

Waste and Resource Recovery Strategy 2030

16 April 2019

Presenter: Jenny Bailey, Manager Engineering Services

Purpose and background

1. On 15 May 2018, the Future Melbourne Committee approved the release of the draft Waste and Resource Recovery Strategy 2030 (strategy) for public comment.
2. Following public engagement, this report presents the revised strategy for approval (refer Attachment 3). Final presentation of the strategy to the Future Melbourne Committee was postponed to factor in further feedback from Councillors and incorporate outcomes of a review of waste collection, including the impact waste has on the city's amenity and the City of Melbourne's role in managing and collecting waste.
3. Once approved, the strategy will replace the Waste Management Strategy (adopted November 2005) and the Waste and Resource Recovery Plan 2015-18 (adopted in September 2015).

Key issues

4. The strategy aims to work towards zero waste through waste reduction, smarter collection, and better resource recovery, in accordance with the principles of the circular economy and waste hierarchy. The strategy aims to reduce environmental impacts through waste avoidance and diversion of waste from landfill – particularly focussed on food waste. The strategy also aims to improve the amenity of the city and enhance the economic resilience of the waste and resource recovery system in Victoria.
5. The strategy is supported by a robust implementation plan built on recommendations from a comprehensive review of City of Melbourne's waste collection approach. The review used human-centred design to build a detailed understanding of Melbourne's waste system, the needs of our community and the unique role of the City of Melbourne. This resulted in an informed future vision of Melbourne's waste collection system that will maximise value to customers, deliver environmental benefits and balance the competing needs of a growing city.
6. The future vision articulates the role of the City of Melbourne to 'deliver and oversee trusted waste collection services that are effective and responsible to enhance city amenity.' The City of Melbourne can show leadership through the direct delivery of services, governance of the waste sector, and influence on community behaviours. It is also recognised there are complex issues facing the waste sector that can be resolved only through collaborative state-wide and regional approaches with other government, private and community sector stakeholders.
7. The strategy will be a 'living document', to be reviewed every four years (initially in 2023). This will allow the City of Melbourne the flexibility to adopt new innovative approaches and adapt to new circumstances as they arise, to achieve its long-term waste reduction and landfill diversion targets.
8. Ten priorities have been identified for the first four years of the strategy:
 - 8.1. Engage and educate community and businesses.
 - 8.2. Incentivise and promote innovative solutions.
 - 8.3. Support growth of a circular economy through government procurement.
 - 8.4. Lead by example through City of Melbourne operations and events.
 - 8.5. Advocate for better producer stewardship and product design.
 - 8.6. Improve waste governance and planning.
 - 8.7. Establish new systems to source separate and collect organic waste.
 - 8.8. Transform the collection and transfer of recycling and residual waste.
 - 8.9. Improve the efficiency, effectiveness and viability of recycling.
 - 8.10. Explore advanced waste processing of residual waste that cannot be otherwise recovered.
9. Attachment 1 provides a summary of the consultation undertaken, with a detailed report at Attachment 2.

Recommendation from management

10. That the Future Melbourne Committee:
 - 10.1. Endorses the Waste and Resource Recovery Strategy 2030.
 - 10.2. Notes the community engagement feedback at Attachment 2 of this report.
 - 10.3. 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 3 of 131)
2. City of Melbourne – Draft Waste and Resource Recovery Strategy Public Engagement Analysis (Page 5 of 131)
3. Waste and Resource Recovery Strategy 2030 (Page 79 of 131)

Supporting Attachment

Legal

1. The strategy proposes that amendments to the Council's local laws and 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 Waste and Resource Recovery Strategy 2030 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 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 this 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. A community and stakeholder engagement process was undertaken between November 2017 and March 2018 to develop the draft strategy.
10. A second phase of extensive engagement was undertaken from 21 May to 28 July 2018 to receive feedback on the draft and inform the development of the final strategy.
11. The Participate Melbourne website provided access to the draft strategy and four discussion papers on key topics of: waste collection in the central city; current recycling challenges; food waste; and waste-to-energy.

12. Community feedback was received through online surveys, social media posts, direct submissions, a public forum and a forum for the retail and hospitality sector. More than 1,150 respondents provided input through these avenues. Stakeholder meetings were held with representatives from Sustainability Victoria, Metropolitan Waste and Resource Recovery Group, the Victorian Waste Management Association. A workshop was held with business and community representatives to discuss the proposed Waste Minimisation and Innovation Fund.
13. The feedback was supportive of the directions taken in the draft strategy. Reducing, reusing, recycling and recovering waste were rated the most important priorities.
14. Some of the key areas of feedback received, and how they have been incorporated into the final strategy, are as follows:
 - 14.1. Changing behaviour through education and engagement – now included as a Priority.
 - 14.2. High level of support for introduction of a container deposit scheme – better producer stewardship and product design is now included as priority.
 - 14.3. Organic waste – now included as a specific priority.
 - 14.4. City of Melbourne should take more action and deliver with greater speed – more ambitious targets and expansion from four to ten priorities.
15. A public engagement analysis report is included at Attachment 2.

Relation to Council policy

16. The recommendation is consistent with the following Council policies:
 - 16.1. Council Plan 2017-2021: Goal - a city that cares for its environment.
 - 16.2. Climate Change Mitigation Strategy.
 - 16.3. Emissions Reduction Plan for our Operations.
 - 16.4. Food City – the City of Melbourne's Food Policy.
 - 16.5. Transport Strategy.

Environmental sustainability

17. 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 CO₂-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.



Global Research
Turning **Information** Into **Insight**

City of Melbourne – Draft Waste and Resource Recovery Strategy

Public Engagement Analysis

28 September 2018

Report prepared by Global Research Ltd

For



CITY OF MELBOURNE

Contents

Table of Figures	3
Table of Tables.....	3
Executive summary	4
Introduction	5
Overview	5
Engagement process	5
Feedback collected and analysed	6
Analysis and results presentation.....	7
Key findings	9
Overall	9
Specific findings.....	9
Level of support for the strategy	10
Suggestions and recommendations	11
Strategy recommendations ~ omitted aspects and suggestions.....	12
Analysis of option selection questions	13
Composition of online survey respondents	13
Importance of Priorities	14
Ranking of initiatives	16
Analysis of contributors' comments	21
General comments.....	21
Priority one: Reduce, reuse, recycle, recover	35
Priority two: Developing landfill alternatives	52
Priority three: Stimulating innovation	54
Priority four: Reducing amenity impacts from waste collection	57
Appendices.....	60
Appendix 1: Analysis of contributors' responses, from connection to Melbourne group perspectives	60
Appendix 2: Importance of priorities and ranking of initiatives, presented as tables	67
Appendix 3: Website links provided by submitters	71

Table of Figures

Figure 1: Contributors' connection(s) to Melbourne	13
Figure 2: Rated importance of priorities.....	14
Figure 3: Count of contributor rankings for waste and resource recovery initiatives	17
Figure 4: Count of times each initiative was ranked first.....	18
Figure 5: Count of times each initiative was ranked in positions 1-3	19
Figure 6: Count of times each initiative was ranked in positions 7-9	20
Figure 7: Repeated figure of contributors' connection to Melbourne	61
Figure 8: Number of comments on each priority per connection-to-Melbourne group.....	62
Figure 9: Proportions of comments on priorities were consistent across connection-to-Melbourne groups	63
Figure 10: Number of comments made by each group on priority 1 topics	64
Figure 11: Topics of priority 1 were consistently commented on by connection-to-Melbourne groups	65

Table of Tables

Table 1: Counts and percentages of ranked importance of each Priority	67
Table 2: Percentages of each ranking for each initiative	68
Table 3: Percentages of each ranking for each initiative	68
Table 4: Contributors' connection to Melbourne.....	69
Table 5: Connection to Melbourne groups' comments on Priorities	69
Table 6: Connection to Melbourne groups' comments on Priority 1 topics	70
Table 7: Submitted websites and links.....	71

Executive summary

- Over 1,150 Melburnians provided feedback on The City of Melbourne’s Draft Waste and Resource Recovery Strategy (the Strategy) between 21 May to 28 July 2018. Contributors included: city residents and workers; resident groups and associations; precinct trader associations; waste industry associations and businesses; and, state government departments within the environment portfolio.
- Overall, feedback on the Draft Waste and Resource Recovery Strategy was supportive of the general approach, as well as of specific priorities and actions. Contributors sought high-level changes, as well as individualised behaviour change, to reduce waste impacts and increase recovery of resources.
- Information was received via: City of Melbourne’s Participate Melbourne and general websites (3,750 visits); social media posts; a public forum; a retail and hospitality forum; and, direct submissions. Mechanisms to encourage feedback included: four discussion papers; and, three face-to-face events.
- Seventy nine percent of contributors live in Melbourne. Respondents connections to Melbourne (live here, own a business here, etc) had minimal influence on their responses.
- Results to two direct questions were:
 - Highest and lowest Priority importance:
 - Highest importance: Priority 1 (Reduce, reuse, recycle, recover) – 93% rated high
 - Lowest importance: Priority 4 (Reducing amenity impacts from waste collection) – 42% rated high.
 - The three initiatives that were considered the most helpful to reduce waste were:
 - Education programs about waste avoidance, reuse and recycling
 - A container deposit program for Victoria (e.g. 10 cents for bottles)
 - A third bin, for food scraps and garden waste.
- Key findings from written comments were:
 - Residential and hospitality waste were the main forms of waste discussed by contributors. With a small amount of comment focused on industrial waste, such as from the construction sector.
 - Contributors valued efforts to reduce waste generation, and for waste that is produced to be sustainably and responsibly managed through resource recovery and limiting landfills.
 - New or improved waste management systems and actions were thought to be required to move the City of Melbourne and its residents and businesses in a more environmentally responsible direction.
 - Support from CoM, in terms of providing appropriate infrastructure and services, was thought will lead the community to be more proactive in how it manages waste.
 - Education, initiatives, and new regulations or legislation were identified as ways to promote better practices.
 - Overall, changing behaviours and increasing public and commercial sector waste management (particularly hospitality) knowledge were thought to be key to improving resource recovery and reducing waste generation.

Introduction

OVERVIEW

This report presents analysis of feedback on the City of Melbourne's Draft Waste and Resource Recovery Strategy (the Strategy). The feedback was collected during the consultation and engagement period from 21 May to 28 July 2018. The purpose of the engagement was to obtain stakeholder input to inform the final Strategy.

ENGAGEMENT PROCESS

A dedicated page on the Participate Melbourne website containing: the Draft Strategy; associated Discussion Papers; and, other related information, invited feedback and ideas through an online survey and a document submission option.

The consultation and engagement were promoted to a wide range of stakeholders, including:

- City residents and workers
- Resident groups and associations
- Precinct trader associations
- Waste industry associations and businesses
- State government departments within the environment portfolio.

Promotional channels included the following were used:

- City of Melbourne's Participate Melbourne and general websites
- City of Melbourne newsletters such as Green Leaflet and Knowledge Melbourne newsletters
- Social media including the Eco-City Facebook and Twitter channels, City of Melbourne Facebook and LinkedIn sites
- Direct email of engagement flier to stakeholder network lists
- Sustainability Victoria and Victorian Waste Management Association newsletters.

Four discussion papers were released during the consultation period, on the following topics:

1. Waste collection in the central city
2. Current recycling challenges
3. Food waste
4. Waste to energy

Two events were held to allow stakeholders a face-to-face opportunity to provide feedback on the Draft Strategy:

- Public forum and workshop
- Forum for retail and hospitality sector.

A Melbourne Conversations event was also held to encourage debate. No feedback was captured at the event, but attendees were provided with a link to the online survey.

A range of other face-to-face meetings were also held with industry and government stakeholders.

The Participate Melbourne webpage was visited by over 3,750 individual visitors throughout the consultation period. Half of these visitors came to the site through a link from a social media site. Twenty-three per cent came directly to the site (by entering the website into their browser), 21 per cent from other websites and seven per cent by searching in a search engine.

FEEDBACK COLLECTED AND ANALYSED

Submissions were collected from the City of Melbourne community in five ways. All of the information below has been analysed within this report to inform finalisation of the Strategy:

- **Participate Melbourne Website online survey:**
 - 891 contributions were made by answering a six-question survey. The survey contained three closed (response selection) questions, analysed in the first section of the report and three open ended free-text questions (which have informed the synthesis of comments contained in the body of the report). These were the three open-ended comments that were asked:
 - 2. Do you have any comments on the priorities?
 - 4. Is there anything else that would be helpful?
 - 5. Do you have any comments on the Draft Strategy or Discussion Papers?
 - The survey also asked contributors to specify their connection to Melbourne such as whether they lived or worked here. Analysis of contributors' responses, from connection to Melbourne group perspectives is presented in Appendix 1.
- **Social media posts:**
 - 140 contributors expressed opinions on five social media posts covering these topics: waste to energy; current recycling challenges; food waste; world environment day; general. All of these comments informed the synthesis of comments contained in the body of the report.
- **Public forum**
 - A public forum was held to gain face-to-face feedback on the Strategy from members of the Melbourne community. 35 people attended the forum. Feedback was provided on sticky notes, which were later collated into twelve pages of bullet pointed notes. The comments focused on the overall Strategy and goal and the four priorities. All of these comments also informed the synthesis of comments.
- **Retail and hospitality forum**
 - A forum was held targeting City of Melbourne's retail and hospitality sectors. Eighty people attended the forum. Feedback was provided on sticky notes, which were later collated into twelve pages of bullet pointed notes. The comments focused on food waste, single use items/packaging, waste collection, and other ideas. All of these comments also informed the synthesis of comments.
- **Direct submissions**
 - Twenty-two emails and six PDFs were received during the consultation period on a variety of topics. These comments also informed the synthesis of comments.

ANALYSIS AND RESULTS PRESENTATION

Analysis approach

This report is an objective presentation of all feedback received on the Draft Waste and Resource Recovery Strategy. The purpose is to present to the City of Melbourne a synthesis of the comments and suggestions on what has been proposed, with a focus on suggestions for how the Strategy can be improved.

Quantitative analysis of response selection questions

The analysis is broken into two main parts. The first section contains quantitative analysis of contributors' responses to two selection questions, which asked survey respondents to assess how important each of the four Strategy Priorities are to them and the second question asked respondents to rank the importance of nine Strategy initiatives.

For the Priorities assessment question, each respondent was asked to individually rank each Priority. The results were analysed by counting and presenting the number of times each Priority was ranked 1–5. The results have been presented in a chart and a written interpretation of results has also been provided.

For the importance of initiatives question, respondents were asked to rank all of the nine initiatives one to nine – forcing respondents to compare initiatives. To complete this analysis, the number of times each initiative was ranked 1–9 has been presented on a chart and interpreted. Additional charts also contain the number of times each initiative was ranked '1' and the number of times each was ranked '1, 2 or 3'.

Qualitative synthesis and analysis of written feedback

All written feedback has been analysed in a single analysis framework, no matter how it was collected. The framework was primarily based on the Strategy's Priorities. Under each of the Strategy Priorities, relevant themes and topics were created to combine similar comments. In addition to the Priority themes, comments that were more general in nature, or discussed broader themes, were combined in their own group of topics. Once all comments had been read and grouped into appropriate topics, analysis of the most to least common points made on each topic was completed. This is presented in the discussions that comprise the body of the report.

In completing this analysis most comments have been included in multiple places, as they provided multiple ideas, and so the total number of comments analysed is significantly more than the number of individual pieces of feedback received.

To assist the analysis, NVivo qualitative analysis software was used. Multiple analysts completed the organising of comments into topics and the report writing; this and peer review of analysts' work reduced individual bias within the findings.

Report structure and presentation

Following the Introduction section, Key findings are presented. These are the main points made by contributors on the Strategy. They included the most common individual points made on particular topics and also themes and topics that ran through multiple areas of the analysis.

The next section is the Analysis of Option Selection Questions. This presents the quantitative analysis of response option questions (described above). Results are presented as summary charts and a written description of individual findings is also provided.

The final section is the Analysis of Contributors' Comments. This is a synthesis of the comments made under each topic, initially ordered by Priorities 1–4 and then followed by a discussion of general comments. Each section begins with a Summary of findings for that section. The discussion within each section is then ordered by key topics, in order of the most commonly discussed to the least discussed. Sub-topics, again in the order of least to most discussed are presented under each of the topics. Within the discussion, to indicate the number of points made on topics, the descriptors below have been consistently applied:

- A very large number of comments: 150+
- A large number: 100–149
- A sizeable number: 75–99
- A substantial number: 50–74
- A considerable number: 25–49
- A moderate number: 15–24
- Several: 8–14
- A small number: 4–7
- A few: 3
- A couple: 2

The use of proportions, such as: *half*, *three-quarters*, or *two-thirds* of a particular section, have also been used when appropriate. It is important to note that these proportions are for the topic being discussed, and do not represent the proportion of contributors who hold a particular viewpoint across the whole project.

Representative quotes from contributors are included to illustrate specific points throughout the report – they are italicised and indented from the margins. Quotes are verbatim; spelling and grammar errors have not been corrected. They present the flavour and depth of opinions on particular topics, in contributors' own words.

Throughout the report, those who have contributed feedback on the report have been referred to as contributors.

Key findings

OVERALL

Contributors considered waste management and resource recovery issues important for the City of Melbourne. Overall, they valued efforts to reduce waste generation, and for the waste that is produced to be sustainably and responsibly managed to recover useful resources and limit landfill volumes. New or improved systems and actions were thought to be required – to push the way City of Melbourne and its residents and businesses deal with their waste in a more environmentally responsible direction. Support from CoM, in terms of providing appropriate infrastructure and services, was thought to lead the community to be more proactive in how it manages waste. Education, initiatives, and new regulations or legislation were also thought to promote better practices. Overall, changing behaviours and increasing public and commercial sector waste-management knowledge (particularly in hospitality) were thought to be key to improving resource recovery and reducing waste generation.

Residential and commercial sector hospitality businesses waste were the main areas discussed by contributors. A relatively small amount of comments focused on industrial waste, such as that created by the construction sector.

A very large number of suggestions and ideas were submitted, many of which were examples of effective systems implemented in other parts of Australia or in other countries.

SPECIFIC FINDINGS

Assessment of Priorities and initiatives from Participate Melbourne Survey respondents

- When asked directly in closed-response survey questions, contributors rated Priority 1 (Reduce, reuse, recycle, recover) as having the highest importance, whereas Priority 4 (Reducing amenity impacts from waste collection) was considered to have the lowest importance.
- When provided with nine initiatives to rank according to helpfulness in reducing waste, these were the three highest ranked initiatives: education programs about waste avoidance, reuse and recycling; a container deposit program for Victoria (e.g. 10 cents for bottles); and, a third bin, for food scraps and garden waste.

Priority 1: Reduce, reuse, recycle, recover

- Priority 1 was the most commonly discussed and supported Priority, with most Participate Melbourne online survey contributors ranking it as very important (90%).
- Contributors' comments primarily supported efforts to reduce the amount of waste generated, as many thought that this was key to positive change. Recycling and recovery of resources from waste were also deemed important steps in limiting the volume of waste going to landfill; primarily, infrastructure and services to support residents and businesses in recycling items and allowing resources, especially organic waste, to be recovered from waste

and ideally converted to compost. Reuse was the least commented on aspect of Priority 1; however, those that commented, supported resale and repair of goods.

Priority 2: Developing landfill alternatives

- Overall, contributors sought valuable resources to be diverted from landfill.
- Harnessing energy from waste was the most commonly discussed landfill alternative. This was a contentious topic; some considered this a better alternative for waste than landfill, while others argued that this was not environmentally responsible and may in fact encourage waste generation.

Priority 3: Stimulating innovation

- Support for innovative ideas to manage waste was expressed by a substantial number of contributors. Many considered funding essential to develop new technologies or systems to more efficiently and sustainably manage waste and/or recover resources. Waste from the hospitality sector and/or organic waste was commonly discussed.
- As technology advances, it was felt that more modern and advanced waste management options would be designed and implemented.

Priority 4: Reducing amenity impacts from waste collection

- Reducing the impact of waste and associated infrastructure and services on amenity was discussed by a substantial number of contributors. For many of these contributors, the current bins and waste collection services decreased Melbourne amenity values through visual and noise pollution.

More synchronisation and collaborative collection methods were suggested to reduce noise and transportation issues.

LEVEL OF SUPPORT FOR THE STRATEGY

Overall, feedback on the Draft Waste and Resource Recovery Strategy was supportive of the general approach, as well as specific priorities and actions. Contributors stated that high-level changes, as well as individualised behaviour change, were needed to reduce waste impacts and increase recovery of resources. A small number of comments opposed specific elements of the Strategy, although typically they expressed support for an alternative initiative or suggested a new idea; for example, focusing on reducing waste and recovering resources was preferred over investing in stimulating innovation.

Across all Priorities, Priority one (reducing, reusing, recycling and recovering waste) received the most feedback, with investment in this Priority being widely supported. Reducing waste production was considered the most effective waste management method, with contributors believing that waste reduction would ultimately reduce the need to recycle and recover. In addition, contributors were very supportive of recovering waste, particularly organic waste that is a by-product of commercial and residential activities. Specific practical solutions for change included, for example, practical solutions for waste recovery for businesses, and apartments and high-rise buildings.

On Priority two (developing landfill alternatives), contributors were divided on instigating waste to energy schemes. While two-thirds of contributors were supportive of waste to energy, one third were opposed. Contributors in opposition were concerned that this approach could increase environmental pollution, greenhouse gas emissions, or demand for waste.

Contributors were mostly supportive of Priority three (stimulating innovation), with only a small number opposed. Supportive comments discussed Priority three as forward thinking and contributing to increased sustainability. Opposing comments were sceptical about costs and/or believed other priorities would more effectively improve waste management.

Priority four (reducing amenity impacts from waste collection) received general support, with no opposing comments. Some comments highlighted Priority four as a measure of the success of other Priorities, while other comments expressed general satisfaction with this Priority.

SUGGESTIONS AND RECOMMENDATIONS

Contributors suggested that regulations, incentives, CoM actions, education programs and specific ideas could be used to better enhance waste management. Regulations were seen as a way to encourage residents and businesses to comply with waste management. Contributors sought the implementation of new regulations, such as: law and policy changes; fines for non-compliance; and, waste taxes. Contributors also discussed holding businesses, landlords, and individuals more accountable for the waste they produce.

Incentives were considered as a way to reward businesses, residents, and communities who practice effective waste management. Contributors suggested: discounts for customers using reusable products (e.g. coffee cups, or containers); reducing rates for businesses or households that consistently reduce landfill waste; and, rewards for producers reducing the amount of plastic product packaging. Recycling incentives were also sought, such as container deposit schemes and rewards for businesses that use sustainable materials.

Actions that CoM could undertake to enhance waste management practices included providing more support for businesses, such as: specific strategies to reduce waste; information on disposal or separation; monitoring and auditing; and, more recognition for businesses operating sustainably. Contributors also wanted CoM to collaborate with other municipal agencies, central and state government, institutions and communities to ensure the most efficient waste management approaches are put in place. In addition, some contributors wanted CoM to review previous research undertaken on waste management, such as “the War on Waste” survey. Several best-practice examples from Australian and international jurisdictions were suggested as approaches that CoM could adopt. CoM procurement was discussed, and contributors suggested that: CoM foster markets for recycled materials; resource and provide more effective waste collection; and, implement strategies that provide employment opportunities.

STRATEGY RECOMMENDATIONS ~ OMITTED ASPECTS AND SUGGESTIONS

The most commonly suggested change to the Strategy was for CoM to take more action and deliver with greater speed – some thought that CoM was lagging behind other Councils, both nationally and internationally. Contributors sought faster implementation of proposed actions to reduce environmental impacts, and ultimately reducing the volume of waste going to landfill. Contributors also expressed frustration with regulations that prevent businesses donating surplus food to worthy causes, over it entering the waste stream.

Contributors also wanted CoM to have an ambitious approach to reducing waste.

A number of comments were made regarding the process of the Draft Strategy. Some contributors believed that aspects of the Draft Strategy need greater clarity. Specifically, this referred to: defining key terms; better wording of the document; and, more information on specific projects within the Strategy.

Analysis of option selection questions

In the Participate Melbourne Website online survey, two selectable answer questions were included. The section below presents the analysis of 891 CoM Waste and Resource Recovery Strategy Survey responses to the two questions. Further analysis of what each connection-to-Melbourne group discussed is presented in Appendix 1; no differences were identified between the comments from any of the groups. Appendix 2 presents the data tables used to prepare charts.

COMPOSITION OF ONLINE SURVEY RESPONDENTS

Contributors were asked: What is your connection to Melbourne?

RESULTS

Figure 1 presents the Participate Melbourne Website online survey contributors' connection(s) to Melbourne.

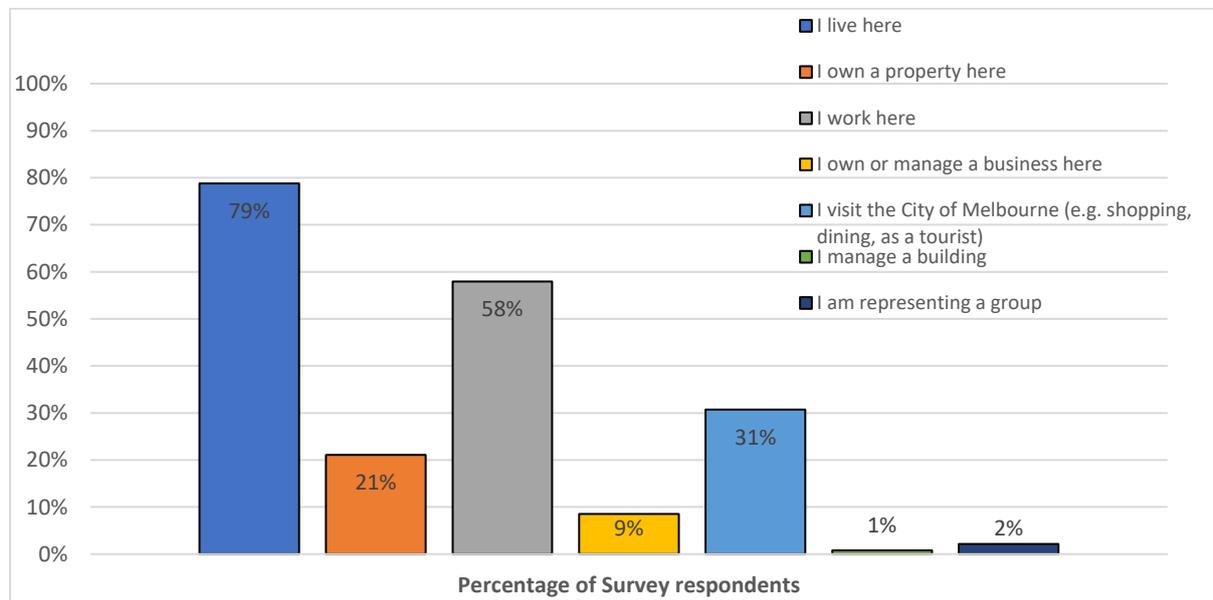


Figure 1: Contributors' connection(s) to Melbourne

The bar chart displays the percentages of online survey contributors' connection(s) to Melbourne. Note that respondents could have more than one connection to Melbourne. Key (right) indicates the colour of each connection type. Percentage of each connection is displayed in the corresponding bar; percentages rounded to nearest whole number.

ANALYSIS

Contributors' connection(s) to Melbourne:

- Contributors' most common connection to Melbourne:
 - o 79% of contributors (702) live in Melbourne.
 - o 58% of contributors (516) work in Melbourne.
 - o 31% of contributors (274) visit Melbourne.
- Contributors' least common connection to Melbourne:
 - o 1% of contributors (7) manage a building in Melbourne.
 - o 2% of contributors (19) represented a group from Melbourne.

IMPORTANCE OF PRIORITIES

Contributors were asked: How important are the four priorities to you? (rating out of five)

The four priorities that contributors were asked to rate were:

- o Priority 1: Reducing, reusing, recycling, and recovering waste.
- o Priority 2: Developing landfill alternatives (by establishing large processing facilities for the material that we currently send to landfill).
- o Priority 3: Stimulating innovation (by providing financial support for businesses, social enterprises and community groups).
- o Priority 4: Reducing amenity impacts from waste collection (noise and congestion, bins on the street, dumped rubbish and overflowing bins, vermin and litter).

RESULTS

Figure 2 presents the number of times each importance rating was selected for each Priority.

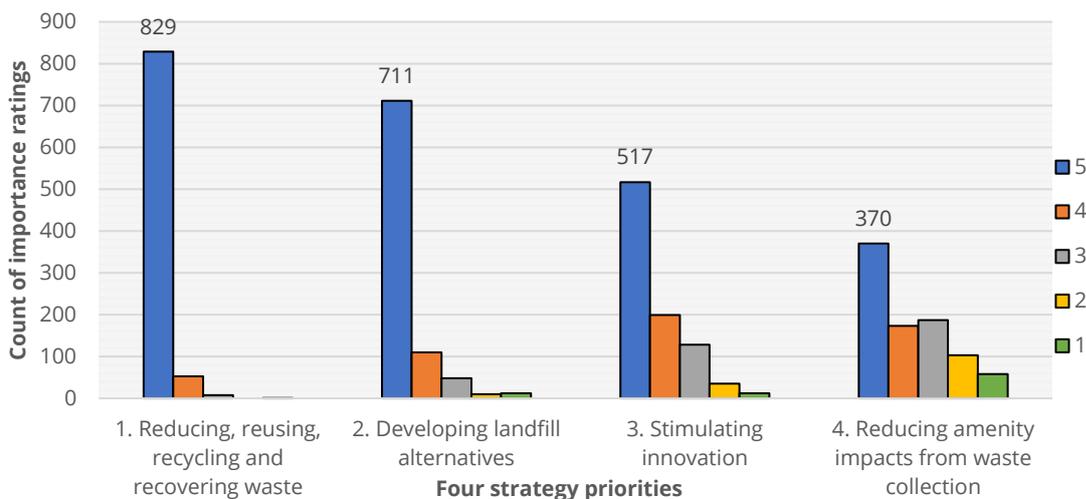


Figure 2: Rated importance of priorities

The number of online survey contributors who rated the importance of each Priority (x-axis) from 1-5 is displayed (1 being lowest priority to 5 being highest priority; colour key shown on right). The number of contributors rating each priority as having high importance (number 5) is presented in the chart, above the blue bars.

ANALYSIS

Contributors' assessment of the importance of priorities:

- **Priority 1: Reducing, reusing, recycling and recovering waste** was the most important priority for respondents:
 - 93% of contributors ranked Priority 1 as number 5
 - 6% of contributors ranked Priority 1 as number 4
 - 1% of contributors ranked Priority 1 as either number 3-1
- **Priority 2: Developing landfill alternatives by establishing large processing facilities for the material that we currently send to landfill** was the second most important priority:
 - 80% of contributors ranked Priority 2 as number 5
 - 12% of contributors ranked Priority 2 as number 4
 - 7% of contributors ranked Priority 2 as either number 3-1
- **Priority 3: Stimulating innovation by providing financial support for businesses, social enterprises and community groups** was the third most important priority:
 - 58% of contributors ranked Priority 3 as number 5
 - 22% of contributors ranked Priority 3 as number 4
 - 19% of contributors ranked Priority 3 as either number 3-1
- **Priority 4: Reducing amenity impacts from waste collection (noise and congestion, bins on the street, dumped rubbish and overflowing bins, vermin and litter)** was the fourth most important priority:
 - 42% of contributors ranked Priority 4 as number 5
 - 19% of contributors ranked Priority 4 as number 4
 - 40% of contributors ranked Priority 4 as either number 3-1

RANKING OF INITIATIVES

Contributors were asked: As a resident, what would help you most to reduce your waste?

Contributors were asked to rank each initiative from 1-9; where 1 is the most helpful initiative to reduce their waste, to 9, the least helpful initiative to reduce their waste.

Initiatives contributors were asked to rank from most to least helpful were:

- A container deposit program for Victoria (e.g. 10 cents for bottles).
- A reuse and repair centre.
- A third bin, for food scraps only.
- A third bin, for food scraps and garden waste.
- Better recycling systems and education for apartment buildings.
- Council taking your rubbish to a high-tech facility to recover materials and/or energy.
- Drop-off locations for food scraps.
- Drop-off locations for soft plastics and polystyrene.
- Education programs about waste avoidance, reuse, and recycling.

ALL RANKINGS FOR ALL INITIATIVES

Figure 3 represents the number of times each initiative was ranked 1 (most helpful) through to 9 (least helpful).

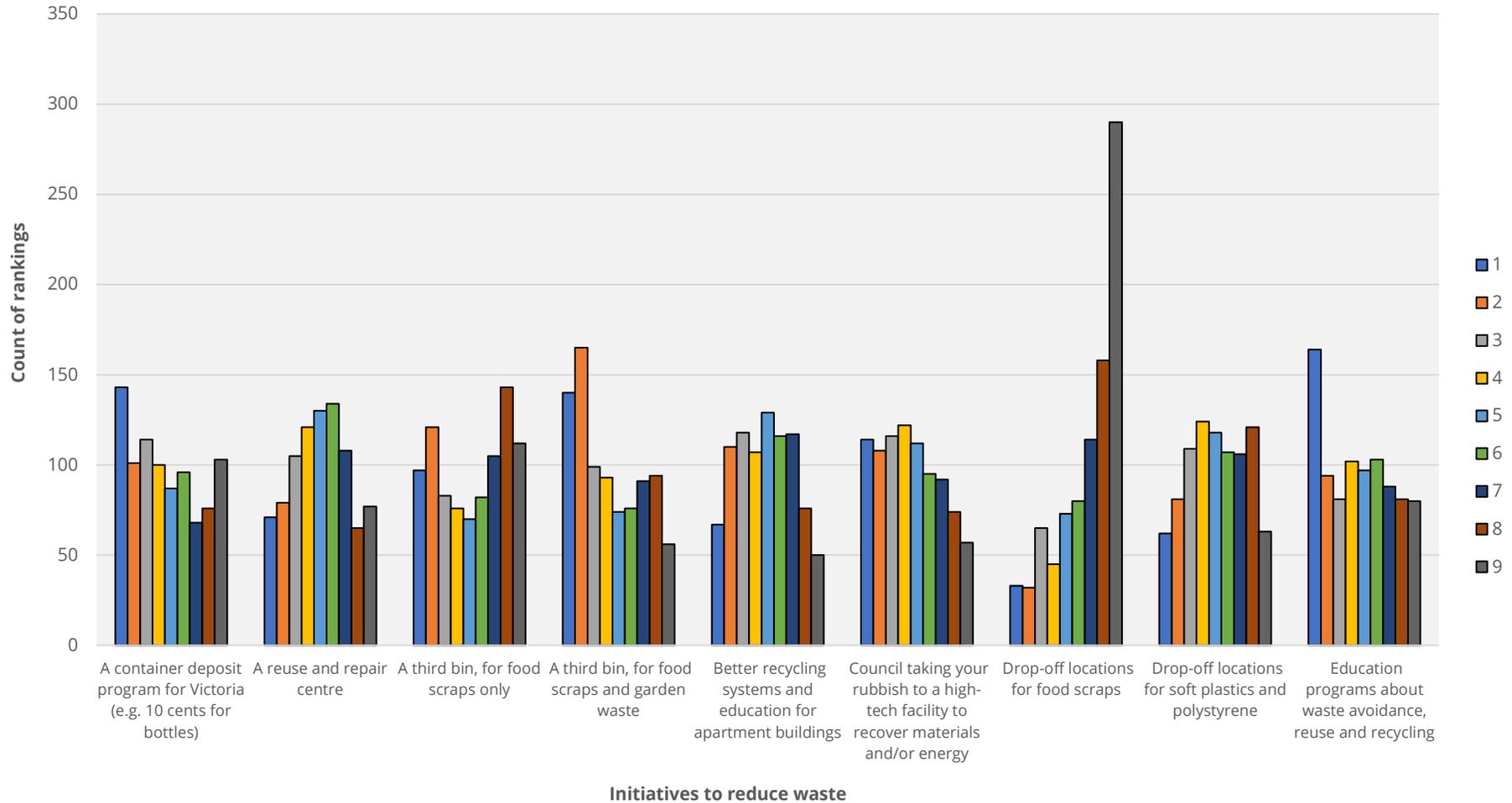


Figure 3: Count of contributor rankings for waste and resource recovery initiatives

The count of the number of online survey contributors' who ranked each initiative (x-axis), from most to least helpful, is displayed (1 being most helpful to 9 being least helpful; colour key on right).

NUMBER OF TIMES EACH INITIATIVE RANKED 1

Figure 4 presents the number of times each initiative was ranked number 1.

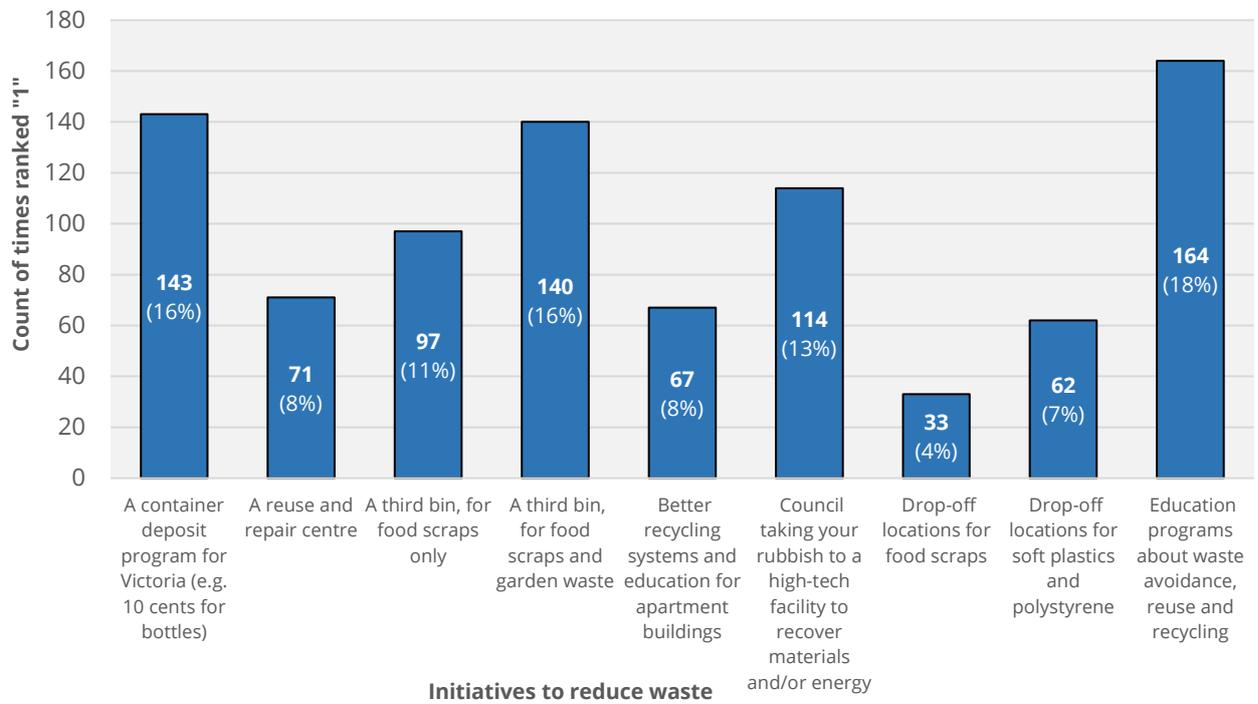


Figure 4: Count of times each initiative was ranked first

The count of the number of online survey contributors' who ranked each initiative (x-axis) as most helpful (1) is displayed in each bar. The percentage of number 1 rankings that each initiative received is also shown.

NUMBER OF TIMES EACH INITIATIVE RANKED 1-3

Figure 5 presents the count of the number of times each initiative was ranked in first to third position.

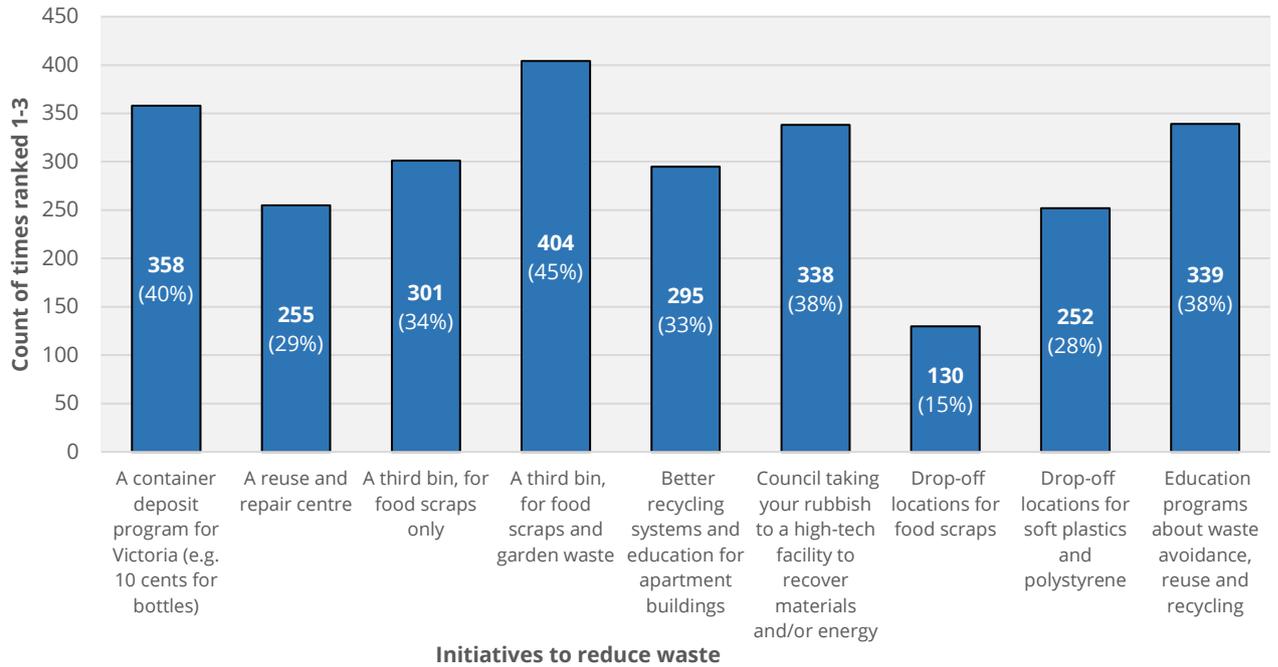


Figure 5: Count of times each initiative was ranked in positions 1-3

The count of online survey contributors who ranked each initiative (x-axis) in one of the first three positions is displayed (rankings 1-3). The number of contributors who ranked each initiative in the first three positions (rankings 1-3) are shown in each bar; the percentage of 1-3 rankings that each initiative received is also shown.

NUMBER OF TIMES EACH INITIATIVE RANKED 7-9 (LEAST POPULAR)

Figure 6 presents the count of the number of times each initiative was ranked from seventh to ninth position.

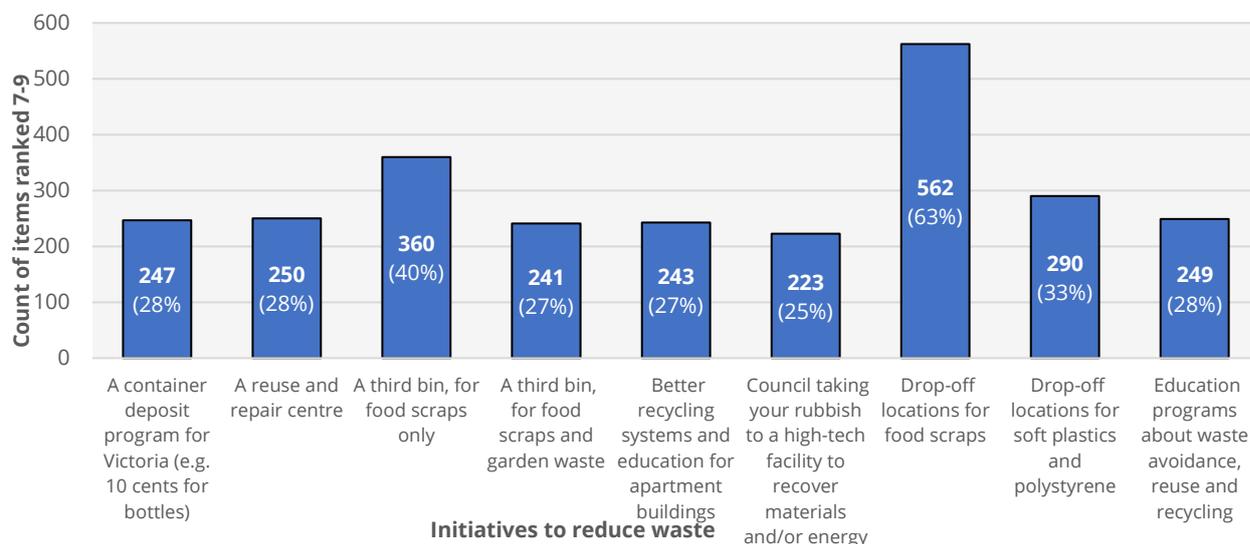


Figure 6: Count of times each initiative was ranked in positions 7-9

The count of online survey contributors who ranked each initiative (x-axis) in the last three positions is displayed (rankings 7-9). The number of contributors who ranked each initiative in the last three positions (rankings 7-9) are shown in each bar; the percentage of 7-9 rankings that each initiative received is also shown.

ANALYSIS

Highest ranked initiatives:

- **Education programs about waste avoidance, reuse and recycling**
 - Most commonly ranked as number 1. Ranked 1 by 162 contributors (18%).
- **A container deposit program for Victoria (e.g. 10 cents for bottles)**
 - Second most commonly ranked as number 1. Ranked 1 by 143 contributors (16%).
- **A third bin, for food scraps and garden waste**
 - Third most commonly ranked as number 1. Ranked 1 by 140 contributors (16%).
 - Received the highest number of 1-3 ranking. Ranked 1-3 by 404 (45%) contributors.

Lowest ranking initiative:

- **Drop off locations for food scraps**
 - Fewest number 1 rankings – Ranked 1 by 33 (4%) of contributors.
 - Received the highest number of 7-9 rankings and number 9 rankings; 562 (63%) contributors and 290 (33%) contributors, respectively.
- **Third bin for food scraps only**
 - Received second most 7-9 rankings; by 360 contributors (40%)

Analysis of contributors' comments

The discussion that follows presents analysis of all written feedback provided to the City of Melbourne on the Draft Waste and Resource Recovery Strategy.

General comments that did not relate to one of the four Priorities have been discussed in the first section. The following sections present all comments regarding each of the four Priorities.

GENERAL COMMENTS

Summary of findings

Overall:

A very large number of comments discussed broad topics outside of the four priorities. There was no overall theme within these comments.

Specific findings:

- Changing behaviour: Contributors believed that the most effective way to change behaviours was through education aimed at schools, businesses and residents. The need to educate on the types of products that could be recycled, and on composting, food waste, and waste reduction generally was also identified. Education programs targeted toward residents, businesses, and schools were sought. Also sought was more information to improve uptake of recycling, composting organic waste, and, waste reduction generally. Contributors also wanted residents to be more connected with their waste and acknowledged difficulties in creating behaviour change.
- Contributors reported on the effectiveness, ambition and leadership of the CoM. Contributors believed that CoM could do more regarding waste and resource recovery management and initiatives. They also wanted CoM to be more ambitious and proactive in setting targets and measuring performance. They also suggested a range of actions that could be undertaken by the CoM such as: supporting businesses in waste resource recovery, collaborating with other Councils, instigating targets and measurements, and changing the CoM procurement policy to be more environmentally conscious.
- Regulation: Introducing new regulations were seen as a way to encourage businesses and residents to better manage their waste. Contributors wanted more effective laws and policies, taxes on waste, fines for non-compliance, and more accountability for businesses and residents with poor waste management practices.
- Environmental impacts: The impacts of waste and litter on the environment, particularly local waterways, was a concern for contributors. Many sought more emphasis on sustainability and protecting the environment.
- Apartments and high-rise buildings: Reported as having insufficient infrastructure to appropriately deal with waste streams. Contributors discussed various ways in which apartments could become better equipped to deal with different waste streams through: communal composting/community gardens and additional recycling and rubbish chutes.
- Specific ideas: A variety of ideas not related to the four priorities were presented; most commonly, contributors sought more community engagement in waste and resource recovery projects or discussed waste hierarchy.
- Examples from outside Melbourne: Contributors thought CoM should implement solutions already successfully running in other locations. Some requested that a wider area of Melbourne should be included within the Strategy, to ensure consistency throughout the region.

Educating and communicating with the public 293 comments

General

A substantial number of contributors provided general comments on education for waste management. Most comments were broad in nature and discussed the value or importance of educating residents to support waste reduction strategies.

A small number of contributors believed there was a need to educate foreigners and international students who may not be familiar with Australian waste management practices. Some contributors believed that this could be addressed through providing signage in multiple languages.

Educate in many languages – I live in a block of flats with lots of international students and they don't know.

A small number also discussed the importance of culture change and behaviour change initiatives, particularly around the use of single-use plastic items. One individual believed that this could be achieved with effective policy and more infrastructure.

I think behaviour change and creative design will occur naturally, the most important thing the CoM can do is make sure that policies and infrastructure support waste reduction and reuse; e.g. banning single use plastic, more waste sorting and landfill alternatives.

In addition, a small number felt that there needed to be more education programs and education around the waste disposal process.

I'd like to see more education for the public on the impact of their daily habits and simple changes they can make that have a big impact.

Education on recycling

A sizable number of contributors wanted more information and awareness around what materials or products could be recycled. Contributors stated that there was not enough information on various aspects of the recycling process. A moderate number of contributors highlighted a lack of awareness around what products could, and what products could not be recycled.

Very clear information postcard that shows exactly what can and can't be recycled. I am still confused

In addition, several contributors were unaware: exactly how to recycle certain products; and, what constituted contaminated recycling. Specifically, more information was sought on the range of items that can be recycled and, whether certain recyclable products needed to be washed before being sent to recycling bins.

Education and awareness should be part of all the strategies. At the moment people are very confused as to what constitutes contamination in recycling, as demonstrated by the number of people who tie their bottles up in plastic bags. Clear communication

should be increased, particularly in the short term when we are not sure if we are doing it right.

There were several contributors who stated that residents needed to be more aware of the recycling process. This included information such as: where recycling waste is sent; where it may end up; and, the consequences if waste was not appropriately sorted by households.

Other educational aspects sought by contributors discussed recycling instructions, particularly on recycling bins. Contributors stated that instructions on recycling bins and packaging were vague or non-existent and more information needed to be provided in a variety of different languages. A couple also wanted more signage in public areas or information sheets that educated residents, communities and businesses on what items could be recycled.

Multi-lingual instructions and signage for recycling bins.

Having clear and detailed information available will reduce confusion about recyclables, decreasing contamination in the recycling process and lessening the amount of recyclable waste put in the landfill bins.

Targeting residents

A substantial number of contributors wanted education campaigns to target communities or residents. Contributors stated that it was necessary to educate residents as they felt many residents discarded waste incorrectly. Specifically, a small number of contributors wanted more education on waste separation and sorting as well as education on the recycling processes as it was thought that this would encourage better waste practices.

almost every person I know doesn't realise you aren't supposed to put food waste in your regular bin and the fact when this breaks down it creates toxic gases. So education is key hot tips for reducing, reusing, recycling

Behaviour change campaigns were also sought by a small number of contributors in order to encourage people to recycle and recover more and thus change social perceptions on waste management.

Contributors also sought clearer communication that catered for different languages with a range of methods such as pamphlets. One individual wanted information sessions to teach city occupants how to recycle properly.

Education and signage in multiple languages and with pictures

Other general comments were discussed by several contributors and included: the importance of education; education is a powerful tool; and, the need for residents to educate other residents.

Targeting businesses

A considerable number of contributors wanted education campaigns or various initiatives to help inform businesses on the best waste management practices. Most comments discussed general measures that could be undertaken to support businesses such as: providing businesses with information on recycling waste; information on separating waste streams; and, encouraging

businesses to reduce consumption and waste generally. One individual wanted businesses to be educated on the potential benefits that could be obtained through operating more sustainably.

Business should be targeted more directly to start separating their waste into different streams (organic/food, recycling, cardboard etc).

A couple of contributors discussed working with high waste industries such as construction, to support them in reducing the amount of waste that was sent to landfill. Two contributors also believed that businesses were not solely responsible for waste. Instead, they suggested that education should be provided for staff and customers to better support separation of waste streams.

Assist companies to complete a waste audit for education purposes and teach staff how to separate waste streams

Targeting schools

A considerable number of contributors wanted to target schools to educate students on appropriate waste management strategies. Several favoured implementing education workshops or school programs that would help to educate both students and families on waste and appropriate waste management.

Implementing education programs for school children to teach them the importance of sustainability. This can range from teaching them how to properly discard rubbish (or how to reuse) when they're younger to more complex programs such as land management/sustainable gardening for those studying in high school. Fostering this knowledge when they're younger will pave the way for future societies to be more responsible for their waste as well as mitigating its impact on our environment.

A small number of general comments were also made that emphasised: the importance of teaching children from a young age; the importance of promoting waste education in schools generally; and, engaging families as well as children.

A couple of contributors were also concerned that international students were not aware of the appropriate waste management and believed that it was important to ensure that students were up to date with the appropriate waste management strategies.

One individual also discussed a more practical measure such as developing field trips where students could travel to either environments impacted by waste or facilities where waste was processed.

Composting food waste

A moderate number of contributors wanted more information on how to manage organic waste streams. Several stated that there needed to be more information and education on how to manage household food waste; and instructions on how they could compost food waste locally.

There was also a desire for information to be more readily available for residents who were interested in managing their waste. Contributors stated that it was difficult to find the information that was needed for composting or establishing worm farms. One individual also wanted clearer instructions on what organic matter could be composted.

There needs to be a raft of initiatives to dramatically reduce Melbourne's waste. From a residential perspective there should be a program, that includes compost bins and worm farms, to support residents accompanied by an active education program and other initiative like composting hubs and street composting currently operating in Kensington

A few contributors discussed encouraging households to self-manage their organic waste. A couple of comments also discussed behaviour change and business practices. One contributor stated that standards for produce needed to be revised in order to prevent food waste.

Change how consumers and supermarkets see 'perfect' produce. On farms so much goes to waste due to supermarkets only buying 'perfect' produce, when majority of the produce is fine!

Waste reduction

A moderate number of contributors discussed strategies to encourage waste reduction. This included mostly non-specific comments around a range of education measures that could be catered toward individuals, communities and businesses. This included information on: what waste could be disposed of and to what bin; general education around reusability to help reduce waste; teaching individuals about their own personal impact on the environment; and, creating more public awareness about waste production.

Other topics on waste reduction discussed generally included: incentives for businesses who reduce their waste; a greater focus on education to reduce waste; and, education on reducing plastic waste (e.g. over packaging).

generate less waste, educate people and generate awareness of the impact we each have on the environment.

Consumers awareness of waste production 26 comments

A considerable number of contributors stated that it was important to connect residents to their impacts. This included comments that called for a range of programs to help consumers see the waste they produced. Those discussed included: garbage tours; education programs; public bins to make waste visible; and providing factual information about waste to households. One individual also highlighted the importance of communities taking responsibility for their own waste.

Allowing communities to actually know what happens to their waste and recyclables and where they go

Acknowledging difficulty in changing human behaviour 15 comments

A moderate number of contributors highlighted some of the barriers to improving residents' waste management practices. Obstacles for better waste management included: laziness; overconsumption; and, general difficulty.

Contributors stated that in order for people to improve their waste management practices, waste needed to be visible. This was so that residents or individuals were able to see the amount of waste

they produced. In addition, contributors believed that any changes to waste management must focus on making it easy for residents to follow in order to be successful.

ultimately, while people want to do good things, we are lazy. I support anything that makes it easier for the average person to make positive changes.

Illegal dumping of rubbish from residents 3 comments

A few contributors discussed illegal dumping of rubbish by residents. One contributor believed that this could be reduced by reducing the cost of hard rubbish collection.

Stop charging for hard rubbish drop-off at the Transfer Centres and that will encourage more use rather than just dumping the rubbish elsewhere

CITY OF MELBOURNE ACTIONS 159 COMMENTS

CoM performance and ambition 86 comments

A sizable number of contributors commented on the performance and ambition of CoM.

CoM performance

Of the considerable number who discussed CoM performance, the majority thought that CoM could have done/could do more regarding waste and resource recovery management and initiatives. A sense of urgency was expressed by a moderate number of contributors; they sought faster implementation of proposed strategies (or any action) aiming to reduce environmental impacts or reduce the volume of resources going to landfill. Some added that there has been enough discussion and planning and it is now time for implementation.

Zero waste is the best aim and achievement. Needed to happen like YESTERDAY. Get cracking.

Some thought that Melbourne needs to “catch up” and be more proactive in their approach to waste and resource recovery and become a “green city”; a couple considered Melbourne to be lagging behind other regions or countries. Another gave the following statement.

Taking 'cost effective' out of the equation - being resourceful with resource recovery will be a more "cost effective" solution long term, however it will need support from council to be kick started and you will need to cop that cost otherwise nothing will happen.

A moderate number of contributors negatively discussed the performance of CoM. Most referred to regulations that inhibit residents, business owners, or communities to develop initiatives that aim to reduce volumes of waste or valuable resources going to landfill. Several referred to hospitality businesses trying to donate unsold or surplus food or the closing of Joost Bakker’s zero-waste café; more support by CoM for these types of initiatives was sought. Other comments asked for CoM to be more responsible and proactive in waste and resource management and initiatives or asked for CoM to be more engaging with the public on these matters.

CoM ambition

A considerable number of contributors thought that CoM should be more ambitious in their approach to reducing waste and valuable resources going to landfill.

You should aim to be as ambitious as possible. Melbourne has wasted far too much time not doing enough on this - you have a lot of catching up to do!

Contributors wanted CoM to be more bold, proactive, and more like other admired councils or countries, particularly European countries. A moderate number thought that CoM should be a global or national leader in implementing efficient and sustainable waste and resource recovery strategies; some called for CoM to take on modern, innovative ideas. Strong leadership, in terms of making bold decisions generally and regarding business practices, was also sought.

Several thought that CoM's proposed targets regarding waste and resource recovery should be more ambitious. Contributors thought that a CoM should aim to reach their targets in a shorter space of time (sooner than 2030) or a greater waste reduction percentage should be aimed for. One noted that more ambitious targets need to be set, otherwise Melbourne will continue to play "catch up". Another thought CoM should make environmental sustainability its top priority.

The City of Melbourne is aiming to reduce waste by only 30% by 2030? I feel this is not taking waste very seriously, since other whole industries are looking at a larger waste reduction. City of Melbourne operations needs to aim for ZERO waste by 2030 to be a role model for others to follow.

Suggested actions for CoM

73 comments

A substantial number of comments were made suggesting broad ranging actions CoM should conduct to improve waste and resource recovery in Melbourne.

Support businesses in waste and resource recovery

A considerable number thought that CoM should provide more support for businesses to responsibly manage their waste. Strategies where the best practice of waste separation and disposal are clearly detailed, and systems are implemented, were sought by a small number of contributors; monitoring, auditing, and enforcing these new guidelines was also suggested. Another small number sought an integrated collection service network for commercial waste; comments discussed the logistics of drop-off locations and CoM support, both financially and in contributing space. As a positive incentive, a small number suggested that waste-responsible businesses should be celebrated and rewarded by CoM.

Establish a list of businesses doing the right thing for others to use/learn from

Collaboration and a supportive relationship between CoM, businesses, and systems were thought to streamline waste management and resource recovery solutions by a small number of contributors.

Other comments on CoM supporting businesses manage their waste included: support individual businesses' sustainability initiatives; waste management plans or investigations for demolition and construction businesses and health services; a tailored approach to specific businesses' "waste streams"; and, promotion of a "waste expo" for facility managers.

Collaboration or advice from elsewhere

A moderate number suggested CoM collaborate with other councils, governments, research institutions, or communities to ensure that the best possible strategies for managing waste and resource recovery are put in place. Contributors' discussions on CoM collaborating or getting advice included: reference to the War on Waste Survey Key Findings and Report document, which investigated "Australia's waste attitudes and behaviours"; other Australian councils that they considered to have good approaches; seeking advice from universities; working with State and Federal governments to introduce laws regarding packaging of goods or to set up waste and resource recovery processing facilities; collaborate with utility services for greener outcomes (e.g. grease traps in hospitality); and, engage and encourage involvement of communities and support their efforts and ideas.

It's helpful knowing what City of Melbourne is in charge of and its limitations but I feel like the council could really try to lead change by bringing all the stakeholders together (Federal, State, Local governments, businesses and manufacturers and end-consumers).

Targets, management, and measurement

Several contributors broadly discussed CoM setting targets for waste and resource recovery strategies, and then implementing management and measurement of those targets. Overall, these contributors asked for all targets to be met. Specific comments included: having immediate goals as well as long-term goals; including specific projects or key performance indicators in the Strategy; conduct research on where waste comes from and how much is generated prior to developing strategies for businesses; methodology of how waste management behaviours and progress data is collected and interpreted; have audits; compare targets and achievements with international best practices; and, use technology to monitor progress.

All the priorities are fine in an abstract way. The proof comes in the specific projects and implementation. We often establish a bunch of priorities without thinking through the fine grain of how to achieve them or what they might really mean. It would be a good test to try to put actual real projects into these priorities.

Procurement

CoM procurement was discussed by several contributors in terms of waste and resource recovery. A wide range of topics were mentioned, including: CoM to foster markets for recycled materials or purchase such goods; increase rates for businesses but supply improved CoM-managed waste collection services; and, implement strategies that provide employment opportunities.

Waste Zero Australia requested that CoM award contracts and grants that focus on sustainability, especially for waste disposal companies, as well as modify procurement policy to "mandate environmental weighting criteria with special focus on recycled content in products".

Other suggested actions

A few other suggested CoM actions included: install more water refill stations to reduce need for purchasing packaged drinks; and, public behaviour and innovation will occur if CoM has policies and infrastructure in place to encourage them.

REGULATION

139 COMMENTS

Law and policy**53 comments**

Many contributors wanted stricter regulations that both businesses and consumers would have to abide by. A moderate number stated that they wanted stricter policies on packaging and recycling. Specifically, this would: make it mandatory for businesses to separate waste and recycle; make it mandatory for producers to remove unnecessary plastic on certain items (e.g. fruit and vegetables); and, make it mandatory for producers to use only recyclable products.

Bring in laws that make retailers (eg. Big supermarket) use less plastic packaging. Packaging of fresh produce that doesn't need to be packaged is out of control. Too much unnecessary waste coming from these big corporations.

A small number of contributors stated that regulations ought to go further, such as by banning the production of single use products entirely. A few also wanted to implement mandatory regulation that would require those living in apartments and high-rise buildings to separate their waste streams.

Tax**38 comments**

A considerable number of contributors supported taxes on specific items or waste streams to prevent waste from being produced. Several stated that they wanted taxes on non-recyclable products and packaging to deter businesses and individuals from either producing or purchasing items and materials that would be destined for landfill. In addition, a few contributors discussed the possibility of implementing taxes on raw materials and subsidising recycled materials to encourage better recycling practices.

Regulate to force businesses to design and operate sustainably (cradle to cradle rather than cradle to grave) Putting a tax on virgin materials and subsidise recycled materials.

A small number of contributors favoured increasing taxes or levies for: residents or businesses that produced excess landfill; and, increasing the cost for dumping waste at landfill sites.

Fines**33 comments**

A moderate number of contributors supported imposing fines to encourage better management of various waste streams. A small number wanted penalties for households and businesses that did not comply with regulations. Comments discussed: imposing fines as a deterrent on households and businesses that did not responsibly dispose of waste; and, increasing penalties for littering or for illegal dumping of rubbish.

Strict penalties in apartment buildings for wrong rubbish dumping. My building is terrible for putting recyclable materials in general waste and vice versa

General**15 comments**

General comments from contributors around regulation discussed societal responsibility. A small number of contributors stated that businesses needed to be held more accountable for the waste

they produced; and, a couple believed that landlords and individuals should also be held more accountable for their waste. A few contributors also made non-specific comments around punishment and enforcement.

Individuals and businesses (builders in particular) need to be held responsible for the disposal of their rubbish.

ENVIRONMENTAL IMPACT

56 COMMENTS

A substantial number of contributors generally commented on the environmental impacts of waste and litter. All sought more emphasis to be placed on sustainability and being responsible for the health and preservation of the natural environment. Some stated that caring for the environment should be prioritised regardless of the cost. Plastics and polyester were often negatively referred to.

Ideally we should prioritise sustainability and the environment first. Everything else should come second considering the issues we are facing in the future

Concern regarding the amount of litter was expressed by many of these contributors. A moderate number thought more should be done to protect the waterways from litter and waste, particularly the Yarra River and local beaches; several made similar comments regarding wildlife.

Some thought that the public should be more aware and active in response to reducing waste and littering, with a small number seeking more public clean up days or events. Several expressed their frustrations regarding poor disposal habits of cigarette butts, with many noting the excessive volume in certain areas. One suggested banning smoking in public places, while others sought fines for those who littered. More regulation and enforcement regarding general litter was sought by a few other contributors. Increasing the number of public rubbish bins and how often they are emptied was thought to be an effective solution to reduce littering.

APARTMENTS AND HIGH-RISE BUILDINGS

54

COMMENTS

Food waste and compost

24 comments

A moderate number of contributors addressed the effective management of organic waste by apartment residents. Some merely noted that food waste was difficult to deal with when there are no backyards, however, most contributors wanted “viable composting solutions” for those living in apartments. Many contributors provided suggestions as to how this might occur. Ideas included: small bins for homes and large bins to empty these into on the ground floor of apartments; communal or community compost bins; and, some type of collection service. A common sentiment was that there needs to be innovative thinking to solve the issue.

Implement innovative compost locations and strategies for residents living in high rise apartments within the city so that they can compost their kitchen waste locally and

contribute to local and accessible community gardens (ps. as nature time is beneficial for the overall health of a community)

Recycling

12 comments

More or better recycling facilities in apartments was supported by several contributors. In around half the comments contributors noted that the onus should be on developers to provide facilities or space for this to occur at the time apartments are being constructed (e.g. rubbish/recycling chutes). Other comments simple called for the promotion of recycling amongst residents.

Waste

10 comments

Waste disposal was considered an issue for several contributors. Many of the comments suggested that a potential lack of knowledge of waste disposal was the issue for residents of apartments; to this end “waste introduction pack(s)” for residents were suggested. Other comments were about creating better systems in apartments to deal with waste; for a couple of contributors this was viewed as a management issue and suggested that building managers could report on “waste tonnages” with a view to making annual reductions.

General

8 comments

A small number of contributors had general comments. Better solutions, more rubbish collections, and shared facilities were mentioned in relation to waste from high-rise buildings.

A simple way to communicate how buildings and apartments are performing when it comes to waste management, e.g. star ratings.

ABOUT THE PROCESS

51 COMMENTS

A considerable number of contributors discussed the development of the Draft Waste and Resource Recovery Strategy or the public engagement process.

A moderate number sought more involvement with other councils or State or Federal Governments to develop strategies or infrastructure to manage waste and recover resources; this was discussed above in the *Suggested actions for CoM*.

The Draft Waste and Resource Recovery Strategy was discussed by several contributors. A few sought more specific details or projects within the Strategy.

While the strategy appears to be quite comprehensive, I would have preferred to see a more concrete set of recommendations right up-front and a less bureaucratic (ie more business-like) writing style.

Other comments on the Strategy included: the goal stated should be “a city that puts the environment as its top priority”; the figures should be clearer; CoM to include their definition of waste; include emotive images of the impact of waste and litter on wildlife; and, more publicisation of the Strategy to increase public engagement. One contributor provided a detailed discussion and breakdown of the Strategy; CoM can read the entirety of this submission to obtain its detail.

A small number of contributors sought systems that could be easily implemented by residents and communities; simplicity and functionality of the system was preferred.

The simpler the system is for the residents the better - do not rely on everyone sorting and washing their rubbish it doesn't work.

The online survey was referred to by a small number of contributors. A couple disapproved of the wording of question 3, while another wanted to be able to only select two options, rather than completing the list requirements. One wanted to be able to save their progress, and another thought the survey was a "great primer".

Other comments regarding the process included: one contributor hoped good ideas were submitted; one contributor wanted to attend a public forum; opposition to privatisation; query how this Strategy is related to the "zero net emissions strategy"; and, "have it in break outs – in document".

GENERAL SUPPORT

44 COMMENTS

A considerable number of contributors provided general supportive comments. Many of these generally stated that they supported CoM efforts to manage waste and resource recovery in a more efficient and sustainable manner; some added that a significant change, such as this Strategy, was required.

This is a fantastic initiative and I look forward to seeing some real, positive action from the Melbourne government.

Several stated that they supported all four priorities, with some noting that they are all equally important. A small number of contributors commended CoM on the Draft Waste and Resource Recovery Strategy; it was described as comprehensive and an "excellent starting point" or "first step".

Please do all the above. We need to move quickly. Australia is choking in garbage and we need our government to support our wishes for a cleaner country and planet. Future generations and the amazing species of this world are relying on us to act now!

SPECIFIC IDEAS

38 COMMENTS

A considerable number of specific or broad ideas were made that did not directly refer to the priorities discussed above.

Increasing community involvement and engagement was thought to encourage the public or specific groups of the population to take more responsibility and action in reducing waste and improving resource recovery. A small number generally mentioned that more waste and resource recovery initiatives could provide more jobs or could be carried out by prisoners, the homeless, or other groups of people; one added that social services and systems could collaborate with this initiative.

A small number discussed the idea of waste hierarchy, where preferred initiatives or aspects of waste and resource recovery are prioritised over others. Most spoke generally, seeking more emphasis in

reducing disposal and refusing unsustainable options; however, one thought that implementing a waste hierarchy system could limit progress of all levels of the system.

We need to start implementing the Waste Hierarchy. Disposal should be the absolute last thing a business or individual should do with their waste.

A couple referenced the underground automated waste collection system planned for the Sunshine Coast and sought a similar initiative for Melbourne. Implementing rating systems, personal incentives via “green money”, and improved back-hauling systems were suggested each by a couple of contributors. Other specific ideas included: labelling cardboard products that also contain plastic; street lights that monitor when rubbish bins need to be emptied; information on where to dispose of chemicals; supporting the hemp industry; more “onsite micro solutions”; online information regarding waste from retailers; and, creating a “sustainability hub”.

3R Services submitted a couple of documents presenting specific ideas for public waste and resource recovery systems: Smart Cities Waste and Recycling Discussion Paper; and, ASCA Brochure. Both presented a new design of “smart bins” with their associated collection system.

Bin Clock contributed a detailed submission, presenting an idea to help residents remember which wheelie bin to put out for collection each week: a fridge-mounted alter system indicating which bin to put out on which day.

CIRCULAR ECONOMY

24 COMMENTS

A moderate number of contributors discussed the circular economy. Most comments were general and highlighted the importance of the circular economy in reducing waste and enhancing sustainability. A couple of contributors also stated the importance of engaging stakeholders and convincing businesses to adapt to a circular economy model. One individual highlighted the potential opportunities of a circular economy, suggesting that it could represent an extensive new job market.

I am concerned that there is too strong a reliance upon incinerating our waste to create energy when this should be the last option on the waste hierarchy. This will not promote behaviour change but rather reinforce current or higher rates of waste production. More effort needs to be spent on reducing waste and encouraging a circular economy. Councils and the Metropolitan Waste industry can support and facilitate this kind of innovation as well as provide education to reduce waste in the first place. We all need to value waste more and possibly financial incentives / taxes can play a role.

OUTSIDE CITY OF MELBOURNE

18 COMMENTS

A moderate number of contributors made general comments regarding areas outside of the City of Melbourne. Several generally asked CoM to seek ideas and solutions regarding waste and resource recovery from other cities, regions, or countries. Some made comments that CoM does not have to

reinvent the wheel, just research successful initiatives and systems in other locations; European countries were commonly referenced.

A small number asked for the Draft Waste and Resource Recovery Strategy to cover a broader area, rather than just the City of Melbourne. Some of these contributors noted that residential areas and suburbs need to be more sustainable, while others sought consistency of services throughout the greater Melbourne area or Victoria.

PRIORITY ONE: REDUCE, REUSE, RECYCLE, RECOVER

Summary of findings

Overall:

Comments in this section predominantly showed the opinion that waste management needs to emphasise waste minimisation, particularly measures to reduce the production of waste in the first instance. Single-use plastics and consumer packaging were most commonly identified as problematic.

Specific findings:

- **Reduce:** Considerable comment was focused on the reduction of plastic products, particularly single-use products. Items commonly identified as requiring non-waste or biodegradable alternatives were: coffee cups, straws and plastic cutlery. Reduction of single-use plastics and excessive product packaging (i.e. fruit and vegetables) and takeaway food/drink containers was sought. Commonly, the onus was placed on businesses to reduce product packaging and throw-away items at the point of sale.
- **Recycle:** Fundamentally, people wanted a locally managed, efficient, holistic approach to recycling, that returns positive outcomes (i.e. through the re-use of the recycled product and/or a considerable reduction in waste going to landfill). There was consistent support for the recycling of more material, particularly soft plastics, along with the development of more recycling facilities. More recycling guidance and support at facilities for public users, such as cleaning stations was wanted. Increased uptake and promotion of products made from recycled materials (infrastructure, benches from recycled plastic) was also sought.
- **Recover:** A very large majority of recover feedback discussed organic waste. Organic waste was considered both an under-utilised resource and an unnecessary burden on waste collection/transportation systems. Many comments discussed how organic waste can be better recovered, for example: management and collection of commercial (particularly food) waste; the provision of depositories for food and garden material to promote community composting; facilities for particular circumstances, such as apartment complexes. There was a small amount of comment on recovery of other waste, for example commercial building waste.
- **Reuse:** There was less comment on reuse, than the three topics above. Overall, contributors wanted waste to be diverted from the waste stream through continued use. Examples were: reusing plastic as road material; reusing food and beverage containers; repairing damaged goods – electrical appliances, whiteware and furniture. Incentivising reuse was also suggested.

REDUCE

600 COMMENTS

Reduce, restrict, limit or ban single-use products 143 comments**General**

There were a considerable number of non-specific comments from contributors on single-use plastic items. Most comments called for bans and restrictions on single-use plastics. Many comments were conveyed with a sense of urgency and passion that reductions need to be made soon. A small number of contributors stated they wanted bans on all non-recyclable or non-biodegradable plastic (e.g. polystyrene), suggesting that it should not be allowed to enter the market. This was a typical comment.

Banning single use lightweight plastic bags is very important and is already implemented. So happened within a very short time period. However it doesnt go far enough. All plastics that are not biodegradable, unrecoverable, and/or unrecyclable should be banned including the fibres that make our clothes.

Non-recyclable cups

The production and use of single-use plastic cups, particularly takeaway coffee cups and lids was a concern for a considerable number of contributors. Several of these discussed the possibility of banning or regulating single-use plastic cups due to their environmental impact. Contributors strongly favoured producing cups that are either biodegradable, compostable, or recyclable. In addition, they also wanted a greater push for BYO coffee cups and for businesses to offer incentives for customers who used them.

I think we need to either implement a way to recycle coffee cups, or advertise the fact that we can't currently recycle coffee cups. I see recycle bins full of coffee cups and it makes me sad. People want to do the right thing, I don't think many realize that they can't be recycled in Melbourne

Cutlery, crockery and straws

Single-use plastic items used for eating or drinking, such as cutlery, crockery or straws, were viewed unfavourably by contributors. A moderate number of contributors wanted tougher regulations on these products. Several contributors called for specific industries, such as hospitality, to change their practices and not supply this type of single-use products to consumers. Others suggested that the use of biodegradable take-away cutlery, crockery, and straws should be promoted.

Please assess how businesses serve the food. All around the city there are food courts where people can actually sit and have lunch, and all the restaurants still use disposable plates and cutlery. They shouldn't allowed to do that. This is unnecessary waste! There are so many food courts I have been that don't do this and have system in place to pick up and clean the dishes. Laws are needed.

Containers

A moderate number of contributors expressed concern over single-use plastic and polystyrene containers. They discussed: implementing government bans; encouraging businesses to introduce

additional charges on specific items to reduce consumption; and, promotion of biodegradable takeaway containers.

Businesses in the CBD minimising the sale of disposable containers/bags/cutlery etc for single purchases or adding extra charges for bags etc past 9pm

Plastic bottles

A moderate number of contributors addressed plastic bottles. Concerns were raised over their environmental impact and many stated that they wanted their availability reduced; to achieve this they sought bans on single-use plastic bottles. A small number of contributors advocated for CoM to provide more water fountains throughout the City to help encourage the public to refill their own bottles, rather than buy bottled water.

Banning sale of bottled water in shopping centres and forcing those building to provide free drinking facilities will reduce the amount of plastic that ends up in consumers hands

Reduce Packaging

131 comments

Business practices

A sizeable number of contributors stated that the CoM and businesses must be held accountable for the waste they produce and wanted these organisations to take practical steps to reduce their environmental impact. Contributors were dissatisfied with business practices that used single-use products or did not adequately separate landfill waste. They suggested: phasing out single-use items such as plastic cutlery, crockery, and cups and replacing them with reusable or biodegradable products; and, providing an organic collection service for businesses producing food waste.

Target businesses, as consumers we are not creating as much waste as industry

Consumers, businesses, & councils all need to take responsibility. There needs to be accountability in place at every step. From packaging items (businesses), buying items, discarding items, (consumers) & managing waste (councils/businesses)

Reduce plastic at point of sale

There was a strong desire for plastic packaging on goods to be reduced or eliminated by a substantial number of contributors. Specifically, a considerable number of contributors expressed a level of frustration at what was viewed excessive plastic packaging at point of sale. Others sought more biodegradable packaging to be used.

one of the keys priorities should be reducing the amount of packaging that is distributed in the first place.

Supermarkets were criticised by several contributors for overpackaging goods, and fruit and vegetables. This was a common comment.

Plastic packaging on fruits and vegetables needs to be reduced. Organic waste can be composted and reused but the plastic used is so wasteful and unnecessary

A small number of contributors specifically mentioned reducing the amount of non-recyclable or plastic bottles at the point of sale; primarily supermarkets were mentioned. Reduction of plastic bottles has been discussed elsewhere in this section.

Reduction should be the highest priority 109 comments

A sizeable number of contributors stated that the most important step to managing waste was to prioritise reduction or prevention of waste in the first place. For many this was viewed as a fundamental aspect of addressing the environmental impacts of waste.

I think reducing is so important and needs to be embedded in our culture

Contributors noted methods of waste reduction such as reducing consumption and reducing production of various waste streams. Contributors stated that reduction should take greater priority over reusing or recycling because it requires less energy and averts waste creation. A small number of contributors suggested that providing residents with smaller waste bins would encourage them to send less waste to landfill.

Reducing and recovering materials is the most essential factors. Especially office and construction materials. End users must be more responsible for their waste (eg: a sliding discount scale or end of year incentive bonus scheme for businesses in the City of Melbourne which reduce their landfill). Innovation incentives can be useful, but it doesn't change user behaviour and over-consumption, which is where the real problem lies.

Businesses taking an active role 46 comments

General

A moderate number of contributors were critical of businesses that did not take an active role in reducing their waste. They wanted businesses well known for producing significant waste to be held more accountable. Comments included: implementing enforceable standards on businesses that would require them to alter their practices; providing more support services for businesses (e.g. organic waste collection); and, rewarding businesses that use sustainable practices.

Businesses need to play a more important part with reducing waste. What would help is having colour coded waste bins in the offices to help separate waste. There should also be an education program letting people know what goes into general landfill and what can be recycled.

Barriers for businesses

During the retail and hospitality sector forum event, contributors were asked to list the barriers for reducing their waste. Businesses reported the following barriers: the high cost of waste separation; high cost of training staff to separate waste; a lack of incentives and uncertainty around the benefits of waste separation; a lack of education; a lack of support from landlords; and, a lack of space, or poor ability to retrofit older buildings to reduce waste.

Hard to know what to actually do, lack of clear instructions/info

Reduce or ban plastic bags

45 comments

Contributors stated that there was a need for greater restrictions on single-use plastic bags. A moderate number of contributors discussed regulations to either prohibit or restrict the use of plastic bags. Several contributors felt the onus was on large supermarket chains to implement bans or reduce the supply of plastic bags.

Big supermarket chains to actually ban plastic bags (not introduce a different plastic bag at 15c, there should be NO plastic bag option)

Several suggested that biodegradable bags, bin liners, and dog poo bags should be promoted to reduce the number of plastic bags. One contributor referenced BioGone, a company that produces biodegradable bags (including bin liners and dog poo bags) and suggested CoM use these.

Incentives to reduce

42 comments

A considerable number of contributors discussed a range of incentives to encourage both businesses and consumers to reduce waste. Several discussed the possibility of reducing rates or providing other financial incentives for residents or businesses who reduced their landfill waste each week. Several respondents wanted businesses to provide incentives for customers who reduced waste by supplying a bring your own (BYO) cup or container. Incentives were also sought for producers or businesses that reduced the amount of plastic packaging on certain products.

Incentives to encourage people to reduce takeaway food, bring their own reusable containers to get takeaway.

Reduce or avoid food waste

29 comments

Opportunities and barriers for businesses to reduce food waste

A moderate number of contributors highlighted both the potential opportunities and barriers for businesses taking part in schemes to help reduce food waste. Opportunities for businesses included: having a better reputation among the public; reducing their impact on the environment; and, improved amenity.

Increase reputation and attract more customers

Some contributors also highlighted potential barriers for businesses, which included: limited capacity to implement waste prevention to reduce food waste (due to business demands); and, time and cost barriers.

Time is money for businesses

General comments regarding food waste

Several contributors wanted better methods to both prevent and manage food waste. They suggested: better education around dealing with food waste; food sharing initiatives; better general management of food waste; and, the Council prioritisation of dealing with food waste.

post ads with alternatives to do with food scraps (freeze it, make vege stock etc.)

Specific ideas to reduce

28 comments

Specific ideas from contributors on methods to reduce waste were diverse. A couple discussed the potential to reduce consumption through creating tool libraries or “libraries of things” where individuals could borrow a range of items (tools, household appliances, etc.) rather than purchase them.

A Library of Things” - I lived in a town in the UK where this was so helpful and popular. I think it would do well here in southbank/inner city where lots of people live in small spaces. It really reduces the need to buy things that will be used once or twice, and is great for building community connection. Things I would love to borrow but not own: camping gear, esky, food processor, a muffin tin, canoe, board games, a drill, picnic basket and blanket, party decorations, umbrellas, dumbbells, juicer...

Let's do it!!!! Google Frome Library of Things

Contributors also discussed installing new infrastructure or products that would help reduce demand for single-use plastics. This included an idea from an individual to fund research into biodegradable plastics, while another suggested that CoM build more water fountains throughout the City, so citizens were able to refill reusable water bottles. Another individual discussed reducing demand for single-use plastics through creating “boomerang bags”.

Also how about more "Water Vending" machine, and water fountains to refill water bottle. I (trying to get into the habit), carry my own reusable water bottle on my regular commute and when I go into the city. My problem is finding a free or at least cheap as well as clean and suitable place to refill.

A small number of contributors discussed methods that may help to incentivise households to reduce waste. This included suggestions such as: a user pays scheme, where households pay for the weight of their rubbish; and, reducing the size of the general waste bins. It was expected that this would incentivise households to recycle.

Weigh our waste and charge by weight, that will encourage reduced waste in land fill. As per European countries.

One detailed submission from Min Tech presented more sustainable construction materials, or “Eco Building Systems”, that aim to reduce the construction industry’s carbon and environmental footprint. CoM can see specific details and images within this submission.

Public rubbish-creation reduction

13 comments

There was concern from several contributors about the amount of waste and rubbish produced at large events. Contributors wanted CoM to lead the way and implement better waste management practices to help reduce litter and the number of single-use products sent to landfill. Contributors discussed: reducing the waste produced by events; providing only compostable cutlery, crockery, or cups; and, issuing fines for littering at events. This comment referred to Brisbane’s system.

Council should lead the way as they have done in Brisbane City council and Darebin and eliminate the use of single-use plastics in council operations, venues and events

Other comments

14 comments

Other comments that discussed reduction were varied and included: producing less paper in favour of digital media; providing more incentives for customers that brought reusable containers or ordered smaller portion sizes; and, reducing the regularity of waste collection to incentivise waste reduction. In addition, a few responses simply gave the website addresses of what looked to be recycling companies (see Appendix 3 for list of all websites provided).

RECYCLE

344 COMMENTS

Ability to recycle a broader range of materials

113 comments

A sizeable number of contributors wanted to be able to recycle a broader range of materials. In the majority of cases, contributors expressed their opinion in simple terms, such as “Introduce large recycling bins at the Transfer Stations”, or the following.

Capacity to recycle more items that are currently not being recycled.

Soft plastics were the most frequently cited material in need of recycling. Contributors were also in favour of the ability to recycle the following materials: hard plastics; dental hygiene products; cooking oil; electronic items; metals; “foam” products; clothing; batteries; and, polystyrene.

In addition, several wanted: recycling bins that accept a greater variety of recycled goods in the Central Business District and other public areas; and, more local Melbourne recycling facilities. A small number of contributors also believed that bins needed more instructions on what can or cannot be recycled to ensure that items were being appropriately recycled.

Making the recycling bin available for more materials, and/or offer more drop off locations for materials that can't be recycled or put into the normal bin - I'm thinking toothpaste tubes, make up containers, CLOTHES, shoes, electronic waste

In order to increase the capacity to deal with waste, contributors stated that it was necessary to have the facilities to deal with recyclable materials. Several wanted either: an expansion of the Degraves recycling hub; a higher number of facilities located throughout the City of Melbourne district, or more efficient facilities that had the capacity to deal with a broader range of materials. Frequently, these contributors sought facilities to process recyclables locally; some added that this could increase job opportunities.

There is a national urgency for actual recycling facilities to be built and run. I believe City of Melbourne should be pushing (alongside other councils), for state / federal funding to create these facilities so that all waste processing is completed in Australia. Spin it as an employment increase if needed.

Suggested ideas and initiatives

55 comments

A substantial number of contributors suggested ideas and initiatives regarding recycling.

More recycling bins were sought by a considerable number of contributors. Comments generally requested more recycling bins to increase sorting of recycling from waste or different types of recyclable materials. A moderate number sought more recycling bins in public places, usually requesting recycling bins next to general waste bins; one added that food scrap bins and washing stations could be adjacent to public recycling bins to reduce contaminated material going into recycling. A small number of these contributors expressed frustration over the removal of public recycling and/or rubbish bins in Melbourne City.

Increase number of recycling bins throughout CBD -- there should never be a rubbish bin without recycling.

A small number of contributors suggested modern public recycling bin systems, often referencing examples from Europe or the City of Gold Coast with underground recycling and waste systems.

A few suggested increasing popularity (through marketing) or usage of goods made from recycled materials, with one adding that these should be viewed as “premium product[s]”. A couple suggested that businesses that produce recyclable waste, such as supermarkets, should have recycling bins on their properties.

Other ideas regarding recycling included: promoting APCO’s packaging program; export recyclable material to willing countries; a method to compact soft plastics for easier storage and transportation; cleaner recycling streams to reduce contamination; bottle crushers to reduce volume of bottles; and, one individual suggested coffee cup recycling bins as they cannot be recycled with other recyclable materials and are a significant source of litter in Melbourne City.

Container deposit schemes

46 comments

A considerable number of contributors supported a container deposit scheme, similar to one implemented in South Australia. Specific ideas on how a container deposit scheme may be implemented mostly favoured a reverse vending machine where coins were given when a user deposited a plastic bottle.

A couple of contributors suggested vouchers (e.g. for movies, power credits, or train travel) or bus credit could be given instead of coins. A few contributors were opposed to a container deposit scheme, they believed that it may increase waste (e.g. by people searching kerbside recycling bins for containers worth a deposit fee and discarding remaining recyclable items to landfill) or encourage anti-social behaviour (e.g. encourage people to search through bins).

I think the state government needs to have the container deposit system like SA has, I still can't understand why we don't have this across the whole of Australia yet! Landfill should only be used as the last resort for waste that can't be reused, recycled, composted, etc.

General comments

31 comments

A considerable number of contributors spoke generally about recycling. The majority were supportive of recycling, or that more needed to be done or else that recycling initiatives should be more highly prioritised. Some referenced European examples of successful recycling schemes.

Prioritising recycling was important for a moderate number of contributors. Most comments were general and emphasised the importance of having an efficient and effective recycling system. Managing recycling waste was also discussed by two contributors. One suggested recyclable waste should be managed and processed onshore whereas the other suggested it was important to find new countries willing to accept recyclable waste.

Given that China has recently raised the standard of accepted imported recycling products, I think our main priority in Australia is to research and implement viable, onshore waste management processes. This should include soft plastics, as well as the current recycled materials accepted in Australian bins.

A few were opposed to aspects of recycling. A couple thought that improving recycling facilities and the ability to recycle materials was not the correct approach to reduce waste overall. Another was opposed to implementing recycling drop-off points, claiming that people required a lot of motivation to use these facilities.

People are lazy. Even if there were drop-off locations, would people go? People don't like even going to the bin areas in apartment buildings. Good luck with getting them to go to drop-off locations. What would be the incentive? Say it's better for the environment has been done and dusted and has not worked.

Incentives to recycle

28 comments

A moderate number of contributors discussed providing incentives to either businesses or residents to encourage more recycling. A small number wanted to reward businesses who used recyclable materials or provide subsidies to businesses to help them innovate and use more sustainable practices.

In addition, contributors were supportive of a container deposit scheme or reward programs, where recyclable materials could be returned to a specific location for a small cash refund.

One individual suggested gamification of a recycling system, where users can achieve badges or new levels the more they recycle. Another suggested increasing the fees to send waste to landfill and using the additional funds to subsidise recycling.

I think that the reimbursement programs would have the most impact, perhaps a small reimbursement per kg of clean soft plastics returned to a drop-off point, and things like tax incentives or rebates for companies if they use recycled plastic in their products.

Importance of management and processing

27 comments

A considerable number of contributors highlighted the importance of ensuring recycling processes were managed effectively. Contributors discussed implementing enforcement and regulation around recycling to ensure recycling centres were appropriately sorting waste streams. A few contributors also stated that waste should be processed and managed locally.

Important to also incorporate strategies to encourage the use of, and demand for, recycled products (eg making it cheaper to companies to make new products from recycled materials than from virgin materials)

Capacity for electronic waste recycling

20 comments

Several contributors raised the issue of electrical goods; there was consensus that there is a lack of suitable places to recycle these products. Several wanted more drop-off locations or facilities to deal with electronic waste such as batteries, handheld devices, accessories, computers and mobile phones. The lifespan of (some) appliances and computers was thought too short, resulting in unnecessary waste. One suggestion to address this follows:

Also, I would also recommend that manufacturers of electrical items should be made responsible for the entire lifecycle of their product. Consumers should be able to return an electrical appliance to the manufacturer once it is no longer needed. This will encourage manufacturers to ensure their product is fully and easily recyclable.

Barriers for businesses to recycle

17 comments

Contributors from the business community were asked to identify the barriers that prevented their businesses from recycling. A small number of contributors stated that cost was the most significant barrier to recycling. This included costs of: alternatives to plastic products; cost of recyclable materials; and, cost of collection services. Other barriers included: difficulties with building managers; lack of space for recycling facilities; a lack of access to facilities; bio-products not biodegrading; and, risk of damage to reusable products (e.g. plates or cups getting chipped).

Co-mingling

7 comments

A small number of contributors discussed co-mingling waste bins. A couple were opposed to co-mingled waste bins, believing that they encouraged error. One contributor provided general support. Contributors appeared to have a different understanding of co-mingled waste, with some suggesting that co-mingled waste should include everything except organic waste and others suggesting that it contained only various recyclable waste.

Co-mingled bins should go! Need multiple recycling bins – let the people sort and teach them how. Glass – Alum – Plastic and paper.

Waste Zero Australia sought co-mingled compactors to be more straightforward to use to ensure source-separation processes were more efficient.

RECOVER

312 COMMENTS

Organic waste

279 comments

Recovering resources from organic waste was discussed by a very large number of contributors. A large majority of these contributors expressed support for such strategies or sought more emphasis, action, or support from CoM in this area.

Food waste should also be a priority in all areas of the supply chain, from the farm down to landfill. Food waste should go back to the earth in a sustainable way that doesn't result in methane production.

Generating compost from food waste and/or reducing the volume of organic matter sent to landfill were the primary reasons contributors sought improved management of organic waste. Contributors most commonly discussed residential organic waste, often expressing the importance of providing options for those who live in inner city or apartment buildings where individual composting is challenging. A moderate number suggested organic waste could be used to generate compost for public parks or gardens, donated or sold to farms, or sold to fund waste and resource recovery actions; collaboration with neighbouring councils to implement systems and facilities, as well as processing organic waste into compost, was also suggested.

All food scraps should be collected from homes, restaurants and cafes. Also coffee grains should be included. such "rubbish" would make excellent compost for parks, gardens, etc etc

Commercial organic waste

A sizable number of contributors sought action to recover commercial organic waste or unusable food. Many expressed frustrations over the large volume of commercial food or organic waste (particularly from the hospitality industry) that is taken to landfill when it could be recovered, primarily to be converted into compost or donated.

...We produce a ridiculous amount of reusable waste in just one day, one restaurant.

Many sought additional or separate strategies for recovering commercial organic waste over those aimed at residential waste. A moderate number suggested that businesses should have compost bins or that organic drop-off facilities be set up in areas with a high density of hospitality or food-related businesses. Several others sought an improved organic waste collection service for businesses.

Melbourne could have mass composting facilities where businesses and individuals could send their food scraps if they don't have room for a compost/alternative on their property. Personal composting should be encouraged if they have the space and resources, though.

A substantial number of contributors described, or suggested initiatives aimed to recover usable food or organic waste. A moderate number sought recovery and distribution of edible food to organisations or charities serving those in need, such as the Foodbank. A couple disapproved of supermarkets throwing away a lot of produce that is not considered "perfect"; one added that the attitude of buying perfect produce needs to change.

More powers for businesses to donate additional food that is still 100% edible to Food banks and other NGOs.

Several contributors thought that more education and collaboration between CoM and businesses would divert more food waste from landfill to be converted to compost; ensuring that businesses understand best practices and have plans in place. Putting regulations in place and conducting audits

was suggested by several contributors, including a couple who thought an organic waste management audit could be conducted alongside other inspections.

So many teams of CoM visit businesses, better integration across services. Include waste mgmt investigations/educations/questions into the work done by other CoM teams like Health inspectors

Several sought more support for business initiatives and “zero-waste” hospitality businesses, with many particularly mentioning Joost Bakker’s café, Brothl. A small number of contributors sought more financial support from CoM to incentivise businesses to make the effort to responsibly dispose of their organic waste so that it can be recovered. A few contributors sought alternatives to reduce the volume of edible food thrown away in hospitality businesses by encouraging them to allow customers to take their uneaten food away with them or providing smaller meal sizes.

Other ideas included: promotion of technology to track food wastage in hospitality businesses, such as the “LeanPath food waste smart tracker” or weighing devices in bins; funding for incinerators in hospitality businesses; a “Pay-As-You-Feel” initiative in some supermarkets; distributing items such as oyster shells back into their original environment; and, compost bins near normal public rubbish bins in hospitality-business hotspots.

Residential compost bins or worm farms

A substantial number of contributors discussed individualised residential management of organic waste, primarily in terms of residential compost bins or worm farms. The majority of these contributors sought action to reduce the volume of organic waste going to landfill when it could be used to generate compost; dealing with organic waste at its source was considered the best option.

Processing organic waste into a useful end product is one of the easiest things residents can do. We should rather be encouraging people to process their own food scraps not providing them with another plastic bin (high in embodied energy) and transport miles (adding to carbon emissions) and processing/landfill.

Commonly, contributors requested that CoM encourage the use of or supply compost bins or worm farms to residents, along with education on how to correctly use the bins. Several contributors acknowledged the challenges faced by those residing in the inner city or apartments to responsibly manage their organic waste, so suggested that community or apartment gardens with compost systems could be encouraged or mandated. Some thought that this could promote community interaction and that residents (and their community gardens) would directly benefit from their composting. Several sought CoM support for products such as Bokashi bins, or “Compostas”, including providing locations to deposit the generated compost. HomeBiogas systems, which use organic waste as fuel for stove tops and also as liquid fertiliser; adding compost bins or “hungry bins” (worm farms) alongside public rubbish bins; and, CoM to subsidise worm farms and/or compost bins were also suggested.

Discount for people on compost bins/wormfarms if they are not already available through there councils. Some sort of reward/incentive (financial?) for creating less waste.

Residential collection service

A substantial number of contributors discussed the implementation of a residential organic waste collection service. The majority supported or sought a collection service so that organic waste could be converted into compost. Contributors primarily mentioned collection of organic waste bins, while a few suggested compostable bags.

A kitchen caddy (with cornstarch bag or similar) that can be used to collect food scraps (ie. lemon peel/bones/scraps) that can be collected separately in a Green Waste bin. The bags will be essential, to reduce fruit flies and bugs and stop the bins from stinking. This can then be turned into compost and reduce waste.

Several stated that a solution is needed for those whose living situation means they cannot compost organic waste, such as apartment or inner-city living. It was noted that for effective implementation and community participation of an organic waste management system, it needs to be as simple as possible; one added that dealing with organic waste needs to be as simple as throwing it into the normal waste bin.

As an apartment resident, I feel that there is a huge opportunity for reducing waste going to landfill through reducing the amount of food waste that ends up in bins. Having a bin just for food waste would help...

Several contributors expressed support of other councils or countries that already collect organic waste, with some adding that CoM is “lagging behind”. One contributor stated that an organic waste collection service would not require significant investment or technology due to CoM already collecting household waste.

A small number of contributors expressed concerns regarding an organic waste collection service, including: the cost; unpleasantness of having a food waste bin; and, lack of space for an extra bin.

Residential drop-off location

Support for residential organic waste drop-off facilities was expressed by a substantial number of contributors; these comments were typically simple in nature. Contributors favoured the idea of taking food waste to common collection points, to generate compost that would be either sold or distributed throughout public gardens.

Having collection points for kitchen scraps could help people keep them from going into general waste. I take my scraps to my community garden, but a more industrial composting solution would turn over scraps quicker.

Several contributors discussed having community gardens or parks as locations where residents could bring their organic waste; some noted that this could foster more community involvement and spirit, as well as encouraging residents to be more responsible and proactive regarding waste management. Examples of locations where contributors liked the organic waste drop-off system, such as Chippendale in Sydney or certain composting centres, were provided by a small number of contributors.

Composting is another issue. Residents need to be encouraged to compost their organic waste and one way of doing this is to promote community gardens where residents can be in contact with the growing process of their own leafy greens.

A small number of contributors opposed or expressed concerns about community organic waste drop-off facilities. These contributors did not think such facilities would be well utilised, and a more impacting action is required; one stated that they could not justify the time or effort to travel to common composting facilities, so preferred a collection service. A couple of contributors thought that the unpleasantness of taking waste to these facilities and the facilities themselves would reduce use.

Other comments and ideas

A moderate number of other comments and ideas for how to recover resources from organic waste were made. While some gave general examples of other areas where composting solutions worked, specific ideas included: putting strategies in place for people to donate unused food for homeless people or those in need; experimenting with new worm farming methods; community members should decide the best way to manage their own organic waste; providing public green waste composting bins for people to use when they are out (example of Monash University); using earthworms to decompose waste; using San Francisco's system as the "gold standard"; using television programs to educate residents about organic waste; generating biochar; companies making compostable nappies; paying by weight of waste was thought to increase usage of organic waste recovery systems; and, the following.

Social enterprise to employ people to collect food waste for reuse or composting/biofuel

Suggested recovery ideas

12 comments

Several ideas focusing on recovery were submitted. A small number suggested that recycled plastics or glass could be used for roading infrastructure (including tarmac, markings, and signs), with some adding that other countries have been experimenting with this approach. A few contributors thought that recycled plastics could be used in building materials, such as building blocks; some noted that this was being done in Mexico. Other recovery-focused ideas included: using recycled plastics in 3D printers; encourage goods to be made from recycled plastics; using recycled waste to generate products such as toilet paper or packaging; and, generating furniture from recycled products.

Many countries are looking at ways to use plastic for roads building and other infrastructure why is Melbourne not looking into this

Commercial and construction industries

8 comments

Several contributors commented on recovery of commercial or construction industry waste. These comments were broad, referring to waste from a wide range of industries. A couple of contributors thought that improving the understanding of what is in particular sector(s) or commercial waste, where it comes from, and the environmental impacts of it, before developing resource recovery strategies with businesses, was required.

Other comments included: recovery of useful building materials; reducing cost of repair compared to cost of new items; CoM to develop system to recover unused soap from accommodation businesses;

improved collection of hard waste so that it is recovered in better condition (for donation); and, initiatives for businesses to have their unwanted goods recovered and reused.

Other comments

13 comments

A moderate number of other broad comments referring to resource recovery from waste were provided. Overall, these contributors sought more implementation of systems and infrastructure or action from CoM to recover useful resources from waste. Many also sought reduction of environmental impacts and volume of waste going to landfill, or they expressed opposition to wasteful actions and attitudes. Some sought prioritisation of recovery over other initiatives, such as AWRRT that converts waste to energy or recycling. A few referenced international examples of successful recovery initiatives. One commented that rate payers would not mind paying a bit more if CoM introduced a “cleaner and greener waste and resource recovery strategy”. Another thought that resources in waste should be more highly valued.

make waste products into commodities (eg: sell your waste to a collector! Don't pay them to take it away)

REUSE

88 COMMENTS

Resale or repair

43 comments

Comments about the resale or reuse (through repair) of goods were made by a substantial number of contributors. Several contributors wanted to prevent hard rubbish (e.g. furniture, whiteware, electronics) from being sent to landfill; these goods were viewed as having the potential to be salvaged. Repair centres or “repair cafés” could be established to repair products if this were feasible. One contributor believed that these centres could be staffed by volunteers who could share their expertise with the community. Contributors believed that this would help to foster more sustainable living.

Recycling and repurposing of larger waste items such as white goods and computer should also be a priority

A small number of contributors, including one substantial submission from the Kensington Community Network (KCM), expressed support for the development of the Kensington Repair Hub. This Hub would be a location where tools, facilities, and teachers are present to aid the public or groups in repairing damaged goods; mentoring programs to educate people, particularly youth, how to repair and reuse machinery, electronic equipment, and other goods would also be run here. This initiative was supported as it reduces hard waste going to landfill, reduces consumerism, provides vulnerable communities with repairing skills, and improves “repair economy”. The KCN requested funds to conduct a feasibility study for the Kensington Repair Hub.

Reusing waste

34 comments

General

Contributors expressed the need to reuse items instead of throwing them away into general waste or recycling bins; this was thought to reduce landfill waste volumes. Support and encouragement of businesses and residents to reuse items was commonly sought by these contributors; some explained

that promotion of reuse or having facilities and services available was required. Encouragement of “upcycling” was also noted.

Food and beverage containers

Several contributors stated that they want businesses and companies to reuse containers and bottles (e.g. glass jars or bottles) that are sent to recycling facilities. They also wanted businesses to provide incentives such as discounts for customers who brought their own reusable cups or containers to their outlets.

Bring back REUSED glass bottles and jars. All that needs to be done to them is to have them washed and sent back to the factories where food is packaged. The only costs will be transport, and washing facilities. Glass jars and their metal lids will last hundreds of times and are very safe and hygienic to reuse for food storage many many times.

Specific examples of reuse

A small number of contributors discussed the different possibilities of turning different waste streams into useful products. Examples included: sewing groups to make reusable bags from donated materials; and, increasing the market for reuse of large furniture, whiteware items, or computers.

Incentives to reuse

7 comments

Contributors also sought incentives that supported facilities for repairing and reusing. Commonly discussed was a repair café or hub where consumers could return faulty goods to be repaired rather than sending them to landfill. A few contributors stated that these should be subsidised.

Divert landfill by advocating repair cafes and recycling hubs and providing financial support for them.

Suggested ideas

4 comments

A small number of contributors suggested ideas to promote reuse of products. These were: “community swap” meetings; “female-orientated education” to encourage reuse of clothing; encourage washing plastic goods to reuse them and develop legislation to make businesses use packaging that can be reused (e.g. Tupperware-type containers); and, encourage businesses to reuse packaging and boxes for transportation of goods.

GENERAL SUPPORT

26 COMMENTS

A moderate number of contributors generally expressed support for Priority 1 or initiatives within this Priority. Overall, these contributors supported efforts, infrastructure, and services to encourage reducing, reusing, recycling and recovering resources; some thought that the implementation of more facilities and services in this area would create jobs.

I read a quote by Pete Seeger, "If it can't be reduced, reused, repaired, rebuilt, refinished, resold, recycled or composted, then it should be restricted, designed or

removed from production." This is absolutely the fact of it. We need genuine leadership on this.

Reducing the volume of waste going to landfill, particularly if it contains valuable resources, was the primary concern for these contributors. Some sought more effort from CoM to put initiatives in place (such as the actions described under Priority 1), while others thought that Melbourne residents need to be more responsible for their waste.

Diverting waste from landfill is priority. If that means more bins on the street and relying on residents to sort their waste then so be it.

OTHER COMMENTS

7 COMMENTS

Other comments relating to Priority 1, or generally regarding reducing, reusing, recycling, or recovering waste and resources were made by a small number of contributors. Comments included: storage for more bins for businesses; management of waste on-site; more options for public rubbish disposal and collection services; more sustainability-focused waste and resource recovery facilities for apartment buildings; use of re-usable plastic crates to transport goods into and out of Melbourne to reduce cardboard box use; and, one thought that more knowledge regarding sector and industry waste, including how much waste and where it comes from, was required prior to developing management strategies for businesses.

PRIORITY TWO: DEVELOPING LANDFILL ALTERNATIVES

Summary of findings

Overall:

Development of landfill alternatives were typically discussed favourably by a considerable number of contributors. Overall, these comments were generally supportive or suggestive in nature, seeking environmentally sustainable methods to minimise waste to landfill and recover useful resources.

The most commonly discussed alternative waste and resource recovery technology (AWRRT) was a waste to energy system. While many were in favour of developing this technology and/or system to reduce the volume of waste going to landfill, others expressed concerns that this was not an environmentally sustainable option (due to pollution of burning waste and discouraging reduction of waste generation).

A small number of contributors supported waste sorting AWRRT, while others suggested other ideas to divert waste going to landfill.

Specific findings:

- Value was seen in harnessing the energy within waste into a useable form.
- It was acknowledged that AWRRT, such as those that produce energy from waste, would require innovative and novel approaches.
- Specific suggestions to develop landfill alternatives included using elements of waste as fill for roading and using green waste for agricultural purposes.

AWRRT

68 COMMENTS

AWRRT Waste to Energy

61 comments

A considerable number of contributors expressed support for AWRRT (alternative waste and resource recovery technology). Converting waste into a valuable resource and diverting it from landfill was the primary reason for supporting this initiative. Contributors primarily mentioned burning waste as a method of energy generation, while a couple discussed anaerobic digestion. Several made note of successful international examples of using waste to generate energy, European countries were most commonly mentioned. Some contributors felt that Australia was lagging behind other countries' efforts to reuse landfill waste to produce energy. One suggested that more research should be done into the efficiency of methane-converting facilities.

Building 0 waste facility for destruction of land field garbage and accumulation of energy, similar to one in Norway! Number one priority!

Concerns regarding waste to energy AWRRT were raised by a moderate number of contributors. Some supported efforts to reduce landfill volume; however, they sought reassurances that any implemented

waste to energy system produced “clean” or “green” energy. Others were strongly opposed to this initiative as they did not consider it a long-term environmentally sustainable or recovery-efficient option; reduced public incentive to responsibly manage waste was noted. A couple commented on the negative impacts of a waste-to-energy facility on residential amenity, while others noted that it is being phased out in other countries.

Please don't turn waste to energy through incineration, it will increase air pollutants and add mercury into the toxic mix. It is not a path for sustainability, it is a short term solution to a long term problem.

AWRRT Sorting

7 comments

A small number of contributors discussed sorting AWRRT. Accurately sorting waste, either prior to collection or in processing facilities, was thought to reduce the volume of recyclable material being sent to landfill. One suggestion was to distribute rubbish bins equipped to sort waste into distinct compartments; another noted that this could increase rubbish bin numbers, but that more waste would be recycled. Sending sorted recyclable waste overseas was suggested by an individual. Having a separate disposal system for hazardous materials was suggested once.

OTHER COMMENTS

12 COMMENTS

General support

6 comments

A small number of contributors expressed general support for efforts to develop landfill alternatives. Some sought more prioritisation or proactive actions to reduce the volume of waste and reusable resources going to landfills.

I think this is one area where government really is going to have to take the lead - individual efforts can only do so much within existing infrastructure and options for waste reduction/disposal. To this end the development of landfill alternatives and better local recycling options (including for organic waste) should take priority.

New ideas

3 comments

Alternative ideas to reduce reusable resources going to landfill were provided by a small number of contributors. A variety of ideas were suggested, including: generating fuel from coffee waste; use method of diverting food from landfill like City of Yarra in 2013-14 (no specifics given); and, promotion of food waste smart trackers within hospitality businesses, such as “LeanPath”.

LeanPath food waste smart tracker (www.leanpath.com). Is used by businesses including PwC at Souhbank and Monash Health to help prevent food waste. Novotel Brisbane has used LeanPath to reduce food costs by 80% by preventing pre-consumer food waste

Other concerns

3 comments

Concerns regarding landfill alternatives were expressed by a few contributors, including: consideration of processing plants’ environmental impacts should be included in decision-making processes; odour and vermin issues associated with food drop-off collection points; and, concern that large processing facilities just support big businesses.

PRIORITY THREE: STIMULATING INNOVATION

Summary of findings

Overall:

Contributors had faith in innovative ideas being a solution to waste problems in future, however, these comments were relatively few compared to other topics.

Food waste from hospitality and commercial food production was viewed as problematic. Unused food was viewed as a resource, the distribution of which was perceived to reduce waste to landfill.

Specific findings:

- Applications (apps) were viewed as an innovative way to facilitate the distribution of food, and other items of potential use to others.
- Technological innovations were suggested, as well discrete ideas such as large-scale composting, the dehydration of organic waste.
- A considerable number of contributors provided specific innovative ideas regarding waste and resource recovery.

SPECIFIC IDEAS

33 COMMENTS

Hospitality and food waste

9 comments

Several contributors shared their innovative ideas regarding the hospitality industry and commercial food waste. A small number of contributors suggested mobile phone apps to notify people when businesses had excess food to be sold cheaply, identify businesses that are waste-responsible, or to assist staff to monitor kitchen waste. Other ideas included: edible utensils; small-scale solution of dehydrators for hospitality businesses; deposit system of re-usable takeaway bags, containers, and utensils for events and businesses; and, support for businesses that use unwanted food (e.g. soup kitchens using bones and vegetables from other restaurants).

I mentioned to our CoM table rep.....open air events held at Fed Square + Birrarung Marr sidewalk could benefit from having reusable takeaway bags and attempt to replace plastic serving ie cutlery plates and take home chopsticks. They pay a stall holder fee so maybe a portion of the fee could go into a fund and CoM subsidise the remanies monies to buy in bulk and distribute to foodies each time an event is on. The foodie win by not having the expense of purchasing plastics and helps our environment by reducing plastic waste

Technology

7 comments

Innovative ideas utilising modern technology were provided by a small number of contributors. A few ideas utilised 3D printers and/or discussed substrate options, including: plastic bottles; and, cement.

Revise the prescriptive standards on structural cement to allow chemistries that can stably entomb incinerator ash, such as calcium Sulpho aluminate to ettringite, which would also create a local supply for 3D printing cement.

A couple made suggestions regarding apps or websites; one suggested an app to connect people and businesses to reuse items, while the other proposed a website to direct residents to locations where they could dispose of their non-recyclable waste. Note that a small number discussed apps relevant to the hospitality industry, which are discussed above.

A suggestion for a machine that scans deposited plastic bottles and remakes them into new bottles was made, while another generally sought improved use of technology in waste recovery efforts.

Organic waste

7 comments

Innovative ideas to reduce or reuse organic waste were suggested by a small number of contributors. These ideas included: use of organic waste dehydrators; large scale composting facilities to service city gardens; fuel generation from coffee waste; black soldier fly larvae to process food waste and then be used as stock feed; crop food waste to be better utilised (e.g. human or pet food); and, CoM to provide information and products on their website to help public self-manage their food waste.

Other ideas

10 comments

Several other innovative ideas were submitted.

A small number mentioned large-scale innovative initiatives, including: composting facilities; thermal or solar glass recycling plant; use of (suggested) waste tax to build a large recycling facility; and, one sought small-scale facilities as well as large-scale ones.

An individual suggested looking for ideas outside of typical government or council models for ideas, while another thought "inter-council competition" would produce innovative solutions.

Other ideas included: community projects to reuse commonly recycled products (e.g. weather shelters or community glass houses from plastic bottles); use of greener alternatives such as "paper, glass, and hemp"; and, recycling deposits at schools of unusual recyclable items (e.g. toothpaste tubes).

GENERAL SUPPORT

15 COMMENTS

Support for stimulating innovation was expressed by a moderate number of contributors. Encouraging innovation of solutions to waste and resource recovery was viewed positively and as a forward-thinking, sustainable approach.

If Melbourne city wants to be a global leader and not a global follower in waste management, than the most important thing is innovation, we need to do something

that is brand new in the waste management industry in a scalable fashion such that others can follow

Some thought that stimulating innovation and implementation of these ideas could be a community-minded effort, while a few noted that this could create jobs. A small number sought more emphasis on innovation regarding waste and resource recovery efforts or encouragement of the community to get involved with providing and implementing new ideas. One sought Melbourne to be a leader of innovation regarding waste and resource recovery strategies.

This is a real opportunity for the state of Victoria to lead the way and come up with innovative solutions that provide real benefits for the environment and also encourages innovation, entrepreneurial spirit and creates jobs.

FUNDING INNOVATION

15 COMMENTS

A moderate number of contributors suggested providing funds to stimulate innovation of new ideas or methods to manage waste and resource recovery. Many suggested seed funding businesses or education providers to encourage the innovation, implementation, and upscaling of new ideas; this was considered a proactive approach. Investment to support innovation of methods to recycle or reuse plastic was commonly sought by these contributors.

There are many innovative groups that could revolutionise the way we treat waste, but no-one is willing to gamble on them. I would like to see a open and merit-based assessment of proposed solutions, with funding \$\$\$ going to the ideas and skillsets that are truly radical (rather than the 'least risky')

A couple of contributors suggested that more provisions for innovative research of waste and resource recovery strategies should be made available. Another couple specifically requested that financial support to stimulate innovation should come from CoM or the government.

QUESTION INVESTMENT

7 COMMENTS

A small number of contributors questioned the need for (or investment in) stimulating innovation around waste and resource recovery. One thought that creative designs would “occur naturally” if support in the form of infrastructure and services was in place. Comments from contributors included: a couple who questioned the monitoring of financial support for businesses and the support of innovation for sustainability purposes; one who sought innovation outside of classic models, forums, and action plans (that supporting innovation is good, but may not be enough to change consumerism and resident behaviour); and, one who made the following comment.

In regards to "Stimulating innovation by providing financial support for businesses, social enterprises and community groups". I think the council would be better off by just installing better systems for waste management, particularly food waste. Rather than paying people to do it for them.

PRIORITY FOUR: REDUCING AMENITY IMPACTS FROM WASTE COLLECTION

Summary of findings

Overall:

There were amenity concerns about waste collection processes; these were mainly in the form of the unsightly or obstructive nature of bins, and noise from collection vehicles. Only a few contributors expressed an opinion to the contrary.

Larger waste bins (i.e. skips) were identified as unsightly when left unemptied for extended periods, and in some cases too large for the space they occupied.

Specific findings:

- Full waste bins, and bins obstructing business operations were viewed unfavourably.
- Waste collection vehicles operating within set time frames was desired to minimise noise.

AMENITY

20 COMMENTS

Negative impacts on amenity

16 comments

A moderate number of contributors expressed frustration over the impacts of waste or associated infrastructure on residential amenity. A small number noted that the noise from collection vehicles driving on residential roads or collecting waste was a “big problem”; particularly, noise at early hours of the morning or from multiple collection companies over the course of one day.

Personally as a resident in the CBD I find the noise from the collection of waste to be an issue along with overflowing bins and waste from collection vehicles. The noise generated from collection may be difficult to improve on, particularly the noisy glass in recycling collection

Unsightly rubbish bins were an issue for a small number of contributors, primarily due to them overflowing, or due to their positioning on the footpath or in front of retail businesses, attracting vermin, or graffiti. Other impacts on amenity caused by waste, or its collection or associated infrastructure, included: volume of waste on Punch Lane due to the increasing number of business; waste fluid from bins not being collected and spilling onto road and into drains (reported as an amenity and environmental concern); amenity issues at Dynon Road waste disposal complex; cardboard boxes on Flinders Lane; and, the possibility of odour and vermin issues at food waste collection points.

Amenity is not a problem

4 comments

A small number of contributors did not think that waste-related impacts on amenity were a problem. Reducing the environmental burden of waste and promoting responsible waste management were

more important for a couple of contributors over amenity. Another contributor stated that noise was just part of city living.

I don't really get the fourth priority? It will certainly make living more convenient, but I don't see how it will make people want to play a greater role in being environmentally friendly. I think a big part of seeing the bins on the street, and seeing the trucks come through the neighbourhood is a huge reminder about our waste and our responsibility to be environmental. ...

NEW IDEAS

16 COMMENTS

Bins and compactors

9 comments

A small number of contributors offered ideas regarding waste bins/skips or compactors. A couple considered compactor bins to reduce amenity; one suggested smaller compactor bins in laneways, while another suggested underground bins. Improved bin ownership accountability and ownership was sought by a couple of contributors. Regarding on-street bins, one sought more consultation with business owners about placement of bins and another requested locked bins. Other ideas included: bins for cardboard on Flinders Lane; and, improved coordination with "Planning around storing bins onsite".

Technology

3 comments

A few comments suggested implementing technological approaches to waste and resource recovery management. These comments were: trucks with "smart-sensor technology", making them quieter, reducing contamination and escaping litter, or require someone to move bins into place; "smart bins", which can put themselves away after being emptied; and, the following comment.

Use of an app as alert system to collect waste. Employ local unemployed people and equip them with bikes

Other ideas

4 comments

Other ideas included: promoting residents to manage their organic waste to reduce the number of collection trucks; to enforce local laws, introduce more CCTV; and collaboration with "QVM re-development" to reduce waste impacts.

COLLECTION

15 COMMENTS

A moderate number of contributors discussed the process of waste collection in terms of amenity. Many reported issues with collection vehicles: noise produced by vehicles driving and collecting waste, both in terms of frequency and time of the day or night; and, environmental impacts caused pollutants released from poor vehicle upkeep or unsecured litter.

The trucks are old, polluting, and incredibly noisy. Ruining the dining experience for all those in the area.

To reduce the negative impacts on residential amenity, and to improve collection efficiency, a small number supported efforts to collaborate or coordinate collection services. Consolidation of waste and/or recycling collection companies to reduce the number of vehicles and collection occurrences was requested; consolidation of collection services was sought for high-rise apartments and the point was made that this should occur at a “reasonable” hour.

by encouraging and combining waste and recycling services within high rise developments - hopefully this also means collection of waste can be coordinated to minimise number of separate service providers collecting waste at all different times and reducing noise from waste collection companies

To improve collection, a few provided some suggestions, including: zones for collection; reducing frequency of collection to increase residential responsibility of their waste; and, improved waste collection system for businesses managed by CoM.

GENERAL SUPPORT

7 COMMENTS

Comments providing a positive sentiment towards efforts to reduce negative impacts of waste on amenity, or expressing support for Priority four, were made by a small number of contributors. These comments were general and simple in nature, supporting this Priority. One contributor sought more effort to reduce the impact of waste and resource recovery on amenity.

Appendices

APPENDIX 1: ANALYSIS OF CONTRIBUTORS' RESPONSES, FROM CONNECTION TO MELBOURNE GROUP PERSPECTIVES

Aim of this analysis: To determine if contributors with different connections to Melbourne commented on certain priorities or aspects of the Draft Strategy, differently.

Note: only respondents who completed the Participate Melbourne online survey are included within this analysis. Each respondent could select multiple connections – therefore there are more connections than number of online survey contributors.

SUMMARY

The overall aim of this analysis was to determine if the connection-to-Melbourne groups discussed each Priority or aspects of Priority 1 differently.

Key findings were:

- Contributors most common connection to Melbourne was living there, followed by working in or visiting Melbourne.
- Proportion of comments on each priority was typically consistent between groups.
- Priority 1 was the priority most commonly commented on by all groups.
- Proportion of comments on Priority 1 topics was typically consistent between groups.

COMPOSITION OF ONLINE SURVEY CONTRIBUTORS

Contributors who completed the Participate Melbourne survey were asked: What is your connection to Melbourne?

Contributors' answers to this question were used to classify contributors into connection-to-Melbourne groups, which were then used to complete this analysis.

Results

Figure 7 presents the Participate Melbourne Website online survey contributors' connection to Melbourne; these will be referred to as connection-to-Melbourne groups throughout this section.

Note: This figure has also been presented as Figure 1, but has been repeated here as the data directly relates to the rest of the analysis below and is useful to visualise when interpreting this data and analysis.

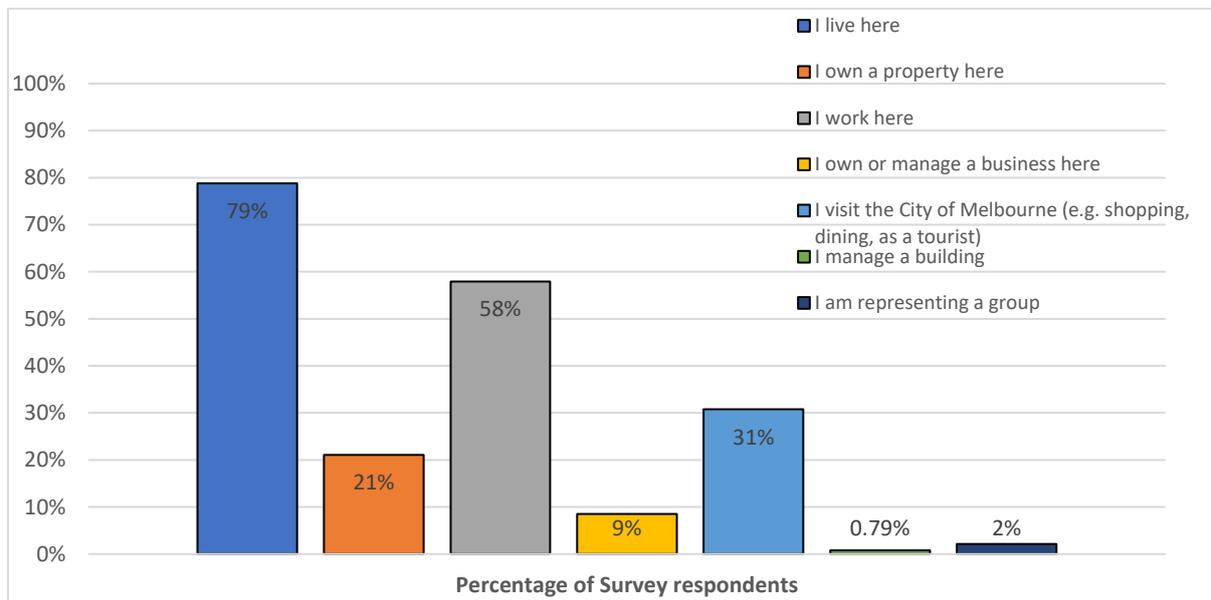


Figure 7: Repeated figure of contributors' connection to Melbourne

The bar chart displays the percentages of online survey contributors' connection(s) to Melbourne. Note that respondents could have more than one connection to Melbourne. Key (right) indicates the colour of each connection type. Percentage of each connection is displayed in the corresponding bar; percentages rounded to nearest whole number.

Analysis

Contributors' connection(s) to Melbourne:

- **Contributors' most common connection to Melbourne:**
 - 79% of contributors (702) live in Melbourne.
 - 58% of contributors (516) work in Melbourne.
 - 31% of contributors (274) visit Melbourne.
- **Contributors' least common connection to Melbourne:**
 - 1% of contributors (7) manage a building in Melbourne.
 - 2% of contributors (19) represented a group from Melbourne.

WHAT EACH GROUP DISCUSSED

To determine if there were any differences in what each connection-to-Melbourne group discussed, the number of comments made on each topic were counted, proportional to the size of each group.

Results

The number of comments made by each connection-to-Melbourne group on each Priority were counted; Figure 8 presents the number of comments made, while Figure 9 shows the proportion of comments made on each Priority, by each connection-to-Melbourne group.

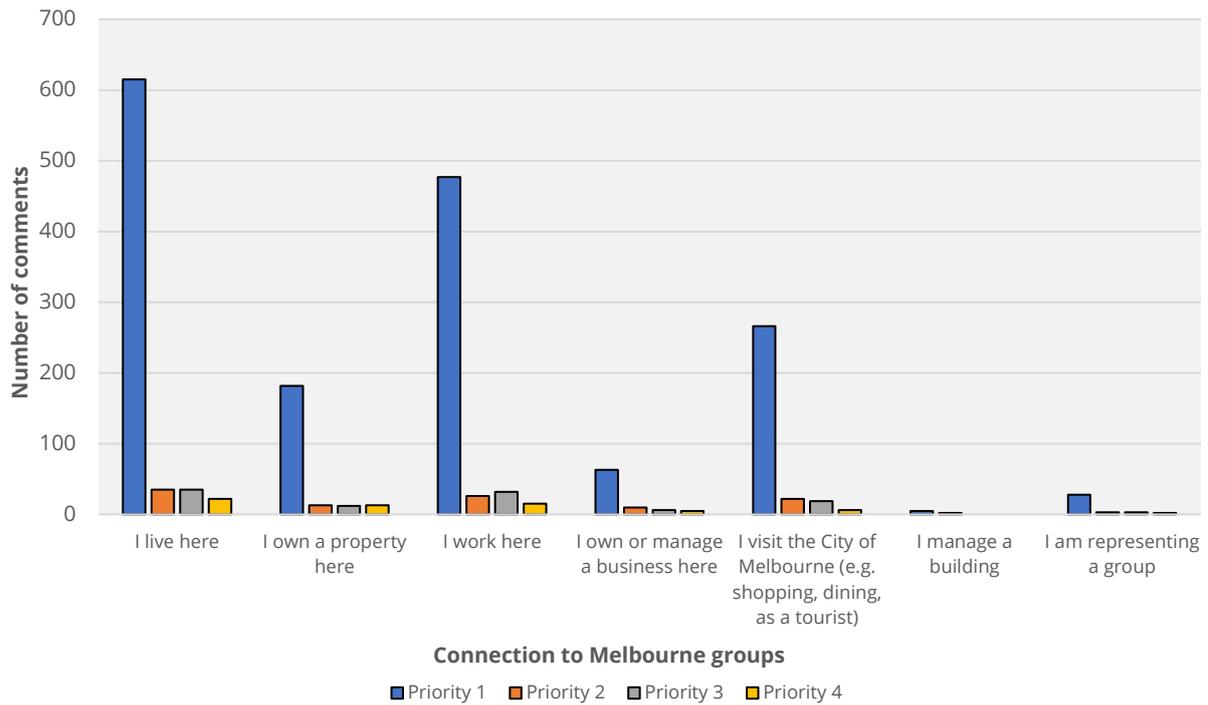


Figure 8: Number of comments on each priority per connection-to-Melbourne group

Number of comments (y-axis) regarding each Priority per connection-to-Melbourne group (x-axis) is displayed; colour key (below) indicates priorities.

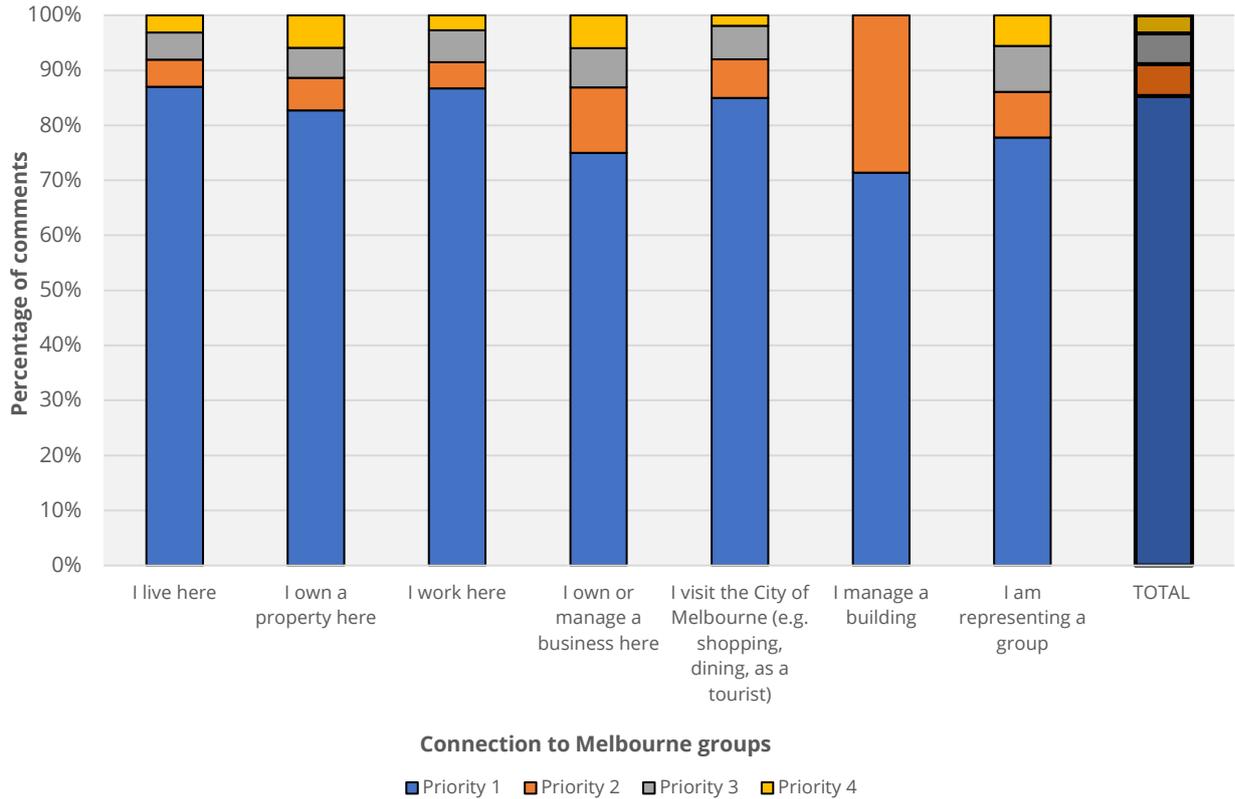


Figure 9: Proportions of comments on priorities were consistent across connection-to-Melbourne groups

Percentage of comments (y-axis) made on each Priority by each connection-to-Melbourne group (x-axis); colour key (below) indicates Priority. The percentages of all comments from all groups is labelled “TOTAL” (darkened bar).

Analysis

Predictably, the number of comments made by larger connection-to-Melbourne groups (Figure 1 and 7) made more comments than other groups; for example, those that live in Melbourne made more comments than those who own property in Melbourne (Figure 8).

All groups most commonly commented on Priority 1, with at least 70% of Priority comments made by every group being on Priority 1. Priorities 2-4 were discussed significantly less by all groups (all received 35 comments or fewer).

Overall, there were few differences in the proportion of comments made by each group on each Priority (figure 9). One difference observed was in the groups “I own or manage a business here” and “I manage a building”, which had higher proportions of comments on Priority 2 (Developing landfill alternatives) compared to other groups. However, due to the small number of contributors from these groups (Figure 1 and 7), caution is advised regarding this finding.

DISCUSSION OF PRIORITY 1 BY GROUPS

Due to the large number of comments made on Priority 1 by all connection-to-Melbourne groups, further analysis was conducted to identify if any groups made proportionally more comments on certain topics within Priority 1, compared to other groups, such as: reduce; reuse; recycle, recover; general supportive comments; and, other comments were determined.

Results

The number of comments made on each of Priority 1 topic by each connection-to-Melbourne group was identified (Figure 10), after which, the proportion of comments made on each topic by each group was determined (Figure 11).

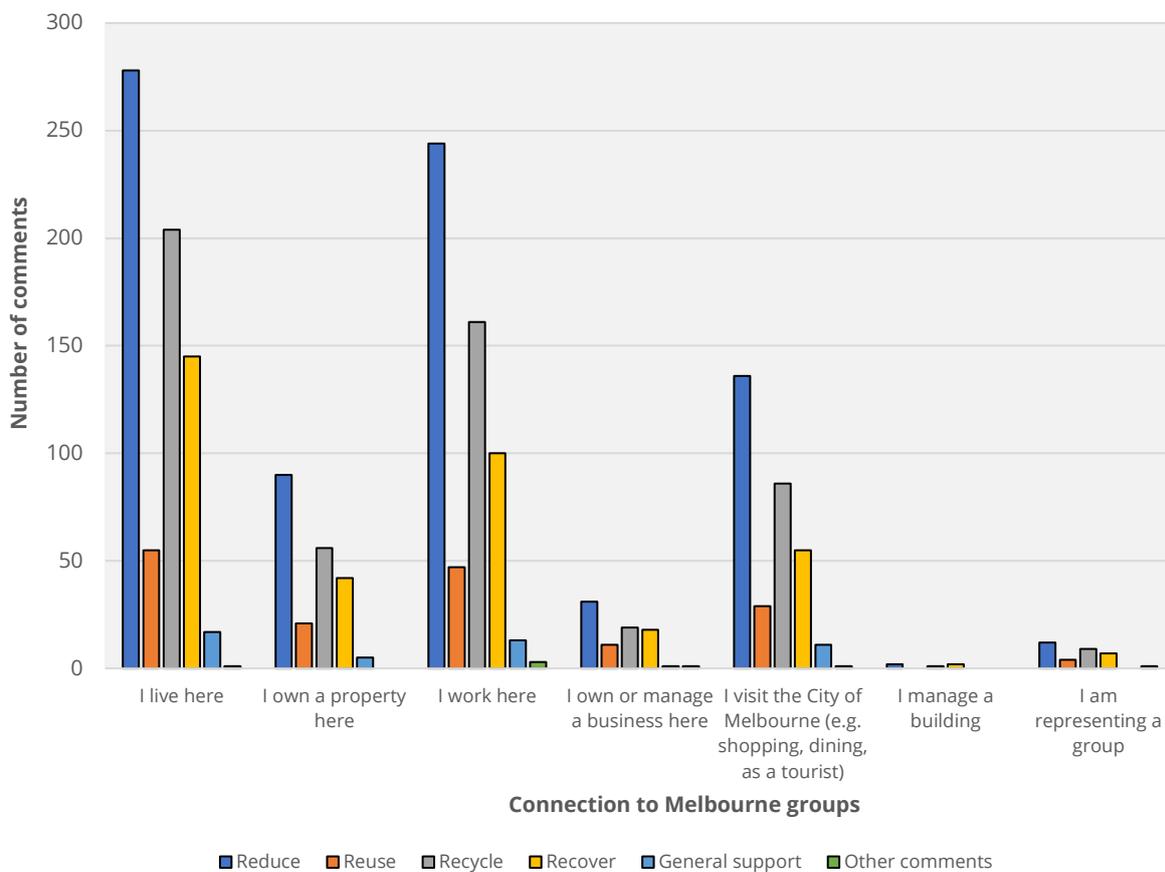


Figure 10: Number of comments made by each group on priority 1 topics

Number of comments (y-axis) made by each connection-to-Melbourne group (x-axis) on Priority 1 topics; colour key (below chart) corresponds to topics of Priority 1.

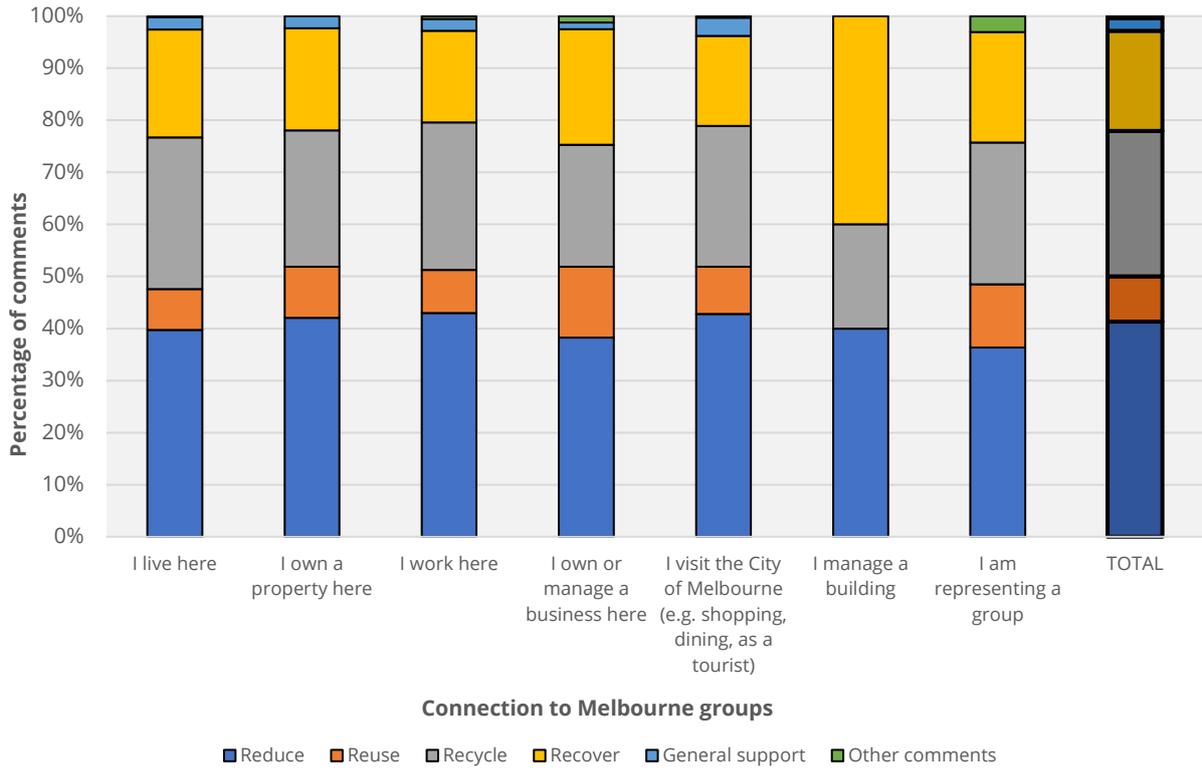


Figure 11: Topics of priority 1 were consistently commented on by connection-to-Melbourne groups

Percentage of comments (y-axis) made by each connection-to-Melbourne group (x-axis) on topics within Priority 1; colour key (below chart) indicates topics. The percentages of all comments from all groups is labelled “TOTAL” (darkened bar).

Analysis

Across all connection-to-Melbourne groups, the most commonly discussed topic was Reduce, followed by Recycle and then Recover; this was consistent with the amount of discussion on each topic contained in the body of the report.

The proportions of comments made by each group on Priority 1 topics was typically consistent between groups and compared to the total (all groups combined) (Figure 11). One exception was the “I manage a building” group, which had a higher proportion of comments on Recover compared to other groups; however, due to the small number of contributors within this group (7 contributors; Figure 1 and 7), this finding should be considered cautiously.

CONCLUSION

Contributors who completed the Participate Melbourne online survey were asked what their connection to Melbourne was. This information was used to determine if contributors with different connections to Melbourne commented on different aspects of the Draft Waste and Resource Recovery Strategy, or commented more or less on particular topics.

The majority of Participate Melbourne online survey contributors lived (79%), worked (58%), or visited (31%) Melbourne. Very few contributors connected to Melbourne through managing a building (1%) or represented a group from Melbourne (2%).

As expected, more comments were provided by larger connection-to-Melbourne groups than smaller groups. Priority 1 was most commonly discussed by all groups; at least 70% of comments made by each group on a Priority discussed Priority 1 topics. Due to this, the number of comments made on Priority 1 topics by each group was investigated to find out if different topics within Priority 1 were discussed in different amounts by different connection-to-Melbourne groups. 'Reduce' was most commonly discussed by all groups, followed by 'Recycle' and then 'Recover'. These findings were consistent with the level of discussion in the body of the report.

The proportion of comments made on the Priorities and Priority 1 topics were consistent between groups. This indicates that contributors with different connections to Melbourne discussed particular Priorities and topics within Priority 1 similarly.

APPENDIX 2: IMPORTANCE OF PRIORITIES AND RANKING OF INITIATIVES, PRESENTED AS TABLES

ANALYSIS OF OPTION SELECTION QUESTIONS

The tables below present the data used to generate various figures within the body of the report; Table 1 presents data of Figure 2, and Tables 2 and 3 present data of Figures 3-6.

Table 1: Counts and percentages of ranked importance of each Priority								
	Number of responses				Percentage of responses			
Importance rating [†]	Priority 1: Reducing, reusing, recycling, and recovering waste	Priority 2: Developing landfill alternatives	Priority 3: Stimulating innovation	Priority 4: Reducing amenity impacts from waste collection	Priority 1: Reducing, reusing, recycling, and recovering waste	Priority 2: Developing landfill alternatives	Priority 3: Stimulating innovation	Priority 4: Reducing amenity impacts from waste collection
5	829	711	517	370	93%	80%	58%	42%
4	53	110	199	173	6%	12%	22%	19%
3	8	48	128	187	0.9%	5%	14%	21%
2	0	10	35	103	0.0%	1%	4%	12%
1	1	12	12	58	0.1%	1%	1%	7%
TOTAL	891	891	891	891	100%	99%*	99%*	101%*

Footnotes:
[†] Number 5 ranking represents the most important Priority to number 1 being least important Priority.
^{*} Percentages displayed do not add to 100% due to rounding to whole numbers.

Table 2: Percentages of each ranking for each initiative										
	1	2	3	4	5	6	7	8	9	TOTAL*
A container deposit program for Victoria (e.g. 10 cents for bottles)	143	101	114	100	87	96	68	76	103	888
A reuse and repair centre	71	79	105	121	130	134	108	65	77	890
A third bin, for food scraps only	97	121	83	76	70	82	105	143	112	889
A third bin, for food scraps and garden waste	140	165	99	93	74	76	91	94	56	888
Better recycling systems and education for apartment buildings	67	110	118	107	129	116	117	76	50	890
Council taking your rubbish to a high-tech facility to recover materials and/or energy	114	108	116	122	112	95	92	74	57	890
Drop-off locations for food scraps	33	32	65	45	73	80	114	158	290	890
Drop-off locations for soft plastics and polystyrene	62	81	109	124	118	107	106	121	63	891
Education programs about waste avoidance, reuse and recycling	164	94	81	102	97	103	88	81	80	890
Footnotes:										
* Totals are not all the same because not all respondents answered all questions.										

Table 3: Percentages of each ranking for each initiative										
	1	2	3	4	5	6	7	8	9	TOTAL*
A container deposit program for Victoria (e.g. 10 cents for bottles)	16%	11%	13%	11%	10%	11%	8%	9%	12%	101%
A reuse and repair centre	8%	9%	12%	14%	15%	15%	12%	7%	9%	101%
A third bin, for food scraps only	11%	14%	9%	9%	8%	9%	12%	16%	13%	101%
A third bin, for food scraps and garden waste	16%	19%	11%	10%	8%	9%	10%	11%	6%	100%
Better recycling systems and education for apartment buildings	8%	12%	13%	12%	14%	13%	13%	9%	6%	100%
Council taking your rubbish to a high-tech facility to recover materials and/or energy	13%	12%	13%	14%	13%	11%	10%	8%	6%	100%
Drop-off locations for food scraps	4%	4%	7%	5%	8%	9%	13%	18%	33%	101%
Drop-off locations for soft plastics and polystyrene	7%	9%	12%	14%	13%	12%	12%	14%	7%	100%
Education programs about waste avoidance, reuse and recycling	18%	11%	9%	11%	11%	12%	10%	9%	9%	100%
Footnotes:										
* Total percentages do not equal 100% due to rounding to whole numbers when taking decimal places into account, total is 100%										

ANALYSIS OF CONTRIBUTORS CONNECTION TO MELBOURNE (APPENDIX 1)

Table 4 presents the count and percentages of contributors' connection to Melbourne; this data is presented in Figure 1 and 7 in the report body and appendix 1, respectively. Note, contributors could have multiple connections to Melbourne.

Contributors' connection to Melbourne	Number of contributors	Percentage of all contributors
I live here	702	79%
I own a property here	188	21%
I work here	516	58%
I own or manage a business here	76	9%
I visit the City of Melbourne (e.g. shopping, dining, as a tourist)	274	31%
I manage a building	7	1%
I am representing a group	19	2%

Table 5 presents the connection-to-Melbourne groups' comments on the four Priorities; both counts, and percentages are presented. This data is displayed as charts in Figures 8 and 9.

Connection to Melbourne	Count of comments on Priorities				
	Priority 1	Priority 2	Priority 3	Priority 4	TOTAL
I live here.	615	35	35	22	707
I own a property here.	182	13	12	13	220
I work here.	477	26	32	15	550
I own or manage a business here.	63	10	6	5	84
I visit the City of Melbourne (e.g. shopping, dining, as a tourist).	266	22	19	6	313
I manage a building.	5	2	0	0	7
I am representing a group.	28	3	3	2	36
TOTAL	1636	111	107	63	1917
Connection to Melbourne	Percentage of comments on Priorities				
	Priority 1	Priority 2	Priority 3	Priority 4	TOTAL
I live here.	38%	32%	33%	35%	37%
I own a property here.	11%	12%	11%	21%	11%
I work here.	29%	23%	30%	24%	29%
I own or manage a business here.	4%	9%	6%	8%	4%
I visit the City of Melbourne (e.g. shopping, dining, as a tourist).	16%	20%	18%	10%	16%
I manage a building.	0%	2%	0%	0%	0%
I am representing a group.	2%	3%	3%	3%	2%
TOTAL	100%	101%	101%	101%	99%

Table 6 presents the connection-to-Melbourne groups' comments on Priority 1 topics; both counts, and percentages are presented. This data is displayed as charts in Figures 10 and 11.

Table 6: Connection to Melbourne groups' comments on Priority 1 topics							
Connection to Melbourne	Count of comments on Priority 1 topics						TOTAL
	Reduce	Reuse	Recycle	Recover	General support	Other comments	
I live here.	278	55	204	145	17	1	700
I own a property here.	90	21	56	42	5	0	214
I work here.	244	47	161	100	13	3	568
I own or manage a business here.	31	11	19	18	1	1	81
I visit the City of Melbourne (e.g. shopping, dining, as a tourist).	136	29	86	55	11	1	318
I manage a building.	2	0	1	2	0	0	5
I am representing a group.	12	4	9	7	0	1	33
TOTAL	793	167	536	369	47	7	1919
Connection to Melbourne	Percentage of comments on Priority 1 topics						TOTAL
	Reduce	Reuse	Recycle	Recover	General support	Other comments	
I live here.	40%	8%	29%	21%	2%	0%	100%
I own a property here.	42%	10%	26%	20%	2%	0%	100%
I work here.	43%	8%	28%	18%	2%	1%	100%
I own or manage a business here.	38%	14%	23%	22%	1%	1%	100%
I visit the City of Melbourne (e.g. shopping, dining, as a tourist).	43%	9%	27%	17%	3%	0%	100%
I manage a building.	40%	0%	20%	40%	0%	0%	100%
I am representing a group.	36%	12%	27%	21%	0%	3%	100%
TOTAL	41%	9%	28%	19%	2%	0%	100%

APPENDIX 3: WEBSITE LINKS PROVIDED BY SUBMITTERS

Table X presents websites provided by contributors. Many show specific examples of waste and/or resource recovery initiatives or infrastructure. Contributors' method of submission and, if appropriate, the corresponding comment to the website link.

Table 7: Submitted websites and links		
Submission type	Comment	Website/link
Participate Melbourne online survey	Please check out this link, this is what Melbourne should adopt, as the most livable city and leading in innovation. Melbourne need to step up the game and go outside the box and become a real model city for not just Australia but the world.	http://www.abc.net.au/news/2018-05-20/kamikatsu-the-japanese-town-with-45-different-recycling-bins/9776560
Participate Melbourne online survey	Compost facility so food & green waste can be collected and processed from CoM and other surrounding councils, it could be a joint council initiative to make the investment worthwhile - I think looking to San Francisco is great as the 'gold standard'	https://www.theguardian.com/environment/2014/jun/17/san-francisco-zero-waste-recycling-composting
Participate Melbourne online survey	City of Gold Coast are doing this- please do this in Melbourne:	http://www.goldcoast.qld.gov.au/mobile/environment/recycle-street-44936.html
Participate Melbourne online survey	It should look at the bigger cities in the world to understand what would happen if we fail now. A look at Perungudi Dumping Yard ,Chennai, India	http://www.thehindu.com/news/cities/chennai/perungudi-dumpyard-smoulders/article3466737.ece
Participate Melbourne online survey	Support local Kensington residents who are actively wanted to establish a Repair Hub to prevent hard rubbish going to landfill and teach repair skills to provide employment and ultimately 2nd stage recycled goods for sale see link	https://www.weforum.org/agenda/2017/04/recycled-shopping-centre-sweden-plastics-circular-economy/?utm_content=buffer1d753&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer
Participate Melbourne online survey	There are good schemes out there that are not well advertised, for example www.sharewaste.com , which is how we manage our food scraps despite the fact that we live in apartment with no garden for compost.	www.sharewaste.com
Participate Melbourne online survey		http://www.abc27.com/news/harrisburg-street-lights-to-get-smarter-collect-data-on-anything-from-traffic-to-trash_20180313091317349/1037012401
Participate Melbourne online survey	This should be a priority	https://www.sunshinecoast.qld.gov.au/Council/Planning-and-Projects/Infrastructure-Projects/Automated-Waste-Collection-System
Participate Melbourne online survey		https://www.sunshinecoast.qld.gov.au/Council/Planning-and-Projects/Infrastructure-Projects/Automated-Waste-Collection-System
Participate Melbourne online survey		https://www.eastbayexpress.com/oakland/oakland-homeless-resident-organizes-green-teams-to-clean-the-city/Content?oid=17480138

Participate Melbourne online survey	In line, we have recently proposed assembling a state-wide task force to help industry and agriculture to reduce their environmental footprints, while sustaining profitability. This is based on the general strategy from our new book, "Saving Planet Earth: Why agriculture and industry must be part of the solution." See:	http://www.connorcourtpublishing.com.au/Saving-Planet-Earth-Why-agriculture-and-industry-must-be-part-of-the-solution_p_120.html
Participate Melbourne online survey	I find that most people don't really understand what can properly go in a recycling bin. The Guardian had a quiz on line and I was surprised and the things that even me (a conscientious recycler was getting wrong). The council needs to educate people more about what can and can't be recycled:	https://www.theguardian.com/environment/2018/jul/01/think-you-know-how-to-recycle-take-the-quiz
Participate Melbourne online survey	... And Melbourne city council can organise to manufacture and sell those worm farms so it's the cheapest price available to Melbourne residents and perhaps make a profit too, as nowadays worm farms are pretty expensive, a lot of margins on the product ... And it' s one of the best ones out there, so maybe the council instead of wasting money on compostrevolution.com.au subsidising such highly margined prices, make their own product for their citizens to use.	http://www.hungrybin.co.nz/
Participate Melbourne online survey	Also, start to experiment new ways such as having a vertical worm farm(similar to vertical farming https://www.youtube.com/watch?v=-_tvjtUHnmU), fly larvae, for converting organic waste directly back into food. Research into inventing new ways to cook the worms for humans(as they' re very nutritious) so they can be a food source both for humans too and not just chickens/fish.	https://www.youtube.com/watch?v=-_tvjtUHnmU
Social media post (current recycling challenges)	Reusable Collapsible leakproof coffee cups for a start. 50,000 an hour in Australia on a weekday morning!	www.nixcups.com
Social media post (food waste)	Support innovators via seed funding / support? create a showcase / food-lab that gives agency to test / bend the rules - thinking Joost Bakker's Brothl.	https://www.broadsheet.com.au/.../joost-bakkers-brothl-close
Social media post (waste to energy)	Trying to avoid these products [non recyclable plastic packaging on food] in the first place is best, of course, but there is also a great program called RedCycle that recycles soft plastics. They have bins in most Coles and Woolworths supermarkets that take plastic bags and many other soft plastics...	www.redcycle.net.au
Social media post (waste to energy)	We need to build one of these...	https://www.ted.com/talks/mike_biddle/up-next
Social media post (waste to energy)	Oslo Waste to Energy Plan (OV)	https://www.youtube.com/watch?v=2dkmjjZD9_M&app=desktop
Social media post (world environment day)	City of Gold Coast is addressing the environment with a recycle street- maybe Melbourne should follow suit:	http://www.goldcoast.qld.gov.au/.../recycle-street-44936...
Retail and hospitality forum event		www.trashlesstakeaway.com.au
Emailed submission (Kensington Repair Hub)	Creating Wealth from Waste	https://www.demos.co.uk/files/Creatingwealthfromwaste.pdf
	This discussion paper addresses the Waste and	https://www.tccs.act.gov.au/_data/asset

Emailed submission (3R Waste and Recycling Discussion Paper).	Recycle Management Code (for the ACT) Version 2 – Revision 1 – October 2016 Sections 2, 3 and 4. The code can be found here -	s/pdf_file/0003/1126983/Waste_Code_Version2_October_2016.pdf
	Revised residential allocations (Appendix 3) within the code can be found here -	http://www.tccs.act.gov.au/_data/assets/pdf_file/0007/1085245/Engineering-Advisory-note7-Revised-Waste-and-Recycling-Allocation.pdf
	Reference is also made to Better Ways With Waste – Discussion Paper, Transport Canberra and City Services, ACT NOWaste October 2017. The Discussion paper can be found on the your say link here -	https://www.yoursay.act.gov.au/application/files/7215/0958/8125/DCC_Review_Discussion_Paper_Final_for_website.pdf
	This Discussion paper also addresses other waste management areas that are not covered by any design code within the ACT, including public spaces, recreation areas waste and recycling bins and the Recycling Drop Off Centres (RDOC)'s managed by TCCS. Information for the RDOCs can be found here –	https://www.tccs.act.gov.au/recycling-and-waste/drop-off
	The ACT can lead the way for Australia with real waste and recycling innovation gaining higher rates of recycling, increased safety and lower costs whilst significantly lowering emissions. Further information can be found here	https://www.youtube.com/watch?v=HreHWMK2ovg
Emailed submission	LeanPath food waste smart tracker... Is used by businesses including PwC at Souhbank and Monash Health to help prevent food waste. Novotel Brisbane has used LeanPath to reduce food costs by 80% by preventing pre-consumer food waste. The Savings in the City program helped some of Melbourne's largest hotels to divert waste from landfill, but to prevent commercial food waste we need to enable people with technology.	www.leanpath.com
Emailed submission (3R Services)	...Also, the Nord Engineering containers transform recycling outcomes, so I have also provided for info here - Nord Easy System info here on U Tube	https://www.youtube.com/watch?v=nkHSnZlI6U

This report has been prepared by:

Global Research
150 Office Rd
Merivale
Christchurch 8014
New Zealand
+64 3 355 4562
www.globalresearch.nz



Global Research
Turning **Information** Into **Insight**

WASTE AND RESOURCE RECOVERY STRATEGY 2030

Attachment 3
Agenda item 6.3
Future Melbourne Committee
16 April 2019





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.

CONTENTS

Message from City of Melbourne	7
Executive summary	8
Vision: towards a zero-waste city	10
Principles	12
Strategic and policy context	16
Waste in Melbourne today	18
Why we need a new approach	22
Taking action towards zero waste	26
Strategic priorities	29
Appendix A: Implementation plan	43
Appendix B: Measurement and evaluation	47
Appendix C: Approaches of other cities	49
Appendix D: Advanced waste processing analysis	50
Glossary of terms	51
References	52

April 2019

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

Disclaimer

This report is provided for information and it does not purport to be complete. While care has been taken to ensure the content in the report is accurate, we cannot guarantee it is without flaw of any kind. There may be errors and omissions or it may not be wholly appropriate for your particular purposes. In addition, the publication is a snapshot in time based on historic information which is liable to change. The City of Melbourne accepts no responsibility and disclaims all liability for any error, loss or other consequence which may arise from you relying on any information contained in this report.

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

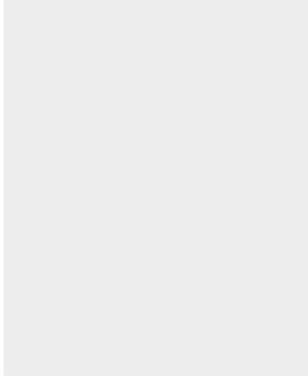
Table 1:	Priorities mapped to strategic outcomes	11
Table 2:	Priority 1 actions impact assessment	31
Table 3:	Priority 2 actions impact assessment	32
Table 4:	Priority 3 actions impact assessment	33
Table 5:	Priority 4 actions impact assessment	35
Table 6:	Priority 5 actions impact assessment	36
Table 7:	Priority 6 actions impact assessment	37
Table 8:	Priority 7 actions impact assessment	38
Table 9:	Priority 8 actions impact assessment	39
Table 10:	Priority 9 actions impact assessment	40
Table 11:	Priority 10 actions impact assessment	41
Figure 1:	Key outcomes and targets of the Waste and Resource Recovery Strategy 2030	10
Figure 2:	Waste hierarchy	12
Figure 3:	Current state of the waste and resource recovery system	14
Figure 4:	Future state of the waste and resource recovery system	15
Figure 5:	Total waste generated in the municipality 2016-17	18
Figure 6:	Household waste generation based on 2016-17 data	19
Figure 7:	Waste generation and recycling based on 2016-17 data	19
Figure 8:	Composition of household waste	20
Figure 9:	Composition of commercial and industrial waste	20
Figure 10:	Composition of construction and demolition waste	21
Figure 11:	Household waste pathway to 90 per cent landfill diversion	27
Figure 12:	Current household waste pathway	28
Figure 13:	Future household waste pathway	28
Figure 14:	Priorities mapped against different stages of the circular economy	29
Figure 15:	Our approach to implementing strategy actions	30



Figure 3: Bar staff separating waste for recycling

MESSAGE FROM CITY OF MELBOURNE

Text to be added following
committee approval



Ximil iunt, ullaut aut est re por aspe doluptas a comnita abo. Velist, conem aut ma atur, saeperes ab intur, audam que de voluptaquo ipsa venda derum quati que voluptat eum necta doluptio blacescium consendae. Et lantur re, quo doloreste proreniam veliqui utem et ut

Heading goes here

Tur ma qui rem laborer eprovid molor atia prepre, quiam ressim volor sum harions equam, idebitati cupiet et, sunt acculpa ea qui volupta eremodia nusaerunt, as derci dolenim oditaturenim simodis volore voluptatiam.

Sime dolestio te aut rehent dolest qui odias es essi quia por aut la core con pedi conectum ni ullitiniet.

Con expere, consequunt volorero omnis dollenis deniet, ium corum harchilis inis dolo blaccus eniae distem quam, intion nihil ium eum rero od mint hil inulliquis ant dolorep tatet, te pedionsendus erferi volum nus.

Voluptatem ra ni occum dolorro doluptat iliciam fugit faccusam quatem cuptae paris expliquis militatio. Ic tem solum aliqui quiat ea cusam quisitium.

Quis nobitio et volum, conet endae net et et, cum coritas dolorum quiaepel eventisitaes.

Perae pliaten isciat pedit que della voloriorit, nostius nosam doloreh enitet harum re dolupta quiatur, sundi bla nones endandae nit debis ditat peditem porehen ihicatur? Agnis voles enim dolessi dis et maximint. Id qui core sin consequae nemporum eum que ommo volupti occaboriam sus nobit alit volor alis in consed min ne velique.

Excearit, nos et dolupis quam aliqui doloriam, atessin eum ratecae. Iquunt molo omnimin cienem quiae ni rae si volupta tioriberero consedi conetur re pro volupta ectur? Quiaecatur, sum fuga. Nequaer empercit, idus cullaborionem. Ut que niminve llanditiur.

Nis as aut evelesti blab iur sum quiaero velecaepudit experfe raturem qui blabo. Utendem rem. Quiasint optatet utem fugitat uriatia posamus vit ut aboratischia nimporem ut etusdae laut reptat alicae volorum qui dolo eatur, uteni doluptius pror acea perit occum rem.

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 use recycled materials and are 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: delivery, 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 resource recovery plan guidelines 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 collective procurement. Diversify the recycling sorting sector and improve material sorting to meet market contamination standards.
- **Local manufacturing:** Incentivise new specialised product manufacturers through Invest Victoria. 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 beauty 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



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	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							●

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:

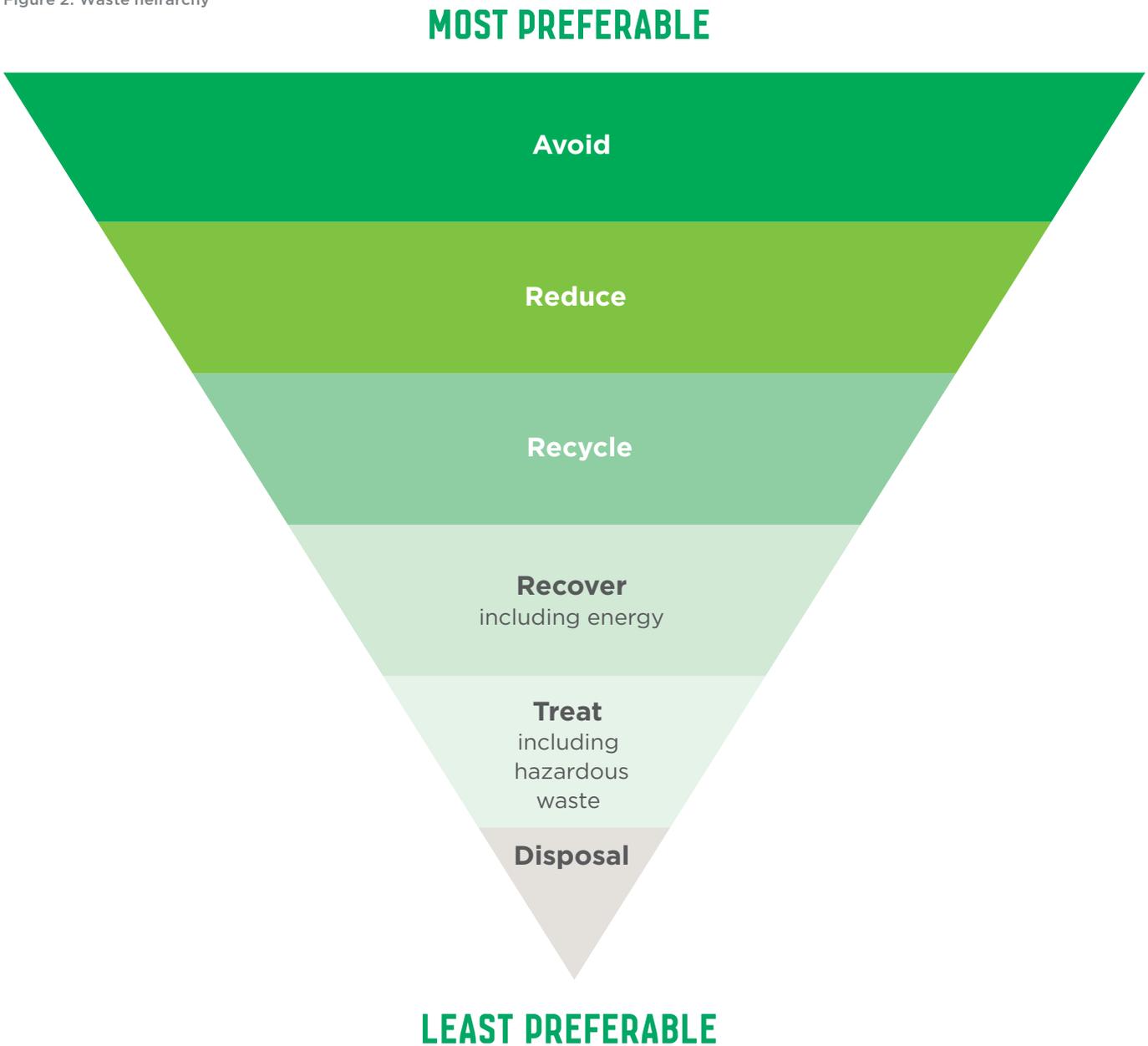
- the waste hierarchy
- the circular economy

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 heirarchy



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.

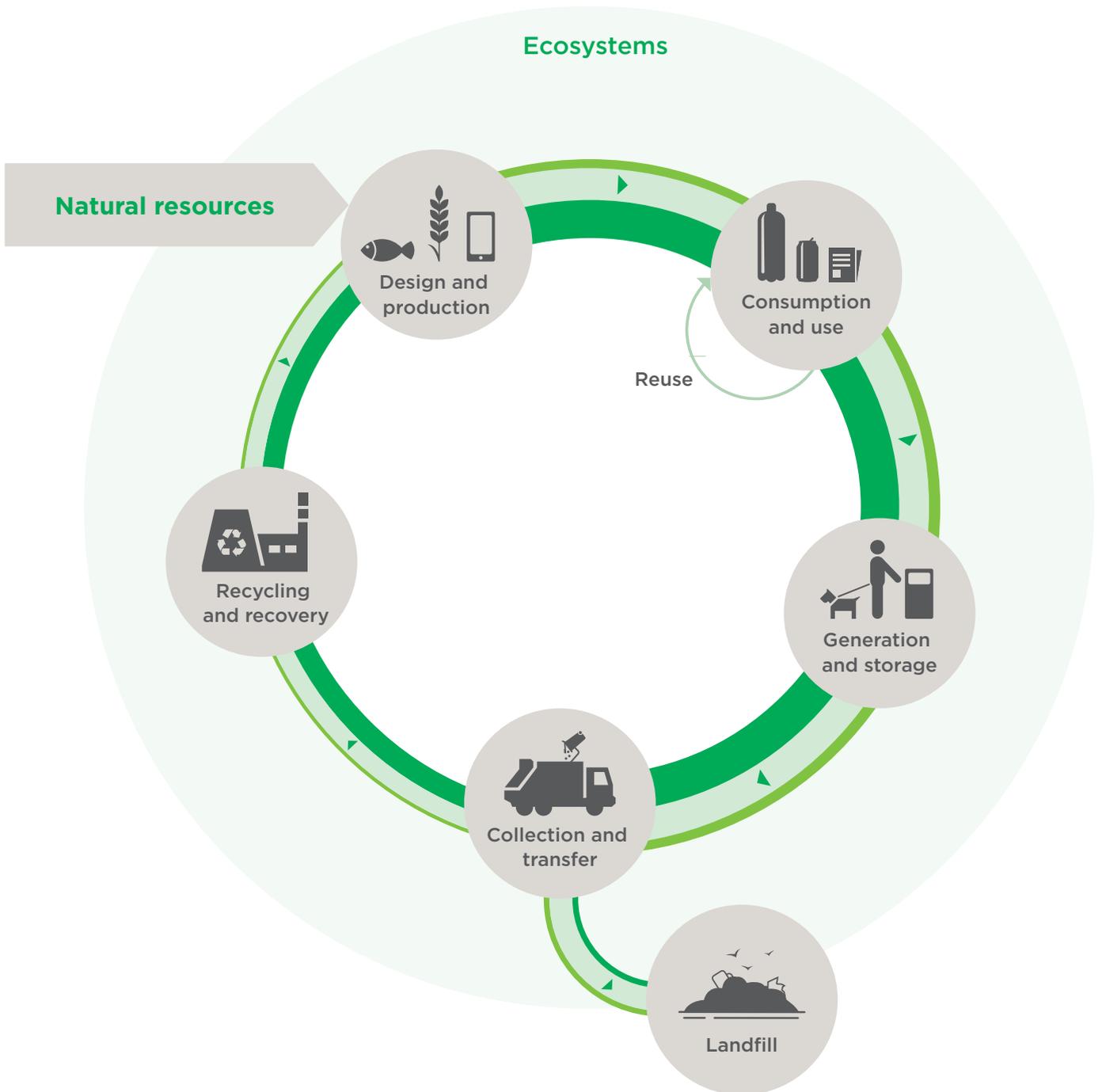
Figure 3 outlines the stages of the circular economy and the movement of materials. It shows the extraction of natural resources and raw materials ultimately depends on ecosystems.

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.”



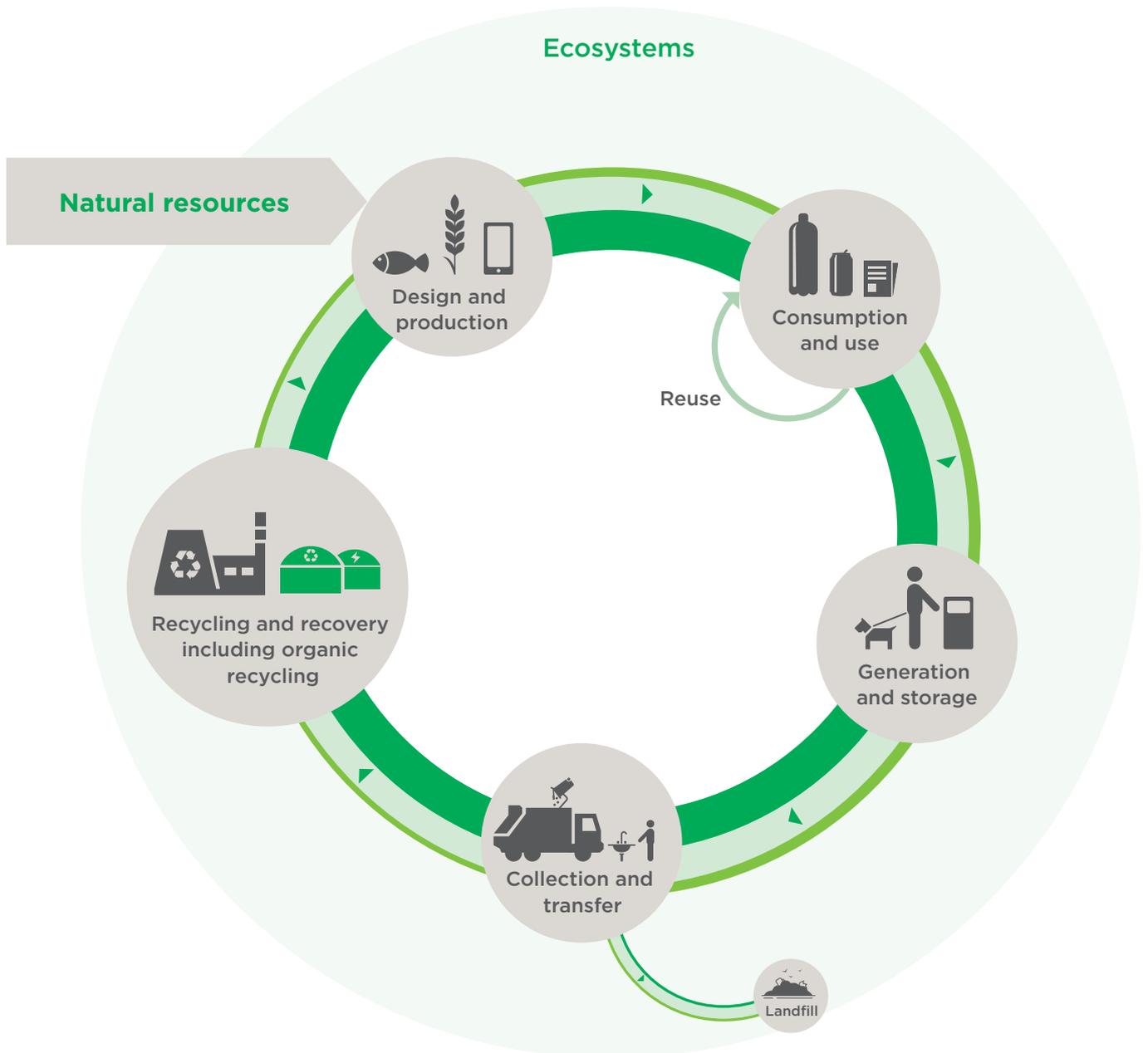
Figure 3: Current state of the waste and resource recovery system



Source sector (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



Source sector (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 C 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

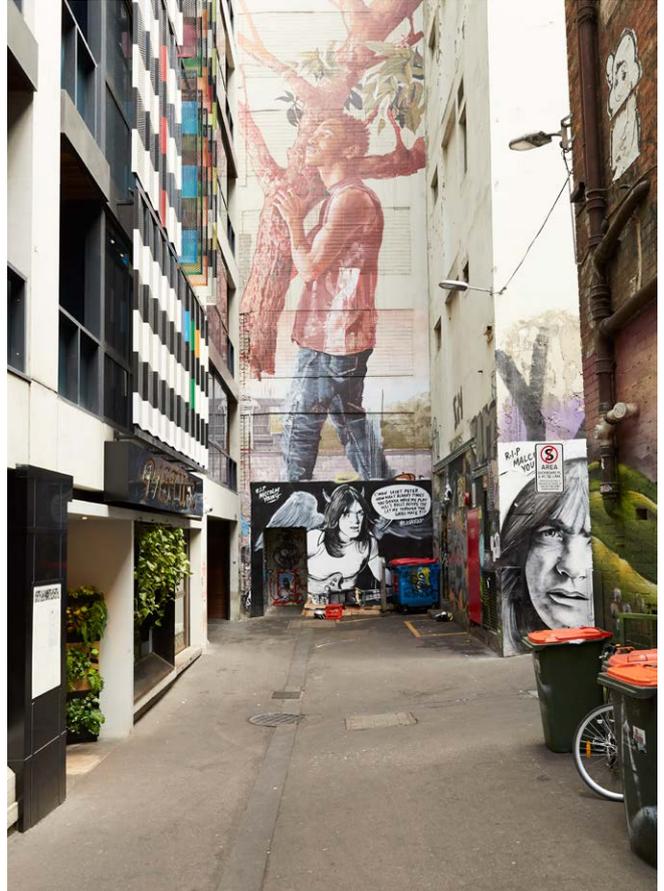
Victoria has a legislative and strategic waste and resource recovery framework that focuses on increasing recycling and recovery, diverting of waste from landfill and safe management of materials (Sustainability Victoria, 2018). Key initiatives include the resilience of the recycling industry, food waste, 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 include 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 (800,000 tonnes in 2016-17) (Blue Environment, 2018)

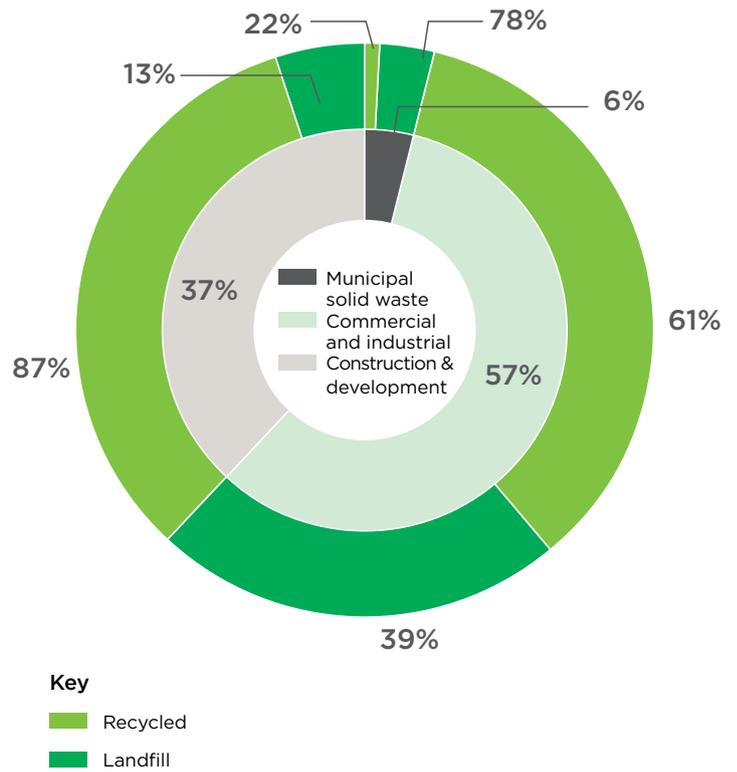


Figure 6: Household waste generation based on 2016-17 data (Blue Environment, 2018)

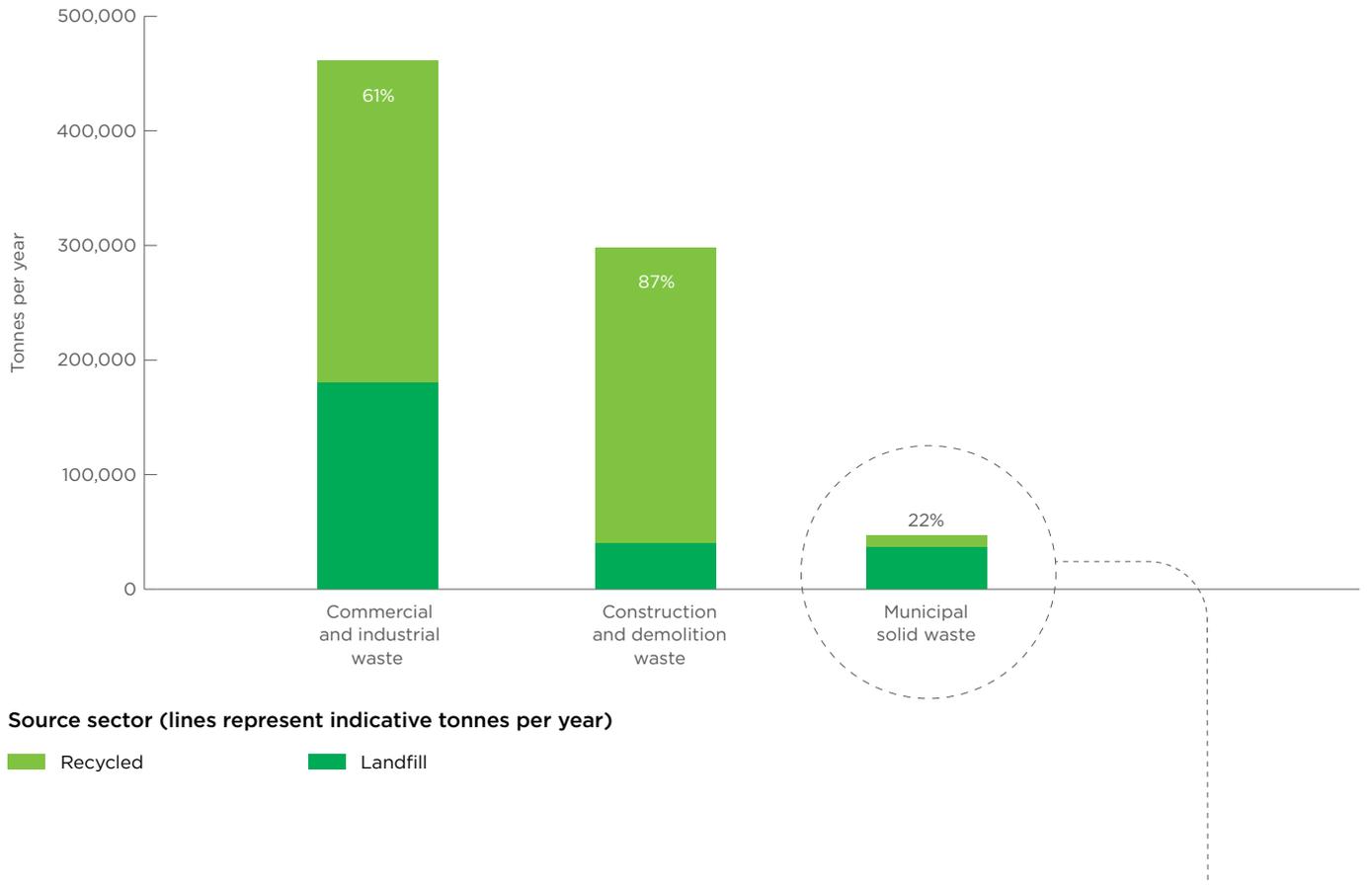
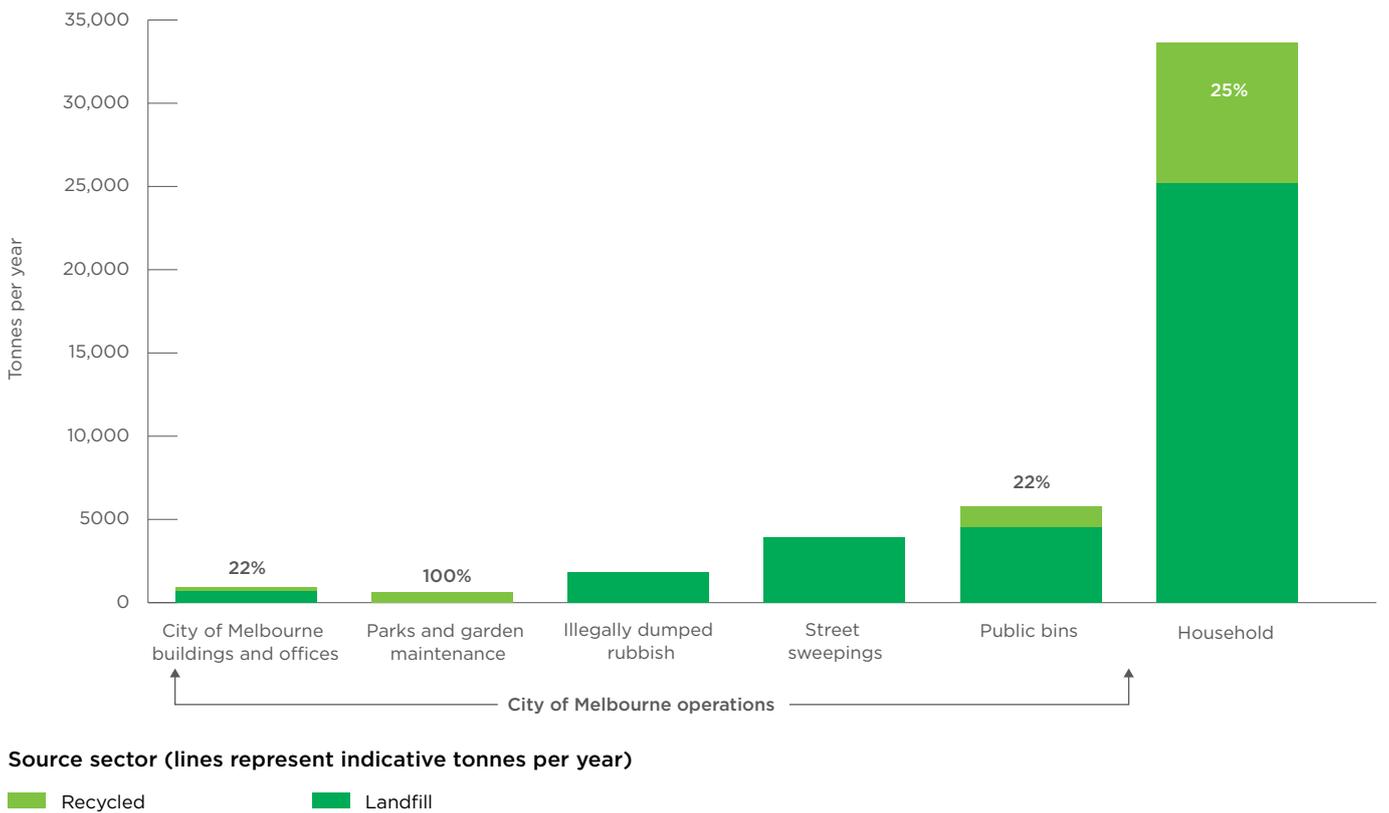
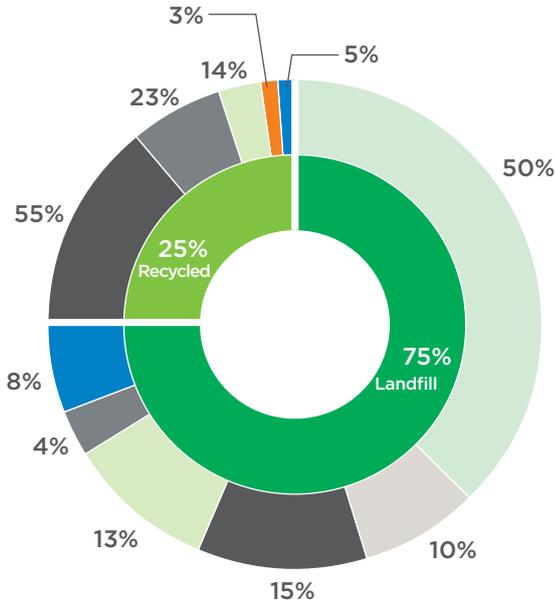


Figure 7: Waste generation and recycling based on 2016-17 data (Blue Environment, 2018)



Household waste

Figure 8: Composition of household waste



Source sector (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.



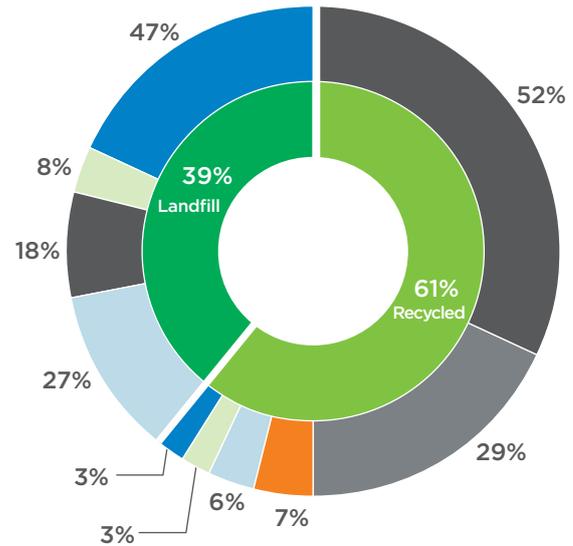
Household recycling
60kg/person/year



Household garbage
177kg/person/year

Commercial and industrial waste

Figure 9: Composition of commercial and industrial waste



Source sector (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.

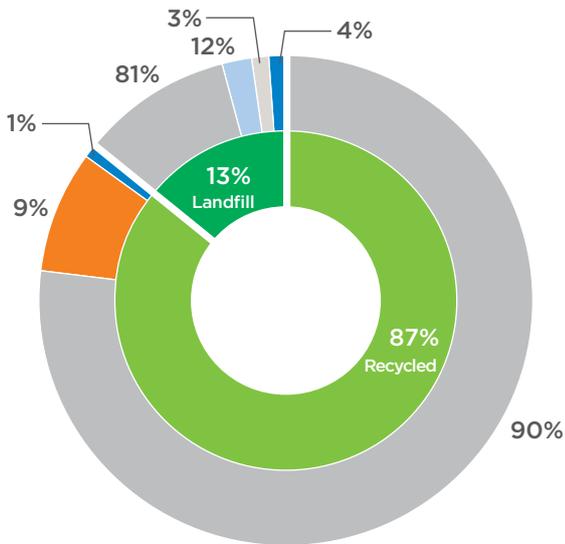
Commercial and industrial waste is mostly privately collected, and so it is difficult to get accurate data. Our estimates are based on an extensive survey and modelling (Blue Environment, 2018). Of the estimated 60 per cent that was recycled, around half of this was paper and cardboard, 44 per cent was 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



Source sector (lines represent indicative tonnes per year)

- Masonry 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 Degraeves 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. Organic 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 odour and 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.”

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 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: 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 and 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).

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.

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 European countries.”

Packaging

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.

Case study: 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 organics 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 as well as reducing waste generation per person. 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 organics waste turning it into valuable compost. 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 use and the 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

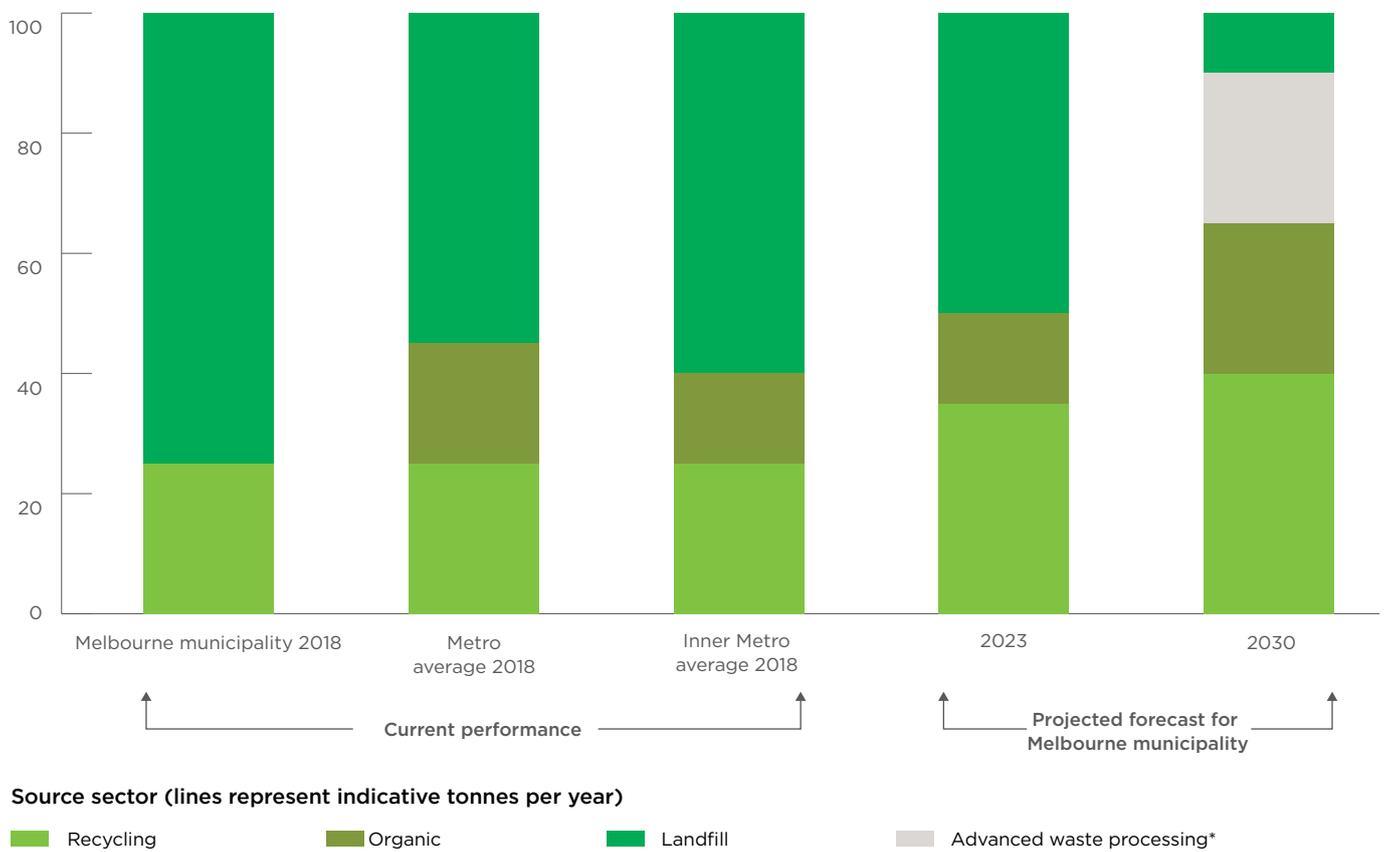
The Australian Government has an over-arching role in waste management through national legislation, strategies and policy frameworks, including the Product Stewardship Act 2011, the National Food Waste Strategy (2017) and National Waste Policy (2018).

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

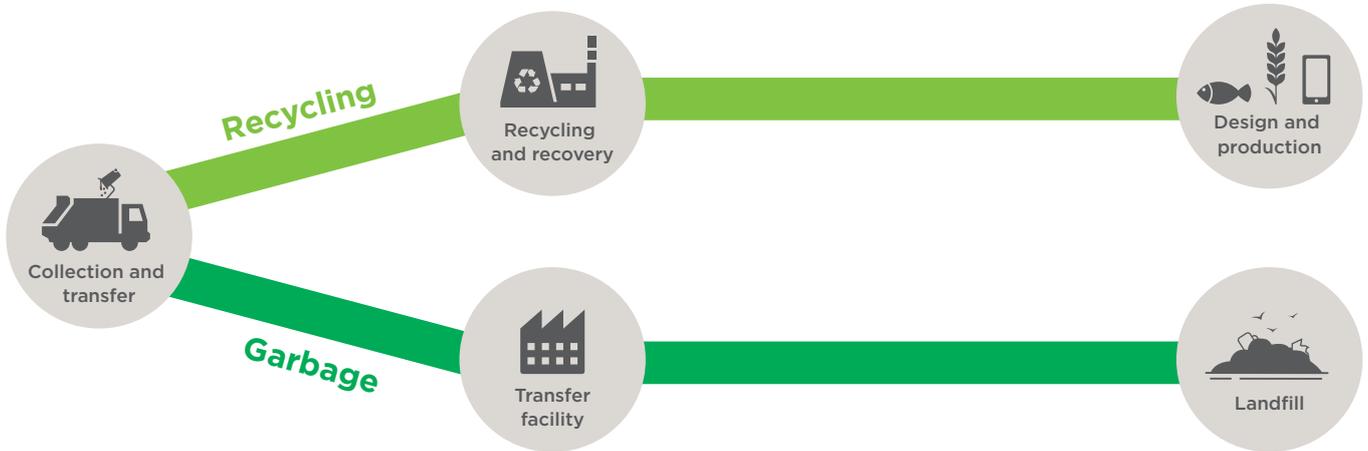
We have set ambitious but achievable targets and actions to move the city towards zero waste. Our priorities will affect all waste sectors: municipal solid waste, commercial and industrial waste, and construction and demolition waste. A key focus is improving the recycling and organics diversion of household waste. Figures 11, 12 and 13 outline the possible pathways and processes for increasing household waste recovery.

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



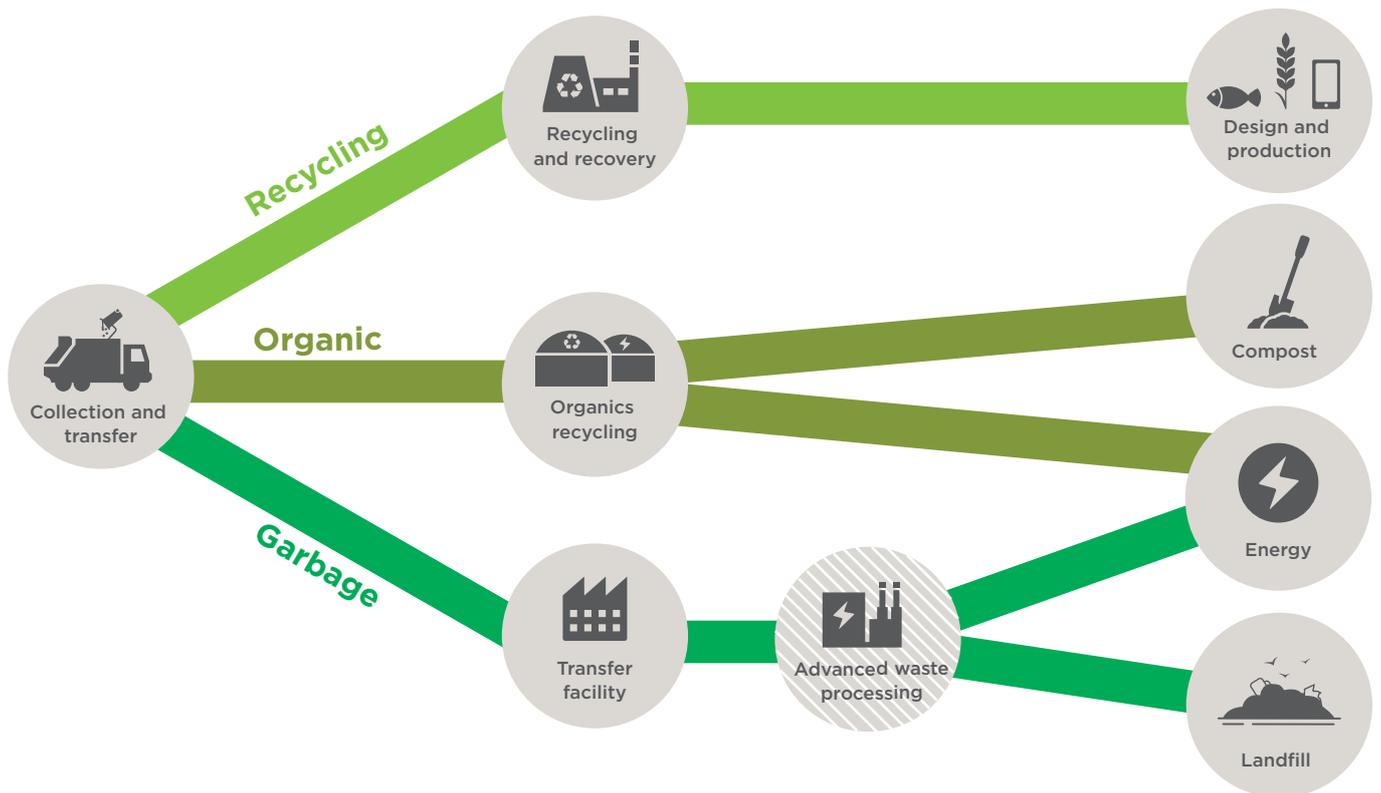
* Advanced waste processing (AWP) is a least preferred option, to be considered once all other options have been exhausted. The City of Melbourne will review this strategy in 2023 and assess the merits and implications of AWP in light of future circumstances.

Figure 12: Current household waste pathway



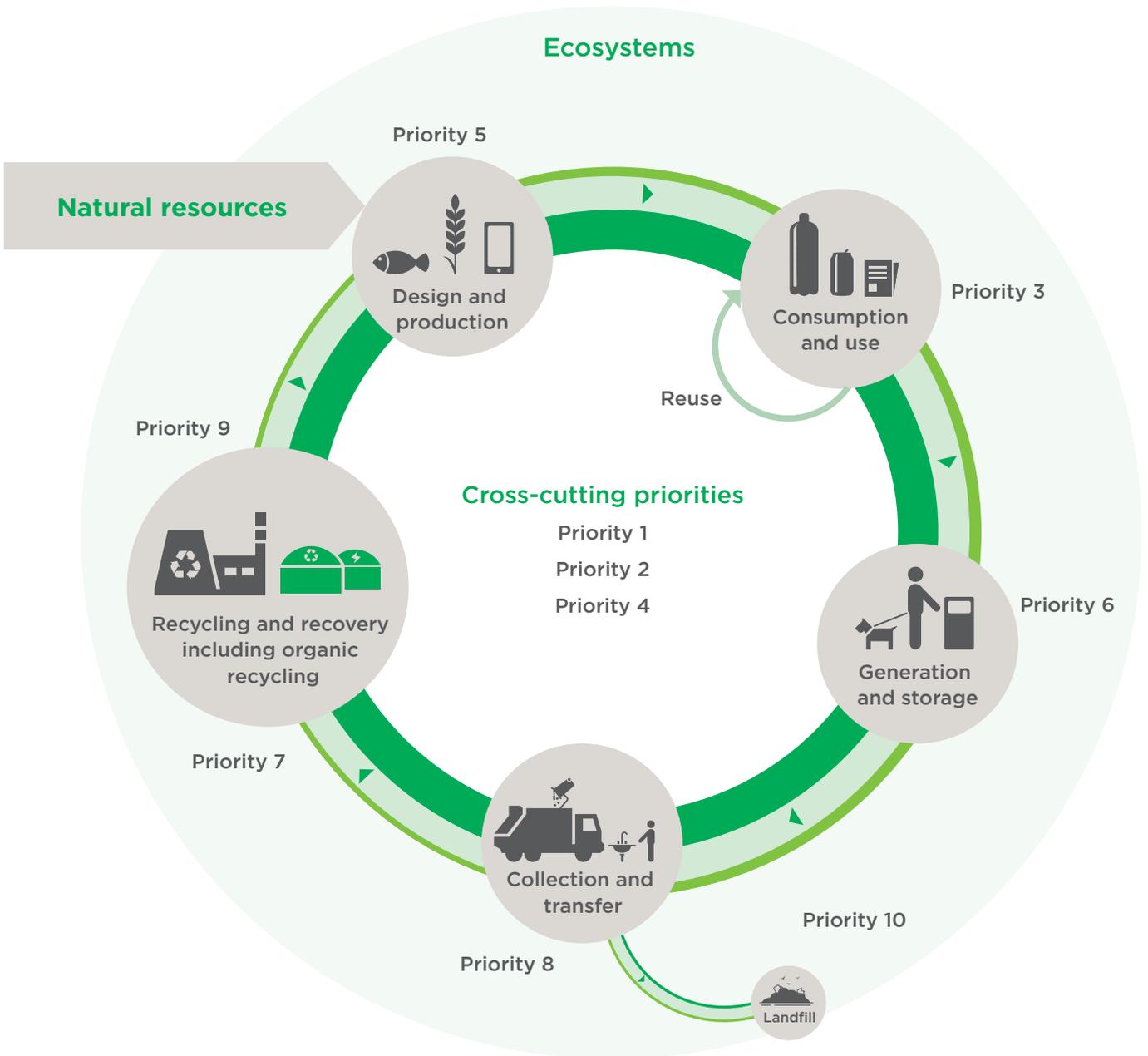
“Our efforts can create a stronger circular economy that will reduce environmental impacts, improve the beauty and liveability of the city, and make the waste and resource recovery system more resilient.”

Figure 13: Future household waste pathway



STRATEGIC PRIORITIES

Figure 14: Priorities mapped against different stages of the circular economy



Source sector (lines represent indicative tonnes per year)

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

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 14).

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 livable city.

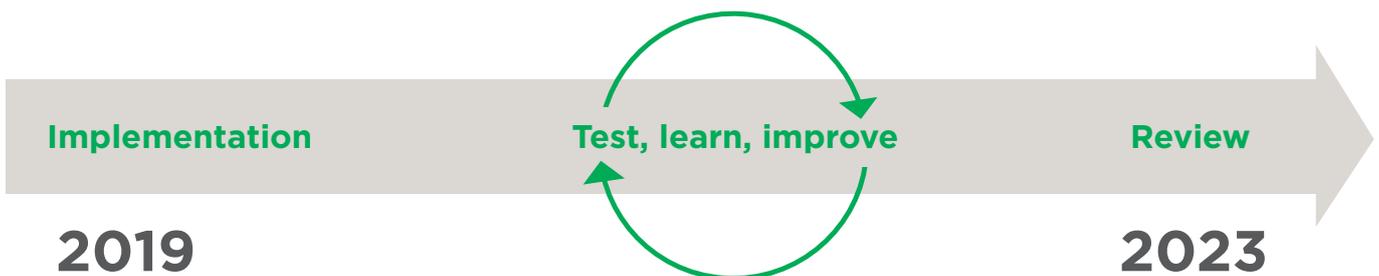
In the tables on the following pages, the level of impact has been estimated using the following criteria:

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 15: Our approach to implementing strategy actions



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 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 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 improving recycling practices.

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 Advocate for an extensive, significant state-wide recycling education campaign.
- 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	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 solutions that target waste. Innovative solutions that address higher order waste management principles, such as reducing waste generation and encouraging product reuse, will be a priority.

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.

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 separation, 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	●	●	●
2.2	Influence	Community organisations, partnering businesses	●	●	●
2.3	Deliver	Residents and businesses	●	●	●

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. The lessons and insights from this process can be shared with the wider sector.

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.
- 3.3 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 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 as well as managing and recovering waste.

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. This would involve investigating the capacity of existing systems for sorting and processing waste, including the Dynon Road Waste and Recycling Centre.

We will look for ways to reduce litter in the city through education, infrastructure, campaigns and collaboration with other key organisations.

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

			LEVEL OF IMPACTS		
ACTION	OUR ROLE	KEY STAKEHOLDERS	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 regulation.

The City of Melbourne will promote extended producer responsibility by advocating for the expansion of the Australian Government’s Product Stewardship Act 2011, as well as the introduction of a container deposit scheme through Victorian Government legislation.

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 Develop and adopt a policy position for the City of Melbourne on extended producer responsibility (EPR) and a container deposit scheme (CDS).
- 5.2 Advocate to other levels of government for stronger EPR and CDS requirements to improve design and production.

Table 6: Priority 5 actions impact assessment

ACTION	OUR ROLE	KEY STAKEHOLDERS	LEVEL OF IMPACTS		
			Diversion	Emissions	Amenity
5.1	Influence	Internal stakeholders			Supports action 5.2
5.2	Influence	Australian and Victorian Government	●	●	●

* 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.

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, similar to a number of other cities where this has seen positive results.

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 Resource Recovery 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 Explore amendments to the Activities Local Law to require organics waste recovery.
- 6.4 Investigate better ways to influence behaviour change 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	●	●	●
6.2	Govern	Businesses, private waste contractors	●	●	●●●
6.3	Govern	Businesses, private waste contractors	●●	●●●	●●
6.4	Govern	Residents and businesses	●●	●●	●

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.

An optional garden-only kerbside collection bin was trialled in Kensington from November 2016 to June 2017. The lack of differentiation between the new pay to use kerbside fortnightly bin based garden collection and the ongoing free to use monthly at-call green waste service resulted in significantly low uptake (fewer than 300 households). The trial finished in June 2017.

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 or units, 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.

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 Degraeves 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 Degraeves 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.

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	Low	Low	Low
9.3	Deliver	Residents	Low	Low	Low

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 D 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.

Benefits of taking action

- AWP captures energy and materials from residual waste that would otherwise go to landfill.
- AWP can help to meet our high targets.
- AWP can produce green energy and avoids landfill greenhouse gas emissions.

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

			LEVEL OF IMPACTS		
ACTION	OUR ROLE	KEY STAKEHOLDERS	Diversion	Emissions	Amenity
10.1	Deliver Influence	Other councils in Victoria, Victorian Government			

Estimated level of impacts  High  Medium  Low

What this strategy means for residents, businesses, developers and visitors

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 or 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 take advantage of the City of Melbourne's 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 for different product types. Drop-offs would be offered free of charge for any items that can be recycled, for example old computers and electronic devices.

Residents can help achieve our 2030 vision through:

- Making informed consumer choices by opting for reusable and recycled products.
- Supporting social enterprises and charities that aim to recover waste.
- Forming a local community swap/sell/share group to maximise product reuse and use of recovered materials.

Developers

Developers will ensure that new buildings have efficient and effective waste services. Developers will need to include an appropriate resource recovery plan in new developments in order to obtain a planning permit. Depending on the building location, the City of Melbourne might also work with the developer to investigate a precinct-based resource recovery hub within the new development. As an incentive to providing the resource recovery hub, a developer may receive concessions for a new project, helping to get them a better return on their investment.

Developers can help achieve our 2030 vision through:

- Including best-practice waste systems and resource recovery infrastructure that are optimised for residential, commercial and mixed-use buildings.
- Piloting and testing innovative approaches to recycling, for example vacuum systems or in-sink disposal units.
- Maximising recycling of construction and demolition waste.

Businesses

Businesses will be encouraged to use alternative shared resource recovery facilities and networks as we limit the number of permits for permanent private bins in the public realm. The introduction of an expanded City of Melbourne resource recovery hub network will encourage some businesses to switch to their local hub. This would enable access to shared facilities and more recycling streams. Businesses could take advantage of the City of Melbourne's expert advisory service to identify the most appropriate waste and resource recovery solution for their needs.

Businesses can help achieve our 2030 vision through:

- Analysing their waste management and improve their resource recovery options to reduce their environmental impact.
- Considering the material inputs in their supply chain and supporting reusable and recycled products where possible.
- Exploring using the shared hubs to manage waste.

Visitors

Visitors will experience a beautiful, safe and livable 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. Buildings in the city will provide simple and convenient recycling systems for workers.

Visitors can help achieve our 2030 vision through:

- Correctly disposing of waste in litter bins.
- Encouraging organisations and businesses to improve their waste management practices.
- Reporting any ideas or improvements to the City of Melbourne.

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
		2019	2020	2021	2022		
1 Engage and educate community and businesses							
Provide an expert advisory service to support an improved waste system.	Deliver	●	●	●	●	M*	Part cost recovery
Advocate for an extensive, significant state-wide recycling education campaign.	Influence	●	●	●	●	L	Operational budget
Promote innovation through our communications and events.	Influence	●	●	●	●	L	Operational budget
2 Incentivise and promote innovative solutions							
Establish and deliver a waste minimisation and innovation fund.	Deliver	●	●	●	●	M*	Operational budget
Deliver an incentive program to drive investment in new resource recovery infrastructure and other solutions.	Influence	●	●	●	●	M*	Externally funded in-kind, grants and sponsorships
Explore innovative approaches to waste separation, collection, storage and recovery.	Deliver	●	●	●	●	M*	Operational budget
3 Support growth of a circular economy through government procurement							
Strengthen the City of Melbourne's procurement practices to use recycled materials where appropriate.	Govern	●	●	●	●	M*	Capital and operational budget
Partner with local and state government to develop best practice sustainable procurement policies and processes.	Govern Influence	●	●			L	Operational budget
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
		2019	2020	2021	2022		
4 Lead by example through City of Melbourne operations and events							
Improve City of Melbourne operations, tenancies and developments toward zero waste to landfill.	Deliver	●	●	●	●	M*	Capital and operational
Reduce waste and improve recycling at City of Melbourne sponsored and run events.	Deliver	●	●	●	●	M*	Operational budget
Recycle public realm waste where practical.	Deliver		●	●	●	M*	Rates
Investigate new opportunities to recycle dumped rubbish and manage litter.	Influence	●	●	●	●	L	Rates
5 Advocate for better producer stewardship and product design							
Develop and adopt a policy position for the City of Melbourne on extended producer responsibility (EPR) and a container deposit scheme (CDS).	Influence	●				L	Operational budget
Advocate to other levels of government for stronger EPR and CDS requirements to improve design and production.	Influence		●	●	●	L	Operational budget
6 Improve waste governance and planning							
Strengthen Waste Management Plan guidelines and review and update waste generation rates to ensure higher recovery rates in new developments.	Govern	●		●		L*	Operational budget
Review regulations and permit conditions for private waste operators, skip bins, and bins permanently stored in the public realm.	Govern	●				L	Operational budget
Explore amendments to the Activities Local Law to require organics waste recovery.	Govern				●	L	Operational budget
Investigate better ways to change behaviour to improve recycling.	Govern	●	●			M*	Operational budget

ACTION	OUR ROLE(S)	TIMEFRAME FOR DELIVERY				INDICATIVE COST	FUNDING MODEL
		2019	2020	2021	2022		
7 Establish new systems to source separate and collect organic waste							
Explore and trial options to separate organic waste across different residential property types.	Deliver	●				M*	Operational budget
Implement successful organic waste solutions.	Deliver		●	●	●	M*	Rates
Establish organics processing contracts to support organics solutions.	Deliver		●			L*	Operational budget
8 Transform the collection and transfer of recycling and residual waste							
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
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							
Advocate for increased investment from landfill levy funds and policy improvements to support a resilient local recycling sector.	Influence	●	●	●	●	L	Operational budget
Establish new, improved recycling contracts	Deliver	●	●	●	●	L	Operational budget
Expand e-waste recycling options for residents.	Deliver	●	●	●	●	L*	Rates
10 Explore advanced waste processing of residual waste that cannot be otherwise recovered							
Explore advanced waste processing and advocate for Victorian Government investment after all other waste minimisation and recovery efforts are implemented.	Deliver Influence	●	●	●	●	H*	Partial external / internal funding



APPENDIX B : MEASUREMENT AND EVALUATION

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.

OUR KEY 2030 TARGETS			
		<ul style="list-style-type: none"> • 90% of waste diverted from landfill • 7.5Mt CO₂-e in greenhouse gas emissions avoided • 20% reduction in household waste produced 	
	OUTCOMES	2030 SUPPORTING TARGETS AND INDICATORS	OUR TARGETS ARE UNDERPINNED BY THE FOLLOWING ASSUMPTIONS
REDUCE	More efficient use of resources	<ul style="list-style-type: none"> • Increase in number of products covered by extended producer responsibility • Victoria implements a container deposit scheme 	<p>State and/or federal governments support and implement policy for strong producer stewardship.</p> <p>Producer stewardship schemes successfully influence better product design and a decrease in waste generated.</p>
	The city produces less waste	<ul style="list-style-type: none"> • 20% less household waste per person • 30% reduction in City of Melbourne office waste produced • 90% construction and demolition recovery rate for City of Melbourne developments 	<p>Positive customer uptake of expert advisory services.</p> <p>Successful roll out of state-wide education campaign.</p>
COLLECT	More effective recycling separation systems	<ul style="list-style-type: none"> • 50% less contamination in household recycling bins • More organic and comingled recycling waste collected from City of Melbourne sponsored events 	<p>Positive customer uptake of improved communal waste and recycling hub facilities.</p> <p>Positive customer use of improved events waste separation facilities.</p>
	A city with high amenity	<ul style="list-style-type: none"> • Fewer private bins in the public realm • 20% reduction in complaints about waste collection and storage • Average customer experience rating of at least 3.5 out of 5 	<p>Positive customer uptake of improved communal waste and recycling hub facilities.</p>
RECOVER	Food and green waste recovered	<ul style="list-style-type: none"> • 50% of organics recovered from household waste • 50% of organic waste recovered from City of Melbourne sponsored events 	<p>Residential food and organics diversion from landfill initiatives successfully trialled and sustainable model implemented.</p> <p>Positive customer uptake of improved communal waste and recycling hub facilities.</p>
	A resilient recycling sector	<ul style="list-style-type: none"> • Increase in use of recycled materials in City of Melbourne new developments • Increase in recycled content in all products procured by City of Melbourne. 	<p>Victorian Government investment in recycling sector.</p> <p>State-wide adoption of circular procurement practices.</p> <p>Post-collection sorting of waste is economically viable.</p>
	Waste to landfill minimised	<ul style="list-style-type: none"> • 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 	<p>Residential food and organics diversion from landfill initiatives successfully trialled and sustainable model implemented.</p> <p>Successful roll out of state-wide education campaign.</p>

APPENDIX C : 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)	Advanced waste processing	Other measures
INTERNATIONAL EXAMPLES				
Amsterdam	<ul style="list-style-type: none"> 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 	●	● Waste to energy	<ul style="list-style-type: none"> Green procurement Cross-sector innovation (e.g. circular buildings project) (City of Amsterdam, n.d.)
London	<ul style="list-style-type: none"> 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 	●	● Waste to energy	<ul style="list-style-type: none"> 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)
Stockholm	<ul style="list-style-type: none"> 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 	●	<ul style="list-style-type: none"> Waste to energy ● Biological (anaerobic digestion) 	<ul style="list-style-type: none"> 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.)
Tokyo	<ul style="list-style-type: none"> 37% recycling rate for municipal solid waste by 2030 27% recycling rate for municipal solid waste by 2020 	●	● Waste to energy	<ul style="list-style-type: none"> 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.)

	Diversion / recovery target(s)	Organics recovery (food waste)	Advanced waste treatment	Other measures
AUSTRALIAN EXAMPLES				
Brisbane	<ul style="list-style-type: none"> Reduce domestic solid waste disposed to landfill to 250 kg per person each year by 2031 	●	<ul style="list-style-type: none"> Waste to energy and/or biological (anaerobic digestion) 	<ul style="list-style-type: none"> Divert organics from landfill Community outreach Investigate innovative waste recovery programs Prevent litter Improve corporate performance on waste <p>(Brisbane City Council, 2018)</p>
Sydney	<ul style="list-style-type: none"> 90% diverted from landfill by 2030 	●	<ul style="list-style-type: none"> Waste to energy 	<ul style="list-style-type: none"> 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 <p>(City of Sydney, n.d.)</p>

APPENDIX D : 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 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. We are unable to move towards zero waste and reach our targets without AWP.

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: Electrical or electronic waste.

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.

REFERENCES

- Blue Environment, 2016, 'City of Melbourne commercial waste survey' (Unpublished).
- Blue Environment, 2018, 'City of Melbourne waste data and projections' (Unpublished).
- City of Amsterdam, n.d., 'Policy: Circular economy', City of Amsterdam website, accessed on 19 February 2019: www.amsterdam.nl
- Brisbane City Council, 2018, 'Brisbane Clean, Green, Sustainable 2017-2031', Brisbane City Council website, accessed on 19 February 2019: www.brisbane.qld.gov.au
- City of Melbourne, 2017, 'Census of Land Use and Employment Profile 2017', City of Melbourne website, accessed on 21 February 2019: www.melbourne.vic.gov.au
- City of Melbourne, 2017, 'Daily Population Estimates and Forecasts', City of Melbourne website, accessed on 21 February 2019: www.melbourne.vic.gov.au
- City of Sydney, n.d., 'Leave nothing to waste: Sydney Waste Strategy and Action Plan 2017-2030', City of Sydney website, accessed on 19 February 2019: www.cityofsydney.nsw.gov.au
- City of Vancouver, 2018, 'Single-Use Item Reduction Strategy', City of Vancouver website, accessed on 1 October, 2018: www.vancouver.ca
- Department of Environment, Land, Water and Planning, 2018, 'Investing in a more sustainable future - Victorian Government Sustainability Fund 2017-18 Activities Report', Department of Environment, Land, Water and Planning website, accessed on 19 February 2019: www.environment.vic.gov.au
- Department of Environment, Land, Water and Planning, 2018, 'Transitioning Victoria to a circular economy', Department of Environment, Land, Water and Planning website, accessed on 19 February 2019: www.environment.vic.gov.au
- Department of the Environment and Energy, 2018, 'National Waste Policy', Department of the Environment and Energy website, accessed on 25 February 2019: www.environment.gov.au
- EPA Victoria, 2018, 'Landfill and prescribed waste levies', EPA Victoria website, accessed on 18 February, 2019: www.epa.vic.gov.au
- .id, 2018, 'Population and household forecasts, 2016 to 2041', City of Melbourne website, accessed on 21 February 2019: www.melbourne.vic.gov.au
- DJR Environmental, 2018, 'City of Melbourne Organic waste recycling options. Final report, September 2018' (Unpublished).
- Inform, Inc., 2003, 'Electric Appliance Recycling in Japan' Inform website, accessed on 21 February 2019: www.informinc.org
- Mayor of London, 2018, 'London Environmental Strategy 2018', Greater London Authority website, accessed on 19 February 2019: www.london.gov.uk
- Metropolitan Waste and Resource Recovery Group, 2016, 'Metropolitan Waste And Resource Recovery Implementation Plan 2016', Metropolitan Waste and Resource Recovery Group website, accessed on 21 February 2019: www.mwrrg.vic.gov.au
- Ministry of Economy, Trade and Industry Tokyo, n.d., 'FY 2016 Enforcement Status of the Home Appliances Recycling Law and Recycling Statistics for Manufacturers and Importers', Ministry of Economy, Trade and Industry website, accessed on 21 February 2019: www.meti.go.jp/english
- Recycling Council of British Columbia, 2019, 'Extended Producer Responsibility (EPR) Programs in BC', Recycling Council of British Columbia website, accessed on 1 October, 2018: www.rcbc.ca
- Reincarnate, 2017, 'City of Melbourne: Context, initiatives and innovations - Waste and resource recovery strategy 2030' (Unpublished).
- Sustainability Victoria, 2018, 'State-wide Waste and Resource Recovery Infrastructure Plan', accessed on 1 October, 2018: www.sustainability.vic.gov.au
- United Nations, 2015 'Sustainable Development Goals', United Nations website, accessed on 21 February 2019: www.un.org
- United Nations Environment Programme, 2015, 'Global Waste Management Outlook', United Nations Environment Programme website, accessed on 21 February 2019: www.unep.org
- Stockholm City, n.d., 'Waste management plan for Stockholm 2017-2020' Stockholm City website, accessed on 19 February 2019: www.stockholm.vattnochavfall.se

How to contact us

Online:

melbourne.vic.gov.au

In person:

Melbourne Town Hall - Administration Building
120 Swanston Street, Melbourne
7.30am to 5pm, Monday to Friday
(Public holidays excluded)

Telephone:

03 9658 9658
7.30am to 6pm, Monday to Friday
(Public holidays excluded)

Fax:

03 9654 4854

In writing:

City of Melbourne
GPO Box 1603
Melbourne VIC 3001
Australia



Interpreter services

We cater for people of all backgrounds
Please call 03 9280 0726

03 9280 0717 廣東話
03 9280 0719 Bahasa Indonesia
03 9280 0720 Italiano
03 9280 0721 普通话
03 9280 0722 Soomaali
03 9280 0723 Español
03 9280 0725 Việt Ngữ
03 9280 0726 عربي
03 9280 0726 한국어
03 9280 0726 हिंदी
03 9280 0726 All other languages

National Relay Service:

If you are deaf, hearing impaired or speech-impaired,
call us via the National Relay Service: Teletypewriter (TTY)
users phone 1300 555 727 then ask for 03 9658 9658
9am to 5pm, Monday to Friday (Public holidays excluded)

melbourne.vic.gov.au



CITY OF MELBOURNE