style-type: none"> <li>• enables assessment of sustainability measures</li> <li>• encourages a greater quantity and quality of green infrastructure</li> <li>• encourages designers to include green spaces that are publicly accessible and provide multiple benefits to occupants, users and visitors as well as ecosystem services.</li> </ul>

	<p>We requested Ministerial authorisation to exhibit Amendment C376 in October 2020 and as at August 2021, are yet to receive a formal response.</p>
<p>Planning Provisions</p>	<p>City of Melbourne is advocating for the introduction of state-wide planning provisions to champion environmentally sustainable design, with a local schedule to enable mandatory requirements and allow tailoring by Councils as all local governments will require similar, yet localised provisions.</p> <p>Introduction of state planning policy, alongside changes to the National Construction Code is needed to streamline implementation of mandatory sustainability standards and establish a common language and approach across levels of Government, providing certainty and a level playing field for developers and investors.</p>
<p>Assets and Infrastructure Vulnerability to Climate Change</p>	<p>The City of Melbourne is completing vulnerability to climate change assessments for all Council buildings. This will identify actions to improve:</p> <ul style="list-style-type: none"> <li>• building performance in extreme weather</li> <li>• incorporate thermal comfort,</li> <li>• drainage and water storage</li> </ul> <p>A similar process should be done for Victorian Government infrastructure including public housing. New buildings need to be:</p> <ul style="list-style-type: none"> <li>• designed to high standards,</li> <li>• reference to best practice examples such as PassivHaus and 6-star Green Star</li> <li>• built to consider the impacts of flooding and sea level rise.</li> </ul>
<p>Circular Economy</p>	<p>We recommend:</p> <ul style="list-style-type: none"> <li>• circular economy principles (enshrined in the state's Recycling Victoria policy) should underpin all adaptation work.</li> <li>• by shortening supply chains and diversifying resource sources, circular economy principles help reduce vulnerability to climate change.</li> </ul>
<p>Green Infrastructure</p>	<p>We recommend support for green infrastructure, including green facades, walls and roofs should be stated. This should include:</p> <ul style="list-style-type: none"> <li>• protecting and investing in urban green and blue infrastructure</li> <li>• Integrating green and blue infrastructure into all the established investment processes for general infrastructure and retrofits</li> </ul>
<p>Traditional Owners</p>	<p>The Adaption Plans should:</p> <ul style="list-style-type: none"> <li>• support Aboriginal expert knowledge, including but not limited to sustainable land management practices into the contemporary management, planning and development of adaptation methods.</li> <li>• incorporate Traditional Owner knowledge and perspectives into all aspects of climate change adaptation work.</li> </ul>



The following table (Table 2.) outlines recommendations for consideration and incorporation into the Plan:

**Table 2. City of Melbourne recommendations for the Built Environment AAP**

Section	Comments
Objectives	<p>Short-term objective (2022–26):</p> <ul style="list-style-type: none"> <li>• need measurable targets and actions, beyond strengthening policies and standards,</li> <li>• this would show true leadership and commitment to adaptation.</li> </ul> <p>Medium-term objective (2027–31):</p> <ul style="list-style-type: none"> <li>• should mandate for all organisations to have a plan for how they operate and transition towards climate positive operations.</li> </ul> <p>Long-term objective (to 2050):</p> <ul style="list-style-type: none"> <li>• should include ongoing monitoring and constant adaptation of operations to the best available climate change science.</li> <li>• support for new investment pathways to be developed and explored</li> </ul>
Table 3. Adaptation Outcomes sought	<p>New and Existing Buildings:</p> <ul style="list-style-type: none"> <li>• Further expand on what constitutes ‘improved climate resilience’ beyond thermal performance and energy including sustainable transport, onsite waste management options, integrated water management, canopy for cooling and habitat and onsite power generation and storage in new and existing buildings</li> <li>• Recommend including measurable goals and targets as part of the above outcome.</li> </ul> <p>Infrastructure</p> <ul style="list-style-type: none"> <li>• Alternative water outcome should have a target attached to its reference to ‘extensive’ use.</li> <li>• The flood-reduction assets outcome should also recognise impacts on community needs to be included as part of resilient flood assets.</li> </ul> <p>Urban green spaces:</p> <ul style="list-style-type: none"> <li>• Reference to water supply being available to maintain vegetation cover should include a preference for alternative water supply.</li> <li>• The canopy cover target should specify whether it refers to public or private realm or both.</li> </ul> <p>Heritage:</p> <ul style="list-style-type: none"> <li>• Amend dot point 3 to “Consider Aboriginal cultural values and other heritage values in decision making”. This will ensure that all heritage values are considered.</li> </ul>

Action 1	<p>We recognise that the Victorian Government is seeking to support local governments to make such changes through The ESD Roadmap for Victoria's Planning System. We strongly advise that the roadmap is tailored to local context. For example, Amendment C376: Sustainable Building Design has been developed to push ambitious and evidence-based climate change adaptation and mitigation for all new buildings and development within the City of Melbourne.</p> <p>Updates to the planning scheme should support holistic building design for climate change adaptation beyond heat and thermal comfortable. Support should be given for:</p> <ul style="list-style-type: none"> <li>• on-site green infrastructure and canopy cover</li> <li>• integrated water management</li> <li>• passive solar design, as well as reflective materials and facades.</li> </ul> <p>Greater frequency in the review and update of Victoria's planning policy for climate change impacts is needed. We recommend DELWP:</p> <ul style="list-style-type: none"> <li>• provide an annual review of Victorian planning policy and climate change provisions to ensure ongoing responsiveness to climate change impacts.</li> <li>• review current local schedules currently awaiting Ministerial approval where local governments have already prepared an evidence-base, feasibility testing, and planning provisions and standards that will achieve greater Built Environment outcomes</li> </ul>
Action 3	<p>We recommend the following tools and guidelines be considered when updating building standards:</p> <ul style="list-style-type: none"> <li>• The Green Factor Tool which helps municipalities to assess against these targets and provides developers and industry with a comprehensive and easy-to-use tool to improve the quality and quantity of sustainability measures in their projects.</li> <li>• <i>Good Design Guide for Buildings in Flood Affected Areas</i> as an example of ensuring good design and accessibility outcomes are balanced with flood risk management.</li> </ul>
Action 4	<p>The upfront capital cost of upgrades of existing homes should be subsidised to ensure vulnerable communities are not left behind. We support programs such as the Household Energy Savings Package and recommend their ongoing expansion.</p> <p>We also recommend supporting and encouraging the following retrofitting options:</p> <ul style="list-style-type: none"> <li>• on structure vegetation such as green facades, walls and roofs</li> <li>• co-uses such as combined green-solar PV roofs.</li> </ul>
Action 5	<p>Grid infrastructure planned for Melbourne's urban renewal areas needs to ensure it is renewable-ready and resilient to climate impacts is far cheaper than retrofitting infrastructure.</p> <p>In line with the Victorian gas substitution roadmap consideration should be made for the gas distribution infrastructure. To build resilience of the grid we recommend:</p> <ul style="list-style-type: none"> <li>• avoid installing new natural gas distribution in major urban renewal precincts and prioritise electrification of existing gas services</li> </ul>

	<ul style="list-style-type: none"> <li>• transitioning to a single electricity network and investing in local generation and storage to support a more decentralised and resilient energy system.</li> </ul>
Action 6	<p>The City of Melbourne has a Major Initiative as part of its 2021-25 Council Plan entitled “Engage and prepare residents and communities to enhance their resilience to hazards, disasters and the health impacts of climate change.”</p> <p>We would interested in partnering with the Victorian Government to develop and deliver elements of this program to develop a disaster and climate resilience community behavioural change, communications and capacity building actions.</p>
Action 9	<p>Guidance to support decision makers and practitioners should be informed by:</p> <ul style="list-style-type: none"> <li>• current climate risk projections and include an understanding of multiple hazards and potential intersections</li> <li>• robust evidence and mapping to ensure outcomes are performance-based (rather than prescriptive) and appropriate to context-specific conditions</li> </ul> <p>We would be very open to working with the Victorian Government to explore frameworks, guidelines and decision-making tools.</p>
Action 10	<p>City of Melbourne has developed a planning scheme amendment, C384, to update the municipality’s LSIO maps and associated policies. We seek support from the Victorian Government in finalising and implementing this amendment and support Action 10’s focus on similar processes being undertaken for multiple hazards across all of Victoria.</p>
Action 14	<p>To support place based resilient energy generation we recommend:</p> <ul style="list-style-type: none"> <li>• Funding programs that support innovation such as City of Melbourne’s Power Melbourne pilot program</li> <li>• Planning and regulatory environments enable place-based energy generation. The embedded networks review should support microgrids and local energy systems</li> <li>• Planning provisions should be progressively updated to respond to climate change based on the most current advice from relevant authorities</li> <li>• Issues of social inclusion, equity and affordability be considered as the energy system is electrified. The Victorian Government should provide clear market signals to encourage gas distribution companies to write down asset value in a staged manner and to ensure the costs are equitable across the community.</li> </ul>
Action 17	<p>The use of economic tools could enable investment in adaptation. We recommend the Victorian Government consider the following:</p> <ul style="list-style-type: none"> <li>• Climate bonds or sustainability linked loans</li> <li>• Promoting ambitious projects to grow local supply chains and scale-up solutions, a strong local workforce to deliver the services required to adapt our cities could be grown.</li> </ul>

## 3.2 Education and Training

City of Melbourne is supportive of the priority areas for action. These actions will not only build resilience of infrastructure and assets but also support the safety, health and wellbeing of students, staff and vulnerable communities.

Climate resilient assets can also function of places of refuge from extreme heat, poor air quality, and flooding.

Empowering young people to act on climate change is important way to build their resilience and adaptive capacity. Providing support for education and training providers to incorporate climate change into teaching and learning will help empower young people to make informed decisions and increase their capacity to adapt to climate change and extreme weather events.

The following table (Table 3.) outlines recommendations for consideration and incorporation into the Plan:

**Table 3. City of Melbourne’s recommendations for the Education and Training AAP**

<i>Action</i>	<i>Recommendation</i>
4	All government schools designed and retrofitted should consider: <ul style="list-style-type: none"> <li>• Making reference to best practice examples such as PassivHaus and 6 star Green Star</li> <li>• Designing building ventilation systems to enable safe operation under extreme poor air quality conditions such as those caused by bush fire smoke</li> </ul>
21	The City of Melbourne has a large international student population that is highly exposed to the impacts of extreme weather events. Programs and policies should be developed to increase students’ awareness and preparedness for these events.

## 3.3 Health and Human Services

Of significant concern to the City of Melbourne are the health impacts that arise from rising temperatures, extreme weather events including heatwaves, flash floods and storm events, drought and air pollution.

Climate change can also undermine people’s mental health directly and indirectly. In addition to the trauma caused by experiencing extreme weather events, there are growing concerns about the impacts of eco-anxiety – a chronic fear of environmental doom, especially amongst younger people.

Table 4 outlines recommendations for consideration and incorporation into the Plan:

**Table 4. City of Melbourne’s recommendations for the Health and Human Services AAP**

<i>Action</i>	<i>Recommendation</i>
3-5	To improve building performance designs should consider: <ul style="list-style-type: none"> <li>• Making reference to best practice examples such as PassivHaus and 6 star Green Star</li> <li>• Designing building ventilation systems to enable safe operation under extreme poor air quality conditions such as those caused by bush fire smoke.</li> </ul>
7	When building resilience of infrastructure to extreme heat consider the following:

	<ul style="list-style-type: none"> <li>• Cross system collaboration is needed to address vulnerabilities that arise from interdependencies across systems, in particular the reliance on Communications and Energy (electricity) systems.</li> </ul>
14	Consider using research by Sustainability Victoria to help inform the development of mental health support that targets various age groups and their concerns about climate change impacts.

### 3.4 Natural Environment

City of Melbourne is supportive of a transformative adaptation approach, but urgent action is required. Action should not be delayed as there are cost effective solutions available today.

The key issues that highlight future climate risk for the natural environment in Melbourne are:

- disease
- weeds and pests
- rapid population growth,
- increasing density of buildings and infrastructure
- land-use legacies

To support adaptation in the natural Environment system annually secured financial support will be crucial to implementation.

### 3.5 Primary Production

The Primary Production system is critical to Melbourne through the supply of food and essential groceries.

Primary Production relies on the Transport and Water systems and disruptions to these can result in flow-on effects. Due to the reliance on components like roads, public transport and sewage - addressing cross system interdependencies will be important to build resilience within the Primary Production system.

City of Melbourne's City Engine project found that Food and Grocery is highly reliant on the freight network (Transport), appropriate adaptation interventions to address this vulnerability is important.

The disruption of agricultural food production can also impact food security and negatively impact the health and wellbeing of vulnerable communities.

The plan should give consideration to:

- Circular economy principles - Resilient Primary Production has a shorter supply chain, to this end, a focus on circular economy and waste-to-resource would be appropriate especially in the innovation sections of the plan.
- Acknowledge the role cities play in the system - cities are also the location of primary production, via aquaponics, hydroponics, and forms of urban 'farming'. The plan should support innovation to increase primary production in non-traditional locations to improve food security to vulnerable groups, as well as shorten supply chains.

### 3.6 Transport

The Transport action plan should give consideration to:

- promoting sustainable transport modes – walking, cycling and public transport – over private vehicle trips
- supporting projects that help adapt to urban heat such as ‘Green Tram tracks’ (increasing permeability of tramlines in Southbank with Yarra trams) and ‘Cool Routes’ (a free mapping platform for active travellers to plot thermally comfortable routes between destinations in the CBD)
- implementing policies that enhance the growth of walking and free movement of people on foot
- transport agencies should complete necessary risk assessments on the impact of climate change on transport infrastructure and put measures and design standards in place to reduce risks. Emergency management needs to be included in risk planning
- integrating cycling infrastructure and networks with public transport particularly at stations

Table 5 outlines recommendations for consideration and incorporation into the Plan:

**Table 5. City of Melbourne’s recommendations for the Transport AAP**

<i>Action</i>	<i>Comment</i>
3 and 4	Links between transport nodes and services need to be included in vulnerability assessments. Additionally, transport agencies need to be encouraged to provide bicycle compatible public transport. There is also concern around the use of older public transport vehicles which do not have appropriate air conditioning and cannot keep temperatures regulated as heatwaves increase.

### 3.7 Water Cycle

Communication of climate change risks and impacts related to water security is a high priority action that needs prioritising moving forward. We see complacency among the general population and irrigators that our current desalination plant provides all we need. It is challenging to build the business case for diverse water supplies and resilient infrastructure when stakeholders do not realise risk to water supply. We recommend strengthening Action 13 to be much stronger and output focussed.

The Water Cycle action plan recognises flood risk but only talks to traditional management strategies. These approaches will not be suitable in a changing climate with increasing urbanisation. We are already experiencing this challenge in urban renewal areas where space is limited. Investment should be made in innovative solutions that celebrate water in the landscape and perform multiple functions for recreation, environmental protection, water and flood management and community and economic activation. We strongly recommend Integrated Water Management will be essential in adapting to flood risk.

We also recommend the plan align with:

- DELWP Catchment Scale Integrated Water Management Plans
- Port Phillip and Western Port Flood Management Strategy
- Melbourne Water Healthy Waterways Strategy

## References

City of Melbourne, 2017. Climate Change Adaptation Strategy Refresh [Online] Available at: <https://www.melbourne.vic.gov.au/sitecollectiondocuments/climate-change-adaptation-strategy-refresh-2017.pdf>

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Good Design Guide for Buildings in Flood Affected Areas IN FISHERMANS BEND, ARDEN AND MACAULAY [Online] Available at: <https://www.melbourne.vic.gov.au/about-council/committees-meetings/meeting-archive/MeetingAgendaItemAttachments/950/16871/AUG21%20FMC1%20AGENDA%20ITEM%206.3%20ATT3%20and%204.PDF>

Sustainability Victoria (2016/17), Victorians' perceptions of climate change

## Appendices

### Appendix 1. City Engine: Integrated Urban Systems Heat Vulnerability Analysis Findings

	<p>All of the nine urban systems analysed (banking and finance, communications, energy, food and grocery, government, health, natural environment, transport and water) have <b>components that are extremely vulnerable to extreme heat</b> and are therefore all vulnerable to an extent.</p> <p>These systems were included because the services they provide are identified as being critical to Victorians, and if they were to be disrupted or lost for an extended period of time, the social and economic wellbeing of the Victorian community would be greatly impacted</p>
	<p>The key vulnerability that needs to be managed is the <b>nexus between the Communications system and the Energy (electricity) system</b>:</p> <ul style="list-style-type: none"> <li>• Both systems have highly vulnerable components and are heavily relied upon by other systems (e.g. Banking and Finance and Health).</li> <li>• Each system relies on the other in order to function effectively.</li> <li>• Both systems are inherently linked to many of the flow-on effects identified throughout the analysis, due to society's reliance on electronic processes and mobile devices.</li> </ul> <p>Managing the vulnerabilities within and between these two urban systems will be critical to ensure <b>holistic systems resilience</b>.</p>
	<p><b>Transport and Water were also identified as two highly critical and heavily relied upon systems</b>:</p> <ul style="list-style-type: none"> <li>• Almost all systems are dependent on road network access (Transport) and water supply (Water)</li> <li>• More people-centric systems, such as Health and Food and Grocery, are also highly dependent upon the system components relating to public transport (Transport) and sewerage (Water)</li> </ul>
	<p>While on the surface it seemed that systems where majority of the services can be delivered remotely, such as Banking and Finance, are overall less vulnerable <b>the critical system interdependencies mean significant socio-economic disruption is still felt</b>, even if the system can keep functioning “effectively”.</p>
	<p>The Natural Environment system is unique from the others due to its <b>minimal upstream dependencies</b>; disruption to ecosystem services can have adverse impacts on health and wellbeing to humans and non-humans but also have positive flow-on effects due to its role mitigating urban heat.</p>