2023

Ballarat State of the Environment Report

sustainable environment ballarat

CITY OF BALLARAT

The City of Ballarat acknowledges the Traditional Owners of the land we live and work on, the Wadawurrung and Dja Dja Wurrung People, and recognises their continuing connection to the land and waterways.
We pay our respects to their Elders past, present and emerging and extend this to all Aboriginal and Torres Strait Islander Peoples.

Contents

Acknowledgements

The City of Ballarat wish to acknowledge the working party members from the Regional Sustainability Alliance Ballarat (RSAB) who guided the scope of the State of the Environment Report 2023 and overseen the development of report content. The RSAB working group included,

- Ballarat Renewable Energy and Zero Emissions (BREAZE)
- City of Ballarat
- City of Ballarat Councillor Belinda Coates
- Environmental Volunteers and Agency Network (EVAN) Central West Victoria
- Federation University Australia (Ballarat)
- Friends of Canadian Corridor (FoCC)

The Report was informed by more than 50 sources of information and data. The content providers are acknowledged throughout the text, and data providers acknowledged in Appendix 1 Report Framework.

A Sustainable City Aspiration

An environmentally sustainable Ballarat is a key priority for the City of Ballarat and its community. These shared aspirations were integral in shaping the City of Ballarat Council Plan 2021-2025 and will inevitably be a key long-term focus.

A sustainable city (municipality) is one that is designed for social, economic and environmental resilience and improvement for the existing population without compromising the same attributes for future generations. There are many definitions of a sustainable city, with these characteristics being common across them.

What is a State of Environment Report

This is the first State of Environment Report for Ballarat. This Report term covers 2022 and 2023.

A State of Environment Report (the Report) focusses on the 'environmental' pillar of a sustainable city. In simple terms, the Report uses a range of key statistics to demonstrate positive or negative momentum across a range of environmental themes. Think of it as being a scorecard of environmental conditions. The objectives of the State of Environment Report are explored further below.

The City of Ballarat frequently engages with residents and businesses, not-for-profit groups, research organisations, agencies, and other land managers. This uniquely places the City of Ballarat to exert influence that delivers against the shared aspiration for a sustainable future and to bring together information from a wide range of sources to measure the environmental performance of our municipality.

Why do a State of Environment Report

Measuring the environmental performance of the municipality is important because it helps us to understand if Ballarat is tracking towards the goal of a more sustainable future. It serves as an education tool, celebrates success, and identifies areas for improvement or where more detailed analysis is required. This first edition is a brief snapshot (not a long-detailed read) intended to start a conversation and to seek feedback that will help shape future editions.

Objectives of the State of Environment Report

- Establish a long-term environmental reporting tool, intended to be updated every two years
- Represent the municipality, including Ballarat and surrounding towns and rural areas
- Inform our community audience and to provide an evidence-base to support advocacy and other projects
- Bring together data and information from a wide range of sources to a central place while providing links to sources for more detailed data and information
- Celebrate successes of the past two years, highlighting projects and other initiatives that contribute to better environmental outcomes for the municipality
- Establish a reporting structure like common reporting systems such as the Victorian State of Environment Report, Regional Catchment Strategies, and the Global Sustainable Development Goals (United Nations)

The State of Environment Report does not

- Measure the individual sustainability performance of any agency, organisation, or group
- Report detailed progress against a specific Strategic Plan or Action Plan
- Measure the adequacy of governance and resourcing
- Provide policy or management recommendations
- Benchmark Ballarat against other municipalities, however some interesting comparisons are made
- Report socio-economic indicators, which are elements of many sustainable cities reporting systems

Key highlights and concerns of the past two years

- Providing a network of community services like dental, general practitioners, chiropractic etc. that are more accessible to our neighbourhoods (see page 2)
- Large industry becoming more energy efficient while continuing to grow the city's economic activity (see page 4)
- Establishing planning controls to create more sustainable future homes and subdivisions (see page 14)
- Levels of contamination in residential and commercial waste/recycling services continued at alarming levels (see page 6)
- Not getting best use from our rainwater tanks installed at existing homes and newly built homes (see page 8)
- The extent of rural wetlands continued to decline rapidly due to drying climate and agricultural practices (see page 10)

How to read this document

As mentioned, this the first State of Environment Report which represents the years 2022 and 2023. There are eight environmental themes explored in this State of Environment Report.

Climate and Atmosphere

Sustainable Transport

Clean Energy

Waste and Circular Economy

Sustainable Water Use

Land and Biodiversity

Waterways and Wetlands

Sustainable Development

Each theme is explored through a simplified version of Program Logic, which is a well-recognised reporting method for environmental management. The intention is that measurable action on the key strategic directions will lead to measurable positive change toward the environmental outcomes. A detailed description of the indicators used is provided in the Reporting Framework (Appendix 1).

Outcomes	Statement of the desired end-state. This is a short summary of what success would look like in the longer-term for each environmental theme.
Outcome indicators	Statistical measure(s) that indicate change toward/away from the desired Outcomes.
Direction indicators	Statistical measure(s) representing change toward/away from the strategic directions.
Key strategic directions	Summary of guiding principles / focus areas, which shape the range of actions required.

DISCLAIMER: This is the first State of Environment Report for Ballarat and many of the included data sets are therefore relatively new. The trends compared to previous years were not always able to be achieved. The range of indicators used will evolve from one edition to the next as data is improved and new data becomes available over time. Where any raw data has been used for analysis, and presented in a different format to that received, the analysis was conducted in good faith by the City of Ballarat for the purposes of developing the first State of Environment Report for the municipality.

Climate and Atmosphere

In 2018, the International Panel on Climate Change (IPCC) highlighted the scale of change required to limit global warming to 1.5 degrees above pre-industrial levels by 2100. Five years later, the IPCC 6th Assessment Report in 2023 highlighted the challenge has become greater due to a continued increase in global greenhouse gas (GHG) emissions. The pace and scale of action so far is insufficient. We are in a Climate Emergency and urgent action is required to minimise or avoid devastating impacts on species, ecological function, and human communities.

Indicators (Global)	2022	2023
Annual average temperature recorded across the globe (rank since 1880 records commenced)	6	1

Indicators (Local)	Result	Trend
Greenhouse gas emissions that were emitted from Ballarat municipality (millions of tonnes of carbon dioxide equivalent, Co2e)	1.381	-0.2%
Greenhouse gas emissions of key sectors,		
Electricity	701,000	-8%
Gas	204,000	-2.6%
Transport	290,000	+3%
Waste	28,000	-1.7%

What the data is telling us

The year 2023 was the hottest year on Earth on record since global records commenced in 1880. Over the past two years almost every month has ranked in the top ten percent. It has now been 47 years since Earth has experienced a below average year (Source: National Centres for Environmental Information).

Key achievements

Ballarat is responding to the Climate Emergency. A key to success was the release of the Municipal Net Zero Emissions Plan in 2022. The Plan,

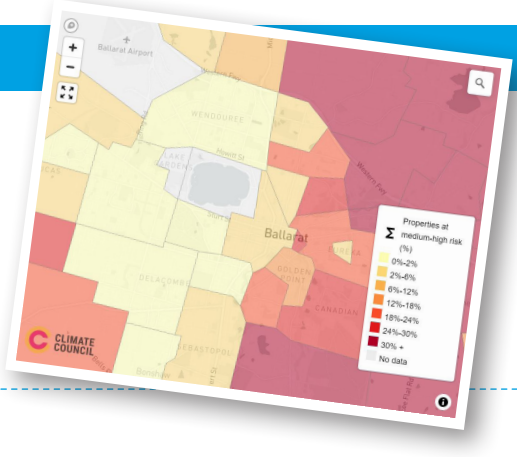
- Establishes a target of zero emissions by 2030 which is equivalent to the Ballarat community's contribution to limit global temperature increase to 1.5 degrees
- Outlines key strategies on how the Ballarat community can achieve the zero emissions target
- Acknowledges existing efforts to continue and build upon

It is intended that future editions of the Report will explore data and action relating to local atmospheric conditions and climate adaptation in this section (e.g. air quality, heat waves, flood and storm)

Insight Insurance and Climate Change

Did you know that an increasing risk of extreme events like fire and flood can affect the community's ability to obtain insurance or their costs to obtain insurance? Check out the insurability of suburbs here [Climate-risk-map by Climate Council]

Example: Climate risk of Ballarat suburbs at 2050 (combined score of all climate hazards under medium emissions)



Sustainable Transport

A sustainable transport system is a key need for societies worldwide. Well-connected and sustainable transport has a significant positive impact on prosperity, healthy and sustainable living, improving wellbeing and quality of life.

What would sustainable transport look like?

A compact and connected city that is less dependent on cars, emitting zero greenhouse gas emissions (Source: Ballarat Integrated Transport Action Plan 2020 and Ballarat Net Zero Emissions Plan 2021).

Some key challenges

Local challenges include the rapid growth in population (mainly through urban growth), the need to connect people with the services they require daily, the lack of disincentives for using cars, and the level of behaviour change required to encourage people to use more sustainable transport options.

Key strategic directions (long-term)

- Facilitate the 10-minute city by closely connecting our neighbourhoods to daily necessities and services so they become easier to walk or ride
- Increase in shared mobility (e.g. bikes and scooters, micro mobility and shared cars) and on-demand transport
- Increase and improve access to active transport (e.g. walking and cycling) and public transport
- Uptake of Electric Vehicles (target 50 percent new sales by 2030. Victoria's EV Roadmap 2021)

Outcome Indicators	Result	Trend
Passenger vehicle travel (kilometres per capita per year) with start and end of journey within City of Ballarat (InBoundary)	3,080	+5.9%
Average length of journey (kilometres) for InBoundary passenger vehicle travel	5.35	+3.9%

Action / Key Directions Indicators	Result	Trend
Fraction of registered motor vehicles that are electric vehicles (compared to Victoria in brackets)	0.19% (0.39%)	+0.14% (+0.29%)
Median number of social services in each neighbourhood	4.9	+7%
Median number of daily conveniences in each neighbourhood	1.0	0%

Note: data systems relating to shared mobility, walking and cycling, public transport and other on-demand transport services etc. under review at time of writing.

What the data is telling us

Recent mobility data is difficult to analyse due to the Covid pandemic and wetter than usual conditions (including a moderate La Nina 2021/2022 and 2022/2023) potentially influencing our transportation habits. In the past two years we have seen minor increases in passenger vehicle travel, the length of journeys taken and greenhouse gas emissions from transport. This is most likely due to workplaces, lifestyles and tourism returning to normal post-Covid. A longer-term view of the data, dating back to 2018, indicates potential decreases in these indicators.

The data also indicates that Ballarat neighbourhoods are becoming more connected to necessities and services (e.g. medical, family services, and conveniences), which could support this longer-term observation of vehicle travel. However, the travel distances data is a relatively new data tool and is unable to be confirmed at this stage. It is also promising to see that electric vehicle ownership in Ballarat began to escalate in the past two years, but worth noting that the rate of increase remains considerably lower than the Victorian average.

Sustainable Transport

Key achievements

- 6.5km of new bike/shared use path in existing parts of Ballarat (e.g. Sturt Street, Learmonth Rd, Grenville Street)
- Many new/expanded community services in new suburbs and existing parts of Ballarat (e.g. Ballarat East swim and early years learning, Ballymanus daycare, Delacombe medical etc.)
- Many new/expanded daily conveniences in new suburbs and existing parts of Ballarat (e.g. Ballarat East shopping complex, expansions at Delacombe Town Centre etc.)
- Active to School and Tag On in Schools programs established. These initiatives resulted in seven student transport leadership groups, six Active to School maps, and 12 schools involved in Ride 2 School Day 2023
- Report Recharging Ballarat released outlining the benefits of fuel standards (refer to Solarcitizens)
- Many new public and private Early Years Learning Centres and medical facilities have been built (e.g. dentist, chiropractic and general practice)

Fact Benefits of Electric Vehicles (EV)

- Significantly lower emissions than combustion vehicles throughout their life. Up to 70 percent lower in some countries (Source: International Council on Clean Transport)
- Do not emit particulate matter or nitrogen dioxide, which can cause pollution incidents (Sourve: World Health Organisation)
- Battery life is generally 10-20 years, with most guaranteed for eight years and/or 160,000km (Source: EV Council)
- Cheaper running costs and easier maintenance, while purchase costs are expected to be equal to combustion vehicles within five years (Source: Drive)
- Find your nearest EV charging point at Plugshare. There are more than you think!

Case study Shared e-scooter trials in Ballarat

An important privately operated transport mode in Ballarat since late 2021, when the trial was launched. A survey conducted by the operator indicates,

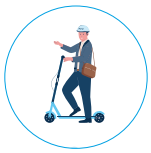
- 63 percent of e-scooter trips replaced car trips (which is more than Melbourne at 45 percent)
- 52 tonnes of greenhouse gas emissions have been saved from reduced car use
- 16 percent of trips would not have occurred if the e-scooters were not available, meaning local businesses would have missed out on valuable sales

More info here: E-Scooter Trial

note: respondents could select more than one option

19.4%
Appointments
(professional or private)

16.5%
Connect to public transport
(bus, train etc.)



32.1%
Commuting
(work, study etc.)

30.0%
Errands
(shopping etc.)

78.9%
Leisure/ recreation
(cafe, restaurant, exploring the city)

Clean Energy

From work to education and entertainment, the use of energy is an integral part of our society. We should all have access to affordable, reliable and clean energy that is not dependent on fossil fuels (Source: United Nations).

What would sustainable energy look like?

Our community and businesses actively engaged in reducing energy demand, and rapidly transitioning to renewable energy sources (Source: Ballarat Net Zero Emissions Plan 2022).

Some of the key challenges

Local challenges include population growth leading to increased energy demand, a cool climate with high energy demand for air space heating (particularly gas), and industry with diverse energy uses that require cost effective solutions with reliable technology. Achieving participation from a large audience is a key challenge to reach the scale of action required.

Key strategic directions (long-term)

- Facilitate the uptake of solar electricity systems and purchase of renewable energy
- Creating new homes and retrofit existing homes with high sustainable design principles
- Engagement in energy efficiency retrofit programs like solar water and heat pumps etc.
- Rapid transition away from fossil gas in commercial, major industry and our homes

Outcome Indicators	Residential	Business
Trend in electricity demand (residential per person) (business per local full time equivalent jobs)	-3.8%	-3.6%
Trend in gas demand (residential per person) (business per local full time equivalent jobs)	-5.64%	-9.7%
Trend in the number of gas connections	+0.4%	-12.25%

Action / Key Directions Indicators	Result	Trend
Fraction of homes and business with solar electricity	17.2%	+1.4%
Fraction of electricity demand that is met by excess solar electricity delivered into the distribution grid	6.4%	+0.7%
Examples of participation in incentive/rebate programs and accreditations,		
Green Star and the National Australian Built Environment Rating System (NABERS)	6	Not available
Install of Solar Water Heater with Heat Pump	1,279	+29.3%
Emissions savings by residents and businesses based on Victorian Energy Efficiency Certificates (VEECs)	180,128	-5.0%

What the data is telling us

Greenhouse gas emissions from electricity decreased in the past two years despite the growth in population and growth in local jobs. Key influences include the increasing levels of renewable energy in the Victorian electricity grid, as well as Ballarat homes and business using less electricity and gas. This is difficult to analyse in recent years due to the impact of Covid on our home and working lives. However, as workplaces have resumed post-Covid Ballarat's businesses (particularly large industry) are using less gas and disconnecting/not-connecting to gas supplies while using electricity more efficiently. This is taking place as the number of local jobs and local economic output continues to rise, based on Ballarat's economic profile (Source: .idcommunity demographic resources).

Clean Energy

Key achievements

- Big businesses (e.g. McCains, Laminex - and others) installing on-site solar farms, heat recovery and bioenergy systems
- The Committee for Ballarat continued to develop a business case to establish a distributed community-owned energy network designed to power Ballarat with 100 per cent locally generated renewable energy
- The City of Ballarat joined Australia's largest renewable energy buying group, the Victorian Energy Collaboration (VECO) and commenced partnership to establish renewables bulk-buy for businesses
- The Grampians Community Power Hub released the Regional Guide to Community Energy and initiated the first heat pump hot water bulk-buy for the region. The Hub also identified a pipeline of projects for community services. The Hub includes Ballarat
- More than 20 public events hosted by the City of Ballarat, Smart Living Ballarat, and BREAZE. Topics included 7 star homes, all-electric homes, local foods, indigenous plants, and more
- Registered charity, BREAZE, established zero interest loans for local not-for-profit groups to access renewable/energy efficient resources

Insight Energy use in Ballarat

Approximately one third of electricity and three quarters of all the gas supplied to Ballarat is used in homes. Below are so me useful links with events in Ballarat, including events relating to sustainability.

- Ballarat Green Drinks (Facebook)
- Smart Living Ballarat
- Ballarat In The Know
- Visit Ballarat

The City of Ballarat has joined City Switch!

This is a FREE national program helping office-based business to reduce greenhouse gas emissions and their environmental impacts.

Businesses can connect with others and receive tools and support along the way to reduce office energy use, switch to renewable energy and much more.

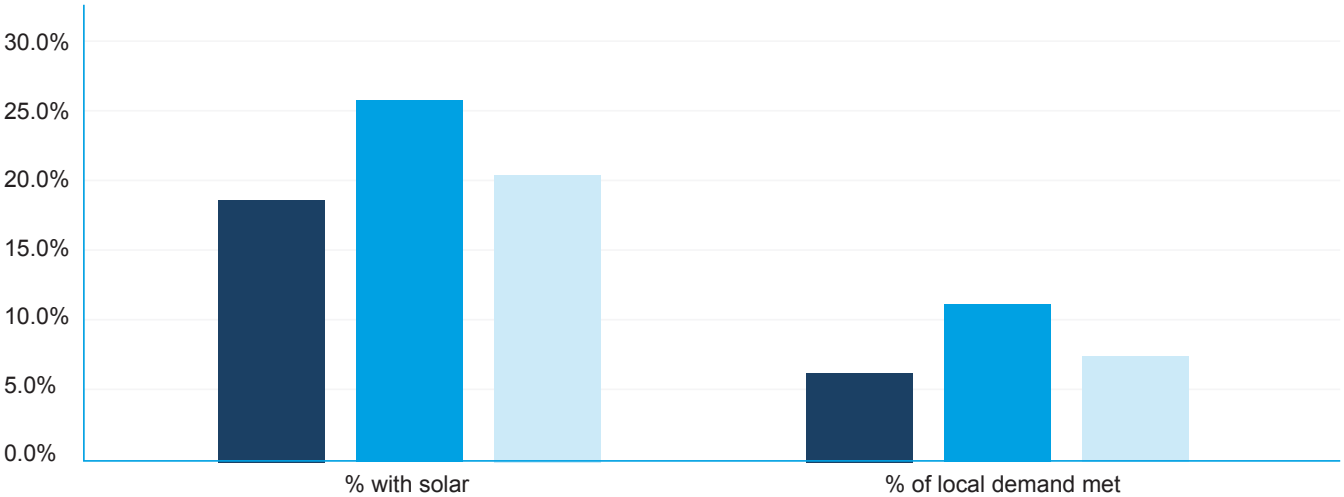
To find out more, or visit www.cityswitch.net.au

CITY SWITCH

Case study Ballarat's progress at installing solar electricity

Installing solar panels is a well-recognised solution to save costs and switch to renewables while reducing demand on the electricity grid. Compared to Bendigo and Geelong, industry data at 2022 reveals Ballarat has,

- A slightly lower fraction of homes and businesses with solar
- A slightly lower percentage of electricity demand that is met from local solar exported into the grid



Waste and Circular Economy

Ballarat is moving to a Circular Economy. A Circular Economy benefits social wellbeing (e.g. education, liveability), provides economic benefits (e.g. job creation, reduced costs) and environmental outcomes (e.g. reduced carbon footprint, zero waste).

What would a functional Circular Economy look like?

Community and businesses actively reducing waste and reusing items, while efficiently using recycling services and purchasing items made from recovered resources (Source: Circular Ballarat Framework 2020).

Some key challenges

Reaching a growing audience to reduce and reuse as first principle is a key challenge. Contamination is the greatest challenge for materials placed in waste management services. A lack of recycling and remanufacturing infrastructure is also an issue with forecast increases in recyclables volume from population growth and efforts to divert material from landfill.

Key strategic directions (long-term)

- State-wide transition to kerbside collection of Food Organics and Garden Organics (FOGO) and a separate glass collection service
- Facilitate/support upcycling (e.g. reuse and repair) opportunities in homes and businesses
- Clear standards (i.e. what materials go in which service) backed by education and enforcement
- Facilitate development of local and regional scale recycling and remanufacturing services and market development for goods made from recycled content

Outcome Indicators	Result	Trend
Residential kerbside waste to landfill (kilograms per person per year)	192.8	-7.3%
Business (commercial and industrial) waste to landfill (kilograms per local full time equivalent jobs per year)	606	Not available

Action / Key Directions Indicators	Result	Trend
Residential – the fraction (by weight) in kerbside waste bins that should have been in recycle service or garden organics bin	24.0%	Not available
Residential – the fraction (by weight) of contamination in kerbside recycle bins	20.0%	Not available
Commercial – the fraction (by weight) of potentially avoidable organics and recyclables found in commercial loads taken to landfill	73.0%	Not available

Note: Data systems relating to manufacturing using recovered resources is not currently available.

What the data is telling us

Ballarat residents sent less waste to landfill (per capita) in the past two years, returning to similar levels to pre-Covid. Further reductions are anticipated soon, particularly due to increased focus on food waste (e.g. home composting and kerbside FOGO). Contamination of household bins continued to be a significant issue, with the level of contamination equating to almost 5,000 tonnes per year of household recyclables incorrectly sent by residents to landfill and about 1,200 tonnes per year of general waste placed in recycling bins. Contamination in commercial waste also continued to be a significant issue, with almost 20,000 tonnes per year of material received at landfill considered to be common/locally recyclable items.

Waste and Circular Economy

Key achievements

- More than 100 local business have joined Ballarat's materials trading platform Aspire
- Strong expressions of interest were received from industry to invest in a Circular Economy Precinct in Ballarat
- More than 360 items repaired by the Ballarat Repair Café, saving more than 650kg from landfill and increased awareness about repairing and reusing
- The City of Ballarat commenced/continued rebate programs for worm farm, compost, and sustainable nappy and sanitary products
- Almost 20 business completed waste and recycling site audit and short course
- Zero Plastics have processed more than 1 million milk bottle lids into everyday products (e.g. USB's, clipboards etc.)

Insight Businesses going circular

Ballarat has an online tool, known as Aspire, that supports business to trade, donate or sell materials whilst calculating their circular economy impact.

How to join Aspire?

- You can join at www.aspireme.com. More than 100 local business have joined already

Why join Aspire?

- Ballarat business generate waste products that can be high quality when retained separately and reused by other business. Using Aspire to trade, donate or sell materials can potentially save on waste disposal and supply chain costs

Do you know how much waste goes to landfill?

- Victorians currently send more than 4.7 million tonnes of waste to landfill every year (Source: Recycling Victoria dashboard 2020-21)
- Locally, Ballarat residents and businesses fill a hole with waste each year that is equivalent to filling Mars Stadium almost six metres deep!
- Valuable resources within waste are being lost to landfill while raw materials continue to be sourced to make new products (the linear economy), which is not sustainable

Case study Living a waste free lifestyle

In 2023, almost 40 local households completed 'waste free lifestyle' courses hosted at the Ballarat East Neighbourhood House and Sebastopol Library.

The short course was supported by Sustainability Victoria through the Communities Fund (Round 2). It was designed by local firm Environmental Evolution in partnership with the City of Ballarat, Neighbourhood House, the Ballarat Wholefoods Collective and Repair Café, and with the participants enrolled in the course.

Environmental Evolutions training coordinator Julie White said the greatest success was to "see households feeling empowered, taking the learnings home to achieve real change in purchasing and waste management habits, and feeling inspired to become ambassadors to propagate their learnings to family and friends".

Sustainable Water Use

Water is essential to human life, Traditional Owner values and the economic prosperity of Ballarat. A collaborative approach to using all forms of water will minimise impacts on our water supplies and the ecosystems that depend on the water cycle.

What would sustainable water use look like?

Key water user groups of residents, businesses and open space managers using all forms of water efficiently to create healthy and valued landscapes and support economic prosperity.

Some of the key challenges

Well recognised key local challenges include population/ urban growth leading to increased water demand and increased stormwater runoff, and Climate Change leading to increased frequency and severity of drought and lower overall rainfall and runoff to storages. Cost effective and innovative solutions are required to improve liveability and support economic prosperity.

Key strategic directions (long-term)

- High efficiency appliances, rainwater tanks and grey water systems at home. Target 155 litres per person per day (existing urban) and 124 litres (new homes) (Ballarat IWM Plan 2018)
- Empowering residents, businesses and open space managers to better understand their impacts and be more water efficient
- Supporting water efficiency and increase the uses of recycled water and reclaimed stormwater, particularly for open spaces and industry uses

Outcome Indicators	Result	Trend
Business and Industry water use (litres per day per local full time equivalent jobs)	106	-1.1%
Residential water use (litres per person per day)		
Existing homes in Ballarat	184	-1.5%
Homes in growth suburbs of Ballarat	159	+4%
Smaller townships and villages	200	-0.2%

Note: This report focusses on domestic water uses. Refer to Southern Rural Water (www.srw.com.au/more/publications) for information about the sustainability of surface water diversions and groundwater extractions, resultant from water use by all sectors.

Action / Key Directions Indicators	Result	Trend
Volume of recycled and reclaimed water used for irrigation of urban open spaces (megalitres/million litres)	111	0%
Examples of key water efficiency initiatives/ rebate programs and accreditations	To be determined (e.g. rainwater tanks, water efficient appliances, greywater systems etc.)	

What the data is telling us

Recent water use trends are difficult to analyse due to wetter than usual conditions (moderate La Nina 2021/2022 and 2022/2023) and working from home arrangements during the Covid pandemic. The data indicates similar levels of water use the past few years, but a longer analysis has not occurred. New homes in growth suburbs are proving to be more water efficient than existing dwellings. The typical daily usage in new homes is likely to be lower than shown, which would include water used for landscaping and construction. The lower daily usage of new homes also demonstrates what could be achieved at existing homes (e.g. water efficient appliances and rainwater tanks). The 2021 Census results for Victoria (see case study next page) also suggests that rainwater tanks are not being used to their full potential at new and existing homes, but there is no local data to confirm this. The volume of recycled/reclaimed water has remained constant during recent years. Future reports should see a considerable increase in this resultant from the current City of Ballarat and Central Highlands Water partnership to expand processing capacity and to connect additional sites to recycled/reclaimed water supplies.

Sustainable Water Use

Key achievements

- Central Highlands Water (CHW) facilitated the State Government Schools' Water Efficiency Program (SWEP) to more than 30 campuses, reaching more than 800 students
- Over 350 CHW customers supported through CHW's Customer Rebate Plumbing Program (CRP) and Community Housing Retrofit Program (CHRP)
- CHW has sold over 2,000 Choose Tap reusable water bottles, with 100 percent of proceeds donated to Ballarat and District Aboriginal Cooperative (BADAC) Youth Programs
- CHW, with the support of the City of Ballarat, commenced studies for roof water harvesting in Ballarat's west to replenish groundwater supplies
- City of Ballarat and CHW entered partnership to upgrade recycled water supplies at the Ballarat North Water Reclamation Plant and establish new connections to community assets, starting with Victoria Park and Wendouree West Recreation Reserve
- Advocating for high water efficiency and recycled/ reclaimed water are key parts of the water servicing strategy and stormwater plan for new Precinct Structure Plans

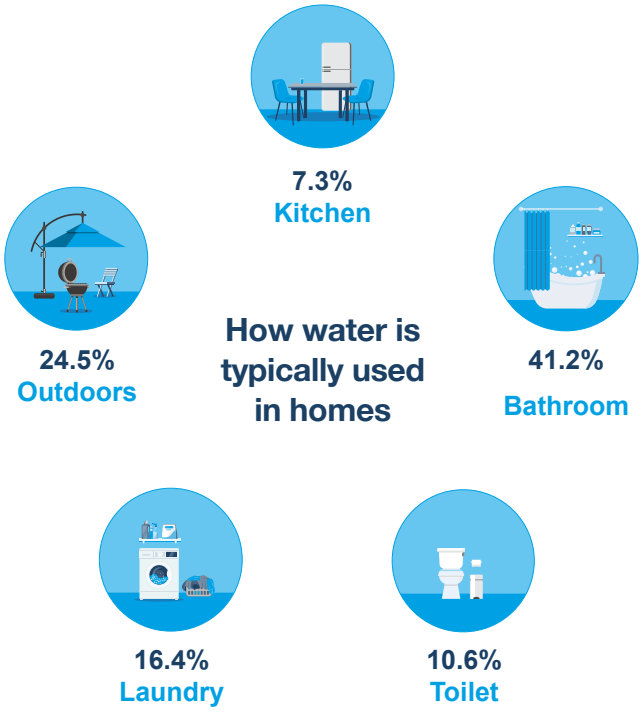
Case study — Rainwater tanks giving power to the people

Since the Millenium Drought residents in the region have reduced their water consumption by approximately 30 to 35 percent. While Permanent Water Saving Rules (PWSR) played a part, the key to success was people power. It was behaviour change by the user at home with a renewed focus on waterwise gardens, using rainwater tanks, using water efficient appliances, and eliminating wastage.

Sustainable water use at home is the greatest opportunity for the future. Approximately 70 percent of potable water supplied by CHW is used in the home (Source: CHW Annual Report 2022/2023).

Installing a rainwater tank is one of the greatest proven opportunities for residents to save water and costs at home.

- Ballarat residents could save up to 25 percent of their daily water needs by connecting a new or existing rainwater tank to their toilet, laundry and outdoor irrigation
- That would be up to 1,750 million litres of water saved each year if every home did this. That's equivalent to the amount of water used in approximately 14,000 new sustainably designed and water efficient homes



Fact — Rain water tank maintenance

Did you know that only 58 percent of rainwater tank owners in Victoria claim to conduct maintenance (Source: Census 2021, Australian Bureau of Statistics). The cleaning of gutters, filters, insect proofing and checking pumps is essential to realising the full benefits of saving water and saving money.

Healthy Waterways and Wetlands

Think of Ballarat's waterways as green spokes connecting the city's environments and connecting the city to rural landscapes. They are vital links for flora and fauna, recreation and community health, and rich in Traditional Owner and Gold Mining heritage.

What would healthy waterways look like?

The ecological function of Ballarat's waterway and wetlands will be restored, also enhancing amenity and recreation, and protecting heritage values.

Some key challenges

Urban sprawl, stock/grazing pressures, habitat clearing/ fragmentation, pest plants and animals, streambank erosion from historic soil disturbance and increased urban stormwater flows, difficult site access and need for long-term commitment and coordination across many landowners/managers.

Key strategic directions (long-term)

- Increase land reserved for waterways and wetlands for conservation
- Identify and take targeted action on key values/risks to waterway and wetland health
- Escalate the level of investment and action in riparian restoration in urban and rural/agricultural areas
- Action on urban stormwater quality improvement in new developments and existing areas

Key waterways	Condition (at 2010)	Water Quality (current)	Life (current)
Yarrowee River upstream of the inner-city area	Very poor	Mostly excellent	Moderate pollution
Yarrowee River downstream of the inner-city area	Very poor	Mostly good	Moderate pollution
Canadian Creek and its tributaries	Very poor	No data	No data
Winter Creek and its tributaries	No data	No data	No data
Burrumbeet Creek and its tributaries	Poor	No data	No data

Wetlands	Result	Trend
Perennial wetlands - average annual increase/decrease in extent (since 2010 break of the Millenium Drought)	-	-2.4%
Seasonal wetlands - average annual increase/decrease in extent (since 2010 break of the Millenium Drought)	-	-3.0%

Note: Further research is required regarding measurement systems for the condition, water quality and life at wetlands, and the data gaps identified above for waterways, as well as measuring the progress of action toward the key strategic directions.

What the data is telling us

The last Victorian Index of Stream Condition (ISC) was in 2010 when the main tributary of most local waterways were assessed to be in very poor physical condition mainly because of increased urban runoff and history of soil disturbance from gold mining (Yarrowee River and Canadian Creek) as well as clearing for agriculture (Burrumbeet and Winter Creek). The amazing efforts of Landcare, Friends of Groups, and many others, over the past two years toward riparian restoration is discussed on the next page.

Water quality and macroinvertebrate surveys have continued for the Yarrowee River and indicate water quality decreases as it passes through the city. While the water quality is still considered to be satisfactory downstream of the city in the Yarrowee River, the in-stream macroinvertebrate show signs of stress from pollution and disturbance. The water quality of Burrumbeet Creek was also continually measured as poor condition, and the instream macro-invertebrate life also likely to be stressed but has not been continually measured.

An alarming local observation is the continued decline in the extent of perennial and seasonal wetlands, despite wetlands being constructed in development areas. The decline in wetland extent is likely from the result of drying climate and agricultural impacts. Unfortunately, there is a lack of local data regarding wetland conditions.

Healthy Waterways and Wetlands

Key achievements

- Napoleons Enfield Landcare created ponds/habitat for Growling Grass Frog at Scotchman's Lead, and including Yarra Gum in riparian projects
- Friends of Yarrowee reformed the Specimen Vale group and have continued small scale restoration projects adjacent Black Hill, Specimen Vale Creek and Little Bendigo Creek
- Wattle Flat Pootilla Landcare celebrated 20 years, conducted flora and fauna surveys of Brown Hill and Wattle Flat, and continued revegetation of the upper Yarrowee River
- More than 30 schools/community planting days with more than 400 participants by Landcare community
- Central Highlands Water extensive revegetation of Sebastopol (see case study) and along sewer pipe upgrades, as well as continued efforts at Gong Gong, Kirks and White Swan areas
- Hydrology impacts study complete for Mullawallah Wetlands. The Cardigan Windermere Landcare and the Western Region Ecological Network (WREN) has commenced Management Plan development

Case study Gobata Dja team caring for the Yarrowee River

In 2023 the City of Ballarat, Central Highlands Water and Wadawurrung Traditional Owners Aboriginal Corporation partnered to deliver a significant restoration project on the Yarrowee River in Sebastopol, following upgrades at the adjacent ponds of the Ballarat South Water Reclamation Plant. The restoration efforts included streambank stabilisation from erosion impacts and the establishment of more than 12,700 indigenous plants.

The City of Ballarat's Coordinator of Gardens and Natural Resources, David Keighrey, said the project was "good timing and testament to what partnerships can deliver. This was one of the most degraded sections of the Yarrowee River flagged as a priority under the Yarrowee River Master Plan 2020, and CHW's adjacent upgrade works were a great catalyst to get the restoration efforts going. The project site is near the Dowcra Street entrance to the Yarrowee River Trail and the project delivers great outcomes for the environment, public recreation and for Traditional Owners". This section of the trail attracts about 260 to 315 visits each day and access was recently upgraded through the Spotlight on Sebastopol project with support of the Victorian Government.

The Yaramlok (Yarrowee River) is significant to Wadawurrung Traditional Owners as a stronghold for water, food and resources. The revegetation project was carried out by the Wadawurrung's Gobata Dja (Caring for Country) team, who will continue to maintain the site for two years. Wadawurrung Traditional Owner and Gobata Dja NRM Field Representative, Will Blake, who worked on the project said "it felt really good giving back to Country and putting some life into the Yaramlok (Yarrowee River)". Gobata Dja Senior Team Leader, Paul Marriott said "this is the largest on-ground planting project we have delivered within the central highland's region. It's been rewarding to see our young local Traditional Owners stand up and begin to heal this waterway. Our aim is simple, to return this site to a place of deep connection and interaction for Wadawurrung Family and the broader community".

Land and Biodiversity

From the volcanic plain grasslands in the west to the heathy dry forests in the east, Ballarat has a wide variety of native plants and animals. From big or small, all plants and animals play a part in maintaining a healthy ecosystem.

What healthy ecosystems would look like?

Championed by an actively engaged and informed community, the natural environment is protected, restored and connected for health and resilience. (Source: City of Ballarat's Biodiversity Vision and Commitment 2023).

Some of the key challenges

Examples of local challenges include urban sprawl, stock/grazing pressures, habitat clearing/fragmentation, pest plants and animals, loss of old growth and hollow bearing trees, climate change impacts on species ability to adapt, loss of genetic diversity, and the need for long-term commitment and coordination across many landowners/managers.

Key strategic directions (long-term)

- Increase urban canopy/vegetative cover across both public and private land
- Establish ecological links in city environments and rural areas, connecting to remnant vegetation
- Targeted action on high value / high risk flora, fauna and ecological communities
- Action on pest plants and animals
- Engage with Traditional Owners and increase community participation in natural resource management

Outcome Indicators	Result	Trend
Urban canopy/vegetative cover (percent) in Ballarat across public and private land	13.2%	Not available
Average annual increase/decrease (as hectares) of land covered by native vegetation (since 2010 break of the Millenium Drought)	9,954	+0.56%

Action / Key Directions Indicators	Result	Trend
Net gain in number of street trees in existing parts of Ballarat (excluding new suburbs)	3,320	Not available
Estimated number of native trees/shrubs/ground cover planted, mainly in degraded areas outside of conservation reserves	>20,000	Not available
Area (hectares) of protected private property limited to Conservation Covenants. Data pending regarding other forms of protections	73	-

Note: (Conservation Covenants shown. Data pending regarding other protections)

What the data is telling us

Overall vegetation cover has increased about 8% since 2010 (since the Millenium Drought). Visual interpretation of aerial images suggests that most gains were in forestry and regional/state reserves, as well as conservation efforts along waterways. Limited action has occurred in fragmented landscapes away from waterways, based on the visual interpretation. The Victorian Government is progressing with innovations in remote sensing to measure "Net Gain" which is a combination of vegetation extent and condition, as well as measure the level of fragmentation. This will hopefully enable better local analysis of local trends in future editions of the Report. Besides vegetative cover (e.g. shrubs and trees), the Ballarat area has significant grasslands (rare and endangered), but it is difficult to locate data regarding current condition of grassland populations in the local area

Within the urban environment, the current canopy cover in Ballarat across public and private land is 13.2%. The City of Ballarat has increased its focus on tree planting along streets and public open space reserves in recent years. These continued efforts and the adoption of the Sustainable Subdivision Framework (see Development in Focus section) should result in an increase in urban canopy cover in the future as monitoring systems to track urban canopy cover continue to be developed and repeated.

Land and Biodiversity

Key achievements

- Goldfields Little Creeks Restoration Plan and Indigenous Plant Suppliers Guide released (Bunanyung Landscape Alliance)
- Release of the Indigenous Insect Guide and Indigenous Wildlife of Southern Ballarat: 40 Fauna for Juniors (Leigh Catchment Group)
- Napoleons Enfield – establish 10 strongholds for flower/seed of understorey species, trials of Kangaroo Grass and Yam Daisy establishment.
- Friends of Canadian Corridor hosted Wildflower Walk (with Field Naturalists Club) with over 600 participants, and continued Koala surveys
- City of Ballarat Biodiversity Vision and Commitment Statement released, leading to development of Biodiversity Strategy (in writing)
- Increased street tree planting, focussing particularly on heat affects. Targets include streets and pedestrian routes adjacent schools / childcare centres and the suburbs of Wendouree, Alfredton, Sebastopol and Ballarat North
- Friends of Skipton Rail Trail continued tree establishments, further supported by Friends of Yarrowee

Fact **A tree hollow is a home**

In many instances it can take 80 or more years for a tree to grow and mature to form tree hollows. Yet it can be lost in only minutes!

There are old Oak Trees and native trees in Ballarat and places like Buninyong, Learmonth and rural areas with Possum and Rosella and much more.

The right plants, in the right numbers at the right time.

- A Guide to Indigenous Plant Suppliers for the Ballarat, Bacchus Marsh and Geelong Regions
- go to Nursery Guide by Bunanyung Landscape Alliance)

Case study **Get onboard Gardens for Wildlife Ballarat**

Do you consider yourself a “green thumb”? Have you heard the saying “a healthy tree, health me”?

- Gardens for Wildlife Ballarat is a FREE program available to all residents of Ballarat. It’s run by volunteers and almost 300 local households have joined since the program commenced in 2019 in Ballarat, along with more than 1,000 social media followers
- Participants receive targeted information, participate in events, join peer-to-peer learning, and have access to trained mentors (“Garden Guides”) regarding local plants, water wise and climate adapted species, and the values to local animals
- Visit the Ballarat group here www.gardensfor wildlifeballarat.com to learn more and to get gardening

Development in Focus

Ballarat is one of the fastest growing regional cities in Australia. The municipality's population 10 years ago was 98,000 and today is 120,000. Population is set to grow to more than 140,000 by 2035. That's a population growth of 42 percent in just over 20 years. Long-term growth areas beyond 2035 are also at early stages of planning.

In 2023 the City of Ballarat,

- Endorsed [by Council] its Environmentally Sustainable Design Policy (ESD Policy, March 2023). Permit applications are now required to demonstrate significantly improved sustainability outcomes for factors such as daylight and natural ventilation, stormwater management and energy efficiency. This applies to all development except single dwellings or subdivisions.
- Sustainable Subdivision Framework (SSF) has now evolved into Guidelines for development. This considers factors such as street layout, liveability, ecology and urban heat, and efficient use of resources and waste. This ensures a future of carefully planned communities setup to achieve quality of life & well-being of the environment and people.

Outcome Indicators and Action / Key Directions Indicators	Result	Trend

Note: local data recording systems for sustainability outcomes in subdivisions and new suburbs, and the sustainability outcomes within allotments and their dwelling(s) are not yet fully developed for Ballarat. It is intended that future editions of this Report will measure the positive outcomes of initiatives like the Sustainability Subdivision Framework and ESD Policy 2023 in the Ballarat municipality.

Case study — Sustainable living, from the developer and residents point-of-view

The Nightingale development consists of 27 apartments on 4 levels. It was completed in 2022 with a high focus on sustainable design principles that were driven by the Nightingale developments with Breathe Architects and local project manager, Hygge Property.

The project managers director, Joseph Van Dyk said "we are a team of locals and we are here for the long-term. We want to carve out a 'brand' that focusses on energy efficient and sustainable living. We talked with the developer and the community early in the process and we knew there was demand for sustainable living in Ballarat".

The residents love it too. Here is what they have to say,

- "everything you would want to do to make the building more sustainable has already been done"
- "the thoughtful design means that we have everything we need and nothing that we don't, and the apartments are spacious"
- "The communal spaces are such a luxury and having open areas with space for plants in an apartment building really makes a difference"

- ✓ All-electric
- ✓ 8+star
- ✓ 100 percent Green Power
- ✓ Solar electric
- ✓ Heat pump Hot Water
- ✓ Double glaze windows
- ✓ Cross-ventilated
- ✓ Shared laundry and roof garden
- ✓ Recycled bricks
- ✓ Local materials
- ✓ Carbon neutral
- ✓ Car share spaces
- ✓ Bike parking area
- ✓ Close to Public Transport

Appendix 1 - Report Framework

This Reporting Framework outlines the data sources used and acknowledgements, units of measure, scale of data (e.g. suburb, city, municipality), and describes what the indicator represents and known data limitations. The range of measures used will evolve in future editions.

Environmental Data

Environmental Theme	Indicator	Unit of Measure	Description	Geographical scale	Data Source / Acknowledgements	Link to source
Climate and Atmosphere	Annual Average Temperature	Rank	Rank of annual average temperature, as measured consistently across the globe since 1880	Global	National Centres for Environmental Information of the National Oceanic and Atmospheric Administration (NOAA)	https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature
	Greenhouse Gas (GHG) Emissions	Tonnes of Carbon Dioxide Equivalent (t/Co2e)	Major sources of GHG emissions calculated consistent with the Global Protocol for GHG Emissions reporting (the GPC Protocol) for electricity, gas, transport, waste, industrial processes and product use (IPPU), agriculture and other land uses. The key sectors discussed in individual section of the State of Environment Report are listed below, (1) Transport - emissions from all forms of transport including bus, car, train etc. that occurred within the municipal boundary (for InBound, OutBound and InBoundary journeys) (2) Energy - emissions from gas and electricity individually reported for residential, commercial and industrial. (3) Waste - the Waste and Circular Economy section focusses on emissions from landfill caused from residential, commercial and industrial wastes (Note: emissions from wastewater treatment excluded from the Waste and Circular Economy section)	Municipality	Free resource by Beyond Zero Emissions and Ironbark Sustainability for community use.	https://snapshotclimate.com.au/locality/municipality/australia/victoria/ballarat/
Sustainable Transport	Passenger vehicle travel	"Kilometres (per person per year)"	Analysis includes InBoundary meaning that the start and end points of the journey occur within the City of Ballarat. Analysis excludes InBound and OutBound, as best to represent majority of Ballarat's typical day-to-day travel. A declining trend for InBoundary car travel would indicate a reduced dependency on cars.	Municipality	Google Environmental Insights Explorer (Google EIE)	Subscription service for detailed analysis tool that is additional to the publicly available resource https://insights.sustainability.google/
	Electric Vehicle (EV) ownership	Count	Reported as fraction (percent) of motor vehicles registered for road use in Australia that are Electric, Hybrid Electric or Hydrogen propelled. Filtered to Ballarat postcodes, local passenger and light commercial to, at best, represent the dominant vehicle ownership categories in the municipality.	"Municipality (by postcode)"	Bureau of Infrastructure and Transport Research Economics (BITRE) for the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA)	https://www.bitre.gov.au/publications/2022/road-vehicles-australia-january-2022-re-issue
	Social Infrastructure Index	Median	The Social Infrastructure Index refers to the number of social services that occur in Ballarat neighbourhoods (Statistical Area 1 according to the Australian Statistical Geography Standard). Examples include (but not limited to) health, education, early childhood and cultural services. An increasing trend in median would indicate that neighbourhoods are becoming more closely connected to social services to encourage walking and cycling, and reduced dependency on cars.	Ballarat urban area, including Buninyong and Miners Rest	Australian Urban Observatory by the Royal Melbourne Institute of Technology (RMIT University)	Subscription service for detailed analysis tool (see https://map.auo.org.au/ for more details)
	Daily Conveniences Index	Median	Average number of daily living destinations present within 1.600m of Ballarat neighbourhoods (Statistical Area 1 according to the Australian Statistical Geography Standard). Includes features like (but not limited to) supermarkets and convenience stores. An increasing trend in median would indicate that neighbourhoods have their daily needs locally, which encourages walking and cycling and reduced dependency on cars.	Ballarat urban area, including Buninyong and Miners Rest	Australian Urban Observatory by the Royal Melbourne Institute of Technology (RMIT University)	Subscription service for detailed analysis tool (see https://map.auo.org.au/ for more details)

Environmental Theme	Indicator	Unit of Measure	Description	Geographical scale	Data Source / Acknowledgements	Link to source
Clean Energy	Electricity Demand	Usage (kilowatt hours)	Electricity (kWh) supplied through the distribution network per person (for residential customers) and per Full Time Equivalent (FTE) local jobs (for commercial & industrial). At 2022/2023 it is generally considered that declining trend indicates uptake of energy efficiency measures. It is expected that progress against Victoria's gas substitution roadmap (see victorias-gas-substitution-roadmap) , and uptake/increase in electrification will influence the interpretation of this indicator in future years.	Municipality	Powercor network planning tools "energy consumption by Local Government Areas".	https://www.powercor.com.au/network-planning-and-projects/network-planning/
	Gas Demand	Number of connections	Victoria is preparing to substitute/transition away from gas (see victorias-gas-substitution-roadmap). The number of homes and number of business (commercial and industrial) with gas connections provides a good indicator of change.	"Municipality (by postcode)"	Data provided on request, with thanks to AusNet Services	Data provided on request, with thanks to AusNet Services
		Usage (t/Co2e)	There is a direct correlation between gas usage volumes and GHG Emissions. Therefore, the trend in municipal emissions from residential and business (commercial + industrial) gas usage was used, relative to population and number of Full Time Equivalent (FTE) local jobs.	Municipality	Free resource by Beyond Zero Emissions and Ironbark Sustainability for community use.	https://snapshotclimate.com.au/locality/municipality/australia/victoria/ballarat/
	Solar Electricity	Number of connections	Two indicators are used. Change (percent) in the number of homes and business with solar electricity, and Change (percent) in how much of the kWh supplied by the distribution network that was met by local solar (known as feed-in). At 2022/2023 raw data was not structured in a manner to individually analyse residential and commercial uptake of solar electricity.	Municipality	Powercor network planning tools "energy consumption by Local Government Areas".	https://www.powercor.com.au/network-planning-and-projects/network-planning/
		Usage (kilowatt hours)				
	Action on energy efficiency	“Multiple (see description)”	Several examples of the level of participation in incentive/rebate mechanisms and accreditations are provided. These include the number of Green Star and National Australian Built Environment Rating System (NABERS) accreditations, Solar Water Heater and Heat Pump installed through rebate programs, and the number of GHG emissions saved by residents and business form project registered for Victorian Energy Efficiency Certificates.	"Municipality (by postcode)"	Multiple	Multiple
Waste & Circular Economy	Waste to Landfill (Residential)	Kilograms (per person per year)	Based on the City of Ballarat's kerbside collection service. Excludes general waste materials self-hauled to Transfer Station. Kerbside only (excluding Transfer Station) enables comparison to other Victorian regional cities.	Municipality	Data provided by City of Ballarat, with comparison data retrieved from the Victorian local government waste data dashboard (Recycling Victoria)	https://www.vic.gov.au/victorian-local-government-waste-data-dashboard
	Waste to Landfill (Commercial & Industrial)	Kilograms (per local jobs)	Kilograms of waste received at the Ballarat Regional Landfill (BRL) relative to the number of Full Time Equivalent (FTE) local jobs. Data used excludes Prescribed Industrial Waste (PIW). This is considered reasonable indicator because most Commercial & Industrial waste received likely originates from within the Ballarat municipality. Some commercial customers might also use landfill other than BRL.	Municipality	Data provided by City of Ballarat	Data provided by City of Ballarat
	Contamination (Residential)	Fraction (of Volume)	Two indicators of residential contamination are used as measures of the communities ability to "get it right on bin night". Indicator 1 is the fraction (percent) of general waste bin that is recyclables incorrectly sent to landfill by residents, and Indicator 2 is the fraction (percent) of the recycle bin that is general waste. This assessment is based on the service standard (what can go where) at the time of writing, noting that service standards can change over time.	Municipality	Data provided by City of Ballarat	Data provided by City of Ballarat
	Contamination (Commercial & Industrial)	Fraction (of Volume)	Commercial & Industrial contamination was defined as the fraction (percent) of recyclables received at Ballarat Regional Landfill (BRL) as measured by site inspections. The loss of recyclables to landfill from this user group was defined as typical/common recyclables (e.g. plastic and glass bottles, paper and cardboard) and materials with known local recycling options available (e.g. metals, concrete/rubble, plasterboard and timbers).	Municipality	Data provided by City of Ballarat	Data provided by City of Ballarat

Environmental Theme	Indicator	Unit of Measure	Description	Geographical scale	Data Source / Acknowledgements	Link to source
Sustainable Water	Water Demand (Residential)	Litres (per person per day)	Based on metered water consumption data from the Ballarat & District, Learmonth and Waubra water supply systems for localities that are within the City of Ballarat. The litres (l/pp/day) is reported separately for three key residential categories of Ballarat (existing homes), Ballarat (homes in growth suburbs) and small townships (e.g. Buninyong, Learmonth).	"Municipality (see description)"	Data provided on request, with thanks to Central Highlands Water	Data provided on request, with thanks to Central Highlands Water
	Water Demand (Commercial & Industrial)	Litres (per local jobs)	Reported as litres per number of Full Time Equivalent (FTE) local jobs per day (l/FTE/day) based on metered water consumption data from the Ballarat & District, Learmonth and Waubra water supply systems for localities that are within the City of Ballarat.	Municipality	Data provided on request, with thanks to Central Highlands Water	Data provided on request, with thanks to Central Highlands Water
	Recycled/Reclaimed Water	Litres (Millions)	Includes treated wastewater and harvested stormwater provided through reticulated networks to irrigation uses. This measures the level of fit-for-purpose recycled/reclaimed water being used as direct substitute for potable water.	Municipality	Data provided by the City of Ballarat and Central Highlands Water, with thanks.	Data provided by the City of Ballarat and Central Highlands Water, with thanks.
	Action on water efficiency	"Multiple (see description)"	Examples of the level of participation in water efficiency initiatives under review at time of writing State of Environment 2022 - 2023			

Healthy Waterways & Wetlands	"Index of Stream Condition (1- Condition)"	See Description	Condition has been represented as a qualitative interpretation of the combined scores of three ISC categories of hydrology, physical form and streamside zone. Based on the available ISC data, the Report includes the Yarrowee River (upstream and downstream of the inner-city), Canadian Creek and Winter Creek in the Corangamite Basin and the Burrumbeet Creek in the Glenelg Hopkins Basin. The ISC presents an assessment of the main tributary, with the length of each reach assessed outlined in the ISC reports (see link).	Key waterways (see description)	Third ISC Reports 2010 for the Corangamite and Glenelg Hopkins regions	www.water.vic.gov.au/our-programs/water-monitoring-and-reporting/third-index-of-stream-condition-report
	"Index of Stream Condition (2- Water Quality)"	See Description	Water Quality results for Dissolved Oxygen, pH (acidity/alkalinity), salinity (measured as electronic conductivity), reactive phosphorus and turbidity. Measured in autumn and spring with results assessed and reported against the Australian and New Zealand Environment and Conservation Council (ANZECC) water quality guidelines 2000.	Key waterways (see description)	Third ISC Reports 2010 for the Corangamite and Glenelg Hopkins regions, and from 2010 onward uses from the Victorian Waterwatch program collected for and reported to the City of Ballarat.	www.water.vic.gov.au/our-programs/water-monitoring-and-reporting/third-index-of-stream-condition-report
	"Index of Stream Condition (3- Life)"	See Description	Life refers to the level of life within the waterway (i.e. in-stream). The sampling of macro-invertebrate populations in autumn and spring is used to measure the diversity and abundance of macro-invertebrate groupings. The Stream Invertebrate Grade Number, known as Signal scoring method is used.	Key waterways (see description)	Third ISC Reports 2010 for the Corangamite and Glenelg Hopkins regions, and from 2010 onward uses from the Victorian Waterwatch program collected for and reported to the City of Ballarat.	www.water.vic.gov.au/our-programs/water-monitoring-and-reporting/third-index-of-stream-condition-report
	Wetland	Size (extent)	Reported is the percent change in the extent (square kilometres) of perennial wetlands and seasonal wetlands as measured in 5 year periods. The average annual change since the Millenium Drought has been used.	Municipality	Victorian Land Cover Time Series 2019 (as XLS), as updated. Victorian Department of Energy, Environment and Climate Action.	https://discover.data.vic.gov.au/dataset/victorian-land-cover-time-series

Environmental Theme	Indicator	Unit of Measure	Description	Geographical scale	Data Source / Acknowledgements	Link to source
Land & Biodiversity	Urban Canopy Cover	Percent	Canopy cover at 2023 assessed by remote sensing technologies. All forms of canopy cover are represented in the urban environment regardless if big/ small, native/introduced. All forms of canopy cover provide benefit in the urban environment. The data was filtered to exclude large areas (e.g. Woowookarung Regional Park, Lake Wendouree, Victoria Park, and along waterways) to at-best represent the extent of canopy cover across private property and public land within typical urban landscapes.	Ballarat urban area	Google Environmental Insights Explorer (Google EIE)	Data provided on request, with thanks to Ironbark Sustainability and the Google EIE program
	Native Vegetation Cover	Square Kilometres	Includes categories of native shrub, native trees, native scatter trees and natural low cover but excludes native grass herb. This has been reported as the percent change in the extent of these categories as measured in 5 year periods. The average annual change since the Millenium Drought has been used, with further visual interpretation of historic aerial photography since 2010.	Municipality	Victorian Land Cover Time Series 2019 (as XLS), as updated. Victorian Department of Energy, Environment and Climate Action.	https://discover.data.vic.gov.au/dataset/victorian-land-cover-time-series
	Street Trees	Number (Net Gain)	The Net Gain excludes works in development areas where planting density requirements apply. The Net Gain therefore mostly represents improvement efforts in existing suburbs, towns and villages. Net Gain calculated as the number of trees installed by the City of Ballarat as implementation against Urban Forest Strategy, plus customer requests, minus tree removals by the City of Ballarat. This includes all plants from grasses to trees through City of Ballarat programs.	Municipality	Data provided by City of Ballarat	Data provided by City of Ballarat
	Native Vegetation Establishment	Number	City of Ballarat plant nursery donations to groups (e.g. Landcare and friends of groups), giveaways (e.g. events and school education days), and numbers gleaned from the annual reports and by interview with groups (e.g. Landcare and friends of). A conservative round number has been used. This excludes efforts in conservation reserves by land managers such as Parks Victoria to at-best represent the conservation efforts occurring in degraded landscapes.	Municipality	Various (see description)	Various (see description)

Development In Focus	Local data recording systems for sustainability outcomes in subdivisions and new suburbs, and the sustainability outcomes within allotments and their dwelling(s) are not yet fully developed for Ballarat.

Supporting Data

ID Forecast	Annual statistics for Estimated Residential Population (ERP), Residential Dwellings, number of business/industry, and number of local jobs as Full Time Equivalent (FTE) sourced from .idcommunity demographic resources (see https://forecast.id.com.au/ballarat)
Postcodes	For environmental datasets categorised by postcode the following postcodes were included, based on postcode boundaries at time of writing 2022/2023. The delivery and PO Box postcodes of 3350, 3352, 3353, 3354, 3355, 3356, 3357 and 3358 were used. Postcode boundaries don't always align with Local Government boundaries. Postcode 3364 was therefore excluded due to very minimal overlap with City of Ballarat in rural areas, whereas all of 3352 was included due to majority of population and development occurring within the City of Ballarat.

CITY OF BALLARAT

The Phoenix | 25 ArmStreetrong Street South, Ballarat, VIC 3350
City of Ballarat | PO Box 655, Ballarat, VIC, 3353

03 5320 550 ballarat.vic.gov.au