Report to the Future Melbourne (Environment) Committee	**Agenda item 6.1**

Waste and Resource Recovery Strategy 2030	**16 July 2019**

Presenter: Jenny Bailey, Manager Engineering Services

Purpose and background

1. At the Future Melbourne Committee meeting on 16 April 2019, the Waste and Resource Recovery Strategy 2030 (the Strategy) was endorsed, subject to minor changes.

2. The Strategy is now provided to the Future Melbourne Committee with those changes for final endorsement. This report and attachment outline the changes.

Key issues

3. The Strategy has undergone a number of final edits after consultation with Councillors (Attachment 2). A high level overview of the final strategy is at Attachment 3.

4. A summary of changes and relevant page numbers for each recommendation are in Attachment 4.

5. The Future Melbourne Committee resolution of 16 April 2019 included a request to management to rank priorities from most–to-least effective in meeting waste diversion targets, as well as alignment to the waste hierarchy. The implementation costs and landfill diversion impacts and alignment of each priority against the waste hierarchy are provided in Attachment 5.

6. All the priorities and actions are linked and support each other. Transforming the waste and resource recovery system requires sustained actions on many initiatives at local, state and federal government levels. A high level Implementation Plan with actions for 2019-20 is at Attachment 6.

7. The Strategy has been designed to be flexible and adaptable to manage the complexity and rapid changes in the waste and resource recovery sector. This means actions will be tested through pilots to improve efforts to focus on what works.

8. The Strategy will be reviewed in 2023 to assess progress and adjust actions if and where appropriate.

Recommendation from management

9. That the Future Melbourne Committee:

    9.1. endorses the Waste and Resource Recovery Strategy 2030

    9.2. authorises the Director City Operations to make any further minor editorial changes to the Waste and Resource Recovery Strategy 2030 prior to publication.

Attachments:
1. Supporting Attachment (Page 2 of 74)
2. Waste and Resource Recovery Strategy 2030 (Page 4 of 74)
3. One page summary Waste and Resource Recovery Strategy (Page 60 of 74)
4. FMC resolution16 April 2016 –actions (Page 61 of 74)
5. Impacts V costs (Page 66 of 74)
6. Strategy Implementation Plan and monitoring framework (Page 71 of 74)

Supporting Attachment

Legal

1. The strategy proposes that amendments to the Council's local laws and the associated permit process be considered.

2. Any proposal to amend a local law requires a statutory public notice and submission process in accordance with the Local Government Act 1989.

Finance

3. Indicative costings of the actions in the Strategy have been developed utilising current contract information, projected service outcomes and any available industry data and projections.

4. Currently, we spend $24 million on all waste services. Substantial city growth will result in nearly double the annual cost allocation for waste services from $24 million in 2019 to $44 million by 2030.

   Modelling of the Strategy's implementation 2019-2030 has identified indicative direct costs of $22.4 million:

   - $5.3 million in capital investment

   - $3.6 million in employee costs

   - $13.5 million in service delivery costs.

   These costs are offset by avoided disposal fees forecast in excess of $21.5 million due primarily to improved recycling and diversion of organic waste from landfill.

5. It is recommended that financial modelling is regularly updated to ensure funding requirements are accurate and continue to respond to ongoing and future contracts, service delivery outcomes and changes in the broader waste and resource recovery industry.

6. Actions in the Strategy and ongoing investment decisions supporting strategy implementation of the Strategy will be subject to budget allocation via the annual planning and budgeting process.

Conflict of interest

7. No member of Council staff, or other person engaged under a contract, involved in advising on or preparing his report has declared a direct or indirect interest in relation to the matter of the report.

Health and Safety

8. Health and Safety will be considered prior to the implementation of each of the proposed initiatives.

Stakeholder consultation

9. No external consultation has occurred since the Strategy was presented to Future Melbourne Committee in April.

Relation to Council policy

10. The recommendation is consistent with the following Council policies:

    - Council Plan 2017-2021: Goal - a city that cares for its environment

- Climate Change Mitigation Strategy

- Emissions Reduction Plan for our Operations

- Food City – the City of Melbourne's Food Policy

- Transport Strategy

Environmental sustainability

11. Environmental sustainability issues and opportunities are integral to the strategy. The Strategy aims to achieve: 90 per cent of waste diverted from landfill, 20 per cent reduction of household waste produced, 7.5Mt CO_2-e in greenhouse gas emissions avoided. The Strategy is aligned to the new Climate Change Mitigation Strategy which recognises waste reduction as a key pillar for reducing Melbourne's greenhouse gas emissions. The principles of a circular economy and waste management hierarchy in the Strategy are well aligned to the City of Melbourne's environmental sustainability objectives.

WASTE AND RESOURCE RECOVERY STRATEGY 2030

CITY OF MELBOURNE

A CITY THAT CARES FOR THE ENVIRONMENT

Environmental sustainability is the basis of all Future Melbourne goals. It requires current generations to choose how they meet their needs without compromising the ability of future generations to be able to do the same.

Acknowledgement of Traditional Owners

The City of Melbourne respectfully acknowledges the Traditional Owners of the land, the Boon Wurrung and Woiwurrung (Wurundjeri) people of the Kulin Nation and pays respect to their Elders, past and present.

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July 2019

Cover Image: Centre Place, near the Degraves Street Recycling Facility

Disclaimer

To find out how you can participate in the decision-making process for City of Melbourne's current and future initiatives, visit **melbourne.vic.gov.au/participate**

LIST OF TABLES AND FIGURES

MESSAGE FROM CITY OF MELBOURNE

With Melbourne growing at an unprecedented rate, our priority is to make sure our great city retains its liveability. One of the biggest challenges is finding innovative ways to manage our waste, with an ambitious goal of putting Melbourne on track to becoming a zero waste city by 2030.

To achieve this, we need a long-term, integrated strategy to substantially reduce waste, modernise our collection systems and re-invigorate our recycling sector. The days of sending large volumes of waste to landfill are over. This strategy examines sustainable initiatives that will deliver positive environmental and economic outcomes, and create better amenity for our city.

Finding solutions to the separation and collection of food waste is a key goal. This strategy guides our first steps in trialling how a food waste collection service could work – for residents with kerbside bins and also residents in larger apartment blocks. Community education on food waste disposal will be a priority.

Reusing, recycling and recovering materials will also reduce landfill and greenhouse gas emissions. The City of Melbourne will advocate for the development of a resilient and sustainable waste and resource recovery sector in Victoria, creating an opportunity to work with all levels of government and business to set procurement targets and revitalise our recycling sector.

The cleanliness, atmosphere and general amenity of our city is of high importance to our residents, workers, students, visitors and businesses and we will aim to ease congestion and noise pollution through more streamlined services.

As our community has told us, keeping the city safe, clean and environmentally sustainable are fundamental to the task of growing a great city well, and this is the City of Melbourne's core business.

Sally Capp
Lord Mayor
City of Melbourne

Cr Cathy Oke
Chair, Environment Portfolio

EXECUTIVE SUMMARY

The waste and resource recovery system is facing serious challenges. These threats present an opportunity to accelerate the move towards a circular economy where we maximise reuse, recycling and recovery, and minimise waste to landfill.

The current recycling crisis caused by changing export markets (particularly in China) compels us to act quickly to reform the recycling system. We need to improve waste management in the city to reduce congestion, odour and noise and improve safety, particularly as Melbourne's population grows rapidly. The apartment building boom requires innovative solutions to make recycling convenient and effective. Longer term challenges include reducing greenhouse gas emissions by reducing truck movements and landfill methane.

These challenges require bold solutions. Melbourne prides itself on being a city that is a great place to live and work, a vibrant economic and cultural city, and a city that cares for its environment. For Melbourne to continue to flourish and prosper we will take decisive action to divert waste from landfill, reduce greenhouse gas emissions and improve amenity.

Our vision is for Melbourne to transition toward zero waste to landfill. We imagine a future where people and businesses avoid generating waste where possible, and appreciate waste as a valuable resource. Products are designed to be durable and repairable, use recycled materials and be easy to recycle. Any waste that is produced is reused or recycled easily, efficiently and effectively. Residual waste is processed to recover useful materials and energy. Landfill is only used for materials that can't be recovered.

The waste and resource recovery system is complex and changing rapidly. Our actions will be bold and flexible; innovation is at the heart of this strategy. We will test new initiatives, learn from this evidence, and then adapt our interventions to progress what works best. This strategy is a living document, and will be reviewed in four years.

This strategy is based on the principles of the circular economy and the waste hierarchy. A circular economy is one where resources are valued, used efficiently and only discarded when their materials have no further use. Creating a more circular economy requires action across all stages (see figure 3). The waste hierarchy (figure 2) recognises that sending waste to landfill is a lost opportunity to recover valuable materials and energy, and generates greenhouse gas emissions, leachate, litter and odour. This strategy supports our Climate Change Mitigation Strategy which calls for a significant reduction in waste to landfill over the next few decades to reduce greenhouse gas emissions.

Significant increases in reuse, recycling and recovery will help reach our 90 per cent waste diversion target. Transitioning to a circular economy will further unlock environmental, social and economic benefits.

The City of Melbourne has prepared this strategy as a collective call to action. Delivering this strategy requires action by government, businesses, organisations, and the community. Together we can overcome the current challenges and transform the waste and resource recovery system towards a sustainable, circular economy that benefits people and ecosystems.

Strategy highlights

The City of Melbourne has three clear roles in this strategy: deliver, govern, and influence others.

The City of Melbourne will deliver:

- options to separate organic waste
- new resource recovery hub network for businesses
- a new expert advisory service to support an improved waste system
- a waste minimisation and innovation fund
- electronic waste recycling options for residents.

The City of Melbourne will improve governance by:

- strengthening Waste Management Plan guideline for new developments
- reviewing regulations and permits for waste operators and bins in the public realm
- ensuring that critical waste infrastructure is protected and enhanced.

The City of Melbourne will influence others and advocate for:

- investment in new resource recovery infrastructure
- an incentive program to improve collection systems
- best practice sustainable procurement policies and processes
- extended producer responsibility and a container deposit scheme in Victoria.

Recycling industry reform

The Victorian recycling system is facing unprecedented stress. Urgent reforms are needed. The Victorian Government must act quickly and decisively, in partnership with industry, community and local government.

The government has $511 million from unspent landfill levy sitting in the Sustainability Fund. Every year the government collects around $220 million from the landfill levy, of which $80 million ends up in the Sustainability Fund (Department of Environment, Land, Water and Planning, 2018). Much of this is paid by councils.

The City of Melbourne is leading the way to creating a strong circular economy. This will ensure a resilient and sustainable waste and resource recovery system. It will boost local recycling and manufacturing and help create jobs and business growth. The Victorian Government needs to show leadership by creating new policies and investing the Sustainability Fund.

The key areas for investment and policy reform are:

- **New technology:** Invest in and increase support for new and upgraded material recovery facilities and high value reprocessing plants established through investment, support, and collective procurement. Diversify the recycling sorting sector and improve material sorting to meet market contamination standards.

- **Local manufacturing:** Incentivise new specialised product manufacturers. Nurture innovation through targeted grants and other council and government support.

- **Better education:** Improve behaviour and build support for new initiatives through a broad, extensive and well-funded education campaign that targets reuse, recycling, including reduction in contamination, and tackles food waste.

- **Sustainable procurement:** Create demand across all levels of government by purchasing goods using recycled materials, coordinating purchasing policies, and investing in research and development.

- **Increase the landfill levy:** Increase the landfill levy to drive improved recycling and investment in new facilities.

The Victorian Government in partnership with City of Melbourne, industry and community can help solve the current recycling problems and create a stronger, more resilient recycling system.

"Together we can overcome the current challenges and transform the waste and resource recovery system towards a sustainable, circular economy that benefits people and ecosystems."

VISION: TOWARDS A ZERO WASTE CITY

This strategy envisions a future where our city produces less waste and maximises the life of materials through reuse, recycling and recovery. Our efforts can create a stronger circular economy that will reduce environmental impacts, improve the amenity and liveability of the city, and make the waste and resource recovery system more resilient.

Figure 1: Key outcomes and targets of the Waste and Resource Recovery Strategy 2030

OUTCOMES

- More effecient use of resources
- The city produces less waste

REDUCE

OUTCOMES

- More effective recycling separation systems
- A city with high amenity

COLLECT

KEY 2030 TARGETS

- 90 per cent of waste diverted from landfill
- 1.2Mt CO2-e in greenhouse gas emissions avoided
- 20 per cent reduction in household waste produced

RECOVER

OUTCOMES

- Food and green waste recovered
- A resilient recycling sector
- Waste to landfill minimised

This table outlines how we will achieve our strategic outcomes. Bold action is needed to tackle the waste and resource recovery system challenges.

Table 1: Priorities mapped to strategic outcomes

PRIORITY / OUTCOMES	REDUCE		COLLECT		RECOVER		
	More efficient use of resources	The city produces less waste	More effective recycling separation systems	A city with high amenity	Food and green waste recovered	A resilient recycling sector	Waste to landfill minimised
1 Engage and educate community and businesses	●	●	●	●	●	●	●
2 Incentivise and promote innovative solutions	●	●	●	●	●	●	●
3 Support growth of a circular economy through government procurement	●					●	●
4 Lead by example through City of Melbourne operations and events	●	●	●	●	●	●	●
5 Advocate for better producer stewardship and product design	●	●					
6 Improve waste governance and planning			●	●	●		
7 Establish new systems to source separate and collect organic waste			●	●	●		●
8 Transform the collection and transfer of recycling and residual waste			●	●	●	●	
9 Improve the efficiency, effectiveness and viability of recycling					●	●	●
10 Explore advanced waste processing of residual waste that cannot be otherwise recovered							●

PRIORITY STAKEHOLDER ACTIONS

The City of Melbourne cannot deliver this strategy alone; everyone must take action. Achieving a circular economy, reducing waste and increasing recycling depends on the efforts of government, community and businesses working together.

Below are some actions from the strategy for different sectors of the community. For a full list of actions in the strategy, see pages 36 to 46.

1. Residents

Residents will be empowered to rethink and reduce their consumption. They will have access to convenient services that enable them to reuse and recycle a wide range of materials. Residents will be able to separate and recycle their garden and food waste. For single unit and low-storey dwellings, this might take the form of a regular organics bin service. Apartments will be able to use the expert advisory services and incentives program to identify tailored solutions for their waste disposal needs. Residents will have access to drop-off and at-call services that cater for multiple waste streams.

KEY ACTIONS FROM THE STRATEGY	HOW RESIDENTS CAN GET INVOLVED
1.2 Run, support and advocate for education campaigns.	Engaging in education campaigns and making informed choices by reducing waste and opting for reusable and recycled products. Supporting community groups, social enterprises and charities that recover waste, for example local swap-sell-share groups.
7.1 Explore and trial options to separate organic waste across different residential property types.	Participating in organics trials, giving feedback and supporting organics services.
9.3 Expand e-waste recycling options for residents.	Using expanded recycling options nearby – whether this is in their building or nearby council hub.

1.1 Students

Students will live in accommodation with convenient and effective recycling systems. The building managers will be able to use the expert advisory service to improve building performance. This will include education materials in a variety of languages to assist international students. Students will have access to drop-off services and hard waste and e-waste recycling.

KEY ACTIONS FROM THE STRATEGY	HOW STUDENTS CAN GET INVOLVED
2.3 Explore innovative approaches to waste reuse, collection, storage and recovery.	Participating in local swap-sell-share groups to dispose of unwanted goods and using hard waste services to recycle bulky items. For example donating hard waste to charities at the end of semester.
7.1 Explore and trial options to separate organic waste across different residential property types.	Participating in organics trials, giving feedback and supporting organics services. For example they can support cafes and restaurants that reduce and recover food waste.
4.4 Investigate new opportunities to recycle dumped rubbish and manage litter.	Disposing of waste in litter bins to keep the city beautiful, for example reducing cigarette butt litter by using butt bins.

2. Community groups

Community groups will be involved in designing the innovation fund; they can also apply for grants which will provide support and resources for their innovative projects. Groups will also help implement organics trials, both in low and high-rise buildings. They will be able to support our advocacy efforts and campaigns on education, investment and product stewardship.

KEY ACTIONS FROM THE STRATEGY	HOW COMMUNITY GROUPS CAN GET INVOLVED
1.2 Run, support and advocate for education campaigns.	Contributing to education campaigns through new ideas, participating in events and promotions.
2.1 Establish and deliver a waste minimisation and innovation fund.	Applying for grants for innovative projects, particularly ones that target waste avoidance and reuse, as well as problematic materials such as food and plastic waste.
7.1 Explore and trial options to separate organic waste across different residential property types.	Helping City of Melbourne plan and design organic waste trials and lending support to the trial.

3. Businesses

3.1 Retailers, hospitality and food businesses

Businesses will take advantage of the expert advisory service to identify the best waste and resource recovery solution for their needs, including avoidance and reuse. Fewer bins in the public realm will make the city more beautiful and activate laneways, providing new opportunities for cafés and restaurants. Hospitality and food businesses such as hotels, restaurants, cafes and grocery stores, may have access to organic waste recovery services.

KEY ACTIONS FROM THE STRATEGY	HOW BUSINESSES CAN GET INVOLVED
1.1 Provide expert advisory service to support improved waste system.	Considering the material inputs in their supply chain and supporting reusable and recycled products where possible. Analysing their waste management and improving their recycling, for example reducing and recovering food waste and avoiding unnecessary plastics.
2.1 Establish and deliver a waste minimisation and innovation fund. **2.3** Explore innovative approaches to waste reuse, collection, storage and recovery.	Working with council to reduce problem materials such as plastic and food waste. For example this may include education campaigns or local laws to reduce or recover food waste or single-use plastics. Getting involved in innovative projects funded through the innovation fund, such as plastic alternatives.
7.2 Implement successful organic waste solutions.	Avoiding and reducing food waste by using new practices and technology. Supporting and participating in organics trials and hubs with organics recycling.
8.1 Improve existing waste hubs and recycling facilities and expand the existing resource recovery hub network for city businesses.	Using communal hubs to recycle their waste, particularly key materials such as e-waste.

3.2 Offices

Building managers and tenants will have access to simple, effective and convenient recycling systems. This will include recycling options for key materials such as food waste and e-waste.

KEY ACTIONS FROM THE STRATEGY	HOW OFFICES CAN GET INVOLVED
1.1 Provide expert advisory service to support improved waste system.	Building managers working with expert advisors to review and redesign building waste systems.
2.2 Deliver an Incentive Program to drive investment in new resource recovery infrastructure and other solutions.	Building managers and tenants getting involved in new projects to reduce waste and increased recycling. For example this could involve projects from the innovation fund, bulk buy schemes, or partnering with entrepreneurs.
7.1 Explore and trial options to separate organic waste across different residential property types.	Installing and supporting new systems to divert food waste, for example third bins or in-sink grinders.

3.3 Manufacturers

Manufacturers will have access to high quality recycled materials from improved sorting technology to use in their products. There will be a strong market for high quality products made from recycled materials from government, councils, industry and the community.

KEY ACTIONS FROM THE STRATEGY	HOW MANUFACTURERS CAN GET INVOLVED
2.3 Explore innovative approaches to waste reuse, collection, storage and recovery.	Working with local sorting and reprocessing businesses on new products that use recycled materials.
3.1 Strengthen City of Melbourne's procurement practices use recycled materials where appropriate.	Collaborating with the City of Melbourne to provide goods using recycled material that meet the demands of the city, for example road base, street furniture, or mulches.

4. Developers

Developers will ensure that new buildings have efficient and effective waste services. The City of Melbourne might also work with developers to put a resource recovery hub within a new development; a developer may receive concessions on their project as an incentive.

KEY ACTIONS FROM THE STRATEGY	HOW DEVELOPERS CAN GET INVOLVED
6.1 Strengthen Waste Management Plan guidelines and review and update waste generation rates to ensure higher recovery rates in new developments.	Designing and constructing new buildings that use best-practice waste and resource recovery systems and maximise recycling of construction and demolition waste. For examples, developers could pilot and test innovative approaches to recycling, for example vacuum systems or weight-based billing.
7.2 Implement successful organic waste solutions.	Designing buildings that have systems to recover organics waste, consulting with expert advisors.
8.1 Improve existing waste hubs and recycling facilities and expand the existing resource recovery hub network for city businesses.	Locating new hubs in existing or new buildings to provide an effective, communal waste management option.

5. Entrepreneurs

Entrepreneurs will get support and help to address the challenges facing the waste and resource recovery system. They will be supported by our innovation fund that will provide resources and support to nurture new ideas. Start-ups will partner with council, businesses or manufacturers to expand and trial new products and services.

KEY ACTIONS FROM THE STRATEGY	HOW ENTREPRENEURS CAN GET INVOLVED
2.1 Establish and deliver a waste minimisation and innovation fund.	Submitting creative ideas to the innovation fund to solve complex waste and recycling problems.
2.3 Explore innovative approaches to waste reuse, collection, storage and recovery.	Partnering with progressive businesses, community groups and council to trial innovative approaches to waste management.
4.4 Investigate new opportunities to recycle dumped rubbish and manage litter.	Helping the City of Melbourne improve waste services and reduce environmental impacts, for examples through new ways to collect and manage pet waste.

6. Visitors

Visitors will experience a beautiful, safe and liveable city. A network of public litter bins will reduce litter in parks, streets and waterways. Reduced truck movements, and fewer private bins in the public realm will make the city safer, less congested, and help activate laneways.

KEY ACTIONS FROM THE STRATEGY	HOW VISITORS CAN GET INVOLVED
4.2 Reduce waste and improve waste management at City of Melbourne sponsored and run events.	Enjoying our events, avoid waste where possible and correctly separate waste and recycling.
4.3 Recycle public realm residual waste where practical.	Disposing of waste in litter bins to keep the city beautiful, and using cigarette butt bins to reduce litter.
4.4 Investigate new opportunities to recycle dumped rubbish and manage litter.	Contributing new ideas or improvements to the City of Melbourne and encourage businesses to improve their waste management practices.

7. The Victorian Government and other councils

The City of Melbourne will partner with the Victorian Government and other councils to share ideas, collaborate on projects, and improve legislation and policy. State-wide initiatives will include significant education campaigns, a container deposit scheme and investment into avoidance, reduction, and recycling initiatives and infrastructure.

KEY ACTIONS FROM THE STRATEGY	HOW GOVERNMENT CAN GET INVOLVED
1.2 Run, support and advocate for education campaigns.	Planning and funding a significant, long-term education campaign to increase avoidance and reuse, and improve recycling behaviour. Collaborating to design and deliver programs with councils, industry and community.
5.2 Advocate to other levels of government for stronger extended producer responsibility and container deposit scheme requirements to improve design and production.	The Victorian Government can demonstrate leadership by advocating to the Australian Government on expanding extended producer responsibility schemes. The government can implement a container deposit scheme to improve recycling rates.
9.1 Advocate for increased investment from landfill levy funds and policy improvements to support a resilient local recycling sector.	Using the Sustainability Fund to invest into infrastructure, projects and campaigns to improve the recycling sector, for example better sorting or beneficiation technology. Delivering an ambitious circular economy policy.

PRINCIPLES

Rubbish doesn't appear when we throw it in the bin, or disappear when the bin is empty. We need to view waste as part of a larger, complex system covering the life cycle of goods and materials.

Two key principles underpin this strategy:

• the waste hierarchy

• the circular economy

These principles are fundamentally about minimising the waste system's environmental impacts, improving amenity, and enhancing economic performance.

Waste hierarchy

The waste hierarchy states that waste should be managed in order of preference: avoid and reduce, recycle, recover and dispose of as a last resort.

Figure 2: Waste hierarchy

MOST PREFERABLE

Avoid

Reduce

Recycle

Recover
including energy

Treat
including
hazardous
waste

Disposal

LEAST PREFERABLE
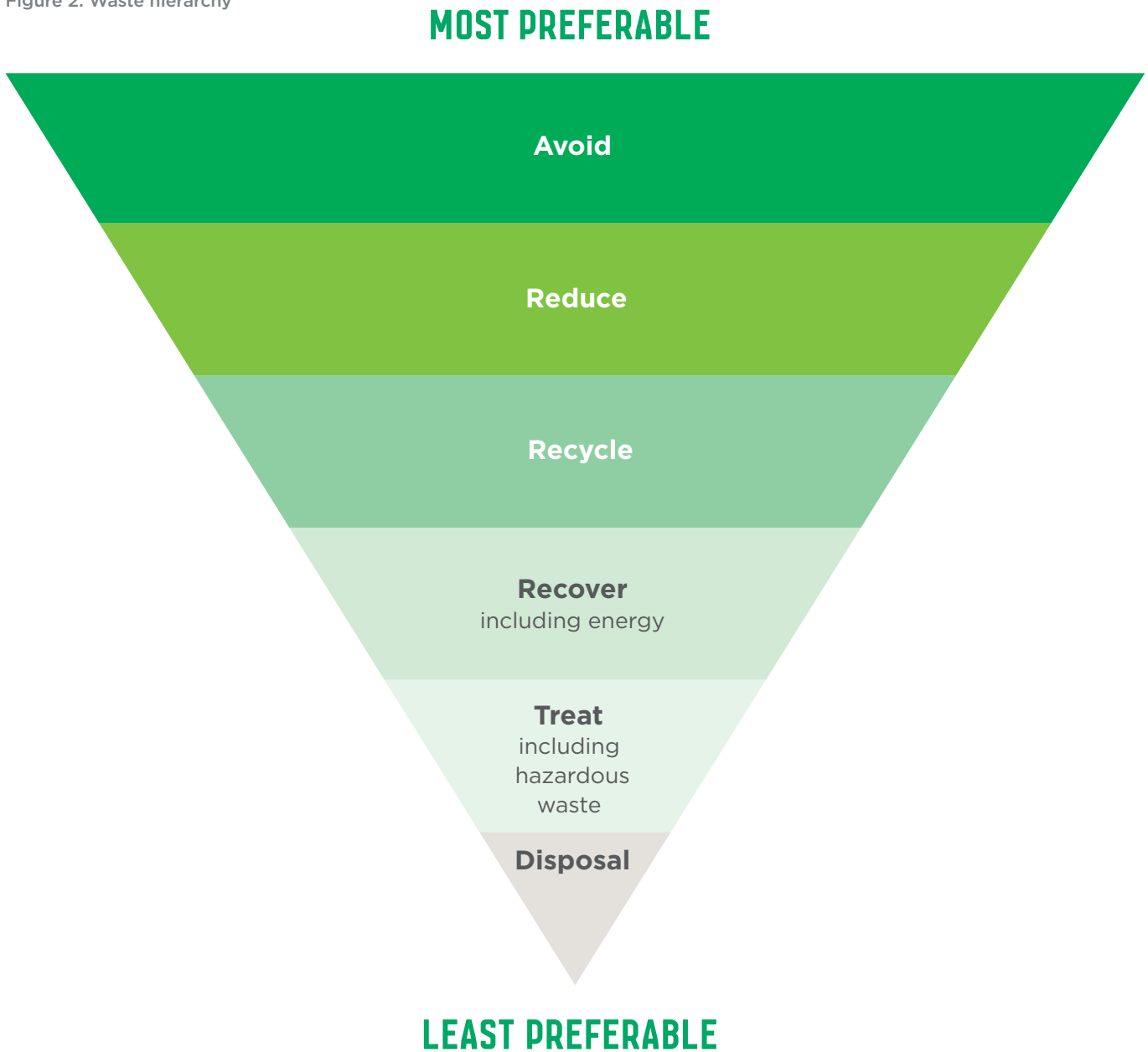
Circular economy

A circular economy is one where resources are valued, used efficiently and only discarded when their component materials have no further use. This is in contrast with the current linear economic model is based on a 'take—make—throw' extractive approach. A circular economy designs out waste and pollution, keeps materials in use as long as possible, and returns materials to the economy through efficient recycling processes. A circular economy minimises environmental impacts by reducing consumption of finite natural resources and limiting the amount of waste to landfill both of which help to avoid climate breakdown and ecological destruction.

Figure 3 outlines the stages of the circular economy and the movement of materials. It shows that the extraction of natural resources and raw materials ultimately depends on ecosystems.

Figure 4 illustrates the ideal future state circular economy this strategy aims to achieve, including an increased focus on waste collection, recycling and recovery, as well as organic recycling.

"We imagine a future where people and businesses avoid generating waste where possible, and appreciate waste as a valuable resource."

Figure 3: Current state of the waste and resource recovery system
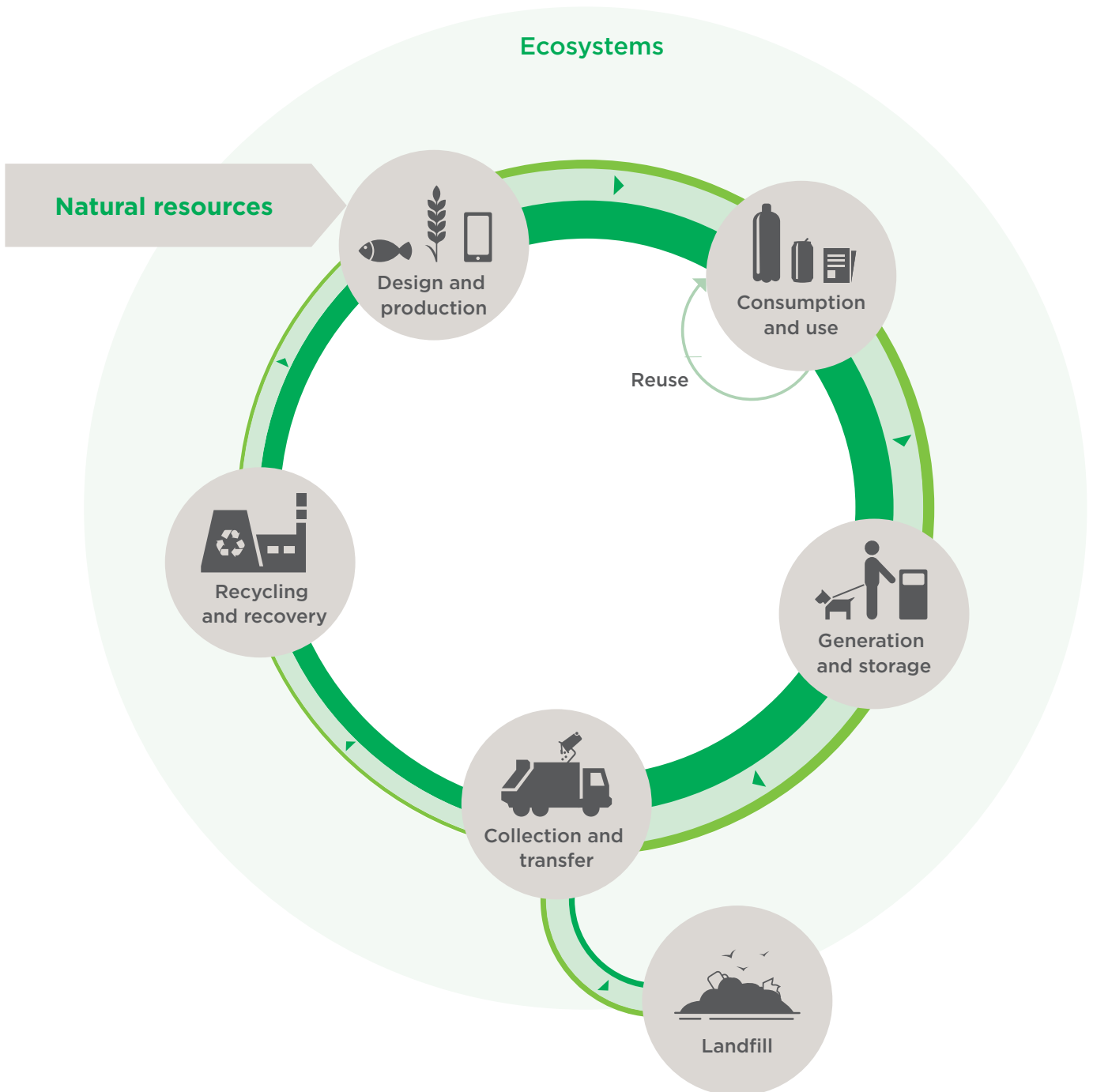
Key (lines represent indicative tonnes per year)

Municipal solid waste

Commercial and industrial waste

Construction and demolition waste

Figure 4: Future state of the waste and resource recovery system
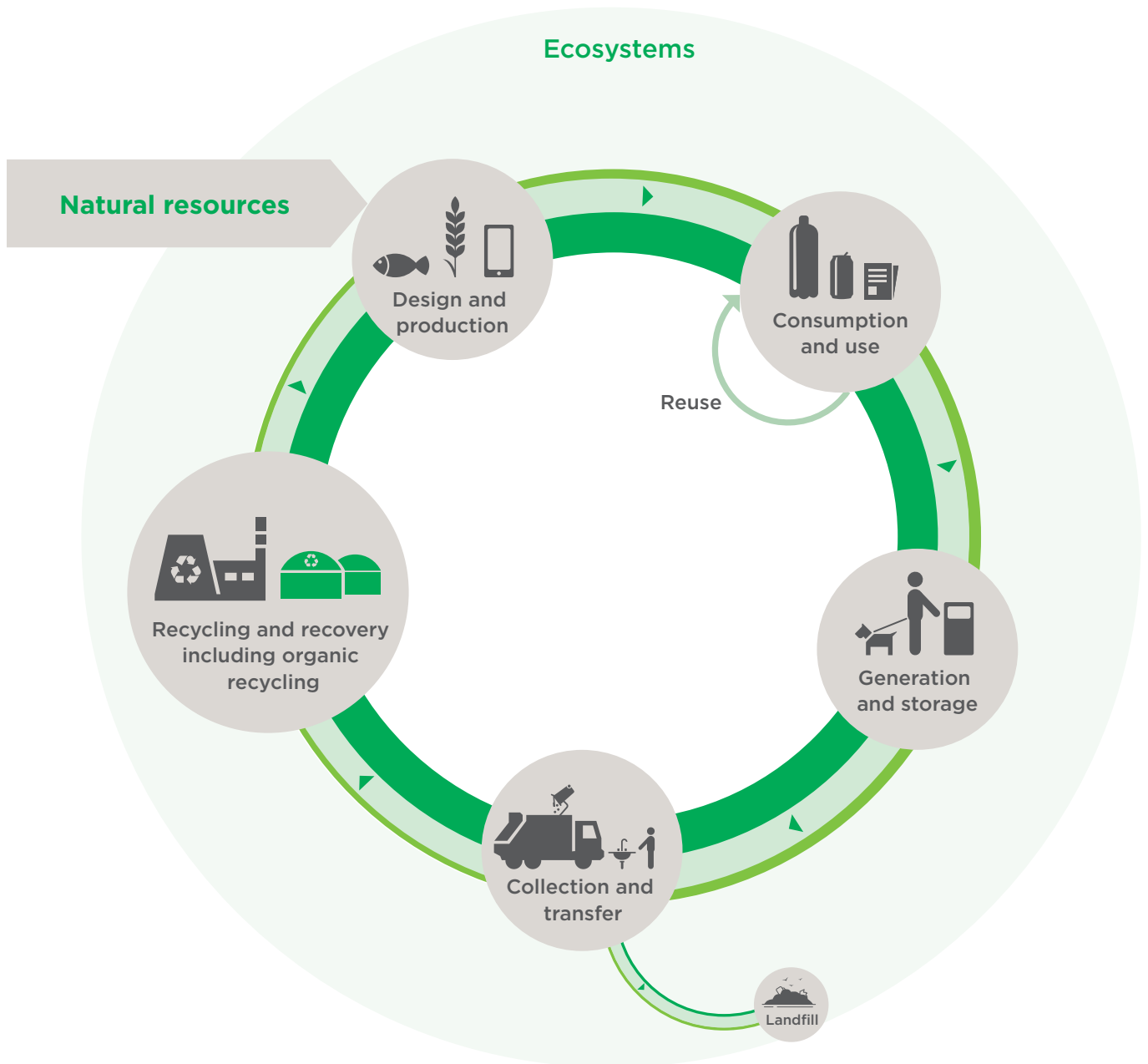
Key (lines represent indicative tonnes per year)

- Municipal solid waste
- Commercial and industrial waste
- Construction and demolition waste

STRATEGIC AND POLICY CONTEXT

International

Australia adopted the United Nations Sustainable Development Goals in 2015. The 17 goals and 169 global targets address common global issues. Goal 12 aims to ensure sustainable consumption and production patterns (United Nations, 2015).

Around the world, cities are embracing a range of different approaches to achieve improved diversion from landfill and resource recovery outcomes. See Appendix B for more information.

National

The circular economy is at the heart of the Australian Government's National Waste Policy 2018 where waste is a resource that should be continually reused and recycled. The policy provides a framework for collective action by businesses, governments and communities (Department of the Environment and Energy, 2018). The Australian Government is responsible for product stewardship oversight as well as leading national waste and resource recovery initiatives.

State

Victoria has a legislative and strategic waste and resource recovery framework that focuses on increasing recycling and recovery, diverting of waste from landfill and safe management of materials (Sustainability Victoria, 2018). Key initiatives include the resilience of the recycling industry, food waste, education programs, market development, and improving the performance of councils and the commercial and industrial sector. The Victorian Government has committed to developing a whole-of-government circular economy policy and action plan by 2020 (Department of Environment, Land, Water and Planning, 2018).

Metropolitan Melbourne

The Metropolitan Waste and Resource Recovery Implementation Plan applies Victoria-wide priorities in the metropolitan region. This plan sets out how infrastructure needs will be met over a 10-year period in order to meet four strategic objectives:

- reduce waste to landfill

- increase diversion of organic waste

- deliver community, environmental and economic benefits

- plan for a growing population.

The plan focuses on avoiding new landfills through improving recycling, recovering food waste and advanced waste processing (Metropolitan Waste and Resource Recovery Group, 2016).

Links with other City of Melbourne strategies and policies

The City of Melbourne has a number of other strategies and policies that address the broader implications of waste from an environmental and amenity perspective.

Climate Change Mitigation Strategy to 2050

The Climate Change Mitigation Strategy to 2050 aligns with the 2015 Paris Climate Agreement, and supports international efforts to stay below a 1.5°C rise in global average temperatures. Melbourne has set ambitious emissions reduction targets for 2030 and a goal to achieve net zero emissions before 2050.

A key priority is to reduce the impact of waste. The strategy sees organic waste as a particular issue of concern because it generates methane which has a warming impact 25 times greater than carbon dioxide.

The strategy advocates moving towards a circular economy that designs out waste and keeps products and materials in use at their highest value through sustainable supply chains, supporting a low carbon economy. This can occur through reduced packaging, and developing new products from recycled materials.

Food City - Food Policy

The Food Policy aims to improve people's health and wellbeing by promoting a food system that is secure, healthy, sustainable, thriving and socially inclusive.

A theme of the policy is to reduce food waste by encouraging the redistribution of food and recycling of organic waste and water.

The policy suggests ways to achieve this including educating households and food businesses to reduce food waste and identifying opportunities to reduce the greenhouse gas emissions associated with Melbourne's food consumption.

Transport strategy

The Transport strategy has a vision of Melbourne as a connected city that puts people first. Central to the vision is an integrated network of streets, lanes and transport routes that support walking, cycling and public transport as the dominant modes of travel.

The strategy recognises the need for innovative, low-impact freight, particularly in the central city, to keep pace with a growing residential and visitor population and volume of deliveries and waste collection. The strategy notes that current arrangements for waste removal are inefficient and results in a loss of urban quality, especially in central city laneways, where waste collection competes with the need to support street-life and people-oriented uses.

Emissions Reduction Plan for our operations

This plan summarises the actions that the City of Melbourne will take to reduce emissions from its activities to maintain carbon neutral status.

The plan has seven priority areas, including a priority to reduce emissions from waste. It recognises the necessity of developing a low carbon culture through waste avoidance and reducing waste generated from City of Melbourne and partner events, the supply chain, and infrastructure development. It also recognises the need to address emissions from waste collection services, such as those associated with waste vehicles.

Council Plan

This strategy is one of a suite adopted in conjunction with the Council Plan and should be read as consistent with the overall vision and outcomes of the Council Plan. Note that any specific actions or initiatives outlined in this strategy are not binding upon the City of Melbourne but may inform its planning and resourcing considerations and be endorsed as part of its Annual Plan and Budget.

WASTE IN MELBOURNE TODAY

Waste sources

Waste and recycling is generated from three sources within the Melbourne municipality:

1. Municipal solid waste - mainly from household waste but also City of Melbourne operations (for example our offices, street sweepings and public parks) and public place bin waste.

2. Commercial and industrial waste - from shops, offices, cafes and restaurants, hotels, hospitals, manufacturers and other organisations.

3. Construction and demolition waste - mainly concrete, bricks and rubble.

The vast majority of waste comes from the commercial and industrial and construction and demolition sectors.

Figure 5: Total waste generated in the municipality based on 2016-17 data, by waste source and recycling/landfill

Key
- Recycled
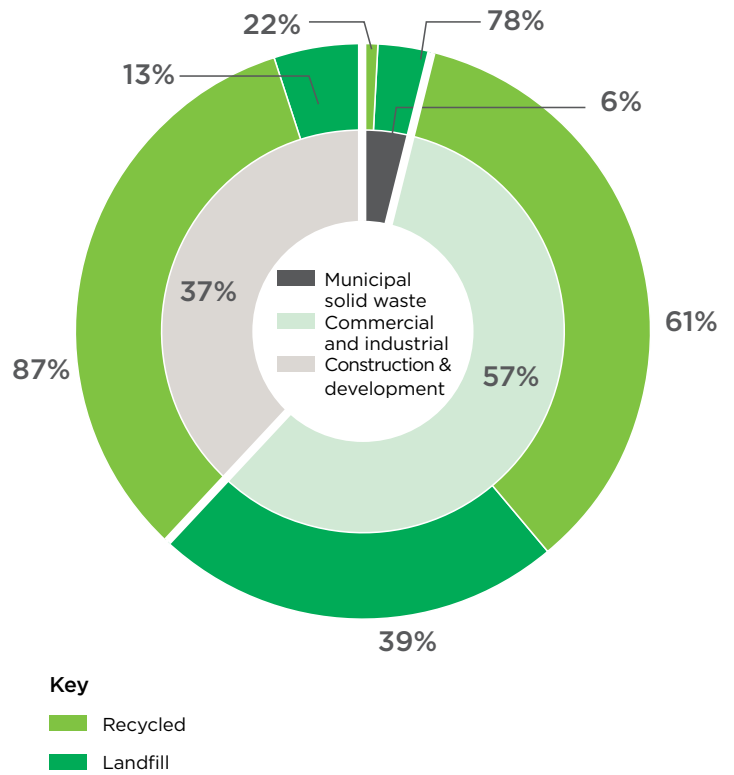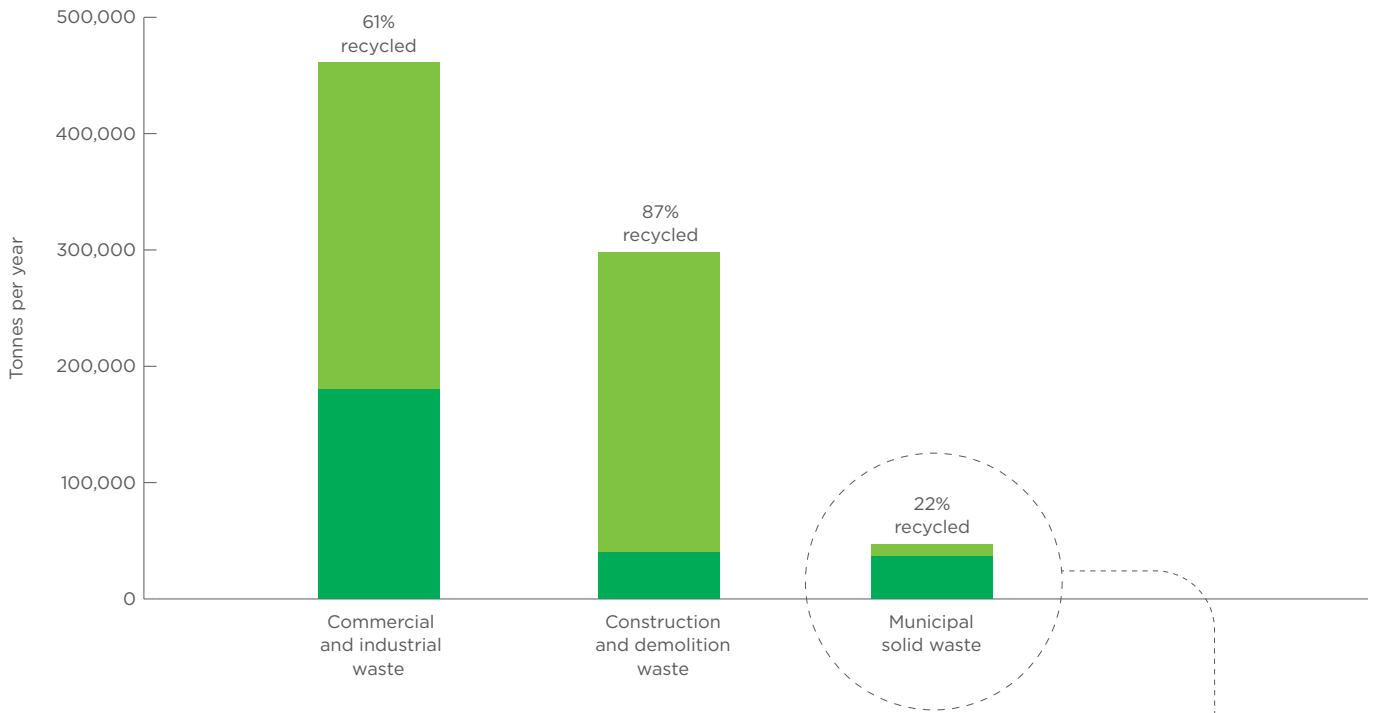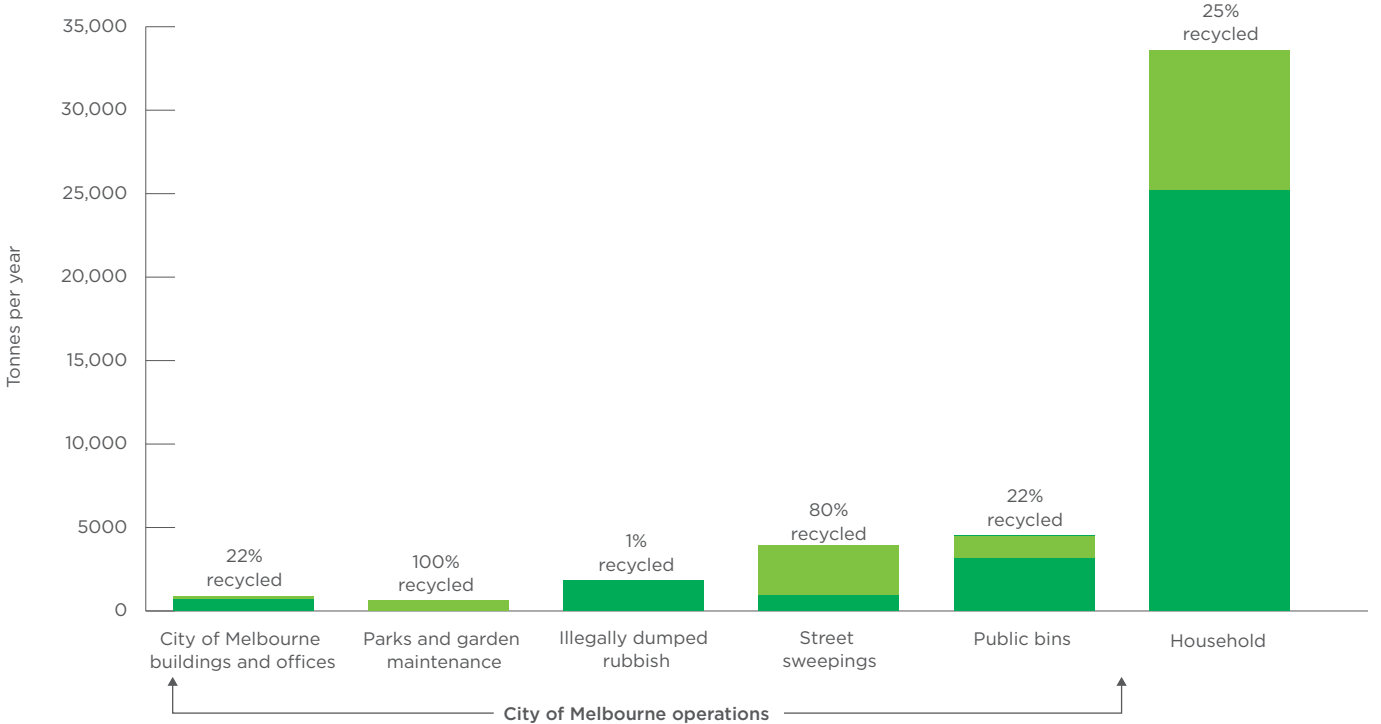- Landfill

Figure 6: Total waste generated in the municipality based on 2016-17 data, by waste source and recycling/landfill

Key (lines represent indicative tonnes per year)

■ Recycled ■ Landfill

Figure 7: Municipal solid waste generated in the municipality based on 2016-17 data, by waste source and recycling/landfill

Key (lines represent indicative tonnes per year)

■ Recycled ■ Landfill

Household waste

Figure 8: Composition of household waste
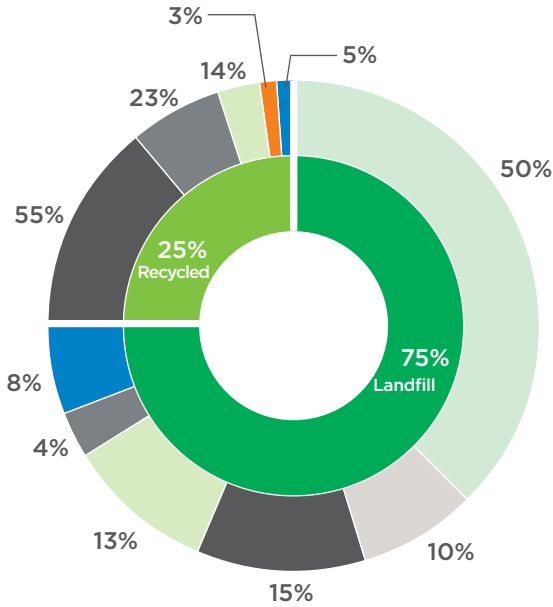
Key (lines represent indicative tonnes per year)

- Food
- Paper/cardboard
- Glass
- Other
- Garden
- Plastic
- Metal

Household waste makes up around 5 per cent of the total waste in Melbourne. Residents recycle only 25 per cent of their waste, which is low compared to the Victorian average of 45 per cent. This is mostly due to the lack of organic recycling - half of all household waste to landfill is food waste. Residents discarded an estimated 12,000 tonnes of food waste in 2016–17 (Blue Environment, 2018).

More than 50 per cent of the household recycling bin is paper and cardboard, nearly 25 per cent is glass and 14 per cent is plastic.

Electronic waste makes up only one per cent of material sent to landfill in Australia, but it's one of the fastest growing waste streams and contains toxic heavy metals. In 2016–17, we picked up 14 tonnes of e-waste; our collections are increasing as more apartment buildings request bins for e-waste.

Household recycling
60kg/person/year

Household garbage
177kg/person/year

Commercial and industrial waste

Figure 9: Composition of commercial and industrial waste
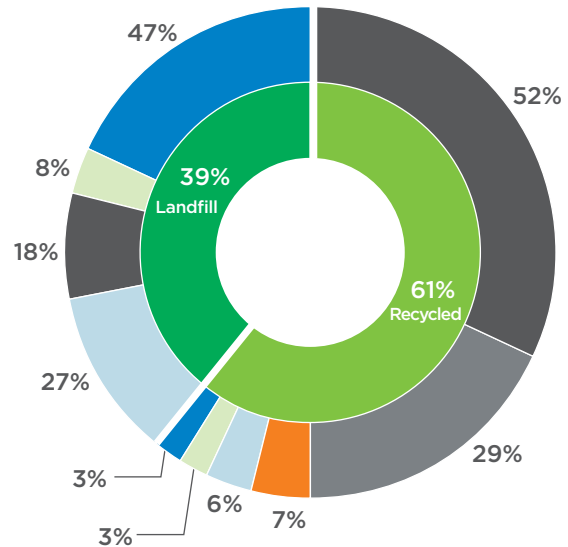
Key (lines represent indicative tonnes per year)

- Paper/cardboard
- Metal
- Plastics
- Glass
- Organics
- Other

There are approximately 16,700 business establishments in the municipality of Melbourne, employing nearly half a million people (City of Melbourne, 2017). The commercial and industrial sector produces over 50 per cent of the total waste and recycling in the municipality, recycling around 60 per cent of it. Over 70 per cent of the total waste to landfill is from this sector.

Commercial and industrial waste is mostly privately collected, and so it is difficult to get accurate data. Our estimates are based on an extensive survey and modelling (Blue Environment, 2018). Of the estimated 60 per cent that was recycled, around half of this was paper and cardboard, 44 per cent was mixed recyclables or glass, and the rest was made up of organics, such as food, garden material and wood (5 per cent) and other materials (1 per cent).

Hospitality and food retail businesses generated over one third of commercial and industrial waste. They have relatively low recycling rates of 47 per cent (hospitality) and 61 per cent (food retail) when compared to other business types such as health care and social assistance (92 per cent recycling rate) and office-based businesses (86 per cent recycling rate).

The commercial and industrial sector generated over 64,000 tonnes of organic waste in 2015-16, with 25 per cent recovered and 75 per cent sent to landfill.

Construction and demolition waste

Figure 10: Composition of construction and demolition waste
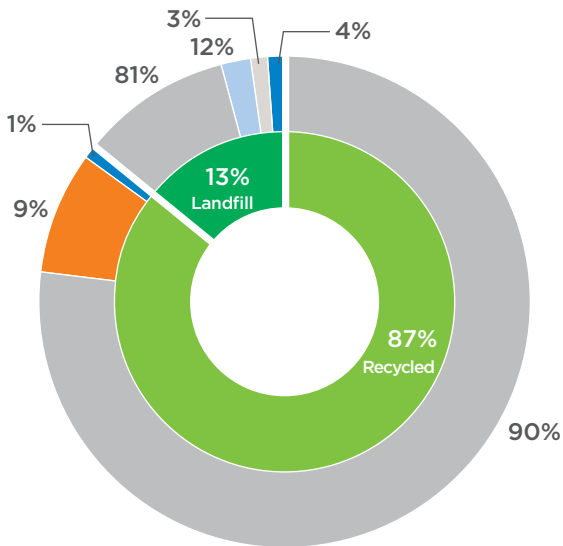
Key (lines represent indicative tonnes per year)

▢ Masonary and soil		▢ Metal	
▢ Timber		▢ Garden	
▢ Other			

Building projects mainly generate concrete, masonry, soil, metals and timber waste. Over 87 per cent of this material is recycled. Waste volumes have been estimated based on the value of building permits issued and the overall amount of waste generated in metropolitan Melbourne.

City of Melbourne operations

City of Melbourne operations are less than 2 per cent of the total waste in Melbourne. Only 11 per cent of City of Melbourne's operational waste is recycled, and more than half of the City of Melbourne's waste from operations comes from street sweeping.

Public litter bins are provided by City of Melbourne on streets and in parks. Single-stream, solar-powered compacting public litter bins were installed across the central city in 2018 to reduce the number of truck movements. This material is currently sent to landfill due to the prohibitive cost of sorting and recycling.

Waste storage and collection

City of Melbourne provides collection services for our own operations, for public litter bins, for residential properties and for some commercial properties. We provide residential properties with collection services for garbage, comingled recycling, garden organics, hard waste and electronic items.

Commercial rateable properties are entitled to a weekly collection of one small garbage bin and one small or large recycling bin. If businesses require additional collections they must arrange their own collection service from one of the many waste and recycling collection companies operating in the municipality. The City of Melbourne's Activities Local Law 2009 places requirements on where bins can be stored in the public realm and when they can be collected.

We have three specialised collection facilities to service the commercial sector:

1. The Degraves Street Recycling Facility processes food waste and collects glass, steel, aluminium, plastic and cardboard generated from surrounding cafes and restaurants.

2. Communal waste compactors in central city laneways take waste from up to 130 businesses at five locations.

3. Recycling hubs offer free recycling to businesses at twelve locations, with an additional 76 cardboard bins in 41 laneways across the central city.

Disposal

Much of the waste collected by both City of Melbourne and by private companies is deposited at the Waste and Recycling Centre on Dynon Road. This centre is considered by the Victorian Government to be a waste infrastructure hub of state significance (Sustainability Victoria, 2018).

Recycling is sorted into material streams and then sold to reprocessors and manufacturers in Australia and abroad.

WHY WE NEED A NEW APPROACH

Challenges

The waste and resource recovery system is facing many complex challenges.

Climate change and resource extraction

The traditional economic model of 'take-make-throw' has a multitude of environmental impacts. Natural resources are extracted and processed to produce goods, with impacts on biodiversity and ecosystems. Greenhouse gas emissions are generated as waste is transported, and as organic materials break down in landfill. Landfilled waste can also leach heavy metals and toxic chemicals into the soil and water.

Amenity - congestion, noise, and odour

Waste storage and collection can have an impact on amenity in neighbourhoods and public spaces, from odour and visual amenity from bins, noise from waste collection, traffic congestion and disruption to residents due to the large number of collection trucks. Public spaces with high concentration of bins has been shown to lower people's perception of safety. Landfills can produce odour that affect surrounding neighbourhoods, can produce litter, and waste trucks can also affect local traffic congestion.

Rapid city growth

Melbourne is growing fast. Melbourne's residential population is expected to grow to more than 286,000 by 2030. The estimated daily population on an average weekday in the city, including workers and visitors, will reach approximately 1.2 million (.id, 2018). Extra residents and visitors will generate more waste and recycling and place more pressure on waste infrastructure and systems. Without bold action, congestion will increase and amenity will decline, both impacting on public health and safety.

Recycling industry challenges

In early 2018 China introduced restrictions on the type and quality of recyclable material it imports, significantly changing the international market in recycled commodities. As a result, Melbourne is facing increased costs for recycling sorting. The Victorian Government responded with a Recycling Industry Strategic Plan, released in July 2018. It aims to stabilise the recycling sector, increase the quality of recycled materials, improve the productivity of the sector and develop markets for recycled materials.

Trends in waste management

Food waste

Around half of household garbage is food waste. Significant amounts of food waste are generated by the commercial sector, especially hospitality and retail. Diverting food waste from landfill is an urgent priority to reduce greenhouse gas emissions. A growing number of councils are implementing food organics collections through the green organics bin. In the commercial and industrial sector, some businesses and organisations are introducing small-scale, on-site organics processing units and larger scale, off-site composting or anaerobic digestion facilities for food organics. There are substantial efforts being made internationally to avoid, reduce and recover food waste. Initiatives include: food waste avoidance campaigns, food rescue activities, food sharing platforms, formal policy and regulatory measures, food waste collections and use of in-sink disposal units.

> **"Without bold action, congestion will increase and amenity will decline, both impacting on public health and safety."**

Case study: Recycling cigarette butts

The City of Melbourne is showing leadership by collecting and recycling cigarette butts and turning them into into practical plastic items such as shipping pallets and plastic furniture.

Over nine million butts are collected each year. Cigarette butts are the most littered item and have serious impact on waterways and marine ecosystems. Recycling the butts is more environmentally friendly than other disposal options.

Case study:
Tackling food waste

Many cities are providing options for households to avoid, reduce and recover food waste from landfill. Cities such as Copenhagen, Milan, Paris, some boroughs of London, Toronto, Vancouver, San Francisco and Auckland all provide food waste collections to households and some to small commercial sites such as cafes and restaurants. New York City provide households with a mix of kerbside collection, drop off locations and community gardens (DJR Environmental 2018). Adelaide has a food waste collection service for residents and City of Sydney have committed to trialling a food waste collection scheme.

In-sink food waste disposal units are also being trialled and used in some cities. These units require the user to separate food waste and flush it through the unit with a small amount of water. The food is macerated into small pieces and passes into the sewerage system for treatment.

Legislation and regulations for businesses are driving action on food waste (Reincarnate, 2017). San Francisco's Mandatory Recycling and Composting Ordinance was introduced in 2009 to require residents and businesses to separate recyclable, compostable and landfill materials. Metro Vancouver introduced a regional ban on disposal of food waste in the residual waste bin in 2015, following their introduction of an organics collection service. Ninety-three per cent of residential apartment buildings shifted to using the bin-based food organics collection service since the ban was introduced. In New York City, specific businesses (based on business type, floor space and/or number of locations) are required to divert food waste from landfill. French law requires businesses producing over 10 tonnes of organic waste per year to recycle this material, with substantial fines for non-compliance (DJR Environmental 2018). Milan's high rate of organics recovery is backed by strict penalties requiring all households and commercial properties to separate out food waste, including fees for bin contamination (DJR Environmental 2018).

Regulatory intervention
The Environment Protection Amendment Act 2018, commencing in 2020, introduces a general environmental duty that requires risks of harm to human health and the environment from pollution and waste to be minimised. The Victorian Government has introduced a ban on e-waste to landfill that will come into effect on 1 July 2019 and a ban on single-use bags in late 2019.

Landfill levy
Most Australian states and territories have landfill levies as a disincentive for waste disposal to landfill and a means of raising funds for environmental initiatives (EPA Victoria, 2018). The Victorian levy, introduced in 1992, is $64.30 per tonne in 2018–19. The Victorian Government receives over $210 million in landfill levy every year, spending over half on environmental agencies, the balance goes into the Sustainability Fund ($80 million every year). There is currently over $500 million in the Sustainability Fund (Department of Environment, Land, Water and Planning, 2018).

Advanced waste processing
Advanced waste processing (AWP) facilities recover more resources from waste. A number of different technologies have been used abroad to recover recyclables and produce electricity, heat, gas, liquid fuel and solid fuel. These facilities are common abroad - there are around 800 MSW waste to energy plants globally (United Nations Environment Programme, 2015). They are an effective solution to recover the energy and materials in waste.

A number of major projects are under development in Victoria, such as Australian Paper's proposed energy-from-waste and the Metropolitan Waste and Resource Recovery Group's AWP collaborative procurement project.

Case study: Extended producer responsibility

British Columbia, Canada, is widely regarded as a global leader in the implementation of extended producer responsibility (EPR), a regulatory approach whereby producers (manufacturers, sellers, brand-owners and first importers) are responsible for managing their products and packaging across the full life-cycle, from selection of materials and design, to funding and managing recycling programs at the end of the product's life (Recycling Council of British Columbia, 2019). Industry schemes cover many products including tyres, electronic products, packaging, medicines, outdoor equipment and light globes. In each of these EPR programs, companies are required to set up and pay for recycling programs for the products and packaging they make and sell; resulting in a significant amount of diversion of these materials from landfill and incinerator.

In Japan, EPR schemes extend to packaging, automobiles and electronic goods. Retailers are subject to an 'old for new' requirement; every time they sell a product, they must take back from the consumer a similar used product (Inform, Inc., 2003). The Home Appliance Recycling Law requires manufacturers and importers to collect and recycle their own appliances, including air conditioners, refrigerators, televisions and washing machines. This has resulted in high rates of recycling for home appliances in recent years, exceeding 90 per cent for air conditioners, 80 per cent for refrigerators, between 73 to 89 per cent for televisions and 90 per cent for clothes washers and dryers (Ministry of Economy, Trade and Industry Tokyo, n.d.).

"Extended producer responsibility has been adopted in many countries."

Extended producer responsibility

Extended producer responsibility (EPR) is a policy approach in which producers are given a significant responsibility for the treatment or disposal of post-consumer products. It has been adopted in many countries, including most European Union member states. EPR schemes typically involve the establishment of collection and recycling services funded by product manufacturers or retailers, so consumers can access a convenient recycling service at no cost to themselves or to the local authority.

Plastic waste

Plastic waste has significant impacts on marine ecosystems. Wildlife can get entangled or ingest plastics, harming their health. Plastics can also cover and harm coral reef and other marine environments. Many countries and cities are seeking to reduce the impact of packaging through requirements or bans on particular packaging materials, such as non-recyclable containers, cutlery or crockery, or through container reuse schemes. Victoria is banning single-use plastic bags in 2019. Many businesses are now removing unnecessary plastic items from their stores.

Case study: Plastic packaging

In San Francisco, disposable cutlery and crockery must be compostable or recyclable. Food outlets are encouraged to incentivise customers to bring reusable cups and containers and charge a fee for additional costs for disposable containers (Reincarnate, 2017). Other cities, such as Seattle and Minneapolis, have introduced requirements for all take-away packaging to be compostable or recyclable. Bans have also been enacted in many US cities to prohibit the use of polystyrene packaging from restaurants, food vendors, and in some locations, supermarkets and other retailers. Vancouver adopted a single-use items reduction strategy in 2018 and is investigating bans or requirements for recyclability (City of Vancouver, 2018). Container share programs are active in some cities. The Portland 'GO Box' program has 80 outlets using reusable, returnable packaging for takeaway food, with containers collected and sanitised before reuse (Reincarnate, 2017).

"Our strategy focuses on increasing recycling, capturing organic waste, and improving the local recycling sector."

TAKING ACTION TOWARDS ZERO WASTE

Melbourne will be a leader in waste and resource recovery. We have set an ambitious goal towards zero waste, aiming for a 90 per cent recovery rate. We will aim to avoid waste and reduce household waste generation by 20 per cent. We will improve how waste and recycling is separated, stored and collected in order to reduce noise, odour and congestion and improve the beauty of the city. We will capture and recycle organic waste. Our aim is to recover all valuable material if viable, with minimal waste going to landfill.

We will investigate and pilot new and innovative ways to recover waste.

> **"Melbourne will be a leader in waste and resource recovery."**

Meeting the vision will require collective action from all stakeholders - residents, visitors, businesses, organisations, the community sector and the state and national government.

Roles and responsibilities

Local government

City of Melbourne is responsible for providing waste and recycling services to residents. The City of Melbourne outsources the delivery of waste services to private companies through a competitive tender process. We also undertake local planning, develop policy and implement education and behaviour change programs for waste reduction and recycling. We control our own consumption and waste generated from our own operations. We collect residential waste and determine how this is stored, collected and recovered or disposed. We approve waste management plans for new developments. However, we have very little influence over the waste system or for commercial and industrial or construction and demolition waste – the vast majority of waste generated in the municipality.

Victorian Government

State governments plan, licence and regulate and manage the impacts of waste management activities. Various legislation, policies and programs exist at the state- and metropolitan-level. The Victorian Government's waste portfolio includes the Department of Environment, Land, Water and Planning, the Environment Protection Agency, Sustainability Victoria, and seven regional groups including the Metropolitan Waste and Resource Recovery Group (MWRRG). MWRRG plan for waste facilities across metropolitan Melbourne, facilitate joint procurement of facilities and services for groups of councils and manage a number of council networks aimed at capacity building and knowledge sharing.

Australian Government

The Australian Government has an over-arching role in waste management through national legislation, strategies and policy frameworks, including the Product Stewardship Act 2011, the National Food Waste Strategy (2017) and National Waste Policy (2018).

While the City of Melbourne's role in influencing the pathway towards 2030 is limited, particularly in the commercial sector, there are ways we can engage the community through information, education and advance new solutions through regulation, advocacy and partnership with other stakeholders. We can also create change by providing support for innovation by businesses and the community and demonstrating best practice.

Pathway towards 2030

We have set ambitious but achievable targets and actions to move the city towards zero waste. Our priorities will affect all waste sectors: municipal solid waste, commercial and industrial waste, and construction and demolition waste. A key focus is improving the recycling and organics diversion of household waste. Figure 11 outlines the possible pathways and processes for increasing household waste recovery.

The future proportion of materials going to recycling, organics, and landfill is uncertain. Advanced waste processing (AWP) is a least preferred option, to be considered once all other options have been exhausted.

The City of Melbourne will review this strategy in 2023 and assess the merits and implications of AWP in light of progress and future circumstances.

Figure 11: Household waste pathway to 90 per cent landfill diversion
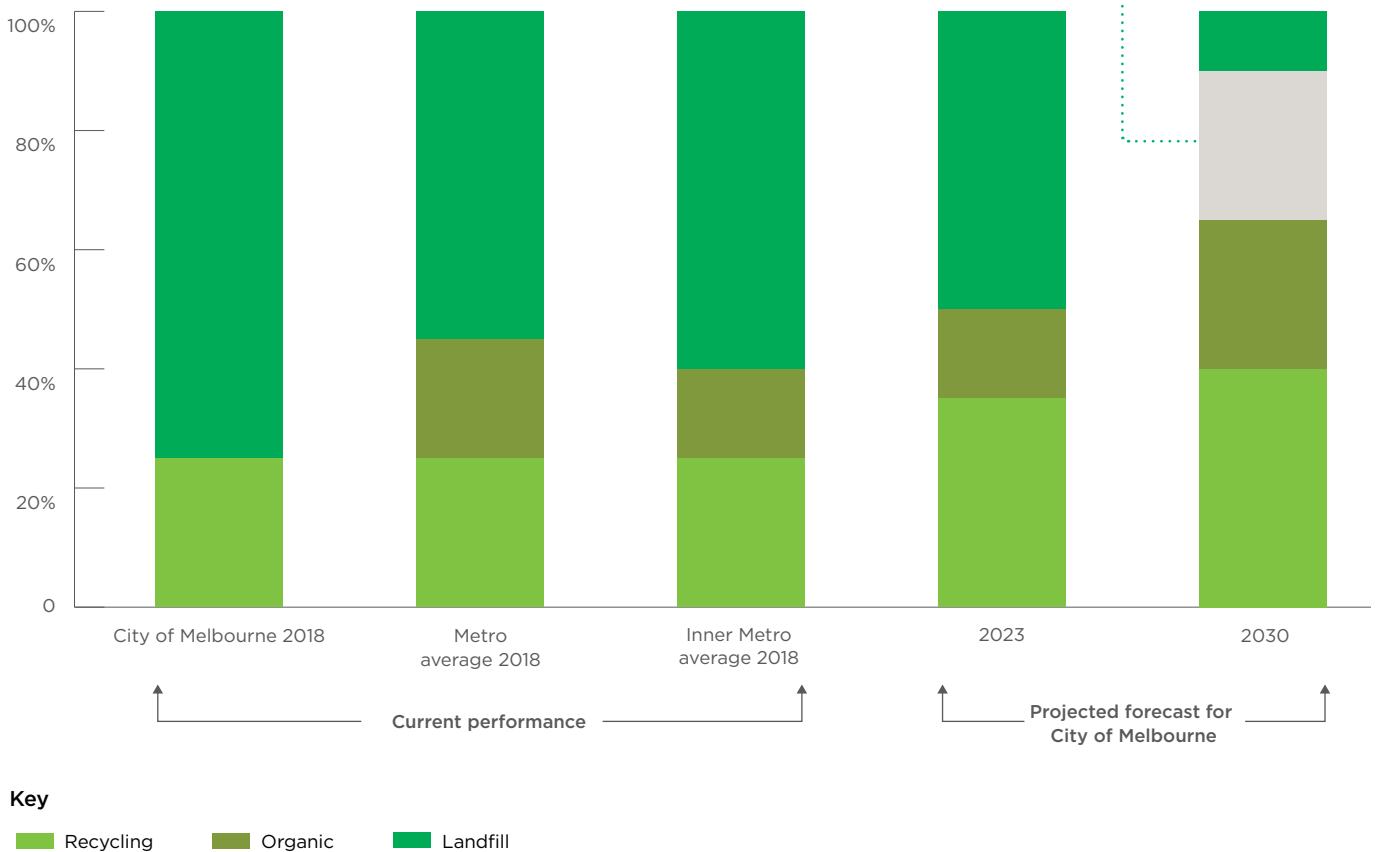
Key

Recycling   Organic   Landfill

"Our efforts can create a stronger circular economy that will reduce environmental impacts, improve the beauty and liveability of the city, and make the waste and resource recovery system more resilient."

STRATEGIC PRIORITIES

Figure 12: Priorities mapped against different stages of the circular economy
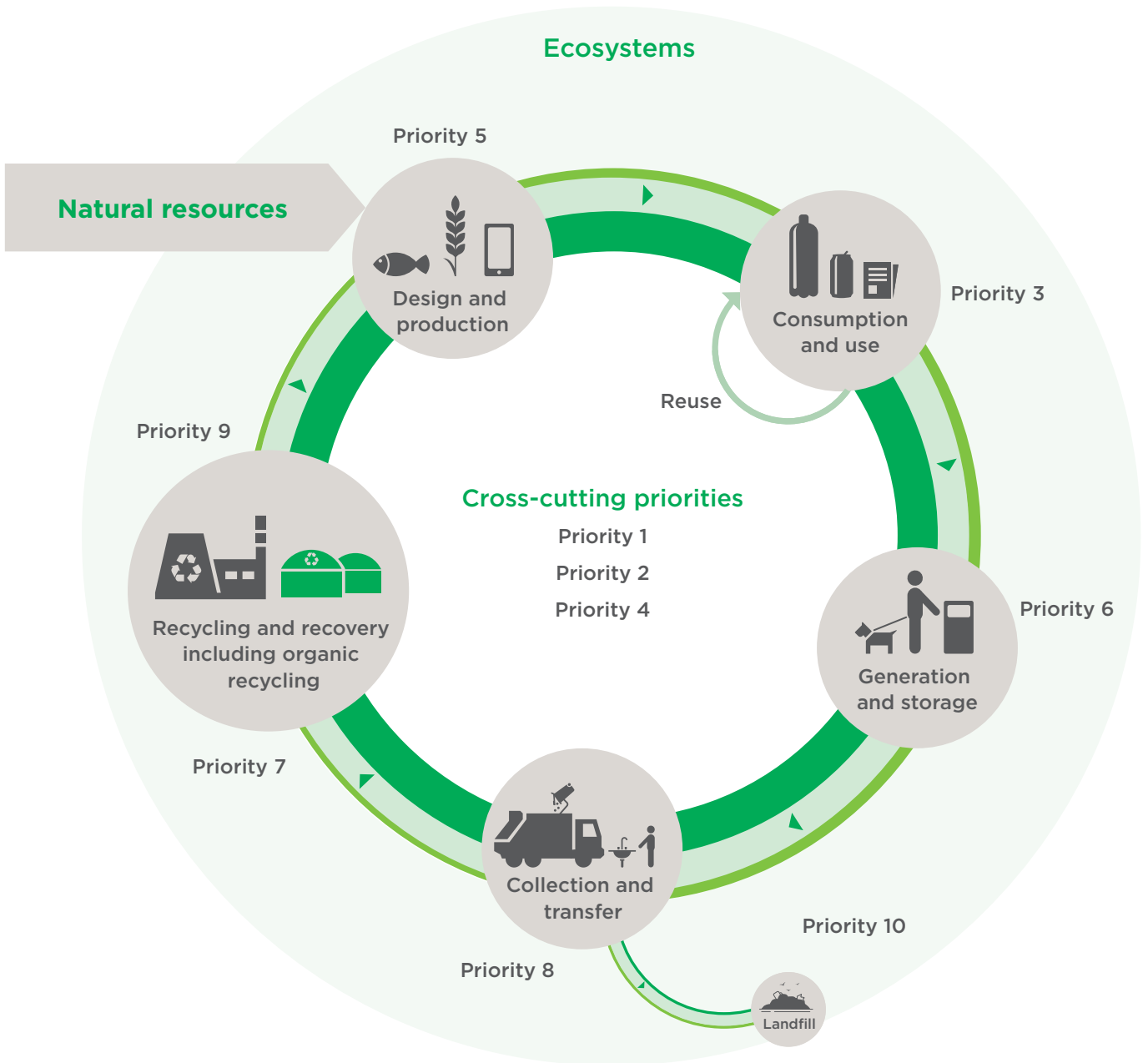
Ecosystems

Natural resources

Priority 5

Design and production

Priority 3

Consumption and use

Reuse

Cross-cutting priorities

Priority 1
Priority 2
Priority 4

Priority 9

Recycling and recovery including organic recycling

Priority 6

Generation and storage

Priority 7

Priority 10

Collection and transfer

Priority 8

Landfill

Key (lines represent indicative tonnes per year)

- Municipal solid waste
- Commercial and industrial waste
- Construction and demolition waste

Figure 13: Priorities mapped against the waste hierarchy

MOST PREFERABLE

Avoid
1. Engage and educate community and businesses
2. Incentivise and promote innovative solutions

Reduce
3. Support growth of a circular economy through government procurement
4. Advocate for better producer stewardship and product design

Recycle
5. Lead by example through City of Melbourne operations and events
6. Improve waste governance and planning
7. Establish new systems to source separate and collect organic waste
8. Transform the collection and transfer of recycling and residual waste
9. Improve the efficiency, effectiveness and viability of recycling

Recover
10. Explore advanced waste processing of residual waste that cannot be otherwise recovered

Treat

Disposal

LEAST PREFERABLE

TARGETS AND INDICATORS

We will track our performance against this strategy based on the targets and indicators below, at different points through the life of the strategy. This will help us answer a number of key questions:

- What actions have been implemented to date?
- What difference have we made?
- Are we on track to achieve our targets?

We will monitor the implementation of our actions on an annual basis. We will also undertake continual monitoring to understand our progress, and to inform whether or not we need to adjust course when we review our strategy in four years' time. In the first year of the strategy, we will carry out an initial baseline assessment to identify the city's current performance. This strategy will be reviewed in 2023 to assess progress.

		TARGETS AND INDICATORS 2023	TARGETS AND INDICATORS 2030
	KEY TARGETS	• 50% of all waste diverted from landfill • 5% reduction in household waste produced • 0.3 Mt CO2-e in greenhouse gas emissions avoided *(for 2025)*	90% of all waste diverted from landfill 20% reduction in household waste produced 1.2 Mt CO2-e in greenhouse gas emissions avoided *(from the Climate Change Mitigation Strategy 2050)*
REDUCE	**More efficient use of resources**	• At least one new extended producer responsibility scheme • Victorian Government commits to a container deposit scheme	Increased number of extended producer responsibility schemes Victorian Government implements a container deposit scheme
	The city produces less waste	• 10% reduction of City of Melbourne office waste produced • 90% of construction and demolition waste from City of Melbourne led developments is recovered	30% reduction of City of Melbourne office waste produced 90% of construction and demolition waste from City of Melbourne led developments is recovered
COLLECT	**More effective recycling separation systems**	• 20% less contamination of household recycling bins • 90% of waste is recovered from at least four City of Melbourne run or sponsored events • 20% reduction in waste produced from at least four City of Melbourne run and sponsored events	50% less contamination of household recycling bins 90% of waste is recovered from all City of Melbourne run and sponsored events 20% reduction in waste produced from all City of Melbourne run and sponsored events
	A city with high amenity	• 20% less private bins in the public realm • Average customer experience rating of at least 3.5 out of 5	No private bins in the public realm Average customer experience rating of at least 3.5 out of 5
RECOVER	**Food and green waste recovered**	• At least one trial achieves 50% of organics in household waste recovered	50% of organics in household waste is recovered
	A resilient recycling sector	• At least one pilot precinct that eliminates unnecessary single-use plastic • Increase in recycled content in products procured by City of Melbourne	No unnecessary single-use plastic in the City of Melbourne Increase in recycled content in products procured by City of Melbourne
	Waste to landfill minimised	• 50% of household waste is recovered • 70% of commercial and industrial waste is recovered • 90% of construction and demolition waste is recovered • 60% of City of Melbourne operational waste is recovered	90% of household waste is recovered 90% of commercial and industrial waste is recovered 90% of construction and demolition waste is recovered 90% of City of Melbourne operational waste is recovered

Priorities and actions: 2019–2023

The priorities and actions in this strategy will set Melbourne on a course towards zero waste by 2030. The whole strategy will be reviewed in 2023. Creating a circular economy where resources are valued, used efficiently and discarded only when their materials have no further use, requires a multi-pronged approach (see Figure 12).

Where should we direct our effort?

City of Melbourne is one of many stakeholders in the waste and resource management system. There are some things we can control, and others where we can only influence. Our actions fall into three categories.

Deliver
Delivering services, establishing pilot trials, and leading by example by improving our own operations.

Influence
Providing information and advisory services as well as support and funding to innovative projects. Seeking action from other levels of government or other organisations.

Govern
Developing guidelines, regulation and administering local laws.

Measuring impact
Environmental sustainability is at the heart of this strategy. The city must be designed and managed to minimise the city's environmental footprint which will improve the health of ecosystems and social wellbeing.

For this strategy it means minimising pollution from greenhouse gas emissions, leachate (which can include heavy metals), dust, litter and odour. It means avoiding and managing substances that cannot be broken down naturally in the environment, such as plastics. It means improving our reuse of materials to avoid overproduction and raw material extraction which degrades ecosystems and harms biodiversity. All these actions will help Melbourne towards a sustainable future.

We will measure the impacts of our actions against three sustainability criteria:

1. Increasing landfill diversion - reusing, recycling and recovering resources strengthens the circular economy and reduces depletion of finite resources. Decreasing wasted materials helps minimise emissions, leachate and litter from landfills.

2. Avoiding greenhouse gas emissions - keeping organic material out of landfill reduces methane emissions, and capturing energy and resources from waste helps to reduce the footprint from raw material production.

3. Enhancing amenity - improving waste storage and collection will minimise noise and odour, remove bins from laneways and reduce traffic congestion, making Melbourne a safer, more beautiful and liveable city.

In the tables on the following pages, the level of impact has been estimated using the following criteria:

1. **Diversion from landfill:** High - greater than 30,000 tonnes per annum, Medium - 15,000 to 30,000 tonnes per annum, Low - less than 15,000 tonnes per annum.

2. **Greenhouse gas emissions** considers tonnages and the materials targeted: High - specifically organics and metals, Medium - plastics and glass, Low - other materials.

3. **Amenity** considers if an initiative specifically targets congestion, noise, odour, public realm bins, or organics waste: High - specifically targets amenity, Medium - somewhat targets amenity, Low - little targeting of amenity.

Test, learn, improve
We need to be flexible and adaptable to manage the complexity and rapid changes in the waste and resource recovery sector. This means that for all our actions we will test them through pilots, learn from the evidence and then improve our efforts to focus on what works.

Figure 14: Our approach to implementing strategy actions

Implementation **Test, learn, improve** **Review**

2019 **2023**
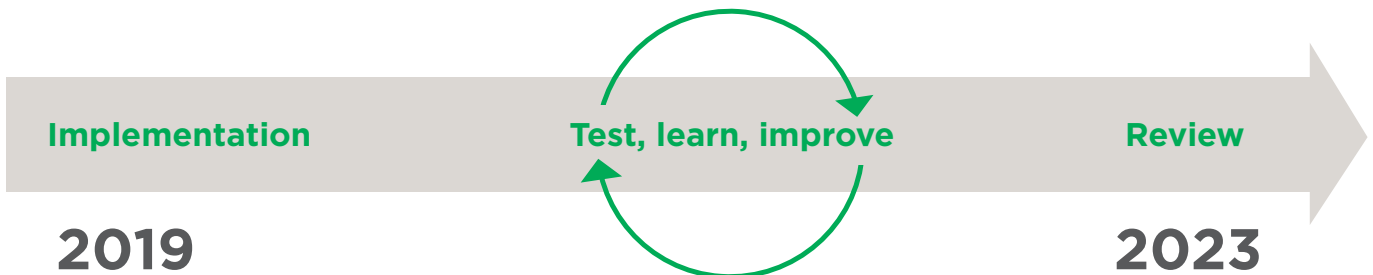
Priority 1: Engage and educate community and businesses

The City of Melbourne plays a critical leadership role in engaging, educating and collaborating with community and businesses to improve the waste and resource recovery system.

The commercial and industrial sector is responsible for producing more than half the waste in the municipality, so it is important that business owners and organisations play their part in reducing waste and increasing recycling. There are growing numbers of people living and working in high-rise buildings, some of which are not optimised for resource recovery, so waste infrastructure and processes need to be upgraded and future-proofed.

Interviews and workshops with our community and industry tell us that businesses need advice on better approaches to waste management and resource recovery. There is currently limited information and support networks available to commercial and business owners and operators on what options and best practice approaches might be appropriate to their individual circumstances.

The opportunity

There is an opportunity for the City of Melbourne to play a significant role in providing expert advice and information to businesses based on their unique needs. There is scope to do more particularly in the retail and hospitality sectors to improve avoidance, reduction, and recovery of food and other materials, a significant proportion of which currently end up in landfill.

The City of Melbourne high-rise recycling program supports residents to reduce waste and improve resource recovery in apartment buildings and is a useful example that could be expanded on to provide a tailored advisory service for the commercial sector.

Community information and education will be critical to support improved behaviours and performance. We will strongly support a state-wide education campaign aimed at avoiding and reducing waste, improving recycling behaviour and building confidence in the recycling system.

We can use our promotional channels to encourage residents, workers, visitors and students to adopt more waste-conscious behaviours. This includes, for instance, influencing the adoption of alternative consumption models. Instead of individual ownership, alternatives would include buying second-hand, swapping or giving things away, 'product as a service' in which service providers offer access to products (for example, photocopiers), and sharing platforms, which enable shared use or access to products (such as cars or household tools).

Benefits of taking action
- Drives understanding and behaviour change, especially for waste avoidance and reduction.
- Encourages social enterprise built on alternative consumption models.
- Higher customer satisfaction through relevant and tailored advice.

Linked outcomes
- This is a cross-cutting priority that links to all outcomes.

Key actions for this priority
1.1 Provide an expert advisory service to support an improved waste system.

1.2 Run, support and advocate for education campaigns.

1.3 Promote innovation through our communications and events.

Table 2: Priority 1 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
1.1	Deliver	Businesses and building managers	●	●	⬤
1.2	Deliver Influence	Victorian Government, community organisations	●	●	●
1.3	Influence	Community organisations	●	●	●

Estimated level of impacts   ⬤ High   ● Medium   ● Low

Priority 2: Incentivise and promote innovative solutions

New and creative ideas are needed to transform the waste and resource recovery system. Without sufficient incentives and supporting structures wasteful practices and behaviours can be slow to improve, innovative ideas for reducing, recycling, or recovering resources can struggle to get off the ground because the solutions aren't matched by funding. While local government has limited influence, it can help to support a new virtuous cycle through targeted financial support and partnership with other stakeholders to promote the right conditions for change.

The opportunity
The City of Melbourne will incentivise new, innovative solutions, prioritising those that reduce waste generation and encourage product reuse. Key materials such as food and plastic waste will be targeted.

We will support community organisations with innovative waste solutions by providing in-kind support through endorsements and promotions. We will also partner with businesses to design incentive schemes that leverage private investment.

One gap in the city's capacity to recover resources is the outdated infrastructure and systems in much of its building stock. Retrofitting existing buildings to enable better resource recovery can be complex and expensive. To create the right incentives for residents and businesses to improve their performance we will work with key partners and suppliers to identify incentives which may include bulk buy schemes, promotions, rebates and grants.

We will continue to explore other innovative approaches to waste separation, storage, collection and recovery. Examples of some possible new approaches today include in-sink disposal units for food waste, vacuum waste systems that use vacuum pressure to collect and transport waste through a piped network and weight-based billing. New ideas can be nurtured and supported through events, procurement, local laws and pilot projects.

Benefits of taking action

- Encourages innovation, jobs and social enterprise
- Develop new solutions for complex problems
- Builds strong partnerships between organisations and the City of Melbourne

Linked outcomes
- This is a cross-cutting priority that links to all outcomes

Key actions for this priority
2.1 Establish and deliver a waste minimisation and innovation fund.

2.2 Deliver an incentive program to drive investment in new resource recovery infrastructure and other solutions.

2.3 Explore innovative approaches to waste reuse, collection, storage and recovery.

Table 3: Priority 2 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
2.1	Deliver	Community organisations and individuals	High	High	High
2.2	Influence	Community organisations, partnering businesses	High	High	High
2.3	Deliver	Residents and businesses	High	Low	Low

Estimated level of impacts ● High ● Medium ● Low

Priority 3: Support growth of a circular economy through government procurement

Strong end markets for recycled materials are essential to make the recycling sector sustainable in the long term. The current end markets for products made from recycled products are weak. Materials that could potentially be recovered and resold as new products are ending up in landfill partly due to the lack of strong and diverse local markets. Other barriers include:

- lack of quality standards and specifications for recycled material
- shortage of research and development of new uses for recycled materials
- inadequate sorting processes
- scarcity of extended producer responsibility schemes
- unclear procurement policies.

Creating a sustainable and mature market for recycled materials will drive product design and innovation, as well as boost reprocessing and manufacturing sectors. A strong market creates incentives for improving source separation and better quality recyclable materials to be recovered through sorting processes. Educating consumers to choose recycled materials will also drive end markets.

The opportunity

Local government is major purchaser of goods and is well positioned to help stimulate new markets for products that incorporate recycled content. There are significant opportunities for local government to expand demand for diverse recycled materials through alternative procurement decisions. For example, some of the components used in road asphalt, drainage pipes, street furniture, bollards and other commonly used infrastructure could be sourced from recyclable materials.

The City of Melbourne will collaborate with local and state government to drive new approaches in procurement within the public sector. A partnership approach would generate sufficient purchasing power to stimulate changes in the market towards more sustainable production and new business for recycled materials. We will review our procurement practices with a view to incorporating circular procurement principles. For example, we may procure from businesses that show leadership in waste avoidance, reduction and reuse (such as single-use plastics and food waste).

As a provider of major infrastructure, local government can support innovative approaches to the use of recycled materials through demonstration projects. This would help to increase acceptance for recycled products amongst other industries.

Benefits of taking action
- Supports new markets for recyclable materials
- Provides revenue to support sustainability of the local recycling industry
- Encourages innovation and facilitates development of alternative business models

Linked outcomes
- More efficient use of resources
- A resilient recycling sector
- Waste to landfill minimised

Key actions for this priority
3.1 Strengthen the City of Melbourne's procurement practices to use recycled materials where appropriate.

3.2 Partner with local and state government to develop best practice sustainable procurement policies and processes.

3.1 Pilot sustainable procurement projects that demonstrate circular economy principles.

Table 4: Priority 3 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
3.1	Govern	Partnering businesses and suppliers	●	●	●
3.2	Govern Influence	Other councils in Victoria, Victorian Government	⬤	●	●
3.3	Deliver Influence	Other councils in Victoria, Victorian Government	●	●	●

Estimated level of impacts   ⬤ High   ● Medium   ● Low

Priority 4: Lead by example through City of Melbourne operations and events

The City of Melbourne is proud of being a leader in sustainability, and we will strive to improve our operations and services to respond to waste and resource recovery challenges.

We provide publicly available bins on streets and in parks for the convenience of city users. The introduction of solar compacting single stream bins with inbuilt sensors lessens public litter bin collections, minimises waste truck movements and helps reduce overflowing public litter bins. Single stream public litter bins improve amenity and efficiency, but are challenging to recycle.

The opportunity

The City of Melbourne can model best practice by striving towards becoming a zero waste organisation by 2030. This means City of Melbourne operations, tenanted buildings and publicly available facilities all encourage avoidance and reuse, and offer waste stream separation for resource recovery and strive for a 90 per cent recovery rate.

As a developer of new city assets and infrastructure, the City of Melbourne can prioritise the purchase and supply of items, assets and materials made from reclaimed resources that can also be recycled after they reach end-of-life.

Building on staff behavioural change programs introduced in the past, there is scope to reduce the amount of waste generated from City of Melbourne operations, and increase the diversion of this waste from landfill. The introduction of an organic stream has been trialled successfully in Council House 2 and can be expanded on to ensure all buildings operated by the City of Melbourne have systems to segregate organics and recyclables.

The City of Melbourne can use public events it either runs or sponsors as opportunities to showcase best practice in reducing and recovering waste. We will aim to recycle 90 per cent of this event waste.

We will look for ways to reduce litter in the city through education, infrastructure, campaigns and collaboration with other key organisations. This will include new education campaigns for cigarette butts, for plastic alternatives for pet waste, and to reduce litter in waterways. Enforcing local laws is important to support education campaigns.

There is opportunity to explore the technical and financial feasibility of collecting and sorting waste from public litter bins and street sweepings so that only non-recyclable waste goes to landfill.

Benefits of taking action

- Facilitates development of new and alternative markets and business models

- Strengthens the City of Melbourne's reputation as a leader demonstrating sustainability best practice

Linked outcomes

- This is a cross-cutting priority that links to all outcomes

Key actions for this priority

4.1 Improve the City of Melbourne's operations, tenancies and developments toward zero waste to landfill.

4.2 Reduce waste and improve recycling at City of Melbourne sponsored and run events.

4.3 Recycle public realm waste where practical.

4.4 Investigate new opportunities to recycle dumped rubbish and manage litter.

Table 5: Priority 4 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
4.1	Deliver	Internal stakeholders	●	●	●
4.2	Deliver	Partnering suppliers and organisations	●	●	●
4.3	Deliver	Waste contractors	●	●	●
4.4	Deliver	Community organisations, Victorian Government	●	●	●

Estimated level of impacts ● High ● Medium ● Low

Priority 5: Advocate for better producer stewardship and product design

The way consumer products are designed, manufactured, packaged and then disposed of has a significant impact on overall volumes of waste. Disposable packaging is ubiquitous, and much is unnecessary and difficult to recycle. Electronics and furniture are increasingly becoming throwaway products. In the fashion industry, there has been a shift from quality, durable items towards cheap, 'fast fashion' to be worn and discarded.

While profits from sales and consumption go to retailers and manufacturers, they typically do not bear the cost of waste collection and transfer, recovery and recycling or landfill disposal. With the price signals broken, manufacturers have no incentive to source more sustainable materials for their products and retailers have no interest in what happens to their products and how they are disposed of once sold.

The opportunity

State and local government can encourage more responsible behaviour by manufacturers and retailers by supporting better price signals and regulations. Products need to be designed to use minimal materials that are sustainable, and need to be easy to reuse and recycle..

The City of Melbourne will promote extended producer responsibility by advocating for the expansion of the Australian Government's Product Stewardship Act 2011. We will continue our strong advocacy for a container deposit scheme in Victoria.

To achieve real reductions in waste generation, the design of production systems, products and packaging must be changed. Designers and producers must receive the right signals through different material and production costs, consumer demand and regulations.

Benefits of taking action

- Transforms the economics of the circular economy by incentivising efficient use of finite resources

- Encourages innovation

- Environmental benefits through reduced use of raw materials and responsible end-of-product life management

Linked outcomes

- More efficient use of resources

- The city produces less waste

Key actions for this priority

5.1 Advocate for a container deposit scheme in Victoria.

5.2 Advocate for stronger extended producer responsibility.

Table 6: Priority 5 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
5.1	Influence	Australian and Victorian Government	High	Low	Low
5.2	Influence	Australian and Victorian Government	High	Low	Low

* The benefits will depend on the actions of the Victorian and Australian Government.

Estimated level of impacts   High   Medium   Low

Priority 6: Improve waste governance and planning

Rapid city growth, new patterns of consumption and behaviours, and increased waste volumes require better regulations, governance and planning. Improving resource recovery in new developments is a major priority.

Our engagement tells us access and safety are very important priorities for industry, visitors and residents. The infrastructure of the city, parked cars, building sites and pedestrian movements present many challenges to waste collection and to city residents, workers and visitors. We need to better manage waste collections by the multiple private waste companies that operate across the city.

Apartment buildings create difficulties for waste storage and collection. Convenient recycling systems were not built into older apartment buildings, and they are difficult to retrofit. Collections in high-density areas during the day can cause traffic congestion and risks to the general public, but late at night the noise can be disruptive to residents.

The opportunity

The City of Melbourne can maximise resource recovery of new buildings through the planning scheme. Current waste guidelines could be reviewed to ensure all new developments requiring a planning development permit facilitate waste reduction and manage specialised waste streams such as organics and e-waste. We will explore amending the Activities Local Law to introduce mandatory recovery of organics waste. We will investigate a local law to ban unnecessary single-use plastic products. We will advocate to the Victorian Government for legislation to reduce or avoid unnecessary single-use products.

Collection permits will be reviewed to align to changing city needs and to improve safety outcomes for waste collection operators and city users. More formal controls could be introduced over bins stored permanently in the public

realm, with tighter restrictions on the number of permits issued. Limiting the number of permits for permanent bins would encourage businesses to use alternative shared resource recovery facilities and networks, thereby releasing valuable space in the city.

To support improved recycling behaviours, besides education campaigns, the City of Melbourne could investigate introducing penalties for compliance, such as higher fines for littering.

Benefits of taking action

- Improve new building performance to increase recovery rates

- Improves public amenity by reducing the reliance on permanent bins and introducing stricter controls on bins in the public realm

- Improves public safety and amenity by reducing the impact of truck collections

Linked outcomes

- More effective recycling separation systems

- A city with high amenity

- Food and green waste recovered

Key actions for this priority

6.1 Strengthen Waste Management Plan guidelines and review and update waste generation rates to ensure higher recovery rates in new developments.

6.2 Review regulations and permit conditions for private waste operators, skip bins, and bins permanently stored in the public realm.

6.3 Investigate and advocate for regulations to avoid and improve recovery of organics and plastics waste.

6.4 Deliver behaviour change campaigns to improve recycling.

Table 7: Priority 6 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
6.1	Govern	Developers. Building managers	Medium	Medium	Medium
6.2	Govern	Businesses, private waste contractors	Medium	Medium	High
6.3	Govern	Businesses, private waste contractors	High	High	Medium
6.4	Deliver Govern	Residents and businesses	Medium	Medium	Low

Estimated level of impacts   ● High   ● Medium   ● Low

Priority 7: Establish new systems to source separate and collect organic waste

The current household landfill bin contains approximately 60 per cent organic waste (food and garden waste). Organic waste causes amenity issues through odours and vermin, and in landfill is a significant source of greenhouse gas emissions as well as leachate. Growing, transporting, and buying good food only to send it to landfill is a huge waste of natural resources such as soil fertility, water, fossil fuels, animal lives as well as human time and effort.

The size of bins currently provided to customers as part of their rateable entitlement does not account for the removal of organic material, nor does it encourage waste minimisation behaviour.

Significant environmental benefits could be achieved by segregating and recovering organic material. However, as our city grows and dwellings trend towards multi-use high-rise developments, we need to consider the unique issues presented by organic waste collection in high-rise buildings. Any future service will need to take account of customers' diverse lifestyle patterns based on their particular dwelling type and size, and which may involve a combination of kerbside collections and on-site separation and/or processing of organic waste.

The opportunity

Introducing new systems for the recovery of organic waste is critical for achieving our outcomes and targets. There is not one perfect solution to collecting and recycling organic waste - multiple solutions will be needed.

The three main options for segregating and recovering organic waste are:

- on-site processing, such as compost bins, worm farms and dehydrators

- processing and transfer via the sewerage network, such as through in-sink disposal units

- separate collection and transfer for off-site processing.

Further investigation and trials will be required to create a comprehensive plan for organic waste segregation and processing, prior to a large-scale rollout. Research is needed to understand residents' waste behaviour and practices, particularly for those living in high-rise apartments, to identify the most appropriate solutions for individual circumstances as well as how scheduled collections could be more responsive. These initiatives will need to be supported by education and engagement.

We will work with food retail and hospitality businesses to understand barriers and opportunities for food waste avoidance, reuse and recycling. This may tie in with the hubs network expansion, as well as our incentive program and innovation fund.

Benefits of taking action

- Addresses the single most significant source of greenhouse gas emissions arising from landfill waste

- Improves odour and amenity in the city and at landfills

- Captures the value of organics waste to turn back into compost and soil fertility

Linked outcomes

- More effective recycling separation systems

- A city with high amenity

- Food and green waste recovered

- Waste to landfill minimised

Key actions for this priority

7.1 Explore and trial options to separate organic waste across different residential property types

7.2 Implement successful organic waste solutions

7.3 Establish organics processing contracts to support organics solutions

Table 8: Priority 7 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
7.1	Deliver	Residents and developers	●	●	●
7.2	Deliver	Residents and developers	●	●	●
7.3	Deliver	Waste contractors	●	●	●

Estimated level of impacts   ● High   ● Medium   ● Low

Priority 8: Transform the collection and transfer of recycling and residual waste

The City of Melbourne has achieved great success in expanding services to business customers through the Degraves Street Recycling Facility, laneway landfill compactor program and recycling hub network. However these existing facilities do not have the capacity to meet growing future demand. New solutions are needed to maximise the use of space and the efficiency of waste collection by prioritising communal waste systems and solutions.

The existing laneway compactor waste streams include landfill, co-mingled recycling and paper and cardboard. Only the Degraves Street Recycling Facility offers additional waste stream recycling such as organics. Additional waste stream recycling options for the city's commercial sector are needed to increase resource recovery.

The opportunity

There is an opportunity to explore expanding the number and reach of the City of Melbourne's resource recovery network of collection hubs. The future network could target businesses within key precincts around the city, and include tailored waste streams based on the waste profile of the hub location. For example we will work with food retail and hospitality businesses to find ways to avoid, reuse and recycling waste, particularly food and plastic waste.

A fair payment system would encourage businesses to separate out waste streams to maximise cost savings and diversion from landfill. Waste collection partners may specialise in servicing specific waste streams across the network. Resources may also be separated after collection at a processing facility.

The City of Melbourne also has a role in ensuring the ongoing availability of the current Waste and Recycling Centre on Dynon Road as a hub of state significance, alongside any future expanded resource recovery network.

Benefits of taking action

- Providing more recycling opportunities
- Efficient approach to waste collection and resource recovery based on tailored services
- Enhanced city amenity through improved use of space

Linked outcomes

- More effective recycling separation systems
- A city with high amenity
- Food and green waste recovered
- A resilient recycling sector

Key actions for this priority

8.1 Improve existing waste hubs and recycling facilities and expand the existing resource recovery hub network for city businesses.

8.2 Enact planning controls to ensure that the Waste and Recycling Centre on Dynon Road maintains its role as a hub of state significance and develop a plan for future upgrades.

Table 9: Priority 8 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
8.1	Deliver	Businesses	●	●	●
8.2	Govern Influence	Victorian Government and industry	●	●	●

Estimated level of impacts   ● High   ● Medium   ● Low

Priority 9: Improve the efficiency, effectiveness and viability of recycling

Current weaknesses in the Victorian recycling system have been highlighted since the restrictions on recycling imported to China came into force in 2018. Without viable local processing facilities, significant volumes of recyclable material have been stockpiled or sent to landfill. The lack of investment in recycling technology means this problem will only be compounded by future population growth.

We know many residents, workers and businesses will recycle more of their waste if they have access to more convenient recycling services for a wider range of products.

The opportunity

The City of Melbourne will work closely with other local government bodies and the Victorian Government to ensure the right policy settings are in place to support the development of a resilient recycling sector. This would include ensuring there is appropriate investment directed to support the long-term sustainability of local and manufacturing of recycled products.

Currently, the Victorian Government collects a landfill levy for waste that councils pass on to ratepayers through rates. The current recycling industry crisis means there is an urgent need for the levy to be directed towards supporting the local recycling sector. The City of Melbourne supports increasing the levy to fund investment in new facilities.

City of Melbourne services for ratepayers could be expanded to include new segregated waste streams, such as electronic waste. An expanded service and more convenient collections would in turn support the development of recovery networks including social enterprises, charities and swap/sell/share groups to maximise the potential reuse of recovered materials.

Benefits of taking action

- Facilitates new social enterprise and growth in new markets for reusable and recyclable products
- Diverts waste from landfill from public bins and street sweepings
- Provides new opportunities to recycle materials

Linked outcomes

- Food and green waste recovered
- A resilient recycling sector
- Waste to landfill minimised

Key actions for this priority

9.1   Advocate for increased investment from landfill levy funds and policy improvements to support a resilient local recycling sector.

9.2   Establish new, improved recycling contracts.

9.3   Expand e-waste recycling options for residents.

Table 10: Priority 9 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
9.1	Influence	Other councils in Victoria, Victorian Government	● High	● High	● Low
9.2	Deliver	Recycling industry	●	●	●
9.3	Deliver	Residents	●	●	●

Estimated level of impacts   ● High   ● Medium   ● Low

Priority 10: Explore advanced waste processing of residual waste that cannot be otherwise recovered

Waste sent to landfill contains valuable resources. Capturing the materials and energy in this waste is critical to build a circular economy. Sending waste to landfill also has significant social and environmental impacts from greenhouse gases, odour and leachate. In landfills methane is created by the breakdown of organic waste in anaerobic conditions. Methane is a greenhouse gas with 25 times the global warming impact of carbon dioxide. Landfill emissions are around six per cent of Melbourne's greenhouse gas emissions. Escaped landfill gas can threaten human health. Leachate may contain heavy metals and other pollutants, and can contaminate surrounding land or water. Many residents near landfills complain of impacts from odour, litter, and truck movements.

In addition to the social and environmental impacts, sending waste to landfill is expensive. Landfill transport and disposal costs are rising across metropolitan Melbourne due to increasing landfill levies, gate fees and transport costs.

The City of Melbourne's initial focus is on increasing our recycling rate, especially recovering organic waste. We will explore advanced waste processing (AWP) as a potential solution to capturing value from residual waste. Our 2023 review will determine if AWP is needed.

The opportunity

AWP facilities recover materials and energy from waste that is currently sent to landfill. AWP is a final step before landfilling. There are a number of different technologies have been used successfully abroad to recover recyclables and produce electricity, heat, gas, liquid fuel and solid fuel. They usually recover metals either before or after processing. These facilities are common abroad, and are an effective solution to recover the energy and materials in waste.

We commissioned modelling which concluded that achieving a 90 per cent diversion rate by 2030 was only achievable through a combination of improved recycling (mainly food and garden organics collection) combined with AWP. AWP diverts significant amount away from landfill, and captures energy and materials. It is estimated that AWP disposal costs will become equivalent to landfill within a decade, partly depending on the landfill levy and gate fees. See Appendix C for more details.

The risks

There are risks associated with establishing AWP. No large scale AWP has been established in Victoria. There are considerable uncertainties about the cost of building and operating an AWP facility. We will carefully evaluate any AWP proposal to ensure it has positive social, environmental and economic benefits and does not have any unintended consequences. City of Melbourne will only support AWP if:

- It does not undermine our avoidance, reuse and recycling actions

- It meets very high environmental standards, including minimising emissions

- It is financially viable for council

- It has a social licence to operate

Next steps

Establishing AWP can take at least five to seven years. Our review in 2023 will inform our AWP commitment. City of Melbourne is participating in a collective procurement process facilitated by the Metropolitan Waste and Resource Recovery Group. We will evaluate AWP against our fundamental principles underpinning a circular economy and the waste hierarchy.

Key actions for this priority

10.1 Explore advanced waste processing and advocate for Victorian Government investment after all other waste minimisation and recovery efforts are implemented.

Table 11: Priority 10 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
10.1	Deliver Influence	Other councils in Victoria, Victorian Government	*Will be part of the 2023 review.*		

APPENDIX A : IMPLEMENTATION PLAN

The implementation plan includes the indicative costs of each action over four years - L equals low (up to $100,000), M equals medium ($100,000 to $1 million), H equals high ($1 million plus).
*Costs with an asterisk represent items that are subject to the Annual Plan and Budget and business case.

ACTION	OUR ROLE(S)	TIMEFRAME FOR DELIVERY				INDICATIVE COST	FUNDING MODEL
1 Engage and educate community and businesses		2019	2020	2021	2022		
1.1 Provide an expert advisory service to support an improved waste system.	Deliver	●	●	●	●	M*	Part cost recovery
1.2 Run, support and advocate for education campaigns.	Deliver Influence	●	●	●	●	L	Operational budget
1.3 Promote innovation through our communications and events.	Influence	●	●	●	●	L	Operational budget
2 Incentivise and promote innovative solutions							
2.1 Establish and deliver a waste minimisation and innovation fund.	Deliver	●	●	●	●	M*	Operational budget
2.2 Deliver an incentive program to drive investment in new resource recovery infrastructure and other solutions.	Influence	●	●	●	●	M*	Externally funded in-kind, grants and sponsorships
2.3 Explore innovative approaches to waste reuse, collection, storage and recovery.	Deliver	●	●	●	●	M*	Operational budget
3 Support growth of a circular economy through government procurement							
3.1 Strengthen the City of Melbourne's procurement practices to use recycled materials where appropriate.	Govern	●	●	●	●	M*	Capital and operational budget
3.2 Partner with local and state government to develop best practice sustainable procurement policies and processes.	Govern Influence	●	●			L	Operational budget
3.3 Pilot sustainable procurement projects that demonstrate circular economy principles.	Deliver Influence			●	●	M*	Capital and operational budget

ACTION	OUR ROLE(S)	TIMEFRAME FOR DELIVERY				INDICATIVE COST	FUNDING MODEL
4 Lead by example through City of Melbourne operations and events		**2019**	**2020**	**2021**	**2022**		
4.1 Improve City of Melbourne operations, tenancies and developments toward zero waste to landfill.	Deliver	●	●	●	●	M*	Capital and operational
4.2 Reduce waste and improve recycling at City of Melbourne sponsored and run events.	Deliver	●	●	●	●	M*	Operational budget
4.3 Recycle public realm waste where practical.	Deliver	●	●	●	●	M*	Rates
4.4 Investigate new opportunities to recycle dumped rubbish and manage litter.	Influence	●	●	●	●	L	Rates
5 Advocate for better producer stewardship and product design							
5.1 Advocate for a container deposit scheme in Victoria.	Influence	●	●	●	●	L	Operational budget
5.2 Advocate for stronger extended producer responsibility.	Influence	●	●	●	●	L	Operational budget
6 Improve waste governance and planning							
6.1 Strengthen Waste Management Plan guidelines and review and update waste generation rates to ensure higher recovery rates in new developments.	Govern	●		●		L*	Operational budget
6.2 Review regulations and permit conditions for private waste operators, skip bins, and bins permanently stored in the public realm.	Govern	●				L	Operational budget
6.3 Investigate and advocate for regulations to avoid and improve recovery of organics and plastics waste.	Govern	●	●	●	●	L	Operational budget
6.4 Deliver behaviour change campaigns to improve recycling.	Deliver Govern	●	●	●	●	M*	Operational budget

ACTION	OUR ROLE(S)	TIMEFRAME FOR DELIVERY				INDICATIVE COST	FUNDING MODEL
7 **Establish new systems to source separate and collect organic waste**		**2019**	**2020**	**2021**	**2022**		
7.1 Explore and trial options to separate organic waste across different residential property types.	Deliver	●				M*	Operational budget
7.2 Implement successful organic waste solutions.	Deliver		●	●	●	M*	Rates
7.3 Establish organics processing contracts to support organics solutions.	Deliver	●	●			L*	Operational budget
8 **Transform the collection and transfer of recycling and residual waste**							
8.1 Improve existing waste hubs and recycling facilities and expand the existing resource recovery hub network for city businesses.	Deliver	●	●	●	●	L*	User pays, full cost recovery
8.2 Enact planning controls to ensure that the Waste and Recycling Centre on Dynon Road maintains its role as a hub of state significance and develop a plan for future upgrades.	Influence	●	●	●		L	Operational budget
9 **Improve the efficiency, effectiveness and viability of recycling**							
9.1 Advocate for increased investment from landfill levy funds and policy improvements to support a resilient local recycling sector.	Influence	●	●	●	●	L	Operational budget
9.2 Establish new, improved recycling contracts	Deliver	●	●	●	●	L	Operational budget
9.3 Expand e-waste recycling options for residents.	Deliver	●	●	●	●	L*	Rates
10 **Explore advanced waste processing of residual waste that cannot be otherwise recovered**							
10.1 Explore advanced waste processing and advocate for Victorian Government investment after all other waste minimisation and recovery efforts are implemented.		AWP assessed as part of 2023 review					

APPENDIX B : APPROACHES OF OTHER CITIES

Around the world, cities are embracing a range of different approaches to achieve improved diversion from landfill and resource recovery outcomes.

	Diversion / recovery target(s)	Organics recovery (food waste)	Other measures
INTERNATIONAL EXAMPLES			
Amsterdam	• 65% of household waste separated for recycling or reuse by 2025 • 50% reduction in use of primary materials by 2030 • Full circular economy by 2050	●	• Green procurement • Cross-sector innovation (e.g. circular buildings project) (City of Amsterdam, n.d.) • Waste to energy
London	• No biodegradable or recyclable waste sent to landfill by 2026 • 65% municipal waste recycled by 2030 • 50% decrease in food waste and packaging per head by 2030	●	• Encourage businesses to cut waste, increase reuse and recycling • Dry recycling for specific products, plus separate food waste collection where practical and cost effective • Consolidate waste services for businesses • Advocacy on national standards, incentives, funding for recycling infrastructure. (Mayor of London, 2018) • Waste to energy
Stockholm	• Less than 250 kg food and residual waste per person per year by 2020 • 70% food waste collected by 2020 • 70% of construction and demolition waste reused or recycled by 2020	●	• Communication and information campaigns • Support product reuse • Incentivise waste separation through fees • Support increased separation at source • Strengthen requirements on demolition contractors • Encourage food waste separation • Prioritise safe and secure waste disposal services (Stockholm City, n.d.) • Waste to energy / anaerobic digestion
Tokyo	• 37% recycling rate for municipal solid waste by 2030 • 27% recycling rate for municipal solid waste by 2020	●	• Reduce food waste • Reduce single use and promote reusable products • Promote resource recovery and separation at source • Promote recycling of construction material (Ministry of Economy, Trade and Industry Tokyo, n.d.) • Waste to energy

	Diversion / recovery target(s)	Organics recovery (food waste)	Other measures
AUSTRALIAN EXAMPLES			
Brisbane	• Reduce domestic solid waste disposed to landfill to 250 kg per person each year by 2031	●	• Divert organics from landfill • Community outreach • Investigate innovative waste recovery programs • Prevent litter • Improve corporate performance on waste (Brisbane City Council, 2018) • Waste to energy / anaerobic digestion
Sydney	• 90% diverted from landfill by 2030	●	• Promote innovation on waste • Improve recycling by expanding collection and drop-off services • Sustainable design in council developments • Improve waste management and transportation • Better data management • Future long-term treatment solution (waste to energy) (City of Sydney, 2017.)

APPENDIX C : ADVANCED WASTE PROCESSING ANALYSIS

We commissioned modelling of various scenarios for capturing value from waste, both through food and garden organics (FOGO) collection, as well as advanced waste processing (AWP).

This modelling included:

- Waste to energy (combustion) – burning the waste to produce energy (e.g. electricity or steam).

- Waste-to-energy (gasification) – heating (but not burning) the waste to release gases that can be used for energy.

- Mechanical Biological Treatment –mechanically separates the recyclables (e.g. metals), and biologically treats organic material (such as composting or anaerobic digestion), the residual is sent to either landfill or waste to energy facilities.

- Anaerobic digestion – a biological process that produces gas that can be used to generate electricity.

SCENARIO	DIVERSION	ADDITIONAL COSTS	ADDITIONAL COST / TONNE	EMISSIONS ABATED
		(Net Present Value compared to BaU)	(NPV per Additional tonne diverted ($/t))	(t-CO2e/year)
Business as usual (no intervention)	25%	—	—	
1. FOGO collection	37%	$110m	$683	5,695
2. Waste to energy	65%	$4.1m	$7	16,161
3. FOGO + waste to energy	85%	$64m	$76	26,971
4. Mechanical- biological treatment + anaerobic digestion + waste to energy (gasification)	68%	$38.80m	$38	22,720

These scenarios only consider FOGO and AWP - they do not consider any of the other initiatives in this strategy to increase recovery such as education, experts, or hubs.

Scenario 1 is for a full FOGO service provided by council to all residents. This has significant cost, due to the additional fleet of collection trucks. There are small savings on disposal costs compared to landfills. There is a large uncertainty about the amount of organics waste that is captured through a full FOGO service because of variable participation and contamination rates. It was assumed that around 40-50 per cent of organics is diverted through FOGO collections, resulting in diversion of around 12 per cent of total waste.

Scenario 2 sends garbage to a waste to energy facility. It is the cheapest scenario because it does not require a new fleet of trucks, and gate fees for AWP are expected to be comparable with landfill around 2030, although this is highly uncertain.

Scenario 3 combines scenario 1 and 2, and has the highest recovery rate, although significant costs due to the FOGO collection service.

Scenario 4 uses gasification and anaerobic digestion facilities to recover some organics and energy from the residual waste. Costs are lower because there is no FOGO collection system, however these facilities are expected to be expensive to build and operate. This scenario does not recover as much as combined FOGO and combustion.

This assessment shows that when compared to landfill disposal, AWP can achieve high diversion rates and reduce greenhouse gas emissions. This analysis shows we should trial FOGO and continue to explore AWP opportunities, especially waste to energy. This strategy proposes that the City of Melbourne will trial a variety of organics collection systems - such as bins, in sink disposal units, and small building-scale units - to determine which ones work best, and where. Our review in 2023 will assess the next steps for City of Melbourne for advanced waste processing.

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GLOSSARY OF TERMS

Commercial and industrial waste: Commercial and industrial waste produced by institutions and businesses; includes waste from schools, restaurants, offices, retail and wholesale businesses, and industries including manufacturing.

Construction and demolition waste: Waste produced by building and demolition activities, including road and rail construction and maintenance and excavation of land associated with construction activities.

Disposal: The deposit of solid waste in a landfill or incinerator, net of recovery of energy.

E-waste: E-waste (electronic waste) refers to any item with a plug, battery or cord that is no longer working or wanted.

Energy recovery: The process of recovering energy that is embodied in solid waste.

Municipal solid waste: Waste produced primarily by households and council operations.

Product stewardship: A policy approach recognising that manufacturers, importers, governments and consumers have a shared responsibility for the environmental impacts of a product throughout its full life cycle.

Recycling: Activities in which solid wastes are collected, sorted, processed (including through composting), and converted into raw materials to be used in the production of new products (the amount of solid waste recycled is net of any residuals disposed).

Resource recovery: Materials sent to recycling and energy recovery (net of contaminants and residual wastes sent to disposal).

Recovery rate: The proportion calculated by dividing resource recovery by waste generation (also referred to as the 'recovery rate').

Reuse: Reallocation of products or materials to a new owner or purpose without reprocessing or remanufacture, but potentially with some repair (e.g. resale of second-hand cars or clothing re-sold via opportunity shops or the repair of wooden transport pallets for resale).

Waste: Materials or products that are unwanted or have been discarded, rejected or abandoned, including materials or products that are recycled, converted to energy, or disposed.

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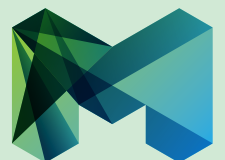
CITY OF MELBOURNE

Vision: Towards a zero waste city	

Overall benefits of this strategy: reduce environmental impacts, improve city amenity, reform economic performance of the waste and resource recovery system.

Key 2030 Targets	90% of all waste diverted from landfill 20% reduction in household waste produced 1.2 Mt CO2-e in greenhouse gas emissions avoided

Themes	**Reduce**		**Collect**		**Recover**	
Outcomes	More efficient use of resources	The city produces less waste	More effective recycling separation systems	A city with high amenity	Food and green waste recovered	A resilient recycling sector	Waste to landfill minimised
2030 Targets	• Victorian Government implements a container deposit scheme. • Increased number of extended producer responsibility schemes	• 30% reduction in City of Melbourne office waste produced • 90% of construction and demolition waste from City of Melbourne led developments is recovered	• 50% less contamination in household recycling bins • 90% of waste is recovered from all City of Melbourne run and sponsored events • 20% reduction in waste produced from all City of Melbourne run and sponsored events	• No private bins in the public realm • Average customer experience rating of at least 3.5 out of 5	• 50% of organics in household waste is recovered	• No unnecessary single-use plastic in the City of Melbourne • Increase in recycled content in products procured by City of Melbourne	• 90% of household waste is recovered • 90% of commercial and industrial waste is recovered • 90% of construction and demolition waste is recovered • 90% of City of Melbourne operational waste is recovered

Note: priorities underpin all outcomes

Priorities (To deliver on our goals we will…)	**1 Engage and educate community and businesses**	**2 Incentivise and promote innovative solutions**	**3 Support growth of a circular economy through government procurement**	**4 Lead by example through City of Melbourne operations and events**	**5 Advocate for better producer stewardship and product design**	**6 Improve waste governance and planning**	**7 Establish new systems to source separate and collect organic waste**	**8 Transform the collection and transfer of recycling and residual waste**	**9 Improve the efficiency, effectiveness and viability of recycling**	**10 Explore advanced waste processing of residual waste that cannot be otherwise recovered**
Actions (what we will do)	• Provide an expert advisory service to support an improved waste system. • Run, support and advocate for education campaigns. • Promote innovation through our communications and events.	• Establish and deliver a waste minimisation and innovation fund. • Deliver an incentive program to drive investment in new resource recovery infrastructure and other solutions. • Explore innovative approaches to waste reuse, collection, storage and recovery	• Strengthen City of Melbourne's procurement practices to use recycled materials where appropriate. • Partner with local and state government to develop best practice sustainable procurement policies and processes. • Pilot sustainable procurement projects that demonstrate circular economy principles.	• Improve City of Melbourne's operations, tenancies and developments toward zero waste to landfill. • Reduce waste and improve recycling at City of Melbourne sponsored and run events. • Recycle public realm residual waste where practical. • Investigate new opportunities to recycle dumped rubbish and manage litter.	• Advocate for a container deposit scheme in Victoria. • Advocate for stronger extended producer responsibility.	• Strengthen Waste Management Plan guidelines and review and update waste generation rates to ensure higher recovery rates in new developments. • Review regulations and permit conditions for private waste operators, skip bins, and bins permanently stored in the public realm. • Investigate and advocate for regulations to avoid and improve recovery of organics and plastics waste. • Deliver behaviour change campaigns to improve recycling.	• Explore and trial options to separate organic waste across different residential property types. • Implement successful organic waste solutions. • Establish organics processing contracts to support organics solutions.	• Improve existing waste hubs and recycling facilities and expand the existing resource recovery hub network for city businesses. • Enact planning controls to ensure that the Waste and Recycling Centre on Dynon Road maintains its role as a hub of state significance and develop a plan for future upgrades.	• Advocate for increased investment from landfill levy funds and policy improvements to support a resilient local recycling sector. • Establish new, improved recycling contracts. • Expand e-waste recycling options for residents.	• Explore advanced waste processing and advocate for Victorian Government investment after all other waste minimisation and recovery efforts are implemented.

Waste and Resource Recovery Strategy 2030: FMC motion

This document outlines our actions to finish the Waste and Resource Recovery Strategy based on FMC motion on 16 April 2019.

Waste and Resource Recovery Strategy 2030

Resolved:

1. That the Future Melbourne Committee:

    1.1. Notes the community engagement feedback at Attachment 2 of the report from management and further community submissions.

    1.2. Endorses the Waste and Resource Recovery Strategy 2030 subject to the following changes and inclusions:

FMC motion	Action taken	Page
1.2.1. Establishment of the setting of targets for 2023, measures, benchmarks and milestones to evaluate results and evolve those actions for 2024-2030.	**Action:** Updated table with 2023 and 2030 targets. New targets include for City of Melbourne events, single-use plastic and bins in the public realm.	34
1.2.2. Priority activities for the resident, retailer, student, business, commercial and industry and visitor sectors to meet City of Melbourne 2030 targets.	**Action:** New section with more stakeholder actions and categories. Added manufacturer, retailer, food business, offices, and students. Each stakeholder has list of key actions and how they can contribute or how the actions will help them.	12-15
1.2.3. Ranking of priorities from most–to-least effective in meeting City of Melbourne waste diversion targets, also referencing for each priority the impact, cost and alignment to the waste hierarchy.	**Action:** Priorities ranked against implementation cost and diversion impact – see ranking under each action, and summary in council background briefing document. **Action**: Priorities mapped against waste hierarchy	36-45 34 (Fig 15)

FMC motion	Action taken	Page
1.2.4. An elevation of focus under commercial and industrial waste in relation to hospitality and food retail businesses and the need for stronger waste improvement.	**Action:** Updated text in priority 1/2/4/6/7/8 about how current actions will influence commercial and industrial waste in food retail and hospitality Action 2.3 modified to include reuse.	36/37/40/42/ 43/44 37
1.2.5. Incentives for residential, commercial and industrial sectors to reuse.	**Action:** Action 2.3 modified to include reuse. Edits to text in priority 1 and 2 around incentives for reuse (e.g. innovation fund, City of Melbourne procurement, education, pilot projects or local laws).	36/37 (Action 2.3)
1.2.6. Targets for reduction in packaging, single-use plastic bag and plastic in general.	**Action:** Set targets in target table Added plastic waste text and case study on plastic packaging. Action 6.3 modified to include plastics and strengthened text in priority 1/2/4/5/6.	34 28/36/37 40/41/ 42
1.2.7. The setting of higher 2030 waste recovery targets for City of Melbourne sponsored events.	**Action:** Set new targets for event waste reduction and recycling	34
1.2.8. Exploration of alternatives to plastic for dog waste and disposal systems.	**Action:** Added text in priority 4 about litter (relevant action is action 4.4). City of Melbourne already using bioplastic for dog bags, in discussions with parks team about further improvements.	40
1.2.9. Inclusion of campaigns and advocacy to reduce and repurpose cigarette butt litter in the City of Melbourne.	**Action:** Added case study in *Trends* section. We have recycling all cigarette butts since 2017 through teracycle. Added text in priority 4 about litter innovation (relevant action is action 4.4).	26 40
1.2.10. Amended text and graphics to reflect the strategy's commitment to explore waste to energy only after the review in 2023.	**Action:** Modified pathway graphic (Figure 11)	31
1.2.11. Undertake a review of Local Laws to consider harsher fines for littering.	**Action:** Added text in priority 4 and 6 about enforcement (both litter and other areas). Covered under action 6.4.	40/42

FMC motion	Action taken	Page
1.3. Requests that the final Waste and Resource Recovery Strategy 2030, and a 2019-20 Implementation Plan inclusive of a one-year monitoring and evaluation framework, be reported to this Committee by July 2019 and that the submitters to the draft strategy be informed of the committee date.	**Action:** Create a separate Implementation Plan 2019-20 (including monitoring and evaluation framework). **Action:** Inform submitters of waste strategy at July FMC.	Completed Completed
1.4. Requests management, as part of the next update of Council's 10 year financial plan, allocate sufficient financial and human resources in order to implement the strategy.	**Action:** Update the 10 year financial plan	Noted
1.5. Requests management to liaise with the Kensington Compost Hub Committee to explore opportunities for the Compost Hub Committee to work with Council in devising and delivering the City of Melbourne waste reduction trial project for Kensington and City of Melbourne, and report back to Councillors before implementation of the trial.	**Action:** Held discussions with Kensington Compost Hub Committee about organics trial. We will report back to councillors before the trial begins (in late 2019/early 2020)	Underway
1.6. Requests management to make a City of Melbourne submission to the Victorian Parliamentary Inquiry into Recycling and Waste Management, with a focus on Council's recent resolutions supporting procurement targets for products with recycled content, advocating for a container deposit system, product stewardship legislation, significant investment in a local recycling industry and noting that waste to energy technology should only be considered for residual waste once all avenues for reuse and recycle have been exhausted.	**Action:** Submit to the Inquiry	Complete

Councillor comments

This table outlines key councillor comments from discussions and emails

Councillor comments	Action taken	Page
Will we be investing in education or behaviour change campaigns or are we solely looking to statewide programs?	**Action:** Action 1.2 updated: Run, support and advocate for education campaigns. City of Melbourne runs targeted education campaigns as part of current projects, and also supports state-wide campaign (e.g. current e-waste campaign). Large education campaigns are very expensive, and require state government funding and coordination across all councils – we will advocate to state government for funding and action. The Victoria Government's *Recycling Industry Strategic Plan* identifies education as a key action: *Action 2.1: Educate the community about recycling:* *Sustainability Victoria will deliver a three year statewide education program to equip the community with information on recycling effectively. This will include a campaign focussing on how best to recycle in households.* City of Melbourne will continue to work with the Victorian Government on this and other education campaigns.	36
We already have a policy to support container deposit legislation and product stewardship, so emphasise advocacy not develop a policy position.	**Action:** Action 5.1 updated. Advocate for a container deposit scheme in Victoria. Action 5.2 updated: Advocate for stronger extended producer responsibility.	41
1.2.6 – We want a target for reduction in single use plastics / plastics bags – in lieu of nothing, make it a ban on plastic bags and single use plastics	Added text: 'We will investigate a local law to ban unnecessary single-use plastic products. We will advocate to the Victorian Government for legislation to reduce or avoid unnecessary single-use products.'	34/42

Councillor comments	Action taken	Page
1.2.7 – higher 2030 waste recovery targets for CoM sponsored events – set at 90% recycling. What about waste avoidance target?	**Action:** Event waste avoidance target set: • **2023:** 20% reduction in waste from at least four City of Melbourne run and sponsored events • **2030:** 20% reduction in waste from all City of Melbourne run and sponsored events	34
1.2.9 – we want an action in the strategy to be a cigarette butts waste reduction campaign, and to highlight the teracycle recycling program	**Action:** Added text in Priority 4 about running cigarette butt campaign, which will include promoting the Teracycle recycling program.	40
1.2.10 – amend text and graphics to reflect commitment to only explore waste to energy after review in 2023	**Action:** Figures removed or updated.	31
5.1 Advocate for extended producer responsibility (EPR and Container deposit scheme) (delete the develop and adopt) – update in all instances	**Action:** Actions 5.1 and 5.2 updated	41
Waterway waste – is there an action to focus on waste in our waterways?	**Action:** Added text about reducing litter in waterways in Priority 4	40
Minor changes to Priority Stakeholder Actions	**Action:** Text updated, particularly to clarify education campaigns and that businesses are eligible for the innovation fund	12-15
Update AWP text to clarify review in 2023.	**Action:** AWP text updated in to clarify AWP review in 2023.	31/46/49/53
Make action 6.4 stronger	**Action:** Action 6.4 updated: Deliver behaviour change campaigns to improve recycling.	42

Waste and Resource Recovery Strategy 2030: Impact vs costs

This document estimates the implementation costs of each action in the strategy, as well as the impact each action will have on landfill diversion.

It is often difficult to accurately estimate costs and impacts. This is particularly true of advocacy actions, grants programs, and pilot projects. We will review the strategy in 2023 to assess progress and adjust our actions.

The table below estimates the 10 priorities and their impact on landfill diversion and their implementation costs. The most effective actions for recovering or avoiding waste are those that advocate (priorities 5 and 9) followed by education and experts (1), better governance (6), and organics separation (7).

Some actions have significant amenity benefits or demonstrate leadership (rather than landfill diversion) these include establishing hubs (8) and improving events and CoM buildings (4).

Impact on landfill diversion	Implementation cost: High	Implementation cost: Medium	Implementation cost: Low
High	3. Support growth of a circular economy through government procurement		5. Advocate for better producer stewardship and product design 9. Improve the efficiency, effectiveness and viability of recycling
Medium		2. Incentivise and promote innovative solutions 8. Transform the collection and transfer of recycling and residual waste	1. Engage and educate community and businesses 6. Improve the waste governance framework and planning 7. Establish new systems to source separate and collect organic waste
Low			4. Lead by example through City of Melbourne operations and events

Implementation cost

Note: The viability of Priority 10: Explore advanced waste processing of residual waste that cannot be otherwise recovered will be assessed in 2023.

Strategy priorities	No.	Action	Our role	Impact	Implementation cost	
				Diversion	2019-2023	2019-2030
1. Engage and educate community and businesses	1.1	Provide expert advisory service to support improved waste system.	Deliver	M	M	M
	1.2	Run, support and advocate for education campaigns.	Deliver Influence	M	L	L
	1.3	Promote innovation through our and events.	Influence	L	L	L
2. Incentivise and promote innovative solutions	2.1	Establish and deliver a waste minimisation and innovation fund.	Deliver	M	M	L
	2.2	Deliver an Incentive Program to drive investment in new resource recovery infrastructure and other solutions.	Influence	M	M	M
	2.3	Explore innovative approaches to waste reuse, collection, storage and recovery	Deliver	M	M	M
3. Support growth of a circular economy through government procurement	3.1	Strengthen City of Melbourne's procurement practices use recycled materials where appropriate	Govern	M	M	H
	3.2	Partner with local and state government to develop best practice sustainable procurement policies and processes.	Govern Influence	M	L	L
	3.3	Pilot sustainable procurement projects that demonstrate circular economy principles.	Deliver Influence	M	M	M
4. Lead by example through City of Melbourne operations and events	4.1	Improve City of Melbourne's operations, tenancies and developments toward zero waste to landfill	Deliver	L	M	L
	4.2	Reduce waste and improve waste management at City of Melbourne sponsored and run events.	Deliver	L	M	L
	4.3	Recycle public realm residual waste where practical.	Deliver	L	M	M
	4.4	Investigate new opportunities to recycle dumped rubbish and manage litter.	Deliver Influence	L	L	L
5. Advocate for better producer stewardship and product design	5.1	Advocate for a container deposit scheme in Victoria.	Influence	H	L	L
	5.2	Advocate for stronger extended producer responsibility.	Influence	H	L	L

Strategy priorities	No.	Action	Our role	Impact	Implementation cost	
				Diversion	2019-2023	2019-2030
6. Improve the waste governance framework and planning	6.1	Strengthen Waste Management Plan guidelines and review and update waste generation rates to ensure higher recovery rates in new developments.	Govern	L	L	L
	6.2	Review regulations and permit conditions for private waste operators, skip bins, and bins permanently stored in the public realm.	Govern	L	L	L
	6.3	Investigate and advocate for regulations to avoid and improve recovery of organics and plastics waste.	Govern	M	L	L
	6.4	Deliver behaviour change campaigns to improve recycling.	Govern Deliver	M	M	L
7. Establish new systems to source separate and collect organic waste	7.1	Explore and trial options to separate organic waste across different residential property types	Deliver	L	M	L
	7.2	Implement successful organic waste solutions	Deliver	M	M	L
	7.3	Establish organics processing contracts to support organics solutions	Deliver	M	L	L
8. Transform the collection and transfer of recycling and residual waste	8.1	Improve existing waste hubs and recycling facilities and expand the existing resource recovery hub network for city businesses.	Deliver	M	L	M
	8.2	Enact planning controls to ensure that the Waste and Recycling Centre on Dynon Road maintains its role as a hub of state significance and develop a plan for future upgrades.	Influence	L	L	L
9. Improve the efficiency, effectiveness and viability of recycling	9.1	Advocate for increased investment from landfill levy funds and policy improvements to support a resilient local recycling sector.	Influence	H	L	L
	9.2	Establish new, improved recycling contracts.	Deliver	L	L	L
	9.3	Expand e-waste recycling options for residents	Deliver	L	L	M

| Strategy priorities | No. | Action | Our role | Impact | Implementation cost | |
				Diversion	2019-2023	2019-2030
10. Explore advanced waste processing of residual waste that cannot be otherwise recovered	10.1	Explore advanced waste processing and advocate for Victorian Government investment after all other waste minimisation and recovery efforts are implemented. **Note: the 2023 review will assess the need for AWP - see strategy for more information.**	Deliver Influence	H	H	H

Implementation costs - assessment criteria

The service planning project provided details about the costs for the first four years of the strategy 2019-2023. The costs from 2019-2030 are much more uncertain due to the longer time frame.

Impact	Implementation cost	
Diversion assessment (estimated per year) over 2019-2030: • High: greater than 30,000 tonnes/year <u>or</u> an increase greater than 10% recovery rate within the sector (either MSW, C&I or C&D) • Medium: between 15-30,000 tonnes/year <u>or</u> an increase between 5-10% recovery rate within the sector • Low: less than 15,000 tonnes/year or increase of less than 5% recovery rate within the sector	Cost assessment over 2019-2023: • Low: up to $100,000 • Medium: $100,000 to $1 million • High: $1 million plus	Cost assessment over 2019-2030: • Low: up to $300,000 • Medium: $300,000 to $3 million • High: $3 million plus

Implementation Plan 2019-20

This document is a high level summary of our actions for 2019-20 to deliver the Waste and Resource Recovery Strategy 2030.

Strategy priorities		Action	Our role	19	20	21	22	Key actions for 2019-20
1. Engage and educate community and businesses	1.1	Provide expert advisory service to support improved waste system	Deliver	▓	▓	▓	▓	• Expert advisors - service design • Pilot expert advisor service in 2 to 3 buildings • Refine and expand service, and integrate with other projects (e.g. high rise organics)
	1.2	Run, support and advocate for education campaigns.	Deliver Influence	▓	▓	▓	▓	• Develop engagement plan and materials • Run education campaigns to support projects • Meet with government departments and ministers
	1.3	Promote innovation through our communications and events	Influence	▓	▓	▓	▓	• Communications plan in each project, especially innovation fund • Engage with Events Team and Smart City Office for opportunities
2. Incentivise and promote innovative solutions	2.1	Establish and deliver a waste minimisation and innovation fund.	Deliver	▓	▓	▓	▓	• Design innovation fund, with community engagement • Deliver Year 1 innovation fund, work closely with media and communication team
	2.2	Deliver an Incentive Program to drive investment in new resource recovery infrastructure and other solutions.	Influence	▓	▓	▓	▓	• Investigate using incentives in FOGO trial and high-rise organics trial (e.g. in-sink-grinder partnership) • Link innovation fund projects with developers or building managers for pilots
	2.3	Explore innovative approaches to waste reuse, collection, storage and recovery	Deliver	▓	▓	▓	▓	• Ties into innovation fund • Engage with developers and precincts on opportunities for trials (e.g. Arden-Macaulay or Fishermans Bend)
3. Support growth of a circular economy through government procurement	3.1	Strengthen City of Melbourne's procurement practices to use recycled materials where appropriate	Govern	▓	▓	▓	▓	• Update sustainable procurement guidelines • Support Procurement Team
	3.2	Partner with local and state government to develop best practice sustainable procurement policies and processes	Govern Influence	▓	▓			• Engage with Sustainability Victoria, MWRRG, MAV, Procurement Australia and LGV to identify opportunities for improving procurement policies and procedures
	3.3	Pilot sustainable procurement projects that demonstrate circular economy principles	Deliver Influence			▓	▓	*No planned action in 2019-20, unless opportunities arise*

Strategy priorities		Action	Our role	19	20	21	22	Key actions for 2019-20
4. Lead by example through City of Melbourne operations and events	**4.1**	Improve City of Melbourne's operations, tenancies and developments toward zero waste to landfill	Deliver	▓	▓	▓	▓	• Work with Parks, Property and Waterways branch to review, plan and implement improvements to council building waste and recycling systems
	4.2	Reduce waste and improve recycling at City of Melbourne sponsored and run events	Deliver	▓	▓	▓	▓	• Work with Event Team to plan and drive increased recycling at events
	4.3	Recycle public realm residual waste where practical	Deliver	▓	▓	▓	▓	• Investigate opportunities to recycle public realm residual waste
	4.4	Investigate new opportunities to recycle dumped rubbish and manage litter	Influence	▓	▓	▓	▓	• Work with contractors and PPW Branch and On-street Compliance Services branch to identify opportunities and assess costs and benefits.
5. Advocate for better producer stewardship and product design	**5.1**	Advocate for a container deposit scheme in Victoria.	Influence	▓	▓	▓	▓	• Develop our policy and advocacy plan on a container deposit scheme, including public submissions to the Victorian Government and meeting with key stakeholders
	5.2	Advocate for stronger extended producer responsibility.	Influence	▓	▓	▓	▓	• Develop our policy and advocacy plan on extended producer responsibility, including public submissions to the Australia Government and meeting with key stakeholders
6. Improve the waste governance framework and planning	**6.1**	Strengthen Waste Management Plan guidelines and review and update waste generation rates to ensure higher recovery rates in new developments	Govern	▓		▓		• Update waste management plan guidelines • Review and update waste generation rates *See services handbook for more information*
	6.2	Review regulations and permit conditions for private waste operators, skip bins, and bins permanently stored in the public realm	Govern	▓				• Update local law to improve streamline and improve waste clauses, working with Governance & Legal Team • Improve permit operations and bin storage process • Site Services Team to engage skip bin operators to understand process *See services handbook for more information*
	6.3	Investigate and advocate for regulations to avoid and improve recovery of organics and plastics waste.	Govern	▓	▓	▓	▓	• Explore amending local law for mandatory food waste recovery as well as reduction in single-use plastics
	6.4	Deliver behaviour change campaigns to improve recycling.	Govern Deliver	▓	▓	▓	▓	• Deliver education campaigns as part of ongoing and new projects, such as food recovery and hubs expansion. • Advocate to for large, statewide education campaigns.

ATTACHMENT 6

Strategy priorities		Action	Our role	19	20	21	22	Key actions for 2019-20
7. Establish new systems to source separate and collect organic waste	7.1	Explore and trial options to separate organic waste across different residential property types	Deliver	▓				• Plan and begin FOGO trial in low-density neighbourhood • Plan high-rise trial for 2020-21
	7.2	Implement successful organic waste solutions	Deliver		▓	▓	▓	*No planned action in 2019-20, unless opportunities arise*
	7.3	Establish organics processing contracts to support organics solutions	Deliver	▓	▓	▓		• Short-term arrangements for processing facility for the FOGO trial
8. Transform the collection and transfer of recycling and residual waste	8.1	Improve existing waste hubs and recycling facilities and expand the existing resource recovery hub network for city businesses	Deliver	▓	▓	▓	▓	• Improve existing hub performance and cost-recovery • Amend local laws and permits • Plan for a new hub *See services handbook for more information*
	8.2	Enact planning controls to ensure that the Waste and Recycling Centre on Dynon Road maintains its role as a hub of state significance and develop a plan for future upgrades	Influence	▓	▓	▓		• Work with planners, CityWide and MWRRG to continue planning the future of Dynon Road waste and recycling centre
9. Improve the efficiency, effectiveness and viability of recycling	9.1	Advocate for increased investment from landfill levy funds and policy improvements to support a resilient local recycling sector	Influence	▓	▓	▓	▓	• Advocate for Victorian Government investment for examples in local sorting and reprocessing infrastructure • Engage with the Victorian Government on waste policies, including the circular economy
	9.2	Establish new, improved recycling contracts	Deliver	▓	▓	▓	▓	• Continue review and performance of recycling contract with MWRRG
	9.3	Expand e-waste recycling options for residents	Deliver	▓	▓	▓	▓	• Continue to expand e-waste recycling infrastructure • Support e-waste education programs
10. Explore advanced waste processing of residual waste that cannot be otherwise recovered	10.1	Explore advanced waste processing and advocate for Victorian Government investment after all other waste minimisation and recovery efforts are implemented						AWP assessed as part of 2023 review

Monitoring and evaluation

This table summarises our key targets for the Waste and Resource Recovery Strategy 2030. It is underpinned by a monitoring and evaluation plan. In 2023 we will review progress and may adjust targets.

		Targets and indicators 2023	Targets and indicators 2030
Key targets		50% of all waste diverted from landfill	90% of all waste diverted from landfill
		5% reduction in household waste produced	20% reduction in household waste produced
		0.3 Mt CO2-e in greenhouse gas emissions avoided *(for 2025)*	1.2 Mt CO2-e in greenhouse gas emissions avoided *(from the Climate Change Mitigation Strategy 2050)*
Reduce	**More efficient use of resources**	At least one new extended producer responsibility scheme	Increased number of extended producer responsibility schemes
		Victorian Government commits to a container deposit scheme	Victorian Government implements a container deposit scheme
	The city produces less waste	10% reduction of City of Melbourne office waste produced	30% reduction of City of Melbourne office waste produced
		90% of construction and demolition waste from City of Melbourne led developments is recovered	90% of construction and demolition waste from City of Melbourne led developments is recovered
Collect	**More effective recycling separation systems**	20% less contamination of household recycling bins	50% less contamination of household recycling bins
		90% of waste is recovered from at least four City of Melbourne run or sponsored events	90% of waste is recovered from all City of Melbourne run and sponsored events
		20% reduction in waste from at least four City of Melbourne run and sponsored events	20% reduction in waste from all City of Melbourne run and sponsored events
	A city with high amenity	20% less private bins in the public realm	No private bins in the public realm
		Average customer experience rating of at least 3.5 out of 5	Average customer experience rating of at least 3.5 out of 5
Recover	**Food and green waste recovered**	At least one trial achieves 50% of organics in household waste recovered	50% of organics in household waste is recovered
	A resilient recycling sector	At least one pilot precinct that eliminates unnecessary single-use plastic	No unnecessary single-use plastic in the City of Melbourne
		Increase in recycled content in products procured by City of Melbourne	Increase in recycled content in products procured by City of Melbourne
	Waste to landfill minimised	50% of household waste is recovered	90% of household waste is recovered
		70% of commercial and industrial waste is recovered	90% of commercial and industrial waste is recovered
		90% of construction and demolition waste is recovered	90% of construction and demolition waste is recovered
		60% of City of Melbourne operational waste is recovered	90% of City of Melbourne operational waste is recovered