

CITY OF MELBOURNE

DRAFT WASTE AND RESOURCE RECOVERY STRATEGY 2030

EXECUTIVE SUMMARY

1. The City of Melbourne wants to become a global leader in waste management, resource recovery and reduction of all waste streams to landfill. The draft Waste and Resource Recovery Strategy 2030 establishes a long-term vision to help reach this goal.
2. As a local government, City of Melbourne is responsible for collection and recycling or disposal of waste from our operations, our residents and public places such as streets and parks. We also run education and behaviour change campaigns for residents, businesses and visitors to our City and work with events to reduce their waste footprint.
3. As a Capital City we also have a responsibility to advocate to and work with businesses and industry, state and federal governments and neighbouring Councils to decrease single use waste products, increase efficiency in waste collection across the whole municipality and state and to maximise collective ambition for best practice resource recovery and recycling operations including waste to energy opportunities and organic and food waste reduction.
4. We have developed some world leading initiatives such as Degraeves Street Recycling Facility, laneway garbage compactor and recycling hub program and the Single Use Waste Reduction Fund to work with businesses, visitors and residents to test opportunities to reduce waste in our city regardless of whose responsibility it is.
5. The main challenges for waste management in the City of Melbourne are: population growth, collection from high-density development, greenhouse gas emissions and climate change, amenity and under-developed recycling or reuse markets.
6. It is important to note that the vast majority of waste in the City of Melbourne is generated by the commercial and industrial and construction and demolition sectors (see table below).

Table 1 Waste generation and recycling (tonnes, estimated, 2016-17 or baseline year)¹

Waste stream	Waste landfill/recycling	Amount collected for recycling	Recycling rate
City of Melbourne operations	7,300	800	11%
Municipal solid waste:			
• Household waste	33,600	8,400	25%
• Public place bins	5,800	1,300	22%
Commercial and industrial (2015-16)	461,000	280,500	61%
Construction and demolition (2014-15)	298,500	258,400	87%
Total	805,800	549,353	68%

7. To become a world leader, the draft Waste and Resource Recovery Strategy 2030 sets out to develop cost effective, environmentally responsible waste and resource recovery systems, with these goals and outcomes (Figure 1).

Figure 1 Strategy goal and outcomes



8. Indicators and targets have been identified to track our progress towards 2030, including 85 per cent of all residential waste is diverted from landfill, recycling quality is at 95 per cent, 75 per cent of commercial and industrial waste is diverted from landfill and the City of Melbourne reduces waste by 30 per cent including at our events.

Table 2 Summary of 2030 targets

Source	Indicator	Baseline	Target - 2030
City of Melbourne operations	Amount of waste produced in CoM buildings	55 kg / EFT / year	38.5 kg / EFT / year
	Events indicator and target - to be developed when baseline is available		
Residential waste	Diversion from landfill rate	25 per cent	85 per cent
	Recycling quality	90 per cent	95 per cent
Commercial and industrial waste	Diversion from landfill rate	61 per cent	75 per cent

9. The Strategy includes an action plan outlining the priorities and actions for the first four years. The four priorities are:
- Reducing, reusing, recycling and recovering waste – collection options and education campaigns focusing on the most problematic waste streams, including organic waste, plastic and single-use items and e-waste and supporting local solutions to recycling materials produced in the municipality, not reliant on overseas operations.
 - Developing landfill alternatives – through establishment of Alternative Waste and Resource Recovery Technologies with other Councils and the Victorian and Federal governments.
 - Stimulating innovation –through the establishment of a waste minimisation innovation fund, in partnership with our City’s business, retail, hospitality and residential communities.
 - Reducing amenity impacts from waste collection – extending our existing programs and finding new ways to reduce amenity impacts from residential and commercial waste collection operations on our streets and in waterways.

10. This includes actions such as partnering with other organisations to establish a Fisherman's Bend Sustainability Hub, the establishment of a Waste Minimisation Innovation Fund, new programs to maximise resource recovery from the City of Melbourne's own operations and extending the network of communal waste compactors and recycling hubs.
11. The City of Melbourne will rely on the support and effort of its own constituents, other levels of Government and the community as a whole to achieve its vision of sustainable waste management.

DRAFT

INTRODUCTION

The Waste and Resource Recovery Strategy 2030 (the Strategy) establishes a long-term vision for the City of Melbourne to become a global leader in waste management and resource recovery.

Our residents, workers, students, visitors, businesses and other organisations are purchasing, using and disposing of products and materials as they go about their daily routines. More than 800,000 tonnes of waste (including garbage and recycling) is estimated to be generated in City of Melbourne each year. However, less than 1 per cent of this is generated by City of Melbourne's operations and only 6 per cent is collected by City of Melbourne. The remaining 94 per cent is generated by the commercial and construction and demolition sectors and collected by private waste collection companies. Our challenge is to reduce the negative social and environmental impacts associated with waste management and to provide ratepayers with efficient and effective services.

As a Capital City we also have a responsibility to advocate to and work with businesses and industry, state and federal governments and neighbouring Councils to decrease single use waste products, increase efficiency in waste collection across the whole municipality and state and to maximise collective ambition for best practice resource recovery and recycling operations including waste to energy opportunities and organic and food waste reduction.

The economic impacts of waste are substantial. For example, food waste in Australia leads to a loss of \$20 billion to the overall economy each year². These losses occur at all stages of the food life-cycle, from production, processing and manufacturing, distribution, retail, hospitality and food service, and at the household level. Food is not unique in this way - waste occurs throughout the life-cycle of all goods and materials.

This Strategy sets out a way forward, a platform through which waste can be managed as a resource for a modern city. The impacts and trends are identified, followed by a snapshot of the current waste profile and City of Melbourne's services and programs and identification of the key challenges. This provides the context for our pathway towards 2030.

The 2030 goal is for City of Melbourne to develop and introduce cost effective, environmentally responsible waste and resource recovery systems. The five outcomes to support the goal are:

- the City is a leader in sustainable waste management
- waste to landfill is minimised
- cost to ratepayers is minimised
- the waste management system is carbon neutral or better
- amenity impacts of the waste collection system are minimised.

Ambitious targets and supporting indicators will help to track our progress. Four priorities, each with supporting actions, will guide our efforts for the first four years of implementation. The priorities and actions will be reviewed and updated in year four to provide the next steps forward.

² Commonwealth of Australia. (2017a). *National Food Waste Strategy: Halving the Nation's Food Waste by 2030*. www.environment.gov.au

THE CONTEXT

Environmental Impacts

Production, use and disposal of materials and products are a large component of an individual, household or business' environmental footprint. The main environmental impacts of the management of waste are:

- Production and manufacturing of materials that then become waste.
- Waste collection - the large number of trucks collecting waste in the City leads to exhaust fumes and greenhouse gas emissions.
- Waste disposal - landfill disposal impacts include leaching of heavy metals and chemicals and methane gas emissions. Methane is a greenhouse gas with 25 times the global warming impact of carbon dioxide³. In landfills it is created by the breakdown of organic waste in anaerobic (oxygen-free) conditions. Whilst many landfills also have the technology for methane capture, this is not necessarily an efficient process. Landfills also occupy space that could be used for a more useful purpose.
- Natural environment (such as waterways) health which can be impacted due to inappropriate disposal practices or litter.

Trends

Global trends

Global trends in waste management relate to a drive to improve processes and delivery through innovation and new technology. Whilst many European countries moved away from landfill some years ago, treatment facilities continue to grow in sophistication and in their capacity to convert waste to useful materials and/or energy.

There is a growing international awareness and community understanding of the resource value of items that are discarded and a move towards the recovery of items that used to be considered 'residual' such as industrial equipment and plastic films. Other developments include the use of more sustainable and environmental-friendly raw materials and improvements in product design to increase recyclability.

Major cities are taking up the idea of the circular economy as a means of maintaining economic growth while reducing environmental degradation: this approach moves away from the current 'take-make-waste culture'⁴. The vast majority of goods don't need to end up as waste. Creating a more circular economy involves designing out waste where possible, then recovering more materials to re-use and recycle; eventually no longer sending any waste to landfill. This allows more value to be gained from products and materials and for a reduction in the negative social, environmental and economic impacts associated waste.

Cities are making evidence based decisions by leveraging community-generated data capturing personal behaviours relating to waste and litter pollution in urban areas and waterways. The creation of such data sets is reflective of a growing understanding of the degradation of ocean and waterway ecosystems through discarded waste, especially plastics.

Many cities have set ambitious targets for diversion of waste from landfill through recycling or recovery. For example, Sydney City Council has targets for 90 per cent diversion for waste from council operations, residents and businesses and other organisations.

³ Commonwealth of Australia. (2017b). National Greenhouse Accounts Factors. www.environment.gov.au

⁴ www.ellenmacarthurfoundation.org

These positive trends towards greater recovery and recycling have been dramatically impacted by the change in global markets for recyclable materials in early 2018. The market change has occurred as a result of China restricting the type of waste materials that they accept as imports. In 2016, China spent over \$US18 billion on imports of recyclable materials and accepted more than half of the world's waste paper exports and half of its waste plastic exports⁵. China, having gradually tightened the standards for imports over a number of years through their Green Fence program, implemented new restrictions on 24 categories of solid waste from 1 January 2018 under the National Sword policy⁶. The restrictions have had immediate effect, with imports in January 2018 dropping by 44 per cent for scrap paper imports (compared to January 2017) and by 94 per cent for plastic scrap (compared to the previous month)⁷. This is driving an interest in expanding local recycling industries and markets.

Australian and Victorian trends

Increases in waste generation are driving a move towards alternative waste and resource recovery technology facilities as the preferred destination for waste that cannot be re-used or recycled. These technologies allow value to be recovered through sorting and processing which may include waste to energy.

Organic waste is increasingly being seen as a priority waste material. A growing number of councils are implementing a "FOGO" system that collects food organics and garden organics in a single bin. This can be introduced as a change to an existing garden waste collection bin service or as a new organics bin. In the commercial and industrial sector, proactive businesses and organisations are introducing 'boutique' options to enable resource recovery for food organics, honing in on anaerobic digestion as a means of processing this waste.

The Victorian Government's Metropolitan Waste and Resource Recovery (MWRRG) Implementation Plan⁸ sets out how infrastructure needs will be met in the metropolitan region over 2016-2026. The Plan notes that the existing regional landfill arrangements expire in April 2021 and that in the south east of metropolitan Melbourne, landfill space is almost exhausted.

In Victoria, there is also a trend towards more regulatory intervention in waste management. The Victorian Government has announced plans to ban single, light weight plastic bags and have begun community engagement on how such a ban is best managed and over what time period. The banning of electronic waste from landfill has also been announced. The Victorian Government's landfill levy currently stands at \$63.28 per tonne, more than doubling the cost of sending waste to landfill. This levy increases in line with Department of Treasury and Finance indexing for inflation⁹.

State and local governments across Australia have been impacted by the changes in global recycling markets in early 2018. Councils are facing increased costs for recycling sorting and have to renegotiate contracts for this service. The Victorian Government has provided a short-term assistance package of \$12 million to fund the increased costs to councils for the period 1 March – 30 June 2018 and has made a further \$1 million available to the Victorian recycling industry for new infrastructure to improve the quality of recovered plastic, paper

⁵ The Economist. (2017, 3 Aug). [China tries to keep foreign rubbish out](http://www.economist.com). www.economist.com

⁶ Inside Waste. (2018, 9 Feb). [National Sword: urgent action needed](http://www.insidewaste.com.au). www.insidewaste.com.au

⁷ Taylor, B. (2018, 23 Feb). [Scrap imports drop in China in early 2018](http://www.recyclingtoday.com). www.recyclingtoday.com

⁸ MWRRG. (2016). *Metropolitan Waste and Resource Recovery Implementation Plan 2016*.

www.mwrrg.vic.gov.au

⁹ www.epa.vic.gov.au

and cardboard¹⁰. In April 2018, Ipswich City Council in Queensland announced that they would be landfilling all recyclable waste but then reversed this decision¹¹. The issue has become one of the most urgent challenges for recycling in Australia and will be discussed at the meeting of state and territory environment ministers on 27 April 2018¹².

Population and waste generation trends

In April 2018, the population of Australia was 24.9 million¹³. Waste generation rates are a function of population growth, the level of urbanisation and per capita income. Australians produced 64 million tonnes of waste in 2014-15, averaging 2.7 tonnes per person¹⁴. Waste generation increased by an average of 1.2 per cent, per year from 2006 to 2015, while population grew by 1.5 per cent¹⁵.

In 2017 there were an estimated 142,000 residents and a daily population of 922,000 residents, workers, students and visitors within the City of Melbourne. This is expected to grow to 233,000 residential and 1.23 million daily population by 2030¹⁶. Our 142,000 residents occupy 71,000 residential dwellings, of which 86 per cent are apartments and 14 per cent are houses or townhouses¹⁷.

ROLES AND RESPONSIBILITIES

The roles and responsibilities of government, industry and waste generators are outlined briefly below.

Local government

Councils are responsible for providing waste and recycling services to residents. While the Local Government Act 1989 does not specify how these services should be delivered, it does state that the objective of local government is: 'to endeavour to achieve the best outcomes for the local community having regard to the long term and cumulative effects of decisions'¹⁸. Many Councils, including the City of Melbourne, outsource the delivery of waste services through a competitive tender process. Local government also undertakes local planning, develops policy and implements education and behaviour change programs for waste reduction and recycling.

State 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 MWRRG Group.

Australian government

The Australian government has an over-arching role in waste management through national legislation, strategies and policy frameworks. Their role in developing and implementing legislation and schemes for product stewardship has been a particular focus in recent years.

¹⁰ www.environment.vic.gov.au

¹¹ Bavas, J. (2018, 20 April). [Ipswich Council backflips on decision to scrap recycling, wants fewer pizza boxes in yellow-lid bins](http://www.abc.net.au/yellow-lid-bins). www.abc.net.au

¹² <https://greensmps.org.au/articles/josh-frydenberg-must-settle-recycling-solution-upcoming-meeting-environment-ministers>

¹³ www.abs.gov.au

¹⁴ Blue Environment. (2016). *Australian National Waste Report 2016*. www.environment.gov.au

¹⁵ Blue Environment. (2016). As above.

¹⁶ www.melbourne.vic.gov.au Daily population estimates and forecasts.

¹⁷ City of Melbourne. (2016). *Census of Land Use and Employment Profile 2016*. www.melbourne.vic.gov.au

¹⁸ Reincarnate. (2017). *City of Melbourne: Context, initiatives and innovations - Waste and resource recovery strategy 2030*. (Unpublished).

For example, the National Television and Computer Recycling Scheme has resulted in increased availability of free recycling services for these products.

Waste and resource recovery industry

The waste and resource recovery industry provides a wide range of services and infrastructure for collection, transport, sorting, reprocessing, exporting and disposal of waste. Nationally the waste sector is worth over \$14 billion and employs 50,000 people both directly and indirectly¹⁹. The industry has a substantial impact on the waste and resource recovery outcomes in the City of Melbourne's municipal boundaries.

Waste generators

Households, businesses, governments and other organisations and construction and demolition companies all consume materials and goods and use services as part of their daily activities. When choosing the type and quantity of materials and goods they have an opportunity to support the circular economy. For example, by purchasing only what is really needed, choosing second-hand or remanufactured goods and using materials or goods made from recycled content or renewable resources. Shifting to using services rather than purchasing goods can also reduce waste, for example, by renting goods or using sharing services like car-share programs. When discarding unwanted goods or materials, individuals, households and businesses or other organisations have a responsibility to sort and separate their waste and ensure that they are selecting the highest value pathway for their unwanted items.

Waste policy

The Strategy operates within the broad context of the Australian and Victorian waste policy frameworks.

Australian government

The National Waste Policy (2009) provides an overall direction for waste and resource recovery until 2020. The Australian Government has played an important role in enhancing product stewardship in Australia, through the *Product Stewardship Act 2011* and the implementation of national regulatory and co-regulatory schemes, most notably the National Television and Computer Recycling Scheme²⁰. The Australian Government launched a National Food Waste Strategy in November 2017 which refers to the United Nations Sustainable Development Goals (SDGs) target 12.3: 'By 2030, halve per capita food waste at the retail and consumer levels and reduce food losses along the production and supply chains, including post-harvest losses'²¹.

Victorian Government

The Victoria policy and strategic planning framework for waste and resource recovery includes legislation, strategic planning documents and enabling strategy documents, as shown in Figure 2.

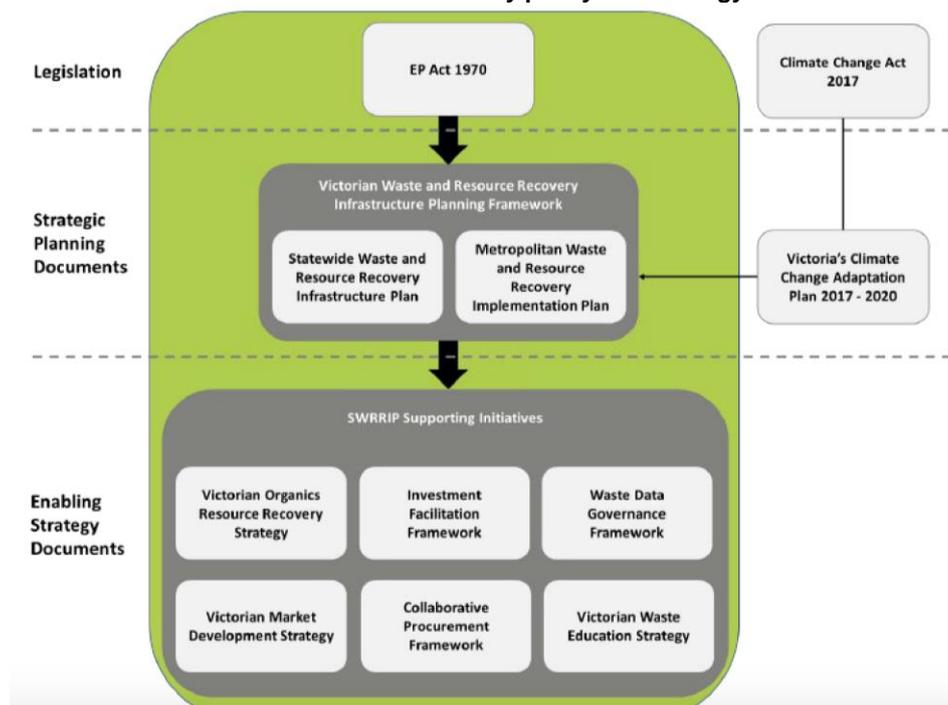
¹⁹ Ritchie, M. (2016, April 20). State of Waste 2016 - current and future Australian trends.

<http://blog.mraconsulting.com.au>

²⁰ Reincarnate. (2017). As above.

²¹ Reincarnate. (2017). As above.

Figure 2 Current Victorian waste and resource recovery policy and strategy framework²²



The Victorian framework identifies the current resource flows in Victoria's waste and resource recovery system as a form of a circular economy²³. The framework has a strong focus on improving diversion of waste from landfill and on processing and management of food and other organic waste. Improved recovery, education and processing for commercial and industrial waste is also a focus, while acknowledging the challenges posed by the large number of businesses and waste service providers²⁴.

The MWRRG Implementation Plan²⁵ applies the 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 and plan for a growing population. Actions include the establishment of new infrastructure that can recovery resources from residual waste and improving the organic waste recovery and processing network. Collaborative procurement between local governments is a key mechanism for establishing new infrastructure.

Sustainable Development Goals

Australia is one of many nations globally that has adopted the United Nations SDGs. The 17 goals and accompanying 169 targets were agreed in 2015 to address common global issues. An assessment of the SDGs to the waste and resource recovery system identified that goal 12 is the most directly relevant goal, addressing 'responsible consumption and production', which seeks to 'ensure sustainable consumption and production patterns'. Five other goals were also relevant: making cities more sustainable (goal number 11), taking action to combat climate change (13), to lessen our impacts for life below water (14) and on land (15) and by using partnerships to achieve the goals (17).

²² Reincarnate. (2017). As above.

²³ For example, refer Figure 1-1 in Sustainability Victoria. (2017a). State-wide Waste and Resource Recovery Infrastructure Plan (SWRRIP) Amendment consultation draft. www.engage.vic.gov.au

²⁴ Reincarnate. (2017). As above.

²⁵ MWRRG. (2016). *Metropolitan Waste and Resource Recovery Implementation Plan 2016*. www.mwrrg.vic.gov.au

WASTE AND RESOURCE MANAGEMENT - A SNAPSHOT

Sources of waste

Waste is generated by four sources within the municipality. These are:

- City of Melbourne operations - i.e. buildings, parks maintenance etc.
- Municipal solid waste - i.e. household waste, public place bin waste.
- Commercial and industrial waste - shops and offices but also factories/warehouses.
- Construction and demolition waste - building and renovation projects.

The estimated amount of waste generated from each of these sources of waste is presented in Table 3 below.

Table 3 Waste generation and recycling (estimated, 2016-17 or baseline year)²⁶

Waste stream	Amount of waste generated (landfill and recycling)	Amount collected for recycling	Recycling rate
City of Melbourne operations	7,300	800	11%
Municipal solid waste:			
• Household waste	33,600	8,400	25%
• Public place bins	5,800	1,300	22%
Commercial and industrial (2015-16)	461,000	280,500	61%
Construction and demolition (2014-15)	298,500	258,400	87%
Total	805,800	549,353	68%

City of Melbourne operations

Waste generation and recycling for City of Melbourne's operations is shown in Table 2 below.

Table 4 Waste generation and recycling for City of Melbourne operations (estimated, 2016-17)²⁷

Waste source	Amount of waste generated (landfill and recycling)	Amount collected for recycling	Recycling rate
Buildings	900	200	22%
Parks and garden maintenance	600	600	100%
Illegally dumped rubbish	1,800	0	0%
Street sweepings	3,900	0	0%
Total	7,300	800	11%

²⁶ Blue Environment. (2017). *City of Melbourne waste data and projections*. (Unpublished)

²⁷ Blue Environment. (2017). As above.

Municipal waste

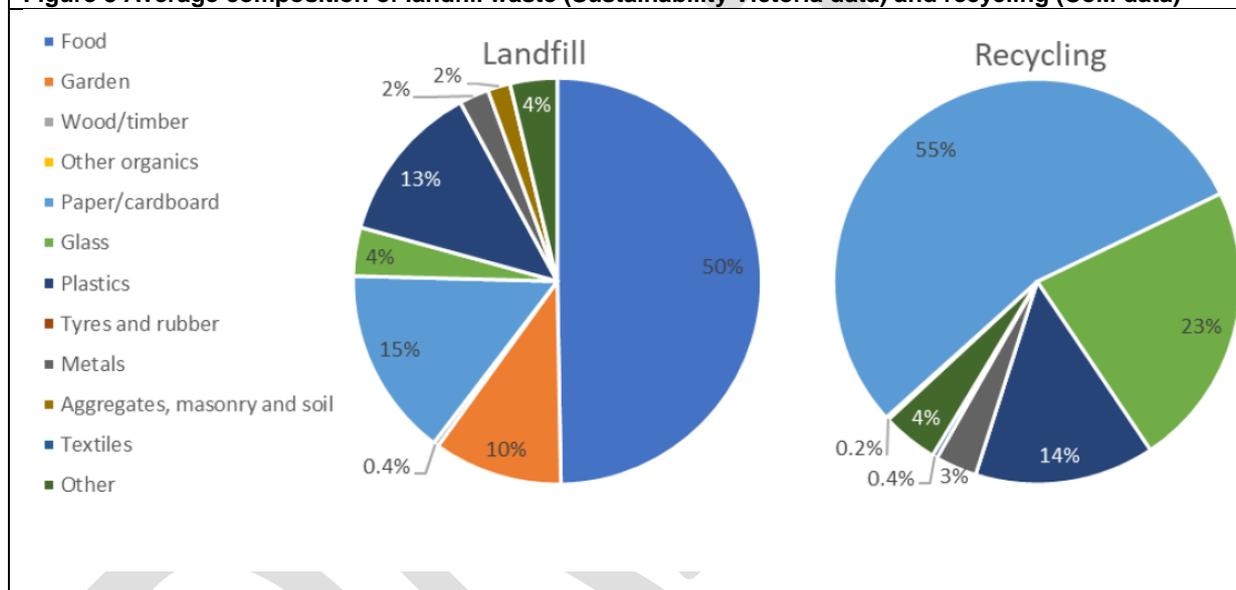
Household waste

Residents of City of Melbourne currently only recycle 25 per cent of the waste they generate. This is low compared to the Victorian average of 40 per cent²⁸ and metropolitan Melbourne average of 48 per cent²⁹ of waste recovered from municipal solid waste (which includes material generated by households, council operations and users of public spaces).

Overall satisfaction by residents is high, with a 2017 survey of 300 residents finding 86 per cent satisfaction with both garbage and recycling services. Satisfaction was lower for hard waste collection (e.g. furniture, white goods) at 57 per cent and garden materials at 47 per cent satisfaction³⁰.

The graph below details the indicative landfill and recycling composition for households in the City of Melbourne.

Figure 3 Average composition of landfill waste (Sustainability Victoria data) and recycling (CoM data)³¹



Public place bins

Public place bins are provided by City of Melbourne on streets and in parks. Users of our public spaces, including workers, students and visitors, disposed of 5,800 tonnes in public place litter and recycling bins in streets and parks during 2016-17 with approximately 22 per cent recycled. Solar-powered compacting litter bins were installed across the central city in 2018. The material collected will be sorted to recover comingled recyclables.

Commercial and industrial waste

With 16,000 business establishments and 456,000 jobs in 2016³², the commercial and industrial sector generates most of the waste in the municipality. Waste generation and recycling estimates are based upon an extensive survey and extrapolation model developed

²⁸ Sustainability Victoria. (2017a). As above.

²⁹ MWRRG. (2016). *Key Data: Metropolitan Waste and Resource Recovery Implementation Plan*. www.mwrrg.vic.gov.au

³⁰ Colmar Brunton. (2017). *City of Melbourne. Waste services research*. (Unpublished)

³¹ Blue Environment. (2017). As above.

³² City of Melbourne. (2016). As above.

in 2016³³. Actual data was not available as collections are provided by up to 40 different commercial waste and recycling companies.

Of the 461,000 tonnes of waste generated in 2016, 60 per cent was recycled. Around half of this was paper and cardboard (including secure paper destruction collections, 44 per cent was mixed recyclables or glass and the rest was made up of organics recycling (5 per cent) and other materials (1 per cent).

Hospitality and food retail businesses generated over one third of the waste despite having less than 20 per cent of employees. They also had 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) and office-based businesses (86 per cent recycling).

Construction and demolition waste

Construction and demolition activities primarily generate concrete, masonry and soil, metals and timber. Actual data on construction and demolition waste generation from City of Melbourne was not available as this material is managed by commercial waste and recycling collection companies. Waste volumes have been estimated based on the value of building permits issued and the overall amount of waste generated for metropolitan Melbourne³⁴.

City of Melbourne waste services and programs

City of Melbourne provides collection services, infrastructure programs and education/behaviour change programs for resource recovery and waste management.

Collection and infrastructure

The City of Melbourne provides residential properties with collection services for garbage/landfill, comingled recycling, cardboard, garden organics, hard waste items (e.g. furniture, white goods) and electronic items. Commercial rateable properties are also entitled to a weekly collection of one small garbage and one small or large recycling bin. Those businesses who generate more waste than this are required to purchase their own waste disposal service from a commercial collection provider. Electronic items can also be dropped off for recycling at three community hub/library locations, the Waste and Recycling Centre in West Melbourne and during collection events.

The City of Melbourne has established three specialised infrastructure programs. These are:

- The Degraeves Street Recycling Facility which, from a basement carpark, processes food waste and collects glass, steel, aluminium, plastic and cardboard generated from surrounding cafes and restaurants. The facility currently processes 600 kilograms of food waste per day from two machines. Participating businesses are not charged for use of the facility.
- Communal waste compactors. Five waste compactors are in place in central city laneways each taking waste from up to 130 businesses at each location. Fees apply for most businesses. The garbage compactor quarterly access fee is currently charged on the basis of low, medium and high usage levels, depending on how often the garbage compactor is used. Residents use the compactors free of charge in lieu of their rateable service.
- Recycling hubs. Free recycling is available to businesses through 55 cardboard and 65 comingled recycling bins located in twelve recycling hubs and a further 76

³³ Blue Environment. (2016). *City of Melbourne commercial waste survey, 2016*. (Unpublished).

³⁴ Blue Environment. (2017). As above.

cardboard bins in 41 laneways across the central city. The large bins are collected up to three times per day to meet demand.

Collection services are provided through the Waste Management Services Contract. City of Melbourne also has contracts for landfill disposal, sorting and on-selling of recyclables and garden waste processing. These contracts are managed by the MWRRG on behalf of City of Melbourne and other participating councils.

Behaviour change and education

The compactor, recycling hub and Degraeves Street Recycling Facility programs include a substantial behaviour change and education component, with staff working with users to increase the amount and quality of material being recovered. Other behaviour change and education programs focus on high-rise and residential recycling, home composting and organic waste, single use items and sustainable rewards.

Household recycling has been improved through programs for high-rise buildings and other residential properties. 340 buildings with more than 58,000 apartments have been engaged through the High Rise Recycling Program since it started in 2013. Improvements typically include larger recycling bins, addition of electronic recycling and clothing/household good donation bins, signage and educational materials. The program has resulted in estimated increases of 1040 tonnes of recycling, 260 tonnes of clothing/household goods and 10 tonnes of electronic items recovered annually.

Free educational materials including fridge magnets and stickers are available on request to help residents to recycle correctly. The quality of residential recycling is also improved through the annual recycling bin inspection program. During the 2016-17 inspections a total of 7,100 bins inspected. Correct recycling behaviour increased from 61 per cent of bins in the first inspection to 68 per cent in the follow-up inspection³⁵.

The City of Melbourne provides discounted compost bins, worm farms and bokashi bins through the Compost Revolution website to promote home composting of food and garden waste. Between September 2016 and February 2018, 89 households purchased an item through this service and 1,240 residents completed an educational tutorial³⁶. Worm farm installations have also been supported as an initiative of City of Melbourne's Food Policy, with 55 worm farms and 39 wicking garden beds commissioned between 2014-2017. These are located at a range of sites including City of Melbourne offices and childcare centres, city laneways, apartment buildings and community sites. In Kensington, residents have established a compost service which has been supplemented by a Closed Loop Project where residents take food organics to an off-site processing area at Kensington Town Hall. The compost generated from the food scraps will be used to 'feed' plants growing in a nearby community garden.

Other recent initiatives include:

- A fortnightly garden waste bin trial in Kensington and a part of Flemington. The trial sought membership of a minimum of 200 households to create a critical mass and make the collection investment worthwhile. Only 160 residents joined the trial with most prepared to continue with the standard monthly on call green waste collection service.

³⁵ Envirocom. (2017). *City of Melbourne Recycling Bin Inspection Program*. (Unpublished).

³⁶ Compost Revolution unpublished data.

- A trial of on-site food waste processing technology in three high-rise apartment buildings in 2015-16 with each apartment building choosing to continue to use the technology and build costs into body corporate fees.
- The single-use waste fund which provided small grants to help businesses to avoid or reduce their use of single-use items such as coffee cups. 25 businesses were awarded up to \$2000 each for activities such as providing customers with reusable cups or purchasing reusable alternatives for use in-store.

THE CHALLENGES

Population growth and high-density development

By 2030, the residential population is forecast to grow to 233,000 with a visiting population of 1.23 million people per day³⁷. Business activity is also expected to grow significantly with the number of jobs located within the City of Melbourne predicted to increase from 455,500 in 2016 to more than 627,000 in 2031³⁸. If current waste practices continue, waste generation could increase to more than 660,000 tonnes from households and the commercial and industrial sector by 2030. The City must plan to manage this growth and the potential negative environmental and amenity impacts.

High-rise apartments have traditionally had lower recycling rates than stand-alone houses. This is because convenient recycling systems were not built into older apartment buildings. Storage is at a premium and effective recycling systems are difficult to retrofit. Systems for managing specialised waste streams such as organics and e-waste will also be needed in future. Even though the problems are less evident in new developments, the challenge will be to design apartments in a way that facilitates waste reduction and resource recovery.

Greenhouse gas emissions and climate change

The production, consumption, use and disposal of goods and materials has a substantial impact on greenhouse gas emissions. By implication, unless action is taken, a growth in the amount of waste will also increase greenhouse gas emissions.

The waste sector accounted for 2 per cent of Australia's national greenhouse gas inventory in 2016-17³⁹. The inventory counted emissions from landfills, waste incineration and biological treatment of solid waste and wastewater treatment.

Because this inventory method does not take account of the impact of waste management activity beyond disposal - such as collection, recycling and transport, the real emissions levels are higher. One view suggests that the waste contribution to greenhouse gas emissions could be as high as 20-25 per cent of a city's greenhouse gas emissions⁴⁰.

Amenity impacts from waste collection

Waste storage, collection and transport within City of Melbourne can create negative amenity impacts, particularly in the densely populated central city. Bins stored in public spaces such as laneways can be unsightly and attract vermin if they are not emptied regularly. Emptying bins into collection vehicles can be very loud, particularly for bins with a

³⁷ City of Melbourne. (2016). Residential forecasts. (Unpublished).

³⁸ City of Melbourne. (2016). Employment forecasts. (Unpublished).

³⁹ Commonwealth of Australia. (2017c). *Quarterly update of Australia's National Greenhouse Gas Inventory: June 2017*. www.environment.gov.au

⁴⁰ www.c40.org/blog_posts/waste-to-resources-an-incredible-opportunity-to-reduce-ghg-emissions-and-transform-communities

lot of glass bottles. Many collections occur between the hours of 11pm and 6am to minimise traffic congestion and reduce risks to the general public but this creates late-night noise that wakes inner-city residents. Multiple bins and collection companies operating in a single laneway or precinct means that this disruption may occur many times each night.

City of Melbourne level of influence

City of Melbourne has a limited level of control and influence in the overall waste system. Design and production of materials and products is outside of City of Melbourne control and influence. The Australian Government has some ability to affect change - for example, improved packaging design as a result of the National Packaging Covenant. Advocating for stronger regulation at the national level may be an option for City of Melbourne. At its July 2017 meeting the City of Melbourne's Future Melbourne Committee endorsed a Notice of Motion in response to ABC Television's *War on Waste* series. The Motion requested that the Environment Portfolio Chair write to the Victorian Premier to formally advocate to the State Government for a state-wide ban of single-use plastic bags and reiterate our support for the introduction of a Container Deposit Scheme.

Consumption of materials and products is also limited beyond the City of Melbourne's own procurement and use decisions. Consideration of our operational procedures and policies can provide an avenue here but the overall impact may be relatively small as we are only one organisation of the many operating within the municipality.

Similarly, control and influence over waste generation, collection and disposal is largely constrained. City of Melbourne has direct responsibility over the waste generated through our own operations - buildings, events, recreation and childcare facilities. We are responsible for collecting waste from residential properties, which allows us to influence outcomes by deciding the collection systems provided and the end destination of each collection stream. The vast majority of waste generated within the municipality is within the commercial and industrial and construction and demolition sectors. Businesses and organisations in these sectors are required to make their own arrangements for waste and recycling collections, although City of Melbourne does provide some collection services to businesses through communal waste compactors and recycling hubs. City of Melbourne must identify other ways to influence these sectors, such as leading by example, supporting innovative ideas and demonstration projects, local law regulations and advocating for regulation at the state and national level.

Recycling and resource recovery system viability

The resource recovery system depends on end markets for the materials and products being collected. Victorians are strong supporters of recycling, but fluctuations in demand for recovered materials can lead to an over-supply and stockpiling and reduced recovery industry viability⁴¹. Materials such as paper and cardboard, metals and plastics are often exported for reprocessing⁴². While 86 per cent of the material collected for recycling in Victoria was reprocessed locally in 2015-16⁴³, over half of this material was comprised of aggregates, masonry and soil, which, along with other construction and demolition wastes are not usually exported due to their low value. The recent changes in global recycling markets due to the restrictions on exports of recyclable materials to China is directly impacting City of Melbourne through increased costs of sorting recyclable material, though

⁴¹ Sustainability Victoria. (2016). *Victorian market development strategy for recovered resources*. www.sustainability.vic.gov.au.

⁴² Sustainability Victoria. (2016). As above.

⁴³ Sustainability Victoria. (2016). As above.

as at April 2018, the degree of this impact is unknown as contract negotiations are still underway. The extent of the impact on recycling collections from the commercial and industrial sector is not known. The challenge is to manage the immediate implications while also developing a medium- and long-term plan to transition to a sustainable recycling and resource recovery system.

Living in a throwaway society

The rise in disposable items such as food and drink containers and packaging such as plastic bags has implications for society because so many of these items have been either produced unnecessarily or are made of materials that are difficult to recycle, such as multi-layer materials. For example, Australians use an estimated 3 billion takeaway hot drink cups each year. The mix of plastic and paper in these cups makes them difficult to recycle through mixed recycling streams⁴⁴.

Plastics are widely used in packaging and other products due to their low cost and adaptable properties. Around 1.5 million tonnes of plastic waste was generated in Australia in 2013-14, with more than one third being disposable, single-use packaging⁴⁵. Littered plastic is causing an environmental problem with thousands of tonnes of plastic entering waterways and oceans each year globally⁴⁶.

Other types of items are also becoming 'throwaway' products. E-waste (electronic and electrical items) only comprises 1 per cent of the waste sent to landfill in Australia but it is one of the fastest growing waste streams⁴⁷. According to a 2015 study, Australians spend \$260 million buying almost 1.7 million small electrical items every four weeks⁴⁸. This is consistent with the huge growth in the disposal of furniture and other large items from City of Melbourne households with hard waste collections increasing from 230 tonnes in 2009-10 to 940 tonnes (with only 28 per cent recycled) in 2016-17⁴⁹. In the fashion industry, there has been a shift from quality, durable items towards cheap 'fast fashion' items that are bought and discarded after only being worn a few times.

Combatting the impact of the throwaway society is a significant cultural challenge.

CONCLUSION

Waste generation is projected to increase substantially over the life of the strategy due to increased population growth and business activity. While waste reduction is the most effective way of minimising waste management impacts, this is largely out of our control. In the mid- to long-term, alternative technologies such as waste to energy will become available. We are limited to landfill disposal of residual waste in the short- to medium-term while also pursuing alternative waste and resource recovery technologies. Therefore, a focus on reuse, recycling and recovery provides the best way forward. The circular economy model provides a basis for this approach.

⁴⁴ <http://www.sustainability.vic.gov.au/You-and-Your-Home/Live-sustainably/Single-use-items/Coffee-cups>

⁴⁵ DELWP. (2017a). *Reducing the impacts of plastics on the Victorian environment*. www.engage.vic.gov.au

⁴⁶ DELWP. (2017a). As above.

⁴⁷ DELWP. (2017b). *Managing e-waste in Victoria. Policy impact assessment*. www.engage.vic.gov.au

⁴⁸ Roy Morgan Research. (2015, 28 September). *Nothing small about the small electrical market*.

www.roymorgan.com

⁴⁹ Internal City of Melbourne waste services contract data (unpublished).

TOWARDS 2030

Council Goals

Future Melbourne

Future Melbourne identifies the community's aspirations for the City. The vision put forward in the Future Melbourne 2026 Plan is that 'in 2026, Melbourne will be a sustainable, inventive and inclusive city that is vibrant and flourishing'⁵⁰.

Council Plan 2017-2021

The City of Melbourne's Council Plan 2017-2021⁵¹ includes a goal of being 'a city that cares for its environment' whilst ensuring that:

1. Melbourne's reputation as a global city leader of sustainability is maintained
2. Melbourne is adapting well to climate change
3. Melbourne will meet its pledge to help deliver the Paris Agreement to limit global temperature rise
4. Melbourne uses its resources efficiently.

The City also aims to be a prosperous one that stimulates future growth and innovation through partnerships with government, business, the community and peak bodies. It promotes the City of Melbourne as accessible and safe, emphasising the need for Melbourne's commercial, retail and residential development and supporting infrastructure to meet the needs of a growing working and residential community.

Waste hierarchy

The waste hierarchy states that waste should be managed in order of preference: reduce (also referred to as 'avoid' or 'refuse'), reuse, recycle, recover and dispose only as a last resort. This principle is supported in Victorian Government legislation through the *Environment Protection Act 1970 (Vic)*.

Circular economy

This strategy is underpinned by circular economy thinking: where resources - including those that may have once been considered 'waste' - are valued, used efficiently and only discarded when their component materials have no further use.

A circular economy approach designs out waste wherever possible, keeps materials in use as long as possible (through repair, reuse etc.) and then returns materials to the economy through efficient recycling processes.

Studies have shown that the benefits of a circular economy are both economic (jobs growth) and environmental (greenhouse gas emission reductions)⁵².

Future direction

Goal

Our goal is to develop and introduce cost effective, environmentally responsible waste and resource recovery systems now and into the future.

⁵⁰ <http://www.melbourne.vic.gov.au/about-melbourne/future-melbourne/future-melbourne-2026-plan/Pages/vision.aspx>

⁵¹ <http://www.melbourne.vic.gov.au/about-council/vision-goals/Pages/council-plan.aspx>

⁵² See, for example, Green Industries SA (2017). *Benefits of a Circular Economy in South Australia. Summary.* www.greenindustries.sa.gov.au/circular-economy

Outcomes

Five outcomes have been identified to achieve this goal:

- The City is a leader in sustainable waste management.
- Waste to landfill is minimised.
- Cost to ratepayers is minimised.
- The waste management system is carbon neutral or better.
- Amenity impacts of the waste collection system are minimised.

The outcomes and the key elements of each are shown in Figure 4 below.

Figure 4 Strategy goal and outcomes



The City of Melbourne will rely on the support and effort of its own constituents, other levels of Government and the community as a whole to achieve the goal and outcomes. The environmental benefit of individual actions must be assessed against financial viability.

Indicators and targets

The indicators and targets for 2030 are outlined below along with a short commentary on how they have been developed and a summary provided in Table 5. The indicators will be used to evaluate the success of the strategy implementation.

City of Melbourne's operations

As the only source of waste generation that City of Melbourne can directly control, improving performance our own operations will be an important element of delivering this strategy.

Proposed indicators:

Indicator 1: Amount of waste produced: Waste generation (including garbage and recycling) from City of Melbourne buildings (kilograms per equivalent full time (EFT) employee, based on cleaning contractor data reports and EFT figure for 30 June).

- 2030 Target: To reduce the amount of material generated by City of Melbourne buildings by 30 per cent from 2016-17 baseline.
- Current performance: 55 kilograms per EFT per year (2016-17).
- Commentary: Achievement of this target relies on an assessment of current processes and behaviours that are currently causing waste to be generated unnecessarily. The most recent office waste and recycling audit demonstrated that food organics, paper and single-use items such as coffee cups were some of the main waste streams generated⁵³.

Indicator 2: Events: Waste generation and/or diversion from Council-run and major Council-financially supported events (indicator to be developed when baseline data is available).⁵⁴

- 2030 Target: to be developed when baseline data is available.
- Current performance: data unavailable, baseline data to be gathered in year one of the Strategy.
- Commentary: Some events are already achieving high recycling rates and low amount of waste disposed to landfill but a systematic and planned approach to reducing waste and increasing recovery from produced, sponsored and permitted events would provide substantial waste reduction outcomes.

Residential waste:

Residential waste outcomes can be influenced by City of Melbourne through the collection, recovery and disposal services provided to ratepayers and the requirements in waste management plans for new developments.

Indicator 1: Diversion from landfill rate: Diversion of residential waste from landfill. (Percentage of material collected by City of Melbourne from residential properties for recycling or recovery vs landfill, as reported by our waste collection contractor).

- 2030 Target: To divert 85 per cent of all residential waste from landfill.
- Current performance: 25 per cent (2016-17).
- Commentary: The 2030 target is a substantial performance improvement. This is considered to be achievable with the implementation of Alternative Waste and Resource Recovery Technology infrastructure, which can achieve up to 80-90 per

⁵³ Envirocom. (2016). *City of Melbourne office audits*. (Unpublished).

⁵⁴ At its July 2017 meeting the Future Melbourne Committee endorsed a Notice of Motion in response to ABC Television's *War on Waste* series. The Motion requested that a program be developed to support the establishment of waste reduction targets for the diverse range and scale of Council run events and Council supported events.

cent recovery rates depending on the technology type used⁵⁵. Ambitious “zero waste” targets in the order of 90 per cent have been adopted by other cities. San Francisco started this trend in 2003 by adopting a target of zero waste to landfill by 2020. They achieved an 80 per cent landfill diversion rate by 2012. Other cities have followed their leadership. For example, New York has a target of sending zero waste to landfill by 2030; Auckland City Council has a target of zero waste by 2040; City of Sydney adopted a 2030 target of diverting 90 per cent of waste from residential waste in 2017. Others have specified ‘recyclable’ waste: London: zero recyclable waste to landfill by 2026, Buenos Aires: zero recyclable waste sent to landfill by 2020

Indicator 2: Recycling quality: Quality of comingled recycling stream collected from residential properties (average percentage by weight of correctly recycled items from the most recent three annual recycling contractor audits. Correctly recycled items are those that can be recycled through the kerbside recycling bin).

- 2030 Target: For the comingled recycling stream to be 95 per cent correctly recycled items.
- Current performance: 90 per cent⁵⁶
- Commentary: The quality of the comingled recycling stream has long impacted the ability of recycling sorting companies to produce valuable end products. The importance of clean recycling stream has been heightened by China’s recent restrictions on imports of mixed and contaminated recycling streams.

Commercial and industrial waste:

Indicator: Diversion from landfill rate: Diversion of commercial and industrial waste from landfill through recycling or recovery (Percentage of material collected from commercial properties for recycling or recovery vs landfill, estimated through a repeat of the survey and extrapolation model developed in 2016).

- 2030 Target: To divert 75 per cent of all commercial and industrial waste from landfill.
- Current performance: 61 per cent (2015-16).
- Commentary: A less ambitious diversion target is proposed as the City of Melbourne does not provide C&I waste collection and disposal services. This lack of direct service provision limits our ability to influence the resource recovery outcomes as well as our ability to accurately monitor performance.

Table 5 Summary of 2030 targets

Source	Indicator	Baseline	Target - 2030
City of Melbourne operations	Amount of waste produced in CoM buildings	55 kg / EFT / year	38.5 kg / EFT / year
	Events indicator and target - to be developed when baseline is available		
Residential waste	Diversion from landfill rate	25 per cent	85 per cent
	Recycling quality	90.34 per cent	95 per cent
Commercial and industrial waste	Diversion from landfill rate	61 per cent	75 per cent

⁵⁵ Blue Environment. (2017). As above.

⁵⁶ Just Waste Consulting. (2017). *Kerbside audit of recyclables. Melbourne, Brimbank, Port Phillip and Wyndham. November 2016. Produced for SKM Recycling and MWRRG.* (Unpublished). (90.34 per cent was the average result for audits held November 2014, 2015 and 2016).

TAKING ACTION

The priorities and actions outlined in this section will move the City of Melbourne towards its goals and outcomes. The Strategy will be reviewed every four years and at each interval a new action plan will be developed.

Four priorities have been identified for the initial four-year term of the Strategy period:

- developing landfill alternatives
- stimulating innovation
- reducing, reusing, recycling and recovering waste
- reducing amenity impacts from waste collection.

Each of these priorities is outlined below and possible actions identified. While some actions can be committed to at this time, others require further investigation and assessment against a set of criteria to enable prioritisation. An assessment tool will be developed to assess and prioritise actions. The following criteria will be used:

- Environmental benefit including
 - greenhouse gas emissions reduction including transport CO² emissions and methane from landfill
 - reduced harmful metals and chemicals stored in landfill
 - reduced damage to productive land and habitat through use as landfill.
- Cost to City of Melbourne ratepayers.
- Acceptability to users and stakeholders.

City of Melbourne is one of many stakeholders that can influence the waste production, use and disposal cycle. There are some things we can control, some we can influence and others where we can only advocate. For the purposes of this strategy three possible levels of City of Melbourne involvement or activity have been specified. These are:

- Implementation - where the outcome is managed by City of Melbourne.
- Collaboration - where responsibility for the outcome is shared.
- Advocacy - where the outcome is out of our control and our degree of influence is limited.

Within the City of Melbourne there are three categories in which waste is managed:

- City of Melbourne operations - where we generate our own waste which then requires recycling or disposal.
- Households and public places - residential, public place bin and limited commercial waste collected by City of Melbourne.
- Businesses and other organisations - waste generated by businesses and organisations in both the commercial and industrial and construction and demolition sectors and collected by waste collection and disposal companies that are not part of the City of Melbourne's service.

The main areas for financial investment by City of Melbourne over the period 2018-2022 will be:

- *Priority 1: reducing, reusing, recycling and recovering waste:*
 - identifying and implementing a suite of options to assist residents and businesses to divert their food waste from landfill

- working with residents to improve recycling quality and quantity and extending our network of recycling hubs for businesses
- enabling residents to comply with the Victorian Government's landfill ban on e-waste by providing a range of recycling options.
- *Priority 2: developing landfill alternatives* - establishing an Alternative Waste and Resource Recovery Technology (AWRRT) facility, whether located in Fishermans Bend or elsewhere. More information on the amount and type of investment will be available as the procurement process continues.
- *Priority 3: stimulating innovation* - providing financial support for community, business and social sector initiatives that reduce waste to landfill through the Waste Minimisation Innovation Fund (WMIF).
- *Priority 4: reducing amenity impacts from waste collection* - extending the network of communal garbage compactors and identifying methods of minimising the amenity impacts from commercial waste services within the central city.

Priority 1: Reducing, reusing, recycling and recovering waste

The absence of alternatives to landfill disposal in the short-term means that applying the waste hierarchy levels of reduce, reuse, recycle and recover is the most effective means of reducing landfill volumes and associated environmental impacts.

Actions have been identified across five waste types/categories:

- Organics - which generate the powerful greenhouse gas methane when degrading in landfill.
- Easily recycled materials (paper/steel/aluminium/glass) - which are not being separated and recycled well in some areas (e.g. high rise apartments and small businesses) and for some materials are impacted by the current challenges facing the global recycling industry.
- Plastics and single-use items - problematic due to loss of potentially valuable resources when not recovered and pollution impacts when entering the environment, especially waterways.
- E-waste - high levels of toxicity and loss of valuable resources when not recycled.
- Other (textiles, furniture/hard waste) - increasing volumes of materials not recovered.

The reduction in off-shore recycling markets emphasises the need for further investment in Australian markets for recycled materials. The City of Melbourne will continue to engage with government and peak bodies to resolve this growing problem.

Priority 2: Developing landfill alternatives

The availability of the right mix of collection and processing infrastructure is a key element of the waste management system. Residual waste from all waste sources will continue to go to landfill in the short-term due to the absence of alternative options. If the City of Melbourne is to reach its landfill diversion target, it must radically change how it processes waste. Establishment of alternative waste and resource recovery technology (AWRRT) infrastructure should enable this in the mid-term.

AWRRTs provide an opportunity to recover materials and/or energy from material that is currently being landfilled⁵⁷. The three main types of technology are:

⁵⁷ MWRRG. (2017). *Collective procurement of municipal residual waste processing technologies: Background paper*. (Unpublished)

- Sorting, including material recovery facilities, mechanical biological treatment or mechanical heat treatment technologies
- Biological treatment, including anaerobic digestion or composting
- Waste to energy, including combustion, gasification and pyrolysis.

AWRRTs can divert up to 90 per cent of waste from landfill while producing useful products and/or energy. Some technologies have a strong commercial and technical track record, such as mass burn combustion with energy capture, anaerobic digestion and mechanical biological treatment. Ensuring that commercial and industrial waste can also be accepted at any new facilities will be important to ensure the sector target can be achieved.

The City of Melbourne is partnering with City of Port Phillip, Metropolitan Waste and Resource Recovery Group (MWRRG) and South-East Water to investigate the feasibility of a sustainability hub with shared infrastructure at Fishermans Bend. This would support the Fishermans Bend Draft Framework which included targets for 70 per cent of household waste diverted from landfill and 50 per cent of all food waste diverted from landfill by 2050⁵⁸. Food organics and bio-solids can be processed through an anaerobic digester to generate electricity and an AWRRT facility could process residual waste from both City of Melbourne and City of Port Phillip municipal areas. The concept of a sustainability hub is strongly supported.

The City of Melbourne is also involved in the development of a business case and procurement model for the establishment of an AWRRT facility through the auspice of the MWRRG. This may provide an alternative or addition to the proposed sustainability hub.

Given that the vast majority of waste within the City is generated by the commercial and industrial sector, it is important that the City of Melbourne negotiate for AWRRT facilities to cater for this sector as well as the residential sector.

The MWRRG has undertaken three collective procurement processes that enable 24 metropolitan councils to access organic waste processing sites. City of Melbourne will need to negotiate access to one of these or an alternative facility if a source separated collection service for food organics is to be established.

The proposed actions will contribute to achieving the 2030 targets and outcomes by establishing AWRRT facilities that can process residual waste from households, public places, City of Melbourne operations and businesses and other organisations.

Priority 3: Stimulating innovation

Innovation in technologies for separation and collection, new business models and products and community initiatives all provide opportunities for achieving the Strategy outcomes.

New technologies can improve service delivery. Our solar-powered litter bins provide real-time information on bin-fullness enabling collection efficiency and our communal garbage compactors track the waste deposits made by each user. Further application of smart and digital technologies could provide many other service improvements. High-rise building managers surveyed in 2017 suggested that automated notifications before collection, ability to track the collection truck and a mobile phone application to book hard waste collections would improve our services⁵⁹.

⁵⁸ State Government of Victoria. (2017). *Fishermans Bend Framework. Draft for consultation.* www.fishermansbend.vic.gov.au/framework

⁵⁹ Colmar Brunton (2017) *City of Melbourne. Waste services research.* (Unpublished).

New business models are facilitating waste reduction. City of Melbourne could support the adoption of these business models through procurement decisions, policy and regulation and direct funding support for start-ups or businesses taking on new approaches. For example, Keep Cup, one of the first widely-used reusable coffee cup products, was supported by City of Melbourne in their early stages.

Community initiatives provide an opportunity for local action. An innovative proposal has been received by the City of Melbourne for the establishment of a reuse and repair centre within the municipality. This would involve the creation of a social enterprise where items are repaired for reuse and possibly on-sold at a later date. The City of Melbourne's community grants have previously provided funding to support waste reduction and recycling projects.

A key principle of this waste strategy is to harness the innovation and creativity of the people of Melbourne through the establishment of a Waste Minimisation Innovation Fund that will ask other organisations to propose and implement solutions to divert waste to landfill. The principle here is that government is not 'picking winners' and running programs that could be better run by entrepreneurs, community groups or other organisations.

A key element of this fund will be the development of a robust evaluation tool that enables proposals to be measured against the key criteria of:

- Environmental benefit including
 - greenhouse gas emissions reduction including transport CO² emissions and methane from landfill
 - reduced harmful metals and chemicals stored in landfill
 - reduced damage to productive land and habitat through use as landfill.
- Cost to City of Melbourne ratepayers.
- Acceptability to users and stakeholders.
- Scalability across the City.

The fund would be delivered by City of Melbourne through a combination of existing and new initiatives. The City of Melbourne has provided financial support to community organisations, social enterprises and businesses through a range of grant programs over many years. City of Melbourne's Startup Action Plan 2017-21 provides a platform to support and enhance this support to innovators and entrepreneurs. The CityLab team within City of Melbourne's Smart City Office have conducted 'open innovation challenges' that stimulate the development of prototype solutions for the problems facing the city.

These actions will contribute to achieving the 2030 targets and outcomes by establishing a fund to support community and business initiatives that meet a set of agreed criteria and supporting new business models through the delivery of the Start-Up Action Plan.

Priority 4: Reducing amenity impacts from waste collection

Waste storage and collection has a large impact on amenity due to odour and visual amenity from bins stored in public spaces, noise from waste collection and congestion caused by the large number of collection trucks. These issues are expected increase in waste generation is likely to exacerbate these issues.

City of Melbourne's Activities Local Law 2009 places requirements on waste generators and waste collection companies in the central city. Waste generators may only store their bin in certain locations and when given permission by the City of Melbourne. Waste collectors are not able to collect waste from three 'restricted access areas' between the hours of 11pm and

6am daily. The implementation of this law and other central city waste programs has greatly reduced the number of bins stored permanently in the public space.

Despite these gains, there are still 40 waste and recycling companies collecting material within the central city. Whilst the same amount of waste needs to be collected, a lesser number of collectors would lead to synergies in collection and transportation and improvements in amenity.

Other stakeholders such as the Melbourne Metro Rail Authority also need to be engaged to ensure that waste management in the impacted precincts is well managed and long-term waste collection arrangements are optimal.

DRAFT

ACTIONS

These actions have not been costed. An economic analysis will be undertaken and recorded in the final version of this document. These actions relate to the first four years of the Plan only.

Priority 1: Reducing, reusing, recycling and recovering waste

1. *Collaborate.* Partner with the Victorian Government and local recycling industry to resolve the recent challenges for recycling collections, particularly for plastics and cardboard.
2. *Implement.* Require a detailed waste reduction and resource recovery plan to be developed or provided for all Council-run, Council financially supported and Council permitted major events and critically assess the plan.
3. *Implement.* Review City of Melbourne's procurement policies and practices to support innovative business models including recycling technologies and use recycled materials.
4. *Implement.* Undertake a review of the City of Melbourne's own operations, assess waste practices and introduce changes that build sustainability into City of Melbourne operations.
5. *Collaborate.* Partner with the local community to investigate the viability of a social enterprise-run reuse centre.
6. *Implement.* Use the City of Melbourne's communications and social media channels to promote waste avoidance, reuse and recycling.
7. *Collaborate.* Ensure that the Queen Victoria Market redevelopment maximises organic waste reduction, food rescue and recovery options.
8. *Collaborate.* Work with the food rescue charity operators to identify ways to help them expand their reach.
9. *Collaborate.* Evaluate the Kensington Town Hall communal composting hub in conjunction with users and expand to other community areas if successful.
10. *Implement.* Assess the potential costs and benefits of a bin-based organic collection for all households within the municipality and other options for managing organic waste.
11. *Collaborate.* Work with MWRRG to negotiate access to one or more organic waste processing sites.
12. *Collaborate.* Develop a plan in partnership with cafes and restaurants using communal compactors to source separate their organic waste.
13. *Collaborate.* Work with food businesses, supermarkets and high volume organic waste generators and precincts to separate and recover organics.
14. *Collaborate.* Support developers, Owners Corporation (OC) committees and/or OC- or building managers to avoid, reuse and recycle and engage with residents including high-rise, students and short-stay residents and residents in low-rise or stand-alone housing areas.

15. *Advocate.* Support the benefits of a container deposit scheme that covers a wide range of packaging items including takeaway coffee cups and advocate to the Victorian Government in favour of this scheme.
16. *Collaborate.* Support the Victorian Government's ban on plastic bags and collaborate with business on its implementation.
17. *Collaborate.* Convene a forum with the retail and hospitality sector to assist with development of a plan to fast track further reductions in the use of single use waste items within the municipality.
18. *Implement.* Establish a network of drop-off recycling hubs for soft plastics and polystyrene, large cardboard and textiles/clothing.
19. *Implement.* Enable residents to comply with the e-waste landfill ban by providing a range of recycling options.

Priority 2: Developing landfill alternatives

1. *Implement.* Subject to budget, commit to procurement arrangements that will lead to the processing of residential and commercial/industrial waste through Advanced Resource Recovery Technology facilities.
2. *Collaborate.* Partner with City of Port Phillip, MWRRG and South-East Water to develop the Fishermans Bend Sustainability Hub.
3. *Collaborate.* Partner with the Victorian Government and other Councils in the establishment of an AWRRT that services the City of Melbourne.
4. *Advocate.* Ensure that any future AWRRT facility developed in partnership with City of Melbourne can accept waste generated by the commercial and industrial sector.

Priority 3: Stimulating innovation

1. *Implement.* Establish a Waste Minimisation Innovation Fund. This Fund will be delivered through existing City of Melbourne grants programs.
2. *Implement.* Identify opportunities to support new business models through the delivery of City of Melbourne's Start-Up Action Plan.
3. *Collaborate.* Identify community-generated data sets relating to waste and litter behaviour and use these to engage the community.
4. *Advocate.* Advocate to the Victorian and Australian Government to apply extended producer responsibility requirements to drive innovation in packaging design.

Priority 4: Reducing amenity impacts from waste collection

1. *Implement.* Review the existing waste collection permit system and 'restricted access areas' to identify the potential to further improve amenity.
2. *Collaborate.* Review waste collection in the central city in conjunction with the waste industry and other stakeholders.
3. *Implement.* Extend the existing network of central city waste compactors and recycling hubs, focusing on areas where there are high numbers of cafes and eateries.