Water Sensitive City Strategy

Vision and outcomes

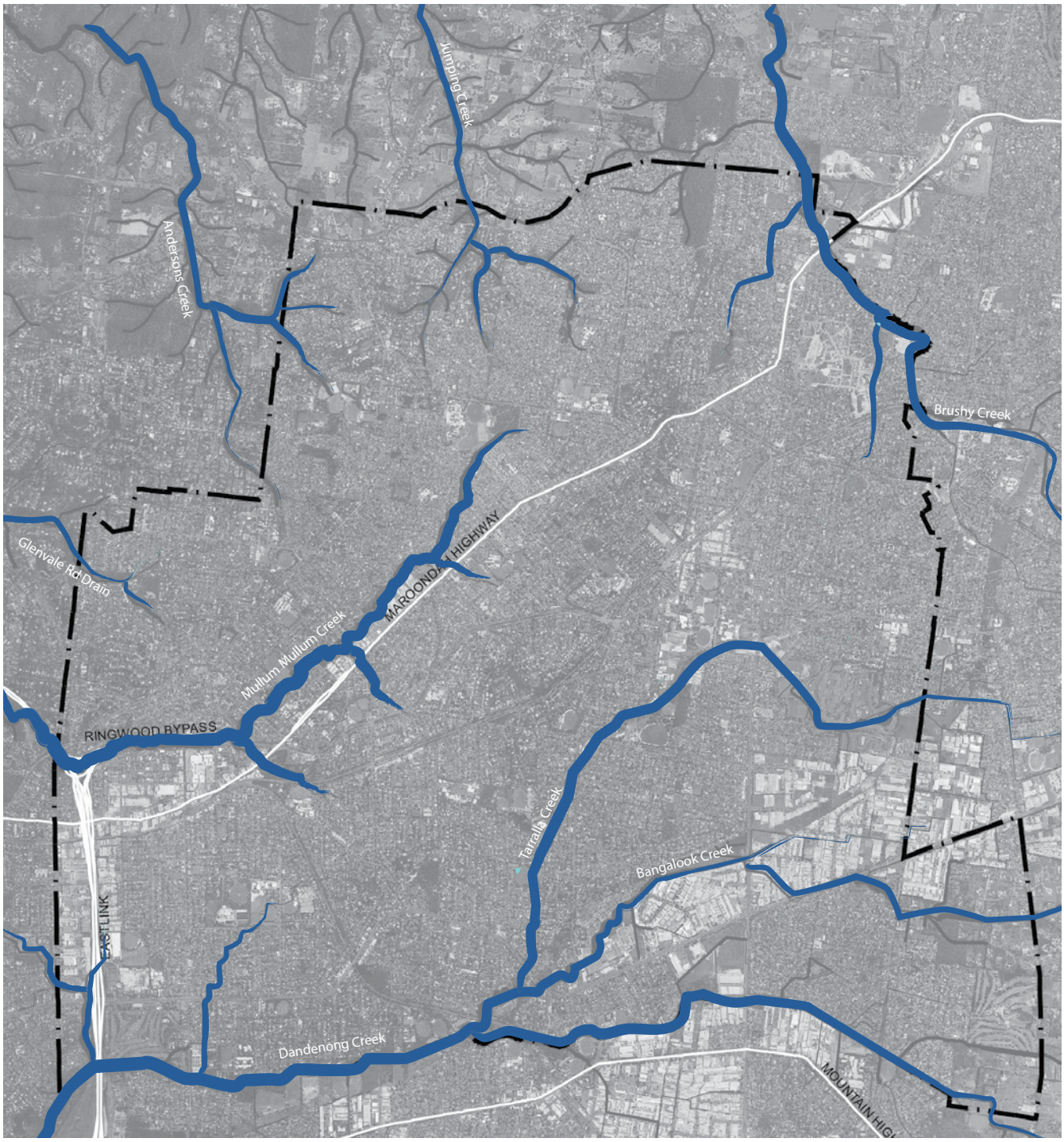
A clean, green and sustainable community

2040 MAROONDAH

Maroondah City Council

Water is a defining feature of the City of Maroondah.

This strategy outlines Council's vision for a Water Sensitive Maroondah, with healthy waterways, resilient neighbourhoods, greener public spaces and water conscious communities.



Maroondah is home to the upper reaches of five major creeks
Some of the creeks shown are piped below ground

Clean, green and sustainable

Contents

In 2040, Maroondah will be a vibrant and diverse city with a healthy and active community, living in green leafy neighbourhoods which are connected to thriving and accessible activity centres contributing to a prosperous economy within a safe, inclusive and sustainable environment.

2040 MAROONDAH Our future together

Council Plan 2013-2017 and Long Term Financial Strategy

Council Policies, Strategies and Plans

Legislated Strategies and Plans

Service Delivery Plans and Annual Budget

Individual Work Plans (RADAR)

Engagement with the community

Water sensitive Maroondah

We want to create a ‘water sensitive city’ of Maroondah, where water is appreciated in all its forms.

A Maroondah where...

- our local creeks, like Mullum Mullum Creek and Dandenong Creek are clean and beautiful, and well used by the community for recreation while also being a healthy habitat for local wildlife.
- we use water wisely, but also appreciate the essential role water plays in supporting our livelihood, and our lush green parks, ovals and trees.
- we make the most of alternative sources of water that are available locally, including rainwater and recycled water.
- heavy rainfall and flood waters are well managed, so water moves safely through the city without causing damage.

Achieving this vision will require a range of changes to be made to our neighbourhoods, our infrastructure and our way of doing things. To do so, Council will need support from our partners who influence different aspects of water management and from our local communities and businesses who live, work, play and visit Maroondah.

This Water Sensitive City Strategy will help Council and the community to achieve its vision for Maroondah in the future. Water is central to our current and future lives and we all have a role in ensuring this vital resource is wisely managed for the wellbeing of all.

The Strategy will be implemented over 10 years and its recommended actions will be integrated into Council departments’ annual service delivery plans.

Implementation will also involve the partners who helped Council to develop the Strategy. These include Melbourne Water, Yarra Valley Water, the Maroondah Environment Advisory Committee and the Department of Environment, Land, Water and Planning.

A cross-Council Water Sensitive City Working Group will take carriage of many of the actions and report progress annually to Council and every four years to the community.

The challenges we face today

High quality water supplies for drinking keep us healthy, irrigation water keeps our parks and gardens thriving throughout the year and water in our environment makes Maroondah a green and attractive place to live.

There are also some downsides to the current way we manage water in our cities and suburbs. A series of reservoirs supply the Melbourne area and these supplies can become strained during peak periods and times of drought. The recent investment in the desalination plant for Melbourne provides back-up security, but desalination is an energy-intensive and expensive water source, so we only want to use it sparingly.

The large areas of paving and roofs in urban areas mean that rainwater rushes into our drains then into our creeks in large quantities, and picks up pollution along the way. Our creeks are suffering as a result. Heavy rainfall events also cause problems with local flooding, and the risk of damage is increasing as Maroondah grows and has more homes and buildings.

Most of us only use one type of water, the water which comes from the mains supply. Typically, we use this for everything – for drinking, for washing the car and for flushing the toilet. There are other types of water available which are more suitable for some uses where drinking water quality isn't needed. For example, we can catch rainwater from our roofs and use it to water the garden. This reduces flooding and damage to our creeks created by excessive stormwater runoff. We can also reuse a lot of our water more than once. For example, water that has been used once to wash our hands, could also be used to flush our toilets. Using mains water sparingly, and matching the right types of water to the right uses are all strategies that can help us improve our water systems.

Community Vision, Maroondah 2040

With a changing climate and growing population, Maroondah City Council believes it is important to improve the way we manage water now so that current and future generations can benefit from secure water supplies, healthy environments and safe and beautiful places to live.

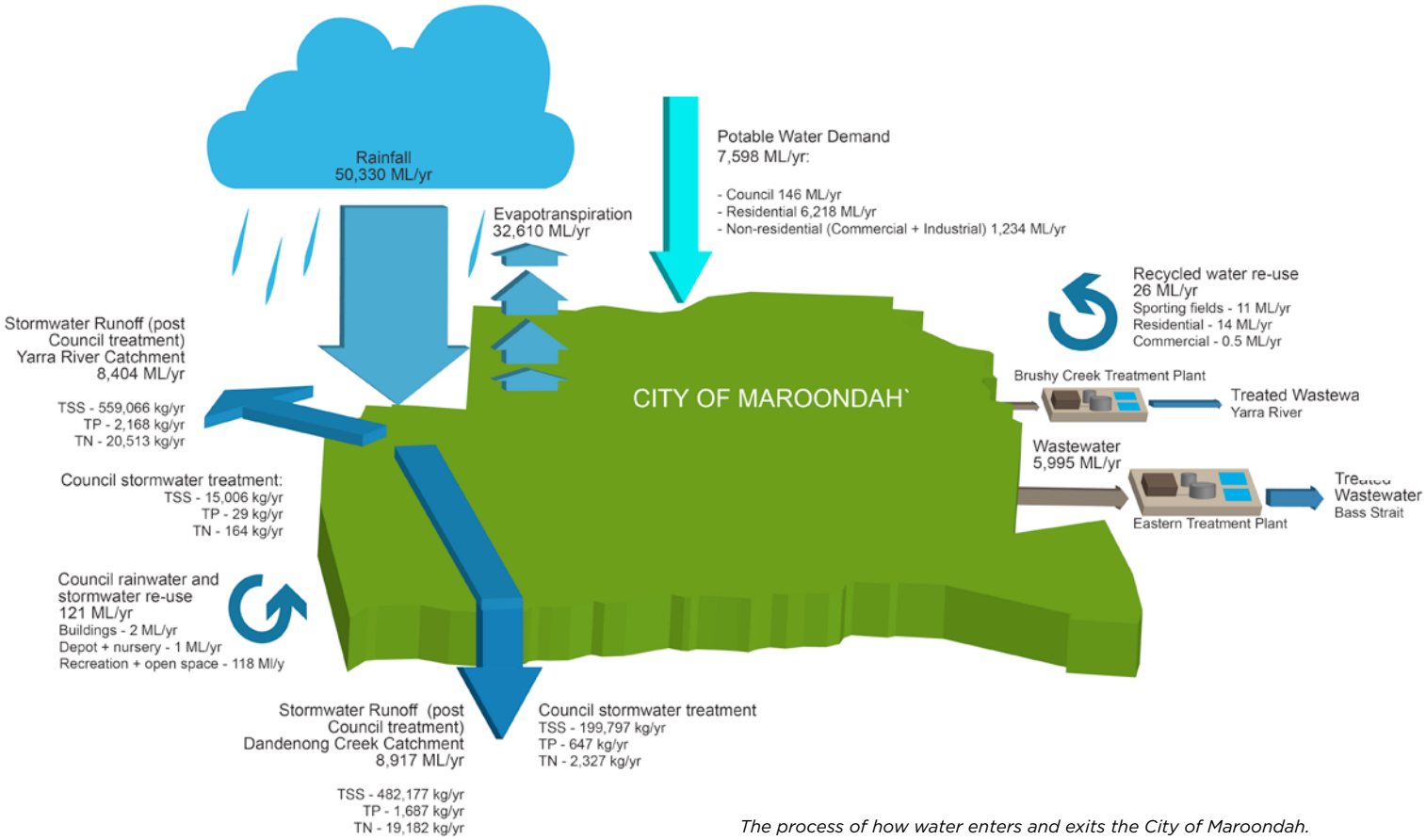
Water, water, everywhere and not a drop to drink?

We actually have more water in Maroondah than we need. We import around 7,000 million litres (ML) of potable mains water each year for use in our homes, businesses and facilities. The total amount of stormwater and wastewater resources available in our City is over 30,000 million litres, but most of this drains into waterways or goes to sewage treatment plants respectively.

If we used more of these alternative water sources locally we could dramatically reduce the burden on the mains supply and help to clean up our creeks and coastlines.

Mullum Mullum Creek, Ringwood

Maroondah's water cycle



The process of how water enters and exits the City of Maroondah.

This diagram shows the water balance for the City of Maroondah in 2014.

A water balance is a stocktake of the volumes and types of water entering and exiting the City.

Several types of water enter Maroondah, including the 'mains' potable water supply which is piped in from the central Melbourne supply reservoirs and the rain that falls on Maroondah each year.

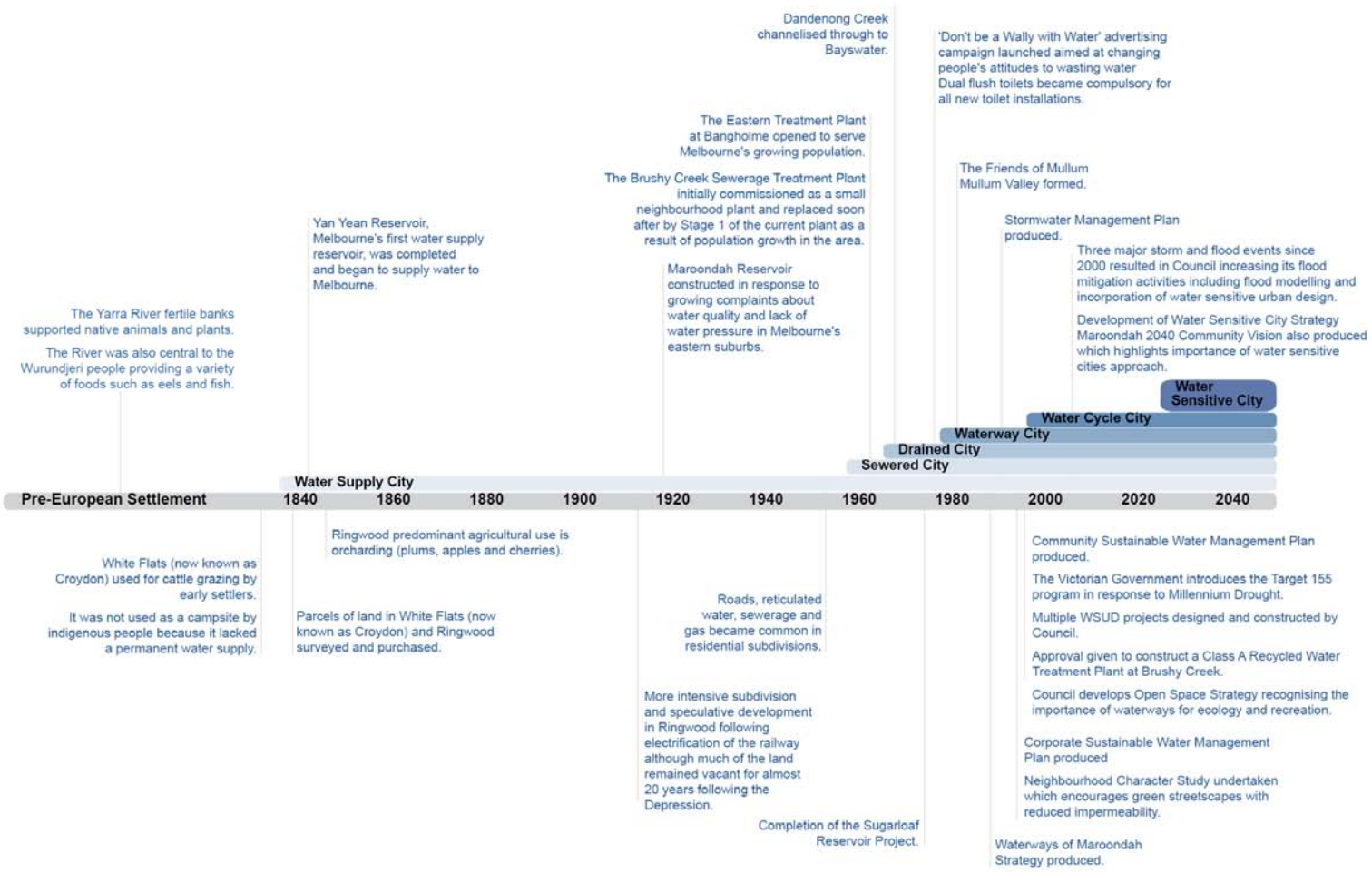
There are two major types of water that then exit the boundaries of the City; wastewater which is collected in the sewerage system and stormwater which flows to Dandenong Creek or the Yarra River through a series of local Creeks.

Maroondah is a predominantly residential municipality and also is home to several major roadways, commercial centres and industrial areas. Due to the relatively high proportion of developed land, there are significant quantities of stormwater being transferred to local waterways.

Some local wastewater is treated locally at the Brushy Creek Recycled Water plant which is located on the border of Maroondah.

Currently, a small portion of local sources of water (rainwater, stormwater and recycled water) are reused locally.

Maroondah's water sensitive journey so far



Our water systems have evolved over time, allowing our cities to benefit from a high quality water supply and efficient drainage of rainwater and wastewater. The development of these systems has been essential to the protection of our health and to support a modern way of life. However, our understanding of water issues and the technology and techniques we have to help us are evolving, and we are still on a journey to improve water management in Maroondah.

This timeline shows major events that have affected water management in the City of Maroondah throughout its history.

The focuses of water management in this area have been fairly typical for their time.

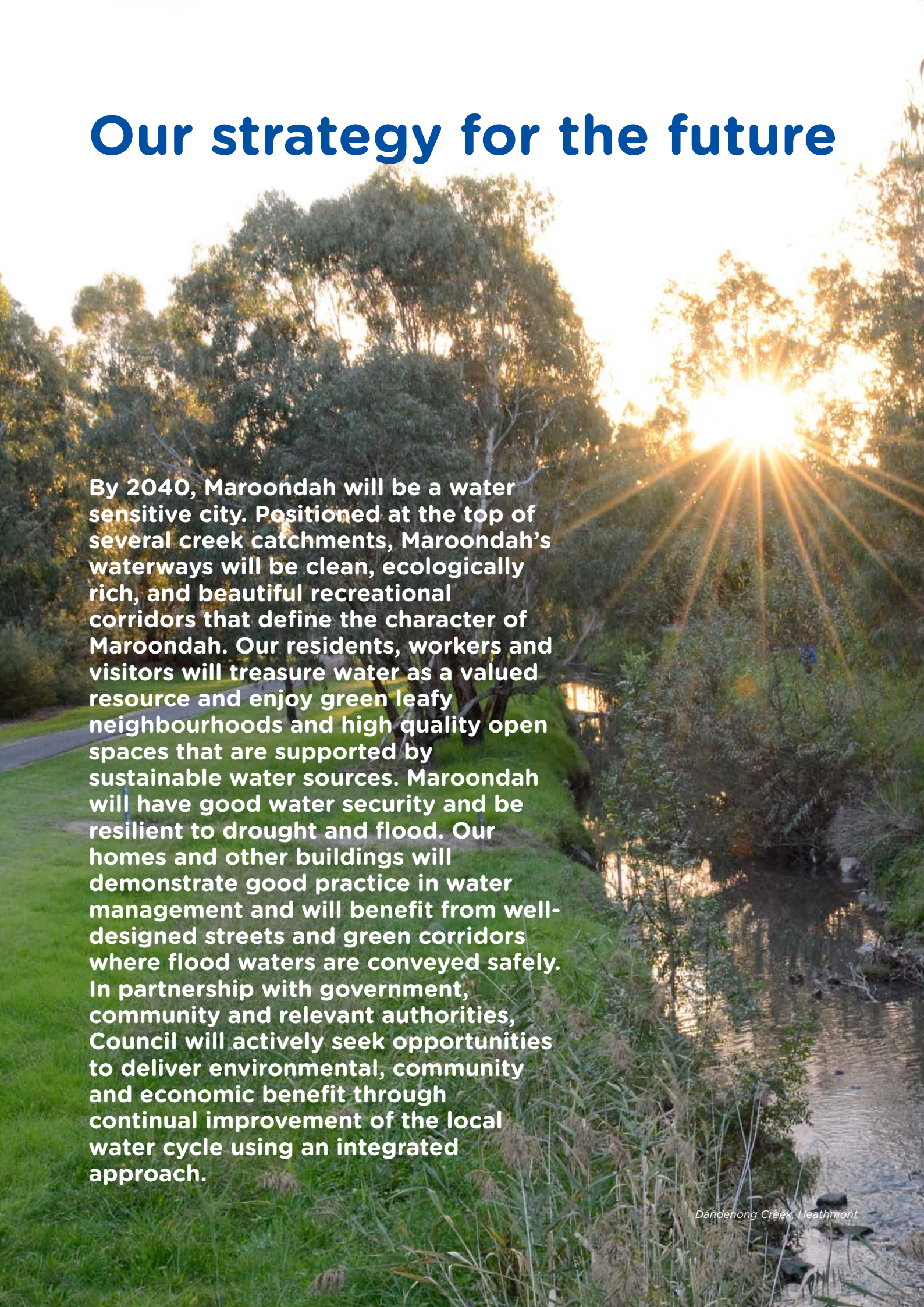
An initial focus on securing water supply allowed settlement to then occur in area and populations grew. In response to the increasing populations, sewerage systems were introduced to protect public health, and drainage systems were included to prevent flooding.

In the last 50 years, the impact of development in the area has been seen in the degradation of local creeks, with greater levels of erosion and pollution being seen. More recent focuses have been on improving waterway health and stormwater management to address this. Recently, we have also seen a focus on water use efficiency during the Millennium Drought.

Maroondah has also experienced several serious flood events in recent years as the risk and probability of flooding has increased with urban development and the effects of climate change.

Our strategy for the future

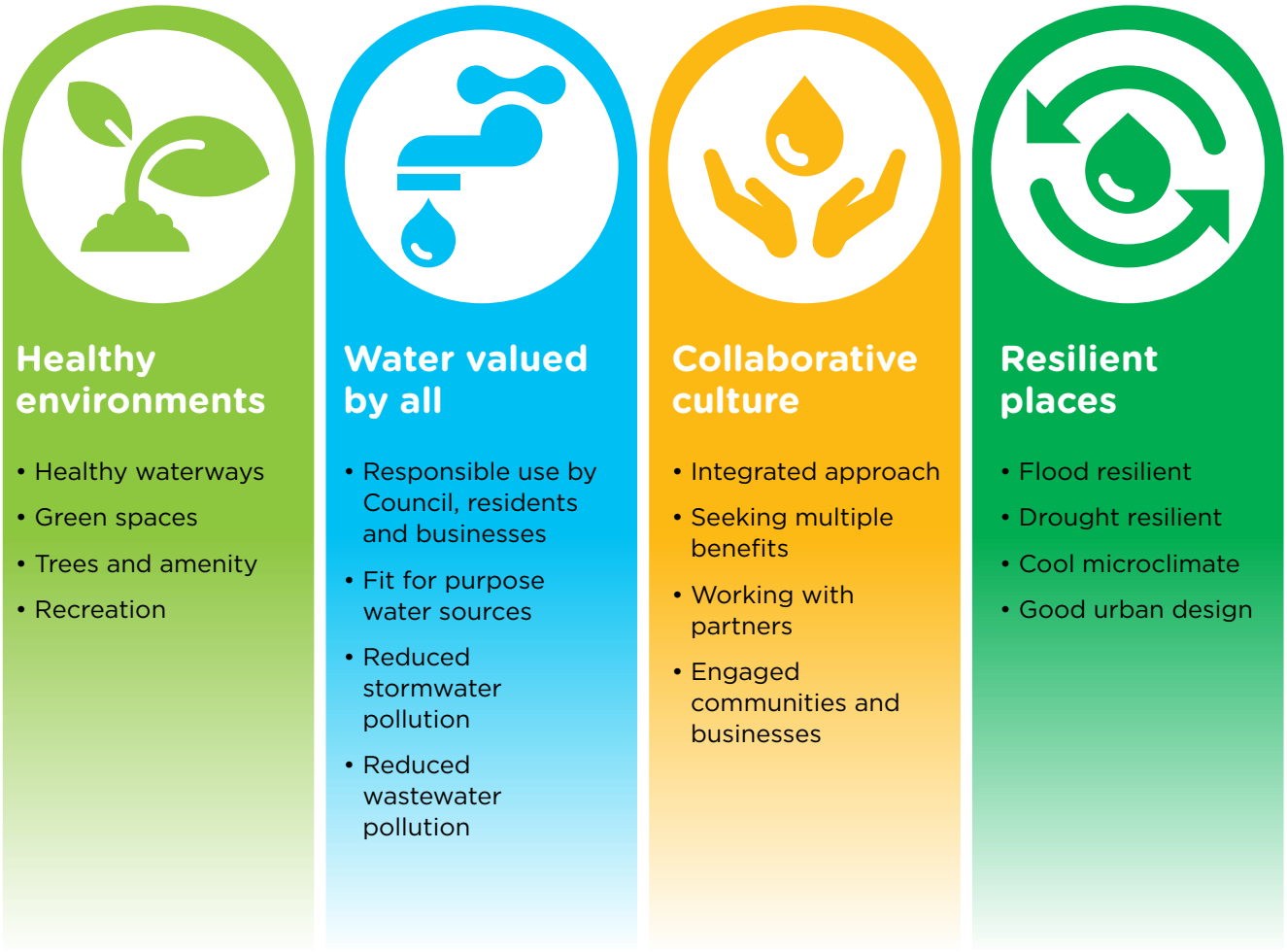
By 2040, Maroondah will be a water sensitive city. Positioned at the top of several creek catchments, Maroondah's waterways will be clean, ecologically rich, and beautiful recreational corridors that define the character of Maroondah. Our residents, workers and visitors will treasure water as a valued resource and enjoy green leafy neighbourhoods and high quality open spaces that are supported by sustainable water sources. Maroondah will have good water security and be resilient to drought and flood. Our homes and other buildings will demonstrate good practice in water management and will benefit from well-designed streets and green corridors where flood waters are conveyed safely. In partnership with government, community and relevant authorities, Council will actively seek opportunities to deliver environmental, community and economic benefit through continual improvement of the local water cycle using an integrated approach.



Dandenong Creek, Heathmont

What we are aiming for

We aim to achieve four key outcomes in creating a Water Sensitive Maroondah.



Healthy environments

- Healthy waterways
- Green spaces
- Trees and amenity
- Recreation

Water valued by all

- Responsible use by Council, residents and businesses
- Fit for purpose water sources
- Reduced stormwater pollution
- Reduced wastewater pollution

Collaborative culture

- Integrated approach
- Seeking multiple benefits
- Working with partners
- Engaged communities and businesses

Resilient places

- Flood resilient
- Drought resilient
- Cool microclimate
- Good urban design

What is Council's role in water management?

Maroondah City Council is responsible for local stormwater drains that collect rainwater from our roads, roofs and paved areas. We are gradually introducing new techniques to manage stormwater by filtering it before it reaches local waterways and providing storage areas that will help to reduce the risk of flooding. We also operate a range of facilities for the community and local businesses, and we aim to use water responsibly in our buildings. We manage a range of parks, gardens and recreation grounds, and aim to source the appropriate types and amounts of water to keep these areas green while reducing demand on precious potable water resources.

We are committed to continuing to work closely with our partners to look for broader opportunities to improve water systems in Maroondah, including Yarra Valley Water who manage mains water supply and wastewater, and Melbourne Water who help to look after our waterways and manage regional flood risk.

Outcome 1 Healthy Environments

We want to ensure that our environment is healthy by providing the right water to natural systems.

Our creeks need clean water, where the flow is controlled to support habitat and prevent erosion, and where waterway corridors are vegetated and protected. Our urban environments also need irrigation water to keep sporting grounds, parks, gardens and street trees green and thriving.

Key directions

Healthy waterways

Maroondah is home to the headwaters of a number of major creeks but all are currently in a poor condition due to urban stormwater pollution. Water quality needs to be improved by reducing the amount of stormwater runoff discharged to creeks and by providing treatment for the water which is discharged. The volume of stormwater can be reduced by harvesting runoff from roofs and paved areas for local reuse. Stormwater can be treated through the use of water sensitive urban design techniques such as raingardens, swales and wetlands which filter water using vegetation and soils before it reaches a creek. Creeks can also be improved by protecting and enhancing riparian vegetation, managing erosion and removing litter.

Green spaces

Green spaces will be designed and maintained to use a limited amount of water, by using efficient irrigation systems and grasses and vegetation which are more resilient to drought conditions. For irrigation water that is needed, local sources of rainwater, stormwater or wastewater should be used.

Trees and Amenity

By keeping our trees in our parks and streets healthy they will provide amenity and shade, keeping our neighbourhoods beautiful and cooler on a summer day. Water features also help to keep the city cool while providing opportunities for play, art and interest in the urban environment. By allowing stormwater which runs off streets and paved surfaces to passively irrigate trees, roadside gardens or water features, we can help to provide these benefits.

Recreation

Recreation is important for residents of Maroondah, including sport, play and walking and cycling. The provision of water to sporting grounds is important to keep soils moist and to prevent injuries. The creation of green corridors for walking and cycling will also encourage people to exercise and travel without using a car.

Measuring our progress

10 Year Targets 2015-2025

- Reduce annual total nitrogen pollution by a further 1000kg.
- Irrigation of 80% of new trees (beyond establishment) is achieved without reliance on potable water.
- All irrigated sportsgrounds are provided with adequate water for safety and amenity, while minimising potable water demand through at least one of these measures:
  - Use of warm season grasses.
  - Use of high efficiency irrigation systems.
  - Use of irrigation systems managed by a central control management system.
  - Use of alternative water sources where feasible.

Priority actions

- Evaluate and prioritise opportunities to harvest rainwater or stormwater for irrigation of ovals, green spaces and trees.
- Review and strengthen planning policy to ensure new developments integrate best practice water management measures.
- In partnership with Melbourne Water and local community groups, continue to support improvement of local creeks.

Cleaning up stormwater in Larissa Avenue

Celebrated on ABC's Gardening Australia show, Larissa Avenue was re-designed as part of a project to link Ringwood Lake and Mullum Mullum Creek by creating a green pedestrian route between the two. The Link draws on the natural history of local waterways as Larissa Avenue lies along the former path of Sandy Creek.

Planted drainage systems capture and clean water from the road allowing cleaner water to enter into stormwater systems, while watering and feeding vegetation along the way.

The project was jointly funded by Council and the State Government.

Communities working together to clean up our creeks

Various community volunteer groups have worked hard to improve the quality of our local creeks. Activities over recent years include weed removal, tree planting, litter collection and water quality monitoring. Maroondah City Council and Melbourne Water have collaborated with volunteer groups like Waterwatch, First Friends of Dandenong Creek, Friends of Mullum Mullum Creek and Friends of Andersons Creek to achieve some great outcomes for the creeks.

Larissa Avenue, Ringwood.

Outcome 2
Water Valued by All

Everybody is involved in managing water in the right way.

A greater appreciation of water as a precious resource will change the way we manage water. Everyone will use it more sparingly, and use the right sources of water for the right uses. Everyone will also need to think about what goes down the drain to avoid polluting our waterways.

Key directions

Responsible use by Council, residents and businesses

Over the last 10 years, we have learned to make more efficient use of water, using only what we need. Continuing water efficient behaviour and using water efficient appliances, taps and fixtures is important to ensure our water resources are sufficient to support a growing population.

Fit for purpose water sources

Choosing the right water source for the right use makes a big difference to water management. In Maroondah, we have a range of local water sources available that are suitable for uses that don't require drinking water standards, including irrigation and toilet flushing. By using local water sources like rainwater, stormwater or recycled water for these uses, we will significantly reduce pressure on mains water sources.

Reduced stormwater pollution

The drains from our roofs, roads and pavements link directly to our creeks, meaning that leaves, litter, oil, grease and chemicals that end up in our drains eventually end up in our creeks. Raising awareness about responsible behaviour and taking physical actions will be important in helping to manage the water entering our drains and our creeks.

Reduced wastewater pollution

Some properties in Maroondah use septic tanks to manage their wastewater. Preventing leaks and inappropriate connections in septic systems will also be needed to protect creeks. Our piped sewerage system can also be damaged by inappropriate discharges of waste from local businesses and industries, and awareness of what can and cannot be disposed to sewer and what requires a trade waste arrangement is needed to ensure we manage water well.

Measuring our progress

10 Year Targets 2015-2025

- Reduce Council's annual potable water use by 5%.
- Support Victorian Government initiatives which reduce current residential potable water use.
- Support State Government initiatives which reduce current non-residential potable water use.

Priority actions

- Evaluate improvement measures for key Council owned facilities with a high water use, including open spaces and aquatic centres.
- In partnership with Yarra Valley Water, continue to help residents to improve the management and performance of septic tank systems and facilitate the transition to sewered systems where appropriate.

A rain garden in Council's City Offices carpark.

Using water wisely at the City Offices, Braeside Ave Ringwood

Water efficient fixtures and fittings were installed at Maroondah City Council offices in 2009 along with a rainwater tank that supplies toilets and garden water to reduce the demand for potable water from the mains supply by over 50%. This has been complimented by the introduction of raingardens in the carpark which help to filter stormwater than runs off the paved car park area before it drains away.

Using the right water for our green spaces and Council Operations

Maroondah City Council has undertaken a number of water sensitive initiatives, including the irrigation of golf courses using stormwater and irrigation of some sports ovals using recycled water from Brushy Creek Treatment Plant.

In addition, Council's Operations Depot in Croydon has been at the forefront of water conservation, the use of alternative water and water quality protection.

The Trade Waste Treatment Facility at the Depot has established best practice in the handling of contaminated waste from rain gardens, street sweeping, drains, and stormwater retention systems.

Council fleet vehicles including street sweepers, suction trucks and tractors deposit these wastes and washing-out water into the facility's bays. A unique drainage system collects the water runoff and contaminants in large concrete pits under the wash bay. A series of filters remove silt, sludge and other contaminants from the water. Finally the water passes through a triple interceptor to remove smaller contaminants before safe disposal to the sewer.

Other water sensitive activities at the Depot include:

- 85 KL of rainwater collection for use in the trade waste facility
- A dam which captures stormwater to irrigate nursery plants
- A second triple interceptor for treating wash water from other fleet vehicles
- Waterless urinals.

The irrigation dam at Council's Operations Depot in Lincoln Road, Croydon.

Outcome 3 Collaborative Culture

Water is connected to everything in some way.

Our food, our homes, our energy and our well-being. Accordingly, many different assets and services affect water and many different skills are required to create good water management solutions. A collaborative way of working is an essential component of a water sensitive Maroondah.

Key directions

Integrated approach

Maroondah City Council will lead by example in the implementation of this strategy to bring together a range of skills and expertise within Council to ensure water management solutions are found across the range of services and facilities that Council can influence directly. Water managment solutions often require a selection of skills found across Council service areas, including engineering, parks and gardens, operations, community services and facility management.

Seeking multiple benefits

We will continually seek to deliver multiple benefits from our investments in water management. While an asset or service may provide a water management function like water treatment, flood mitigation or water supply, where possible we will endeavour to deliver broader benefits like amenity, ecological enhancement, or recreation opportunities.

Working with partners

While Maroondah City Council will lead this strategy, we are reliant on active support and collaboration with partners to achieve significant water management outcomes. Key organisations charged with responsibilities for water management in Maroondah include Melbourne Water, Yarra Valley Water and Southern Rural Water.

Engaged communities and businesses

The communities and businesses who live and work in Maroondah are central to the delivery of good water management outcomes. Council is committed to supporting and working with the community to deliver local projects and to raise awareness on water issues.

Wetlands at The Range, Croydon.

Measuring our progress

10 Year Targets 2015-2025

At least one water-related project per year on average which demonstrates one or more of the following:

- Cross-Council approach
- Multiple benefits
- Cross-organisational partnerships
- Engaged residents, visitors or businesses

Priority actions

- Develop opportunities to showcase integrated water management in key public spaces and Activity Centres.
- Ensure all new Council buildings and renovation projects are provided, where appropriate, with water sensitive urban design measures, fit for purpose water supplies and water efficient infrastructure.
- In partnership with EPA Victoria, continue to work to ensure appropriate stormwater management is applied at industrial and business premises in accordance with the Local Law and state environmental legislation.

Working with partners in the Dandenong Creek Catchment

A working group including representatives from Melbourne Water, Maroondah City Council and the other Councils located within the upper catchment of Dandenong Creek, are prioritising activities to improve the creek. Initiatives from the 'Enhancing our Dandenong Creek' and 'Living Links' projects include the creation of wetlands to manage water quality, enhancement of recreation paths, and flood management works.

Integrated water management at The Range

A new housing development at The Range in Croydon has installed a non-potable water supply system that transfers recycled water from the nearby Brushy Creek Treatment Plant. Recycled water is used to irrigate the grounds and streetscapes, providing lush and green surroundings for residents. Residents will also be able to use this water source for toilet flushing and irrigating their gardens. Integrated planning between developers, Council and Yarra Valley Water will further support the use of local water sources.

Outcome 4 Resilient Places

Maroondah will change over time in response to development, population growth and climate change

It is important that our water cycle also changes for the better. Building resilience to extreme events like heavy rainfall and drought, while also making sure the places we live and work in are pleasant and efficient for the rest of the time, is central to the water sensitive Maroondah vision.

Key directions

Flood resilient

Maroondah has experienced serious flood events in the past. Maroondah City Council has invested in a range of projects and infrastructure designed to minimise flood risk. By integrating more permeable surfaces like grass and gravel and designing in areas where flood waters can be directed and stored safely, we can reduce the risk of damage to properties and the environment and improve safety.

Drought resilient

Maroondah has also experienced serious drought events. We can prepare better for drought by having a range of water sources available, using water wisely and being prepared to cope with less water when we need to.

Heat wave resilient

Water plays a strong role in local climate regulation. Greener, irrigated spaces naturally stay cooler as they won't store heat like concrete and buildings. By keeping trees healthy we will also enjoy a better shade canopy in our streets and parks. Harvesting alternative water sources such as rainwater, stormwater and recycled water and storing them for use in hotter periods facilitates urban cooling. Using locally sourced water for irrigation, including establishing revegetation areas, is better than using our precious drinking water.

Withstanding the test of time

We want to celebrate water and use water as part of the urban form in Maroondah, using channels, water features, ponds and lakes as part of the urban landscape that is appreciated by residents. Good urban design integration is needed with other features like roads, courtyards, and parking areas to ensure these areas have a long lifetime. A key part of good urban design is also a comprehensive maintenance plan.

The Leaf Totem in Town Park was created as part of the Croydon Flood Mitigation Project.

Measuring our progress

10 Year Targets 2015-2025

- Mitigate flood impacts on a minimum of 50 of the 800 dwellings subject to flooding in a major storm.
- Increase Council's use of alternative water sources by 20 ML.

Priority actions

- In partnership with Melbourne Water, prioritise and deliver flood mitigation works to reduce risk of damage to properties and key assets in the area.
- In partnership with Yarra Valley Water, investigate further opportunities to utilise recycled water from Brushy Creek Treatment Plant locally.

Brysons Road, Warranwood

Understanding flood risk across Maroondah

Maroondah City Council has developed state-of-the-art tools that allow us to predict and analyse the risk of flooding across the area for different rain storm events. Using the best information available will help Council to invest in infrastructure upgrades and landform changes that reduce the risk of flooding to local properties and infrastructure. The new flood model will continue to improve Council's ability to plan for multiple benefits when flood works are undertaken. Stormwater harvesting and water-sensitive urban design are examples of such benefits. A great example of other benefits is demonstrated by recent Croydon Civic flood mitigation works. These major works provided an opportunity to improve path alignment and install public art and high grade furniture and bridge, greatly improving the amenity at Fred Geale Oval while mitigating severe flooding for affected residents.

A new look for drainage in Bryson's Road

Brysons Road is a key gateway in Maroondah between city conveniences and our rural surrounds. The local area enjoys natural beauty, with large mature trees and thriving vegetation. A road upgrade was needed, and this was a great opportunity to rethink the local drainage system. Working with the natural landscape, Council built a series of swales, which are planted depressions alongside the road that capture water.

Reflections on Mullum Mullum Creek from a resident in 2040

2015

Growing up in Maroondah, I've seen it change a lot. When I was 15 I used to walk along Mullum Mullum Creek on the way to school.

Back then the creek was more of a drain. It was full of rubbish and sometimes it would turn hazy blue from the pollution or just smell really bad. There weren't many people who walked by the creek back then.

Generally, Maroondah was a nice place to be a kid though, it felt like a mix between the city and the country.

We lived on a street near to the creek with a big back yard to play in. The house was flooded a few times when I was young and that wasn't fun. Thank goodness that isn't common any more. But those green tree-lined streets are what always remind me of home.

2040

I've lived here all my life, and now I'm 40 and I'm bringing up my own kids not so far from my childhood home.

The streets are still beautiful and green. I know a lot of other parts of Melbourne lost their older street trees. So many years of drought was just too much for them to handle. Luckily a lot of the streets around here were changed to shed rainwater onto the tree roots and it kept them healthy through the dry years.

The creek has changed a lot too. You wouldn't recognise it. It's a beautiful green bushland corridor, filled with tall swamp gums, and the water runs clear. It's a fantastic place to bring the kids on the weekend, we ride along the creek path to the Mullum Oval all the time. I think that's one of the reasons the creek is looking better these days. They started taking some of the water out of the drains before it gets into the creek and using it to water the ovals in the summer time. All the businesses along Maroondah Highway did their bit as well and made sure there was nothing nasty going into the Creek.

Local businesses and shops have changed a lot too. Ringwood is looking great. It's got everything we need without feeling too much like you're in the city. We find ourselves out and about a lot, enjoying the parks and having a picnic down by Ringwood Lake.

We moved into a great new house about 10 years ago. It's funny, back when I was a kid, we used to use drinking water for everything, even watering the garden! It seems ridiculous now. What a waste. Our new house has recycled water plumbed in so we can use that for the garden and flushing the loo, saving the drinking water for drinking!

I feel pretty lucky to live here and I hope my kids will feel the same when they are older.

It's just a really nice place to be.

Implementing this strategy

This document provides a vision for the Water Sensitive Maroondah Strategy which Council and its partners will work to achieve.

Making it happen

Partnerships between a wide range of organisations and individuals will be vital in helping to turn the vision for a water sensitive Maroondah into reality. The Water Sensitive City Strategy will help to attain the key directions outlined in Maroondah 2040. The four outcomes outlined in this Strategy have examples of priority actions for Council, community and partners to undertake towards the achievement of the Maroondah 2040 and Water Sensitive visions. Table 1 shows the main correlations between these four outcomes and the key directions of Maroondah 2040 A Community Vision.

A technical toolkit has also been developed as part of this strategy to support Council and its partners in delivering the vision for water sensitive Maroondah. The toolkit includes a number of technical reports and a series of actions that will support the achievement of the targets set out in this Strategy. A copy of the toolkit is available from Maroondah City Council upon request.

Council will develop an internal implementation plan to prioritise its actions, advocate projects, bid for resources and allocate existing resources and responsibilities. It will also develop engagement plans for community and other stakeholder involvement to assist strategy implementation.

Evaluation and Review

To measure progress towards achieving the key outcomes outlined in this Strategy, a number of outcome-based indicators have been selected. Over time, these indicators will be used to identify how successful the initiatives of Council, businesses, residents, Victorian Government, authorities and other partners have been in working towards the preferred outcomes and key directions outlined in this Strategy.

These indicators are not intended to form a definitive list, rather they will be helpful in revealing progress over time. The indicators will be reported against at least once every Council term (four years). This will allow Council and its partners to monitor trends, celebrate achievements, recognise efforts and identify areas for further improvement. Table 2 show the indicators for the Water Sensitive City Strategy, along with some explanatory information.

The results of monitoring and reporting on these indicators will help to evaluate the success of the Strategy. These evaluations will assist with reviewing the Strategy in 2020 and 2025 at which time the water needs and aspirations for the City of Maroondah will be reassessed for appropriate action.

Table 1: Correlation between the four key outcomes and the outcomes of Maroondah 2040 vision

	Healthy environments	Water valued by all	Collaborative culture	Resilient places
A safe, healthy and active community	■			■
A prosperous and learning community		■	■	
A vibrant and culturally rich community	■	■	■	■
A clean, green and sustainable community	■	■		■
An accessible and connected community	■		■	
An attractive, thriving and well-built community	■	■		■
An inclusive and diverse community		■	■	
A well governed and empowered community			■	■

Please note that this table is broadly, rather than exhaustively, indicative of relationships between elements.

Kardinia Creek, Warranwood Reserve, Warranwood.

Table 2
Water Sensitive Strategy Targets

Target No.	Key performance indicator	Key activity	10 year target (2015-2025)	Data source	Baseline	Target justifications
Healthy Environments						
1	Reduction in pollutants in stormwater runoff to creeks (total nitrogen)	Support delivery of water sensitive urban design and permeable surfaces	Reduce annual total nitrogen pollution by a further 1000kg by 2025	Subtract new treatment measures from overall pollutant balance using estimates provided in the Water Sensitive City Strategy Toolkit	2014 Council treatment assets removal: 2,491kg/year Remaining stormwater runoff nitrogen content: 39,695kg/ year	Based on performance scenarios developed, this is achievable through the scoped investment in council assets and in policy for broader application of best practice stormwater management. Nitrogen has been selected as an indicator because of its common use in the water industry as an indicator of stormwater pollution.
2	Proportion of new trees supported by fit for purpose water	Ensure sustainable water management is integrated with tree irrigation, using either: - No irrigation - Passive irrigation - Irrigation using alternative sources	Irrigation of 80% of new trees (beyond establishment) is achieved without reliance on potable water	Record water source for new tree plantings after one year from planting date.	2016	This can be achieved with careful planning and funding of distributed water sources over time. Tree irrigation can be supplied from stormwater using passive irrigation techniques or harvesting schemes. A substantial stormwater supply is already available at Council's Depot and could be expanded. Continue use of drought-tolerant species.
3	Proportion of sporting grounds with responsible water use	Review and continue works to ensure all existing and new sports grounds are irrigated appropriately while applying water saving measures and/or use of alternative water sources	All irrigated sports grounds are provided with adequate water for safety and amenity, while minimising potable water demand through at least one of these measures: • Use of warm season grasses • Use of high efficiency irrigation systems • Use of irrigation programs managed by a central control management system • Use of alternative water sources where feasible	Water use records Record uptake of warm season grasses, technology and infrastructure improvements and alternative water sources	2014 Sporting ground potable water use: 76.2 ML/year	Conversions to warm season grasses already undertaken. Encourage rainwater/ stormwater harvesting for irrigation and use of recycled water for sporting grounds near Brushy Creek Treatment Plant, should its future pipe extensions allows.

Table 2
Water Sensitive Strategy Targets

Target No.	Key performance indicator	Key activity	10 year target (2015-2025)	Data source	Baseline	Target justifications
Water Valued by All						
4	Reduction in Council potable water use	Reduce Council's annual potable water use through efficiencies and greater use of alternative water sources	Reduce Council's annual potable water use by 5%	Yarra Valley Water annual records 2012/2013 baseline: 146,088kL	2014 146 ML/year	There are significant opportunities for rainwater/ stormwater harvesting schemes, use of recycled water or backwash facilities at aquatic centres (or other measures) to assist this target, however the target has been limited given the expected major increase in demand for Aquanation (20-50ML/year).
5	Reduction in residential potable water use	Support communities in reducing potable demands through efficiencies and greater use of alternative water sources	Support State Government initiatives which reduce residential potable water use.	Yarra Valley Water annual records	2014 6,218 ML/year	Reductions will be challenging due to growth in the area, but is a suitable challenge target given best practice will improve. Previous trends have shown consistent decreases over time due to behaviour change, water efficiency measures and rainwater harvesting.
6	Reduction in non-residential potable water use	Support businesses in reducing potable demands through efficiencies and greater use of alternative water sources	Support State Government initiatives which reduce non-residential potable water use.	Yarra Valley Water annual records	2014 1,234 ML/year	Reductions will be challenging due to growth in the area, but is a suitable challenge target given best practice will improve. Previous trends have shown consistent decreases over time due to behaviour change, water efficiency measures and rainwater harvesting

Table 2
Water Sensitive Strategy Targets

Target No.	Key performance indicator	Key activity	10 year target (2015-2025)	Data source	Baseline	Target justifications
Collaborative Culture						
7	Examples/ case studies of projects which encompass partnerships, community engagement and/or multiple benefits (qualitative indicator).	Council's Water Sensitive City group becomes the key driver of a water sensitive culture within and outside Council. Twelve month cross-organisational collaboration when planning major water-related projects; 3 – 6 months for smaller projects.	At least one water-related project per year on average which demonstrates one or more of the following: • Cross-Council approach • Multiple benefits • Cross-organisational partnerships • Engaged residents, visitors or businesses	Council records (of CMT, MEAC and Council meetings). Annual reports from the WSC group.	None	Reasonable expectation which will drive the ongoing activity of the WSC group.
Resilient Places						
8	Reduction in the number of properties subject to flooding	Flood management works to improve Council's stormwater infrastructure. Implemented through capital works and improved flood modelling data provision to planning and building control.	The number of dwellings with habitable floor levels which would currently flood in 1:100 storm events is reduced by at least 50 dwellings. (i.e mitigate flooding impacts on a minimum of 50 of the 800 dwellings subject to flooding in a major storm)	Confirm actual reduction upon periodic completion of district flood mitigation planning, funding availability and project capacities. and Monitor council Engineering approvals under building regulations.	2013 800 dwellings are subject to more than 300mm of flooding which affects floor levels.	This target can be achieved through a combination of: • Capital works, with a current annual budget of $1million with average cost of $340,000 per dwelling protected. A reduction of 30 dwellings is expected over a 10 year period. • Planning and building controls using refined flood modelling to update Planning Scheme Overlays. This allows building plans to be altered accordingly, and action to be mandated through building control. A reduction of 30 dwellings is expected over a 10 year period.
9	Increase in the volume of alternative water used by Council.	Determine where the greatest benefits are and a suitable program of works within budgets for alternative supplies (e.g. rainwater, stormwater, recycled water)	Increase Council's use of alternative water sources by 20 ML	Calculate actual increase from asset register of alternative sources (supplement with meter readings where available)	2014 147ML/year	

Glossary

Alternative water source: Water that isn't sourced from the mains water supply system, this includes harvested rainwater, stormwater, creek/river water and recycled water.

Harvested rainwater: Rainfall which can be harvested from a building roof.

Kilolitre (kL): One thousand litres.

Megalitre (ML): One million litres.

Non-potable water: Water that is not fit for drinking purposes but may be fit for other end uses (e.g. garden watering, toilet flushing etc.).

Potable water: Water that is fit for drinking purposes.

Raingarden: A garden which uses plants and layered filter media (soils and sands) to captures, retains and filters stormwater before slowly releasing it to ground or into the stormwater system.

Recycled water: Wastewater which is treated for reuse for non-potable uses.

Riparian Vegetation: trees, shrubs and ground covers growing along the banks of waterways and other bodies of fresh water.

Stormwater: Surface water runoff that occurs as a result of rainfall on all surfaces within a catchment (e.g. roofs, driveways, roads, footpaths and vegetated areas). Rainwater falling on roofs becomes stormwater once it touches the ground or enters the drainage system.

Stormwater Treatment Wetland: A vegetated waterbody that is specifically designed to treat stormwater (i.e. reduce inflow velocities, settle sediments and remove pollutants). In addition to water treatment, these wetlands also even out flows between peaks and troughs, which are being steadily worsened by climate change and the increase of impervious surfaces.

Total Nitrogen (TN): The sum of the nitrogen present in all nitrogen-containing components in stormwater runoff. A common water quality indicator.

Total Phosphorus(TP): The sum of the phosphorus present in all phosphorus-containing components in stormwater runoff. A common water quality indicator.

Total Suspended Solids (TSS): A measure of the mass of fine inorganic particles suspended in stormwater runoff. A common water quality indicator.

Wastewater: Any water that is intentionally discharged via the sewer.

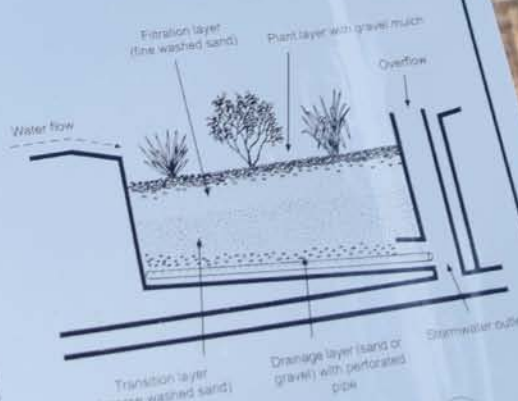
Water Sensitive Urban Design (WSUD): A holistic approach to water management that integrates urban design and planning with social and physical sciences in order to deliver water services and protect aquatic environments in an urban setting. A WSUD approach could include the integration of raingardens and wetlands in an urban area to manage stormwater.

Rain Garden

This Rain Garden was constructed by the City of Maroondah to demonstrate Water Sensitive Urban Design (WSUD).

As rain washes along hard surfaces it carries a variety of litter, nutrients, chemicals and sediment into our waterways, and eventually Port Phillip Bay. This stormwater pollution affects the health of flora and fauna in the waterways.

A Rain Garden resembles a regular garden but is designed to receive and treat stormwater. The Rain Garden initially slows the flow of rain into the stormwater system reducing downstream erosion. As the water infiltrates through the specially selected sand filter layers, sediments, nutrients and chemicals are trapped. The water that eventually flows into the stormwater system is of improved quality.



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