SUBURBAN RAIL LOOP EAST

SRL East Draft Structure Plan | Cheltenham

Climate Response Plan

More Homes For Victorians

VICTORIA State Government

Suburban Rail Loop

PREPARED FOR SUBURBAN RAIL LOOP AUTHORITY

SRL EAST DRAFT STRUCTURE PLAN – CLIMATE RESPONSE PLAN - CHELTENHAM

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Contents

Appendices

Glossary and abbreviations

Acronym	Abbreviation
AEP	Annual Exceedance Probability
ARENA	Australian Renewable Energy Agency
BESS	Built Environment Sustainability Scorecard
C&D	Construction and Demolition (waste)
CASBE	Council Alliance for a Sustainable Built Environment
CO_2e	Carbon Dioxide Equivalent
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CRP	Climate Response Plan
ESD	Environmentally Sustainable Design
GBCA	Green Building Council of Australia
HVAC	Heating, Ventilation, and Air Conditioning
IWM	Integrated Water Management
NABERS	National Australian Built Environment Rating System
NatHERS	Nationwide House Energy Rating Scheme
NCC	National Construction Code
SDA	Sustainable Design Assessment
SDAPP	Sustainable Design Assessment in the Planning Process
SDGs	(United Nations) Sustainable Development Goals
SMP	Sustainable Management Plan
SRI	Solar Reflective Index
SRL	Suburban Rail Loop
SRLA	Suburban Rail Loop Authority
VPP	Victoria Planning Provisions

Executive summary

As part of the Suburban Rail Loop (SRL) East project, Draft Structure Plans (Structure Plans) are being prepared for the neighbourhoods surrounding the new underground stations at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

The Structure Plans will set a vision and framework to guide growth and change in each neighbourhood, while protecting and preserving the character and features people love about them now.

This SRL East Structure Plan - Climate Response Plan – Cheltenham (Climate Response Plan) will inform the development of the Cheltenham Structure Plan.

CLIMATE RESPONSE PLAN

SRL will generate growth and change that presents challenges and opportunities for the surrounding community and neighbourhood. The main climate related changes, challenges and opportunities are listed below.

More medium and high-density development	Greater connectivity	Connected planning	Zero emission mobility choices
Population growth	Liveability pressure in a changing climate	Greater energy and water demand	More pressure on open space, vegetation and natural resources

The Climate Response Plan will support the Cheltenham Structure Plan Area to be more climate responsive to address to these changes, challenges and opportunities.

This Climate Response Plan responds to the Cheltenham Vision Theme 5 – Empowering Sustainability.

Theme 5 aims to guide how development and growth in the structure plan area adapts to and mitigates the effects of climate change and contributes to environmental sustainability.

Seven sustainability focus areas were developed for the Cheltenham Climate Response Plan. The focus areas:

- Support a triple-bottom line approach to achieving climate and sustainability outcomes aligned to the Cheltenham Vision and the SRL vision of productive, connected and liveable communities
- Support and align with relevant guidelines and SRL policies (including the SRLA Sustainability Policy, and SRL Urban Design Framework) to ensure a consistent, best practice approach to delivering SRL.

KEY FINDINGS

The analysis of the sustainability focus areas for the Cheltenham Structure Plan Area highlighted that:

- The Cheltenham Structure Plan Area is currently experiencing sustainability challenges, including:
  - » Flooding vulnerability including some areas in the north and east of the Cheltenham Structure Plan Area
  - » High urban heat vulnerability due to low tree canopy coverage north of Bay Road, east of Nepean Highway, and in commercial and industrial areas, along with fragmentation of open spaces
  - » Greenhouse gas emissions are driven by non-renewable energy sources in residential homes, commercial and industrial areas, and a high dependency on private vehicles.
- Current Victorian and local government policy supports addressing current and emerging climate change and sustainability challenges in the Cheltenham Structure Plan Area. However, the implementation of these policies in the municipal planning schemes is limited, and there is generally a lack of planning support to deliver sustainability policy outcomes.

- Under a Future Business as Usual State, where SRL East is delivered but there is no change to the policy and planning environment of today, it is expected that current sustainability challenges will remain or worsen due to the projected growth and densification of the Cheltenham Structure Plan Area, such as accelerated higher density development around the SRL station. This will create a gap between what is expected and what the aspirations are for the Structure Plan Area.
- Under a Future Accelerated State, where changes to address sustainability challenges are implemented through policy and planning approaches to deliver accelerated sustainability outcomes, a number of sustainability opportunities have been identified that support the Cheltenham Structure Plan Area achieving regional sustainability policy objectives and the Vision.

RECOMMENDATIONS AND OPPORTUNITIES

This Climate Response Plan makes recommendations to consider for each focus area when developing the Cheltenham Structure Plan.

The recommendations are sorted into three categories:

Structure Plan responses to guide and promote sustainability and climate considerations in the future planned land use, built form, and public spaces to support changing community needs.

Planning Scheme responses which recommend new planning controls to improve the climate responsiveness and sustainability of development in the Structure Plan Area.

Other opportunities to promote climate change resilience and sustainability, including partnerships and initiatives with government, industry and other organisations.

The recommendations address the sustainability challenges of the Cheltenham Structure Plan Area, and aim to help achieve the SRL sustainability vision, and the sustainability outcomes of the Cheltenham Vision.

The recommendations aim to close the gap between Future Business as Usual State, and what is possible under a Future Accelerated State.

The goal is for the neighbourhood around the SRL station to become more liveable, connected and productive as its population grows and the density of development increases, with greater climate change resilience and improved sustainability.

RECOMMENDATIONS AND OPPORTUNITIES FOR THE CHELTENHAM STRUCTURE PLAN

Focus area	Recommendations / Opportunities		Ref#
Realising net zero	Net zero buildings	Structure Plan response	1A
	Private development sustainability certification	Planning Scheme response	1B
	Partnerships for a decarbonised energy supply	Other opportunities	1C
Integrated water management	Place-based integrated water management	Structure Plan response	2A
	Alternative water supply	Planning Scheme response	2B
	Partnerships to support integrated water management	Other opportunities	2C
Circular economy and sustainable procurement	Supporting a circular economy	Structure Plan response	3A
	Embodied carbon reduction in new developments	Planning Scheme response	3B
	Construction and operational waste management targets	Planning Scheme response	3C
	Partnerships to support a circular economy	Other opportunities	3D
Place-based measures to promote zero emissions transport	Recommended to deliver zero-emissions transport measures through the SRL East Structure Plan - Transport Technical Report – Cheltenham	N/A	(4)
Climate change adaptation	Climate change adaptation	Structure Plan response	5A
	Climate change risk management standards	Planning Scheme response	5B
Environmental enhancement and protection	Urban greening strategy	Structure Plan response	6A
	Green infrastructure for new developments	Planning Scheme response	6B
	Partnerships to support environmental enhancement and protection	Other opportunities	6C
Urban heat island strategy	Urban heat island mitigation	Structure Plan response	7A
	Private development site urban heat island performance criteria	Planning Scheme response	7B

1. Introduction

Suburban Rail Loop (SRL) is a transformational project that will help shape Melbourne's growth in the decades ahead. It will better connect Victorians to jobs, retail, education, health services and each other – and help Melbourne evolve into a 'city of centres'.

SRL will deliver a 90-kilometre rail line linking every major train service from the Frankston Line to the Werribee Line via Melbourne Airport.

SRL East from Cheltenham to Box Hill will connect major employment, health, education and retail destinations in Melbourne's east and south east. Twin 26-kilometre tunnels will link priority growth suburbs in the municipalities of Bayside, Kingston, Monash and Whitehorse.

SRL East Draft Structure Plan (Structure Plan) Areas will surround the six new underground stations at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

1.1 Purpose of this report

This Climate Response Plan will inform the development of the Cheltenham Structure Plan to guide land use planning and development in the Cheltenham Structure Plan Area.

The Climate Response Plan describes the existing climate change and sustainability conditions in the Cheltenham Structure Plan Area.

Challenges and opportunities relating to climate change and sustainability that impact planning for the development of the Structure Plan Area are identified.

Recommendations to consider when developing the Cheltenham Structure Plan are made. Recommendations include Structure Plan responses, Planning Scheme Responses and other opportunities (such as partnerships).

The recommendations aim to address the sustainability challenges of the Structure Plan Area, support Victorian and local government policies, and help achieve the SRL sustainability vision and the sustainability outcomes of the Cheltenham Vision.

The Climate Response Plan will support the Cheltenham Structure Plan Area to be more climate responsive by:

- Outlining recommendations to reduce greenhouse gas emissions, and setting targets and measures to achieve net zero emissions across the Cheltenham Structure Plan Area
- Identifying resilience strategies for the Cheltenham Structure Plan Area to enhance its ability to withstand climate-related challenges and prepare communities and organisations to adapt to the impacts of a changing climate
- Ensuring a comprehensive approach to targeted sustainability outcomes across seven focus areas (refer to Section 2.1)
- Identifying stakeholders and opportunities for partnerships to support a coordinated effort to address climate change across the Cheltenham Structure Plan Area

1.2 Project context

Construction of the SRL East underground stations is underway at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill. This provides an opportunity to enhance the surrounding neighbourhoods.

SRL East will support thriving and sustainable neighbourhoods and communities that offer diverse and affordable housing options, with easy access to jobs, transport networks, open space, and community facilities and services.

Visions have been developed in consultation with the community and stakeholders for the SRL East Structure Plan Areas and surrounds. The Visions set out the long-term aspirations for the areas so they are ready to meet the needs of our growing population.

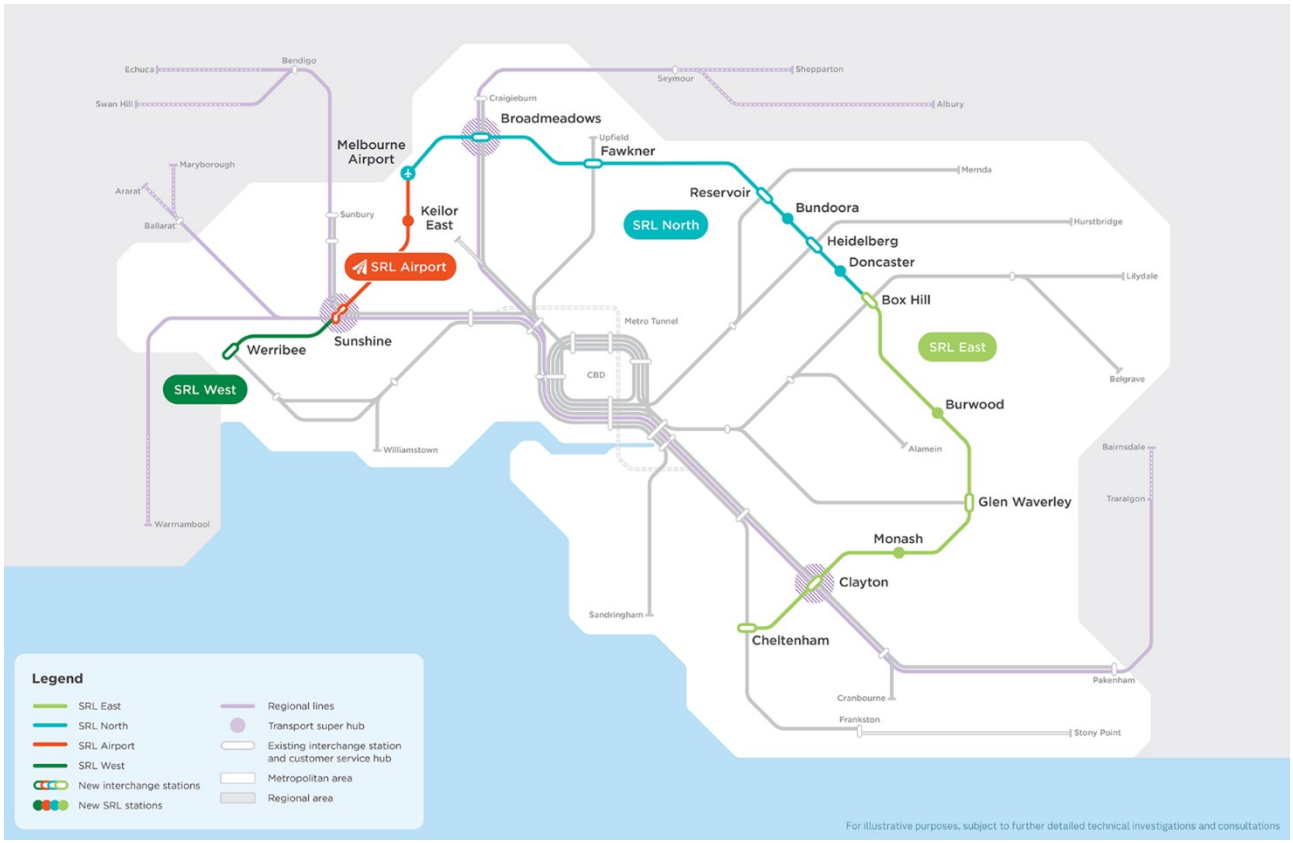

FIGURE 1.1 SRL EAST IN MELBOURNE'S RAIL NETWORK

1.3 Structure planning for SRL East

Draft Structure Plans (Structure Plans) have been prepared for defined areas surrounding the new SRL East stations to help deliver the Vision developed for each SRL East neighbourhood.

The Structure Plans cover defined SRL East Structure Plan Areas that can support the most growth and change. These areas cover a walkable catchment that extends from the SRL station entrances. Additional places are included within each defined area as required to make planning guidance more robust and effective, and to align with each community's aspirations and current and future needs.

A Structure Plan is a blueprint to guide how an area develops and changes over a period of time. Structure Plans describe how future growth within the area will be managed in an appropriate and sustainable way to achieve social, economic and environmental objectives. The plans cover a wide range of matters, such as transport connections and car parking, housing and commercial development, community infrastructure, urban design, open space, water and energy management, climate resilience and sustainability.

By tailoring planning decisions to reflect the needs of a defined area, Structure Plans give effect to the policies and objectives set for these areas and cater for changing community needs. They also provide certainty for residents, businesses and developers by identifying the preferred locations and timing of future land uses, development and infrastructure provision.

Structure Plans take a flexible and responsive approach that enables places to evolve over time.

Planning scheme amendments will be required to implement the Structure Plans into the planning schemes of the cities of Bayside, Kingston, Monash and Whitehorse.

1.4 Structure of this report

Section 1 provides the background and context of this Climate Response Plan.

Section 2 explains the methodology for developing the Climate Response Plan.

Section 3 defines the Cheltenham Structure Plan Area.

Section 4 identifies existing and future climate and sustainability conditions, challenges and opportunities.

Section 5 sets out recommendations to consider for the Structure Plan and other opportunities.

2. Methodology

The methodology for developing this Climate Response Plan involved:

- A Study Area was identified, which for the Climate Response Plan is the same area as the Structure Plan Area (see Section 3).
- Victorian Government and local government policies, strategies and planning schemes and settings relevant to climate change and sustainability in the Structure Plan Area were reviewed. These are summarised in Appendix A.
- Seven sustainability focus areas were developed to guide development of the Climate Response Plan. These sustainability focus areas respond to the United Nations Sustainable Development Goals, as well as the SRLA Vision developed for Cheltenham.
- More information on the sustainability focus areas and the sustainability vision is provided below, in Section 2.1 and Section 2.2.
- Existing climate change and sustainability conditions that identify challenges to deliver the Vision in the Structure Plan Area according to each sustainability focus area were identified. Future challenges under a 'Business as Usual State' and future opportunities under a 'Future Accelerated State' (see Section 4) were also identified.
- Recommendations were developed for each sustainability focus area to support the achievement of the Vision, to address sustainability challenges and close the gap between what is expected under a Future Business as Usual State and what is possible under a Future Accelerated State (see Section 5).

2.1 Sustainability focus areas

Seven sustainability focus areas were developed for the Climate Response Plan.

The focus areas aim to support targeted, practical and impactful recommendations to:

- Support a triple-bottom line approach to achieving climate and sustainability outcomes aligned to the Vision and the SRL vision of productive, connected and liveable communities
- Support and align with relevant guidelines and SRL policies (including the SRLA Sustainability Policy, and SRL Urban Design Framework) to ensure a consistent, best-practice approach to delivering SRL.

In line with Clause 11.02-2S (Structure planning) of the Victorian Planning Policy (VPP) framework,[1] this Climate Response Plan also embeds consideration of the United Nations Sustainable Development Goals (SDGs) into the focus areas and recommendations.

The sustainability focus areas and strategies, and how these align with the United Nations SDGs, are listed in Table 2.1.

[1] A strategy of Clause 11.02-2S of the VPPs is to 'Ensure the ongoing provision of land and supporting infrastructure to support sustainable urban development'.

TABLE 2.1 FOCUS AREAS FOR CLIMATE RESPONSE PLAN AND ALIGNMENT TO THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

Focus area	Focus area strategy	Alignment to SDGs
Realising net zero	Enable reductions in energy consumption and an accelerated transition to net zero	
Integrated water management	Embed sustainable water management practices in planning and design	
Circular economy and sustainable procurement	Foster responsible use of resources and supports the transition to a circular economy	
Place-based measures to promote zero emissions transport	Provide active and sustainable transport options	
Climate change adaptation	Mitigate climate risks and hazards to create climate resilient and adaptive places	
Environmental enhancement and protection	Protect natural habitats and improve biodiversity in green spaces and waterways	
Urban heat island strategy	Mitigate climate risks and hazards to create climate resilient and adaptive places	

2.2 Sustainability vision

The neighbourhoods around the new SRL East stations will be planned to ensure they have services and amenities to cater for and support the people who will live, work, study and visit them.

The SRL vision is to 'help ensure a more liveable Victoria for present and future generations – environmentally, socially and economically'[2] and deliver neighbourhoods that are enduring, sustainable, green and resilient to climate change.[3]

To support the SRL vision, a Vision for each SRL East neighbourhood was developed in consultation with the community, local governments and other stakeholders.

The Vision for Cheltenham is:

> ***A true transit-oriented community where increased connectivity leads to more housing choices, new jobs and lifestyle experiences for everyone.***

This Climate Response Plan directly supports the Cheltenham Vision Theme 5 – Empowering Sustainability.

Table 2.2 outlines the Vision for sustainability and links this to the sustainability focus areas.

[2] SRL Sustainability Policy (Suburban Rail Loop Authority)
[3] SRL Urban Design Framework (Suburban Rail Loop Authority)

TABLE 2.2 CHELTENHAM VISION AND LINK TO SUSTAINABILTY FOCUS AREAS

Vision		Link to sustainability focus area	
Empowering Sustainability will guide how we adapt to and mitigate the effects of climate change and contribute to environmental sustainability. This could be achieved by:			
	Enabling reductions in energy consumption and an accelerated transition to net zero		Realising net zero
	Fostering responsible use of resources and supporting the transition to a circular economy		Circular economy and sustainable procurement
	Mitigating climate risks and hazards to create climate resilient and adaptive places		Climate change adaptation
	Greening urban areas to address heat issues and improve amenity		Urban heat island strategy
	Protecting natural habitats and improving biodiversity in green spaces and waterways		Environmental enhancement and protection
	Embedding sustainable water management practices in planning and design		Integrated water management
	Providing active and sustainable transport options to support healthy lifestyles (from Theme 3 – Better Connections)		Place-based measures to promote zero emissions transport

2.3 Assumptions and limitations

Recommendations in this Climate Response Plan rely on publicly available, secondary information.

The policy and planning scheme review was based on publicly available policies, strategies, planning schemes and other documentation published on Victorian and local government websites.

A detailed, bespoke evaluation of the baseline sustainability conditions in the Structure Plan Area (such as a climate risk assessment) was not undertaken.

No modelling of the recommendations was undertaken to determine the quantified impact on land use, building typologies and population in the Structure Plan Area (such as carbon modelling to determine specific greenhouse gas emissions reductions from recommendations). This was excluded on the basis that high-quality modelling requires a detailed, granular understanding of future precinct development to help inform decision-making, and this level of detail is not yet available at this early stage of precinct planning.

Information is therefore assumed to be accurate at the time this Climate Response Plan was developed, based on best available judgement.

Future detailed planning will refine and identify how Theme 5 – Empowering Sustainability can be delivered in the Cheltenham Structure Plan Area, and support the Victorian Government's objective for Melbourne to remain a global city of opportunity and liveability.

2.4 Interactions with other technical reports

Other documents developed to inform the Cheltenham Structure Plan also have a sustainability focus.

This Climate Response Plan should be read alongside those documents:

- **SRL East Structure Plan - Transport Technical Report - Cheltenham** – to support the Climate Response Plan place-based measures for zero emissions transport outcomes and recommendations.
- **SRL East Structure Plan - Urban Design Report - Cheltenham** – to support the importance of open space quality, function and connectivity, and support the Climate Response Plan environmental enhancement and protection, and urban heat island strategy and recommendations.
- **SRL East Structure Plan - Open Space Technical Report** – to reinforce the importance of open space quality, function and connectivity, and support the Climate Response Plan environmental enhancement and protection, and urban heat island strategy and recommendations.
- **SRL East Structure Plan - Ecology and Arboriculture Technical Report - Cheltenham** – makes recommendations to improve and enhance ecology and arboricultural values, and support the Climate Response Plan environmental enhancement and protection and urban heat island strategy outcomes and recommendations.
- **SRL East Structure Plan - Utilities Servicing Technical Report** – to support the Climate Response Plan delivery of realising net zero and integrated water management outcomes and recommendations.
- **SRL East Structure Plan - Flooding Technical Report** – to support the Climate Response Plan delivery of integrated water management outcomes and recommendations.
- **SRL East Structure Plan - Integrated Water Management Strategy** – to support the Climate Response Plan delivery of integrated water management outcomes and recommendations.

3. Structure Plan Area

This section defines the Structure Plan Area for the Cheltenham SRL East neighbourhood.

The Cheltenham Structure Plan Area surrounds the SRL station at Cheltenham in the cities of Kingston and Bayside.

The Structure Plan Area is generally bordered by residential land north of Stayner Grove and Alison Street to the north, residential land east of Chesterville Road to the east, Park Road to the south and Middleton Street and Worthing Road to the west.

Nepean Highway is a major road that intersects the Structure Plan Area in a north to south-east alignment.

The existing Frankston Line intersects the centre of the Structure Plan Area in a north-south alignment.

The Structure Plan Area for Cheltenham is shown in Figure 3.1.

3.1 Study Area

A Study Area was established for the development of this Climate Response Plan.

The Study Area was based on the Structure Plan Area for Cheltenham.

FIGURE 3.1 CHELTENHAM STRUCTURE PLAN AREA

4. Existing and future conditions

4.1 Current and future states

This section sets out existing sustainability challenges and opportunities (Current State) in the Structure Plan Area against each sustainability focus area.

Future conditions based on a 'Business as Usual' state, compared to a 'Future Accelerated' state are projected.

Current State	Outlines the current challenges in the Structure Plan Area relating to each sustainability focus area and identifies how the current policy and planning environment impacts the achievement of sustainability outcomes.
Future Business as Usual (BAU) State	SRL East is delivered and generates increased density and population in the Cheltenham Structure Plan Area, but there is no change to the policy and planning environment of today. The Climate Response Plan aims to address the sustainability challenges expected to be experienced in the Cheltenham Structure Plan Area under a BAU State.
Future Accelerated State	SRL East is delivered and generates increased density and population in the Cheltenham Structure Plan Area, with changes to address sustainability challenges implemented with updated policy and a planning scheme to deliver accelerated sustainability outcomes. The Climate Response Plan aims to support the delivery of an Accelerated State for Structure Plan Area, where changes are made to the Structure Plan Area delivery framework to realise identified opportunities (that is, Structure Plan responses, Planning Scheme responses and other opportunities).

4.1.1 REALISING NET ZERO

Current State	Future BAU State	Future Accelerated State

Challenges

- Greenhouse gas emissions driven by non-renewable energy sources primarily in residential homes, as well as commercial and industrial buildings (Snapshot Climate 2022a; 2022b).
- Most existing homes in Cheltenham have low energy efficiency, which drives more energy use and greenhouse gas emissions (CSIRO 2024).
- Low uptake of rooftop solar panels compared to the statewide average (Clean Energy Regulator 2024).
- There is increasing reliance on electricity for energy use, which is mainly powered by fossil fuels (Snapshot Climate 2022a; 2022b).

Policy support

- There is strong alignment to Victorian and local government net zero commitments and objectives. See Appendix A for details.

Planning support

- Development is encouraged to reduce greenhouse gas emissions and improve energy efficiency but there is a lack of specific requirements and targets, or requirements for moving towards or achieving net zero. This may risk the achievement of the Vision. See Appendix A for details.
- The National Construction Code 2022 has increased energy efficiency requirements and introduced an energy budget for residential homes to encourage on-site renewable energy systems.
- The National Construction Code 2022 requires future proofing of developments to allow for electric vehicle charging.

Challenges

- Policy alignment remains strong but the Structure Plan Area is unable to achieve Victoria's net zero target due to insufficient performance requirements for development and a lack of strategic planning measures to integrate net zero performance outcomes into land use planning and development.
- At most, development will be incentivised to reduce emissions 20 % under the Built Environment Sustainability Scorecard (Municipal Association of Victoria 2024).
- There is a gap in measuring progress towards net zero. See Appendix A for details.
- Population growth and construction of higher density development may increase energy use and greenhouse gas emissions in the Structure Plan Area.
- There could be higher upfront costs, longer return on investments and technical challenges associated with energy efficient retrofits compared to new builds (Bell et al. 2023).
- There may be a gradual 'greening' of the electricity grid but it may not meet electricity demand.

The Climate Response Plan recommendations aim to address these sustainability challenges (see Section 5.1).

Opportunities

The Future Accelerated State aims to capitalise on net zero opportunities in the Structure Plan Area so that it:

- Supports the delivery of rapid decarbonisation and achievement of net zero by 2045 in line with Victoria's climate action targets
- Eliminates the use of fossil fuels with an accelerated transition to net zero
- Reduces embodied carbon with sustainable design
- Reduces operational emissions with highly efficient buildings that reduce energy loads
- Increases energy resilience and reduced emissions with on-site renewable energy generation and storage
- Delivers environmental co-benefits with credible nature-based solutions to address remaining emissions.

The Climate Response Plan recommendations support the achievement of these opportunities (see Section 5.1).

4.1.2 INTEGRATED WATER MANAGEMENT

Current State	Future BAU State	Future Accelerated State

Challenges

The SRL East Structure Plan – Flooding Technical Report found that:

- There is flooding vulnerability in the Structure Plan Area, including some areas in the north and east (such as Karen Street and near Southland Shopping Centre) where flood depths may exceed 0.6 metres. Flood depths exceeding 1 metre along Marchant Street, Bay Road, Highett Road and High Grove and that upstream development could impact downstream properties.
- The pond at Sir William Fry Reserve provides retardation for the local catchment.
- There is a high dependency on potable water from water mains as there is no alternative or recycled water network available.
- While recycled water is being delivered near the Structure Plan Area through the Dingley Recycled Water Scheme, there is limited water treatment or water sensitive urban design infrastructure in the Structure Plan Area.

Policy support

- Plan Melbourne 2017–2050 (2017b) sets objectives to reduce pressure on water supplies by adopting Integrated Water Management (IWM) Framework strategic measures to protect water assets. See Appendix A for details.

Planning support

- Planning scheme requirements are limited to water efficiency in building design, rainwater storage, and stormwater management. While Clause 53.18 provides requirements for stormwater management, there are limited requirements around additional 'integrated water management' solutions. See Appendix A for details.

Challenges

- Policy alignment remains strong but increased density may increase pressure on Melbourne's water supplies. New development will support IWM by reducing potable water use with water efficient fixtures and rainwater capture and reuse.
- Local streets may not have capacity to manage extreme flood events or contribute to urban cooling, with minimal water sensitive urban design solutions.
- Population growth may increase water use 18 %, including a 30 % rise in residential use by 2051 (ESC 2023).
- Melbourne's need for an additional 600 GL of water by 2070 may be at risk due to hotter, drier conditions.
- An increase in impervious surfaces from denser development and more frequent and intense storm events may exacerbate flooding in the Structure Plan Area.
- Runoff from new developments may contribute to the pollution of existing waterways.
- Existing or new green spaces may lack adequate water, causing their deterioration and reducing their contribution to urban cooling.
- More intense floods may increase damage to homes and infrastructure, maintenance costs, and stress on health and emergency services.

The Climate Response Plan recommendations aim to address these sustainability challenges (see Section 5.2).

Opportunities

The Future Accelerated State aims to support integrated and sustainable water management in the Structure Plan Area. This includes the following opportunities:

- Rainwater reuse and water recovery is maximised to reduce potable water use across all water users, contributing to Melbourne's water efficiency targets.
- An alternative water network reduces potable water use in new developments.
- Water sensitive urban design solutions help improve liveability and amenity by greening streetscapes, active transport corridors, public open space and the private realm.
- IWM supports future flood risk management by promoting co-ordinated development and management of stormwater, using nature-based solutions that capture and slow down the flow rate of surface runoff.

The Climate Response Plan recommendations support the achievement of these opportunities (see Section 5.2).

4.1.3 CIRCULAR ECONOMY AND SUSTAINABLE PROCUREMENT

Current State	Future BAU State	Future Accelerated State

Challenges

- Construction and demolition (C&D) waste is nearly half of all waste generated in Victoria and continues to increase (Recycling Victoria 2023).
- The embodied carbon from the use of virgin materials in non-residential and residential buildings contributes to overall greenhouse gas emissions in the Structure Plan Area.
- A range of resource recovery businesses support a circular economy in the Structure Plan Area, but recycling rates are around 50 % for households, meaning the other 50 % of resources goes to landfill (Recycling Victoria 2023).

Policy support

- Victorian Government policies set ambitious circular economy targets for the state by 2030, including diverting 80 % of waste from landfill and reducing waste generated per person by 15 %.
- There is a strong alignment with the Vision to support a circular economy in the Structure Plan Area. See Appendix A for details.
- Kingston City Council supports circular economy outcomes in local businesses through actions such as providing education, adopting tools like ASPIRE, and empowering businesses to transition from a linear to circular economy.

Planning support

- The planning scheme encourages adaptive reuse of buildings and use of recycled materials but there is no specific consideration of embodied carbon associated with building materials, nor requirements around managing construction waste.

Challenges

- While policy remains strongly aligned to the Vision, it may fail to contribute to a circular economy during design and construction due to the lack of specific planning requirements for development to address resource recovery and circular economy with design, construction and operations.
- Existing resource recovery businesses may support some circular economy outcomes, but population and job growth may increase waste generation 29 % by 2051, with some of this waste ending up in landfill (Recycling Victoria 2023).
- Increased development may risk the achievement of Victorian Government waste diversion targets.
- Rapid development of commercial and residential areas in the Structure Plan Area may contribute to rising embodied carbon and C&D waste. C&D waste in Victoria increases to 29.4 Mt (from 7.7 Mt currently) by 2050 (Recycling Victoria 2023). Virgin materials could contribute to 85 % of a building's total carbon emissions (ThinkStep 2021).
- Development may not easily be disassembled and remains unable to adapt to future resource recovery needs.

The Climate Response Plan recommendations aim to address these sustainability challenges (see Section 5.3).

Opportunities

The Future Accelerated State aims to support a circular economy in the Structure Plan Area. This includes the following opportunities:

- The Structure Plan Area contributes to achieving a circular economy through design, construction and operation, and helps meet Victorian Government waste management and circular economy targets.
- More productive use of resources across all forms of development and enhanced resource recovery.
- Waste to landfill in construction, demolition and operation is avoided wherever possible.
- Durable and resilient infrastructure that requires less maintenance.
- Reduced embodied carbon in new developments with good design and adoption of reused and recycled materials.
- Developments are designed for disassembly and adaptability for alternative uses to avoid future demolition waste.
- Opportunities for new resource recovery solutions are included in the Structure Plan Area.
- Capability and development of local resource recovery and circular economy supply chains is encouraged.

The Climate Response Plan recommendations support the achievement of these opportunities (see Section 5.3).

4.1.4 PLACE-BASED MEASURES TO PROMOTE ZERO EMISSIONS TRANSPORT

Current State → **Future BAU State** → **Future Accelerated State**

Challenges

- The majority of trips (73 %) in, to, and within the Structure Plan Area are by private vehicles. Only 9 % of trips by public transport and 18 % by active travel, walking and cycling.[4]
- A lack of dedicated cycling corridors discourages use or forces cyclists to share road space with high speed traffic (such as along Nepean Highway).
- Walking and cycling accessibility in the Structure Plan Area is limited by barriers to movement, including large suburban blocks, the railway corridor, and infrequent protected crossing points along arterial roads (such as Nepean Highway).
- Pedestrian amenity varies in the Structure Plan Area, with lower quality environments along Bay Road and Nepean Highway and outside the activity centres.

Policy support

- Victoria's legislative and policy framework requires an integrated transport system that is accessible, inclusive and safe for all Victorians.
- Local government policies support improvements to walking and cycling networks, mobility and the integration of transport and land use to ensure a well-planned and liveable city. This includes electric vehicle network opportunities to reduce transport-related emissions.
- See Appendix A for details.

Planning support

- The planning schemes give priority to walking and cycling but transport-related emissions, reductions in car dependency, and support for zero emissions or share vehicles are rarely considered.

Challenges

- Policy maintains strong support for zero emissions transport with considerations for electric vehicles and active transport.
- However, implementation of these policies may be challenged, leading to:
  - » A lack of public micromobility infrastructure
  - » High levels of unrestricted car parking which reduces public amenity and continues to reinforce private vehicle ownership
  - » A lack of secure bicycle parking and end-of-trip facilities, disincentivising residents and employees from cycling
  - » Low-quality pedestrian environments
  - » Limited car share scheme parking spaces
  - » A lack of zero emissions transport infrastructure
- Population and employment growth may continue to increase transport emissions in the Structure Plan Area.

The Cheltenham Transport Plan and Climate Response Plan recommendations aim to address these sustainability challenges (Refer to Section 5).

Opportunities

The Future Accelerated State aims to promote zero-emissions transport in the Structure Plan Area. This includes the following opportunities:

- Upgrades to support priority for walking, cycling and public transport trips in the Structure Plan Area.
- Reduced use of private vehicles.
- An integrated management approach to car parking in the Structure Plan Area, including setting maximum (not minimum) parking spaces for residential and non-residential development, and considering parking provisions for zero emission and car share vehicles.
- A central mobility hub and supporting hubs in the Structure Plan Area.
- Ensuring all new developments support modal priorities and active transport with recommendations for end-of-trip facilities or bicycle parking, car parking reduction and other innovative approaches (car share schemes, micro-mobility, electric vehicle charging).
- Trials and delivery of low and zero-emissions transport initiatives, including micro-mobility solutions and innovative car parking approaches.

The Climate Response Plan and the SRL East Structure Plan - Transport Technical Report – Cheltenham support the achievement of these opportunities (see Section 5.4).

[4] Refer to the SRL East Draft Structure Plan - Transport Technical Report – Cheltenham.

4.1.5 CLIMATE CHANGE ADAPTATION

Current State	Future BAU State	Future Accelerated State

Challenges

- High levels of greenhouse gas emissions drive hotter temperatures and more extreme weather events.
- The Structure Plan Area experiences extreme heat, particularly in areas with low canopy cover and lack of blue-green infrastructure such as areas north of Bay Road, east of Nepean Highway, and in commercial and industrial areas such as the Bayside business district.
- The Structure Plan Area is vulnerable to flooding, particularly in the northern and eastern areas.

Policy support

- There is strong alignment with the Vision to deliver neighbourhoods that are resilient, adaptable and future-proof to climate change.
- Strong policy support towards adaptation measures to prevent canopy cover decline, particularly in Highett Activity Centre.

Planning support:

- The planning schemes contain no provisions related to climate change resilience.

Challenges

- Policy maintains strong action on adapting to climate change but implementation is limited as private development is not required to mitigate the impacts of climate change in design and operations.
- The failure to limit global warming to 1.5°C to 2°C means the most severe impacts of climate change cannot be avoided.
- A potential average temperature increase of 2°C by 2050 may increase extreme heat impacts to buildings, infrastructure, heat-related deaths, stress on essential services and disturbance to ecosystems.
- There may be a poorer quality of life outcomes for local residents.
- There may be higher electricity costs to operate homes and businesses.
- More intense floods may increase damage to homes and infrastructure, maintenance costs and stress on health and emergency services.

The Climate Response Plan recommendations aim to address these sustainability challenges (see Section 5.5).

Opportunities

The Future Accelerated State aims to create a climate resilient and adaptive Structure Plan Area. This includes the following opportunities:

- The Structure Plan Area is climate-ready with strong measures in place to ensure it is planned, designed and operated to be fully adapted and resilient to climate change.
- Homes, commercial and industrial buildings, and infrastructure are planned and constructed to be resilient to climate-related hazards.
- Existing building stock is retrofitted to increase resilience to extreme heat and flooding, as well as more resilient to grid disruptions and rising energy costs.
- The Structure Plan Area features measures to reduce emissions and support adaptation (such as urban greening and diverse local renewable energy generation, distribution and storage).
- Policy vision, objectives and actions are achieved with strong action to adapt to climate change in the public and private realm.

The Climate Response Plan recommendations support the achievement of these opportunities (see Section 5.5).

4.1.6 ENVIRONMENTAL ENHANCEMENT AND PROTECTION

Current State → **Future BAU State** | **Future Accelerated State**

Challenges

- There are some areas of native vegetation near Sir William Fry Reserve and along the rail corridor. However, the risk of disconnected or fragmented green or open spaces can impact biodiversity and ecology connectivity.
- The Structure Plan Area contains a few large open spaces, some very large, with smaller scattered open spaces dominating. There is low tree canopy cover of the Structure Plan Area, with 9.5 % cover.
- The fragmentation of open spaces presents a challenge to providing improved biodiversity and green corridors. Disconnected green or open spaces impact biodiversity and ecology connectivity (i.e. Highett Grassy Woodland masterplan).

Policy support

- There is strong alignment to Victorian and local government urban cooling strategy commitments and objectives. See Appendix A for details.
- There is strong policy support to prevent a decline in tree canopy cover, with a target of 30 % canopy cover.

Planning support

- The planning scheme encourages retaining existing trees but it is not required unless trees are specifically protected.
- Clause 58 provides landscaping requirements relating to deep soil and tree canopy percentage for apartment developments. However, the extent of landscaping provided depends on the site's size and context.
- While environmental protection is supported in the planning scheme, there are not requirements for environmental enhancement.

Challenges

- Policy maintains strong support to retain vegetation and strengthen the capacity of the open space network to create an urban forest, but there may be limited incentive to enhance green spaces, biodiversity or ecological connectivity.
- There may be limited requirements for vegetation and tree canopy coverage for other types of development.
- There may be limited canopy improvement opportunities for cover and connectivity due increased density in the Structure Plan Area.
- Green spaces are likely more fragmented, further reducing biodiversity.
- Tree canopy may continue to be lost through the process of replacing single dwellings with denser multi-dwelling redevelopment.

The Climate Response Plan recommendations aim to address these sustainability challenges (see Section 5.6).

Opportunities

The Future Accelerated State aims to protect natural habitats, improve biodiversity in green spaces and enhance the natural environment in the Structure Plan Area. This includes the following opportunities:

- The growth of healthy trees and vegetation is supported for a cooler and greener urban environment.
- Planning requirements limit further removal of ecological assets.
- Mature trees that support biodiversity and wildlife are retained.
- New and enhanced green corridors and shadier streets make walking and cycling easier and more enjoyable.
- Greening urban areas address heat issues and improve amenity.
- Natural habitats are protected and biodiversity is improved in green spaces and waterways.
- Additional biodiversity connections, integrating with Highett Grassy Woodlands (draft masterplan) and the conservation of indigenous species and natural habitats.
- New open space is created and/or existing open space is enhanced to improve conservation, habitat, and biodiversity functions.

The Climate Response Plan recommendations support these opportunities (see Section 5.6).

4.1.7 URBAN HEAT ISLAND STRATEGY

Current State	Future BAU State	Future Accelerated State
Challenges • There are a few large open green spaces, some very large, and many small open spaces. • There is an urban heat island temperature difference of +9.3°C, driven by limited open space and low tree canopy coverage. • There is high urban heat vulnerability due to low tree canopy coverage north of Bay Road, east of Nepean Highway, and in commercial and industrial areas. • Without focused efforts to proactively mitigate urban heat island effects, outdoor thermal comfort may be at risk.	**Challenges** • Strong policy support is maintained to encourage the delivery of urban heat island mitigation strategies, but a lack of strong planning controls means they are only encouraged, and not delivered in all developments. • Continuing high-density development in the Structure Plan Area may increase the areas of impervious surfaces and reduce open spaces, increasing the urban heat island effect. • Reduced height-to-width ratios of streets (narrower streets relative to building height) may also increase the urban heat island effect. Narrow streets may hinder ventilation and limit the dispersion of heat, contributing to higher temperatures in urban areas. • Proposed taller buildings in the Structure Plan Area may trap additional heat. • As urban density increases, vegetation cover tends to decrease, reducing the crucial role vegetation plays in moderating temperatures by providing shade and evaporative cooling. • There may be inconsistency in the delivery of urban heat island mitigation strategy. The Climate Response Plan recommendations aim to address these sustainability challenges (see Section 5).	**Opportunities** The Future Accelerated State aims to mitigate the effects of urban heat in the Structure Plan Area. This includes the following opportunities: • Urban heat island effects are mitigated. • A cool and green environment is provided for the community to enjoy, promoting physical activity and social interaction. • There is reduced risk of heat-related illnesses, such as heat exhaustion and heatstroke. • Mitigation strategies such as planting trees and creating green spaces help filter pollutants and improve air quality. • Greening urban areas addresses heat issues and improves amenity including: » Energy savings » Improved air » Enhanced comfort » Biodiversity support. The Climate Response Plan recommendations support the achievement of these opportunities (see Section 5)
Policy support • There is strong alignment to Victorian and local government urban cooling strategy commitments and objectives. See Appendix A for details.		
Planning support • The planning scheme encourages measures to address urban heat island issues, such as with landscape design, retention of trees and building design elements. However, there are no performance-based requirements.		

4.2 Case for change

Delivering increased density concentrated around mass rapid transit will support greater connectivity, connected planning and zero emission mobility choices for local communities, delivering sustainability opportunities. In transitioning to a more compact, densified built form, innovative approaches to deliver Integrated Water Management (IWM), enhance ecological values, and urban heat island mitigation are required – these will not be delivered under current planning controls. This may result in continued sustainability challenges in the Structure Plan Area and impacts on its liveability, connectivity and productivity.

If planning controls do not address the sustainability challenges now, the future state of the Structure Plan Area may see unsustainable development, with exposure to climate risk, an increase in greenhouse gas emissions, health impacts from exposure to urban heat, and costly retrofits to upgrade, rebuild and address sustainability challenges. The analysis of the sustainability focus areas above highlights that:

- The Cheltenham Structure Plan Area is currently experiencing sustainability challenges.
- Current Victorian and local government policy supports addressing current and emerging climate change and sustainability challenges in the Cheltenham Structure Plan Area. However, the implementation of these policies in the municipal planning schemes is limited, and there is generally a lack of planning support to deliver sustainability policy outcomes (see Appendix A).
- Under a Future Business as Usual State, it is expected that current sustainability challenges will remain or worsen due to the projected growth and densification of the Structure Plan Area, such as accelerated higher density development around the SRL station. This will create a gap between what is expected and what the aspirations are for the Cheltenham Structure Plan Area. This state is unacceptable as the Cheltenham Structure Plan Area will fail to achieve sustainability policy objectives, or the Cheltenham Vision.
- Under a Future Accelerated State, a number of sustainability opportunities have been identified that support the Cheltenham Structure Plan Area achieving regional sustainability policy objectives, and the Cheltenham Vision.

This Climate Response Plan provides recommendations to close the gap between what is expected to be delivered under the Future Business as Usual State, and what is possible under the Future Accelerated State. The Current State and the Future Accelerated State through the Structure Plan delivery are shown in Figure 4.1.

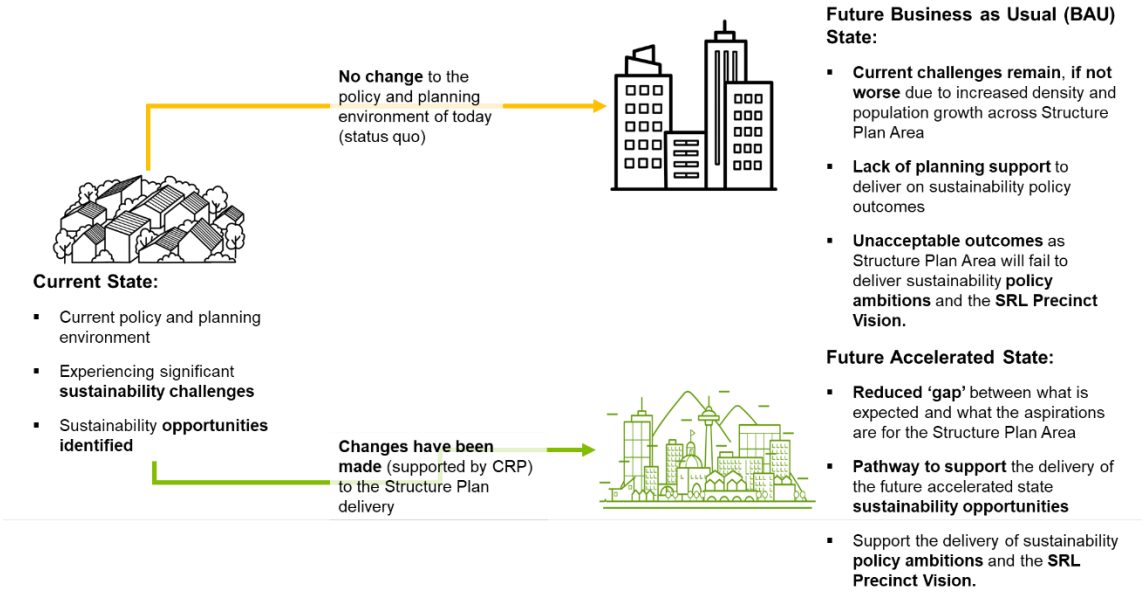

FIGURE 4.1 CURRENT AND POTENTIAL FUTURE STATE IN THE STRUCTURE PLAN AREA THROUGH THE STRUCTURE PLAN DELIVERY

5. Recommendations

This section sets out recommendations to inform the Cheltenham Structure Plan.

The recommendations address the sustainability challenges of the Structure Plan Area, and aim to help achieve the SRL sustainability vision and the sustainability objectives of the Cheltenham Vision.

The goal is for the structure plan area to become more liveable, connected and productive as its population grows and density increases, with greater climate change resilience and improved sustainability.

The recommendations aim to close the gap between what is expected under the Future Business as Usual State, and what is possible under the Future Accelerated State.

They also contribute to achieving Victorian and local government sustainability objectives.

Categories of recommendation

Land use planning is critical to influencing how cities are shaped, perform and respond to climate. However, creating sustainable, climate-responsive neighbourhoods should not rely on just planning controls.

Other opportunities such as partnerships and advocacy are required to build climate change resilience and improve sustainability.

This is why the recommendations are sorted into the three categories defined in Table 5.1.

TABLE 5.1 RECOMMENDATION CATEGORIES

	**Structure Plan responses** guide and promote sustainability and climate considerations in the future planned land use, built form, and public spaces to support changing community needs. • Provides long-term guidance to authorities about land use changes and buildings on private and public land. • Provides community and investor certainty about expectations for the future form of development.
	**Planning Scheme responses** recommend new planning controls to improve the climate responsiveness of development in the Structure Plan Area. • Sets out policies and provisions that regulate how land can be used or developed. • Creates binding requirements that can influence buildings and other infrastructure.
	**Other opportunities** promote partnerships with government, industry and other organisations. • Can include guidance, measurement tools or rating tools, or staging implementation to support Structure Plan and Planning Scheme responses. • Builds relationships and provide access to more resources, a pool of diverse skills and knowledge and shared expertise to foster innovation and creativity. • Enables access to new markets and customers, cost and risk sharing.

No single response will deliver the full scale of change required to address the sustainability challenges in the Structure Plan Area. Recommendations are therefore not prioritised for each focus area. Adopting the full suite of recommendations is advised.

While recommendations and other opportunities are provided against each sustainability focus area, these may overlap with each another to achieve multiple outcomes and co-benefits across economic, environmental and social sustainability. Where this occurs, this is noted in the recommendation or opportunity.

Recommendations related to Planning Scheme responses are advisory only. At this stage, the Climate Response Plan is not able to provide definitive advice on where planning controls should 'sit' in policy, as the planning structure and zoning is not yet resolved. These recommendations will be subject to further testing and refinement during the Planning Scheme Amendment process in 2024 and 2025.

Structure of recommendations

The recommendations are categorised under each sustainability focus area and structured as follows:

- **Focus area summary** – summarises the focus area and the key challenges in the Cheltenham Structure Plan Area, as well as the defined outcomes being sought.

Each recommendation includes:

- **Description** – briefly describes the recommendation.
- **Impact** – describes potential impacts and benefits to be gained from implementation.
- **Implementation considerations** – considerations for implementing the recommendation, including key considerations for the Structure Plan Area and application to planning zones or building typologies where required.

5.1 Realising net zero

SRL is being delivered in the context of targets to rapidly reduce greenhouse gas emissions across the economy and community.

The Victorian Government has committed to an accelerated target to reduce the state's greenhouse gas emissions to net zero by 2045. This target is likely to be among the government's greatest and most critical tasks of the next two decades.

In simple terms, net zero emissions means balancing the greenhouse gas emissions released into the atmosphere, and the greenhouse gas emissions that are absorbed and stored (Climate Council 2023). Achieving net zero requires measures to reduce atmospheric greenhouse gases emissions, so that any remaining emissions can be naturally absorbed and stored, or removed through other methods (UN 2024).

How we consume energy will be a key determinant of Victoria's success or failure to achieve net zero. Electricity consumption is Victoria's major emissions source, much of which is used in buildings. In Australia, buildings account for over 50 per cent of electricity use and almost a quarter of greenhouse gas emissions (GBCA 2023).

Without strong action to transition new development to fossil-fuel free energy and energy efficient designs, the Cheltenham Structure Plan Area will fail to contribute to Victoria's net zero target. Integrating net zero outcomes into new development is critical to avoid the steep costs and technical challenges of energy efficiency retrofits.

The knowledge and technology to decarbonise buildings is available. There is significant opportunity to cut emissions from the built environment in a deep, rapid and sustained way, and to balance emissions from other sectors which are harder to decarbonise.

Energy use represents the biggest source of emissions in SRL East Structure Plan Areas, but achieving net zero will require Victoria to decarbonise its transport systems, industrial processes, product use and waste. For this reason, the measures recommended in Realising Net Zero should be considered alongside other focus areas. The initiatives in Circular Economy and Sustainable Procurement provide more insight into how SRL can address embodied carbon in materials and waste with sustainable design and construction. To understand how SRL can minimise emissions by reducing car dependency and promoting zero-emissions vehicles – see Place-based measures to promote zero emissions transport.

What's the challenge in the Cheltenham Structure Plan Area?

Energy use is the major emissions source in the Cheltenham Structure Plan Area, which accounts for 70 to 77 per cent of municipal greenhouse gas emissions. This equates to approximately 1,429,500 tonnes of carbon emissions (CO_2e) each year.[5] Most of this energy is consumed in buildings.

Key challenges include:

- The Cheltenham Structure Plan Area has a significant pocket of commercial and industrial land. Commercial buildings produce large amounts of greenhouse gas emissions, mainly due to high energy usage.
- The Cheltenham Structure Plan Area is seeing a trend where industrial land is transitioning to commercial use. Future growth in the commercial sector, in areas such as Southland Shopping Centre and the Bayside Business District, will exacerbate energy demand, consumption and greenhouse gas emissions in the Structure Plan Area.
- Most residential dwellings are standalone buildings, which could require greater engagement to decarbonise.

[5] Emissions data has been sourced from Snapshot Climate, a publicly available tool developed by Beyond Zero Emissions and Ironbark Sustainability (https://snapshotclimate.com.au/). Municipal energy-related emissions data for Cheltenham has been measured by taking the average of Bayside and Kingston electricity and gas use for the period 2021/22. Please note that this figure is intended to be indicative only and is not based on carbon emissions modelling for the Structure Plan Area.

- Existing dwellings have low energy efficiency – the average existing dwelling has a 2.3 NatHERs star rating.[6]
- The Cheltenham Structure Plan Area has a lower uptake of on-site small-scale solar installations – the overall installation rate is 16 installations per 100 dwellings, compared to the statewide average of 34.[7]

In addition to this, the Cheltenham Vision identifies the potential provision for:

- Taller mixed-use developments
- Higher-density apartments.

While SRL presents opportunities to enhance the Cheltenham Structure Plan Area's sustainability performance, it will also generate more intensive development to accommodate a growing population. This will increase energy demand, creating major challenges to realising Victoria's net zero target.

Failing to set higher sustainability standards for development in the Cheltenham Structure Plan Area would be a missed opportunity and could also increase risks of obsolescence and poor adaptation to sustainability and climate-related challenges.

Without strong action to transition new development to renewable energy sources that are low in carbon, highly efficient, and offset with credible nature-based solutions, the Cheltenham Structure Plan Area will fail to contribute to Victoria's net zero target. Integrating net zero outcomes into new development is even more critical to avoid the steep costs and technical challenges of retrofitting energy efficiency measures.

Policy and planning challenges

Appendix A summarises the strategies and policies reviewed to inform this Climate Response Plan. Findings include:

- Victorian Government policies demonstrate strong ambition to reduce emissions to achieve net zero by 2045.
- The proposed updated Victorian Renewable Energy Target of 95 per cent renewable electricity by 2035 is considered world leading.
- Victoria's Climate Change Strategy, and Plan Melbourne 2017–2050 (2017b) promote energy demand reductions, energy efficiency upgrades and renewable electricity uptake.
- The sustainability and climate policies of Bayside City Council and Kingston City Council align with these goals of these strategies.
- Planning controls do not require any type of development to demonstrate how it will be net zero ready.
- Updated energy efficiency standards in the National Construction Code (NCC) will reduce emissions from new residential development. However, because the electricity grid remains primarily powered by fossil fuels, population growth in the Cheltenham Structure Plan Area will drive significant increases in emissions. This can be addressed by increasing uptake of on-site renewable energy to reduce emissions at the source.
- Under current regulations, buildings are only required to achieve the standards set by the:
  - » National Construction Code – Section J Energy Efficiency
  - » Built Environment Sustainability Scorecard (BESS) Framework (see Section 5.7A-2 in Appendix A of this report).

[6] NatHERS star ratings have been sourced from CSIRO Energy Rating Dashboard (2024). Data has been measured by taking the average star rating for existing dwellings in the City of Bayside and City of Kingston between the period May 2016 – April 2024. Please note that this figure is intended to be indicative only and is not based on precinct-specific energy modelling.

[7] Solar uptake is based on small-scale solar installation data by postcode from 2001-2022 sourced from the Clean Energy Regulator (2024), and 2021 census data (ABS 2021). Please note that data is intended to be indicative only and is not based on emissions modelling for the Structure Plan Area.

Desired outcomes in the Cheltenham Structure Plan Area

To achieve the Cheltenham Vision, the Cheltenham Structure Plan Area should be sustainable, climate responsive and net zero ready. This involves planning for new energy technologies to enable a smooth, orderly transition to net zero. It also requires embracing sustainable design practices so that new developments are low in carbon and powered by renewable energy. This will support the following outcomes:

- **Phase-out fossil fuels** – development in the Cheltenham Structure Plan Area achieves net-zero emissions by or before 2045 and is free from fossil fuels where feasible (for example, by phasing out new gas connections).
- **Energy supplied from renewable resources** – the Cheltenham Structure Plan Area supports the transition to new, diverse energy technologies for local renewable energy generation, distribution and storage.
- **Reduced energy consumption** – the Cheltenham Structure Plan Area reduces energy consumption through efficient buildings that are built with lower carbon materials and operated with smart energy management strategies.
- **Remaining emissions mitigated** – development in the Cheltenham Structure Plan Area addresses residual emissions with high-integrity, nature-based offsets that provide environmental benefits that can be seen.

Recommendations and other opportunities

The following responses are recommended for the Cheltenham Structure Plan to deliver a Future Accelerated State for realising net zero – aiming to close the gap between the greenhouse gas emissions challenges facing the Structure Plan Area and the desired outcomes, to help achieve net zero emissions:

- **Recommendation 1A** – Net zero buildings (Structure Plan response)
- **Recommendation 1B** – Private development sustainability certification (Planning Scheme response).
- **Opportunity 1C** – Partnerships for a decarbonised energy supply

Recommendation 1A – Net zero buildings

Structure Plan response

Description

A Structure Plan response is recommended to encourage all developments in the Cheltenham Structure Plan Area to support achievement of net zero by 2045, in line with Victoria's emissions reduction targets.

The Structure Plan response could also encourage developments in the Structure Plan Area on private and public land to avoid and reduce emissions through their design and construction.

Impact

- This Structure Plan response could generate benefits including:
  - » Establish net zero as a high priority early and set expectations on the level of energy performance expected for development as early as possible
  - » Support net zero by encouraging development to be fossil fuel free, highly energy efficient and powered by renewables, built with lower upfront emissions and embodied carbon (for new developments), and offset with credible nature-based solutions for remaining emissions.
- This could have the following positive impacts:
  - » Reduced emissions
  - » Reduced energy consumption
  - » Improved electricity grid resilience
  - » Improved air quality, human health and wellbeing
  - » Improved community response to the climate emergency
  - » Reduced exposure to risks associated with transition to a low-carbon economy (such as future carbon and energy policies).
- Support implementation of:

- » Victoria's greenhouse gas emissions reduction target of 75 to 80 per cent by 2035 and net zero by 2045 by supporting the delivery of net zero buildings, which is not currently a requirement in the planning scheme
- » Victoria's Climate Change Strategy, which supports action to transition from gas to renewable electricity, improve household energy efficiency, reduce building energy demand, and deliver local renewable energy projects
- » Bayside City Council's Climate Emergency Action Plan 2020-2025 (2020), which encourages action to transition to zero carbon energy within the community
- » Kingston City Council's Climate and Ecological Emergency Response Plan, which supports net zero and action to adopt low carbon living via energy efficiency upgrades, community renewable energy projects and renewable electricity.

Implementation considerations

- The response is recommended to be supported by Recommendations 1B and 1C.
- There is opportunity for the Structure Plan to include the following directions and actions:
  - » Advance a Planning Scheme Amendment as proposed in Recommendation 1B
  - » Encourage (and require where feasible) industrial and commercial developments to use zero emissions energy sources, and not gas
  - » Future proof and plan for new energy technologies and the precincts to be powered with 100 per cent renewable electricity – see Opportunity 1C
  - » Enable existing developments to be more energy efficient to reduce energy consumption and demand
  - » Construct new development to have low embodied emissions by using lower carbon materials and sustainable design principles
  - » Offset any remaining emissions with credible nature-based solutions.
- Precedent for this recommendation can be found in:
  - » Arden Structure Plan Objective 9 – Establish strong environmental governance that provides certainty, accountability and transparency to achieve the precinct's net zero carbon emissions target by 2040
  - » Fishermans Bend Framework Objective 7.1 – Develop Fishermans Bend as a zero net emissions precinct and Objective 7.3 – Maximise renewable energy generation, storage and distribution.
- Key considerations for the Structure Plan Area:
  - » Cheltenham has an established commercial and industrial footprint, which includes the Bayside Business District. As more industrial land transitions to commercial use, there is an opportunity to accelerate the local transition to net zero – particularly given the large amount of greenhouse gas emissions consumed by commercial buildings. This could be delivered through stronger development standards that align with net zero outcomes, and exploring opportunities for wider sustainable energy generation and distribution.
  - » Achieving net zero across development may involve different levels of effort depending on development typology, land use and other contextual factors. Potential cost uplifts may be involved, such as for existing buildings to eliminate fossil fuels and transition to renewable electricity

1B – Private development sustainability certification

Planning Scheme response

Description

A Planning Scheme Amendment is recommended to require developers to align with achieving net zero by 2045 by achieving a Green Star Buildings (or equivalent independent standard) certification.

Impact

- This Planning Scheme response could generate benefits including:
  - » Promote broader sustainability and climate resilience outcomes using tools such as Green Star (or equivalent) with holistic sustainability criteria that align with SRLA's vision and sustainability focus areas
  - » Create opportunities for higher financial returns, as Green Star-certified assets deliver higher returns on average – 16.4 per cent higher capital value per squared metres, 13.5 per cent higher annual return, 23 per cent longer weighted average lease expire (WALE), 66 per cent less electricity and 51 per cent less water (Green Building Council of Australia 2023)
  - » A Green Star requirement supports developers and building owners to become leaders in sustainability and climate action by preventing disadvantage for developers seeking a sustainability certification. Sustainability credentials can also help attract tenants and reduce risk exposure
  - » Ensure new development over a certain threshold is designed and operated to achieve net zero emissions by 2045, and development below the implementation threshold can contribute to emissions reduction in a cost-appropriate manner
  - » Reduce embodied and operational emissions in design if sustainable design principles are promoted by using a holistic sustainability rating tool
  - » Increase energy resilience and reduce emissions if development uses on-site renewable energy generation and storage
  - » Support net zero if development is required to offset remaining emissions with credible nature-based solutions that deliver environmental co-benefits
  - » May reduce exposure to transitional risks associated with climate change, such as future carbon and energy policies, and increased fossil fuel.

Implementation consideration

- The Planning Scheme Amendment should consider application to the following thresholds:
  - » 5 Star Green Star Buildings (or equivalent independent standard) certified rating to be achieved for a new building or additions that contain 5,000 square metres or more of gross floor area.
  - » For smaller developments below these thresholds, consider seeking BESS-8 'Excellence' rating. 'Excellence' is defined in BESS as an overall score of 70 per cent or higher. Must also include exceeding the requirements of BESS (Energy) by a further greenhouse gas emissions reduction of 20 per cent.
- Precedent can be found in:
  - » City of Melbourne (2023) Amendment C376 and Fishermans Bend Precinct planning controls, where developments above 5000 squared metres require a 5 Star Green Star Buildings rating
  - » Arden Precinct planning controls also promote the achievement of a 6 Star Green Star rating.
- Potential barriers to uptake for this Planning Scheme response include:
  - » Green Star certification is verified by an independent third-party assessment process managed by the Green Building Council of Australia (GBCA)
  - » Green Star certification evidence from development applicants is to be reviewed by a qualified Green Star Accredited Professional (GSAP)
  - » Potential cost increases to developers to achieve a Green Star certified rating, depending on the scale of a development and building application. However, Green Star buildings deliver better returns on average, and costs may be reclaimed through energy savings and increased property values. Refer to the Green Star Buildings Business Case: https://gbca-

web.s3.amazonaws.com/media/documents/green-star-buildings-the-business-case.pdf).

- A number of considerations and incentives would support the adoption of a Green Star Buildings certification including:
  - In Australia, the Green Star suite of tools provide a best-practice, holistic framework that directly aligns with SRLA's sustainability focus areas and can be used to address the current building performance gaps in the planning scheme.
  - Delivering Green Star certification maximises opportunities to drive best-practice sustainability performance and offers assurance that sustainability and climate resilience is embedded in the final building through minimum performance requirements
  - Larger non-residential and multi-unit residential developments above a certain threshold within the Structure Plan Area in the Structure Plan Area are expected to have sufficient financial resources to achieve certification.
- Green Star certification has been demonstrated to deliver a broad range of benefits for many stakeholders. The analysis of ratings tools and frameworks suggest the Green Star suite of ratings tools are the most appropriate for guiding a holistic climate response, and achieving the following performance outcomes:
  - *Fossil fuel free*
  - *Fully electrified*
  - *Highly energy efficient*
  - *Fully powered by renewables*
  - *Built with lower upfront emissions and embodied carbon (for new developments)*
  - *Offset remaining emissions with credible nature-based solutions.*
- Integrating Green Star Buildings in the planning stage facilitates the certification process by reducing development application fees, providing infrastructure charges rebates, deferral of fees, height and density bonuses and green door policies – refer to the GBCA Green Star Buildings: Fact Sheet for Government for more information: https://gbca-web.s3.amazonaws.com/media/documents/green-star-buildings-for-government.pdf
- Guidance on the Green Star tools is available from GBCA publications provided on the Green Building Council of Australia website: www.gbca.org.au/green-star/rating-system
- Guidance on certification schemes such as the Green Star Climate Positive Pathway is provided by the GBCA publications 'Climate Positive Buildings & our Net Zero Ambitions', as well as 'A practical guide to electrification for new buildings', which outlines the steps involved to transition buildings to all-electric, renewable-powered energy sources.
- Administrative considerations include:
  - Green Star Buildings raise standards for new developments to address the climate and sustainability challenges of the next decades. Discretions and exemptions may need to be considered by the responsible authority where it is demonstrated that Green Star Buildings certification is unachievable.
- Where a Green Star certification is achieved, the following focus area recommendations will be impacted:
  - *Integrated water management – alternative water sourcing and demand reduction strategies will largely be covered in the Green Star framework*
  - *Circular economy and sustainable procurement – construction and operational waste reduction strategies and sustainable construction material specification strategies will largely be covered in the Green Star framework*
  - *Climate change adaptation – climate change risk management standards will largely be covered in the Green Star framework*
  - *Environmental enhancement and protection – greening of buildings, increased canopy planting, protection of vegetation and climate adaptive landscaping will be largely covered in the Green Star framework*
  - *Urban heat island strategy – measures to minimise the urban heat island effect from solar gains will be largely covered in the Green Star framework.*

Opportunity 1C – Partnerships for a decarbonised energy supply

Other opportunities

Description

- There is opportunity for the Victorian Government to establish a partnership with a local energy company and/or other relevant organisation(s) (such as the Department of Energy, Environment and Climate Action, ClimateWorks, ARENA, the local government) to investigate and implement a decarbonised energy supply, distribution and storage in the Structure Plan Area, and better demand management solutions.
- Potential solutions that could be investigated:
  - » Renewable energy solutions in the Structure Plan Area:
    - – Local renewable energy generation
    - – New energy solutions including hydrogen, geothermal and bioenergy.
- Distribution and storage solutions:
  - » Smart grids (digital technology to monitor and control the flow of electricity)
  - » Micro-grid (localised/neighbourhood scale distribution system)
  - » 2-way grids (allowing for bidirectional flow of electricity; while Australian regulations do not currently provide for 2-way grids, this will provide a future opportunity
  - » Energy storage opportunities including batteries and other storage systems.
- Demand management solutions using new technology (such as smart grids, blockchain, predictive management, optimisation, system efficiency).

Impact

- This opportunity could generate benefits including:
  - » Help to eliminate implementation barriers and create significant opportunities to drive transformations in energy supply, distribution and storage, and demand management
  - » Increase access to resources, expertise and innovation opportunities, accelerating the development and deployment of a decarbonised energy supply in the Structure Plan Area
  - » Support expanded, cost-effective delivery of decarbonised energy solutions by leveraging solutions that benefit from the economies of scale
  - » Partnerships with energy companies may provide access to new customers that may not otherwise decarbonise their energy supply
  - » Reduce emissions and energy bills, particularly if on-site renewables energy generation and storage is involved
  - » Reduce the level of risk associated with transitioning to a decarbonised energy supply
  - » Fast-tracking solutions to achieve state targets and growing knowledge and skills in the clean energy sector.

Implementation considerations

- The selection of solutions should be informed by an analysis of:
  - » The energy and emissions profile of the Cheltenham Structure Plan Area, the reliability of existing supply and distribution, and the constraints and required upgrades to existing networks identified in the Utilities Assessment
  - » The feasibility of introducing new technology in the Structure Plan Area
  - » The partnership may seek to involve local governments to explore implementation on a broader municipal scale. This may be particularly relevant for implementing on-site renewable energy generation and storage.

5.2 Integrated water management

Integrated water management (IWM) brings together all facets of the water cycle to maximise social, environmental and economic outcomes. It considers how water cycle services are provided and the drivers or constraints that influence its management, such as climate change, population growth, land use change, environmental decline and community preferences.

IWM aims to deliver water sensitive and resilient communities while mitigating the adverse impacts of climate change, including extreme flooding and drought events.

Water for Victoria (2016) and the Integrated Water Management Framework for Victoria (2017a) provide strong policy support for the IWM planning approach by identifying measures to sustainably manage water resources, including establishing the IWM forums to help deliver on IWM objectives using a place-based planning approach. These policies are further reinforced through:

- Plan Melbourne 2017–2050 (2017b) which sets out a key directive to integrate urban development and water cycle management to support a resilient and liveable city
- Target 150, a water efficiency program encouraging Melburnians to limit water consumption to 150 litres per person, per day.

Examples of IWM in the urban environment are shown in Figure 5.1.

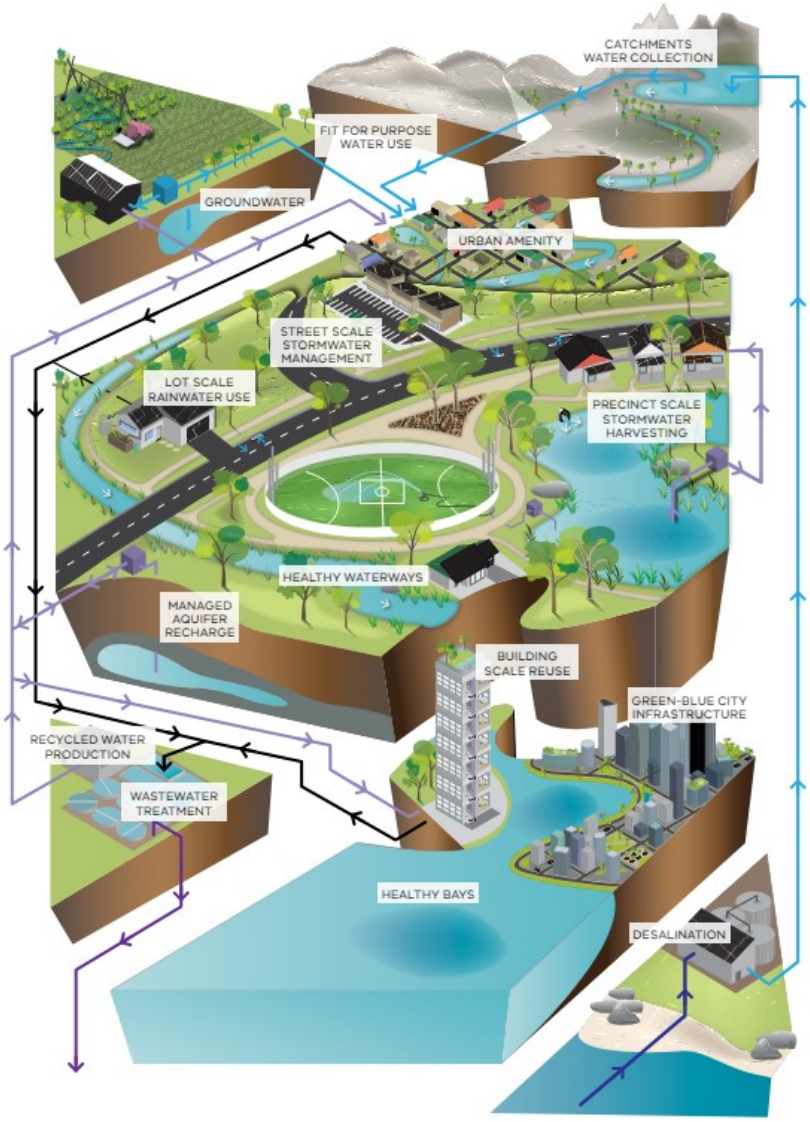

FIGURE 5.1 EXAMPLES OF THE APPLICATION OF IWM IN THE URBAN ENVIRONMENT (DELWP 2017)

What's the challenge in the Cheltenham Structure Plan Area?

The Cheltenham Structure Plan Area is currently exposed to 1-in-100 year flood events at its edge, including some areas in the north and east (such as Karen Street and near Southland Shopping Centre). No alternative water supply network exists for the Cheltenham Structure Plan Area so development currently relies on a potable water mains network. There is limited water treatment or water sensitive urban design infrastructure in the Structure Plan Area (Flooding and Water Management Technical Report 2024).

While flooding events provide surplus water in the Cheltenham Structure Plan Area, water availability for human consumption, biodiversity and urban greening will become increasingly threatened and expensive in the face of climate change.

As Victoria becomes warmer and drier due to climate change, it is expected that streamflows to some catchments could reduce around 50 per cent per year by 2065 (Water for Victoria 2016). At the same time, Melbourne may need 85 GL of additional water by 2030, and 600 GL by 2070 (Greater Western Water et al 2022).

Under a Future Business as Usual State in the Cheltenham Structure Plan Area, water consumption may increase 18 per cent, including a 30 per cent rise in residential use by 2051, placing pressure on existing potable water sources (Essential Services Commission 2023).

Policy and planning challenges

Appendix A summarises the strategies and policies reviewed to inform this Climate Response Plan. Findings include:

- The IWM Framework for Victoria (2017a) is supported by other key Victorian policies to strengthen the IWM planning process. This includes Plan Melbourne 2017–2050 (2017b), which supports the use of all water sources so the city remains liveable and sustainable, and to reduce reliance on drinking-water supplies, and the Greater Melbourne Urban Water & System Strategy: Water for Life (2022) which sets out the need for alternative water supply to meet Melbourne's needs.
- A range of Kingston City Council and Bayside City Council policies support strong ambitions for IWM outcomes and translation of these into structure planning approaches. For example, the Kingston Urban Cooling Strategy calls for structure plans for activity centres to embed details for water sensitive urban design, urban greening and cooling.
- The planning controls have come some way to embedding these policy goals in the planning scheme for the Cheltenham Structure Plan Area at a catchment and development scale. For example, development that would have an adverse impact on the performance of local waterways is discouraged. Water efficient fixtures and irrigation and water sensitive urban design approaches are encouraged.
- While the planning scheme can require connection to alternative water sources for residential development through subdivision requirements, where it exists, there is no similar requirement for commercial or industrial development.

Future challenges

An appropriate neighbourhood-scale planning response will be required to address the water management challenges and planning challenges facing the Cheltenham Structure Plan Area in future decades. With the increase in development and density and population, combined with the complexity of stakeholders involved in water management, issues such as increased flooding risk and reduced water availability from hotter and drier conditions may be exacerbated. Not delivering on these principles means the liveability of the Cheltenham Structure Plan Area and its resilience to a warmer and drier climate may be at risk. This will significantly increase the challenge for Greater Melbourne to ensure sustainable growth and a continued supply of water in the decades to come.

Urban development and redevelopment presents the greatest opportunity to build the required infrastructure and create demand for alternative water sources in the Structure Plan Area.

Desired outcomes in the Cheltenham Structure Plan Area

To achieve the Cheltenham Vision, the Cheltenham Structure Plan Area should embed IWM principles to ensure resilience to climate change effects and extreme events such as flooding, as well as create functional, high-quality green networks that keep water in the landscape. The Cheltenham Structure Plan Area should support IWM by considering the whole water cycle early in the planning and design of new urban areas to improve the water performance of new buildings and the broader Structure Plan Area. This could support the liveability of the Cheltenham Structure Plan Area and ensure its resilience to a warmer and drier climate, supporting the following outcomes:

- **Ensure a safe, secure and affordable supply of water** from a diverse range of water supplies and sources, embedding water efficiency in all new development, to manage water demand to less than 150 litres per person, per day in line with Melbourne's targets
- **Achieve or exceed Victoria's stormwater quality objectives** to protect urban environments and maintain waterway health
- **Enable effective and affordable wastewater systems** that meet public health and environmental standards and maximises waste to resource opportunities
- **Retain water in the landscape** to ensure healthy and valued urban places, cool green urban spaces and support natural water cycles
- **Manage existing and future flood risk, including from climate change events,** to maximise outcomes for the community and minimise risk to life and property.

Recommendations and other opportunities

The following responses are recommended for the Cheltenham Structure Plan to deliver a Future Accelerated State for IWM – aiming to close the gap between the water challenges facing the Cheltenham Structure Plan Area and the desired outcomes:

- **Recommendation 2A** – Place-based integrated water management (Structure Plan response)
- **Recommendation 2B** – Alternative water supply (Planning Scheme response)
- **Opportunity 2C** – Partnerships to support integrated water management (Other opportunities).

Recommendation 2A – Place-based integrated water management

Structure Plan response

Description

A Structure Plan response is recommended to encourage all new development and public realm to incorporate innovative place-based IWM interventions that manage the risk of flooding to future development, enhance waterway health, support the delivery of an alternative water supply and deliver a water sensitive neighbourhood.

Impact

- This Structure Plan response could generate benefits including:
  - » Ensure new developments are encouraged to recognise and consider the contribution of water in creating liveable neighbourhoods that are resilient to climate change impacts
  - » Reduced demand on the metropolitan water supply system by increasing use of alternative water, in line with Victorian Government policy objectives
  - » Reduce localised flooding impacts from extreme climate change events around the SRL station, the Gilarth Street and Highett Main Drains, and Southland Shopping Centre
  - » Retain water in the landscape by providing a passive source of irrigation, enhancing the delivery of urban greening and cooling
  - » Improve quality of stormwater entering waterways and Port Phillip Bay by enhancing how it is captured and filtered in the urban environment, achieving or exceeding Victoria's stormwater quality objectives
  - » Support for community wellbeing by providing more greener public and private realms, and access to healthier, cleaner waterways
  - » Reduced infrastructure costs over the long run by creating affordable and diversified sources of water.

Implementation considerations

- This response is recommended to be supported by Recommendation 2B and 2C.
- Potential strategies to deliver integrated water management interventions in in the Cheltenham Structure Plan may include:
  - » Where streets are being restructured, implement urban greening or Water Sensitive Urban Design assets to help reduce flooding risk along Bay Road (by removing carparking) and increasing storage that can be accommodated in the road reserve – local streets provide much required flood storage and conveyance during a 1 % AEP and lower events
  - » Set minimum infiltration requirements for new development and require it to capture or divert stormwater into tank or water sensitive urban design assets to provide an adequate source of irrigation for green assets, spaces and landscaping
  - » Integrate water sensitive urban design into the design of transport corridors such as Bay Road, Graham Road and Highett Road
  - » Incorporate water sensitive urban design into the green corridor link, with any areas of new open space to prioritise treating stormwater, using permeable surfaces and providing an alternative water source to green spaces
  - » Support the delivery of water infrastructure to provide alternative water as a substitute for potable water for toilet flushing, laundry and irrigation in public and private development
  - » Consider additional built form setbacks to support conveyance of flood water in flood-affected areas such as new development around the SRL station, and Southland Shopping Centre
  - » For capital works, support the use of alternative water as a substitute for potable water where possible.
- Precedent can be found in:
  - » Fishermans Bend Framework Objectives 5.1 and 5.2, which set out strategies and planning controls to harvest, treat and reuse stormwater to minimise flooding, maximise water reuse and minimise potable water use
  - » Arden Structure Plan Objective 19, which seeks to minimise the risk of flooding through creative solutions, including water sensitive urban design

on specific streets and green links; and Objective 20 which aims to provide access to high-quality alternative water to be used in buildings and to irrigate open spaces.

- Key considerations for the Cheltenham Structure Plan Area:
  - » An IWM Plan for the Structure Plan Area should be prepared in collaboration with IWM Forum members that identifies IWM and associated water sensitive urban design interventions, blue-green corridors, and local flooding solutions to address land use limitations and manage water as a strategic resource in a sustainable manner.
  - » The IWM Plan should be prepared with Bayside City Council and Kingston City Council as the owner and managers of public open space and local drainage assets to determine where IWM solutions including stormwater management solutions are viable.
  - » This Structure Plan response should be delivered alongside the Flooding and Water Management Technical Report, the Integrated Water Management Strategy, the Cheltenham Transport Plan, the Open Space Technical Report, and the Precinct Utilities and Servicing.

Recommendation 2B – Alternative water supply

Planning Scheme response

Description

- A Planning Scheme Amendment is recommended to require new development to incorporate available or planned alternative water supply by providing third-pipe plumbing in the development to service:
  - » All toilets and washing machines
  - » Landscaped areas.

Impact

- This Planning Scheme response could generate benefits including:
  - » Reduce potable water demand for approved uses (toilets, washing machines and irrigation) to reduce pressure on drinking water supply – in some recent developments in Melbourne's north-east, the use of recycling water is aiming to reduce potable water consumption 45 per cent (Development Victoria 2023)
  - » Reduce cost of water for Structure Plan Area customers as non-potable water is cheaper to purchase than potable water
  - » Support additional water for irrigation of open space, landscaped areas, and streetscapes, delivering on urban cooling and biodiversity, ecological and urban greening initiatives
  - » Increase resilience of Structure Plan Area to a warmer and drier climate, and support for Victorian-wide policy objectives.

Implementation considerations

- The Planning Scheme Amendment should consider application to the following thresholds:
  - » In line with Recommendation 1B, if a development is greater than 5000 squared metres in gross floor area, the development is recommended to

achieve a 5 Star Green Star Buildings (or equivalent independent standard) certified rating.

  - Under this approach, development will be required to achieve Credit 25 (Water Use) which requires, for credit achievement, that the building has infrastructure for recycled water in a district or location where local council or water authorities (or similar) have planned for installation of recycled water infrastructure.
  - For smaller developments below these thresholds, implementation could be considered through a Sustainable Management Plan (SMP) as required by the municipal planning scheme. The SMP could include a minimum requirement that ensures the third-pipe (to use alternative water) plumbing and any associated infrastructure and fixtures are included in the development.

- Precedent can be found in:
  - The Arden Climate Response Plan planning controls, which set out IWM standards for new developments to meet, including connection to any third pipe and stormwater management system
  - Fishermans Bend Framework Strategy 5.2.1, which supports the delivery of a water recycling plant and associated third-pipe infrastructure to provide recycled water as a substitute for potable water for toilet flushing, laundry and irrigation.
- Potential barriers to uptake for this potential planning scheme response include:
  - Collaboration with water authorities and retailers on the viability and cost-effectiveness of an alternative water system will be required to provide an alternative water supply to development in the Structure Plan Area at an appropriate time
  - South East Water (water retailer) may require sites in the Cheltenham Structure Plan Area for local pump stations and treatment plants.
- A number of initiatives and incentives are underway that would support the adoption of an alternative water supply including:
  - Recycled water connections for households, open spaces, sports fields, and businesses (such as golf courses) have been implemented by South-East Water in outer south-east Melbourne, including at Cranbourne, Clyde, Lyndhurst, Pakenham and Officer
  - The proposed Dingley Recycled Water Scheme (being delivered by South East Water) is near the Cheltenham Structure Plan Area and could be a potential supply solution
  - The commercial viability of requiring development to provide third-pipe plumbing supported by an alternative water supply has been greatly accepted in recent structure planning in Melbourne (Fishermans Bend, Arden, and growth areas) as an acceptable use in residential developments for toilets, laundry and irrigation.
- Administrative considerations – discretions and exemptions may need to be considered by the responsible authority where it is demonstrated an alternative water supply is unavailable or inaccessible.
- This Planning Scheme response could be delivered alongside Recommendation 1B (Private development sustainability certification), as well as the Integrated Water Management Strategy and the Precinct Utilities and Servicing Report.

Opportunity 2C – Partnerships to support integrated water management

Other opportunities

Description

- There is opportunity to use the existing IWM Forum members to prepare IWM Plans for the Structure Plan Area.

Impact

- This opportunity could generate benefits including:
  - » Translate catchment priorities into specific initiatives for the Structure Plan Area that respond to the forecast development, and help to manage existing IWM challenges
  - » Unlock co-investment from parties on delivery of IWM solutions
  - » Support early and upfront IWM asset ownership agreements
  - » Create opportunities for multipurpose land uses, such as co-located drainage infrastructure with recreational facilities, open space, and walking or cycling routes.

Implementation considerations

- This opportunity should support delivery of Recommendation 2A.
- IWM planning takes time with many stakeholders interested in water management outcomes. The IWM forums are responsible for delivering IWM actions for all water-related outcomes across Melbourne. However, more analysis and engagement with potential partners may be required to identify the most appropriate partnership model and appropriate staging of IWM solutions.
- Outcomes of this engagement may be supported and strengthened through collaboration with research organisations such as the Water Sensitive Cities Australia.

5.3 Circular economy and sustainable procurement

A circular economy approach aims to reduce or avoid waste by keeping resources in use for as long as possible by reusing, repairing, sharing, refurbishing and recycling them. It involves a mindset shift from waste as a 'problem' to resources that have continued value and productive use.

Resource flows in a circular economy are shown in Figure 5.2.

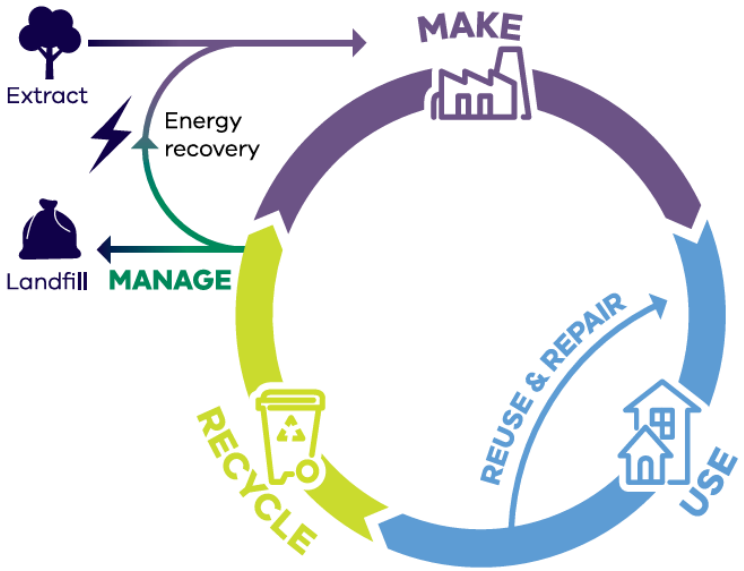

FIGURE 5.2 RESOURCE FLOWS IN A CIRCULAR ECONOMY (VICTORIAN GOVERNMENT 2020)

The Victorian Government's circular economy policy and action plan, Recycling Victoria: A new economy (2020) supports these outcomes.

Victoria has committed to an overhaul of its recycling system, with reform to kerbside recycling, the introduction of a container deposit scheme, new investment in industry, and the creation of waste management as an essential service. Recycling Victoria sets ambitious targets to:

- Divert 80 per cent of waste from landfill by 2030
- Cut total waste generation by 15 per cent per capita by 2030
- Halve the volume of organic materials going to landfill between 2020 and 2030 (with an interim target of 20 per cent reduction by 2025)
- Ensure every household has access to food and organised waste recycling or local composting by 2030.

What's the challenge in the Cheltenham Structure Plan Area?

Circular economy and waste challenges

Current recycling rates in the Cheltenham Structure Plan Area are around 50 per cent,[8] meaning the other 50 per cent of resources goes to landfill. While there is no specific data on construction and demolition (C&D) waste for the Structure Plan Area, C&D waste represents the majority of Victoria's waste – 7.7 Mt of waste generated in 2022 was from C&D activities from a total of 15.82 Mt, with around 15 per cent of C&D waste going to landfill (Recycling Victoria 2023).

In Australia, 228 kilograms of CO_2-e are produced per square metre (squared metres) of floor space in a residential building during construction. For non-residential buildings, this rises to 433 kilograms CO_2-e/squared metres, generally due to larger buildings requiring more substantial foundations and structures (ThinkStep 2021).

Under a Future Business as Usual State, the rapid development commercial and residential areas of the Cheltenham Structure Plan Area, increasing population growth, and the significant amounts of materials required to construct new infrastructure will lead to:

[8] Recycling rates represent an average of 2023 recycling rates for City of Kingston and Bayside City Council. Note this figure is indicative only and is not based on resource modelling for the Structure Plan Area (Source: Recycling Victoria, 2023).

- Increased construction and demolition waste which is expected to rise in Victoria to 29.4 Mt by 2050, an increase of nearly 300 per cent (Recycling Victoria 2023)
- Issues with material availability and rising embodied carbon, with virgin materials contributing to as much as 85 per cent of a building's total carbon emissions by 2050 (ThinkStep 2021)
- Increased waste generation per person, which may rise by around 29 per cent by 2051 in the Cheltenham Structure Plan Area, including a 50 per cent increase in organic waste (Recycling Victoria 2023).

Policy and planning challenges

- The circular economy is strongly considered in Victorian Government policy with ambitious state-wide circular economy policy and targets to be achieved by 2030.
- Victorian Government policy is reinforced through:
  - » Plan Melbourne 2017–2050 (2017b), which sets directions to transition to a low carbon city, reduce waste and improve waste management and resource recovery.
  - » Local government policies for Bayside which set targets to divert waste from landfill over the next decade and support low-emission sustainable procurement.
  - » Local government policies for Kingston, which supports local businesses to transition to circular in their processes and business models through the ASPIRE online tool.
- These policies have limited implementation in the Bayside and Kingston Planning Schemes. There are no requirements for construction waste reduction performance (such as C&D waste diversion targets). There are minimal requirements or targets to manage operational waste in residential, commercial and industrial development.
- Clause 15.01-2L of the Bayside Planning Scheme encourages development to use recycled materials and Clause 15.01-2 of the Kingston Planning Scheme seeks to promote waste avoidance in all stages of development. However, the planning schemes do not set minimum requirements for material choice or the reduction of embodied carbon of new developments. This topic is also not addressed under the Built Environment Sustainability Scorecard (BESS).
- Appendix A summarises the strategies and policies reviewed to inform this Climate Response Plan.

Future challenges

There are significant gaps to be addressed to align policy direction, the planning system and built environment performance outcomes. If not adequately planned for, increased development in the Cheltenham Structure Plan Area combined with more jobs, people and dwellings will contribute to more waste going to landfill, reduced availability of virgin materials, increased pollution and rising greenhouse gas emissions exacerbating climate change.

Continuing a linear economy approach of 'take, use and throw away' will risk achievement of the Victorian Government circular economy and net zero targets and fail to deliver opportunities for innovation and productivity with more efficient resource use.

Desired outcomes in the Cheltenham Structure Plan Area

To achieve the Vision, infrastructure, buildings and places being designed now should support a circular economy by enabling more productive use of natural resources, avoiding waste through good design, and ensuring that infrastructure is durable and adaptive to future changes in resource use.

Embedding circular economy principles into the Cheltenham Structure Plan should support zero waste outcomes in design, construction and the operation of new developments.

Neighbourhoods could be more liveable, durable, resilient and sustainable and achieve circular economy policy targets. This could support the following outcomes:

- **Reduced embodied emissions** – the built environment adopts non-virgin, lower carbon materials contributing to the achievement of Victoria's net zero emission targets
- **A more circular Structure Plan Area** – keeping resources in productive use for as long as possible by encouraging reuse, recycling and reducing construction, demolition and operational waste sent to landfill
- **Durable, resilient and adaptive infrastructure** – which requires less maintenance and is designed to be disassembled or adapted, avoiding future demolition waste and emissions and encouraging a continued circular approach to material use
- **Reduced waste generation per person and for businesses** – by encouraging opportunities for resource recovery.

Recommendations and other opportunities

The following responses are recommended for the Cheltenham Structure Plan to deliver a Future Accelerated State for the circular economy, aiming to close the gap between the circular economy challenges facing the Cheltenham Structure Plan Area and the desired outcomes:

- **Recommendation 3A** – Supporting a circular economy (Structure Plan response)
- **Recommendation 3B** – Embodied carbon reduction in new developments (Planning Scheme response)
- **Recommendation 3C** – Construction and operational waste management targets (Planning Scheme response)
- **Opportunity 3D** – Partnerships to support a circular economy in the Structure Plan Area (Other opportunities).

Recommendation 3A – Supporting a circular economy

Structure Plan response

Description

A Structure Plan response is recommended to facilitate a circular economy in the Structure Plan Area by encouraging all public and private development to adopt leading waste and resource recovery practices to achieve 80 per cent diversion in waste from landfill, reduce the amount of waste produced 15 per cent, and reduce embodied carbon from materials.

It is also recommended the response encourages existing developments to support the Cheltenham Structure Plan response where possible.

Impact

- This Structure Plan response could generate benefits including:
  - » Encourage the design, construction and operation of all new development to consider opportunities to reduce embodied carbon from virgin materials and maximise resource recovery from the early planning stages
  - » Support the aims and targets of the Victorian Government circular economy and net zero policy and targets
  - » Further encourage businesses, jobs or enterprises to support more efficient resource use, resources sharing or resource recovery, building on the existing resource recovery industry in the Structure Plan Area
  - » Support residents and employees in the Structure Plan Area to further understand their role in supporting circular economy outcomes.

Implementation considerations

- This response is recommended to be supported by Recommendations 3B, 3C and 3D.
- Potential strategies to support a circular economy for developments in the Structure Plan Area may include:
  - » Requiring developments to:

- Avoid waste by designing out materials, using fewer materials or more durable materials that require less maintenance, and can be reused or recycled in the future
- Adopt reused, low carbon or recycled materials in design where possible
- Design for future waste streams by allowing appropriate sizing and space
- Manage all waste at the source (such as through on-site organic waste management, or off-site recycling facilities).

» Requiring capital works to:

- Reduce embodied carbon at least 10 per cent and minimise the use of virgin materials by adopting recycled or reused materials
- Adopt materials which are considered to be more durable than standard materials or reduce the maintenance requirements of the works
- Use materials that can be composted, recycled or reused at the end of their life.

» Introducing innovative education and engagement programs for residents, businesses and the construction sector which leverage existing resource recovery opportunities.

- Precedent can be found in:
  - » Fishermans Bend Framework Objectives 8.1 and 8.3, which encourage leading-practice waste and resource recovery management in buildings and maximum value to be extracted from waste
  - » Arden Structure Plan Objective 13 which aims to minimise waste production, optimise reuse and recycling and encourage a circular economy.
- Key considerations for the Cheltenham Structure Plan Area:
  - » The Bayside Business District is already home to a number of resource recovery businesses and waste management services, including a container deposit scheme depot, waste transfer station, and clothing recycler. There are opportunities for commercial and industrial land use and development in the Bayside Business District and Moorabbin Industrial Precinct to strengthen local circular economy outcomes – for example, by investigating new resource recovery centres that align with the core waste streams of the Structure Plan Area (such as retail / food waste from Southland Shopping Centre), encouraging new development to incorporate materials from local recyclers, or investigating opportunities to reuse or adapt existing industrial facilities for alternative commercial uses.
  - » Guidance to support circular economy and waste management outcomes in new development could be sourced from the Victorian Government's circular economy policy and plan, Recycling Victoria: a new economy (2020), Sustainability Victoria or other emerging government policy and guidance.
  - » This Structure Plan response should be delivered alongside the SRL East Structure Plan - Transport Technical Report - Cheltenham.

Recommendation 3B – Embodied carbon reduction in new developments

Planning Scheme response

Description

- A Planning Scheme Amendment is recommended to encourage new development to:
  - » Reduce embodied carbon by at least 20 per cent (compared to those of a reference building)
  - » Minimise the use of virgin materials used by adopting recycled or reused materials
  - » Adopt materials which are considered to be more durable than standard materials or reduce the maintenance requirements of the development
  - » Use materials that can be composted, recycled or reused at the end of their life.

Impact

- This Planning Scheme response could generate benefits including:
  - » Reduced greenhouse gas emissions in the Structure Plan Area by using materials with lower embodied carbon such as recycled or reused materials in new residential and commercial buildings. Materials could include:
    - – Concrete – for a 40 MPa concrete used in a commercial building slab with 30 per cent supplementary cementitious materials (SCM) results in 50 kilograms CO2/t less embodied carbon than standard concrete (CEFC 2021)
    - – Recycled steel – every tonne of scrap used for steel production avoids the emission of 1.5 tonnes of CO2 (AHURi 2023)
    - – Timber use instead of other materials – using 17 per cent timber in construction as an alternative to brick, aluminium, steel and concrete can reduce greenhouse gas emissions by about 20 per cent in a standard building (AHURi 2023).

Implementation considerations

- The Planning Scheme Amendment should consider application to the following thresholds:
  - » In line with Recommendation 1B, if a development is greater than 5000 squared metres in gross floor area, the development is recommended to achieve a 5 Star Green Star Buildings (or equivalent independent standard) certified rating. Under this approach, development will be required to achieve Credit 21 (Upfront Carbon Emissions) which requires, at a minimum, buildings demonstrate reduction of embodied carbon by at least 10 per cent (rising to a minimum 20 per cent reduction for projects from 2026 onwards).
  - » For smaller developments below these thresholds, implementation could be considered through a Sustainable Management Plan (SMP) where developers would respond to a checklist of requirements to demonstrate how they have met the planning control.
- Precedent can be found in:
  - » City of Melbourne (2023) Amendment C376 and Fishermans Bend Precinct planning controls, where developments above 5000 squared metres require a 5 Star Green Star Buildings rating. This contains a minimum requirement that the building's upfront carbon emissions are at least 20 per cent less than those of a reference building
  - » Arden Precinct planning controls promote the achievement of a 6 Star Green Star rating.
- Potential barriers to uptake for this Planning Scheme response include:
  - » There may be cost increases to developers in adopting recycled or low carbon materials, depending on the scale of development and building application (such as structural vs non-structural). For example, potential cost premiums on recycled materials – the capital cost premium of concrete with supplementary cementitious materials is approximately $10/m^3 (Frontier Economics 2022). However, this may be offset with smart design (using fewer materials) or if existing materials are reused on site.
  - » There is currently a modest market for the reuse of construction and demolition waste materials. In addition, the accelerated growth and rapid development of the Structure Plan Area may place increased demand on

recycled materials or low carbon material supply chains, impacting availability and supply of recycled or reused materials.

- A number of initiatives and incentives are underway that would support the adoption of recycled, reused and low carbon materials including:
  - » Sustainability Victoria, Ecologiq and other Australian and Victorian government agencies are supporting the development of new recycled and reused material supply chains and consolidated databases of products available
  - » Environmental Product Declarations (EPDs), which communicate the lifecycle performance of verified products and services, including embodied carbon, are publicly available via EPD Australasia, including for construction products such as aggregates, concrete, asphalt, cladding and façade, and floor systems
  - » Material passports are an evolving concept being adopted by large development and construction companies such as Multiplex, and being investigated by Victorian Government agencies such as Ecologiq. These are electronic identity cards that detail all the components and materials of a building, providing information on material production and performance to support future reuse and recovery, and detailing the embodied carbon. Material passports aim to make it easier for developers to choose circular building materials.
- Administrative considerations – As per the above, this space is still progressing and discretions and exemptions may need to be considered by the responsible authority where it is demonstrated materials are unavailable.
- This Planning Scheme response could be delivered alongside Recommendation 1B (Private development sustainability certification).

Recommendation 3C – Construction and operational waste management targets

Planning Scheme response

Description

A Planning Scheme Amendment is recommended to require multi-residential and non-residential development to achieve:

- 90 per cent diversion of C&D waste from landfill during construction
- 80 per cent diversion of waste from landfill during operation of the development, including:
  - » Ensuring space is allocated for separation and management of four waste streams, including general waste, co-mingled recycling, glass and organics (or other waste streams considered standard at the time of implementation) and other non-standard waste (such as clothing, e-waste)
  - » Appropriate waste management and collection services are in place to meet these targets.

Impact

- This Planning Scheme response could generate benefits including:
  - » Generate savings by avoiding costs of C&D and organic waste to landfill – estimates suggest the avoided cost of C&D waste to landfill (tonnes) is $125/tonne and for organic waste is $93/tonne (including consideration of landfill levies) (Frontier Economics 2022)
  - » Support resource recovery at the development scale by ensuring appropriate source separation – evidence indicates that appropriate source separation in commercial and residential develop could supports resource recovery of up to 92 per cent (Infrastructure Victoria 2020)
  - » Enable waste-related emissions to be avoided and/or reduced by diverting waste from landfill
  - » Support a circular economy by recycling, reusing or repurposing potentially scarce or stretched resources.

Implementation considerations

- The Planning Scheme response should consider application to the following thresholds:
  - » In line with Recommendation 1B, if a development is greater than 5000 squared metres in gross floor area, the development is recommended to achieve a 5 Star Green Star Buildings (or equivalent independent standard) certified rating. Under this approach, development will be required to achieve: Credit 2 (Responsible Construction) which requires, at a minimum, buildings to recycle 80 per cent of construction and demolition waste; and Credit 4 (Operational Waste) where buildings must have appropriate spaces for waste management and an appropriately sized loading dock.
  - » For smaller development below these thresholds, implementation could be considered through the existing Waste Management Plan required under the Built Environment Sustainability Scorecard (BESS) which currently supports on-site reuse of organic waste. This Planning Scheme response could expand the scope of the Waste Management Plan to include construction and demolition waste during construction, and hard-to-manage waste during operation.
- Precedent can be found in:
  - » Fishermans Bend Planning Controls which aim to include requirements for on-site waste separation (Strategy 1.7.1) and deliver leading practice waste and resource recovery management within buildings (Objective 8.1)
  - » City of Melbourne Planning Scheme which requires developments to produce a Waste Management Plan that meets the requirements of the City of Melbourne's Guidelines for Waste Management Plans or a precinct waste management plan (if there is one in place). The guidelines response to the City of Melbourne's target to divert 90 per cent of waste from landfill by 2030.
- Potential barriers to uptake for this Planning Scheme response could include:
  - » For operational waste – implication of spacing requirements (particularly for organic waste on-site management) has not been measured, although this could be done in accordance with Sustainability Victoria's Waste Management and Recycling in Multi-unit Developments Better Practice Guide (2019). If considered early in planning stages, the capital cost for developers is potentially negligible as waste storage areas are required under business-as-usual planning processes.
- There may be opportunity to support the uptake of this planning scheme response by:
  - » Coordinating residential, commercial and/or industrial collection contracts to avoid individual contracts across development, providing a centralised location for waste management and ensuring bulk waste collections. This would be particularly prevalent for commercial areas around Westfield Southland. If considered, this would be delivered alongside the Cheltenham Transport Plan (kerbside waste management).
- Administrative considerations – achievement of waste diversion rates may depend on available and appropriate processing resource recovery infrastructure to manage the waste streams and volumes within each specific development.
- This Planning Scheme response should be delivered alongside the SRL East Structure Plan - Transport Technical Report - Cheltenham.

Opportunity 3D – Partnerships to support a circular economy in the Structure Plan Area

Other opportunities

Description

There is an opportunity to establish partnerships between Victorian Government agencies (such as Sustainability Victoria), local government, research organisations (CSIRO, Australian Circular Economy Hub) or major tenants (Scentre Group, Westfield Southland) to deliver targeted investment in circular economy opportunities in the Cheltenham Structure Plan Area. This could include:

- Opportunities to deliver community-scale resource recovery hubs such as community-driven recycling hubs, sites for local exchanges, or repair cafes
- Opportunities for small-scale resource recovery (such as bioenergy opportunities infrastructure or development of a recycling solution for specific materials)
- Opportunities to connect local industry producers of waste with local recyclers.

Impact

- This opportunity could generate benefits including:
  - » Access to additional project finance – a significant number of Victorian Government initiatives are underway to support local investment in circular economy outcomes (such as through Sustainability Victoria's Circular Economy Innovation Fund)
  - » Help to source appropriate investment opportunities through strategic partnerships to meet the circular economy and resource recovery needs specific to the Structure Plan Area
  - » Support targeted investment in resource recovery solutions (such as community resource hubs)
  - » Increase access to research and innovation (such as the role of artificial intelligence (AI) to accelerate circular economy solutions and outcomes)
  - » Access understanding of industry lessons learnt to deliver circular economy solutions.

Implementation considerations

- Kingston City Council is already progressing circular economy initiatives with local businesses. The ASPIRE online tool supports Kingston businesses to transition to circularity in their processes and business models and an online capacity building program 'Circular Advantage' is being offered to businesses.
- Opportunities identified through partnerships should align to Victoria-wide waste and circular economy infrastructure priorities (including the Statewide Waste and Resource Recovery Infrastructure Plan (Sustainability Victoria 2018) and its future iterations, such as the Victorian Recycling Infrastructure Plan).
- Opportunities for small-scale resource recovery would require an analysis of context, and would need to be undertaken in line with partnerships to support net zero outcomes in the Structure Plan Area.
- A range of stakeholders (government, not-for-profit) could play a role in operating resource hubs. For example, not-for-profit organisations or local government may support repair cafes.

5.4 Place-based measures to promote zero emissions transport

The SRL East Structure Plan - Transport Technical Report – Cheltenham outlines a holistic blueprint for the Cheltenham Structure Plan Area on how the transport network will maximise opportunities in surface transport infrastructure, including zero-emissions transport solutions such as active transport, electric vehicles and mobility solutions.

This Climate Response Plan supports and reinforces the recommendations made in the SRL East Structure Plan - Transport Technical Report – Cheltenham to ensure emissions from transport are reduced in the Cheltenham Structure Plan Area and that opportunities consider the local context. These recommendations should be considered as statutory tools to guide land use and development outcomes across the Cheltenham Structure Plan Area and non-statutory tools that may involve strategic partnerships with local government and other key stakeholders. These recommendations include:

- Upgrades to support priority for walking, cycling and public transport trips in the Cheltenham Structure Plan Area and reduce private vehicle use
- Adopt an integrated management approach to car parking in the Structure Plan Area, including seeking maximum parking rates for residential and non-residential development and consider parking provisions for zero emission and car share vehicles
- Delivery of a central mobility hub and supporting hubs in the Structure Plan Area
- Ensuring that all new development supports active transport in the built environment through recommendations for end of trip facilities or cycle parking, car parking reduction and other innovative approaches (car share schemes, micro-mobility).
- Partnerships with Kingston City Council, Bayside City Council, potential operators and other key stakeholders (e.g., Westfield Southland) on trials and delivery of low and zero-emissions transport initiatives, including micro-mobility solutions and innovative car parking approaches.

5.5 Climate change adaptation

By the time SRL is delivered, Melbourne's climate will be significantly changed. Victorian Government projections indicate that if global greenhouse gas emissions continue rising at high rates, by 2050 the Structure Plan Area could experience the following changes in climate (Department of Environment, Land, Water and Planning 2019):

- **Warmer average temperatures** - maximum daily temperatures could increase by around 1.8 degrees Celsius.
- **More heatwaves and extreme heat days –** days over 35 degrees Celsius could double from around 6 days per year to around 14 days per year.
- **Long-term drying trend** – rainfall will be highly variable but there is projected to be a long-term decline in cool season rainfall and snow, with a possible 8.4 per cent decrease in annual rainfall.
- **More extreme rainfall events** – extreme daily rainfall to be highly variable with significant increases and decreases both possible. A 1-in-20 year extreme rainfall event could see 85 millimetres of rainfall.
- **More dangerous fire weather** – for greater Melbourne, the number of days where the Forest Fire Danger Index exceeds the 95th percentile could increase by 42 per cent (Department of Environment, Land, Water and Planning 2015).

While exposure to climate risks depends on how quickly and aggressively emissions are cut, some impacts from climate change will be unavoidable. This means that how the Cheltenham Structure Plan Area is designed today needs to factor in future climate change.

Climate change adaptation focuses on preparing the Structure Plan Area for the effects of climate change in order to reduce current and future risks, build social and economic resilience, and protect community wellbeing (Department of Environment, Land, Water and Planning 2019). Climate hazards can be categorised into 'shocks' and 'stresses', which can have a range of direct and indirect impacts. For example:

- **Climate shocks** are sudden, extreme weather events such as flash flooding, storms or extreme heatwaves that cause damage to buildings, homes and infrastructure. This may cause disruption to services, business operations, construction activity and movement within the Structure Plan Area.
- **Climate stresses** are typically longer-term, ongoing and emerging changes such as reduced annual rainfall. This may cause vegetation loss over time which then increases pressure on local biodiversity and reduces the amenity and community usage of gardens, sporting fields, and other green spaces.

What's the challenge in the Cheltenham Structure Plan Area?

The built environment of the Cheltenham Structure Plan Area is already exposed to the impacts of climate change. Areas near local waterways experience 1-in-100-year flood events. There are urban heat pockets concentrated in the north of Bay Road, east of Nepean Highway, and in the commercial and industrial areas.

Key challenges include:

- More hot days and intense heatwaves, severe flooding, storm surge and sea level rise poses risks to buildings, infrastructure, services and community wellbeing (Kingston City Council 2021).
- Increasing urban density is causing the loss of vegetation on private land, exacerbating climate change risks such as heatwaves and flooding
- Taller mixed-use developments and higher-density apartments are planned for the Structure Plan Area, bringing more people into the area
- Existing developments and infrastructure may not be resilient enough to the changing climate and extreme weather events

How the Cheltenham Structure Plan Area develops will affect the community's resilience to the physical and transitional risks associated with climate change, now and in future. Without place-based climate adaptation measures, impacts from climate hazards may be exacerbated by SRL. High-density development often increases the amount of heat-absorbing materials in neighbourhoods and could make the Structure Plan Area uncomfortably

hot during warm periods. There is also a risk of localised flooding due to increased runoff from a greater area of impermeable surfaces. This may also increase the risk of economic losses and stranded assets for new development.

Policy and planning challenges

Appendix A summarises planning policies and other documents reviewed to inform this Climate Response Plan. Findings include:

- The Victorian Government supports strong action to plan for climate risks across all sectors of the economy, which has been legislated under the *Climate Change Act 2017* (Vic). Under the Act, climate change adaptation plans for key sectors of the economy must be delivered every 5 years.
- Victoria's Built Environment Climate Change Adaptation Action Plan 2022–2026 (2022b) aims to ensure the built environment is fully adapted to climate change by 2051. This supports action to strengthen planning standards, neighbourhood design and infrastructure to avoid siting development in high-risk locations and to adopt measures that enhance climate resilience (such as through urban cooling and greening).
- While climate change adaptation policy is robust, more action is required to integrate policy actions into the planning system. For example, climate risk is a consideration for planning of settlements, structure planning, and infrastructure development applications (Clauses 11.01-1S; 13.01-1S; 11.02-2S; 19), development is not required to demonstrate how adaptive measures have been incorporated into design and operations to reduce vulnerability to climate risks.
- Bayside City Council and the Kingston City Council have committed to reduce the exposure and vulnerability of council-managed assets to climate hazards. However, climate change adaptation policies are not included in the Bayside and Kingston Planning Schemes. This means there is a gap in managing climate change risks in the private realm.
- The Bayside and Kingston Planning Schemes require stronger provisions to address climate change risks in the private and public realm. This could take the form of a requirement to mitigate the impacts of extreme weather events on building access, power supply or other internal infrastructure, or to consider the degradation of building assets as temperatures rise.
- The Building Environment Sustainability Scorecard (BESS) addresses thermal comfort and stormwater management but it does not require other site-specific climate change risks to be addressed.
- The National Construction Code (NCC) 2022 provides minimum performance standards for homes developed in areas subject to flooding, bushfires and cyclones, but does not account for site-specific climate variables or changing climate conditions.

Desired outcomes in the Cheltenham Structure Plan Area

To achieve the Vision, the Cheltenham Structure Plan Area should be resilient to climate shocks and stresses. Fortunately, adapting to climate change is generally easier, cheaper and more cost-effective at an early stage. Dedicated measures can ensure that new developments consider localised climate risks and develop adaptation measures are bespoke to the development, including impacts of extreme weather events.

Climate change adaptation measures will be crucial for addressing the challenges projected climate change impacts in the Cheltenham Structure Plan Area, and could deliver benefits and outcomes including:

- **Reduced exposure to climate change risks** – new development within the Structure Plan Area is planned and sited to avoid climate risks where possible.
- **Enhanced resilience and durability** – development within the Structure Plan Area is designed to be resilient and adaptable to climate change hazards, contributing to safety and wellbeing of the community.
- **Improved adaptive capacity** – the built environment is operated to be capable of managing climate risks and implement adaptation measures for the full life cycle as required (such as retrofitting existing buildings and preparing emergency response and recovery plans).

- **Provision of co-benefits** – place-based climate change adaptation measures are designed to deliver co-benefits (such as landscaping measures which manage rainfall extremes while improving biodiversity).

Recommendations and other opportunities

The following responses are recommended for the Cheltenham Structure Plan to deliver a Future Accelerated State for climate change adaptation – aiming to close the gap between the adaptation challenges facing the Cheltenham Structure Plan Area and the desired outcomes:

- **Recommendation 5A** – Climate change adaptation (Structure Plan response)
- **Recommendation 5B** – Climate change risk management standards (Planning Scheme response).

Recommendation 5A – Climate change adaptation

Structure Plan response

Description

A Structure Plan Response is recommended to support the design and construction of public and private developments, capital works and infrastructure to be resilient and adapted to climate change impacts.

Impacts

- This Structure Plan Response could generate benefits including:
  - » Reinforce climate change adaptation as a critical issue for the Structure Plan Area and promote stronger climate change adaptation measures in new developments
  - » Improve the adaptive capacity of the built environment in the Structure Plan Area to short-term climate risks (such as flash flooding, extreme heat days) and longer-term climate risks (such as drought, increased average maximum temperatures, sea level rise)
  - » Enhance resilience and durability of the Structure Plan Area by reinforcing the Victorian Planning and Environment Act 1987 (Vic) requirement for climate change to be factored into decision-making about future land use planning
  - » Promote consideration and uptake of climate change adaptation in the design and construction of new development, particularly those which provide co-benefits (such as landscaping measures which aid stormwater management. and support biodiversity.

Implementation considerations

- This response is recommended to be supported by Recommendation 5B.
- Potential strategies to support a climate change adaptation in the Cheltenham Structure Plan Area include:

- » Ensure all new infrastructure incorporates climate change adaptation measures to improve resilience to climate hazards expected during their design life. This may include measures such as:
  - Design drainage system to have capacity for an uplift in extreme rainfall events due to climate change.
  - Apply passive design principles to mitigate heat gain, avoid accelerated degradation of materials, and support user comfort.
  - Design foundations to accommodate enhanced shrink/swell of soils during drought periods.
  - Select materials and finishes to increase durability to hotter temperatures (such as using more durable binders in pavement).
- » Encourage and facilitate existing buildings and infrastructure to be retrofitted to improve resilience to climate hazards expected during their design life. This may include measures such as:
  - HVAC system upgrades to accommodate future temperature rises and more frequent extreme heat events.
  - Update landscaping to include water sensitive urban design in verges and rainwater capture to promote passive irrigation towards garden beds and reduce the likelihood of heat stress to plants (and costs to replace/repair landscaped areas).

- Precedent can be found in:
  - » Arden Structure Plan Objective 7 – Encourage buildings to remain adaptable as uses change over time; Objective 27 – Ensure that early activation and place-shaping activities are delivered alongside early precinct development and in readiness for the station opening, and that long-term planning, development and service delivery are considered early in the life of the precinct to create a distinct sense of place, promote a vibrant and interesting early local experience and ensure the long-term resilience of the precinct (including adaptation to climate change).
  - » Fishermans Bend Framework Goal 4 – 'A climate resilient community' sets a target that the community is resilient to the shocks and stresses of climate change. This goal is supported by four objectives to reduce the urban heat island effect, embed green infrastructure into the design of public spaces and buildings, develop better community understanding of climate risks and deliver 50 per cent urban canopy coverage in public spaces by 2050. Objective 5.1 – Design the urban form to accommodate sea level rise and storm events, also supports a climate resilient community.
- Key considerations for the Cheltenham Structure Plan Area:
  - » The Structure Plan Area is biodiverse, with significant areas of native vegetation. There is also a significant amount of open green spaces. Urban greening is a particularly strong opportunity for the Structure Plan Area, as this could support the precinct's resilience to extreme heat events, flooding, as well as efforts to reduce emissions, enhance biodiversity, integrated water management and urban heat island reduction.
  - » Exposure to climate hazards may not always be avoidable through siting measures. In these instances, there may be cost uplifts involved to deliver climate resilient outcomes for land use planning and/or development. Mechanisms to address issues of commercial viability and/or technical feasibility of climate change adaptation measures should be considered to support uptake.
  - » Climate change adaptation measures should consider short-term, sudden events (that is, storms and extreme heat events) as well as long-term, gradual changes (drought, average temperature increases).

Recommendation 5B – Climate change risk management standards

Planning Scheme response

Description

A Planning Scheme Amendment is recommended to require new development to consider climate change risks and incorporate adaptation measures.

Impact

- This Planning Scheme response could generate benefits including:
  - » Ensure new development considers measures to embed resilience into a the design and operations of a building
  - » Identify multiple and overlapping climate risks and hazards that may occur over time and develop adaptation measures to reduce vulnerability
  - » Significantly extend the lifespan of buildings and reduce the risk of loss and harm from climate-related hazards, leading to improvements in health and wellbeing of building occupants
  - » Safeguarding investment: Reduced operating and maintenance costs by reducing the risk of deteriorating design life or asset capacity. A $1 investment to reduce risks associated with climate hazards or natural hazards has been estimated to save $2 to $11 in post-disaster recovery and reconstruction costs (CSIRO 2020).

Implementation considerations

- The Planning Scheme Amendment should consider application to the following thresholds:
  - » In line with Recommendation 1B, if a development is greater than 5000 squared metres in gross floor area, the development is recommended to achieve a 5 Star Green Star Buildings (or equivalent independent standard) certified rating.
  - » Under this approach, development will be required to achieve Credit 16 (Climate Change Resilience) which requires, at a minimum, applicants demonstrate consideration of potential climate change impacts and risk treatments by completing a climate change pre-screening checklist. Credit achievement requires developing a climate change risk assessment for the project that treats extreme and high risks.
  - » For smaller developments below these thresholds, implementation could be considered through a Sustainable Management Plan (SMP) where developers would respond to a checklist of requirements to demonstrate how they have met the planning control.
- Precedent can be found in:
  - » The Arden Structure Plan features a strategy that requires the design of all buildings to consider future climate scenarios and exceed minimum required life expectancies and aim for at least 100 years of structural performance.
- Potential barriers to uptake of this Planning Scheme response could include:
  - » Potential cost increases for developers in undertaking a climate change risk assessment and integrating adaptation measures into building design, which may require engaging professional advice
  - » Poorly designed adaptation measures can create undesirable outcomes for other Climate Response Plan focus areas – for example, using energy-intensive HVAC systems to adapt a building to extreme heat events would work against achieving net zero objectives to improve energy efficiency and reduce emissions. To avoid this, climate change risk assessments should identify interfaces with other focus area measures.
- A number of initiatives and incentives are underway to support the adoption of climate change risk management standards including:
  - » Existing Australian Standard (AS 5334:2013 Climate change adaptation for settlements and infrastructure) provides guidance on the approach to climate change risk and adaptation assessment
  - » Green Star Buildings Credit 16 provides guidance on climate change risk and adaptation assessment and best-practice operational emergency risk management and guidance on requirements for a suitably qualified professional
  - » Adaptation measures introduced early can reduce future costs to manage climate change (Australian Government Department of Climate Change and Energy Efficiency 2013).
- Administrative considerations – discretions and exemptions may need to be considered by the responsible authority where it is demonstrated that climate change adaptation measures are not feasible.
- This Planning Scheme response could be delivered alongside Recommendation 1B (Private development sustainability certification).

5.6 Environmental enhancement and protection

Environmental enhancement and protection refers to actions and regulations aimed at safeguarding and improving the natural environment. As urban population growth continues it will be vital to reserve space for parks and nature. Green spaces are crucial for:

- **Human wellbeing** – as cities and neighbourhoods become denser, access to green spaces becomes more critical, providing opportunities for relaxation, exercise and mental rejuvenation. Urban residents need direct, personal experiences with nature. When people have positive encounters with green spaces, they are more likely to value and advocate for their preservation. Exposure to greenery has also been linked to reduced stress, anxiety and depression.
- **Physical health** – green spaces encourage physical activity, reducing sedentary lifestyles which can be associated with urban living. Access to nature positively impacts overall health, including stress reduction and improved immune function.
- **Biodiversity and ecosystem services** – green spaces support native flora and fauna. They act as refuges for wildlife, allowing them to thrive even in urban environments. These areas also contribute to ecosystem services such as air purification, carbon sequestration and water retention and treatment.
- **Social cohesion** – green spaces serve as meeting points for communities. They can foster social interactions, community events, and a sense of belonging. Well-designed parks enhance social cohesion and create vibrant neighbourhoods and communities.
- **Climate resilience** – trees and vegetation in green spaces help mitigate the urban heat island effect, regulate temperatures, and absorb excess rainfall. As density in the Structure Plan Area increases, maintaining these natural buffers is crucial for climate resilience.

What's the challenge in the Cheltenham Structure Plan Area?

The Cheltenham Structure Plan Area predominantly comprises residential areas with detached homes which generally have high overall impervious areas per lot. There are a few large open spaces, some very large, with smaller scattered open spaces dominating.

High urban heat in the Cheltenham Structure Plan Area is directly related to its low tree canopy cover, which is currently around 9.5 per cent.

The consolidation of lots and higher-density residential development will further reduce canopy cover and vegetation and increase the area of impervious surfaces, causing more fragmentation of habit and habitat corridors for local fauna (despite a council target to increase canopy cover of the municipality to 30 per cent).

There are significant areas of native vegetation in the Cheltenham Structure Plan Area and to its south-west. However, the potential fragmentation of open spaces presents a challenge for improving biodiversity with development and densification of surrounding private land projected to increase.

Roadways are also major impervious areas that contribute to the urban heat island effect and to air pollution.

Policy and planning challenges

Appendix A summarises planning policies and other documents reviewed to inform this Climate Response Plan. Findings include:

- This Climate Response Plan aligns with Outcome 6 of Plan Melbourne (2017–2050) (2017b) to make Melbourne a sustainable and resilient city, and Direction 6.4 to make Melbourne cooler and greener
- It supports the Victorian Planning Authority's Guidelines for Precinct Structure Planning in Victoria's New Communities, specifically Target 13 – Potential canopy tree coverage within the public realm and open space should be a minimum of 30 per cent (excluding areas dedicated to biodiversity or native vegetation conservation)

- It aligns with Protecting Victoria's Environment – Biodiversity 2037, and the goal 'Victorians Value Nature', by increasing the number of Victorians connecting with nature and enhancing biodiversity
- Greening projects in the Structure Plan Area will build on SRLA commitments to replant double the number of trees removed to construct SRL
- They will support achieving the council target of increasing the municipality's tree canopy cover to at least 30 per cent
- The Victorian Planning Provisions (Clause 56.05: Urban Landscape) set landscaping objectives for residential apartments and urban landscape objectives for public realm in subdivisions, but there is potentially a gap in requirements for the development of private development sites
- Bayside City Council has recently implemented the Bayside Urban Forest Strategy (2022-2040) (ref: C186bays) by making changes to Clause 02.03-2 (Biodiversity) and Clause 02.03-3 (Climate Change), and introduced a new local policy at 12.01-1L (Protection of biodiversity and making consequential changes to the schedule to Clause 72.08 (Background Documents).
- There are currently no planning controls to support the expansion of green infrastructure in the Structure Plan Area.

While environmental protection is supported in the municipal planning scheme, there are gaps in planning controls that require environmental enhancement. It is important to include environmental enhancement requirements as part of development application assessments to limit further removal of key ecological assets.

Desired outcomes in the Cheltenham Structure Plan Area

Effectively managed protected areas are critical for safeguarding biodiversity, maintaining ecosystems and preserving important habitats. Protected areas build climate change resilience, help maintain water quality, conserve natural resources, drive economic success, curb the spread of diseases and pests, and provide other benefits to wildlife and human health.[9]

To achieve the Vision, the Cheltenham Structure Plan Area should support enhancement of the environment, protect natural habitats and reduce fragmentation of biodiversity. This could support the following outcomes, in alignment with local government policy, Plan Melbourne (2017b) and the Cheltenham Vision:

- **Increased tree canopy cover** to support the Bayside City Council and Kingston City Council targets of a minimum 30 per cent tree canopy target (Bayside Urban Forest Strategy (2022–2040) and Kingston City Council's Urban Cooling Strategy (2020))
- **Enhanced greening** of urban areas to address heat issues, improve amenity and create a cool and green environment
- **Protection of natural habitats** that support biodiversity and local wildlife with initiatives such as retaining mature trees in the public and private realm
- **Improving biodiversity** in green spaces and waterways
- **New and enhanced green corridors** and shadier streets to make walking and cycling easier and more enjoyable.

Recommendations and other opportunities

The most effective responses will vary across public and private land in the Cheltenham Structure Plan Area, but all will contribute to the desired outcomes listed above.

The following responses are recommended for the Cheltenham Structure Plan to deliver a Future Accelerated State for environmental enhancement – aiming to close the gap between the environmental enhancement challenges facing the Cheltenham Structure Plan Area and the desired outcomes:

[9] Protected Areas Have a Lot of Benefits. Here's How to Maximize Them. National Geographic (2019)

- **Recommendation 6A** – Urban greening strategy (Structure Plan response)
- **Recommendation 6B** – Green infrastructure for new developments (Planning Scheme response)
- **Opportunity 6C** – Partnerships to support environmental enhancement and protection (Other opportunities).

Recommendation 6A – Urban greening

Structure Plan response

Description

A Structure Plan response is recommended to encourage a minimum 30 per cent tree canopy cover and enhanced green landscaping in the Structure Plan Area.

Impact

- This Structure Plan response could generate benefits including:
  - » Significantly improve the connectivity and health of ecosystems in the Structure Plan Area by creating and enhancing green corridors and rewilding in the public realm
  - » Enhance thermal comfort for the community in the public realm and deliver health benefits by increasing shading of transport corridors (particularly those used for active transport) with canopy cover
  - » Help to ensure that long-lived tree canopy cover in the Structure Plan Area is considered for retention
  - » Improve the provision of high-quality green open spaces that contribute to liveability in the Structure Plan Area, with greater tree canopy coverage and urban greening
  - » Australia-based research has identified that middle-aged and older adults are significantly more likely to undertake moderate to vigorous exercise when more than 20 per cent green space is available within a 1-kilometre radius of their home (Astell-Burt et al. 2014). The impacts on heat vulnerability can be calculated.
- Support implementation of:
  - » The Victorian Planning Authority Guidelines for Precinct Structure Planning in Victoria's New Communities: Target 13 – Potential canopy tree coverage within the public realm and open space should be a minimum of 30 per cent (excluding areas dedicated to biodiversity or native vegetation conservation)

- » Plan Melbourne (2017b): Direction 6.4 Make Melbourne Cooler and Greener
- » Protecting Victoria's Environment – Biodiversity 2037: Goal: Victorians Value Nature
- » Bayside Urban Forest Strategy (2022–2040) and Kingston City Council's Urban Cooling Strategy (2020) which set a canopy cover target for the municipality of 30 per cent.

Implementation considerations

- This objective is supported by the Planning Scheme Amendment in Recommendation 7B.
- Potential strategies to increase urban greening in the Structure Plan Area may include:
  - » Increase tree canopy coverage with understorey planting and greening in the following public spaces:
    - – *Trees and garden bed plantings, including street rights-of-way areas*
    - – *Public transport (rail corridors) and active transport corridors (walking and cycling pathways)*
    - – *Other public realm areas associated with linear infrastructure.*
  - » Encourage green walls and green roofs in new developments (particularly where site setbacks are not available)
  - » Explore opportunities to conserve existing areas with native vegetation in the Structure Plan Area to support habitats for native fauna
  - » Create new biodiversity connections and new open space or improve existing open space that provide conservation, habitat and biodiversity functions
  - » Ensure landscaping is climate-responsive, supports biodiversity, wellbeing and amenity.
- Precedent can be found in:
  - » Arden Structure Plan Objective 21 and Objective 22 which seek to expand and improve green open space and increase the tree canopy to achieve 40 per cent coverage in public and private realm
  - » Fishermans Bend Framework Objective 4.3, which seeks to achieve 50 per cent tree canopy coverage in public spaces by 2050.
- Key considerations for the Cheltenham Structure Plan Area:
  - » Space for trees as critical green infrastructure (including horizontal offsets, overhead clearance, passive irrigation and adequate soil volumes and root bridging) must be prioritised with equal importance with other street infrastructure including overhead and underground services, lighting, signage and urban elements.
  - » Utility service providers have ownership of the utility and have final say and approval of designs, which gives them a high level of influence about their offset requirements for tree plantings.
  - » Depending on the extent of existing green infrastructure on a development site, there may be an initial increase in upfront costs to developers to increase green infrastructure at a site to meet the urban greening targets.
  - » Street section typologies can provide more information about placement and coverage. Where site setbacks are not available, the use of green wall and green roof solutions are encouraged. This is in line with the Building Environmental Sustainability Scorecard (BESS) framework which encourages green roofs and green walls and facades (see Appendix A).
  - » The BESS framework promotes vegetation and green infrastructure within and around private development, although it is limited in its capacity to influence tree canopy coverage and greening in the public realm.
  - » Guidelines such as Victoria's Trees for Cooler and Greener Streetscapes: Guidelines for Streetscape Planning and Design, and Victoria's Movement and Place Framework can provide guidance for prioritising tree planting along transport corridors, along Nepean Highway and Bay Road.
  - » Consideration of recent changes to Bayside Urban Forest Strategy (2022-2040) (ref: C186bays).

Recommendation 6B – Green infrastructure for new developments

Planning Scheme response

Description

A Planning Scheme Amendment is recommended to require development in the Structure Plan Area to deliver environmental enhancement and protection by greening buildings, increasing canopy planting, protecting vegetation, and climate adaptive landscaping.

Impacts

- This Planning Scheme response could generate benefits including:
  - » Multiple benefits from increasing tree canopy coverage and other greening measures, including significant improvements to ambient temperatures from shading and evapotranspiration.
  - » Improved urban biodiversity with green infrastructure that provides habitat, enhances habitat connectivity, and improves air quality.

Implementation considerations

- The Planning Scheme Amendment should consider application to the following thresholds:
  - » In line with Recommendation 1B, if a development is greater than 5000 squared metres in gross floor area, the development is recommended to achieve a 5 Star Green Star Buildings (or equivalent independent standard) certified rating.
  - » Under this approach, a development may pursue: Credit 37 (Nature Connectivity) which requires development sites to encourage species connectivity, including through canopy cover, green roofs and other landscaping; and Credit 36 (Biodiversity Enhancement) which requires landscaping that enhances habitat provision.
  - » For smaller developments below these thresholds, implementation could be considered through an Urban Greening Compliance Report that demonstrates:
    - *Urban greening targets – 30 per cent canopy and 50 per cent garden bed coverage across a development site*
    - *Strategy to protect and retain and enhance existing site vegetation*
    - *Demonstrate the use of an endemic and climate-adaptive landscape palette and vegetation selection*
    - *Achievement of nature-positive outcomes (stopping biodiversity loss and restoring nature) across the development site*
    - *Setbacks are maximised to ensure adequate space for tree canopy planting and landscaping*
    - *Where setbacks are unable not possible, greening of building exterior (with green walls and green roofs).*
- Precedent can be found in:
  - » Arden Precinct planning controls, which require 40 per cent of a site area to be green cover, including vegetation, podium landscaping, green roofs and green walls.
- Potential barriers to uptake for this potential Planning Scheme response include:
  - » Depending on the extent to which a development site currently includes green infrastructure (which is retained), there may be a minor initial increase in upfront costs to developers to introduce additional greening across the site to meet the identified urban greening targets
  - » Where green roofs are being considered, developers may need to consider structural implications from any associated weight loading (which may be particularly relevant for industrial development).
- *Administrative considerations – discretions and exemptions may need to be considered by the responsible authority where it is demonstrated that an environmental enhancement and protection strategy is unfeasible.*
- This potential Planning Scheme response should be delivered alongside Recommendation 1B (Private development sustainability certification), the Urban heat island strategy recommendations, and the Open Space Assessment Technical Report, the Ecology and Arboriculture Technical Report.

Opportunity 6C – Partnerships to support environmental enhancement and protection

Other opportunities

Description

There is opportunity for a greater collaboration and partnership approach to address barriers and realise opportunities for achieving environmental enhancement and protection in the Structure Plan Area, including with Victorian Government departments (such as Parks Victoria), local governments, and major developers.

Impact

- This opportunity could generate benefits including:
  - » Greater access to resources, expertise and innovation opportunities
  - » Access to research and innovation aimed at conserving and protecting nature on Victoria's parks estate (The Nature Conservation Strategy 2021–2031)
  - » Advice from experience in managing a diverse network of parks from protected areas such as national, state and wilderness parks and nature conservation areas
  - » Access to additional project finance (green bonds, sustainable finance).

Implementation considerations

- Opportunities identified through partnerships should align to:
  - » Victoria's Trees for Cooler and Greener Streetscapes: Guidelines for Streetscape Planning and Design
  - » Plan Melbourne (2017b): Direction 6.4 Make Melbourne Cooler and Greener.

5.7 Urban heat island strategy

Urbanisation disrupts the surface energy balance of an urban area. As population centres grow and develop, they modify a greater area of land and with corresponding increase in average temperature, forming urban heat islands.

As per Kingston City Council's Urban Cooling Strategy (2020):

> 'The loss of green space and the construction of hard surfaces that absorb and retain heat increases the temperature in cities. While small areas of hard surfaces can create localised hot spots at the scale of a few metres, large areas of heat can accumulate in "heat islands" at the block or neighbourhood scale. Living and working in these heat islands exposes people to much greater temperatures, which creates health and productivity risks for the community and economy.'

Urban heat islands typically form when vegetation is replaced with non-reflective, high mass, water resistant, impervious surfaces that absorb a high percentage of incoming solar radiation. This often causes significantly warmer temperatures in urban areas. The main cause of the urban heat island effect is the modification of land through urban development which uses materials that retain heat, such as concrete and asphalt, which have a high thermal mass as well as a high heat capacity and thermal conductivity. Darker surfaces also absorb significantly more electromagnetic radiation than light surfaces and so magnify their contribution to an area's overall urban heat island effect.

Urban heat island mitigation measures can include:

- **Canopy cover** – trees can reflect or absorb the sun's energy, limiting the heat absorbed by its shaded surface while providing natural cooling through evaporation. Increasing tree and vegetation cover helps reduce the heat island effect, generates health benefits and improves habitat diversity and connectivity, helping to conserve biodiversity
- **Ground cover** – ground cover that receives enough water absorbs sunlight while providing a cooling effect through evaporation. Ground cover should aim to be passively watered to maximise the cooling effects and minimise water demand (may require supplementary water for irrigation).
- **Surface reflectivity** – minimum Solar Reflective Index (SRI) values should be established for the Structure Plan Area to minimise the urban heat island effect from solar gain. The SRI indicates the ability of a surface (like a roof) to reject solar heat, and is the combined value of reflectivity and emittance. A standard black is zero (reflectance 0.05, emittance 0.90) and a standard white is 100 (reflectance 0.80, emittance 0.90).

What's the challenge in the Cheltenham Structure Plan Area?

The Cheltenham Structure Plan Area currently experiences the highest urban heat island effects of all the SRL East Structure Plan Areas . The current urban heat island effect in the broader the Cheltenham suburb is a temperature difference of +9.3°C, driven by limited open space and low tree canopy cover.

- High urban heat temperatures around the north-east and centre of the Structure Plan Area, including at Sir William Fry Reserve, the Highett Gas Works Site, CSIRO development and Westfield Southland Shopping Centre
- High heat hazard in the central commercial areas and the location of the SRL station
- Potential loss of existing open space at Sir William Fry Reserve for SRL development
- Taller mixed-use developments and higher-density apartments are planned for the Structure Plan Area, which may result in contributing to the urban heat island effect by creating 'urban canyons' that retain heat and prevent natural airflow.
- Urban heat islands in the Cheltenham Structure Plan Area could become more widespread from climate change and increased urbanisation. Kingston City Council's Urban Cooling Strategy (2020) highlights that modelling of the impact of climate change suggests the

area of heat islands in the municipality could significantly expand. As noted in Plan Melbourne (2017–2050) (2017b), 'Urban intensification will add to the urban heat-island effect unless offsetting measures are implemented. Greening the city can provide cooling benefits and increase the community's resilience to extreme heat events'.

Without focused efforts to mitigate urban heat island effects, outdoor comfort for people may be at risk.

Policy and planning challenges

Appendix A summarises planning policies and other documents reviewed to inform this Climate Response Plan. Findings include:

- Outcome 6 of Plan Melbourne (2017–2050) (2017b) aims to make Melbourne a sustainable and resilient city, and Direction 6.4 to make Melbourne cooler and greener
- Protecting Victoria's Environment – Biodiversity 2037 features a goal to help 'Victorians Value Nature' by increasing the number of Victorians connecting with nature and enhancing biodiversity
- The Victorian Planning Provisions (56.05 Urban Landscape) set landscaping objectives for residential apartments and urban landscape objectives for public realm in subdivisions, but there is potentially a gap in requirements for the development of private development sites.
- There are currently no planning controls that require private land developers to deliver urban heat island mitigation measures in the Cheltenham Structure Plan Area.

It is important to include mitigation provisions as part of development application assessments to limit development that may contribute to urban heat island effects.

Desired outcomes in the Cheltenham Structure Plan Area

There is an opportunity to reduce current urban heat island impacts, and implement strategies to mitigate impacts of proposed future development.

To achieve the Vision, the SRL East Structure Plan Areas should feature people-friendly streets, high-quality open spaces, functional green spaces, and embrace the natural qualities of the neighbourhood.

Urban heat island mitigation measures will play a crucial role in addressing the challenges posed by predicted rising temperatures across the Cheltenham Structure Plan Area and could deliver benefits including:

- **Energy savings** – urban heat island mitigation can reduce energy consumption and decrease the need for air conditioning and other cooling systems.
- **Improved air quality** – urban heat island mitigation helps improve air quality and reduce material surface temperatures, contributing to better public health and well-being (protecting the community from extreme heat with fewer heat-related illnesses and fatalities).
- **Enhanced comfort** – cooler urban environments improve community comfort and quality of life, and delivers high-quality outdoor spaces.
- **Biodiversity support** – green spaces and vegetation foster biodiversity by providing habitats for various species. Urban heat island mitigation contributes to urban ecosystems and ecological balance.

Recommendations and other opportunities

The most effective mitigation responses will vary across public and private land but they will all contribute to the desired outcomes listed above.

The following measures are recommended for the Cheltenham Structure Plan to deliver an Accelerated Future State for UHI mitigation – aiming to close the gap between the UHI challenges facing the Cheltenham Structure Plan Area and the desired outcomes:

- **Recommendation 7A** – Structure plan urban heat island mitigation (Structure Plan response)
- **Recommendation 7B** – Private development site urban heat island performance criteria (Planning Scheme response)

Recommendation 7A – Urban heat island mitigation

Structure Plan response

Description

A Structure Plan Response is recommended improve urban heat island mitigation and performance in new developments, capital works and the public realm in the Structure Plan Area.

It is recommended the Structure Plan Response encourages existing developments to support the Structure Plan response where possible.

Impact

- This Structure Plan Response could generate benefits including:
  - » Energy savings with reduced energy consumption for built form (due to reduced external heat load) and associated greenhouse gases
  - » Improved air quality
  - » Enhanced human health, wellbeing and comfort
  - » Biodiversity support by creating green spaces and habitat
  - » Improved functionality of urban design strategy, placemaking, and use of public open space through reduced social infrastructure surface temperatures
  - » Support implementation of Kingston City Council's Urban Cooling Strategy (2020) which identifies planning and building goals and outcomes including: increased community adoption of roof colour and materials that support urban cooling; and structure plans for activity centres will embed details for water sensitive urban design, urban greening and cooling.
- The exact impact of the proposed surface urban heat island mitigation measure cannot be accurately quantified without microclimate modelling as the results are extremely sensitive to quantity and placement of mitigation measures.

Implementation considerations

- This response should be supported by Recommendation 7B.
- Potential strategies to mitigate urban heat island impacts in the Structure Plan Area may include:
  - » Increasing canopy cover – trees and other vegetation to reflect or absorb the sun's energy whilst providing natural cooling through evaporation. Increase in tree canopy cover is proven to mitigate urban heat island impacts, as well as improve mental health and wellbeing, cool the air and reducing the need for active household heating and cooling. Key areas for Cheltenham where there is low tree canopy coverage include north of Bay Road, east of Nepean Highway and in commercial and industrial areas.
  - » Increasing ground cover – grasses, shrubs and low-lying vegetation absorb sunlight while providing a cooling effect through evaporation.
  - » Surface reflectivity – selecting construction materials including for capital works for their minimum Solar Reflective Index (SRI) values will help minimise the urban heat island effect from solar gain on to surfaces, including for capital works.
- Precedent can be found in:
  - » Arden Structure Plan Objective 14 which seeks to mitigate the urban heat island in the public and private realm through strategies such as: requiring 75 per cent of project site areas to use building or landscaping elements that increase solar reflectance; and requiring all new buildings to meet a standard of 40 per cent green cover as demonstrated through the City of Melbourne Green Factor tool.
  - » Fishermans Bend Framework Objective 4.3 – Tree planting to deliver 50 per cent urban forest canopy cover in public spaces by 2050.
- Key considerations for the Cheltenham Structure Plan Area:
  - » Irrigation requirements of existing and additional vegetation (canopy and ground cover) need to be considered. Water is vital to cooling the municipality, particularly through irrigation of green spaces.
  - » Material selection must also consider heritage, character, durability or maintenance criteria.

» The City of Melbourne's Green Factor Tool[10] (or equivalent alternatives) may provide a suitable format to assess the credentials of a project's green infrastructure and its impact on the urban heat island effect.

» This Structure Plan response should be delivered alongside: Environmental Enhancement and Protection recommendations; Recommendation 2A (Place-based integrated water management); and the Open Space Assessment Technical Report.

Recommendation 7B – Private development site urban heat island performance criteria

Planning Scheme response

Description

A Planning Scheme Amendment is recommended that requires development to minimise the urban heat island effect from solar gain by meeting Minimum Solar Reflective Index (SRI) values. The Planning Scheme Amendment should include the following technical compliance criteria:

- Exposed materials across 75 per cent of the total project site (in plan view) that comprise building or landscaping elements to achieve the following SRI values:
  - » SRI>34 for unshaded hardstand surfaces
  - » SRI>64 for roofing material.

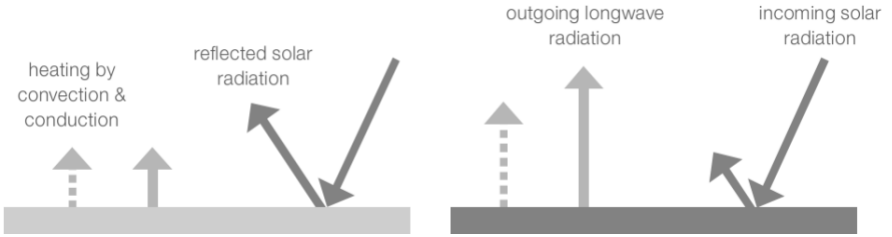

FIGURE 5.3 URBAN HEAT ISLAND EFFECT – IMPACT OF COLOURSPECIFICATION (SOURCE: BLUESCOPE STEEL)

Impact

- This Planning Scheme response could generate benefits including:
  - » Minimised contribution to the built form urban heat island by increasing the heat reflected by pavements and rooftop materials
  - » Minimised rooftop solar gains in buildings

[10] Green Factor Tool: https://www.greenfactor.com.au/

- » Improved functionality of urban design strategy, placemaking, and use of public open space through reduced social infrastructure surface temperatures
- » Reduced energy consumption for built form (due to reduced external heat load) and associated greenhouse gases
- » Human health, wellbeing and comfort.

- The exact impact of the proposed surface urban heat island mitigation measure cannot be accurately quantified without microclimate modelling as the results are extremely sensitive to quantity and placement of mitigation measure.

Implementation considerations

- The Planning Scheme Amendment should consider application to the following thresholds:
  - » In line with Recommendation 1B, if a development is greater than 5000 squared metres in gross floor area, the development is recommended to achieve a 5 Star Green Star Buildings (or equivalent independent standard) certified rating. Under this approach, development will be required to achieve Credit 19 (Heat Resilience) which requires, at a minimum, that a building demonstrates that 75 per cent of the whole site area comprises one or a combination of strategies that reduce the heat island effect.
  - » For smaller developments below these thresholds, implementation could be considered through a Sustainability Management Plan (SMP) where developers would respond to a checklist of requirements to demonstrate how they have met the planning control.
- Precedent can be found in:
  - » Arden Precinct planning controls which contain a minimum requirement that the equivalent of at least 75 per cent of the development's total site area as building or landscape elements that reduce the impact of the urban heat island effect.
  - » Fishermans Bend planning controls for new developments mandate equivalent SRI performance across 70 per cent of the total project site.
- Potential barriers to uptake for this potential Planning Scheme response:
  - » More guidance on what constitutes an increase in solar reflectance will need to be developed to guide developer responses. As much as possible this should mirror the Green Star Buildings credit criteria (Credit 19).
  - » Material selection must also consider heritage, character, durability or maintenance criteria. However, the capital cost impact for lighter coloured metal and pavers is considered cost neutral compared to darker materials.
- A number of initiatives are underway that would support the uptake of private development site urban heat island performance criteria, including:
  - » Kingston City Council's Urban Cooling Strategy (2020) which identifies planning and building goals and outcomes that include:
    - – Incorporating urban heat considerations into the Kingston Planning Scheme
    - – Developing resources and processes to guide cooling inclusions in planning
    - – Investigating development of an industrial area planning policy that incorporates cooling elements
  - » Supporting increased community adoption of roof colour and materials that support urban cooling.
  - » Plan Melbourne (2017–2050) (2017b) Strategy Direction 6.4 which notes that 'Other methods of cooling the city include the use of special heat-reflective coatings for dark building surfaces to reduce the amount of heat absorbed'. By selecting cooler or more reflective materials, surface temperatures can be reduced by 20 to 40°C degrees compared to standard material specification (darker and more absorbent materials).
- Administrative considerations – discretions and exemptions may need to be considered by the responsible authority where it is demonstrated SRI values are unachievable.
- This Planning Scheme response should be delivered alongside Recommendation 1B (Private development sustainability certification), recommendations outlined in Environmental Enhancement and Protection, and the requirements and recommendations of the Open Space Assessment Technical Report.

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Appendix A

Policy and planning review

A-1 Policy and planning review

Provisions of the planning scheme which relate to environmentally sustainable design (ESD) for the Cheltenham Structure Plan Area are:

- The Planning Policy Framework which contains state, regional and local planning policies, including:
  - » Bayside City Council Environmentally Sustainable Design planning policy (Clause 15.01-2L)
  - » Kingston City Council ESD planning policy (Clause 15.01-2L)
- Particular provisions such as the energy efficiency requirements in Clauses 58 and 55.07 for Apartment Development, energy, and Clause 53.18 Stormwater Management in Urban Development.

The local ESD planning policies require the preparation of a Sustainable Design Assessment or Sustainable Management Plan (depending on development thresholds) which are based around the Sustainable Design Assessment in the Planning Process (SDAPP) Framework. The SDAPP framework was developed by Victorian local government councils to provide a streamlined and consistent methodology for requesting, receiving and assessing built environment sustainability outcomes through the planning process. The SDAPP Framework aims to ensure sustainability is considered at the very early design phase to maximise sustainability outcomes. The Framework sets policy objectives articulated in local ESD planning policies and supporting tools to implement the Framework, including the Built Environment Sustainability Scorecard (BESS).

Other requirements such as building regulations under the National Construction Code (NCC) must also be considered in the built environment.

The main sustainability challenges in the Planning Scheme relevant for Cheltenham Structure Plan Area are summarised in Table A.1.

TABLE A.1 SUMMARY OF SUSTAINABILITY CHALLENGES IN CHELTENHAM PLANNING SCHEME

Topic	Summary of challenge
General	• The Kingston and Bayside ESD planning policies both require applicants for medium and large developments to prepare a Sustainable Design Assessment (SDA) or Sustainability Management Plan (SMP) (depending on the size of the development) to demonstrate how the development is addressing local ESD planning requirements. However, many planning policy elements are not mandated (they are 'encouraged') and the responsible authority makes a decision on the adequacy of the development approach
General	• Implementation of SDAs and SMPs using BESS supports mandatory pass requirements on stormwater (100 per cent), indoor environment quality (50 per cent), water (50 per cent) and energy (50 per cent). However, BESS does not mandate achievement against other categories. It also does not address challenges related to materials, embodied emissions, climate resilience, or canopy coverage.
General	• Sustainable Design Fact Sheets support the implementation of ESD policies. Best practice expectations are considered against a range of sustainability challenges and climate response areas. However, implementation is primarily at the discretion of applicants.

A-1.1 POLICY ANALYSIS

Victoria's legislative and policy framework outlines a strong focus on driving sustainability outcomes across climate change, biodiversity, circular economy and transport in the coming decades. Legislation such as the *Climate Change Act 2017* (Vic) and Victorian Government policies such as Recycling Victoria: A new economy (2020), and Water for Victoria (2016) aim to achieve net zero greenhouse gas emissions, support a circular economy, create integrated water management, and address climate change impacts across Melbourne.

A range of Bayside City Council and City of Kingston policies set sustainability objectives for the next decade. Bayside's Climate Emergency Action Plan 2020–2025 and Kington's Climate Change Strategy 2018–2025

outline their ambitions and proposed actions to respond to climate change and support community climate action. These are summarised in Appendix A.

There is a reasonably strong alignment between Victorian Government and local government policies with the SRL vision for sustainability, particularly in relation to biodiversity, urban forests and integrated water management outcomes. Ambitious targets in Plan Melbourne 2017–2050 (2017b) (supported by Bayside and Kingston) include increasing the tree canopy cover to 30 per cent, as well as long-term strategies to support collaboration with water authorities to develop flood resilience and recycled water.

The challenge for the Cheltenham Structure Plan Area is that implementation of these policies through the existing local planning schemes is limited. This is a significant gap which, if not addressed, may prevent the Cheltenham Structure Plan Area from achieving meaningful progress in achieving the SRL sustainability ambition.

A-2 Rating tools and frameworks

SRLA is committed to demonstrating leadership on climate action and sustainability and recognise that decisions on land use and development today have ongoing, long-term consequences for the future. Using a third-party 'green building' rating system may offer benefits of independent verification of built-form sustainability outcomes in the Cheltenham Structure Plan Area. Third-party rating systems provide proof that architects, contractors, and consultants have fulfilled their promises in terms of sustainable design and operation, and help to verify that buildings meets specific standards, ensuring accountability and transparency.

The delivery of SRL offers the opportunity to rethink how development in the Cheltenham Structure Plan Area occurs to drive a more sustainable and resilient built environment. This is particularly critical in the core of the Cheltenham Structure Plan Area, where the most significant increase in development and population is expected.

While increased urban density can provide conveniences and potential sustainability benefits, the projected population growth also:

- **Intensifies resource consumption** – greater demands on energy and other natural resources
- **Increases waste generation** – leads to more waste being generated, which often goes to landfill
- **Reduces urban green space** – increases pressure on green space to accommodate high-density development

There is also increasing expectation from communities, occupiers, employees and investors that buildings are designed with sustainability and health at front of mind.

A range of existing best-practice sustainability guidance documents, frameworks and rating tools can be leveraged to ensure that leading sustainability outcomes in land use and development are achieved in the Cheltenham Structure Plan Area.Table A.2 provides a high-level analysis of the applicability of the National Construction Code (NCC) Section J, the Built Environment Sustainability Scorecard (BESS), and Green Star Buildings to the sustainability focus areas in this Climate Response Plan.

The analysis found:

- The purpose of Section J of the National Construction Code (NCC) is to focus on energy efficiency in buildings. It encompasses regulations, requirements and guidelines to ensure commercial and residential constructions in Australia align with global sustainability standards. Section J can deliver outcomes related to reducing greenhouse gas emissions, efficient energy use and encouraging the use of on-site renewable energy. Section J plays a crucial role in promoting energy efficiency and sustainability in building design and operation, benefiting occupants and the environment, but does not deliver outcomes against the remaining Climate Response Plan focus areas.
- Adopting current sustainability frameworks such as BESS that support Sustainability Design Assessments (SDAs) and Sustainability Management Plan's (SMPs) as part of the Permit Application process do not adequately address the focus areas identified in the Climate Response Plan. The BESS framework is not

mandated, meaning there is currently no requirement for developers to achieve all the outcomes prescribed in BESS (other than achieving the minimum credits for the mandatory categories) when applying for a planning permit. Even when the highest 'Excellent' score is targeted (>70 per cent score) the BESS framework delivers building performance that is below the benchmark of voluntary sustainability rating systems (such as Green Star) and is therefore not the focus of recommendations in the Climate Response Plan.

- Green Star Buildings strongly supports a broader range of sustainability outcomes that go beyond standard practice, and more closely align with the outcomes targeted in the Climate Response Plan, across all Climate Response Plan focus areas. More information on Green Star Buildings is provided below.

TABLE A.2 FOCUS AREAS FOR CHELTENHAM CLIMATE RESPONSE PLAN AND ALIGNMENT TO OTHER FRAMEWORKS

Focus area	Strategy	Alignment to: NCC	BESS	Green Star
Realising Net Zero	Enable reductions in energy consumption and an accelerated transition to net zero	Partial	Partial	✓
Integrated Water Management	Embed sustainable water management practices in Structure Plan Area planning and design	✗	✓	✓
Circular Economy and Sustainable Procurement	Foster responsible use of resources and supports the transition to a circular economy	✗	✗	✓
Place-based Measures to Promote Zero Emissions Transport	Provide active and sustainable transport options	✗	✓	✓
Climate Change Adaptation	Mitigate climate risks and hazards to create climate resilient and adaptive places	✗	✗	✓
Environmental Enhancement and Protection	Protect natural habitats and improve biodiversity in green spaces and waterways	✗	✓	✓
Urban Heat Island Strategy	Mitigate climate risks and hazards to create climate resilient and adaptive places	✗	Partial	✓

A comprehensive evaluation of the performance benchmarks against each sustainability framework in the context of the Cheltenham Structure Plan Area has not been undertaken. The Council Alliance for a Sustainable Built Environment (CASBE) has undertaken more significant analysis on rating tools, which is available here at www.casbe.org.au/what-we-do/sustainability-in-planning/.

A-2.1 GREEN STAR

Green Star is a voluntary sustainability rating system for buildings in Australia. It was launched in 2003 by the Green Building Council of Australia (GBCA), a not-for-profit organisation with the key objective of driving the transition of the Australian property industry towards the design and construction of a more sustainable built environment.

The Green Star tools are holistic sustainability frameworks that are tried and tested in the Australian market.

TABLE A.3 GREEN STAR TOOL RECOMMENDATION

Rating tool – Green Star Buildings
Launched in 2020, Green Star Buildings is especially designed to meet the challenges of the next decade, delivering assets that meet the expectations of today as well as being future ready and able to withstand evolving customer demands, regulatory requirements, and increased scrutiny against greenwashing. Green Star Buildings is a holistic tool that extends beyond the environment to address the issues that will define the next decade of the built environment. The tool's 8 categories enable owners and developers to act on the areas of sustainability that matter most, future proofing a building for the long-term. Green Star Buildings includes the Climate Positive Pathway which requires net zero operational energy. The pathway, which is mandatory for 5 Star Buildings, provides a clear set of targets aligned with the IPCC recommendations to help deliver a climate positive building which is fossil fuel free, powered by renewables, highly efficient, built with lower carbon materials and offset with nature. Any building that meets the climate positive pathway automatically complies with the Climate Bonds Initiative, making attracting investment simpler than ever. Green Star Buildings are specifically designed to align with leading frameworks, including the UN Sustainable Development Goals, GRESB, IPCC recommendations and the Task Force for Climate Related Financial Disclosure.
Recommendation 1B – Private development sustainability certification: Implement a Planning Scheme response that requires achievement of a Green Star Buildings (or equivalent independent standard) certification. For details, see Section 4.1.

A-2.2 EMERGING PLANNING

This Climate Response Plan coincides with other developments underway to improve the integration of best practice sustainable development requirements into Victorian and local government planning schemes. It is recommended this Climate Response Plan is revisited as these planning amendments and changes progress. This includes:

- **CASBE proposed 'Elevating ESD Targets' Potential Planning Scheme responses** (n.d.) for 24 councils including Bayside City Council – the amendments are currently awaiting authorisation. CASBE sets out a range of proposed planning amendments that build on and elevate the existing local ESD policies and seek for them to be included as objectives and standards in a particular provision. Proposed ESD amendments would require new developments to:
  - » produce net zero operational carbon emissions
  - » make buildings more energy efficient
  - » provide a healthier and more comfortable environment for building occupants
  - » better manage water quality, use and collection; protect and enhance greening and biodiversity
  - » be more resilient to changing climate impacts.
- **Victorian Government ESD Roadmap** – implementation of the ESD roadmap is progressively making changes to the Victorian Planning Policy Framework. Further implementation will be underway to embed planning responses related to emerging Victorian Government strategies (such as reducing urban heat exposure, gas substitution). Updates to the Better Apartment Design Standards as a result of the Victorian Legislative Assembly Environment and Planning Committee's 2021 Inquiry into apartment design standards will also be considered as part of the ESD Roadmap.
- **National Construction Code (NCC)** (2022) (to be adopted May 2024) updates – to enhance residential energy efficiency for houses and other low rise multiple dwelling projects, with the aim of improving the minimal level of thermal performance of new homes. NCC 2025 is proposed to progress energy efficiency enhancements for commercial buildings and may consider net zero emissions for residential homes, with consideration of embodied emissions (DCCEEW 2023).
- **Climate Change and Energy Legislation Amendment (Renewable Energy and Storage Targets) Bill 2023** – proposes to bring forward Victoria's net zero emissions targets to 2045, and enshrine interim targets

in legislation. It also proposes to update the *Planning and Environment Act 1987* (Vic) to include specific consideration of Victoria Government climate policy in the planning framework. Updates will also provide an additional duty to planning authorities to give due consideration to net zero targets and potential climate risks associated with development (Municipal Association of Victoria 2023).

The Arden and the Fishermans Bend urban renewal projects are instructive precedents for sustainable structure planning in Melbourne. These projects feature strong sustainability local policies through Clause 11.03 (Melbourne and Port Philip), which address topics including urban heat island and green infrastructure, sustainable transport, operational management plans, thresholds for 6 Star Green Star and a circular economy. Fisherman's Bend also drives improved sustainability performance through Schedule 1 to Capital City Zone (Clause 37.04), which sets out application requirements and mandatory permit conditions relating to ESD. The policy precedents established at Arden and Fishermans Bend offer useful insights into the types of sustainable development requirements that have been pursued through urban renewal projects.

A-3 Detailed review summary

A-3.1 REALISING NET ZERO

Policy	Title	Summary	Delivery alignment
State Policy	*Climate Change Act 2017* (Vic)	This is Victoria's key piece of climate change legislation, which has established a target of net zero greenhouse gas emissions by 2050, which has recently been updated to 2045. This is supported by five-yearly interim emissions reduction targets. Key features include the following: • Objectives to support a transition to net zero emissions and increase the resilience of all systems (including the built environment) to climate-related hazards. • Requires the State Government to develop plans every 5 years to address the impacts of climate change.	• Aligns with the SRL vision to deliver a climate responsive, net zero ready Structure Plan Area by 2045. • To support these targets at a local level, there is a need to align with commitment to deliver buildings that achieve net zero emissions, or that are net zero ready. This is not currently a requirement in the planning scheme.
	Victoria's 2035 emissions reduction target (2023)	This policy establishes Victoria's emissions reduction target of 75-80 % by 2035, and net zero emissions by 2045. It commits to the following: • Update legislated Victorian Renewable Energy Target (VRET) to 65 % by 2030. • Legislate the new VRET target of 95 % renewable electricity by 2035. • Renewable energy storage capacity targets of 2.6 gigawatts (GW) by 2030, and 6.3 GW of storage by 2035. • Support existing homes to reduce emissions (e.g. via Solar Homes Program) and remove mandatory gas connection requirement for new housing developments. • Update energy efficiency standards for all new buildings to support transition to buildings with lower energy use and emissions by 2030.	• Aligns with the SRL vision to deliver a climate responsive, net zero ready Structure Plan Area by 2045 and encourage uptake of renewable energy on a regional scale. • To support these targets at a local level, there is a need to align with commitment to deliver buildings that achieve net zero emissions, or that are net zero ready. This is not currently a requirement in the planning scheme.
	Victoria's Climate Change Strategy (2021c)	This is Victoria's first Climate Change Strategy with actions to cut emissions for 2021–2025 and beyond. It commits to the following: • Target to achieve net zero emissions by 2050 (note: updated to 2045). • Source 50 % of Victoria's electricity from renewable energy sources by 2030 (note: proposed update to target aims for 65 % by 2030 and 95 % by 2035). • Update NCC to require all new homes to meet at least 7 Star energy efficiency standards. • Expand the Victorian Energy Upgrades (VEU) program to improve energy efficiency for households and businesses. • Provide rebates for solar panels, solar hot water systems and batteries to 778,500 households. • Provide rebates for solar panels to 15,000 small businesses. • Fund construction of affordable, energy efficient homes and energy efficient upgrades. • Strengthen NCC energy standards for new commercial buildings and refurbishments from 2025. • Implement the Gas Substitution Roadmap	• Aligns with the SRL vision to deliver a climate responsive, net zero ready Structure Plan Area by 2045. • Opportunity to align with commitment to deliver buildings that achieve net zero emissions, or that are net zero ready, reduce energy demand, elevate energy efficiency standards and facilitate renewable energy generation and storage. • Consider measures to improve energy performance of commercial buildings, given that the strength of future updates to NCC standards is unknown.

Policy	Title	Summary	Delivery alignment
		▪ Deliver local renewable energy projects (e.g. microgrids, neighbourhood batteries).	
	Gas Substitution Roadmap (2023)	This policy provides a roadmap to strengthen planning and building regulations and standards for new homes and commercial buildings by 2025, to phase out gas and transition to clean energy. It commits to the following: • Expand the VEU scheme to incentivise energy efficient products. • Phases out VEU incentives for household gas appliances by the end of 2023. • VPPs to phase out gas connections for new homes requiring planning permits from January 1, 2024 (implemented via amendment VC250). • Investigate phased electrification of all new homes and most commercial buildings where feasible. • Increase minimum energy efficiency standards for rented homes. • Transition NCC to 7 Star Standard for new residential development.	• Aligns with the SRL vision to support deliver a climate responsive, net zero ready Structure Plan Area by 2045. • Opportunity to align with commitments to eliminate gas from new development and transition to renewable electricity where feasible.
	Plan Melbourne 2017–2050 (2017b)	Plan Melbourne sets out Melbourne's 35-year strategy to guide long-term land use, infrastructure, and transport planning. It commits to the following: • Transition to a low carbon city to support Victoria's net zero emissions target (policy direction 6.1). This is to be achieved by actions to reduce energy demand, improve energy efficiency, and increase the share of renewable electricity. • Support local, precinct-scale initiatives that combine renewable energy and energy efficiency solutions. • Review planning system to support ESD outcomes and develop State-level ESD planning standards. • Advocate for higher building energy efficiency standards under the NCC. • Embed renewable energy and energy efficiency considerations in land use planning and precinct structure planning processes.	• Aligns with the SRL vision to deliver a climate responsive, net zero ready Structure Plan Area by 2045. • Opportunity to align with commitments to reduce energy demand, improve energy efficiency, and utilise the planning scheme to provide performance standards that align with net zero targets, as state-wide ESD planning standards have not been introduced yet.
Council Policy	Bayside City Council Climate Emergency Action Plan 2020–2025 (2020)	This policy details actions to minimise greenhouse gas emissions associated with Council assets and reduce vulnerability to climate change. It commits to the following: • Support vulnerable community members in the transition to 'zero carbon' energy and engage with partners to explore and trial innovative zero carbon energy solutions.	• Aligns with the SRL vision to support action to decarbonise energy usage. • Opportunity to extend measures to decarbonise Council assets to address private development emissions.
	Bayside City Council Environmental Sustainability Framework 2016–2025 (2016)	This policy outlines Council's sustainability framework, which features 'zero carbon' as a key theme. It commits to the following: • Commits to engage with households and small-medium businesses to increase use of renewable energy and energy efficiency measures.	• Aligns with the SRL vision to support action to decarbonise energy usage. • Identifies the role of private development to support emissions reductions in built environment.
	Kingston City Council Climate and Ecological Emergency	This policy outlines Council's approach to reduce greenhouse gas emissions in building design. It commits to the following: • Introduce a planning amendment that requires all new buildings to achieve net zero emissions or be 'net zero ready'.	• Aligns with the SRL vision to deliver a climate responsive, net zero ready Structure Plan Area by 2045. • Opportunity to align with commitments to introduce net

Policy	Title	Summary	Delivery alignment
	Response Plan (2021)	• Facilitate a solar scheme for renters. • Advocate for businesses and industry to transition away from gas and towards more energy efficient technology.	zero amendment in the planning scheme, given that this is yet to be incorporated into Kingston planning scheme.
Planning scheme	Settlement	Clause 11.01-1S: • Features a strategy to deliver networks of high-quality integrated settlements by contributing to net zero greenhouse gas emissions through renewable energy infrastructure and energy efficient urban layout and urban design.	• Aligns the SRL vision by providing policy support for planning's role in the transition to net zero greenhouse emissions. • However, the impacts of this high-level policy strategy are limited because the net zero ambition is focused at an urban design scale rather than a building design scale. • Planning scheme does not set out specific requirements to deliver net zero emissions reductions for new developments.
	Built environment and heritage	Clause 15: • States that planning should facilitate development that 'supports the transition to net zero greenhouse has emissions'.	• Aligns with the SRL vision by providing policy support for planning's role in the transition to net zero greenhouse emissions. • However, the impacts of this policy strategy are limited because the planning scheme does not set out specific requirements to deliver net zero emissions reductions for new developments.
	Building design	Clause 15.01-2S: • Features a strategy to improve building energy performance through siting and design measures that encourage passive design responses to minimise energy demand, on-site renewable energy generation and storage technology and use of low embodied energy materials. • Features a strategy to restrict the provision of reticulated natural gas in new dwelling development.	• Aligns with the SRL vision to drive energy performance improvements. • However, the impacts of this policy strategy are limited because the planning scheme does not require building energy performance improvements for every development. • Natural gas is prohibited in new dwellings, however, is allowed in all new commercial buildings (including offices).
	Renewable energy	Clause 19.01-2R: • Features a strategy to facilitate the uptake of renewable energy technologies on a site-by-site and neighbourhood level during the master planning of new communities.	• Aligns with the SRL vision by supporting renewable energy uptake through the planning scheme. • However, there are no requirements for inclusion of renewable energy technologies for development typologies that often consume larger amounts of energy (e.g. high-density commercial buildings).
	Energy and resource efficiency	Clause 15.01-2L-01 (Bayside): • Features strategy for design development to promote sustainable design measures such as solar access, and use landscape design to assist with passive solar heating and cooling.	• However, the impacts of this policy strategy are limited by a lack of specific measures to improve energy efficiency and energy performance outcomes.
	Environmentally sustainable development	Clause 15.01-2L-02 (Bayside) and 15.01-2L (Kingston): • This is the key ESD planning policy in the planning scheme. It includes various strategies to facilitate and encourage environmentally sustainable development.	• Aligns with the SRL vision by requiring applicants to prepare an SDA or SMP that must consider energy efficiency. • However, the planning scheme does not set out specific

Policy	Title	Summary	Delivery alignment
		• Features strategies to reduce energy use and peak demand through design measures including building orientation, shading, optimising glazing and supporting uptake of renewable technology. • A Sustainable Design Assessment (using BESS, STORM, or other methods) or a Sustainability Management Plan (using BESS/Green Star, STORM/MUSIC or other methods) and a Green Travel Plan required for residential and non-residential developments above given thresholds, and mixed-use development.	requirements to deliver net zero emissions reductions for new developments. • BESS requires a 50 % mandatory energy score. However, the impact on development is limited because this score can be achieved through a variety of credits and does not include mandatory on-site renewable energy provision.
	Energy supply	Clause 19.01-1S: • Features strategies to support the development of energy generation, storage, transmission, and distribution infrastructure to transition to a low-carbon economy and to facilitate renewable energy generation and storage to meet on-site energy needs. • Policy guidelines note to consider as relevant the long-term and interim emissions reduction targets under the *Climate Change Act 2017* (Vic).	• Aligns with the SRL vision by supporting renewable energy uptake through the planning scheme. • This policy seeks to facilitate renewable energy development such as solar farms and wind farms. • Opportunity to consider how SRLA can support uptake of renewable energy solutions in the Structure Plan Area, through structure planning and/or strategic partnerships.

A-3.2 INTEGRATED WATER MANAGEMENT

Policy	Title	Summary	Delivery alignment
State Policy	Integrated Water Management Framework for Victoria (2017a)	This policy provides a strategic framework to guide collaboration between water sector stakeholders to deliver urban water management initiatives. • Led to the establishment of forums to implement integrated water management practices. • Forums are responsible for driving integrated water management through collaboration to identify, prioritise and oversee the implementation of shared water opportunities.	• Aligns with the SRL vision by promoting interdisciplinary collaboration to deliver exemplary integrated urban water management outcomes.
	Water for Victoria (2016)	This policy outlines the Victorian Government's strategic plan to sustainably manage water resources. The plan identifies the following measures to support resilient and liveable cities and towns. It commits to the following: • Urban water corporations to develop climate change and resilience strategies which address alternative water sources. • Partnerships between water sector and local government to improve wastewater management. • Review planning and building regulations to improve stormwater management. • Diversify water sources, including recycled water and stormwater. • Adopt integrated water planning across Victoria, with place-based planning to support community values and local opportunities.	• Aligns with the SRL vision by supporting integrated water management to maximise liveability outcomes for all users and promote resilience to climate change and extreme weather events.
	Plan Melbourne (2017-2050) (2017b)	Plan Melbourne sets out Melbourne's 35-year strategy to guide long-term land use, infrastructure, and transport planning. A directive is to integrate urban development and water cycle management to support a resilient and liveable city and reduce pressure on water supplies. It commits to the following: • Strengthen planning provisions and precinct structure planning to make best use of all water sources in homes and precincts. • Integrated water management forums to identify and prioritise places that would most benefit from the development of a place-based integrated water management plan. • Protect water, drainage, and sewerage assets with land area buffers to protect from urban encroachment.	• Aligns with the SRL vision by proposing action to update the planning scheme and structure planning to support integrated water management within the Structure Plan Area.
	Built Environment Climate Change Adaptation Action Plan (2022-2026) (2022)	This policy establishes a vision for the built environment to be planned, designed, and operated to support climate resilient communities that can withstand water scarcity and flooding. It commits to the following: • Planning to address water-efficient design, water conservation and integrated water management practices (e.g. reuse of stormwater and recycled water). • Regulatory options as a cost-efficient means to support water conservation (e.g. rainwater tank installation and higher efficiency standards). • Design all new drainage and flood management infrastructure to account for climate change.	• Aligns with the SRL vision by supporting role of planning to deliver integrated water management design measures to enhance climate resilience.
	Building Victoria's Climate Resilience (2022a)	This policy sets out Victoria's approach to adapt and build resilience to climate change. A priority area is to integrate climate change adaptation into all aspects of the water cycle system (2022-2026). It commits to the following: • Utilise alternative water sources.	• Aligns with the SRL vision by supporting updated planning and building requirements to improve water efficiency and utilise alternative water sources.

Policy	Title	Summary	Delivery alignment
		• New water efficiency standards for homes. • Review building and plumbing requirements for rainwater tanks and water efficiency.	
Council Policy	Co-Designed Catchment Program for the Dandenong Catchment Region: Working Together for Healthy Waterways (2018)	This policy provides a strategic framework to protect and enhance the health of waterways of the Port Phillip and Westernport region to deliver co-benefits to the environment, community, and economy. Goals include managing the catchment to be integrated and address the whole water cycle. It commits to the following: • Use Victoria's planning system effectively to protect and enhance waterway corridor. • Ensure programs, standards, tools, and guidelines are in place to protect wetland vegetation communities from urban and rural threats.	• Aligns with the SRL vision by supporting role of planning to deliver integrated water management design measures to deliver a broad range of liveability benefits.
	Bayside City Council Environmental Sustainability Framework 2016–2025 (2016)	This policy provides a framework to manage Bayside's environmental sustainability performance. It features 'sustainable water' as a focus area with supporting actions and targets to improve performance. It commits to the following: • Reduce Council assets' potable water consumption, increase uptake of alternative water sources and improve water efficiency. • Decrease community potable water consumption per household, improve the quality of stormwater, increase retention of stormwater in the landscape, and manage storm water, debris and waste to enhance the environment.	• Aligns with the SRL vision by promoting increased water capture, reuse, and stormwater treatment. • Community actions can be supported through the planning scheme and structure planning process.
	Kingston's Integrated Water Strategy (2022)	This policy seeks to promote integrated water management practices in the municipality to address climate change and development pressures. It commits to the following: • Improve the planning and design of homes, buildings, and landscapes to enable reuse or infiltrate of water into the soil. • Update the management of building permits, planning schemes and flood overlays to support flood prevention.	• Aligns with the SRL vision by encouraging planning and design measures to address potable water reduction, use of alternative water sources, and protecting waterways from pollution and improving flood management.
Planning scheme	Integrated Water Management	Clause 19.03-S: • Seeks to sustainably manage water supply and demand, water resources, wastewater, drainage, and stormwater through an integrated water management approach. • Features a strategy to plan and coordinate integrated water management, bringing together stormwater, wastewater, drainage, water supply, water treatment and re-use, to: » Consider the catchment context. » Protect downstream environments, waterways, and bays. » Manage and use potable water efficiently. » Reduce pressure on Victoria's drinking water supplies. » Minimise drainage, water or wastewater infrastructure and operational costs. » Minimise flood risks. » Provide urban environments that are more resilient to the effects of climate change. » Manage stormwater quality and quantity through a mix of on-site measures and developer contributions at a scale that will provide greatest net community benefit. » Integrate water into the landscape to facilitate cooling, local habitat improvements	• Aligns with the SRL vision by supporting the proposed outcomes for integrated water management for the Structure Plan Area. • However, the impacts of this policy strategy are limited because supported outcomes are not mandatory.

Policy	Title	Summary	Delivery alignment
		and provision of attractive and enjoyable spaces for community use.	
	Building Design	Clause 15.0-2S: • Includes the strategy to encourage water efficiency and the use of rainwater, stormwater, and recycled water. • Seeks to minimise stormwater discharge through site layout and landscaping measures that support on-site infiltration and stormwater reuse.	• Aligns with the SRL vision by encouraging water efficiency and stormwater reuse. • However, the impacts of this high-level policy strategy are limited because supported outcomes are not mandatory.
	Stormwater Management in Urban Development	Clause 53.18: • Provides standards for the retention and reuse of stormwater, mitigation of the impacts of stormwater on the environment, property, and public safety, and to provide cooling, local habitat, and amenity benefits.	• Aligns with the SRL vision by providing standards that require development to meet the current best practice performance objectives for stormwater quality, to maximise the retention and reuse of stormwater, and to demonstrate capability to manage storm events.
	Integrated waste and stormwater management - Apartment Design Standards	Clause 55.07-5 (Apartments up to 4 storeys) and Clause 58.03-8 (Apartments 5 storeys and above): • Standards apply to apartment buildings only and seek to ensure developments collect rainwater for non-drinking purposes such as flushing toilets, laundry appliances and garden use. • Connecting to a non-portable dual pipe is encouraged but not required. • Policy also seeks that buildings are connected to a non-potable dual pipe reticulated water supply, where available from the water authority.	• Aligns with SRL vision by promoting reuse of stormwater. • However, the impact of standards is limited because they are expectations as opposed to mandatory requirements. • The stormwater management system should be designed to meet the current best practice performance objectives for stormwater quality.
	Integrated water management	Clause 19.03-3L-01 (Bayside): • Features strategies to encourage recycling of stormwater for use on gardens and nature strips and manage the impact of increased development on the quantity and quality of stormwater drainage into the environment. • Some of this policy is implemented through the requirements of Clause 53.18 and SMP requirements of Clause 15.02-2L-2.	• Aligns with SRL vision by promoting reuse of stormwater and stormwater management. • However, the impacts of this policy strategy are limited because supported outcomes are not mandatory.
	Water sensitive urban design	Clause 19.03-3L-02 (Bayside) • Promotes the use of water sensitive urban design, including stormwater re-use and seeks to manage stormwater quality performance.	• Aligns with the SRL vision by encouraging stormwater reuse and management. • However, the impacts of this policy strategy are limited because supported outcomes are not mandatory. • Some of this policy is implemented through the requirements of Clause 53.18 and SMP requirements of Clause 15.02-2L-2.
	Environmentally sustainable development	Clause 15.01-2L-02 (Bayside): • Features a strategy to reduce total operating potable water use through appropriate design measures such as water efficient fixtures, appliances, equipment, irrigation, and landscaping. • Features a strategy to encourage the appropriate use of alternative water sources (including greywater, rainwater, and stormwater). • Features a strategy to incorporate best practice water sensitive urban design to improve the	• Aligns with the SRL vision with some requirements on urban stormwater management. • However, the impact of this policy is limited because other water sensitive urban design measures and stormwater quality treatment measures are not mandatory.

Policy	Title	Summary	Delivery alignment
		quality of stormwater runoff and reduce impacts on water systems and water bodies. • Clause can be addressed under BESS. BESS also seeks water efficient fittings and appliances, and irrigation by non-portable water. • Sustainability Management Plans or Sustainable Development Applications have a mandatory requirement to meet the Urban Stormwater Management Best Practice standards for water quality (CSIRO, 1999), e.g. through min 100 % STORM score, or compliant MUSIC model.	
	Integrated water management	Clause 19.03-3L-01 (Kingston): • Features a strategy to promote the use of water sensitive urban design including stormwater re-use. • Clause seeks to maximise on-site infiltration of stormwater by: » Limiting paving or using porous paving in new residential development, where possible. » Constructing on-site stormwater detention with delayed release into the drainage system, where appropriate. » Incorporating on-site water recycling systems for run-off. » Directing run-off into garden areas.	• Aligns with the SRL vision by encouraging water sensitive urban design. • However, the impact of this policy is limited because requirements do not apply to every type of development.
	Stormwater management	Clause 19.03-3L-02 (Kingston): • Applies to medium and large-scale development and encourages water sensitive urban design measures in development including stormwater reuse, to maintain or improve the quality of stormwater within or exiting the site, minimise stormwater discharge, and provide opportunities for water conservation and reuse.	• Aligns with the SRL vision by encouraging water sensitive urban design. • Clause is mostly implemented through the requirements of Clause 53.18 and SMP requirements of Clause 15.02-2L.
	Environmentally sustainable development	Clause 15.01-2L-02 (Kingston): • Features a strategy to reduce total operating potable water use through appropriate design measures such as water efficient fixtures, appliances, equipment, irrigation, and landscaping. • Features a strategy to encourage the appropriate use of alternative water sources (including greywater, rainwater, and stormwater). • Features a strategy to incorporate best practice water sensitive urban design to improve the quality of stormwater runoff and reduce impacts on water systems and water bodies. • Features a strategy to direct run-off into garden areas. • Clause can be addressed under BESS. BESS also seeks water efficient fittings and appliances, and irrigation by non-portable water. • Sustainability Management Plans or Sustainable Development Applications have a mandatory requirement to meet the Urban Stormwater Management Best Practice standards for water quality (CSIRO, 1999), e.g. through min 100 % STORM score, or compliant MUSIC model.	• Aligns with the SRL vision with some requirements on urban stormwater management. • However, other water sensitive urban design measures and stormwater quality treatment measures are not mandatory and are only encouraged. .

A-3.3 CIRCULAR ECONOMY AND SUSTAINABLE PROCUREMENT

Policy	Title	Summary	Delivery alignment
State Policy	Recycling Victoria: A new economy (2020)	This policy outlines Victoria's targets for 2030 to support waste reduction and resource recovery. It commits to the following: • Reduce waste to landfill (80 % of waste diverted from landfill by 2030) • Reduce waste generation per person (15 % reduction) • Halve the volume of organic materials going to landfill. • All households to have organic waste recycling services by 2030. • Support appropriate waste to energy industry and will require mandatory recycling separation by commercial sites.	• Closely aligns with the SRL vision with clear goals to avoid waste generation and maximise recovery of resources over the next decade. • Provides appropriate support to the expected development in SRL East Structure Plan Areas by ensuring increasing organic waste is managed across households.
	Victoria Statewide Waste and Resource Recovery Infrastructure Plan (2018)	This policy provides strategic direction for managing resource recovery and waste infrastructure in Victoria for 30 years, including across key waste streams such as organics, recyclables, construction and demolition waste, and e-waste. It commits to the following: • Guide an integrated statewide waste and resource recovery system that effectively manages the expected mix and volumes of wastes and materials. • Support a viable resource recovery industry. • Reduces the number of valuable materials going to landfill.	• Closely aligns with the SRL vision by proposing actions that aim to support a circular economy across Victoria by providing the appropriate infrastructure to manage future waste generation and needs, including in SRL East Structure Plan Areas.
Council Policy	Bayside City Council Environmental Sustainability Framework 2016-2025 (2016)	This policy sets various targets addressing waste to achieve by 2025. It commits to the following: • Divert 90 % of Council's waste to landfill. • Increase community waste from landfill diversion to 75 %. • 80 % of Council procurement to be low GHG-, water- and materials-intensive and non-toxic products and services. • Sets goals to improve the percentage of resource recovery, increase production and consumption of local food by the community, and to facilitate opportunities to keep food organics out of landfill. • The Bayside City Council Recycling and Waste Management Strategy 2018-27 (2018b) aligns closely with this framework, with goals to support waste reduction and avoidance, and to increase resource recovery and recycling. It also features goals to support sustainable procurement through LEAP Procurement Program.	• Closely aligns with the SRL vision by committing to targets which will support a Structure Plan Area circular economy through improved resource recovery and support to local food consumption across communities. • However, the proposed rate of action may be insufficient to match growing waste volumes expected in the SRL East Structure Plan Areas, and broadly across Victoria.
	Kingston City Council Climate and Ecological Emergency Response Plan (2021)	This policy sets out priority areas of action to embed a focus on sustainable economic development and a strong circular economy into Council policy and process. It commits to the following: • Support local businesses to transition to circular processes. • A 'zero waste' aspiration through a range of actions to reduce waste generation (e.g. single use plastic) and support resource recovery (e.g. organic recycling).	• Closely aligns with the SRL vision by articulating actions to support existing and new development to transition to more circular business processes. • However, there are no specific targets for waste reduction or management, which may present challenges to support waste generation with the rate of residential development expected in the SRL Structure Plan Area.

Policy	Title	Summary	Delivery alignment
Planning scheme	Waste and resource recovery	Clause 19.03-5S: • Includes a strategy to ensure future waste and resource recovery infrastructure needs are identified and planned for to manage all waste streams safely and sustainably and maximise opportunities for resource recovery.	• Aligns with the SRL vision to sustainably manage all waste streams and to maximise opportunities for resource recovery.
	Building Design	Clause 15.01-2S: • Includes a strategy to ensure the layout and design of development supports resource recovery, including separation, storage and collection of waste, mixed recycling, glass, organics and e-waste.	• Aligns with the SRL vision to facilitate a circular economy through resource recovery. • This policy applies to all new buildings but has limited impact due to a lack of specific performance requirements. • This policy does not include any consideration of construction and demolition waste
	ResCode and Apartment Development Standards	Clause 55.07-11 and Clause 58.06-1: • Requires consideration of waste and recycling in new dwelling developments through the preparation of a Waste Management Plan.	• Aligns with the SRL vision to integrate circular economy and waste considerations into development design and operations. • However, the impact of this policy is limited because it only applies to residential developments. • There are no considerations or requirements around construction and demolition waste.
	Environmentally sustainable development	Clause 15.01-2L-02 (Bayside): • Strategy to promote waste avoidance, reuse and recycling during the design, construction, and operation stages of development. • Strategy to encourage use of durable and reusable building materials. • Strategy to ensure sufficient space is allocated for future change in waste management needs, including (where possible) composting and green waste facilities.	• Aligns with the SRL vision to consider waste in the design, construction, and operation of buildings. • However, the impact of this policy is limited due to a lack of specific requirements for SMPs. • There is also limited scope on waste management credits in the BESS scorecard, which addresses building re-use, food and garden waste and convenience of recycling. • There is a need to strengthen requirements around construction and demolition waste and building materials.
	Environmentally sustainable development	Clause 15.01-2L (Kingston): • Strategy to promote waste avoidance, reuse and recycling during the design, construction, and operation stages of development. • Strategy to encourage use of durable and reusable building materials. • Strategy to ensure sufficient space is allocated for future change in waste management needs, including (where possible) composting and green waste facilities.	• Aligns with the SRL vision to consider waste in the design, construction, and operation stages of development. • but lacks specific requirements for SMPs. • However, the impact of this policy is limited due to a lack of specific requirements for SMPs. • There is also limited scope on waste management credits in the BESS scorecard, which addresses building re-use, food and garden waste and convenience of recycling. • There is a need to strengthen requirements around construction and demolition waste and building materials.

A-3.4 CLIMATE CHANGE ADAPTATION

Policy	Title	Summary	Delivery alignment
State Policy	*Climate Change Act 2017* (Vic)	This policy is Victoria's key piece of climate change legislation, which establishes a target of net zero greenhouse gas emissions by 2050, which has recently been updated to 2045. It commits to the following: • A net zero target with five-yearly interim emissions reduction targets. • Transition to net zero emissions and increase the resilience of all systems (including the built environment) to climate-related hazards. • State Government to develop plans every 5 years to address the impacts of climate change.	• Closely aligns with the SRL vision to deliver climate resilient SRL East Structure Plan Areas by supporting adaptation measures in all sectors of the economy (including the built environment).
	Building Victoria's Climate Resilience (2022a)	This policy sets out Victoria's approach to adapt and build resilience to climate change across seven key systems including the built environment. It commits to the following: • Update building standards to better account for climate change impacts. • Partnerships to support vulnerable communities to adapt to climate change. • Support hazard-exposed communities to develop place-based resilient energy generation, including through temporary relief measures.	• Closely aligns with the SRL vision by supporting adaptation measures that are implemented through building standards and the planning systems.
	Built Environment Climate Change Adaptation Action Plan 2022-2026 (2022b)	This policy establishes a vision for the built environment to be planned, designed, and operated to support climate resilient communities. It commits to the following: • By 2031, integrate climate change adaptation and emissions reduction into all relevant investment and decision-making across the Built Environment system. • By 2051, adapt the entire Built Environment to climate change and contribute to emissions reduction. • Update planning provisions to respond to climate change. • Update building standards relevant to climate hazards. • Support upgrades of existing building stock.	• Closely aligns with the SRL vision by supporting climate change adaptation measures that are integrated into the design and delivery of the built environment. • Supports implementation of climate change adaptation through the planning scheme.
	Plan Melbourne 2017-2050 (2017b)	This policy establishes Melbourne's 35-year strategy to guide long-term land use, infrastructure, and transport planning. It commits to the following: • Strategic land use and infrastructure planning to mitigate exposure to natural hazards and adapt to the impacts of climate change. • Mitigate exposure to natural hazards and adapting to the impacts of climate change	• Closely aligns with the SRL vision by encouraging climate change adaptation considerations to be integrated into strategic land use and infrastructure planning.
	Victoria's Climate Change Strategy (2021c)	This policy details Victoria's current responses to climate change to achieve emissions reductions targets and increase climate resilience. • Priority actions include ensuring relevant legislation, standards and codes support the use of best available climate change data and adaptive planning principles as part of decision-making on land use change and development.	• Closely aligns with the SRL vision to ensure land use planning and development decision-making accounts for climate change.
Council Policy	Bayside City Council Climate Emergency Action Plan 2020-2025 (2020)	This policy proposes to build community resilience to the impacts of climate change through various programs and initiatives. It commits to the following: • Explore the climate resilience of built form, as well as infrastructure, in Bayside. • Promote use of water in the landscape to improve climate resilience by 2025.	• Aligns with the SRL vision to address climate resilience within the built environment by promoting water sensitive urban design and green space provision.

	Kingston Climate Change Strategy 2018-2025 (2018)	This policy establishes a framework to inform climate action and supporting adaptation measures within the City of Kingston. It commits to the following: • Embed climate change considerations into Council's operations, policies, and plans. • Mitigate and adapt to climate change for future generations.	• Aligns with SRL vision by supporting climate change adaptation. Opportunity to extend delivery of climate resilience measures through the built environment
	Kingston Climate & Ecological Emergency Response Plan (2021)	This policy outlines Kingston City Council's vision and plan to accelerate action to mitigate climate change and adapt to climate impacts. It commits to the following: • Assess and address vulnerabilities in the natural and built environment to account for climate change. • Partnerships with government agencies, neighbouring local governments, industry and community to deliver regional climate adaptation programs.	• Aligns with SRL vision to drive climate resilience in the built environment. • This can be delivered through the planning scheme by setting performance-based requirements for development.
Planning scheme	Settlement	Clause 11: • Planning is to recognise the need for, and as far as practicable, contribute, towards climate change adaptation and mitigation.	• Aligns with SRL vision by providing high-level recognition of the role of the planning system in climate change adaptation. • However, the impact of this policy is limited because it does not provide specific policies related to climate change resilience or adaptation relevant to the Cheltenham Structure Plan Area.
	Natural hazards and climate change	Clause 13.01-1S: • Features strategy to develop adaptation response strategies for existing settlements in risk areas to accommodate change over time. • Features strategy to ensure that planning controls allow for risk mitigation and climate change adaptation strategies to be implemented.	• Aligns with the SRL vision by providing support for climate change adaption planning controls to be implemented at the local level. • However, the impact of this policy is limited because it does not provide specific policies related to climate change resilience or adaptation relevant to the Cheltenham Structure Plan Area.
	Vision - Environmental risks	Clause 02.02: • Includes a land use principle for identified environmental risks, including climate change impacts, to be effectively managed, and that risks associated with extreme weather events on human health are addressed.	• Aligns with the SRL vision by supporting climate change risk management. • However, the impacts are limited because this is a high-level principle which does not provide specific local policies to support implementation.

A-3.5 ZERO EMISSIONS TRANSPORT

Policy	Title	Summary	Delivery alignment
	Transport Integration Act 2010 (Vic)	This policy is Victoria's principal transport Act. It features objectives that transport should actively contribute to environmental sustainability (Sect 10). It commits to: • Promote forms of transport which reduce environmental impacts and contribution of transport-related greenhouse gas emissions. • Seek to increase the share of public transport, walking and cycling trips.	• Closely aligns with the SRL vision by promoting active and low-carbon transport options to contribute to a climate responsive transport network and deliver positive environmental outcomes. •
	Victoria's Climate Change Strategy (2021c)	This policy details Victoria's response to climate change to achieve emissions reductions targets and increase climate resilience. It commits to: • Promote action and targets to invest in innovative zero-emissions technologies, climate smart businesses and communities. • Electrify public transport network. • Increase provision of cycling and walking infrastructure	• Closely aligns with the SRL vision by supporting a climate responsive transport network which supports zero emissions technologies. •
	Zero Emissions Vehicle Roadmap (2021d)	This policy provides a roadmap for Victoria to support a fully decarbonised road transport sector by 2045. It commits to the following: • Update the NCC from 2022 to reduce barriers to future installation of EV charging in new buildings. • Land use planning to increase active transport and reduce car dependency.	• Closely aligns with the SRL vision to reduce emissions in transport by supporting uptake of less carbon-intensive transport choices and reducing transport-related GHG emissions.
	Plan Melbourne 2017-2050 (2017b)	Plan Melbourne sets out Melbourne's 35-year strategy to guide long-term land use, infrastructure, and transport planning. It commits to the following: • 20-minute city where communities can meet daily needs within a 20-minute walk, cycle or local public transport trip.	• Closely aligns with the SRL vision by seeking to deliver climate responsive transport network that reduces emissions through increased active transport.
	Victorian Cycling Strategy 2018-2028 (2018)	This policy establishes a vision and strategy to increase cycling uptake in Victoria. It commits to: • Investing in a safer, lower-stress, better-connected network. • Prioritise strategic cycling corridors. • Make cycling a more inclusive experience.	• Aligns with the SRL vision by promoting active and low-carbon transport options to contribute to a climate responsive transport network.
Local Policy	Bayside City Council Environmental Sustainability Framework 2016-2025 (2016)	This policy sets various actions addressing transport emissions to achieve by 2025. It commits to the following: • Land use planning to increase active transport and reduce car dependency. • Increase the use of alternative and low carbon modes of transport amongst community to reduce car dependency and related emissions.	• Aligns with the SRL vision by reducing car dependency and promoting active and low-carbon transport options to contribute to a climate responsive transport network. •
	Bayside City Council Integrated Transport Strategy 2018-2028 (2018a)	This policy seeks to make walking and cycling the preferred modes of transport for short trips in Bayside. It commits to the following: • Maximise provisions for walking in new developments and streetscape upgrades. • Improve the integration of cycling with land use development, public transport and other key amenities. • Optimise parking opportunities by maximising the utilisation of existing parking space. • Balance the needs of drivers to ensure sufficient parking opportunities are available for those who need it.	• Aligns with the SRL vision by prioritising active transport, improving accessibility to transport, and raising awareness of sustainable transport in their LGA. • However, some items are still focused on the use of and provision of infrastructure for cars.

Policy	Title	Summary	Delivery alignment
	Bayside City Council Climate Emergency Action Plan 2020-2025 (2020)	This policy features actions to minimise car dependency and increase uptake of walking, cycling, public transport and zero carbon EVs. It commits to the following: • Support provision of public EV charging sites. • Reduce rates for residential parking permits for EVs. • Review the Integrated Transport Strategy to address climate change impacts. • Investigate dedicated bicycle lane opportunities.	• Aligns with the SRL vision by supporting zero emissions vehicle uptake and actions to facilitate this in the built environment.
	Kingston Climate & Ecological Emergency Response Plan (2021)	This policy features actions to support the expansion of the EV network to reduce transport emissions. It commits to the following: • Contribute to the planning of a rapid charging network and map across the south-eastern suburban region. • Deliver a safe and connected cycling network. • Provide space in private developments for EV charging infrastructure. • Support allocation of more road space to sustainable transport modes.	• Aligns with the SRL vision by prioritising active and sustainable transport through the planning and design of the built environment.
	Keeping Kingston Moving: Integrated Transport Strategy (2020)	This policy seeks to make walking and cycling the preferred transport choices, particularly for short trips. It commits to the following: • Provide high quality and safe cycle parking in activity centres and key destinations. • Develop a network of tree shaded priority pathways for cycling and walking. • Ensure significant new developments provide 'green travel plans' to promote safe, healthy, and sustainable travel modes. • Explore opportunities for new developments to support zero missions mobility through provision of charging stations, shared car parks.	• Closely aligns with the SRL vision by supporting a transport network that facilitates zero emissions mobility through walking and cycling. • Encourages requirements for private development to support zero emissions transport options.
	Kingston Walking and Cycling Plan (2023-2028) (2023)	This policy establishes a vision for Kingston to maximise the uptake of cycling and active transport by providing a network of safe, direct, connected, accessible pedestrian and cycling routes. It commits to the following: • Place-based project opportunities for Council to support to improve pedestrian and cycling connectivity. • Assess planning applications or building controls (or both) for large development sites so that walking and cycling infrastructure and end-of-trip facilities are provided as part of green travel plans.	• Closely aligns with the SRL vision by promoting active and low-carbon transport options to contribute to environmental sustainability outcomes.
Planning scheme	Sustainable and safe transport	Clause 18.01-3S: • Features strategies to deliver the following: » Prepare for and adapt to climate change impacts. » Prioritise the use of sustainable personal transport. » Protect, conserve, and improve the natural environment by supporting forms of transport, energy use and transport technologies that have the least environmental impact. » Avoid, minimise, and offset harm to the environment by protecting biodiversity and reducing transport-related greenhouse gas emissions.	• Closely aligns with the SRL vision by facilitating an environmentally sustainable transport system that prioritises walking and cycling, and public transport over private car use. • However, the impact of this policy is limited because it does not include any specific requirements for new developments.

Policy	Title	Summary	Delivery alignment
		» Design development to promote walking, cycling and the use of public transport, in that order, and minimise car dependency.	
	Environmentally sustainable development	Clause 15.01-2L-2: • Design development to promote the use of walking, cycling and public transport, in that order; and minimise car dependency. • Promote the use of low emissions vehicle technologies and supporting infrastructure.	• Aligns with the SRL vision with objectives to support active and public transport. • However, the impact of this policy is limited because there is no mandatory pass score in BESS for transport categories. • Under BESS, credits can be achieved for providing 1 bicycle space per dwelling for residents and 1 space per 5 dwellings for visitors, located in a convenient location. For non- residential, employee bicycle parking at 50 % more than existing Planning Scheme requirements can be awarded credits. Provisions of electric vehicle Infrastructure is limited to credit for providing one space that has electric vehicle charging infrastructure installed.
	Environmentally sustainable development	Clause 15.01-2L: • Design development to promote the use of walking, cycling and public transport, in that order; and minimise car dependency. • Promote the use of low emissions vehicle technologies and supporting infrastructure.	• Aligns with the SRL vision with objectives to support active and public transport. • However, the impact of this policy is limited because there is no mandatory pass score in BESS for transport categories. • Under BESS, credits can be achieved for providing 1 bicycle space per dwelling for residents and 1 space per 5 dwellings for visitors, located in a convenient location. For non- residential, employee bicycle parking at 50 % more than existing Planning Scheme requirements can be awarded credits. Provisions of electric vehicle Infrastructure is limited to credit for providing one space that has electric vehicle charging infrastructure installed.

A-3.6 ENVIRONMENTAL ENHANCEMENT AND PROTECTION

Policy	Title	Summary	Delivery alignment
State Policy	Plan Melbourne (2017-2050) (2017b)	This policy sets out Melbourne's 35-year strategy to guide long-term land use, infrastructure, and transport planning. It commits to the following: • Support a cooler Melbourne by greening urban areas, buildings, transport corridors and open spaces to create an urban forest. • Features various actions to promote enhanced greening outcomes.	• Closely aligns with the SRL vision by promoting green network enhancements, habitat restoration and open space connectivity.
	Living Melbourne: our metropolitan urban forest (2019)	This policy outlines Melbourne's strategy to 2050 to increase urban resilience by enhancing greening and urban forest approaches across metropolitan regions. It commits to the following: • Protect and restoring species habitat and connectivity. • Increase urban canopy and understorey to achieve various targets across metropolitan regions. • Increase greening in the private realm by strengthening planning and development standards.	• Closely aligns with the SRL vision by advancing targets for canopy coverage and understorey provision to enhance habitat provision and connectivity.
	Protecting Victoria's Environment Biodiversity (2037)	This policy communicates the long-term vision for Victoria's biodiversity to address challenges presented by climate change and population growth. It commits to the following: • Strategic land-use planning tools to better protect areas of private land that support significant biodiversity values. • Identify opportunities for targeted land purchases.	• Closely aligns with the SRL vision by promoting action to deliver biodiversity conservation through strategic planning and provision of habitat.
	Metropolitan Open Space Strategy (2021b)	This policy provides a framework to strengthen Melbourne's open space network to enhance connectivity and maximise positive experiences in open spaces for the community. It commits to the following: • Explore place-based planning approaches to integrate green and blue infrastructure in precinct delivery. • Review and, where needed, update relevant sections of the Victoria Planning Provisions and local planning schemes to align with the strategic framework.	• Closely aligns with the SRL vision by seeking to enhance provision of open space and green infrastructure through the planning scheme and structure planning.
Council Policy	Bayside Urban Forest Strategy (2022-2040) (2022)	This policy outlines actions to increase, improve and retain the Urban Forest, and support ongoing monitoring and management. It commits to the following: • Increase tree canopy to 30 % by 2040 (exceeding Living Melbourne targets). • Prioritise retaining existing trees on public and private land. • Protect and enhance local biodiversity. • Strengthen Council's ability to retain and monitor trees on both public and private land.	• Closely aligns with the SRL vision by supporting enhanced tree canopy coverage targets and seeking to enhance greening measures in the built environment.
	Kingston Urban Forest Strategy (2023-2030) (2023)	This policy provides a framework for protecting and enhancing Kingston's urban forest with targets for canopy and vegetation cover. It commits to the following: • Strengthen controls to increase and protect tree and vegetation cover on private land.	• Closely aligns with the SRL vision by encouraging uplift in standards to protect and enhance vegetation in the public and private realm.

Policy	Title	Summary	Delivery alignment
		• Increase the use of green infrastructure in private development.	
Planning scheme	Protection of biodiversity - Bayside	Clause 12.01-1L: • Features strategies to ensure the siting of new buildings and works minimises impact to habitat corridors, increase the use of vegetation and understorey planting in public areas to support biodiversity while maintaining accessibility, and encourage planting of species that are resilient to climate change.	• Aligns with the SRL vision by providing high-level policy support for green corridors that enhance biodiversity and support climate change adaptation. • However, the impacts of policy strategies are limited because supported outcomes are encouraged, but not mandatory.
	Protection of biodiversity - Kingston	Clause 12.01-1S: • Features strategies to assist in the establishment, protection, and re-establishment of links between important areas of biodiversity, including through a network of green spaces. • Support land use and development that contributes to protecting and enhancing habitat for indigenous plants and animals in urban areas.	• Aligns with the SRL vision by providing high-level policy support for a network of green spaces and enhancing biodiversity. • However, the impacts of policy strategies are limited because supported outcomes are encouraged, but not mandatory.
	Landscaping - Apartment Design Standards	Clause 55.07-4 (Apartments up to 4 storeys) and Clause 58.03-5 (Apartments 5 storeys and above): • Includes metrics for deep soil and canopy tree provision. • This policy applies to apartment developments only. • It provides a sliding scale for greater deep soil and tree canopy coverage for site area. Canopy coverage requirements range from 5 % for small sites to up to 20 % for sites larger than 2500sqm.	• Aligns with the SRL vision by supporting landscaping provisions in high-density developments. • However, the application of this standard is limited because it depends on context.
	Environmentally sustainable development - Bayside	Clause 15.01-2L-02: • Includes a strategy to protect and enhance biodiversity by incorporating natural habitats and planting indigenous vegetation.	• Aligns with the SRL vision by encouraging tree retention, planting of indigenous vegetation, and enhancing biodiversity. • However, the impact of this policy is limited because it does not include any metrics or specific requirements. • Under the BESS credit scoring, more points are available if the percentage of the site that is vegetated is increased. There are no minimum requirements, no metrics around tree canopy coverage, and no mandatory minimum pass scores for urban ecology.
	Environmentally sustainable development - Kingston	Clause 15.01-2L: • Includes a strategy to protect and enhance biodiversity by incorporating natural habitats and planting indigenous vegetation.	• Aligns with the SRL vision by encouraging tree retention, planting of indigenous vegetation, and enhancing biodiversity. • However, the impact of this policy is limited because it does not include any metrics or specific requirements. • Under the BESS credit scoring, more points are available if the percentage of the site that is vegetated is increased. There are no minimum requirements,

Policy	Title	Summary	Delivery alignment
			no metrics around tree native vnage, and no mandatory minimum pass scores for urban ecology.
	Landscape design - Kingston	Clause 15.01-1L-04: • Seeks to maximise opportunities for landscaping, including trees. Strategies include: » Retain existing trees. » Support building and basement design that maximises the availability of deep soil and opportunities to retain trees and plant new vegetation and in ground canopy trees. » Encourage street setbacks that can accommodate large and medium sized trees. » Promote understorey planting below trees to provide a layered greenery outcome. » Support development that provides landscaping treatments on balconies, roofs and walls that maximises the greening of buildings. » Maximise landscaping opportunities in street setbacks. » Policy also includes tree planting size, soil volumes and minimum in ground area requirements.	• Aligns with the SRL vision by encouraging tree retention, understorey, and green infrastructure provision. • However, the impact of this policy is limited because it only applies to residential development. • Tree planting sizes requirements do not apply to apartment developments (specific Clauses 55 and 58 landscape and tree planting requirements apply to apartments).

A-3.7 URBAN HEAT ISLAND

Policy	Title	Summary	Delivery alignment
State Policy	Plan Melbourne (2017-2050) (2017b)	Plan Melbourne sets out Melbourne's 35-year strategy to guide long-term land use, infrastructure, and transport planning. It commits to the following: • Support a cooler Melbourne by greening urban areas, buildings, transport corridors and open spaces to create an urban forest and to strengthen the integrated metropolitan open space network. • Update residential development provisions to mitigate against the loss of tree canopy cover and permeable surfaces because of urban intensification.	• Closely aligns with the SRL vision by supporting measures in land use planning and the planning scheme to enhance greening to support cooling.
	Living Melbourne: our metropolitan urban forest (2019)	This policy outlines recommendations to focus vegetation and canopy cover expansion efforts in various land use contexts. This includes greening in new precincts and infrastructure developments to support cooling. It commits to the following: • Increase urban canopy and understorey to achieve various targets across metropolitan regions. • Increase greening in the private realm by strengthening planning and development standards.	• Closely aligns with the SRL vision by supporting urban heat island mitigation strategies in structure planning.
	Built Environment Climate Change Adaptation Action Plan (2022-2026) (2022b)	This policy supports cooling and greening objectives to support climate resilience in the built environment. It commits to the following: • Update planning schemes to include new provisions to reduce urban heat exposure, including targets and standards such as minimum tree canopy cover.	• Closely aligns with the SRL vision by supporting greening as an urban heat island mitigation strategy through the planning scheme.
	Better Apartments Design Guidelines – Victoria (2023)	This policy supports the implementation of the Better Apartment Design Standards with guidance on landscaping and open space requirements to support canopy trees, plants and other greenery that help to make cities cooler. It commits to the following: • Supports landscaping standards on material specifications to lower surface temperatures and reduce heat absorption.	• Aligns with the SRL vision by providing standards for higher-density development to enhance cooling in the private and public realm.
Council Policy	Bayside Urban Forest Strategy (2022-2040) (2022)	This policy proposes to support the expansion of the urban forest in Bayside. It commits to the following: • Achieve targets for tree canopy cover. • Prepare precinct-based urban forest plans, including in areas that are strategically located to mitigate urban heat island effects for residents. This includes within Major Activity Areas and areas experiencing increased density and construction activity.	• Aligns with the SRL vision with policies to enhance urban greening in strategic locations where higher density development is expected to occur.
	Bayside Environmental Sustainability Framework (2016-2025) (2016)	• This policy identifies priorities to increase tree canopy cover as a means to reduce the urban heat island effect, provide shade and improve overall amenity.	• Aligns with the SRL vision by supporting measures to enhance greening in the urban realm to support cooling.
	Creating a Cool Kingston: Urban Cooling Strategy (2020-2030) (2020)	This policy outlines strategic directions, goals, and actions to address the issue of urban heat in the municipality. It commits to the following: • Increase vegetation cover across Kingston, including tree canopy.	• Closely aligns with the SRL vision to increase vegetation and reduce urban heat gains through built form planning and design.

		• Incorporate urban heat mitigation principles and elements in planning and building decisions. • Community adoption of 'cool' materials as preference (i.e. lighter coloured roads, low temperature paving, reflective roofing material). • Structure plans for activity centres to embed details for water sensitive urban design, urban greening, and cooling.	
Planning scheme	Building Design	Clause 15.01-2S: • Includes a strategy to ensure development provides landscaping that responds to its site context, enhances the built form, creates safe and attractive spaces and supports cooling and greening of urban areas.	• Aligns with the SRL vision to encourage landscaping around buildings that supports cooling and greening of urban areas. • However, the impacts of policy strategies are limited because supported outcomes are encouraged, but not mandatory.
	Environmentally sustainable development	Clause 15.01-2L-2 (Bayside): • Includes the strategy to reduce urban heat island effects through building design, landscape design, water sensitive urban design and the retention and provision of canopy and significant trees.	• Aligns with the SRL vision to encourage building design choices that that support cooling of urban areas. • Under the BESS credit scoring, more points are available if the percentage of the site that is vegetated is increased. • There are no minimum requirements and no mandatory minimum pass scores for urban ecology. • BESS encourages green roofs and green walls and facades, but these are not mandatory. • BESS also does not include any metrics or credits for solar reflective materials or canopy tree coverage.
	Environmentally sustainable development	Clause 15.01-2L (Kingston): • Includes the strategy to reduce urban heat island effects through building design, landscape design, water sensitive urban design and the • retention and provision of canopy and significant trees.	• Aligns with the SRL vision to encourage building design choices that that support cooling of urban areas. • Under the BESS credit scoring, more points are available if the percentage of the site that is vegetated is increased. • There are no minimum requirements and no mandatory minimum pass scores for urban ecology. • BESS encourages green roofs and green walls and facades, but these are not mandatory. • BESS also does not include any metrics or credits for solar reflective materials or canopy tree coverage.
	Building design - Kingston	Clause 15.01-3L • Seeks to support residential development that incorporates light coloured roof materials and light coloured, permeable paving materials.	• Aligns with the SRL vision to encourage building design choices that that support cooling of urban areas. • This applies to residential development only and is encouraged rather than required.

AJM
Joint Venture

222 Exhibition Street
Melbourne VIC 3000

PO Box 23061 Docklands
VIC 8012 Australia

contact@srla.vic.gov.au | 1800 105 105 (call anytime)
suburbanrailloop.vic.gov.au

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