

**City of Melbourne's  
Total Watermark – City as a Catchment  
“Creating a healthy city in a healthy catchment”**

**2013**



## CITY OF MELBOURNE'S APPROACH



## GOVERNANCE



## PROGRESS TO DATE



## CLIMATE CHANGE ADAPTATION AND FLOOD



## LIVEABILITY



## WATER IN THE ENVIRONMENT



## WATER USE AND QUALITY

## City of Melbourne's approach

Total Watermark – City as a Catchment is our plan for integrated water cycle management for the next four years.

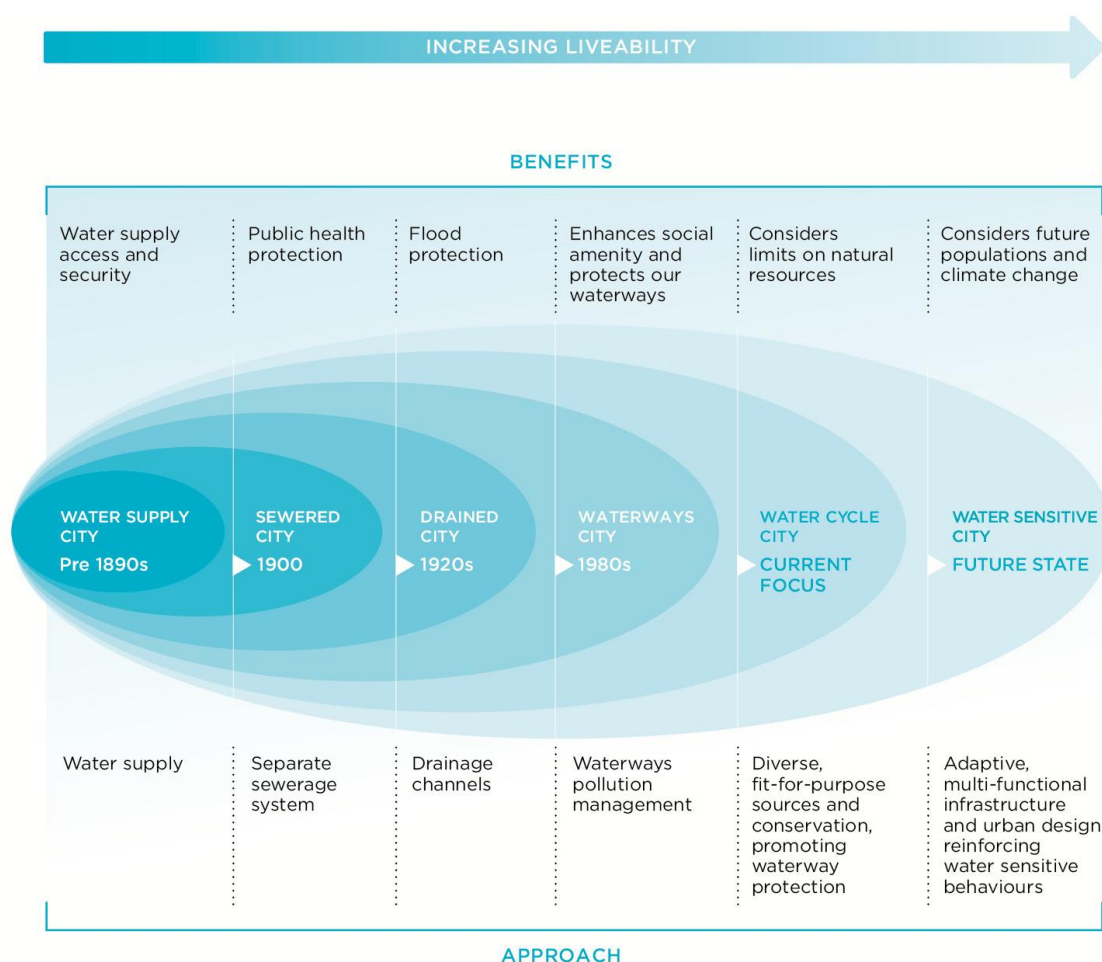
Our vision is a healthy city in a healthy catchment. Seeing our city as a catchment means that we recognise the important roles of the natural and man-made catchments, including roads, roofs and impermeable surfaces. We want the whole of Melbourne's community – residents, workers and businesses alike, to think about water and its role in our future, to help create a healthy city in a healthy catchment.

The water security pressures caused by Melbourne's recent 13-year drought have fundamentally changed the way we use water – in our homes, offices and public open spaces, for recreation and for commercial and industrial purposes. The impact of flooding has necessitated upgraded drainage infrastructure and increased community resilience. The need to better manage water has led to some ingenious and cutting-edge water capture and recycling techniques being implemented by the private sector, government, residents and the City of Melbourne. It has also seen the development of an urban water-focused Victorian Government body, the Office of Living Victoria.

Despite significant progress towards making Melbourne a healthy city in a healthy catchment, there is still work to be done. As a drainage authority and one of the biggest water users in the municipality, the City of Melbourne has a leadership role to play in continuing to implement integrated water cycle management. As

the climate changes and we have less but more intense bursts of rainfall, we need to be clever about how we design our city to ensure that we use the right water for the right purpose, while minimising flood risk. The need to maintain Melbourne's liveability is another key challenge making integrated water cycle management vital.

**City of Melbourne practices integrated water cycle management.** This means coordinated management of all components of the water cycle including water consumption, rainwater, stormwater, wastewater and groundwater, to secure a range of benefits for the wider catchment.



This strategy builds on existing knowledge and successes from our 2002 and 2009 Total Watermark Strategies. It addresses the following areas:

1. **Climate change adaptation and flood:** minimising the impact of current and future changes in climate by increasing the resilience of natural and human systems.
2. **Water for liveability:** maintaining the health, wellbeing and enjoyment of our community through caring for our landscapes, and protecting our waterways and water supply.
3. **Water for the environment:** managing the health of our waterways and urban forest
4. **Water use and quality:** ensuring adequate fit-for-purpose water supply for commercial and residential use and for irrigating grounds and gardens. Reducing storm water pollutants and improving wastewater, waterway and groundwater quality.

#### **Total Watermark – City as a Catchment engagement process**

- In developing this strategy we have collaborated with a broad range of partners and water sector organisations including:
  - Water authorities
  - Victorian government departments
  - Property developers
  - Regulators
  - Research bodies and universities
  - International cities networks.
- From the conception of the strategy, over 15 organisations helped to identify the focus areas, issues and challenges to be addressed. We then consulted further about the actions needed to achieve our objectives and targets.
- An external reference group of leaders in the water sector also provided input and guidance.
- We will run a one-month community consultation, during which community members will have the opportunity to provide feedback on the draft document.

An implementation plan and program will follow the release of this strategy. The plan will set out a clear timeline and budget for action.

#### **What we are aiming to achieve:**

Given the refocusing of Melbourne's water sector from water conservation to integrated water cycle management, our 2009 targets have been revised. Some targets have been removed, as they are no longer relevant or cannot be accurately measured. The table below outlines our new targets.

Section	Objectives	Progress will be measured in terms of:
<b>Climate change adaptation and flood</b>	<ul style="list-style-type: none"> <li>Adaptation and flood risk embedded into planning process</li> <li>The Melbourne municipality has an aware and prepared community</li> </ul>	<ul style="list-style-type: none"> <li>Number of planning initiatives that incorporate climate adaptation considerations</li> <li>Level of awareness of residents and business about climate change and flood risks</li> </ul>
<b>Water for liveability</b>	<ul style="list-style-type: none"> <li>Water and liveability embedded in planning processes</li> <li>Access to waterways and public open spaces help support a healthy population</li> </ul>	<ul style="list-style-type: none"> <li>Number of planning initiatives that incorporate climate adaptation considerations</li> <li>Increased frequency and diversity of water-based public activity</li> </ul>
<b>Water for the environment</b>	<ul style="list-style-type: none"> <li>Our major waterways are healthy and clean</li> <li>Soil moisture supports a healthy urban forest</li> </ul>	<ul style="list-style-type: none"> <li>Health of waterways (measured by Melbourne Water)</li> <li>Decreased run off (modelled data)</li> <li>Increased infiltration (modelled data)</li> </ul>
Section	2018 targets	2030 targets
<b>Water use and quality</b>	<p><b>Water use</b></p> <ul style="list-style-type: none"> <li>Council: 30% of all water use sourced from alternative water sources</li> <li>Municipal: 8% of all water use sourced from alternative sources</li> </ul> <p><b>Water quality</b></p> <ul style="list-style-type: none"> <li>20% reduction in Total Suspended Solids contributed to the waterways from the municipality of Melbourne's catchment, based on a 2000 baseline</li> </ul>	<p><b>Water use</b></p> <ul style="list-style-type: none"> <li>Council: 50% of all water use sourced from alternative water sources</li> <li>Municipal: 20% of all water use sourced from alternative sources</li> </ul> <p><b>Water quality</b></p> <ul style="list-style-type: none"> <li>30% reduction in Total Suspended Solids contributed to the waterways from the municipality of Melbourne's catchment, based on a 2000 baseline</li> </ul>

# Governance

## An efficient water sector implements integrated water cycle management

### Objectives:

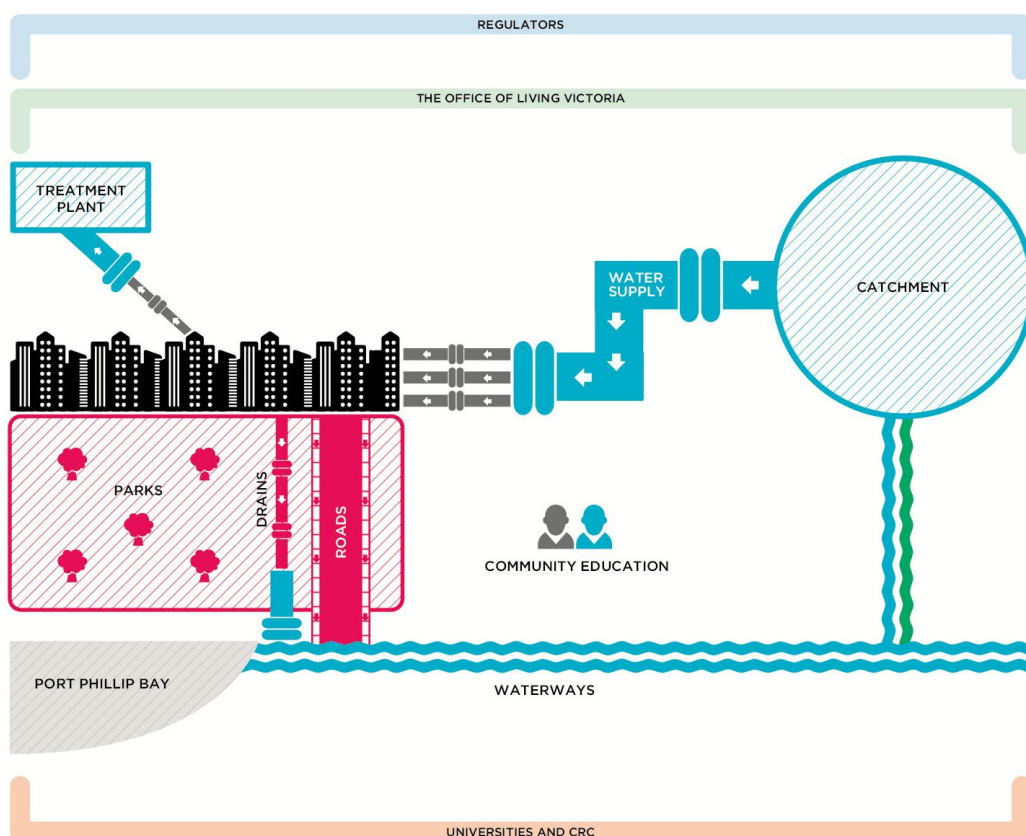
- Private and public organisations working effectively together
- An approach that integrates social, environmental and economic benefits
- Clearly defined water sector roles and responsibilities

Across Melbourne, several levels of government and numerous statutory authorities have responsibility for water use, supply and demand.

### Key challenges

Melbourne's water system is very complex, involving a number of authorities and government bodies with responsibilities that overlap in some areas. In order to manage the city's water supply effectively and remove any uncertainty regarding roles, each organisations' remit needs to be clearly defined.

There is also an urgent need to further progress integration throughout the water sector. This would involve the sector working together to consider the many values of water including environmental, human supply and climate change adaptation. The sector also needs to consistently take timeframes into consideration when making decisions on infrastructure projects.



### KEY

#### Roles and responsibilities:

- **The Office of Living Victoria** (State Government) drives change within the water sector, across both metropolitan Melbourne and Victoria. Its role includes increasing agency collaboration to manage catchments and waterways
- **Melbourne Water** (State Government) manages Melbourne's catchments and bulk water supply, treats and supplies drinking water and recycled water to the retailers, removes and treats most of the city's sewerage. It also manages waterways and the larger drainage systems in the Port Phillip and Westernport region
- **City of Melbourne** works across the municipality and is responsible for drainage, implementing and managing alternative water supply projects. We are in charge of water capture, storage and reuse and water usage across the municipality's operations
- **Water authorities** – City West Water and South East Water (State Government) provide drinking water, sewerage, trade waste and recycled water services to customers in the municipality of Melbourne, inner, western and south eastern suburbs
- **Parks Victoria** (State Government) is the local port manager for Port Phillip Bay, Western Port and Port Campbell, and the waterway manager for the Yarra and Maribyrnong Rivers
- **UNIVERSITIES AND CRC** for Water Sensitive Cities bring together multi-disciplinary expertise to undertake research to improve all aspects of water management
- **Regulators** – These include the State Departments of Health, Environment and Primary Industries and Transport, Planning and Local Infrastructure as well as the Environment Protection Agency. They regulate our water, sewerage and natural environment by administering and enforcing state government legislation

### **City of Melbourne will contribute to the water sectors' work to:**

- Undertake extensive multi-disciplinary and multi-agency collaboration on major projects
- Respond to fast-changing technology. The sector's forward planning must include the capacity to implement long-term and large-scale infrastructure projects while retaining the flexibility to meet future challenges.
- Improve knowledge sharing within the sector. This involves work by the CRC for Water Sensitive Cities, universities, research networks and the Office of Living Victoria.
- Define and communicate clear roles and responsibilities for water management in Melbourne. The Office of Living Victoria will coordinate this work, along with City of Melbourne and other water sector organisations.
- Develop a clear approach to progress measurement, including indicators, base lines and short and long term objectives.

### **In implementing this strategy, City of Melbourne will:**

- Continue to trial innovative approaches to fit-for-purpose water use, and communicate these approaches to our stakeholders.
- Consider the four key elements outlined in this strategy (climate change adaptation, liveability, environment and water use and quality) in the design and implementation of all City of Melbourne projects that impact on our water cycle, in an integrated way.
- Work with the Office of Living Victoria to develop and implement their Melbourne's Water Future Strategy and Inner Melbourne Regional Plan.
- Work with the Office of Living Victoria to coordinate the water sector's ongoing collaboration and engagement in order to achieve desired outcomes.
- Support the implementation of other key strategies across the sector including the Healthy Waterways Strategy - Melbourne Water's strategy for managing rivers, estuaries and wetlands and Yarra Bay Action Plan.
- Develop networks or approaches to help overcome barriers. Through the engagement process around this strategy, key members of the sector have identified City of Melbourne as being uniquely placed to bring stakeholders together to overcome specific challenges.

### **In addition, City of Melbourne will implement the following flagship projects:**

#### **Southbank and Albert Park Lake**

- City of Melbourne is partnering with Parks Victoria, the City of Port Phillip, Melbourne Water and the Office of Living Victoria to investigate and potentially deliver a project that aims to reduce flood risks in the catchment, including Southbank, and provide an alternative water resource for the surrounding parklands including Fawkner Park. This project will run from July 2013 to 2015.

#### **Elizabeth Street Catchment**

- City of Melbourne will work with Melbourne Water and key landowners such as the University of Melbourne and RMIT, to investigate the opportunities to reduce the flood risk in Elizabeth Street. This investigation will involve modelling the effects of distributed Water Sensitive Urban Design interventions, including rainwater harvesting on private land, on the flood extents of 100 year, 20 year, 10 year and 5 year storm events. City of Melbourne has a number of opportunities in this catchment that we are keen to implement, including upgrading University Square in collaboration with the University of Melbourne.

#### **Integrated Climate Adaptation Model**

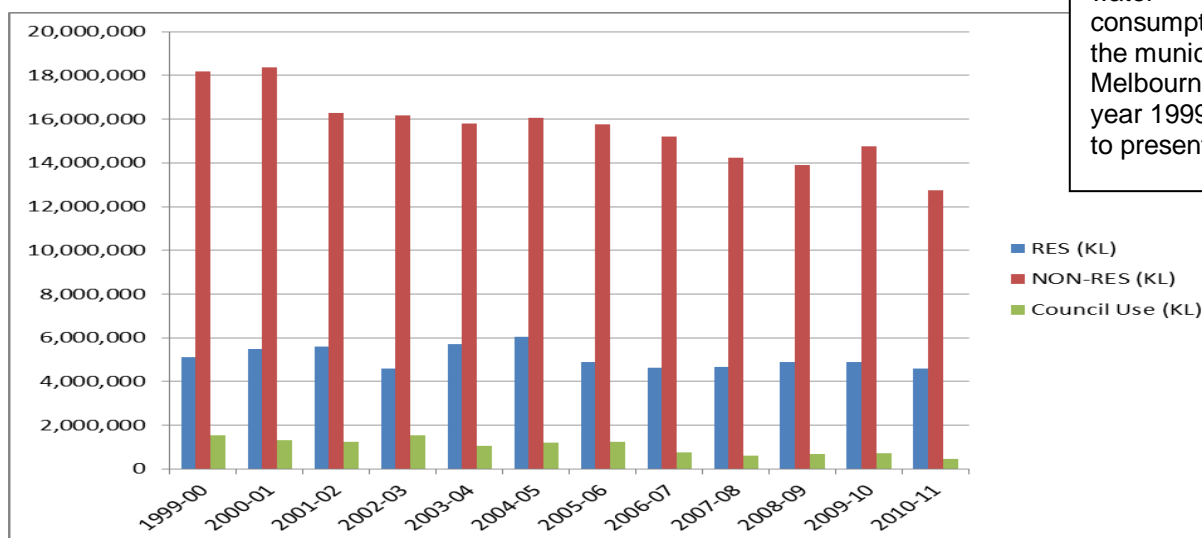
- This GIS-based model will be developed in collaboration with the Office of Living Victoria. It will be a municipal wide model that combines many layers of data including drainage, flood, land use, thermal imaging and soil type in conjunction with climate data and projections. We will then introduce integrated water cycle management interventions to the model to quantify their impacts. The model will include criteria for prioritising the interventions.

**Integrated water cycle management** is coordinated management of all components of the water cycle including water consumption, rainwater, stormwater, wastewater and groundwater, to secure a range of benefits for the wider catchment.

NB. All actions outlined in this strategy are subject to budget approval.



## Progress to date



Since 2002, the municipality of Melbourne has made significant progress in integrated water cycle management practices. The 2009 edition of Total Watermark was developed while Melbourne was in the middle of a drought that lasted over a decade, so the strategy primarily focused on reducing both overall water consumption and reliance on mains water. At that time, many other organisations in Melbourne's water sector also focused on water conservation. This agenda was highly successful. Residential water consumption in the municipality of Melbourne has reduced by 39 per cent since 2000, and is down by 48 per cent per worker. City of Melbourne has also achieved a 28 per cent reduction in its own water use in this time.

### Successes across the municipality since 2008:

- Water restrictions and government campaigns such as Target 155 have changed behaviour, reducing water usage.
- Residents have reduced water consumption by purchasing efficient fittings and appliances; choosing drought tolerant plants; recycling household grey water and installing rainwater tanks.
- The Office of Living Victoria has been formed to drive generational change within the sector.
- The water authorities have worked on developing integrated water management plans.

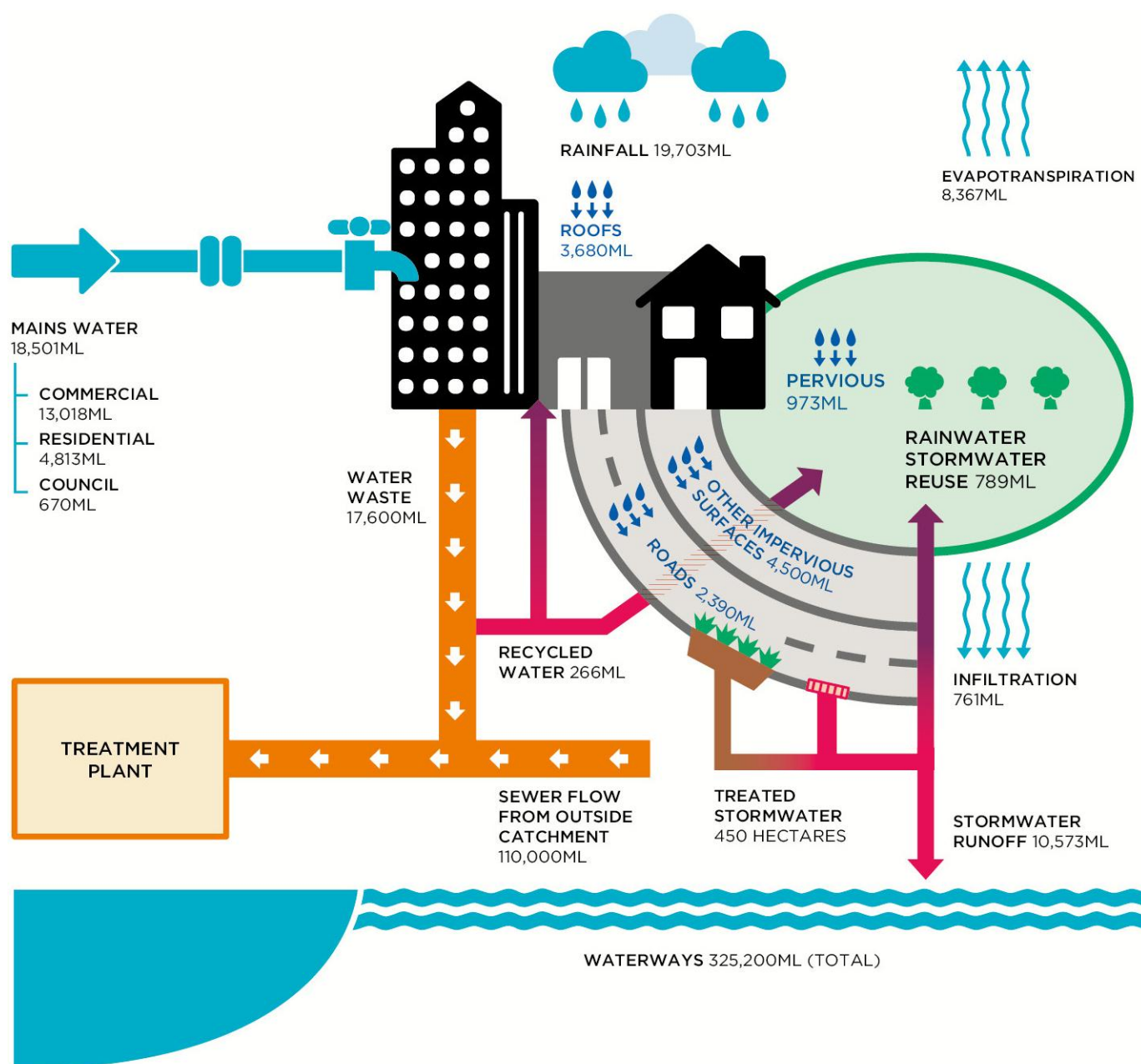
### City of Melbourne's successes since 2008:

- Implemented several large stormwater harvesting schemes including those located in: Fitzroy Gardens, Darling Street, East Melbourne, the Docklands development, Birrarung Marr and Alexandra and Queen Victoria Gardens. This has reduced stormwater pollutants such as suspended solids by 23 per cent and decreased our reliance on mains water by 267 million litres.
- Implemented an extensive drought proofing program in open spaces including converting turf to warm season grasses, installation of storm water harvesting tanks and major changes to irrigation practices and systems.
- Reduced water use in council-owned buildings through efficient fittings and toilets, improving fire-sprinkler-testing regimes, cooling tower efficiencies and rainwater harvesting.
- Our 1200 Buildings program has encouraged building owners and managers to retrofit their buildings and reduce water use in several ways.
- Incorporated water efficient design in many of our streets.



### What City of Melbourne has learnt:

- Our goal to achieve a 100 per cent reduction of potable water use in our parks was based on a potable water offset scheme, and on changing to a drought tolerant landscape. The Victorian Government and City of Melbourne have both moved away from these programs. We are now advocating using appropriate volumes of water for irrigation to maintain our horticultural assets in optimum health. This will require more water in drier times. However, we aim to deliver a large portion of this water from alternative sources.
- Black water and grey water systems in buildings are an expensive source of water and are hard to maintain with the current skill set of maintenance contractors.
- Salinity has been an issue in several projects, therefore we have enhanced our ground water testing to minimise the risk of this challenge in the future.
- City of Melbourne has not always been able to accurately measure water use and quality, making a number of its targets less relevant.



# Climate change adaptation and flood

## A resilient and safe city that is adapted to current and future extreme weather events

<b>Objectives:</b> <ul style="list-style-type: none"> <li>Adaptation and flood risk embedded into planning process</li> <li>The Melbourne municipality has an aware and prepared community</li> </ul>	<b>We'll track progress in terms of:</b> <ul style="list-style-type: none"> <li>Number of planning initiatives that incorporate climate adaptation considerations</li> <li>Level of awareness of residents and business about climate change and flood risks</li> </ul>
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### The case for action

To build a healthy city in a healthy catchment we need to consider current and future changes in climate and take actions to minimise their impact. Adaptation measures reduce the vulnerability of the local natural and human systems, including water, to the effects of climate change by increasing the system's resilience to it.

Over the next 20 years and beyond, while sea level rise has critical risks, Melbourne is most at risk from heat waves, drought and intense rainfall events. As outlined in detail in City of Melbourne's Climate Change Adaptation Strategy 2009, these events are likely to happen sooner, more frequently, and can have significant effects on the community.

**Flood** - flash flooding is the main threat in an intense rainfall event. Even small flooding events can cause damage to property and public transport disruptions. Significant floods can cause mass stranding of passengers, putting more people at risk of injury during the storm. Power outages due to storm damage can also cause transport delays and traffic chaos. For more information on flood risk see: [www.melbourne.vic.gov.au/Sustainability/AdaptingClimateChange](http://www.melbourne.vic.gov.au/Sustainability/AdaptingClimateChange)

**Drought** - into the future it is likely that Melbourne will experience lower average annual rainfall. From 1998 to 2007, Victoria experienced rainfall 14 per cent below average. By 2070, annual average Victorian rainfall is expected to decrease by 11 per cent but come in more intense bursts.

**Heat** - climate change modeling predicts that Melbourne is likely to experience an increase in more days of extreme heat. The city already experiences on average nine days per annum over 35°C but by 2030 it is predicted this will increase to 11 days, and to 26 days by 2070. The most significant risk from heat waves is the likely increased levels of heat stress and death. This is of particular concern for the elderly and infirm. Heat waves already kill more Australians than any other natural disasters.

**Sea level rise** - CSIRO predicts that current sea levels will increase by 1.1 metres by the end of the century.

### Key challenges

Using our planning processes effectively is instrumental to becoming more resilient to future climate changes. We need to design and improve our infrastructure to capture water for use where it is needed most, and to move water away from flood-risk areas.

Another challenge is finding ways to enhance our waterways and other bodies of water such as ponds and fountains, as they help to provide a cooling effect and to retain floodwater. We also need to protect our urban forest, as it provides ecological functions, permeability and shading. To ensure our city is resilient to flood, drought and heat impacts, we need an educated and aware community. Currently, while Melbourne residents are most concerned about climate events such as drought and heat waves, 59 per cent feel they are not prepared for flood events. While flood risk is only prevalent in certain areas of Melbourne, the majority of businesses do not view it as a significant risk (ORC social research, February 2012).

## **City of Melbourne will work with the water sector and key partners to:**

### **Enhance the planning process**

- To consider flood risk in future design and re-design of the public and private realm.
- To further integrate our city with our waterways, both natural and man-made, in order to enhance the city and community's resilience to heat impacts.

### **Enhance infrastructure**

- To design and upgrade the drainage network to cater for current and future flood risk.

### **Increasing community education and awareness**

- By enhancing Melbourne's emergency management processes including warning systems and broadcasting of information.

## **City of Melbourne will:**

### **Enhance the planning process**

- Incorporate flood, drought and heat risks into the development and implementation of structure plans and broader strategic plans.
- Enhance Melbourne's Planning Scheme to consider future impacts.

### **Enhance infrastructure**

- Ensure we are using fit-for-purpose water in parks, streets, gardens and council buildings.
- Upgrade the drainage infrastructure in the central city and urban renewal areas to cater for a 1 in 20 year flood event by 2030.
- Develop a plan to upgrade the municipality's drainage infrastructure to cater for a 1 in 20 year flood event - based on projected 2100 climate conditions. This will be done in line with Engineers Australia's Climate Change Research findings, to be released in 2015.

### **Enhance the public realm and waterways**

- Where appropriate, incorporate permeable pavements in streetscape renewal projects.
- Continue to investigate other sustainable options for increasing permeability of streetscapes.
- Increase canopy cover and urban forest diversity to minimise urban heat island impacts.
- Increase the number of street trees supported by water capture intervention technologies.
- Implement the actions outlined in our Open Space strategy to:
  - Mitigate the urban heat island effect
  - Enhance biodiversity
  - Improve stormwater quality

### **Increase community education and awareness**

- Develop and implement a climate change adaptation awareness program, including preparedness for extreme weather events such as flood and drought, to complement the existing Heatwave Response Plan and Heat Wave Communication Strategy.
- Develop and implement an insurance education and awareness campaign to help community members understand their insurance options related to flood risk.

### **Undertake research**

- **Urban heat island effect** – research the impact that health, energy use and different mitigation measures may have on heat.
- **Climate projection updates** – interpret the latest climate change research to update our approaches and inform our decision-making.
- **Soil moisture, structural soils and salinity** – research the effectiveness of current interventions and new approaches.

## Water for liveability

**A water cycle that supports the health, wellbeing and enjoyment of everyone who lives, works and plays across and beyond the municipality of Melbourne**

<b>Objectives:</b> <ul style="list-style-type: none"> <li>• Water and liveability embedded in planning processes</li> <li>• Access to waterways and public open spaces help support a healthy population</li> </ul>	<b>We'll track progress in terms of:</b> <ul style="list-style-type: none"> <li>• Number of planning initiatives that incorporate climate adaptation considerations</li> <li>• Increased frequency and diversity of water based public activity</li> </ul>
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### The case for action

We are committed to improving and maintaining the wellbeing and lifestyles of our community, and our landscapes form an essential part of Melbourne's appeal. A guaranteed supply of clean, affordable water for use by people, businesses and the environment is also fundamental to making Melbourne a place where people want to live.

The municipality of Melbourne is currently experiencing rapid population growth, leading to a transformation of our residential sector. During the last two decades the population of the municipality of Melbourne has almost tripled, increasing from 35,000 in 1991 to 100,000 in 2011. We are expecting this significant population growth to continue, with an increase of 80 per cent on the 2011 population expected by 2030. Our worker and visitor populations are also increasing rapidly, with 1.2 million daily visitors projected by 2030, up from 800,000 daily in 2013.

***Liveability** is defined as a measure of the attractiveness of a location as a place to live and work. Economic, social and environmental factors all influence liveability, such as the quality of the natural and built environments; amenity; access to educational and health services; and cultural vibrancy. (Victorian Competition and Efficiency Commission November 2011)*

Demographically the city has also changed, shifting towards smaller households with one or two bedrooms, fewer children and higher incomes. An apartment building boom has meant that 93 per cent of new homes built between 2006 and 2012 were apartments. At least 4000 dwellings are expected to be built each year going forward. This expanding population requires a revision of our planning strategies to optimise water use.

### Key challenges

Changes in population, behaviour and urbanisation all have impacts on our use of and interactions with water. We need to consider these changes in designing our city to remain one of the world's most liveable into the future. Integrated water cycle management must also be considered in the Melbourne Planning Scheme.

As City of Melbourne works towards being a healthy city in a healthy catchment, another challenge is to recognise and protect the fundamental roles water plays in our city. These roles include maintaining the health of Melbourne's community through access to clean, affordable water; maintain the health of our waterways, parks and gardens provide areas for rest, recreation and exercise; and maintaining our drainage infrastructure to manage flood risk.

## **City of Melbourne will work with the water sector and key players to:**

### **Enhance the planning process**

- Include provisions for water infrastructure in urban development plans to cater for future use and allow community interaction with natural water systems.
- Increase the accessibility of our waterways.

### **Enhance Melburnians' health and amenity**

- Where appropriate, design our city so we are able to see and interact more with our water systems.
- Increase resident and visitor recreational use of our waterways and public open spaces.
- Ensure flood and heat risk management programs are implemented effectively within the municipality.
- Encourage new and existing developments to include public open spaces to enhance amenity and decrease the urban heat island effect.

### **Ensure access to clean, affordable water**

- Ensure a responsive water market with dynamic and equitable water pricing.
- Ensure that incentives and regulation are driving a reduction in potable water use.
- Develop and communicate finance models for businesses and individuals to effectively manage their water use.

## **City of Melbourne will:**

### **Enhance the planning process**

- Continue to include water and liveability considerations in the development and implementation of structure plans and strategic plans.
- Continue to ensure that waterways and the urban forest are a prominent part of Melbourne's identity.

### **Undertake research**

- To further understand the linkages between human health and access to waterways and public open spaces.
- To further understand the linkages between human health and water quality and availability.

## Water for the environment

### Water managed for biodiversity, healthy public open spaces and clean waterways

<b>Objectives:</b> <ul style="list-style-type: none"> <li>• Our major waterways are healthy and clean</li> <li>• Soil moisture supports a healthy urban forest</li> </ul>	<b>We'll track progress in terms of:</b> <ul style="list-style-type: none"> <li>• Health of waterways</li> <li>• Decreased run off</li> <li>• Increased filtration</li> <li>• Decreased evapotranspiration</li> </ul>
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#### The case for action

Enhanced urban density, climate change and an increasing population mean that the way we interact with our local catchment and how we consider water in the environment is becoming ever more important. Of the three major waterways in the municipality, the current condition of Yarra and Maribyrnong Rivers is considered moderate, while Moonee Ponds Creek is in very poor condition. The health of much of Melbourne's urban forest declined greatly during recent drought-related water restrictions, at significant cost to the amenity of the city.

#### Key challenges

During the recent prolonged drought, the lack of environmental flows put extreme pressure on certain sections of our rivers and creeks. To enhance the health and biodiversity of our waterways, we need to reduce stormwater pollutants and improve water quality.

The way we design, build and retrofit our buildings is a significant opportunity to enhance the way our city interacts with the local catchment. Incorporating water and public open spaces, where possible, into our built environment, will help towards creating healthy waterways and mitigating the urban heat island effect.

Another key challenge is to protect and enhance our urban forest. Melbourne is internationally recognised for its urban forest and public open spaces, yet many of the city's landscapes were created well over 100 years ago. A significant number of our trees are nearing the end of their lives and landscapes are struggling to adapt to a changing climate.

We need to effectively guide the transition of our landscape to one that is resilient, sustainable, healthy and diverse, and that meets the needs of the community.

#### City of Melbourne will work with the water sector and key players to:

##### Enhance our waterways – Yarra River, Maribyrnong River, Moonee Ponds Creek

- Manage the health of our key waterways including limiting the amount of stormwater pollutants entering these systems.
- We will also contribute to Melbourne Water's 20-year strategic priorities to enhance the Lower Yarra Catchment, including:
  - Improving water flows by delivering environmental flows in the Yarra River and tributaries.
  - Improving water quality and implementing stormwater treatment systems in new urban developments.
  - Improving vegetation to benefit amenity and birds.
  - Working with partners to develop litter prevention programs.

#### City of Melbourne will:

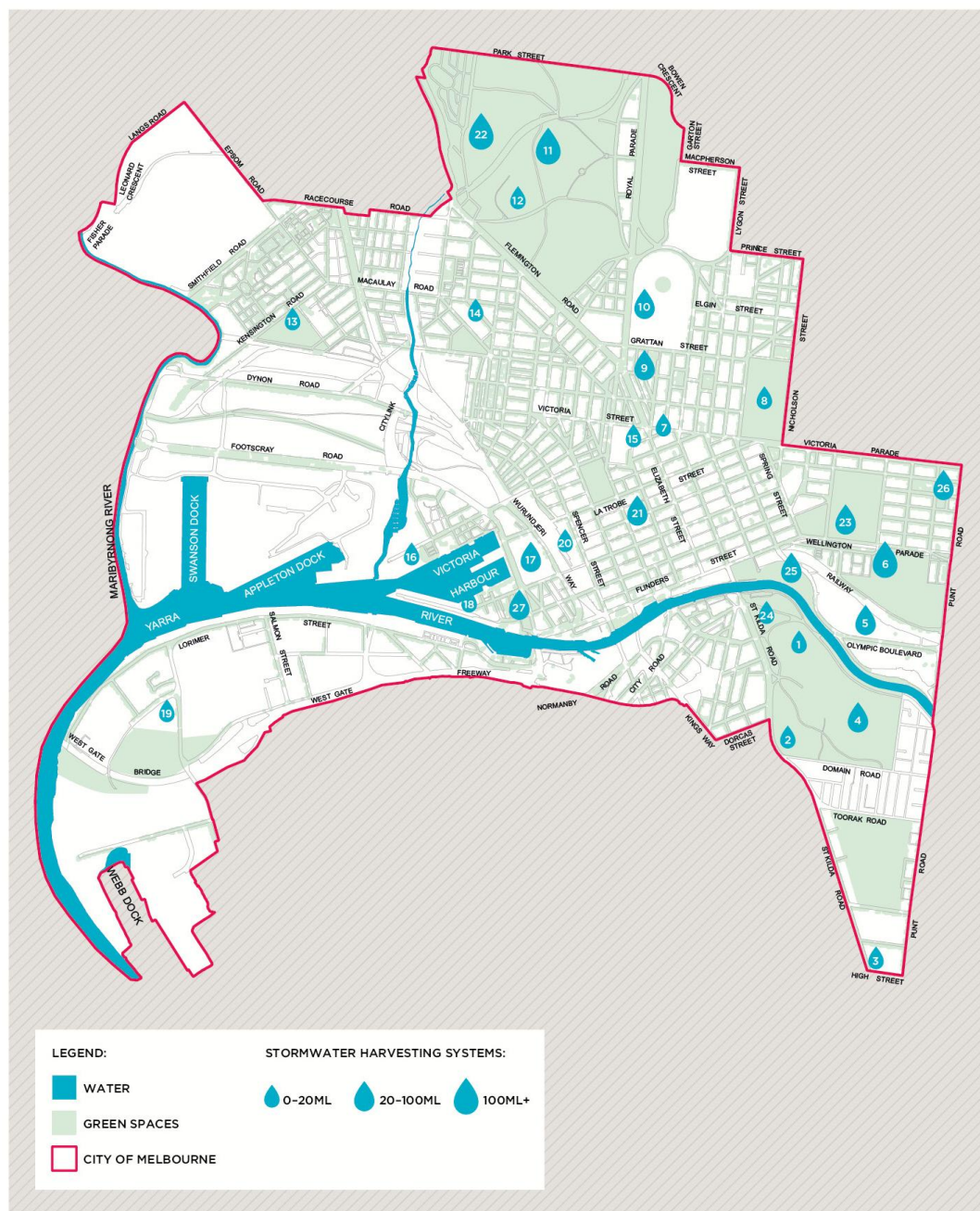
##### Enhance our waterways – Yarra River, Maribyrnong River, Moonee Ponds Creek

- Continue to update and implement the Docklands Waterways Strategic Plan.
- Continue to run free park ranger education programs for the community.



## Enhance use of public open spaces and water to cool the environment

- As part of the Urban Forest Strategy, City of Melbourne will continue to:
  - Increase canopy cover and urban forest diversity.
  - Improve vegetation health and maintain optimum soil moisture levels
  - Improve urban ecology and inform and consult the community.
- Help to enhance biodiversity through the development of an ecology strategy.
- Develop a Growing Green Guide on the installation and maintenance of green roofs and facades.
- Continue to implement the Municipal Strategic Statement and Structure Plan actions relating to water management, in order to enhance Melbourne's parklands, waterways and other open spaces.



### STORMWATER HARVESTING SYSTEMS

- |  |   |   |
|--|---|---|
| 1 Sidney Myer Music Bowl (15ML)            | 9 University of Melbourne Economics Building (32ML) | 19 Herald Weekly Times - Westgate Park (20ML) |
| 2 The Shrine (5.8ML)                       | 10 Trinity College (30ML)                           | 20 Southern Cross Station (5ML)               |
| 3 Wesley Collage (20ML)                    | 11 Melbourne Zoo (150ML)                            | 21 500 Bourke Street (36ML)                   |
| 4 Royal Botanic Gardens (40ML)             | 12 State Netball & Hockey Centre (19ML)             | 22 Royal Park Wetlands (160ML)                |
| 5 Melbourne & Olympic Park (45ML)          | 13 Kensington Community Centre (12ML)               | 23 Fitzroy Gardens (69ML)                     |
| 6 MCC Sewer Mine (180ML)                   | 14 Public Records Office (2.7ML)                    | 24 Queen Victoria Gardens (20ML)              |
| 7 200 Victoria Street (4ML)                | 15 Queen Victorian Market (5ML)                     | 25 Birrarung Marr (30ML)                      |
| 8 Royal Exhibition Building Museum (6.4ML) | 16 New Quay Park (2ML)                              | 26 Darling Street, East Melbourne (21.3ML)    |
|  | 17 Docklands Stadium (25ML)                         | 27 Docklands Park (22.5ML)                    |
|  | 18 Converso (20ML)                                  |   |



## Water use and quality

**Public and private organisations work together to enhance stormwater quality. Fit-for-purpose water use has driven a reduction in demand for mains water**

<b>Objectives:</b> <ul style="list-style-type: none"> <li>• Optimise fit-for-purpose water use</li> <li>• Optimise stormwater quality</li> <li>• Water supply infrastructure is planned for current and future demand</li> </ul>	<b>2018 targets</b> <b>Water use</b> <ul style="list-style-type: none"> <li>• Council: 30% of all water use sourced from alternative water sources by 2018</li> <li>• Municipal: 8% of all water use sourced from alternative sources by 2018</li> </ul> <b>Water quality</b> <ul style="list-style-type: none"> <li>• 20% reduction in Total Suspended Solids contributed to the waterways from the municipality of Melbourne's catchment by 2018</li> </ul>	<b>2030 targets</b> <b>Water use</b> <ul style="list-style-type: none"> <li>• Council: 50% of all water use sourced from alternative water sources by 2030</li> <li>• Municipal: 20% of all water use sourced from alternative sources by 2030</li> </ul> <b>Water quality</b> <p>30% reduction in Total Suspended Solids contributed to the waterways from the municipality of Melbourne's catchment by 2018</p>
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### The case for action

Climate change, development, population growth, upstream impacts and increased demand for water are all putting pressure on our water quality and supply. In every instance where we use water, we need to optimise for fit-for-purpose outcomes.

**Fit-for-purpose water use** prioritises the appropriate quality of alternative water sources for different demands. The closer the match in the quality of the water to the level needed for end use, the less treatment is required. Reducing water treatment is both energy and cost efficient.

### Key challenges

The recent prolonged drought highlighted the need to conserve water and use it in the right way throughout our city. This includes increasing fit-for-purpose water use where appropriate in infrastructure, buildings, parks and gardens.

It also means incorporating integrated water cycle management design and water efficiency into new developments.

The quality of our groundwater is another challenge. The city's groundwater and aquifers are too saline to be used as a resource. Our aquifers are also not suitable for storage and recovery as they are not porous enough. Stormwater is a more viable alternative water source for Melbourne than groundwater. Our task is to continue to improve stormwater quality to help enhance the health and biodiversity of our waterways.

**City of Melbourne will work with the water sector and key players to:**

#### Enhance fit-for-purpose water use

- Work with residents, developers and businesses to explore fit-for-purpose water use options.
- Encourage the uptake of residential water tanks.

#### Enhance infrastructure and buildings

- Undertake new technology trials regarding fit-for-purpose water use.
- Design a third pipe network for urban renewal areas.

## City of Melbourne will:

As the single biggest water user in our municipality, City of Melbourne recognises the need to take on a leadership role in implementing and demonstrating fit-for-purpose water use approaches. The actions listed below outline how City of Melbourne will approach this role:

### Enhance fit-for-purpose water use

- Continue to implement best practice approaches to stormwater harvesting.
- Use our engagement programs to further encourage efficient water use by building owners, manager and tenants.
- Use fit-for-purpose water supply in our parks, gardens, council buildings and sports grounds.
- Educate the community about how and why the City of Melbourne uses water for irrigation.
- Improve water use monitoring and measurement.
- Share information with the public and private sectors about water saving and reuse initiatives.
- Include fit-for-purpose water use considerations into City of Melbourne's asset renewal program.

### Water quality

- Continue to implement new stormwater quality technologies to improve pollutant loads in stormwater releases.
- Continue to increase the number of strategically located gross pollutant traps in our drainage system.

### Enhance infrastructure and buildings

- Continue to implement the Energy, Water and Waste Efficiency Planning Policy, requiring developments over a certain size to meet water efficiency standards.
- Continue to require all developments in urban renewal areas to be capable of connecting to alternative district water supply systems.
- Continue to require developers to incorporate integrated water cycle management design principles into drainage plans prior to receiving planning approval.
- Continue to implement the Municipal Strategic Statement and Structure Plan actions relating to water management, in order to improve water quality in waterways and the bay.



**Back cover full-page photograph night time across the Yarra River**  
Copy: City of Melbourne contact details, printing details and date



# APPENDIX ONE - Previous targets – to be included in online version

The table below outlines the targets set in the 2008 Total Watermark Strategy (using 1999-2000 as the base year) and Melbourne's progress towards achieving them.

Target by 2020	Progress	Comments
<b>40 per cent reduction in potable water consumption per resident</b>	Resident use is down to 125 litres/person/day, a 58% reduction	This target is dependent on community education and water efficiency program run by the water authorities.
<b>50 per cent reduction in potable water consumption per employee</b>	Workers use is steady at 95 l/p/d, a 48% reduction	This target is also dependent on community education and water efficiency program run by the water authorities.
<b>90 per cent reduction in potable water consumption by council</b>	669ML used 2011-12 which is a 60% reduction	We will not be meeting this target. We have installed water efficiency and water reuse interventions in our council buildings. We have also installed storm water harvesting schemes in several of our parks, gardens and reserves. We have improved irrigation practises by upgrading systems and converting to computer-controlled management. Our goal to achieve a 100 per cent reduction of potable water use in our parks was based on a potable water offset scheme that has not been progressed by state government since our 2009 strategy was completed.
<b>25 per cent absolute water saving</b>	18519 million litres of water used in the municipality, this is 26% reduction	The overall municipal-wide target is for a 25 per cent reduction in potable water consumption by 2020. This is dependent on all of the above achievements as well as the increased residential and work population.
<b>Council to source 30 per cent (480ML) of its needs from alternative water sources</b>	Likely to reach this target. On average,	We have made significant investment in storm water harvesting projects (see Water use and quality section). These projects provide council with 361 Megalitres (ML) per annum, or 75 per cent of the target.
<b>Non-council land managers to source 25 per cent (2800ML) water needs from alternative water sources</b>	Projects have contributed approximately 739ML of alternative water. Data set is not complete to determine full progress	The private sector has also invested heavily. Major projects: <ul style="list-style-type: none"> <li>• The Yarra Park sewer mine</li> <li>• The Royal Botanic Gardens "Working Wetlands"</li> <li>• The Shrine and Public Records Office rainwater harvesting schemes.</li> <li>• Storm water recycling plant at Melbourne Zoo</li> <li>• Storm water harvesting project at schools and sporting facilities such as Melbourne and Olympic Park and the State Netball and Hockey Centre</li> </ul>
<b>30 per cent reduction in wastewater across the municipality</b>	Data not available	This is principally linked with water efficiency initiative and wastewater recycling projects. We need CWW and SEWL data to determine progress
<b>Groundwater: where water needs to be re-injected, it needs to be of equal or better quality to the water in the aquifer</b>	No current way of tracking this target	Council and industry have not made meaningful progress regarding the management of groundwater, its quality or how it affects the wider water cycle or ecosystem. Groundwater is the responsibility of Southern Rural Water, the Department of Environment and Primary Industries and the Environment Protection Agency.
<b>Stormwater Quality Improvement targets: Total Suspended Solids Council 20% reduction</b>	23% reduction	Our storm water quality targets are based on the Environment Protection Agency's standards in its <i>Best Environmental Management Practice – Urban Storm water</i> . The figures suggest that council has achieved its targets and the non-council land managers are unlikely to meet the targets, which is not an accurate picture.  Data on the rainwater and storm water interventions on private land is not readily available. These figures are a best guess at the effectiveness of the interventions that council is aware of. There are likely to be many more that we are not aware of.  In addition, the harvesting projects that council has installed capture run-off from both the public and private realm. Moving forward, we will need to carefully consider our targets and how we can effectively report against them.
<b>Non council 20% reduction</b>	7% reduction	
<b>Total Phosphorus: Council 15% reduction</b>	22% reduction	
<b>Non council 25% reduction</b>	8% reduction	
<b>Total Nitrogen Council 30% reduction</b>	30% reduction	
<b>Non council 40% reduction</b>	5% reduction	
<b>Total Litter Council 30% reduction</b>	Need GPT data	
<b>Non council 30% reduction</b>	Need GPT data	