



Final

Resource Recovery and Waste Management Strategy 2018-22



Document control

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Approval

The following people are responsible for signing-off on the content of the document. Signatures constitute an acceptance and agreement of the document's content.

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Abbreviations

AWT	Alternative Waste Technology
Grampians Central West Implementation Plan	Grampians Central West Waste and Resource Recovery Implementation Plan
GCWWRRG	Grampians Central West Waste and Resource Recovery Group
C&D	Construction and demolition
C&I	Commercial and industrial
COB	<i>City of Ballarat</i>
DELWP	Department of Environment, Land, Water and Planning
EPA	Environment Protection Authority
EP Act	Environment Protection Act 1970
EPS	Expanded Polystyrene
FOGO	Food Organics and Garden Organics
GO	Garden Organics
LGPRF	Local Government Performance Reporting Framework
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
MUD	Multi-unit Development
RRC	Resource Recovery Centre
RRWMS	Resource Recovery and Waste Management Strategy
SV	Sustainability Victoria
State infrastructure plan	Statewide Waste and Resource Recovery Infrastructure Plan
TBL	Triple Bottom Line assessment
WRRG	Waste and Resource Recovery Group

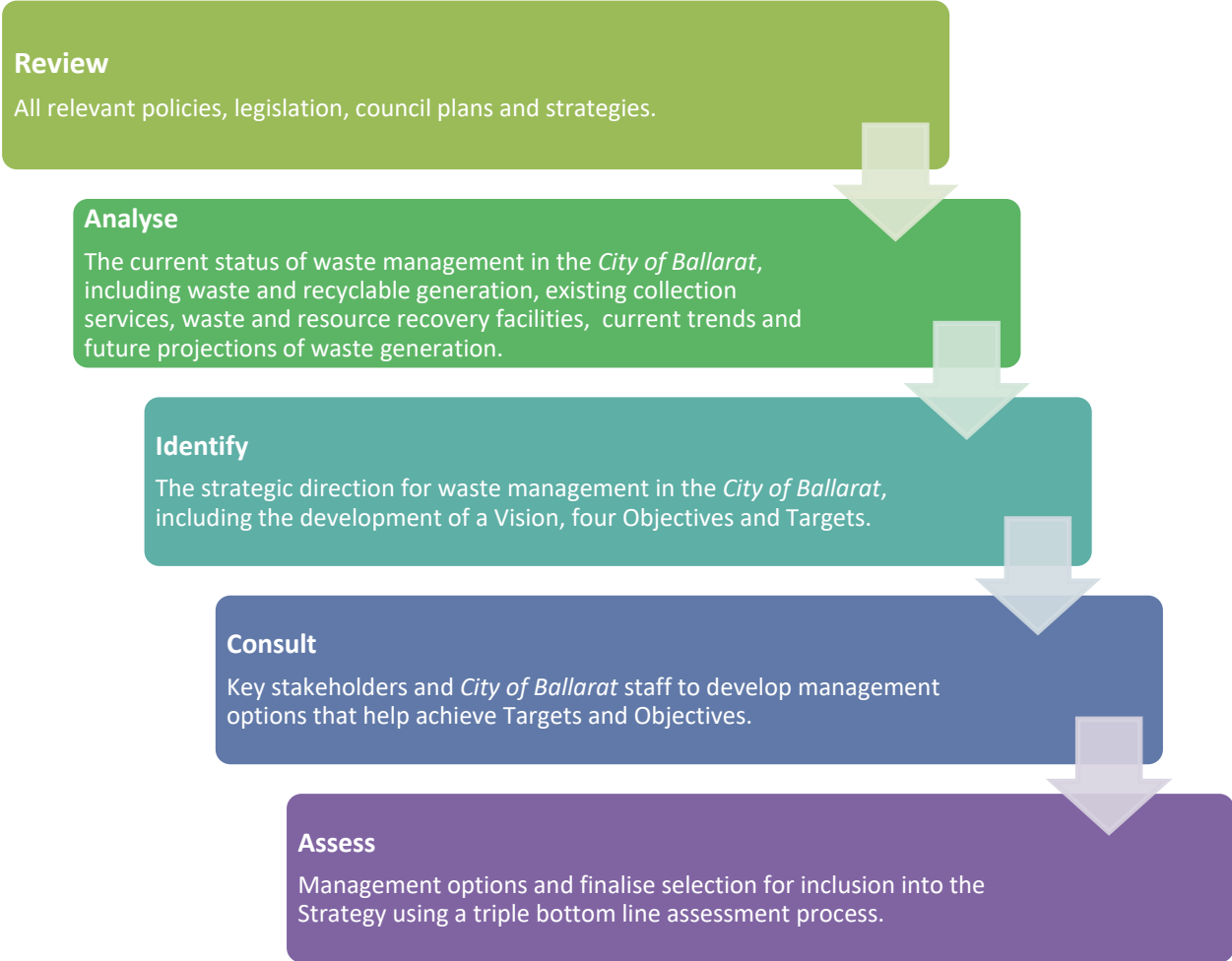
Executive Summary

The *City of Ballarat Resource Recovery and Waste Management Strategy 2018-22* (the Strategy) considers current and future waste management and resource recovery in the *City of Ballarat*. The Strategy identifies long-term strategic direction for sustainable waste management and provides a focus on the *City of Ballarat's* Targets to be achieved over the next five years.

Vision: To achieve zero recoverable waste to landfill by 2040.

- Objective One: Full resource recovery**
- Objective Two: Viable resource recovery markets**
- Objective Three: Adaptive infrastructure and operations**
- Objective Four: Strategic planning**

The Strategy was developed through a comprehensive process as outlined below.



Community Consultation of the Draft Strategy

The community consultation of the Strategy was held over a four-week period from 13th March to 6th April, 2018. Overall the *City of Ballarat* residents that contributed to the consultation survey were positive and in support of the Strategy. This is seen by the summary of statistical results provided below. Detailed information can be found in the Appendix D of the *City of Ballarat Resource Recovery and Waste Management Strategy Background Report, 2017*.

- 92% of the respondents supported the Vision
- 100% of the respondents supported the Objectives
- 92% of the respondents supported the Targets.
- 92% of the respondents supported the Management options. The remaining 8% were neutral.

Complimenting this high level of support, were comments provided by the respondents which were positive and action orientated. Practical suggestions on subjects such as waste reduction, collection, recycling, and education provides the *City of Ballarat* with a rich list to choose from and add to the Annual Implementation Plan. There were also comments that were outside of the *City of Ballarat's* control and in the realm of influence or concern.

Waste in the City of Ballarat

Waste generation and material recovery

Waste management is an issue for all households and businesses, and is central to the *City of Ballarat's* economy. Currently, the *City of Ballarat* has a well-developed waste management sector that generates significant employment and economic activity through the collection, transportation, sorting and processing of waste.

In 2017, 70% of all waste processed in the *City of Ballarat* came from the Municipal Solid Waste (MSW) sector, while 27% came from the Commercial and Industrial (C&I) sector and only 3% came from the Construction and Demolition (C&D) sector.

The *City of Ballarat* sent 26,828 tonnes of MSW to landfill in 2017. This represents approximately 253 kilograms of waste entering landfill for each person living in the *City of Ballarat*. A further 26,051 tonnes of waste were diverted through recovery processes.

The introduction of a kerbside greenwaste collection service in Ballarat in July 2016 saw more than 9,300 tonnes of green waste collected in the first year of operation, resulting in an increase in the diversion rate of municipal solid waste from 38% to almost 50%. These bins also showed very little contamination (1%). However, waste audits indicate that just under 30% of the contents of kerbside garbage bins contained potentially divertible waste.

When looking at the C&I and the C&D sectors, the majority of waste collected was potentially divertible, with 30% being potentially divertible organics and approximately 60% being potentially divertible recyclables. By addressing this potentially divertible waste the *City of Ballarat* can increase diversion rates, lowering the amount of waste going to landfill.

Council services and facilities

The *City of Ballarat* delivers three kerbside collection services: garbage, recycling and greenwaste. In the financial year of 2016/2017, 20,138 tonnes of waste, 9,083 tonnes of recyclables and 9,380 tonnes of greenwaste were collected. To achieve this, a fleet of 14 trucks and 17 FTE staff are employed annually to collect 44,251 garbage bins and recycling bins and 33,680 green waste bins. In addition to kerbside collection, there are 325 public place waste and recycling bins in the *City of Ballarat*. These bins are emptied on a weekly basis, with services being increased to daily in high use areas and during events. The routine collection is also increased during daylight savings.

To service over 40,000 homes and the various businesses, commercial operations and industries in the region, the *City of Ballarat* has a range of waste and recycling facilities. These include; a transfer station, the Smythesdale Landfill, a greenwaste interchange facility and a transfer site for recycling.

Future predictions

Using a 'Business As Usual' (BAU) scenario, it is projected that by 2026 waste generation in the *City of Ballarat* would rise to approximately 61,000 tonnes annually. An estimated 30,000 tonnes would be recovered and 31,000 tonnes would enter landfill.

Appropriate and adaptive infrastructure is integral to the management of waste. Projected increases in waste supports the need to establish a central waste and resource recovery facility that updates the current transfer station, provides a central collection point where all waste and resources are sorted and re-purposed, with minimal waste going to landfill. An All Waste Interchange facility is currently being investigated to fulfil this purpose.

Further to this, the *City of Ballarat* is also investigating the options of a material recovery facility, organic processing and waste to energy solutions for future resource recovery and waste management. In order to change the BAU scenario outcome, the *City of Ballarat* has set a clear Vision for future resource recovery and waste management.

The City of Ballarat's Strategic Direction

Vision: To achieve zero recoverable waste to landfill by 2040.

In order to achieve this Vision four strategic Objectives have been established to provide direction for waste and resource recovery in the *City of Ballarat* over the next five years. This Vision and the four Objectives are in line with State and regional objectives.

Objective One: Full resource recovery

The *City of Ballarat* recognises waste as a valuable resource, which is currently under-utilised and aims to remove all valuable, recoverable materials from the waste stream prior to disposal in landfill.

Objective Two: Viable resource recovery markets

Meeting objective one is reliant on recovered resources entering a viable market. Understanding and supporting the development of viable resource recovery markets underpins the resource recovery process.

Objective Three: Adaptive infrastructure and operations

Invest in infrastructure and operational delivery that adjusts in order to proactively manage new and emerging waste streams and adapts to suit the changes in demand and supply supports the *City of Ballarat's* vision.

Objective Four: Strategic planning

The *City of Ballarat* aims to ensure strategic planning principles are embedded in waste management planning and implementation through the adoption of an adaptive management approach.

Targets and Management Options

The below table outlines Targets and management options for these objectives.

Vision: To achieve zero recoverable waste to landfill by 2040

Objectives	Full resource recovery		Viable resource recovery markets	Adaptive infrastructure and operations			Strategic Planning
Targets	T1.1 The growth in waste generation is less than the rate of population growth.	T1.2 Achieve 70% diversion of waste from landfill by 2022 with a long-term goal of 85% by 2028.	T2.1 90% of recovered material enters a viable market stream with a focus on local enterprise.	T3.1 Infrastructure enables full resource recovery targets to be met.	T3.2 Waste management operations are adaptive and exceed industry standards and benchmarks.	T3.3 Reduce incidents of illegal dumping by 50% by 2022.	T4.1 Adaptive management principles are embedded in waste management planning and implementation.
Management Options	<p>Work with relevant agencies, industry and schools on waste and resource reduction and recovery education and engagement.</p> <p>Educate and raise awareness of waste minimisation and avoidance through the development of a Waste Education Plan.</p> <p>Support/lobby for State Government to assist avoidance of waste by encouraging smarter production, product stewardship schemes and educating on reducing consumption (T1.1, T1.2).</p> <p>Provide advocacy in the community through support of waste minimisation initiatives (T1.1, T1.2).</p> <p>Identify and implement financial incentives and disincentives for waste minimisation across all sectors.</p> <p>Provide community leadership through local groups and businesses.</p>	<p>Develop a Waste Action Program to reduce recycling contamination across the MSW sector.</p> <p>Assess collection needs across all sectors, identify gaps in council services and investigate provision for those additional community needs.</p> <p>Educate and raise awareness of diversion options through the Waste Education Plan.</p> <p>Promote and advocate for the avoidance of single use products.</p> <p>Develop a business case for organic diversion options for MSW and C&I waste sectors.</p> <p>Encourage on-site reuse for construction & demolition waste, and work with local recyclers of C&D to better promote services in the region.</p> <p>Provide community leadership through local groups and business.</p> <p>Support GCWRRG's investigation into increasing the recovery of materials such as wood/timber, agricultural wastes, plastics, textiles, tyres and e-waste.</p>	<p>Develop a Resource Recovery Market plan.</p> <p>Improve resource recovery of priority marketable products, waste streams will go to the All Waste Interchange.</p> <p>Invest in 'pre-sort' infrastructure that aims to maximise on-site resource recovery (MRF). (T1.1, T2.1, T3.1)</p> <p>Undertake a gap analysis and develop a 3-year Strategic Resourcing Plan to enable proactive delivery of Waste Strategy, including opportunity for Resource Recovery Market Officer.</p> <p>Provide support for existing and emerging waste market initiatives.</p> <p>Consult with industry and GCWRRG to gather information on innovation and market development needs and priorities.</p>	<p>Assess and implement options for asset rationalisation, consolidation and upgrade of landfill and RRC infrastructure.</p> <p>Facilitate the consolidation of waste infrastructure including depot and transfer station to an All Waste Interchange (T1.2, T3.1).</p> <p>Invest in state-of-the-art waste service fleet, including investigation of alternative fuel and hybrid drive systems.</p> <p>Continue to pursue a feasibility study that looks at all options of waste to energy facilities that places Ballarat as a central processor of Victoria's waste (T1.2, T3.1).</p> <p>Provide assistance to industry to ensure infrastructure, facilities and services are operating and managed to protect the community, environment and public health.</p>	<p>Establish benchmarks for waste management services including: landfill management; transfer station, street cleaning and waste collection and use to inform best practice and continual improvement processes.</p> <p>Investigate logistics and infrastructure that produce efficiencies in waste transport including understanding the viability verses distance constraint.</p> <p>Implement the Smythesdale Landfill Master Plan.</p> <p>Work with the GCWRRG, industry and the EPA to progress any rehabilitation assessments and requirements for closed landfills.</p>	<p>Facilitate the development of an illegal dumping action plan with partners and key stakeholders.</p> <p>Establish a regional taskforce to address illegal dumping.</p> <p>Work with SV and the Victorian Litter Action Alliance (VLAA) to develop and implementation best practice litter prevention programs.</p> <p>Raise awareness of illegal dumping through the Waste Education Plan.</p> <p>Provide additional resources for enforcement activities.</p>	<p>Implement an annual review of the RRWM Implementation Plan.</p> <p>Apply adaptive management approach to waste management.</p> <p>Implement a reliable and targeted local data system that informs waste and resource recovery decisions and contributes to regional and state data systems.</p> <p>Work with GCWRRG and other councils to develop mechanisms and contingency plans to appropriately manage waste and material during and after emergency or unplanned events.</p> <p>Work with the GCWRRG to facilitate the development of council partnerships to enable efficiencies in resource recovery, materials transport and disposal.</p> <p>Collaborate with GCWRRG on waste infrastructure planning.</p>

GCWRRG = Grampians Central West Waste and Resource Recovery Group. EPA= Environment Protection Authority. SV = Sustainability Victoria

1. Introduction

The *City of Ballarat Resource Recovery and Waste Management Strategy 2018-22* (the Strategy) considers current and future waste management and resource recovery in the *City of Ballarat*. The Strategy identifies long-term strategic direction for sustainable waste management and provides a focus on Targets to be met over the next five years.

Vision: To achieve zero recoverable waste to landfill by 2040.

Objective One: Full resource recovery

Objective Two: Viable resource recovery markets

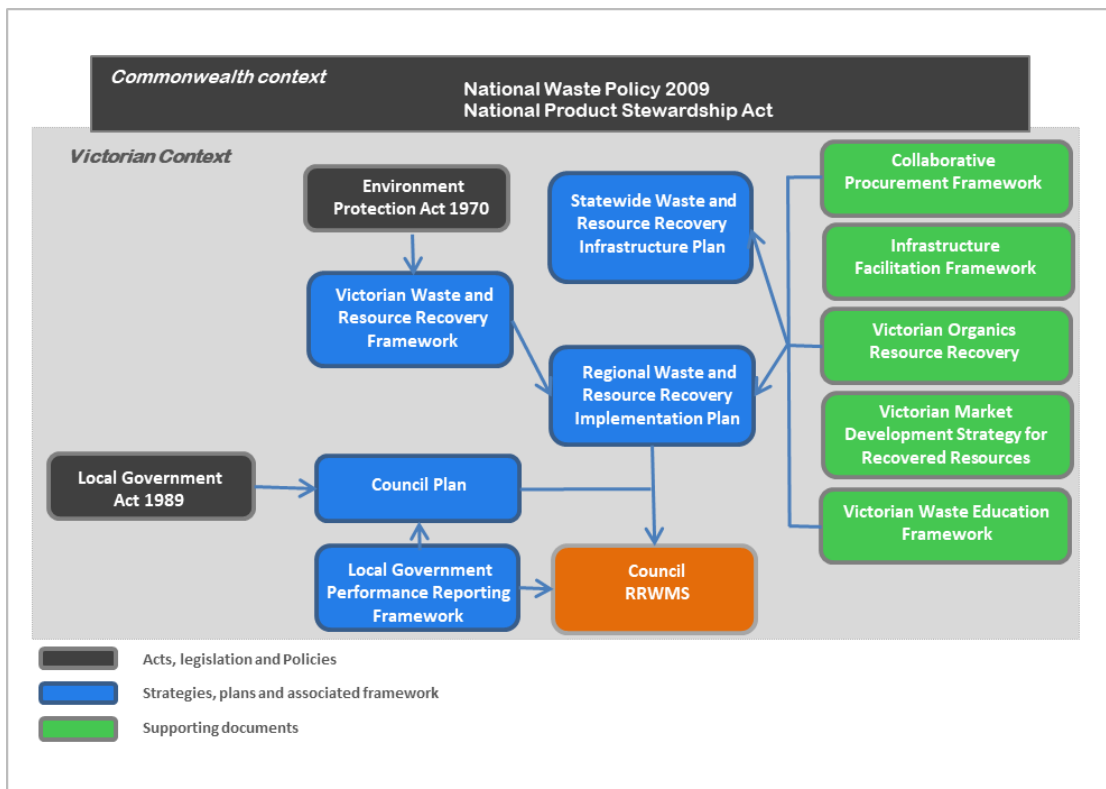
Objective Three: Adaptive infrastructure and operations

Objective Four: Strategic planning

1.1 Strategic Framework

The Strategy was developed within the framework of National, State and local government acts, legislation, policies, regulations and plans and regional initiatives of the Grampians Central West Waste and Resource Recovery Group (GCWRRG). Figure 1.1 shows an overview of this strategic framework.

Figure 1-1 Waste management planning framework



The Strategy was also developed through the following processes:

- Analysis of the current status of waste management in the *City of Ballarat*, including waste and recyclable generation, existing collection services and waste and resource recovery facilities;
- Review of current trends and future projections of waste generation;
- Consultation with key stakeholders;

- Analysis of future projected requirements for waste and resource recovery infrastructure;
- Analysis of existing and proposed management options for improving waste and recycling services;
- Assessment of the environmental, social and financial impacts of future management options for sustainable waste management.

1.2 Guiding principles

Waste Management Hierarchy

The waste management hierarchy is the underlying principle of waste management policies in Australia and is included in the *Environment Protection Act 1970*. It establishes the order of preference for waste management and underpins development of waste management options in the Strategy. The waste management hierarchy is outlined in Figure 1.2.

Figure 1-2 Waste Management Hierarchy

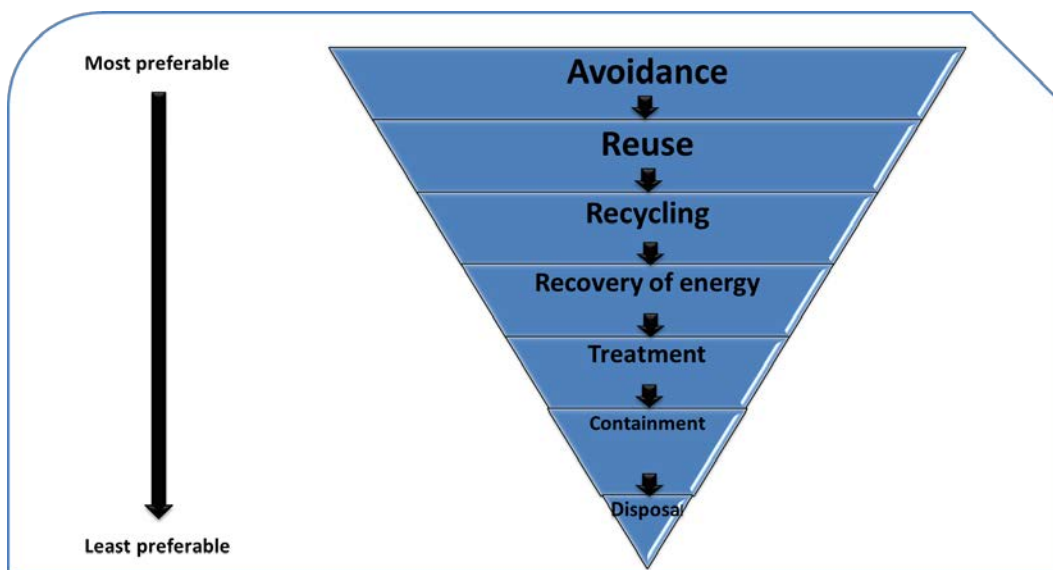
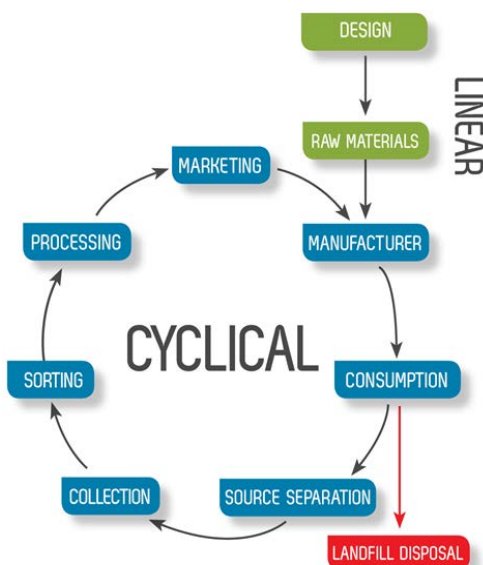


Figure 1-3 Linear and cyclical resource flows



Circular economy

Circular economy is discussed in Sustainability Victoria's *Victorian Market Development Strategy for Recovered Resources*. It suggests there are three key phases in the circular approach, including consumption, resource recovery and manufacturing. The linear 'take-make-dispose' supply chain approach to manufacturing and consumption is made circular by resource recovery, which brings materials back into the cycle for remanufacturing. This approach results in a very small component of waste going to landfill and underpins the *City of Ballarat's* zero recoverable waste to landfill vision. Figure 1.3 outlines both circular and linear resource flows.

2. Overview of waste in the *City of Ballarat*

2.1 Performance and achievements

An analysis of the *City of Ballarat's* performance against goals and targets from the 2013 Waste Management Strategy highlighted the *City of Ballarat's* key achievements over the last four years. These, together with other significant outcomes, are outlined in Table 2.1.

Table 2-1 Key actions and outcomes achieved by the *City of Ballarat*

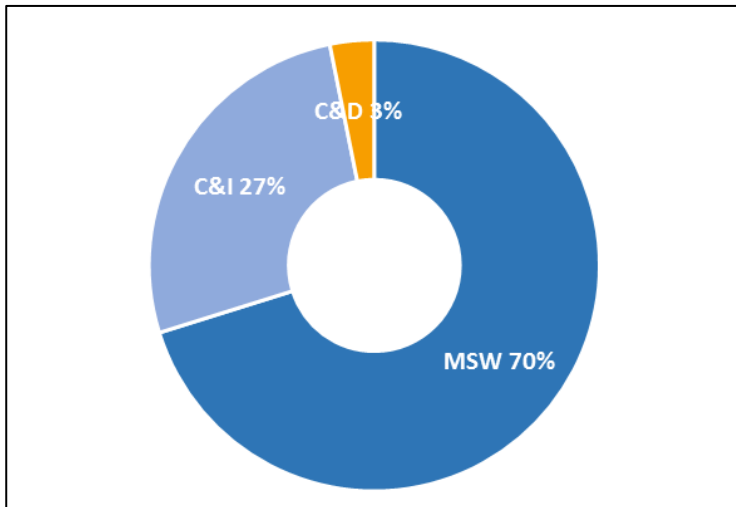
Action implemented	Outcome achieved
Benchmarking for the waste collection service	Waste collection service to remain in-house which allows greater flexibility and adaptability as we grow and the housing density changes.
Introduction of a greenwaste service in July 2016	9380 tonnes of greenwaste diverted. An increase in diversion of waste from 34% in 2013 to 49% in 2017. From the 12-month Review the 'opt in' option was adopted.
Creation of a Waste Education Officer position.	Collaboration with the Grampians Central West Waste and Resource Recovery Group over the past twelve months on some community programs including illegal dumping, recycling and greenwaste kerbside contamination investigation.
The extension of waste audits from kerbside recycling services, to all waste streams	Provides a clearer picture of the waste types generated and potential management responses.
Review the Smythesdale landfill Stage 2.	A Landfill Master Plan
Waste to Energy ready project	Review and alignment of contracts, benchmarking of service, data verification and collation undertaken, placing the <i>City of Ballarat</i> in a position to launch into the next phases of the waste to energy project.
All Waste Interchange Business Case	Subdivisional work in progress.

2.2 Waste generation and material recovery

This section outlines waste generation, material recovery, council services and facilities in the *City of Ballarat*. Analysis of council data provides a clear understanding of current waste generation and recovery in the Municipal Solid Waste (MSW), Commercial and Industrial (C&I) and Construction and Demolition (C&D) sectors. The following graphs have been compiled using the 2017 waste audits. The *City of Ballarat* is currently undertaking comprehensive waste audits, the outcomes of which are not included in this analysis. Once available the results can be used to further inform waste generation and material recovery in the *City of Ballarat*.

Where our waste is coming from.

Figure 2-1 Waste by sector 2017

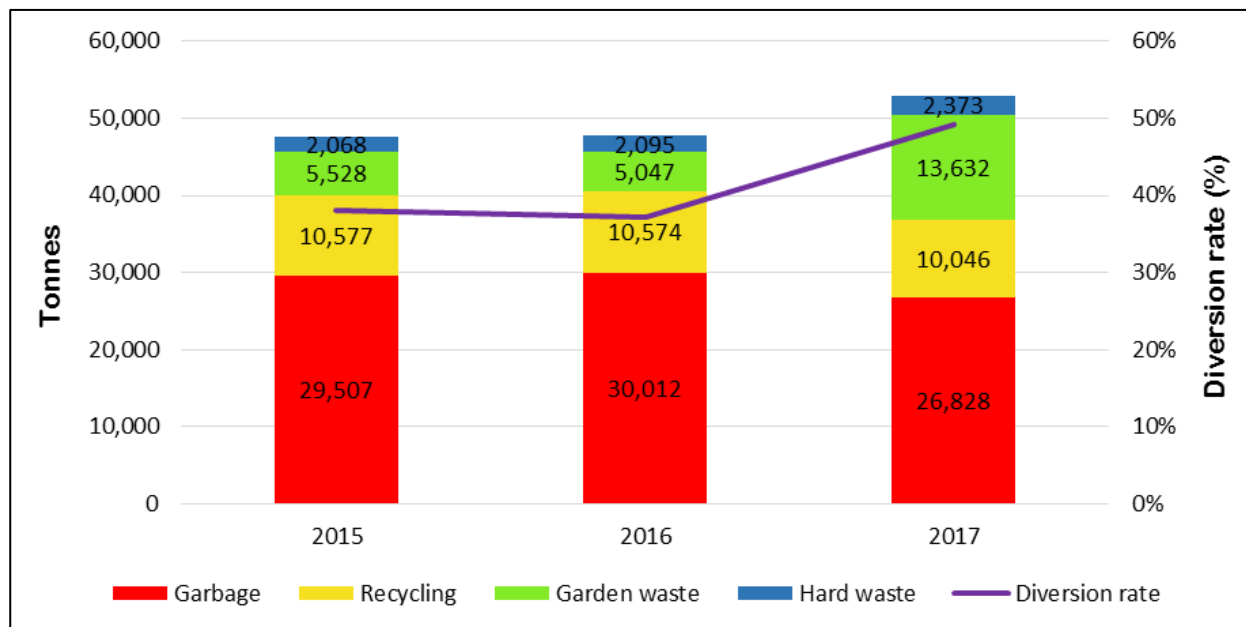


In 2017, 70% of all waste processed in the *City of Ballarat* came from the MSW sector, while 27% came from the C&I sector and only 3% came from the C&D sector (see figure 2.1). It is important to note that inflow may affect overall percentages as landfill figures for C&I and C&D include waste sources by contractors from outside the *City of Ballarat*.

The Municipal Solid Waste Sector

MSW includes waste from the three kerbside collection services, transfer station, public place bins and landfill. Figure 2.2 shows a breakdown of the volume in tonnes of MSW generated in the *City of Ballarat* from 2015 to 2017, as well as the rate of waste that was diverted from landfill either through recycling, greenwaste or hard waste separation and recovery.

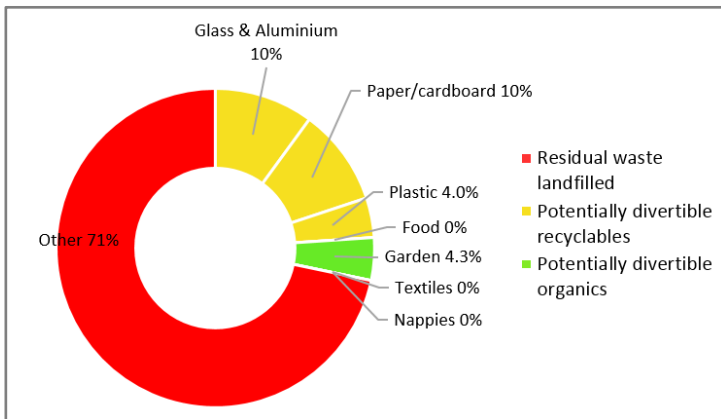
Figure 2-2 Waste and material generation 2015-2017



In 2017 the *City of Ballarat* sent 26,828 tonnes of MSW to landfill, while 26,051 tonnes of waste were diverted through recovery processes. This represents approximately 253 kilograms of waste entering landfill for each person living in the *City of Ballarat*. A further 26,051 tonnes of waste were diverted through recovery processes.

In July 2016, the introduction of a kerbside greenwaste collection service in Ballarat saw more than 9,300 tonnes of green waste collected in the first year of operation, resulting in an increase in the diversion rate of municipal solid waste from 38% to almost 50%. Greenwaste bins also showed very little contamination (1%).

Figure 2-3 Kerbside garbage bin composition 2017



However, waste audits indicated that just under 30% of the contents of kerbside garbage bins contained potentially divertible waste.

Figure 2.3 shows the average composition of waste found in kerbside garbage bins.

Figure 2-4 End point of municipal solid waste (MSW) 2017

Figure 2.4 shows the percentage of MSW that is recovered through recycling and green waste recovery processes. MSW to landfill includes waste from kerbside and public place bins, street sweepings and some material from transfer station. MSW recyclables includes waste from kerbside recycling and transfer station services, while MSW green waste includes waste from kerbside green waste and green material at the transfer station. Just over 50% of MSW was landfilled, with the other 50% recovered through green waste and recycling.

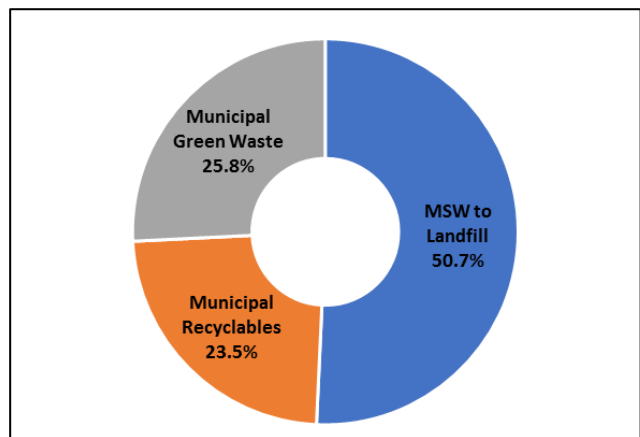
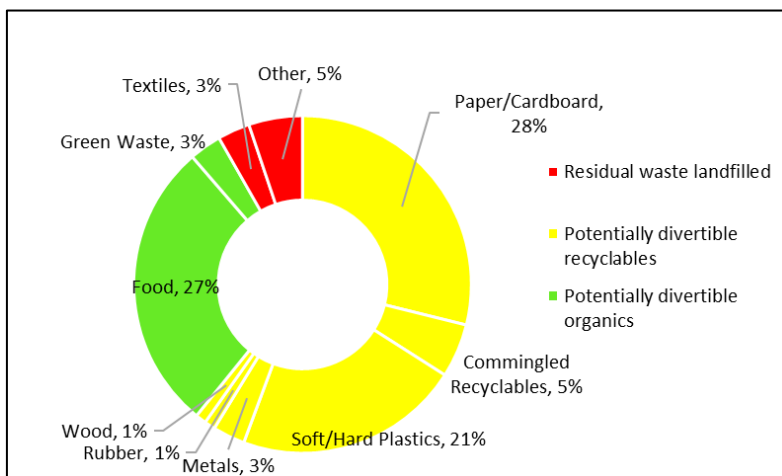


Figure 2-5 Source of waste from C&I and C&D sectors to landfill



C&I and C&D sectors

When looking at the C&I and the C&D sectors, majority of waste collected was potentially divertible with 30% being potentially divertible organics (green) and approximately 60% being potentially divertible recyclables (yellow).

Figure 2.5 show the sources of waste from the C&I and C&D sectors.

Future Predictions

When developing strategic options for continual improvement of waste management, it is useful to consider future waste quantities generated under a 'business as usual' (BAU) scenario.

Figure 2-6 Waste and material generation 2015-2026

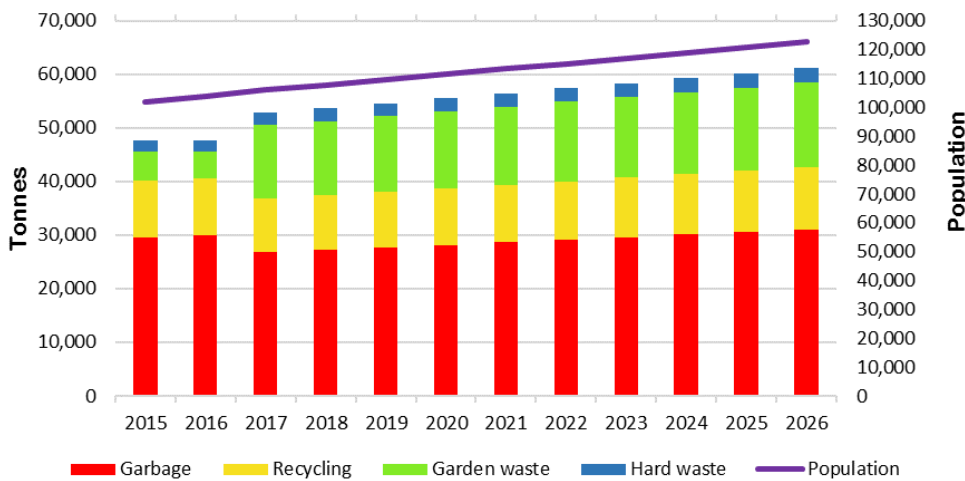


Figure 2.6 shows that by 2026, under the 'business as usual' scenario it is projected that waste generation in the *City of Ballarat* will grow to approximately 61,000 tonnes annually, with an estimated 30,000 tonnes to be recovered and 31,000 tonnes landfilled.

2.3 Council services and facilities

Kerbside collection services

The *City of Ballarat's* kerbside collection is delivered in three services: garbage, recycling and greenwaste. In the financial year of 2016/2017, 20,138 tonnes of waste, 9,083 tonnes of recyclables and 9,380 tonnes of greenwaste were collected. To achieve this, a fleet of 14 trucks and 17 FTE staff is employed annually to collect 44,251 garbage bins and recycling bins and 33,680 green waste bins. Table 2.2 outlines *the City of Ballarat's* collection service.

Table 2-2 Council kerbside collection services

Service	Bin size	Charge		Number of bins	Collection frequency
		Urban	Rural		
Garbage	120L	\$293 ¹	\$293	44,510 tenements ²	Weekly
Recycling	240L				Fortnightly
Garden waste	240L	\$63	\$63	33,925 ³	Fortnightly

¹ Note: Fee on rates includes kerbside recycling & general waste, street cleaning, education programs etc.

² Note: at 44,299 properties

³ Note: at 33,924 properties

Public place waste and recycling bins

In the *City of Ballarat* region there are 325 public place waste and recycling bins. These bins are emptied on a weekly basis, with services being increased to daily in high use areas and during events. The routine collection is also increased during daylight savings. The *City of Ballarat* also employs daily street sweepers.

Recycling and disposal facilities

To service over 40,000 homes and the various businesses, commercial operations and industries in the region, the *City of Ballarat* has a range of waste and recycling facilities. Table 2.3 lists these facilities, their current state, and specific actions required to meet future demands.

Table 2-3 Waste infrastructure status and action plan

Facility	Current status	Actions required
Transfer Station	<ul style="list-style-type: none"> Fully operational Facilities require upgrading 	<ul style="list-style-type: none"> Maintain and expand the service to the community. Create a design that transitions site users into recycling by layout and access. It must accommodate the growing number of material being diverted or planned to be diverted (e-Waste and its expansion into anything with a cord or battery). Relocate transfer station to All Waste Interchange.
Smythesdale Landfill	<ul style="list-style-type: none"> Fully operational 	<ul style="list-style-type: none"> Implement Smythesdale Landfill Master Plan, including review of waste input scenario changes. Review operational benchmarking. Reduce the amount of waste going to this landfill. Options include Waste to Energy and All Waste Interchange.
Greenwaste interchange facility	<ul style="list-style-type: none"> Fully operational 	<ul style="list-style-type: none"> Maintain service to community. Relocate greenwaste interchange facility to All Waste Interchange. Potential to expand to process food organics. Reduce contamination of 1% to 0.5% through targeted education campaign.
Transfer site for recycling	<ul style="list-style-type: none"> Fully operational 	<ul style="list-style-type: none"> Maintain the service. Review potential to relocate to All Waste Interchange once current contract expires.
Closed landfills x 4	<ul style="list-style-type: none"> <i>No longer operational</i> 	<ul style="list-style-type: none"> Maintain management of the closed landfills that require active management, including ongoing monitoring, maintenance and reporting to EPA. Update and implement regular reviews to ensure adequate management is in place.

All Waste Interchange

Appropriate and adaptive infrastructure is integral to the management of waste. Projected increases in waste supports the need to establish a central waste and resource recovery facility that updates the current transfer station, provides a central collection point where all waste and resources are sorted and re-purposed with minimal waste going to landfill. An All Waste Interchange facility is currently being investigated to fulfil this purpose.

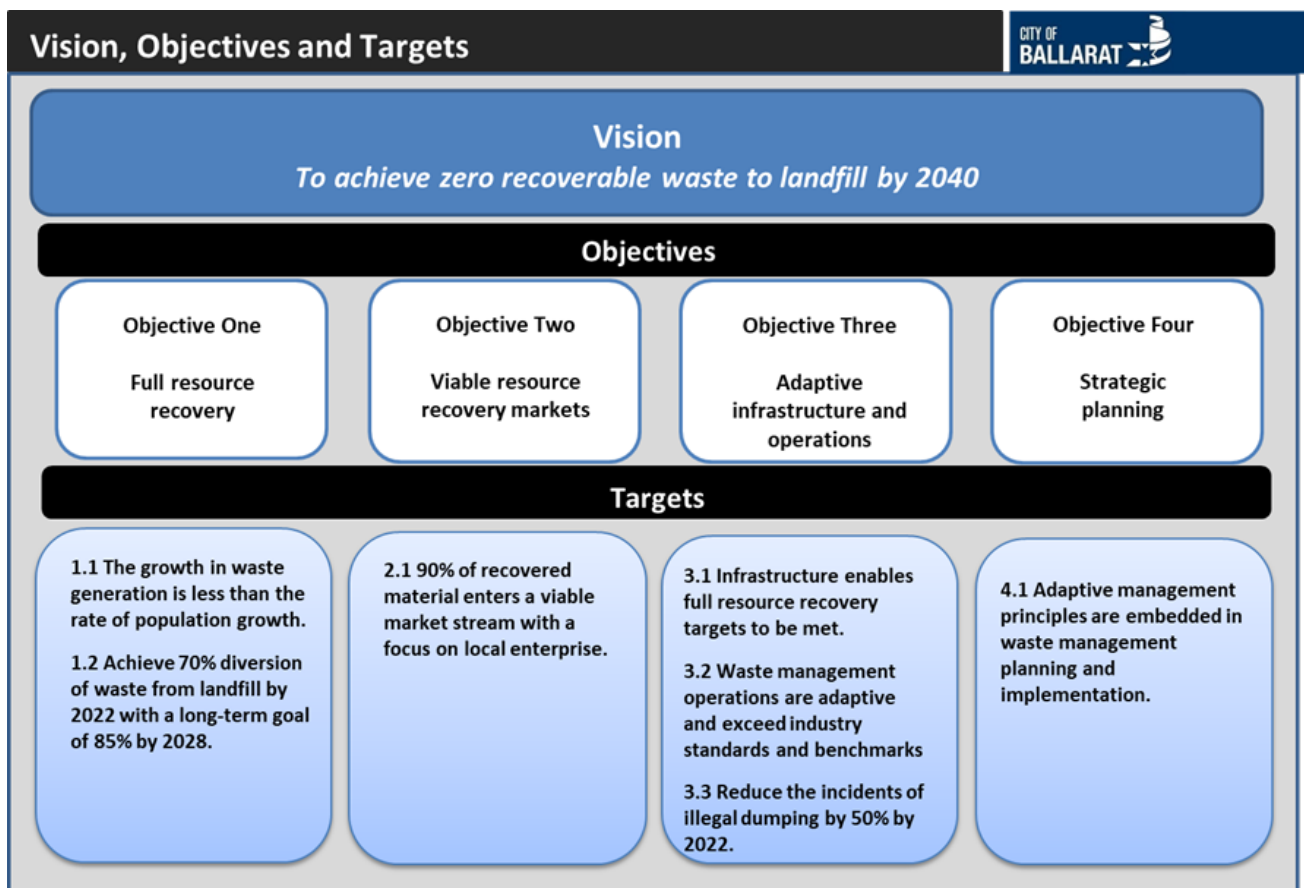
Energy from Waste options

There is an opportunity to establish advanced waste treatment technologies as an alternative to landfill disposal. This includes technologies such as gasification, pyrolysis, anaerobic digestion and other waste to energy technologies. As the technologies suited to MSW require large volumes of waste (at least 100,000 tonnes per year depending on the technology) to justify the large capital outlay involved (over \$30 million for most systems), the *City of Ballarat* intends to work in collaboration with other Councils and the GCWRRRG to investigate and assess innovative opportunities for energy from waste across the Grampians Region.

3. Strategic Direction

The *City of Ballarat* has set a clear, long-term Vision for resource recovery and waste management. In order to achieve this Vision four strategic Objectives and seven Targets have been developed to provide direction for waste and resource recovery in the *City of Ballarat* for the next five years. (see figure 3.1).

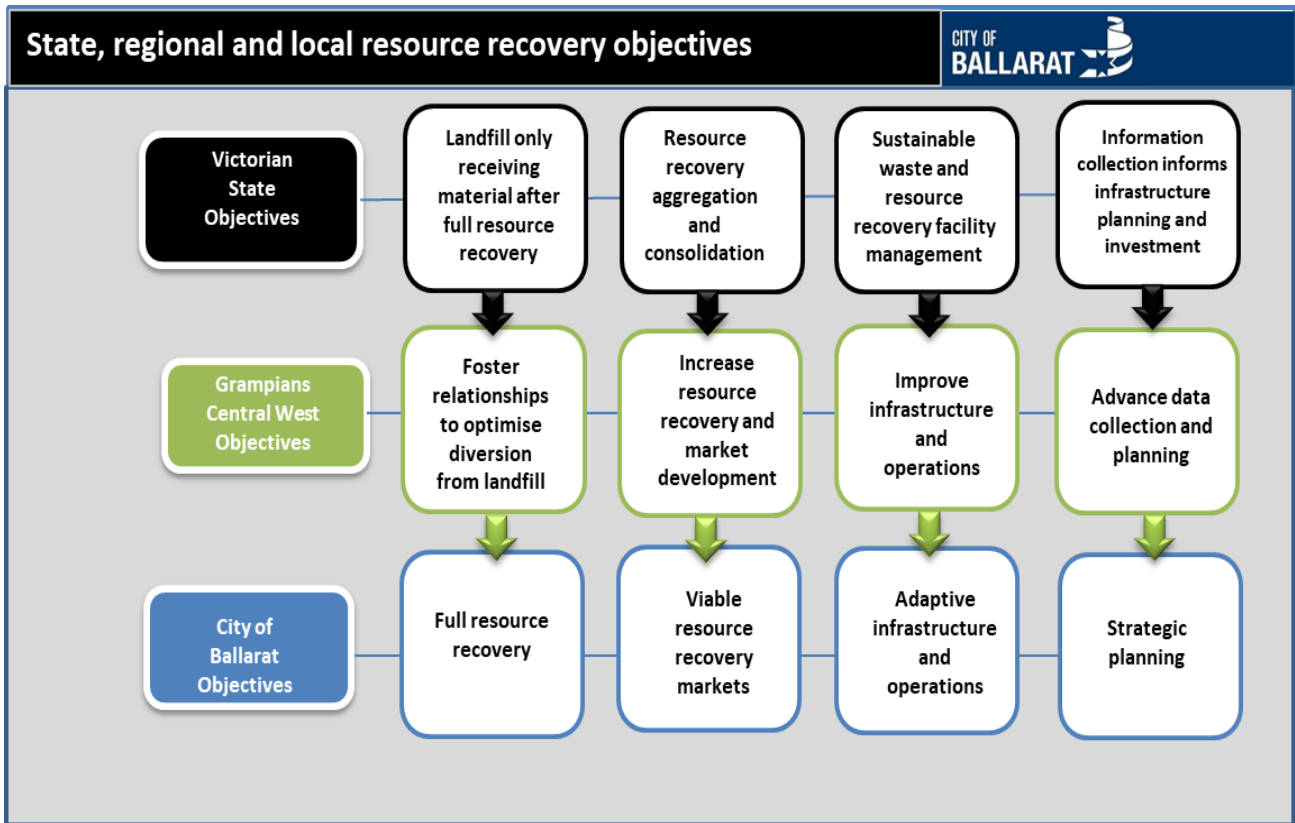
Figure 3-1 *City of Ballarat* Resource Recovery and Waste Management Strategy Vision, Objectives and Targets



3.1 Strategic alignment of the Objectives

The Strategy’s Objectives align with both State and regional strategic directions and aim to shape the *City of Ballarat’s* future waste management directions. Figure 3.2 outlines how the Strategy Objectives align to regional and state objectives.

Figure 3-2 Links to State and Regional Resource Recovery Waste Management Strategy Objectives.



3.2 Strategy Vision

To achieve zero recoverable waste to landfill by 2040

The zero-waste philosophy is a whole systems approach that proposes a massive change in the way materials flow through society, resulting in no waste. It is about moving from linear to cyclical resource flows. The approach encompasses more than eliminating waste through recycling and reuse, it focuses on restructuring production and distribution systems in order to reduce waste.

The Strategy’s Vision of zero recoverable waste to landfill is being applied through a filter of the *City of Ballarat’s* area of influence and control. It focuses on waste management and planning approaches that emphasise waste prevention and encourage redesigned resource life cycles where waste is sorted and all recoverable materials are reused and minimal waste is sent to landfill. Four key Objectives have been developed to support the *City of Ballarat* to meet this Vision.

3.3 Strategy Objectives

Objective One: Full resource recovery

Resource recovery is the separation or selective extraction of disposed materials for a specific next use, such as recycling, composting or energy generation in order to extract the maximum benefits from products, delay the consumption of virgin resources, and reduce the amount of waste generated. The Strategy aims to achieve full resource recovery, where all material that has a viable market has been recovered.

1. Full Resource Recovery

The City of Ballarat will:

1. Work with relevant agencies, industry and schools on waste and resource reduction and recovery education and engagement.
2. Educate and raise awareness of waste minimisation and avoidance through the development of a Waste Education Plan.
3. Support/lobby for State Government to assist avoidance of waste by encouraging smarter production, product stewardship schemes and educating on reducing consumption.
4. Provide advocacy in the community through support of waste minimisation.
5. Identify and implement financial incentives and disincentives for waste minimisation across all sectors.
6. Provide community leadership through local groups and businesses.
7. Develop a Waste Action Program to reduce recycling contamination across the MSW sector.
8. Assess collection needs across all sectors, identify gaps in council services and investigate provision for those additional community needs.
9. Educate and raise awareness of diversion options through the Waste Education Plan.
10. Promote and advocate for the avoidance of single use products.
11. Develop a business case for organic diversion options for MSW and C&I waste sectors.
12. Encourage on-site reuse for construction & demolition waste, and work with local recyclers of C&D to better promote services in the region.
13. Provide community leadership through local groups and business.
14. Support GCWWRRG's investigation into increasing the recovery of materials such as wood/timber, agricultural wastes, plastics, textiles, tyres and e-waste.

These actions aim to achieve the following Targets:

Target 1.1: The growth in waste generation is less than the rate of population growth.

Target 1.2: Achieve 70% diversion of waste from landfill by 2022 with a long-term goal of 85% by 2028.

Objective Two: Viable resource recovery markets

Resource recovery relies on establishing or sourcing suitable market demand for products. Sourcing suitable markets for recovered resources requires a strong understanding of local, national and global resource recovery markets. Market development for recovered resources is about creating and expanding appropriate and sustainable markets for the use of recovered materials and products. The Strategy aims to ensure 90% of all recoverable resources enter viable market streams.

2. Viable Resource Recovery Markets

The City of Ballarat will:

1. Develop a Resource Recovery Market plan.
2. Improve resource recovery of priority marketable products, waste streams will go to the All Waste Interchange.
3. Invest in 'pre-sort' infrastructure that aims to maximise on-site resource recovery (MRF). (T1.1, T3.1).
4. Undertake a gap analysis and develop a 3-year Strategic Resourcing Plan to enable proactive delivery of Waste Strategy, including opportunity for Resource Recovery Market Officer.
5. Provide support for existing and emerging waste market initiatives.
6. Consult with industry and GCWRWRRG to gather information on innovation and market development needs and priorities.

These actions aim to achieve the following Targets:

Target 2.1: 90% of recovered material enters a viable market stream with a focus on local enterprise.

Objective Three: Adaptive infrastructure and operations

In order to proactively manage new and emerging waste streams, and adapt to suit the changes in demand and supply of the waste sector, infrastructure and operational delivery need to adjust. The Strategy aims to ensure that the infrastructure enables full resource recovery Targets are met, and waste management operations are adaptive and exceed industry standards and benchmarks.

3. Adaptive Infrastructure and Operations

The City of Ballarat will:

1. Assess and implement options for asset rationalisation, consolidation and upgrade of landfill and RRC infrastructure.
2. Facilitate the consolidation of waste infrastructure including depot and transfer station to an All Waste Interchange (T1.2).
3. Invest in state-of-the-art waste service fleet, including investigation of alternative fuel and hybrid drive systems.
4. Continue to pursue a feasibility study that looks at all options of waste to energy facilities that places Ballarat as a central processor of Victoria's waste (T1.2).
5. Provide assistance to industry to ensure infrastructure, facilities and services are operating and managed to protect the community, environment and public health.
6. Establish benchmarks for waste management services including: landfill management; transfer station, street cleaning and waste collection and use to inform best practice and continual improvement processes.
7. Investigate logistics and infrastructure that produce efficiencies in waste transport including understanding the viability verses distance constraint.
8. Implement the Smythesdale Landfill Master Plan.
9. Work with the GCWWRRG, industry and the EPA to progress any rehabilitation assessments and requirements for closed landfills.
10. Facilitate the development of an illegal dumping action plan with partners and key stakeholders.
11. Establish a regional taskforce to address illegal dumping.
12. Work with SV and the Victorian Litter Action Alliance (VLAA) to develop and implementation best practice litter prevention programs.
13. Raise awareness of illegal dumping through the Waste Education Plan.
14. Provide additional resource for enforcement activities.

These actions aim to achieve the following Targets:

Target 3.1: Infrastructure enables full resource recovery targets to be met.

Target 3.2: Waste management operations are adaptive and exceed industry standards and benchmarks.

Target 3.3: Reduce incidents of illegal dumping by 50 % by 2022.

Objective Four: Strategic Planning

Effective strategic planning articulates not only an organisation's direction and the actions required to make progress, but also how it will know if it is successful. There are various frameworks and methodologies addressing strategic planning and management. The Strategy will utilise an adaptive management approach.

Adaptive management is a cyclical process that formalises information flows between strategy and planning, implementation and monitoring, evaluation and reporting and learning and adaptation.

4. Strategic Planning

The *City of Ballarat* will:

1. Apply adaptive management approach to waste management.
2. Implement an annual review of the RRWM Implementation Plan.
3. Implement a reliable and targeted local data system that informs waste and resource recovery decisions and contributes to regional and state data systems.
4. Work with GCWWRRG and other councils to develop mechanisms and contingency plans to appropriately manage waste and material during and after emergency or unplanned events.
5. Work with the GCWWRRG to facilitate the development of council partnerships to enable efficiencies in resource recovery, materials transport and disposal.
6. Collaborate with GCWWRRG on waste infrastructure planning.

These actions aim to achieve the following Targets:

Target 4.1: Adaptive management principles are embedded in waste management planning and implementation.