

12 August 2004

**2020 VISION FOR SUSTAINABLE WASTE MANAGEMENT –
DISCUSSION PAPER**

Division Sustainability & Innovation

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Purpose

1. To present a discussion paper, *2020 Vision for Sustainable Waste Management* for endorsement by Council and seek approval for its release for a period of public comment.

Background

2. The City of Melbourne has a waste profile unlike those of other municipalities in metropolitan Melbourne. The majority of waste generated is from commercial, industrial, cultural and events sectors rather than residential properties. The attached paper estimates an annual total of 548,000 tonnes of waste generated in the municipality with an overall diversion rate of 61% to recycling.
3. This is mainly due to the recycling of paper and cardboard by commercial activities and the recycling of concrete, bricks and steel in demolition and construction. Although residents produce the same amount of garbage as the Victorian average (4.4 kg per person per week), participation in recycling is relatively low with a diversion rate of only 18%.
4. The City of Melbourne's *Waste Wise Plan 2002-2005* sets out the City's current priorities and programs to reduce waste. However, the scope and time horizon of the Plan are relatively limited. In recent years Council has developed and endorsed long-term strategies for climate change (*Zero Net Emissions Strategy*) and sustainable water management (*Total Water Mark Strategy*) to the year 2020. The development of a longer term waste management strategy would add to this policy framework and progress Council's goal of a sustainable city.

Issues

5. The attached Discussion Paper identifies future changes in waste management and lists options for possible City of Melbourne involvement. The Paper notes that in Australia there is a gradual shift away from a focus on waste reduction and recycling to a "closed loop or zero waste outcome" involving more sustainable resource use. This is leading to the development of more end product markets, a greater concentration on product diversion from the waste stream, consideration of product stewardship opportunities and ways to encourage people to examine their resource use.
6. The attached Discussion Paper will be used as the basis for a new waste policy document that will seek to place the City of Melbourne at the forefront of national and global changes in waste management.

Future trends

7. Planning for sustainable waste management over a period of decades requires a flexible approach so that greatest advantage may be taken of innovations occurring at local, national and international levels. Such changes include:
 - 7.1. reviews of the Commonwealth Government's Mandatory Renewable Energy Targets (MRET). Changes to this instrument may result in a more favourable economic environment for "waste to energy" projects. Several are planned for Victoria and would provide a value added solution to certain types of waste after options to reduce, reuse and recycle have been exhausted (eg green waste);
 - 7.2. the price charged for landfill disposal in Victoria is considered by many to be too low to provide an incentive for recycling and other alternatives to waste disposal. Changes to any pricing structure would activate a series of options not currently available; and
 - 7.3. the Western Regional Waste Management Group (WRWMG) has, on behalf of the member Councils, recently called separate tenders for the processing of kerbside recyclables (Dry MRF) and domestic waste (Wet MRF) and the collection of domestic waste and recyclables materials. Tender evaluations have been completed and tender acceptance recommendations are planned for consideration by the WRWMG Board during August. Formal consideration of the tender by individual member Councils will then follow including the possibility of the member Councils forming a User Group in accordance with the provisions of S193 of the *Local Government Act 1989*. A report is planned to be considered by Committee and Council at its October meeting.

Consultation

8. The attached discussion paper, *2020 Vision for Sustainable Waste Management*, will be released on endorsement by Council for targeted consultation with peak bodies (eg MAV) and relevant state agencies (eg EcoRecycle Victoria) until December 2004. Release of the paper for a sixty day period of broader community consultation will commence in February 2005 before a final Strategy is prepared and presented to Council. It is anticipated that the current tender of the Western Regional Waste Management Group will have been concluded by that time allowing for more certainty during the public comment period.

Relation to Council Policy

9. The program relates to a number of Council policies including *City Plan 2010* and the *Corporate Plan 2003-2006*, specifically the following strategic directions:
 - 9.1. reduce greenhouse gas emissions generated in the City of Melbourne;
 - 9.2. encourage efficiencies in resource use and waste reduction within the City;
 - 9.3. create a sustainable built form for the City; and
 - 9.4. deliver and provide access to facilities and services to support those living in, visiting, and working in the City.

Government Relations

10. The discussion paper will be used in discussion and consultation with state agencies including the Environment Protection Authority, Department of Sustainability and Environment and EcoRecycle Victoria.

Finance

11. Actions arising from the report have been included in budget submission for 2004/2005.

Legal

12. No direct legal issues arise from the recommendation in the report.

Sustainability

13. The City of Melbourne is committed to decision making based on consideration of ecological, social and economic factors.

Connected and Accessible City

14. There is no significant sustainability impact.

Innovative and Vital Business City

15. The development of a new waste strategy to the year 2020 will explore and foster opportunities for new businesses in the area of waste management and waste reduction. The concept of “closing the loop” sees new businesses starting up using what is now considered “waste” as a raw material for new production. Companies re-processing waste products are already starting to operate in the city, using the city’s waste products, employing people and exporting their products.

Inclusive and Engaging City

16. There is no significant sustainability impact.

Environmentally Responsible City

17. The development of a new waste strategy to the year 2020 will aim to reduce waste and increase the diversion of waste toward recycling. Reducing waste to landfill will also reduce Council’s greenhouse gas emissions.

Recommendation

18. That the Environment, Sustainability and Indigenous Affairs Committee:
 - 18.1. endorse the attached 2020 Vision for Sustainable Waste Management;
 - 18.2. approve the release attached paper for a period of targeted consultation with peak bodies until December 2004;
 - 18.3. approve the release attached paper for a sixty day period of broader community consultation in February 2005; and
 - 18.4. note that this decision is being made by the Committee under delegation from the Council and is subject to the referral notice process.

Attachment:

1. [Discussion Paper](#)

City of Melbourne

2020 Vision for Sustainable Waste Management Discussion Paper

July, 2004

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INTRODUCTION

- **A Vision for Sustainable Waste Management in Melbourne**

How will wastes and resources be managed in the City in the year 2020?

In the year 2020, the City of Melbourne and its residents will be well on their way towards zero waste. Product stewardship and sustainable consumption programs undertaken by the City, residents and the business community will have produced less packaging and less waste. Communities will have moved beyond looking at outputs such as waste and are looking at all the inputs into a sustainable city.

All households participate in recycling and other resource recovery programs separating food and garden organics for collection and processing (that cannot be treated in home composting), while residual materials (less than 1 kg per person per week) will be sent for low impact residual processing rather than to landfill. Recycling and reuse systems will exist for all household items. Repair and reuse will be a feature in a way that is easy and convenient for the community.

The city's parks, gardens, laneways and streets will be litter free. All businesses will have adopted initiatives to reduce resource consumption and waste. All construction projects, both domestic and commercial will use waste reduction and design for environment initiatives and divert 100% of waste from landfill. New businesses have emerged promoting reuse and recycling to help close the loop.

This 'crystal ball' vision for waste in the City of Melbourne, may seem ideal – but it is also a realistic vision, one that with education programs, services provision, commitment and leadership from all levels of government can be adopted by the City of Melbourne in its quest for environmental sustainability.

This discussion paper raises issues in achieving this vision and discusses both short and long term objectives in working towards reducing waste.

Waste Reduction – Part of a Sustainable City

The City of Melbourne is working towards creating an environmentally sustainable city. One of the central goals of environmental sustainability is to reduce the amount of waste produced, and reuse materials more efficiently to minimise impact on the environment. The City of Melbourne through its City Plan 2010, has identified environmental responsibility as one of its four key strategic directions. Local councils across Victoria have long been involved in reducing waste to landfill and have operated increasingly successful recycling programs for over a decade. The City of Melbourne has a major role to play in reducing waste to landfill through the provision of household recycling and waste services.

Despite recycling greater volumes of materials, the overall amount of waste we produce has increased. More emphasis must be placed on reducing the amount of resources we use as part of the path to environmental sustainability.

Increasingly there is a shift towards the concept of zero waste. EcoRecycle Victoria has developed a draft strategy for consultation *Towards Zero Waste – A Materials Efficiency Strategy for Victoria (2003)* which proposes a path towards zero waste.

Council too has a role in working towards zero waste and working within EcoRecycle's targets, providing sustainable waste management services to residents and commercial properties; shifting from waste management to sustainable resource management encompassing waste reduction and sustainable consumption.

Value of Recycling

Reducing waste and recycling has major benefits for the environment by a) more efficient use of material resources b) environmental savings from energy and water use and c) less landfill space required.



The greatest environmental benefit is not from savings in landfill space, but through resource savings from the reuse and recycling of material rather than manufacturing new products from additional raw materials. Waste reduction and recycling also provides savings in greenhouse gas emissions and significant water savings.

In financial terms, the environmental value gained from recycling far exceeds the cost of providing recycling services. A life cycle assessment of recycling conducted by Nolan-ITU in 2002 identified that kerbside recycling in Australia provides a net environmental benefit of \$42 per household per year¹.

The largest determinant on the environmental value is 'avoided product credits', which include all the lifecycle impacts avoided by displacing virgin materials with recycled ones. For example; by collecting and recycling aluminium cans the environmental costs associated with the raw material extraction, transport and refining of aluminium ore are avoided, resulting in a net benefit to the environment – given as a dollar value.

For the City of Melbourne's kerbside recycling collections this means that the greater the amount of recycling collected (yield), the greater the environmental benefit from recycling.

o Strategic Background

The City of Melbourne has a number of policies that guide the development of environmental programs and services in the city.

City Plan 2010 seeks an environmentally responsible city and had identified actions and programs on energy, greenhouse, water, built environment and waste. Specifically the plan sets objectives to promote waste and recycling programs to commercial properties, close the loop, promote the efficient use of resources and improve environmental knowledge of the city's residents and business communities.

Council's *Waste Wise Plan 2002-2005* set the City's current priorities and programs to reduce waste. This discussion paper builds upon Council's *Waste Wise Plan 2002-2005* and examines some of the policy initiatives and directions outlined in the plan.

The City of Melbourne as an environmental leader, has developed long term strategies on water and greenhouse emissions that set a 2020 vision for the development of environmental sustainability in these areas. Council's *Zero Net Emissions Strategy* and *Water Mark Strategy* both set targets for Council, residents and the commercial sector to reduce energy and water consumption and set a clear path for Council to achieve these goals.

This waste management discussion paper will act as a primer for the development of a Waste Management Strategy for the City of Melbourne to work in conjunction with Council's *Zero Net Emissions Strategy* and *Total Water Mark Strategy*, building a policy framework for overall sustainability in the City of Melbourne.

Discussion Paper Development

This discussion paper has been developed in conjunction with City of Melbourne staff and key stakeholders and presents both the issues of today and explores opportunities and solutions for the future. It also asks key questions about waste management in the City of Melbourne - can Melbourne be a zero waste city? If Melbourne is to work towards zero waste, how will it get there? What partnerships and alliances will need to be formed and what is Council's role in both leadership and service provision?

Over 20 stakeholder organisations were consulted in preparing the discussion paper. The feedback from this consultation has helped to shape the direction of the discussion paper. Current waste reduction programs and innovations of stakeholders have been highlighted throughout the document. To canvas the waste management and recycling issues for Council, this discussion paper presents:

¹ Nolan-ITU (2000), *Independent Assessment of Kerbside Recycling in Australia*.



- A profile of waste generation for the whole of the City of Melbourne and highlights key waste generating sectors and possible services for the future;
- Case studies of current projects within Melbourne, nationally and internationally to highlight current waste reduction and recycling initiatives;
- Relevant council, regional, state and federal policy directions; and
- Relevant technologies and their possible applications.

Discussion Paper Structure and Priorities

The discussion paper is divided into four chapters with each chapter focused on four key waste sectors;

- Residential services;
- Other council waste - council buildings, litter, street sweepings;
- Commercial and industrial waste; and
- Construction and demolition waste.

In each of these chapters the current issues and priorities for each sector are presented along with relevant data, case studies and short and long term options and opportunities for the City of Melbourne to pursue sustainable waste management in the city.

These options, if they are to be considered by Council as a part of future planning, must be subjected to community and further stakeholder consultation and analysis to ensure they are in line with Council's environmental, social and financial policies.



MELBOURNE'S WASTE PROFILE

The City of Melbourne is a unique area, it is the Capital City of Victoria and contains a mix of residential, commercial and industrial development. Council's Census of Land Use and Employment (CLUE) provides insight into the City's size and potential for waste generation and diversion.

- Melbourne is home to over 50 000 residents and has experienced a boom in inner city residential development over the past ten years with a large percentage of this growth in student accommodation. With the development of Docklands (and its expected hand over to the City of Melbourne later in 2007), an additional 15 000 residents are expected to live in the City of Melbourne in the next 10-15 years;
- 70% of residential properties are flats, units or apartments – the opposite of most other metropolitan councils;
- Melbourne has a day time workforce of 555 000;
- Within the city there are over 235 300 seats in sporting and entertainment venues including the Melbourne Cricket Ground, Telstra Dome, Olympic Park, Rod Laver Arena, Melbourne Concert Hall and a number of theatres and cinemas;
- Many major events are held in the city every year – including the AFL Grand Final, Melbourne Cup, Melbourne International Festival, Melbourne Flower and Garden Show and Moomba;
- There are over 106 400 students in universities and other educational institutions;
- Hundreds of thousands of visitors visiting key tourism sites and cultural institutions such as the Melbourne Zoo, Federation Square, Southbank, Melbourne Museum and Royal Botanical Gardens every year; and
- Melbourne is a food city, with over 100 000 seats in restaurants and cafes.

All of these venues, events, environments and industries create waste.

Unlike other Victorian councils, where the majority of waste generated in a city is produced by residential properties, it is the commercial, industrial, cultural and events sectors that produce the most waste in the City of Melbourne. These sectors are not under direct council waste management control, which makes the implementation of waste reduction initiatives difficult.

How Much Waste Do We Produce?

The average household in the City of Melbourne produces 390 kg of garbage per year and 83 Kg of recycling.

On average the contents of a typical household garbage bin comprises nearly 50% food and garden waste, 20% potentially recyclable material (paper, cardboard, bottles and cans) and 30% other waste or residual garbage (nappies, non recyclable plastic, contaminated paper and other) (Nolan-ITU, 2002).

Developing a Waste Profile

To highlight current waste generation levels and future program opportunities, a current profile of waste in the whole city has been developed.



Data for the household sector was supplied directly by the City of Melbourne. Developing a profile of commercial and industrial waste is more difficult as there is no consistent data collection method and there are a range of waste management companies operating in the City.

The profile for commercial waste has been calculated using Australian Bureau of Statistics data for total equivalent full-time employees (EFTE) by sector, multiplied by total waste generated per EFT for each sector per year. The multipliers for waste per EFTE per year was compiled from previous studies and developed by Nolan-ITU as part of the development of EcoRecycle’s *Draft Towards Zero Waste Strategy (2003)*.

A profile of waste generation in the C&D sector has been developed using data from EcoRecycle Victoria’s *Solid Industrial Waste Management Strategy*, data on building activity generated by the Building Commission and waste generation and recycling data supplied by Multiplex and Mirvac Constructions.

Garbage Collection

In 2002/2003, 12 012 tonnes of household garbage was collected from 30 900 properties. This equates to;

- A yield per household of 7.5 kg/wk of household garbage; and
- a yield per person of 4.4 kg/wk of household garbage.

The garbage yield per household is comparative to neighbouring councils with similar kerbside garbage and recycling systems and housing types and is 3.5 kgs lower than the state average. The yield per person is also in line with neighbouring councils and is exactly the same as the state average of 4.4 kg per person per year.

Table 2.1 Comparison with Neighbouring Councils - Garbage

Council	Yield per household – kg/wk	Yield per person - kg/wk
Melbourne	7.5	4.4
Yarra	7.7	3.6
Port Phillip	7.7	4.4
Moreland	8.6	4.1
<i>State average</i>	<i>11.1</i>	<i>4.4</i>
<i>Lowest -Nillumbik</i>	<i>3.0</i>	<i>0.9</i>

Recycling Services

In 2002/2003, 2 606 tonnes of recyclables (bottles, cans, paper and cardboard) was collected from 30 900 residential properties. This equates to:

- a yield per household of 1.6 kg/wk of recycling; and
- a yield per person of 0.9 kg/wk of recycling.

The yield per household is much lower than neighbouring councils with similar garbage and recycling systems and housing types and is less than half the state average. The yield per person is also much lower, than neighbouring councils.

Table 2.2 Comparison with Neighbouring Councils - Recycling

Council	Yield per household – kg/wk	Yield per person - kg/wk
Melbourne	1.6	0.96



Yarra	3.4	2.01
Port Phillip	3.5	1.69
Moreland	3.5	1.69
<i>Vic Average</i>	3.7	NA
<i>Highest -Nillumbik</i>	12.4	3.92

Green Waste

In 2002/2003 a total of only 24 tonnes of green waste was collected from all properties in the City of Melbourne. Collected green waste is transported to Organic Recyclers in Brooklyn for processing into compost. The high number of apartments and the low number of households with gardens partly explains why this figure is low when compared with neighbouring councils.

Hard Waste

In 2002/2003 a total of 68 tonnes of hard waste was collected from all properties in the City of Melbourne. There are no figures available for the recovery and recycling of hard waste materials.

Diversion Rate

The diversion rate is a measure of the amount of material diverted from landfill. The more amount of material diverted from landfill through recycling and green waste collections, the greater the diversion rate. It is calculated by adding together the amount of recycling and green waste collected and dividing it by the total amount of material collected from households including garbage. Based on this calculation, the City of Melbourne has one of the lowest diversion rates in Victoria at 18%, compared to the Victorian average of 35%.

Table 2.3 Comparison with Neighbouring Councils – Total Diversion

Council	Diversion Rate
Melbourne	18%
Yarra	34%
Port Phillip	31%
Moreland	29%
<i>Vic Average</i>	35%
<i>Highest - Nillumbik</i>	80%

Other Council Services

Other council waste includes litter collected from 2870 street litter bins; (which includes 980 bins in the CBD and 710 in parks and gardens), litter collected from street cleansing operations, street sweepings and dumped rubbish.

No separate figures are available for public place recycling bins as collected material is included with the residential recycling collections.

In total, 10 775 tonnes of other council waste is collected on average every year, almost as much as the total amount of garbage collected from residential properties (12 012 tonnes). The high amount of litter collected in the city from both the streets and litter bins is an issue for council.

Table 2.4 Other Municipal Waste

Stream	Total Annual Tonnes

Litter bins	2 200 ²
Dumped rubbish (illegal dumping)	1 600 ³
Street litter (street cleaning)	1 500
Street sweeping	5 475 ⁴
Total	10 755

Commercial and Industrial Waste

The profile of waste generation for the commercial sector highlights the annual tonnes produced for each sector. Construction and demolition waste is calculated separately in Section 2.5. A summary table of total waste per sector is included in Table 2.6 and a complete breakdown of each sector and the T/EFTE/Yr. for each sector is included in Table 2.7.

Waste generation levels vary enormously across different commercial and industry sectors. For example, food manufacturing has waste levels per employee many times greater than offices in the finance sector.

Audits of waste levels have been undertaken across a range of sectors in Victoria and NSW. Data from previous studies obtained have established the total waste generated per employee in each commercial and industrial sector. The profile of total waste generation in the City of Melbourne has been developed based on employment levels and waste generation levels for each sector. This assessment has identified an estimated 102 000 tonnes are generated from businesses in the City of Melbourne every year.

Differences in management from site to site will influence this waste generation level and also the diversion rate. Therefore this calculation of 102 000 tonnes should be seen as indicative of the scale of waste in this sector. It is not precise enough to allow year to year measurement of waste level trends. Each sector not only has different generation levels, but also different profile of wastes and different recycling and waste diversion potential.

Overall at commercial sites, the key materials disposed of are printing and writing grade paper, cardboard, flexible plastics, food, beverage packaging and electronic equipment. For example; manufacturing sites will have raw material spoils, cardboard and flexible plastics while food retail, accommodation, cafes and restaurants will generate a waste stream dominated by food, beverage and food packaging and cardboard.

Diversion Rate

The Victorian average diversion rate for the commercial and industrial sector is 68%⁵. Some industries in the manufacturing sectors generate more waste but also have higher waste diversion rates; resulting in higher overall recycling volumes. Other industries have a much lower diversion rate and generate lower amounts of waste.

In the City of Melbourne there is a higher concentration of industries with low waste and lower diversion and only a smaller number of high waste and high diversion industries. Within the City of Melbourne it can be assumed that there will be a higher than average diversion rate for some materials due to the centralised geographic location.

² Average tonnes collected for 2001/2002 and 2002/2003.

³ Figure calculated based on cubic metres collected of 5 130m³ and multiplied by an estimated density of .3 M³/ T.

⁴ Figures from March 2003 to April 2004.

⁵ Nolan-ITU, 2002. *Solid Industrial Waste Strategy Supporting Analysis*, (Report for EcoRecycle Victoria), Nolan-ITU, Melbourne.

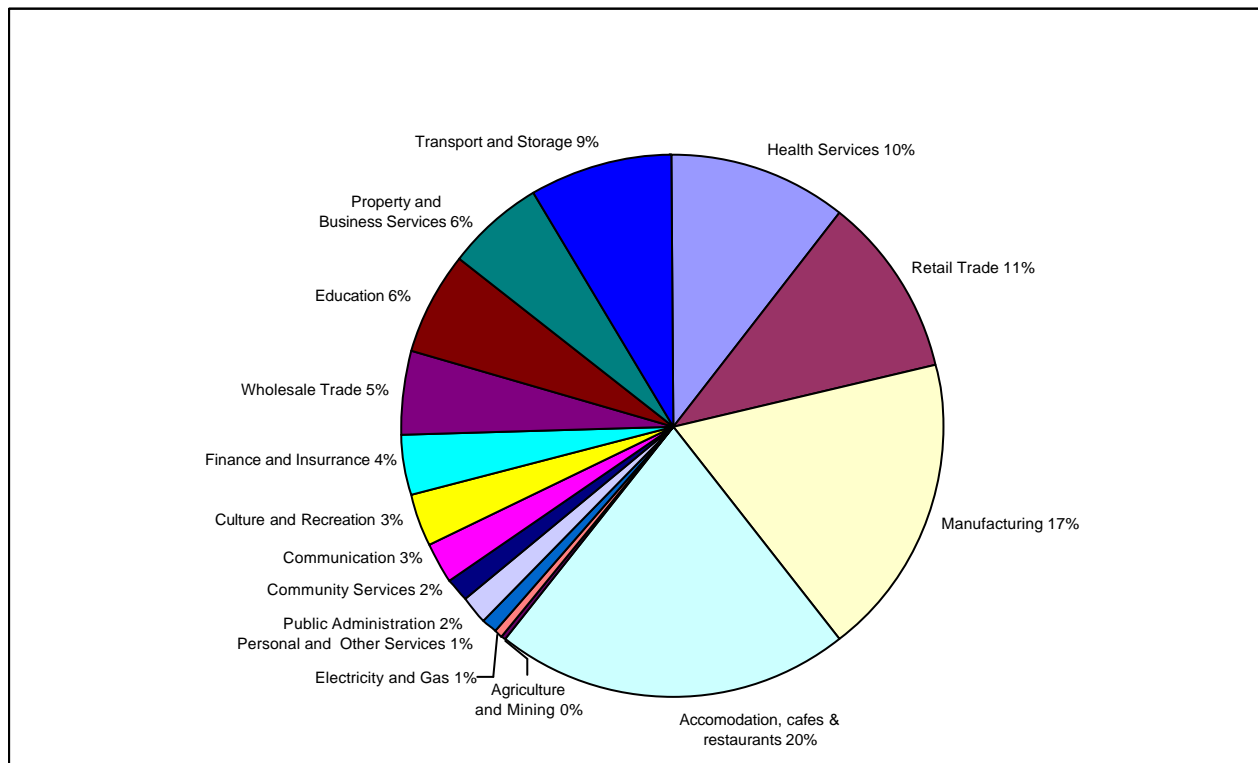


As a result of these factors the diversion rate for Melbourne is likely to be around 40%, with paper and cardboard dominating the recycling activity. There is a need to identify more precise diversion and generation levels from key sectors in the City of Melbourne.

Table 2.6 Commercial Waste Generation – Summary

Industry	Total Tonnes per year
Agriculture and Mining	195
Manufacturing	18 233
Electricity and Gas	600
Wholesale Trade	5 362
Retail Trade	11 500
Transport and Storage	8 549
Communication	2 694
Finance and Insurance	3 851
Property and Business Services	6 323
Public Administration	1 683
Education	5 934
Health Services	10 639
Community Services	1 625
Culture and Recreation	2 860
Personal and Other Services	1 239
Accommodation, Cafes and Restaurants	21 270
TOTAL TONNES	102 557

Figure 2.7 Commercial and Industrial Waste Generation - % by sector



Construction and Demolition Waste

Waste Generation

The total amount of construction waste generated in Victoria is 3 million tonnes, with a 40% diversion rate.⁶

Identifying the generation and diversion rates for the construction and demolition waste in the City of Melbourne is a difficult exercise due to limited data collection. The method used to identify Melbourne's construction and demolition waste generation profile uses as a base the percentage of building activity for the City of Melbourne as a percentage of the total construction and demolition waste generated in Victoria, identified in the development of the Solid Industrial Waste Management Strategy.

Building activity in the City of Melbourne is considerably different from other metropolitan and rural councils, with a significantly higher value of building works and more commercial than residential activity; the opposite of other metropolitan councils. As a result the generation of construction and demolition waste is different in both quantity and composition than other Victorian Councils.

2003 Building activity data for 2003 from the Building Commission identified \$14.4 billion worth of building works in Victoria; of this 14% or \$2.031 Billion was in the City of Melbourne.⁷

The total waste generated by the building sector in Victoria is 3 million tonnes. Where related to building activity, the dollars per tonne equivalent is \$4666 per tonne.

At a value of \$4666 per tonne of waste, \$2.031 Billion dollars of building activity in the City of Melbourne equals 420,000 tonnes of waste generated in the construction and demolition sector. This figure could be higher; due to higher demolition activity and less greenfield developments, or could be lower due to the higher cost of building activity.

Diversion Rate

In the City of Melbourne there is a higher proportion of commercial building activity and a higher proportion of recovery in this sector. Secondly there is a higher degree of demolition in the city than other metropolitan sites. By nature large-scale demolition projects are comprised of highly recyclable materials such as concrete, bricks and steel and have a high recovery rate. Large scale recovery and demolition projects e.g. MCG demolition, where up to 95% of waste is recycled, boosts the overall diversion rate across the sector.

In addition the high degree of excavation works from commercial construction work results in large amount of soil and rock which is not a feature of suburban/rural construction and demolition works. It is likely that the diversion rate from construction and demolition projects within the City of Melbourne is likely to be as high as 70% or higher. This is confirmed with data from both Multiplex and Mirvac Constructions, identifying an average diversion rate of at least 60% for construction and fit out stages. Diversion in the demolition and excavation stage is likely to be over 80% on average.

Melbourne's Total Waste Picture

In total an estimated 548 000 tonnes of waste is generated in the City of Melbourne each year. Of this it is estimated that 336 200 tonnes is diverted from landfill for recycling, a diversion rate for the City of Melbourne of 38%.

The higher level of diversion can be explained by the high amount of construction waste estimated to be generated and the high diversion rate of these materials.

Table 2.7: Melbourne's Total Waste Picture

⁶ Nolan-ITU, 2002. *Solid Industrial Waste Strategy Supporting Analysis*, (Report for EcoRecycle Victoria), Nolan-ITU, Melbourne.

⁷ Building Commission (2003); *Pulse: A1 Volume of Work 2003*, Building Victoria, Melbourne.



Waste Sector	Total Tonnes per year - Garbage	Total Tonnes per year - Recycled	Diversion Rate
Residential Services	14 710	2 200	18%
Council Waste - Other	10 755	-	0%
Commercial and Industrial	102 557	41 000	40%
Construction and Demolition	420 000	294 000	70%
TOTAL TONNES	548 022	337 200	38%



NATIONAL AND INTERNATIONAL TRENDS AND DIRECTIONS

There are several key national trends that are driving changes in household and commercial recycling and recovery programs across Australia and internationally. These will shape the way services are delivered in the City of Melbourne and neighbouring Councils, now and in the future.

Extended Producer Responsibility and Product Stewardship

Acknowledging their Extended Producer Responsibility and Product Stewardship responsibilities, a number of industry sectors are exploring how they might facilitate the recovery of products that they manufacture and sell into the market. The key active sectors in this regard are:

- Oil industry – established a product levy to fund motor oil recovery through council operated transfer stations.
- Television manufacturing industry – shortly to adopt a product levy that will fund the recovery and reclamation of televisions from Australian households. State Governments are asked to provide legislation to underpin the levy across all manufacturers and importers.
- Computer industry – likely to adopt a similar product levy to the television sector for assisting the recovery of computers from household and commercial sources.
- Paint industry – is in the early stages of determining how it can provide assistance to increase the recovery of used paint and paint packaging from householders. This may be through transfer stations or retailer collection points.

An agreement has also been reached between State and Federal environment ministers and the retail industry regarding plastic shopping bags. This involved establishing industry programs to achieve redirection targets set for the end of 2004 and end of 2005. These targets require reductions of 50% in bag usage, and targets for reduced bag litter and increased bag recycling.

Towards Zero Waste

Strategies being developed in all States are aimed at changing the focus from a recycling and waste reduction approach to achieving a closed loop zero waste outcome. The achievement of this outcome is linked to a greater focus on sustainable resource use resulting in less waste generation. There is also a move to shift from landfilling of material to diversion of organic and treatment of residual materials.

In most states, the trend is for council operated transfer stations to become more comprehensive waste diversion facilities. These facilities allow the free (or reduced cost) disposal of a broad range of products/materials for reuse or recycling.

This includes building materials such as steel, timber, concrete but also consumer goods such as furniture, appliances, electronic equipment, toys, paint, oil and batteries.

Bin Based and Commingled Collections

In waste collection, there is a move towards replacing crate and bag based recycling collections with a mobile bin mechanised lifted for garbage and recycling collection. This is being driven by a concern about occupational health and safety issues with manual collection of recycling crates and also by the high participation and yields from bin based collections. There is a mix of dual bin, split bin and single bin (commingled) recycling services.

The strong trend is towards commingled collections; (the inclusion of paper and cardboard in with bottles and cans). This is cheaper overall in collection and sorting costs as only one truck is required (for bottles, cans and paper) rather than two separate vehicles (recyclable and paper). The paper is separated from bottles and cans at a materials recovery facility. Commingled collections also result in less wind blown litter than from recycling crates as all material is contained in an enclosed bin.

Sustainable Consumption

Across Australia and internationally, there is a move towards more 'sustainable consumption', which takes into account the whole lifecycle of a product and questions the need for certain products and materials before they become waste. This push for sustainable consumption is intended to discourage unnecessary consumption and create a shift to lower resource inputs in products consumed. It encompasses issues of global equity of resource use and how a focus on 'reduce' and 'reuse' can restrict the current increase in resource consumption.

Locally, Environment Victoria in partnership with EcoRecycle has established a campaign on raising awareness for the issue of sustainable consumption. This will highlight the global inequity between consumption in the developed and developing worlds. It will look at the impact of reduced life expectancy of cars, appliances and other consumer goods and the trend away from repair to replacement.

Another important trend is the increased individual ownership of goods that were previously shared e.g. DVD's books, tools, coffee machines. Sustainable consumption also requires a focus on potential for cleaner production, lightweighting, product elimination or material substitution; (rethinking the way we use materials and the way products are manufactured).

Closing the Loop – Buying Recycled

Recycling is only recycling if materials that are collected are manufactured into a new product. To support recycling, councils and consumers are being encouraged to 'close the loop' and buy products manufactured from recycled materials. Materials collected at kerbside are manufactured into a variety of products for industry and homes.

The concept of 'closing the loop' is vital to ensure long term sustainability of kerbside recycling; ensuring that there is an end market for the materials collected at kerbside and encouraging resource efficiencies.

International Trends

Kerbside Collections

Most developed countries now provide a kerbside collection for household recyclables, replacing community drop off facilities or bottles banks, that have had a poor residential waste diversion performance.

Limited landfill space and high landfill disposal costs in Europe and North America has fostered the development of alternative waste treatment technologies and legislation for waste reduction by some countries, to keep recyclable material out of landfill.

Product Stewardship

On the product stewardship front, in 2002 the Irish Government introduced a levy on single trip plastic shopping bags. This has resulted in a dramatic shift away from single use bags to durable shopping bags or transactions without a bag.

Some countries have introduced charges on products to fund a recovery program. This is most common in relation to electronic equipment. Other countries have introduced hidden levies on materials in order to cover the environmental cost of these materials in the litter and waste streams or to act as an influence on consumption.

Legislative Approach

The European Union has established legislative requirements for member councils to achieve packaging and recovery rate targets. There are also requirements for programs to assist in the take back of electronic equipment such as computers.

Many European and North American jurisdictions now require that all building construction and demolition waste and commercial and industrial waste is sorted before it is disposed to landfill or sent for waste treatment.

There are also a number of examples of local, state and national bans on recyclable material entering landfill. This occurs most effectively, where adequate markets are established during the introduction of a foreshadowed ban. Some areas such as Wisconsin in the USA have banned the disposal of over 15 recyclable materials and products from landfill with very strong diversion results.

Recyclables Processing and Alternative Waste Treatment

There are a number of processing methods to sort recyclables; the most common infrastructure used is a materials recovery facility (MRF), where recyclables collected at kerbside are processed into different recycling streams. A new development is a 'wet MRF' where household garbage is sorted and recyclables and organics separated from the garbage and sent for further processing.

There is increased cost associated with these facilities, due to the higher level of infrastructure and sorting required. The Metro West Waste is currently considering developing a 'wet MRF' for the region.

There are a range of mechanical treatment systems, known as alternative waste treatment (AWT), that are increasingly proposed as alternatives to landfill by state and local governments as treatment options for residual wastes and organics. Residual wastes is the garbage that remains following reduce, re-use and recycling measures.

In essence AWT methods require the collection of material, transportation to a processing facility (rather than a landfill) where waste material undergoes treatment in controlled environments. The process and technologies are diverse and involve composting, anaerobic digestion and waste to energy techniques such as incineration. AWT methods are varied in their costs, design, processes and in turn social and environmental impacts.

It is essential to stress that AWT technologies are not alternatives to avoidance, re-use and recycling options, but additional measures that can reduce both quantity and toxicity of waste requiring final disposal.

Essentially there are two major AWT processes:

- Mechanical-Biological Treatment
- Waste-to-Energy (WTE, or Thermal Treatment)

Mechanical-Biological Treatment

Biological treatment of waste involves aerobic decomposition and anaerobic decomposition. Some mechanical treatment of the waste is necessary before processing and the term *Mechanical Biological Treatment (MBT)* is usually applied to describe this range of technologies.



Aerobic MBT involves the decomposition of organic materials by microbial activity under aerobic (in the presence of oxygen) and thermophilic ($>45^{\circ}\text{C}$) conditions to produce stabilised organic matter. Microbes and heat are added to the collected material to assist the composting and or decomposition a controlled environment. The most common application for MBT is for food and garden organics via open windrow composting. More developed MBT systems include drum composting systems and enclosed tunnel composting systems.

Anaerobic MBT involves the controlled degradation of organic wastes by microbial activity without oxygen. It is a well-proven technology for clean, organic feedstock and is extensively applied to stabilise biosolids. It is well established in central Europe for treating source separated solid organic wastes and is also used to process municipal solid waste. The products of anaerobic digestion include biogas (consisting mainly of methane and carbon dioxide), and a digestate sludge, which can be used as landfill cover material, for agricultural applications or be further refined to produce a quality soil conditioner.

Waste-to-Energy (WTE, or Thermal Treatment)

Thermal treatment technologies use the application of heat to decompose the waste and produce a stable residue for disposal. Mixed municipal solid waste has a high energy value, energy may be recovered using these technologies, usually in the form of heat and/or electricity.

Recyclables are collected and recovered using traditional kerbside collection systems and the remaining garbage processed for energy recovery rather than sent to landfill.

Conventional incineration of heterogenous waste, or mass burn combustion, is the most widely used thermal process. However, separation at source or preparation of fuel from waste for a specific thermal process is becoming more common as this can result in higher energy recovery efficiencies and resulting in less waste to landfill.

A number of new thermal technologies have emerged that do not utilise direct burning or combustion of waste. These new technologies, including gasification and pyrolysis, are well regarded for their potential production of green energy from specific wastes, for having lower environmental impacts and as having greater compatibility with recycling, as pre-sorting of waste is necessary. Some of these technologies are reaching commercial status for mixed residual waste applications and it is likely that they will be more environmentally and socially acceptable than mass burn combustion.

Internationally the trend is to design AWT processes in conjunction with kerbside recycling services; an integrated approach to waste management; collection, sorting, processing and treatment. The concept of working towards zero waste, utilises the processing and recovery for energy of residential wastes in conjunction with recycling programs; resulting in zero or little waste to landfill.

Reducing waste at source + recycling and increased recovery + treatment of residual waste and energy recovery = zero waste to landfill.

Strategic directions and waste management planning in Australia is reflecting this international trend as AWT is seen as a complementary component to existing kerbside recycling programs, that will help communities work towards zero waste to landfill.

Case Study

Edmonton Canada – Integrated Waste Management Planning



Edmonton in Alberta Canada is a city of just over 1 million people. In 1994, with dwindling landfill provision and the looming possibility of transporting waste interstate for disposal the city adopted a 30 year strategic waste management plan. This involved an integrated waste management system; with a key focus on providing infrastructure to meet the city's waste processing needs. Central development was the Edmonton Waste Management Centre, the 233-hectare site comprises the Edmonton Composting Facility to process organic materials, Materials Recovery Facility to sort recyclables, landfills, landfill gas recovery and leachate treatment, The Edmonton Composting Facility is the largest in North America; the enclosed composting facility processes household and garden organics and biosolids from sewerage treatment. The site is managed as a total waste management centre and provides residential drop off facilities for other materials, ecostations for the disposal of household hazardous wastes and houses the Edmonton Waste Management Centre of Excellence; a partnership arrangement with universities to identify solutions to waste management and recycling issues to increase diversion. The end result is a current diversion rate of 70% and a longer term goal of 90 to 95%. For further information www.edmonton.ca



COUNCIL, REGIONAL, STATE AND FEDERAL POLICIES

A number of local, regional, state and federal government policies are shaping the development of kerbside recycling services in Victoria and across Australia. These have implications for the provision of recycling and waste services in the City of Melbourne.

Melbourne City Council Waste Wise 2002 – 2005 Plan

City of Melbourne's current waste reduction and diversion programs are outlined in Council's *Waste Wise Plan 2002-2005* which sets a short term plan for recycling and waste reduction in the City.

The strategies outlined in the plan are centred on:

- demonstrating leadership;
- infrastructure improvements;
- waste diversion - encouraging recycling and reuse;
- communication; and
- building partnerships.

In addition to the actions in the plan, annual education plans are prepared by CityWide for community and school recycling education programs.

The Waste Wise Plan contains 22 actions for the three year period and are monitored and reported on annually. According to the current June 2004 Annual Progress Report, 14 actions in the plan are listed as completed, two are ongoing and six have not been completed.

One of the central goals of the plan was to quantify the amount of waste and reduce the amount of waste to landfill by 10%. For residential services, from 2001/2002 to 2002/2003 the amount of waste to landfill was reduced by 4.6%. Council is on track to achieving the 10% reduction.

To monitor the overall waste reduction, one of the of the plan's actions was to quantify the amount of commercial waste (including construction and demolition) sent to landfill, however this has not been completed due to the complexity of the task. As no baseline data has been developed it is not possible to measure a reduction of waste landfill from commercial sources.

Overall the plan has been successful in guiding council's actions in the last two years.

The waste reduction programs also have the potential to contribute to Council's greenhouse gas reduction strategy. Not only does reduced waste lead to less greenhouse gases, but it also provides a renewable energy offset.

Regional Policies

The City of Melbourne is a member of the Metro West Waste (Formerly the Western Region Waste Management Group). The region consists of nine member councils; (Brimbank, Maribyrnong, Melbourne, Moonee Valley Port Phillip, Hobsons Bay, Melton, Wyndham and Yarra) and aims to provide a regional perspective on waste generation, disposal and recycling in the Region through it's Regional Waste Management Plan. The plan provides guidance on waste minimisation and reduction, collection and disposal of wastes, landfill sites and education.

The group also employs two Regional Education Officers who work with councils, schools, community groups and businesses on implementing waste reduction and recycling activities as part of EcoRecycle's *Waste Wise* Program.

In May 2004 the region sought tenders for a region wide contract to handle the sorting and receipt of recyclables and garbage from all nine councils. All councils in the region have provided support for

the tender. It is intended that Councils will engage the new contract upon completion of existing contracts or arrangements and if there is a financial benefit to the Council.

Commingled recyclables (bottles, cans and papers) will be sorted at a materials recovery facility (MRF) and the garbage would be processed using a ‘wet MRF’, to separate organics, recyclables and other materials that are in the garbage stream. The remaining garbage will be sent to landfill.

State Policies and Plans

EcoRecycle Victoria’s Draft Towards Zero Waste Strategy

EcoRecycle Victoria is the state government agency responsible for waste and recycling planning and policy development. Key program areas include kerbside recycling services, construction and demolition waste, organics waste collection and waste education and communications. Its most recent waste strategy is a 10-year plan that sets a direction towards zero waste.

EcoRecycle’s draft *Towards Zero Waste Strategy* has set ambitious targets to reduce waste to landfill. The strategy details actions to achieve these targets through increasing materials efficiency, the sustainable recovery of materials and reducing environmental impacts of waste.

The strategy identified priority sectors, streams and materials based on the development of a waste profile. These are outlined in Table 3.1. An analysis of the priorities identified in the strategy shows, several are relevant to the City of Melbourne including - CBD office sector, construction and demolition, food services and food waste, paper and cardboard and computers.

3.1 EcoRecycle’s Zero Waste Strategy - Priority Materials, Sectors and Products

Priority Materials	Priority Industry Sectors	Priority Products
<ul style="list-style-type: none"> □ Garden organics □ Food waste □ Paper/cardboard □ Timber □ Concrete, bricks and asphalt □ Fill material 	<ul style="list-style-type: none"> □ Construction and demolition □ Food services, retail and manufacturing □ Machinery, equipment and metal product manufacturing □ The CBD office sector □ Small and medium enterprises (SMES) 	<ul style="list-style-type: none"> □ Electronics and electrical equipment □ Computers and IT equipment □ Consumer packaging □ Paint □ Fluorescent tubes □ Industrial and transport packaging □ Office paper □ Treated pine □ Batteries □ Motor vehicles □ Film plastics.

The strategy sets targets for increased waste reduction, recycling and diversion for municipal, commercial and industrial and construction and demolitions waste. The key targets is to increase the recovery rate of all solid waste from the current 48% to 75% by 2013; including;

- 45% recovery rate in household solid waste (City of Melbourne’s current residential recovery rate is 18%) by 2008 and 65% recovery by 2013.
- 65% recovery rate in solid industrial waste by 2008 and 80% recovery rate by 2013.

In achieving these targets there is heavy emphasis upon processing materials for resource recovery prior to landfill.

In achieving these targets, the strategy plans to generate savings of 3 million tonnes of carbon dioxide.



EcoRecycle Victoria's Preferred Service Standards for Kerbside Recycling

EcoRecycle Victoria *Preferred Service Standards for Kerbside Recycling in Victoria 2003 and beyond* (2003) set the direction for the provision of kerbside services in the state.

The preferred kerbside system developed after consultation with councils, contractors and recycling processors, is a bin based recycling system, eliminating the need for manual lifting of recyclables, in line with recent WorkSafe Victoria changes (see below).

As a minimum a weekly capacity for recycling of at least 120 L should be provided, either with a 120 L mobile bin collected weekly or a 240 L mobile bin collected fortnightly. The National Standards for bin colours have been adopted and included in the guidelines.

The guidelines also set baseline and aspirational targets for kerbside recycling, with a baseline target of at least 3.5 kg per household per week.

The guidelines identify the range of materials that can be collected for kerbside recycling and recommend the future inclusion of other rigid plastic packaging with the codes 5 and 6 in kerbside collections (currently only plastics 1,2 and 3 are commonly collected).

Expansion of kerbside recycling services to schools, community facilities and businesses, and ensuring the inclusion of flats, units and apartments in kerbside programs is also recommended.

WorkSafe Victoria

In June 2003 WorkSafe Victoria, introduced *Occupational Health and Safety Guidelines for the Collection, Transportation and Unloading of Non-Hazardous Waste and Recyclable Materials* (2003). The guidelines recommend the elimination of manual handling of recycling collections and also cover issues related to recycling collection vehicles.

The guidelines adopt a 'no-lift' approach to the handling of containers and no riding on the outside of collection vehicles. The guidelines also refer to access and reversing of collection vehicles.

The City of Melbourne is required to comply with these new guidelines and to ensure their adherence by collection staff.

The guidelines have implications for council's current manually lifted crate and bundled paper collection systems and are in part the basis for Council's move to a bin based collection system for recyclables.

Federal Polices and Directions

Government at a federal level has limited direct responsibility for waste management. It has seen its role in co-ordinating partnerships between state and local government and industry sectors.

A central partnership has been the National Packaging Covenant (NPC) (see below), encouraging agreements for product stewardship by industry for particular waste issues. Examples of this are the national agreements on the reduction of plastic shopping bags and for the recovery of motor oil.

The federal government has co-ordinated the development of National Environment Protection Measures (NEPM) to underpin the voluntary approach of both the NPC and the oil recovery program.

The federal government also governs the export of hazardous wastes through its implementation of the Basel Convention which controls the export of wastes to developing countries.

At a federal level, Standards Australia are currently framing national standards in relation to:

- biodegradable plastics; and
- waste and recycling bin colours.



National Packaging Covenant

The National Packaging Covenant (NPC) is a voluntary agreement between all levels of the packaging industry and government at a Federal, State and Local level. The Covenant is framed to encourage individual companies and industry groupings to acknowledge a product stewardship commitment to the consumer product packaging that they manufacture, use or sell. This is, in part through a funding contribution towards efficient recycling collection and processing. Signatories are also required to produce action plans to outline how they are contributing to minimising environmental impacts and increasing recovery of packaging. The NPC is currently being evaluated and is likely to be extended in a strengthened format that puts a strong emphasis on achievement of measurable outcomes.

The City of Melbourne should see the Covenant as an opportunity to engage in dialogue with brand owners and city based retailers about their support for retail packaging waste recovery.



RESIDENTIAL SERVICES

Current Programs and Services

Residential properties in the City of Melbourne are currently provided with a weekly collection of garbage from a 120 L garbage bin and recycling from a 55 L crate and newspaper and cardboard bundled and tied. Glass bottles and jars, plastic bottles (with codes 1 and 2), milk and juice cartons and steel and aluminium cans are all collected via the kerbside recycling system.

At flats and apartments, recycling is collected in shared mobile bins and crates. These sites have traditionally had a lower participation rate in kerbside recycling than other households. Garbage chutes are used at some high rise apartment developments with a combination of skips and mobile bins for recycling. Upgraded systems with shared 240 L bins for bottles and cans and 1100 L skips for cardboard have been introduced at over 40 apartment buildings.

In addition, residents are provided with a free at-call green waste collection service and an annual hard waste collection.

Drop off facilities for recyclables, garden waste, engine oil, car batteries and steel are available at Council's Dynon Road Transfer Station.

Commercial properties can also participate in the kerbside service and are provided with access to the same service as residential properties and a cardboard collection of up to 0.5 m³ per week.

It is recognised that Melbourne's residential services require further development. Currently the diversion rate is at 18% - one of the lowest in Victoria and recycling is at levels, half that of neighbouring Councils with similar systems and communities. Reasons for this low diversion rate along with measures to increase waste diversion are discussed in this chapter.

Council will introduce upgraded kerbside services in December 2004 by introducing a 120 L mobile bin for recycling (or the option to choose an 80 L or a 240 L bin for recycling) and providing residents with the option to downsize to an 80 L mobile bin for garbage.

Priorities, Programs and Issues

Low Recycling Yield

The recycling yield in the City of Melbourne is one of the lowest in Victoria – systems where a collection container for paper is not provided generate lower recycling yields than bin based or dual crate systems.

The yield per household per week of 1.6 kg, is substantially lower than EcoRecycle Victoria's baseline targets of 3.5 kg per household per week set out in *the Preferred Services Standards for Kerbside Recycling*.

This can in part be explained by the large number of flats, units and apartments where traditionally the yield is lower than detached households and partly by the larger volume garbage bin at residential properties (120 L) which acts as a disincentive to recycle for some residents.

We know from previous studies that greatest environmental benefit from kerbside recycling is in maximising the yield. Increasing the yield increases the overall environmental and financial benefits from collection.

Occupational Health and Safety

WorkSafe Victoria guidelines introduced in 2003 for recycling collections, which recommend the end to manual handling of kerbside collections, have implications for council's current manually lifted crate and bundled paper collection systems and are the basis for Council's future move to a bin based collection system for recyclables. The guidelines also have implications for collection vehicles.

Council will need to consider the manual lifting of current hard and green waste collections in light of these guidelines.

Melbourne Metropolitan Trends

Across Melbourne, councils are moving to commingled systems for the collection of bottles, cans, paper and cardboard and a bin based system for the collection of green waste. This is based on WorkSafe requirements for the elimination of manual lifting and also by the much higher yields of recyclables that are generated in a bin based commingled recycling collection.

Recycling collection is commonly fortnightly from a 240 L, however some council's provide a weekly collection from a 120 L.

Preferred Service Standards

EcoRecycle Victoria in consultation with Councils has recently updated the Preferred Service Standards for Kerbside Recycling. The updated guidelines are in response to the development of the WorkSafe guidelines and move to commingled recycling systems.

The standards propose a mobile bin for the provision of recycling services; either a 120 L weekly or a 240 L fortnightly.

EcoRecycle has adopted the National Standards for bin colour to include in the guidelines. Bin colour is also an essential component of the kerbside service standards; recommending lid colours of dark green or red for garbage, yellow for recycling and lime green for green waste with a standard dark green or black body. The standard colours are a vital community education tool and builds consistency of recycling systems amongst councils, which is particularly relevant in the City of Melbourne with the high number people moving in and out of the municipality.

Collection in inner urban areas

Inner urban municipalities face unique waste and recycling collection issues. Small streets and laneways, parked cars, heritage housing and a higher density of houses makes collection a difficult exercise.

In outer urban councils mobile bins are collected by a sideloading collection vehicle. This vehicle has a robotic arm collecting bins from the kerb, unhindered by parked cars and operated by a single truck operator. In inner urban councils, larger collection vehicles cannot always fit down small streets, parked cars mean that bins cannot be easily collected by a sideloader and must be manoeuvred to a collection point. There is also less space for the storage of mobile bins on properties.

Terrace houses commonly don't have side lanes, requiring bins to be either stored out the front of a property or wheeled into the house and down a passageway. As systems evolve to two and three bins systems (as is common in outer metropolitan councils), the storage of mobile bins in what are limited outdoor spaces of terrace houses in the City of Melbourne, becomes an issue for residents.

Distribution of an additional mobile bin (or bins) for recycling must be considered in context with the storage space available to residents.

Another issue for council to consider in the future is the use of smaller collection vehicles, small enough to collect from small streets and lanes.

Garbage capacity

The most effective way to reduce the waste to landfill from residential properties is to reduce the household garbage capacity. If the City of Melbourne is focused on reducing waste, reducing the capacity of the current 120 L weekly collection is essential. Other bin options include 80 L mobile bins and a 60 L non wheeled mechanically lifted bin. Any additional or replacement bin purchased now by council, must be considered in context with longer term waste planning.

Mobile bins for garbage and recycling – other than 120 L

The proposed addition of a second 120 L bin for recycling in addition to the current 120 L bin for garbage has already received opposition from some residents based on amenity and storage issues. These bins have a height of 1 000 mm and an on the ground footprint of 600 mm x 600 mm, and hence the storage area requirements for two 120 L bins is 1 200 mm x 600 mm

Other possible recycling and garbage bin options are described below:

- 80 L bins, with a similar footprint and a lower height may be smaller and less conspicuous in the streetscape. 80 L capacity may not be adequate for a weeks worth of recycling from larger properties, but is appropriate for garbage and is used by neighbouring councils.
- 60 L bin – this bin can be mechanically lifted but does not have wheels. The smaller size may enable residents in terrace housing to store at the rear but the lack of wheels may make it difficult for elderly residents to place out for collection.
- 120 L and 240 L split bins - CityWide council's waste and recycling collector, raised the option of split systems rather than commingled systems to keep paper separate and in turn increase the value of the paper product. A 240 L bin has already been ruled out by City of Melbourne due to storage and amenity issues.

Due to the limited range of suitable containers in the marketplace and the commonality of the issues faced by City of Melbourne and other inner urban Councils, Council would be well placed to initiate a dialogue with bin manufacturers to design and develop a mobile 60 L bin to meet the servicing and storage requirements unique to inner city environments.

Flats and Apartments

There are a high number of flats and units within the city ranging from two storey flats to newer high rise apartment blocks. With the increased focus on inner city living, the number of flats and apartments in the City has increased dramatically over the past ten years and will continue to increase. New residential apartment buildings in the inner city and Docklands present new waste and recycling collection challenges, however they also present a unique opportunity to design collection and services to encourage waste diversion.

Due to limited storage space for individual bins, shared bins/crates are generally used. However participation in shared systems is traditionally lower. To increase participation the City has introduced upgraded systems with shared 240 L bins for bottles and cans and 1100 L skips for paper and cardboard. The skips are only installed at sites where there are more than 20 units. An educational fridge magnet highlighting the items that can be recycled is also in progress.

Other councils have shared bin arrangements at flats, units and apartments. Moreland City Council supplies shared bins for garbage, with all units supplied a 120 L bin for garbage to be shared between two units. In some instances where storage of shared 120 L bins is limited, residents are provided with 240 L bins with one bin shared between three or four properties.

Newer residential apartment buildings, built in the last 10 years, have often been built without specialised recycling collections and rely on a garbage chute for disposal of all waste materials. Ideally recycling should be given the same priority as garbage disposal, however a second chute for recycling presents operational difficulties as glass breaks and paper and cardboard can become stuck. Ideally bins should be placed on each floor of the development, next to the garbage chute or in an enclosed garbage and recycling room. However, having recycling bins on every floor of the development is sometimes viewed as a costly system that requires daily maintenance from building managers and there is a perception that there would be smell associated with the recycling bins.

Some residential apartment buildings have recycling facilities in the basements, requiring residents to walk to a carpark area to recycle. Consequently, participation rates are low according to property managers. To increase participation in some development, recycling bins are placed on every floor of a basement car park near the lift areas - residents have to pass them on their way out of the building. Feedback suggests that the participation rates are still low compared to the total amount of garbage disposed.

The provision of a dual bin or a separate storage container in the kitchen area of new developments could help improve recycling participation, as residents would have somewhere to specifically store their recyclables.

There is currently garbage collection from department of housing apartments but no recycling services at these sites. There are issues in relation to getting material efficiently to ground level and keeping contaminant levels under control. Provision of recycling services to these sites offers an opportunity to extend waste diversion.

In New Quay in Docklands, residential apartments and commercial businesses exist in the same building but have very different waste streams and quantities. Large refrigerated compactors are used for the disposal of residential and commercial waste. Providing separate areas for both residential and commercial waste was not seen as a practical option by building managers, as space in high rise departments has a high value.

On consultation with developers and property managers it was suggested that guidelines on the design of recycling systems for architects and management of recycling systems for building managers be developed and enforced to ensure that recycling and garbage systems are adequately planned for. It is clearly a process that requires consultative development with architects, planners, building managers and waste collection companies.

The low participation in recycling at flats, units and apartments is a particular issue with the high number of university students living in rental accommodation in the city, it also represents an opportunity to work with universities to develop generic recycling education programs. Education could focus on products to recycle, rather than systems (as students come from all over Metropolitan Melbourne) and be of benefit to university based public place recycling systems.

Recyclables

Council currently collects a range of recyclables in its kerbside recycling collection, glass bottles and jars, plastic bottles, milk and juice cartons, steel and aluminium cans and bundled and tied newspaper and cardboard.

Plastics have a plastics identification code given as a number from 1 to 7 which identifies the type of plastic an item is made from. Different plastics have different applications. All these plastics are recyclable to some degree, but it all hinges on the availability of markets for the collected materials. There are viable markets available for PET (1), HDPE (2) and PVC (3), however there are more limited markets and for plastics LDPE (4), PP (5), PS (6) and 7 at this stage. As a result these materials are currently excluded from most council collections.

Figure 5.1 Plastics Identification Codes

Code Number	Name	Applications	Recycled Applications
1	PET	Soft drink bottles, water bottles and cosmetics containers.	New bottles, carpets and fabrics.
2	HDPE	Juice containers, cream, Milk bottles	Bins, traffic equipment and some bottles
3	PVC	Cordial bottles, some water bottles	Plumbing applications, tiles, hoses
4	LDPE	Ice-cream lids, plastic bags, plastic sheeting.	Building film
5	PP	Ice-cream, margarine, takeaway food, dip	Recycling crates,



		containers	
6	PS	Yoghurt, coffee cups	-
7	Other	Various	-

As the packaging industry and technology develops the type of packaging ending up in the garbage stream and the recycling stream also changes. The past few years have seen a shift from glass packaging and steel to PET (1) and PP (5); for example some brands of jam are now packaged in PET (1) plastics rather than glass, similarly steel cans of fruit are now packaged in PP (5). Increasingly there is a move in the packaging industry to single serve packaging using PP (5) and PS (6) for dairy products. Recycling collections need to reflect the changes to packaging appearing on supermarket shelves.

Currently City of Melbourne collects PET (1) and HDPE (2) plastics. However there are markets for the collection of PVC (3), LDPE (4), PP (5) and PS (6), council will include PVC (3) in future recycling collections and is investigating other plastics.

It is highly likely in the future that recycling collections will include rigid plastics 4, 5, 6 in the short to medium term, longer term this could be extended to all flexible plastics; including food packaging, film and bags. EcoRecycle Victoria's kerbside standards recommend the inclusion of rigid plastics PP (5) and PS (6) and research is currently underway in the plastics industry to collect and reprocess these materials.

There is also the opportunity to use the recycling bin to collect other materials that can be recycled, such as small appliances, CDs, clothing and other household goods. Looking ten years down the track, recycling could take another form, rather than simply a service for the collection of packaging, it will become a resource recovery container, collecting for the recycling a range of household items. City of Melbourne can take a leading step in implementing this vision, by expanding the range of products collected at kerbside and continually reviewing and expanding the range of materials collected as consumer products and lifestyles change.

Garden Organics Collections

The current 'at call' organics collection last year collected a total of 24 tonnes of green waste. This is a low yield of green waste when compared to other councils. Small gardens and the low number of household with gardens helps to explain in part the small amount of material collected.

In addition the service design may be an issue, as residents are required to telephone council to make a booking. The contractor, is provided with a lump sum payment regardless of how much green waste is collected and is not provided with an incentive to promote the service and increase collections.

Organics collection is a difficult issue for the City of Melbourne due to the relatively low number of houses with gardens. Is there a need for a fortnightly or monthly garden organics collections? Can a regular collection be justified due to the low number of participating households? How can the current service be promoted more effectively?

Residents have provided feedback to council that the current systems of tying green waste for collection presents difficulties. The fact that no container for green waste is provided by council is also an issue for concern; residents have reported that they have placed green waste out for collection in their own containers, but it has not been collected.

One option is to provide a universal bin based organics collection, with a standard and an 'opt in' clause for flats and apartments. Residents of individual unit housing would receive a mobile bin for green waste and a fortnightly collection. Residents who do not want to use the bin can 'opt out' of the service, but, not the charge. There are some issues with access and equity that need to be considered with this service model.

Before any service introduction and expansions council needs to conduct an assessment of the need for the service and a comprehensive audit of the garbage stream to identify potential for future diversion and the need for a garden organics collection.



Moving to a bin based system would also address occupational health and safety issues presented by the manual handling in the current service. Council will need to consider the financial implications of such a service and the implications for its current green waste collection contract.

Food Organics Collection

Garbage audits conducted across Australia highlight that up to 40% of waste remaining in household garbage bins is food waste. There is currently no food organics collection service for residents in the City of Melbourne and little if any infrastructure to process collected domestic food organics within the region.

Currently council promotes household composting and the sale of subsidised compost bins for the on site management of food waste. However home composting has its limitations and in particular is not accessible for residents in high rise apartments.

If council is serious in its quest for sustainability, collection and processing of food organics will have to be considered in the medium to long term.

Combined Food and Gardens Organics Collections

There is an increasing focus on providing combined food and gardens organics collections in the medium to long term.

The Shire of Nillumbik started a combined food and garden organics collection in July 2003, resulting in a total waste diversion rate of 80%. Colac-Otway Shire and the City of Ballarat also operate combined food and garden organics waste collection services for residential properties.

In rural NSW Hastings Shire Council is collecting food and garden organics for composting in a tunnel composting facility, an enclosed facility that processes food and garden organics into premium grade compost. Such facilities can also process bio-solids and organic waste from food manufacturing.

By combining food and garden organics together, council can justify a regular collection service. Although not all households have green waste, all households generate food waste, making it an important option for the city.

Keeping in mind the future introduction of a possible collection service, there may be a need to introduce (especially in flats, units and apartments) a small kitchen bin for the storage and transportation of organic wastes.

While introducing a combined food and garden organics collection appears to be an obvious service choice, lack of available technologies and limited markets for the processed compost products has hindered development of the industry and expansion of collection programs to include food waste.

Including food waste in with garden waste requires the organic material to be processed via alternative waste treatment technologies (AWT). Currently garden waste is commonly processed at open windrow composting facilities, where chipped garden material is composted. The inclusion of food waste requires compost to be processed at higher temperatures and under stricter conditions to reduce issues such as odour. It also requires alternative facilities such as enclosed composting systems and tunnel composting systems; which require greater financial investment.

Siting of large scale composting facilities can present its problems. The location must be far away enough to reduce any impacts (such as odour and noise) on surrounding residents and close enough to enable efficient transportation of organic material to the site.

Collecting organic material is only viable if there is a market for the end product, especially where companies have invested heavily in the development of a facility. Developing markets for the sale of the processed compost material has presented difficulties in the past, with large amounts of material stockpiled at some processing facilities. EcoRecycle Victoria have earmarked the organics processing industry as a priority program for the 2004/2005 business plan.

Home Composting and Worm Farming

Home composting presents a great opportunity to reduce waste by collecting and processing organic waste and producing rich compost for the garden. It is however a process that takes time to perfect and requires storage space for a bin and garden space for the resulting compost. The high amount of organic waste in the garbage stream suggests that few people compost at home. Past studies have suggested 10-15% of households will undertake home composting.

In recent years worm farms have increased in popularity as a method for processing organic waste at home. Worm farms, due to their small size, present a great opportunity for residents in flats, units and apartments with limited outdoor space or small balconies to collect and process their own food waste. The resulting worm castings and liquid can be used in pot plants and window boxes.



Other organic waste processing methods, such as the Bokashi Bucket, also offer food waste processing opportunities at home. This system is popular in Japan, food wastes are placed in the bucket, along with Bokashi powder to aid the fermentation process, processing organic materials into composted material and liquid which is collected from the base. The airtight bucket system is designed for indoor use.

There is a great opportunity here for council to expand its composting promotion activities and develop a program tailored specifically to flats, units and apartments, promoting the use of worm farms and other food waste processing systems in small spaces. Going one step further, this could be expanded to promote sustainable apartment living; promoting green balconies and growing vegetables in small spaces – expanding sustainable gardening programs to flats and apartments and developing a program specifically for small space sustainability.

Community Consultation

Community consultation on the choice of a new recycling service is an essential part of the design and planning of new kerbside services. Issues such as bin size, weekly or fortnightly collection, service cost and even bin colour are important choices in service design and are essential decisions for the community to be involved in.

Already, Melbourne's own community consultation programs have identified that residents prefer a weekly rather than a fortnightly collection, due to storage issues of a 240 L bin for a fortnightly collection. Council has undertaken some community consultation on the new system and has also held community information sessions and mailed a bin choice survey form to all residents.

In May 2004, the delivery of blue recycling bins to residents in Boroondara resulted in a negative reaction from the local community over the bin colour. Similarly some residents in the City of Melbourne have questioned the impact of providing an additional mobile bin.

Before starting any new service Council needs to inform and consult the community. Community ownership of a new service is essential to ensuring a smooth transition and to encourage greater community participation in kerbside recycling. Negative coverage and feedback can at times undo the positive reactions that can be gained from the introduction of a new service. Effective community consultation can ensure that services are designed to meet the needs of the community and help plan for positive public relations.

Waste Wise Education

Council through its waste contractor CityWide has been providing information on recycling and waste reduction in the City through the *Waste Wise Guide*.

Council and CityWide work with schools in the City of Melbourne to encourage them to become *Waste Wise* and provide support and resources for teachers, such as teacher in service and professional development training on waste issues.

Council also links in with education programs through Metro West Waste (formerly WRWMG) and their Regional Education Officers who work with council on Waste Wise Schools, Waste Wise Events and Waste Wise Business Programs as part of EcoRecycle's Waste Wise Program.

While there are a number of initiatives in place, there is always room for further information and education on recycling services, recycling systems and processes and waste reduction. Community education is an essential part of waste service provision especially in the provision of new services and encouraging waste reduction especially where garbage bin sizes are reduced.

Community programs such as *Sustainability Street*, combine waste education with local action. The program works with one street, to encourage all residents to be involved on a whole series of sustainability issues and then encourages residents to share their successes with other residents in their community. Two programs have been running in the City of Melbourne; in Kensington and North Melbourne. The groups are promoting composting, energy and plastic bag issues in their local communities.

There is a groundswell of support in the environmental education field to move from providing information about waste, to looking at how waste issues are part of sustainable living and sustainable consumption. This involves integrating messages from waste, energy, water and bio-diversity conservation programs into an education programs on sustainable living.



The 'Sustainable Living at Home' program run by the City of Port Phillip works with residents on energy, waste, travel, purchasing and water issues; through seminars, newsletters, booklets, events and community projects.

Successful waste education programs conducted over the last 10 years will act as a catalyst for sustainable living education programs. The City of Melbourne could develop a leading environmental education program on sustainable living that brings together messages of waste, energy, water and biodiversity contained in council's water, waste and energy strategy plans, rather than providing competing and overlapping sets of messages and programs.

As previously mentioned due to the large number of flats, units and apartments in the city, there is a great opportunity to develop a program focussed on sustainable living in flats, units and apartments. It is acknowledged that Body Corporate organisations at these sites provide an opportunity to co-ordinate waste education program outcomes.

Product Stewardship

All stakeholders in the chain of a product's life need to take a degree of responsibility for reducing waste and minimising environmental impact. This includes government and consumers but also covers manufacturers and retailers. A growing number of industry sectors are taking seriously this responsibility and contributing to recovery through funding, market assistance or collection infrastructure.

For council there are two key roles in facilitating product stewardship commitment.

Firstly council should seek to identify a recycling collection route for a broad range of products entering the waste stream. Council has already indicated that it will expand the range of products collected at kerbside, however this activity needs to extend beyond households to commercially used products (such as telephones, computers, appliances, paint, oil etc).

Secondly, Council should regularly engage with industry organisations and state government to identify areas where council can benefit from a co-operative effort for product waste reduction.

Alternative Waste Treatment

There are a range of options for alternative waste treatment (AWT) that can be applied to the City of Melbourne. AWT processing systems have an impact on the type of collection systems implemented by Councils. The future development of AWT processing facilities impacts on collection services today and in the future. AWT should be seen as part of an integrated system of services that deliver different financial, economic and environmental outcomes.

It is essential that is not seen as a replacement to existing resource recovery programs, rather a treatment process for residual waste. Alternative waste treatment requires considerable investment and comes with both political and social issues that must be considered.

The treatment of wastes is now seen more in the context of handling residual material after waste diversion has been maximised. In this context the environment equation will generally favour a sound treatment option over continued landfilling of wastes.

In the current Melbourne environment with plentiful and cheap landfill, the financial environment is not favourable to the establishment of waste treatment facilities, which are expensive to build and operate.

Overseas facilities have been established on a large scale for efficiency and it will be a similar case in Melbourne Metropolitan area with four to six facilities required in the future. The development of these facilities will arise out of a State or Regional initiative rather than a municipal proposal.

However Council has a role to play in working with state and regional bodies to ensure that the siting of facilities and the technologies chosen meet the needs of the City of Melbourne and its residents.

Future Potential for Diversion

There are three ways council could further develop garbage collection services and increase the potential for waste diversion.



- Retain 120 L bin for garbage, increase community education and upgrade recycling services. *Projected impact – 6.0 kg, 20% reduction*
- Move from 120 to 60/80L mix of garbage bins plus community education and expanded recycling services. *Projected impact – 5.3 kg, 30% reduction;*
- Retain 120 L bin for garbage and move to a fortnightly collection (subject to the introduction of a food organics collection) plus community education. *Projected impact - 4.5 kg, 40% reduction;* or

Garbage collection and resource recovery systems are continually developing and expanding as the technologies and service issues change and evolve. A possible direction for council is to commit to service upgrades now, service expansion on the medium term and residential treatment in the long term. For example;

- Commitment to short term waste diversion improvements, including recycling service upgrades (in progress) (2004).
- Introduction of upgraded recycling (including an expanded range of products), garbage and organics services (2004-07).
- Identification of a food and garden organics processing outlet (2005-10).
- Expand recycling and organics collection services; subject to markets (2005-10).
- Move residential stream from landfill to treatment for energy recovery or other alternative waste treatment system (2010-2020).

Transfer Station Drop Off Facilities

Drop off facilities are an important part of residential recycling programs, they provide an avenue for the safe and efficient disposal of items that cannot be collected as part of kerbside collection programs and other recyclables.

Council, through CityWide, manages the Dynon Road Waste Management Centre. The site contains a Materials Recovery Facilities (MRF) and disposal of green waste, general waste and mattresses. Free drop off facilities exist for recyclables (bottles, cans) car batteries, motor oil and steel, including white goods. Building materials and concrete are not accepted.

There is currently no long term plan for the management of the transfer station however CityWide and City of Melbourne have both stressed the strategic location of the site and the need for a transfer station and drop off facility in Melbourne inner North and North West.

Council could look at the commercial opportunities for the site. One option is develop a repair and reuse centre or 'tip shop' at the site, creating employment and providing opportunities for the recycling and sale of secondhand goods. Successful models exist at Darebin and Bendigo Councils. The sites have both environmental and social benefits; providing an opportunity to reduce waste to landfill and encourage reuse, but also providing employment to people facing barriers to employment. The centres provide items for sale which have been discarded at the site, repairing some items and or selling as is. At Bendigo one of the most popular sale items is house paint. Residents can drop off unused house paint free of charge, which is then available for sale and promptly sold.

Another option for the site is to consider expanding the range of materials that can be diverted at the site and upgrade signage to enable the general public to drop off an expanded range of materials. Excluding the role of bulk hauling municipal garbage, transfer stations have the ability to divert the majority of materials presented from residential self haul, skips and commercial disposal. Building materials, furniture, tools, appliances, cables, computers and televisions all have the ability to be collected separately at transfer stations and then sent for reprocessing.

A development for council to consider is the proposed move from providing once a year household chemical collections, at transfer station sites where all materials are accepted, to established permanent recycling facilities for the disposal of low toxic household chemicals such as paint, motor oil, gas cylinders and batteries. Both EcoRecycle and the paint industry are currently investigating the development of permanent facilities at transfer stations for the recovery of these items. Similar moves are underway for the collection of electrical and computer equipment by both industry and government. Council needs to consider the future expansion of its drop off services to collect these materials as the services develop.

In light of this and the need for other drop off facilities for self haul, Council should consider the establishment and promotion of diversion opportunities at Dynon Road for all of the following items as part of a long term planning process for the site (subject to adequate market outlets and site capacity):

- | | | |
|------------------------------|--------------------|-------------------------|
| □ cars; | □ gas bottles; | □ tools; |
| □ small appliances; | □ scrap metal; | □ plasterboard; |
| □ audio visual equipment; | □ timber; | □ cable and piping; |
| □ computers and peripherals; | □ paint; | □ beverage containers; |
| □ furniture; | □ oil; | □ cardboard; and |
| □ tyres; | □ bricks; | □ flexible plastic film |
| □ batteries (auto); | □ concrete; | |
| | □ asphalt | |
| | □ garden organics; | |

Options - Short Term

Kerbside Garbage Collections

- Council to work with state government, bin manufacturers and other inner city councils to develop a mobile bin that meets the needs of inner city environments.
- Council to introduce an 80 L bin for weekly garbage collection either through a compulsory bin change over or an opt in service with a differential rate change. This will reduce waste to landfill and provide a more suitable bin option where storage is an issue.

Kerbside Recycling Collection

- Council to introduce a second mobile bin (80 L or 120 L) for the commingled collection of paper and bottles and cans.
- Council to continue to provide information and educational opportunities to the community on kerbside recycling to increase the yield, participation and an understanding of how the system works.

Flats, Units and Apartments

- Council to develop planning guidelines in conjunction with building developers and building managers to guide the incorporation of best practise waste management and recycling collections into high rise developments to ensure all new developments can be provided with a council service.
- Council to work with building managers to develop best practice education and information programs for flats and units, including the provision of permanent signage.



- Continue to monitor and evaluate waste and recycling material collected from flats, units and apartments to identify issues.

Organics

- Council to lobby state government and regional groups for the establishment of enclosed composting systems within 15 kms of the City of Melbourne for food and garden organics processing.
- In the short term, switch the 'at call' green waste collection service to an 'opt in' rate based collection service.
- Council to continue to promote home composting as a method of reduce organic waste to landfill.
- Council to develop a program promoting worm farms and other organics processing options specifically for small gardens and balconies aimed at residents in flats, units and apartments.

Waste Wise Education

- Council to work with CityWide to move recycling education programs towards a sustainable living model.
- Council to develop a 'sustainable living' education program to incorporate waste, energy and water issues, bringing together the educational objectives in councils waste, *WaterMark* and *Zero Net Emissions* Strategy.
- Council to develop a sustainable living education program with a particular emphasis on flats, units and apartments and greening small spaces.

Dynon Road Transfer Station

- Council to expand the range of materials collected at the Dynon Rd Transfer Station and improve signage and information about the materials that can be collected.
- Council to expand the materials collected to include paint and develop a partnership with EcoRecycle Victoria as a potential pilot project for the collection of low toxic household chemicals e.g. paint, gas bottles.
- Council to investigate placing repair and reuse enterprises at the Dynon Road Site and identify suitable partner organisations to develop a business with both environmental and social benefits.
- Council to develop a long term plan for the Dynon Road Transfer Station.

Options – Long Term

Garbage Collection

- Council to move to a fortnightly collection system for residual household garbage when food waste is removed from the garbage stream.
- Council to send residual waste for alternative waste treatment.

Recycling Collection

- Expand the range of materials and products collected to include all plastics and small appliances and other small household items.
- Work with State Government and industry to identify convenient routes for non kerbside materials.

Organics

- Council to introduce a combined food and organics collection from houses and town houses, flats, units and apartments and transport for processing at a regional composting facility or anaerobic digestion.

Case Study

Shire of Nillimbik – Highest Diversion Rate in Victoria

The Shire of Nillimbik is an outer Melbourne metropolitan council encompassing Eltham, Diamond Creek, Hurstbridge and St Andrews. Nillimbik residents have long been viewed as environmentally aware community.

In July 2003, the Shire of Nilumbik implemented a 3 bins system for kerbside recycling, garbage and green waste in line with the shire's visions for zero waste by 2020.

Council's previous system of a 120 L weekly garbage collection and 240 L fortnightly recycling for bottles, cans and bundled paper was upgraded with the provision of an additional 120 L bin for food and organics for weekly collection, and changing the servicing frequency of the garbage bin to a fortnightly collection.

The move has resulted in a diversion rate of 80%, more than twice that of the Victorian average of 35% and more than four times that of the City of Melbourne at 18%.

The results have seen an amazing reduction in the amount of household garbage collected each week reduced to 3.0 kg with an average yield per person of 0.95 kg.

Commingled and organics recycling has increased to 12.4 kgs per household per week, almost four time the state average.

The system was the result of a long research and trial process that closely monitored how residents would cope with a fortnightly garbage collection, including providing incentives for waste reduction and widely promoted sustainable living.

Currently the collected material is composted and used as landfill rehabilitation cover for the shire's old landfills.

Repair and Reuse Centres

Minibah at Darebin City Council and City of Greater Bendigo

A common site at many transfer stations today is a repair and reuse centre or 'tip shop', providing for sale items that have been discarded at a landfill or transfer station. Goods are repaired or sold as is at the site.

Minibah have been developing resource recovery shops at 3 sites; Darebin, Hampton Park and Pakenham employing 30 people to divert waste and repair old goods for resale. The shop sells old furniture, old paint, household goods and nic nacs. The model provides opportunities to create an industry from waste as well as provide supported employment to people with disabilities.

Other successful examples are in Eaglehawk in Bendigo, where the Eaglehawk Recovery and Sales Yard located at the City of Bendigo's landfill site is a shining example of the repair and reuse and employment model at work.

Most Centres are open to the public 7 days a week:

Darebin / Minibah Community Centre



Kurnai Avenue (off Henty Street)
RESERVOIR
Mel Ref: Map 18 C6
Phone: (03) 9230 4799

Food and Garden Organic Processing, Hastings Shire Council NSW.

Hasting Shire Council in Northern NSW has developed an enclosed composting system for the processing of garden and food organics. Residents are supplied with a mobile bin for garden waste and vegetable and fruit waste, collected fortnightly. The collected materials are processed at an enclosed tunnel composting facility.

Biosolids from sewerage treatments works are added to the collected organic materials. All organic material is placed in an enclosed climate controlled tunnel, which speeds up the green waste processing time. The resulting material is sold as high quality compost for agricultural and horticultural applications.

FURTHER INFORMATION

Bokashi Bucket - www.eco-organics.com.au

City of Port Phillip - Sustainable Living at Home - www.portphillip.vic.gov.au/slah

Sustainability Street - www.sustainabilitystreet.org.au

OTHER COUNCIL WASTE

Current Programs and Services

Other municipal waste includes waste collected from council offices, litter bins, public place recycling bins, events and waste collected from street sweepings, street litter and dumped rubbish collections. This is an important issue for council as the amount of 'other council' garbage collected each year is almost as much as the total amount of garbage collected from residential properties.

With street litter, litter bins and dumped rubbish combined, over 5 300 tonnes is collected from Melbourne's streets each year. Although this is incredibly high, it is a result of the centralised commercial activity, large number of sporting and cultural events and the estimated 500,000 visitors to the city every day; activity that all generates litter. Even so there are strategies that council can employ to reduce litter.

The City of Melbourne has long been a leader in the areas of litter prevention, education and enforcement. Recent litter abatement programs have focused on cigarette butt litter through a combination of education and enforcement.

There are now 46 public place recycling bins within the CBD, 2 780 litter bins and 200 cigarette butt bins.

Public place recycling bins have been a feature of public areas in the CBD for almost 10 years. Audits conducted in 2002 identified that public place recycling bins are generally correctly used by the community with low to medium levels of contamination depending upon the location.

Priorities, programs and Issues

Litter

Litter is a large issue for the City of Melbourne. Litter enters storm water drains flowing into the Yarra River and Port Phillip Bay and impacts on the appearance of the capital city. Council has a well developed approach to litter education and the provision, siting and maintenance of litter bins.

A program is in place to rationalise the number of litter bins in the city and introduce litter bins into parks and gardens that can be mechanically lifted. The result will reduce the current number of bins by up to 500.

Council has been proactive in education and enforcement programs on litter and is a member of the Victorian Litter Action Alliance (VLAA), implementing integrated education and enforcement programs in line with VLAA best practice approach. Priority litter issues identified by VLAA are ATM litter, building sites, charity bin dumping, cigarette butts, dog poo, fishing litter, illegal dumping, posters and plastic bags.

Council has been particularly active on cigarette butt education and enforcement programs; developing an integrated program of education, enforcement, incentives, infrastructure and communication. It has also participated in studies to monitor and identify littering behaviour in the city.

Statewide litter education programs will be developing a two year campaign in the lead up to the Commonwealth Games in 2006. There is a great opportunity here for council to be involved in an education program to address litter with the aim of preparing the city for the international spotlight. Council, community and businesses can work together to identify and address litter issues in a local park, street, shopping centre or litter hot spot through a Litter Prevention Task Force (LPTF). Developing a LPTF may be applicable for some of the city's local areas.

Public Place Recycling

Council is currently expanding the public place recycling systems throughout the CBD and trialing 32 bin in parks and gardens.



Recycling bins present unique servicing issues; bin placement, signage and maintenance all impact on their correct use and levels of contamination. In an audit in 2002, 227 kg of materials collected from public place recycling bins in the city was examined. The audit identified that contamination was an issue in some locations (such as outside fast food chains) and an upgrade in signage was required to ensure consistency.

Council is currently in the process of expanding public place recycling bins to its parks and gardens. It has also introduced upgraded signage on bins and is currently working with EcoRecycle to test the new signage.

By June 2005 there will be 108 public place bins in the city. This is a fraction of the current 2 780 litter bins and represents 4% of the total number of street bins, the potential for diversion from this number of sites is limited. Council needs to identify more locations for recycling bins to increase the diversion and opportunities for recycling.

While acknowledging that cost is a factor in the provision of public place recycling infrastructure, Council needs to consider that diversion of recyclable material achieves both short term savings in avoided landfill costs and longer term environmental savings. The more opportunities for diversion of recyclables, the higher the yield of recycling and the higher the environmental benefit. This highlights the need for data collection on public place recycling bin yields.

A large number of newspapers were identified in recycling bins through the public place recycling bin audits, including both daily newspapers and free newspapers. An issue for council to consider is that as recycling systems across metropolitan Melbourne move to commingled systems for bottles and cans and paper – will public place recycling bins in the city also be upgraded to a commingled collection. The current design of public place recycling bins does not permit the inclusion of paper. Council needs to consider the inclusion of paper in future bin design and or an additional recycling bin for paper.

There is an opportunity to work with train and tram operators in the city to establish public place recycling facilities for bottles and cans (and newspapers) at train stations and tram stops. Council could use the 2006 Commonwealth Games as an incentive to provide public place recycling facilities at train stations, in line with other litter and recycling programs to be undertaken for the Games.

There is a need for guidance for developers and commercial building managers on providing PPR in public areas in private developments, such as the new QV development on Lonsdale Street. Public place recycling bins have been installed in the central plaza area. The bin is provided in the same unit as a garbage bin, however the only signage is text based and both bins look the same.

Signage is one of the most important features of public place recycling and requires a balance between clear graphics and text, creative and eye catching colours and graphics and is one of the elements that is most commonly over looked.

Council can use the knowledge it has developed from its successful public place recycling program to develop guidelines (consistent with EcoRecycle's Best Practise Guidelines) to provide to developers at the planning stages of developments that are to include some public space. This is also applicable to commercial food courts where similar issues such as siting, maintenance, bin design and signage are applicable. Guidelines could include advice on litter and recycling bin colours, design, placement, signage and servicing and also include information about starting commercial recycling collections. To promote public place recycling in streets, public areas and in private areas such as train stations, food courts, private plazas and events, there is a need to develop a generic education and marketing program. Utilising advertising in trains and trams, education programs would promote locations and the correct use of public place recycling.

There are other alternative systems such as the Sulo Iceberg, which has most of the bin stored underground and appears as a normal sized bin at street level. The bin has the potential to stored large amounts of recyclable materials, eliminating the need for regular collections and could be applicable for some of the busier sites in the city that generate high volumes of recyclable material. The downside is that the bin may require a crane truck to empty it and will also require excavations and considerable construction works before it can be installed.



Internationally, the City of Toronto is in the process of replacing all its current litter bins with recycling boxes that have three separate compartments; for litter, paper and bottles and cans. The bins have been designed as an all in one unit; avoiding the need for two or three separate bins and are affixed with advertising panels; similar to Adshel bus stands.

Council should continue to monitor the range of bins and collection systems available for public place recycling both in Australia and internationally, and consider working in conjunction with bin manufacturers to design a bin that best meets the needs of the city.

Dumped Rubbish

The City of Melbourne collects approximately 1 600 tonnes of dumped rubbish per year, the combined totals of street litter and dumped rubbish collected from city streets exceeds 3 000 tonnes annually. Strategies that could be employed to reduce dumped rubbish include identifying hot spots, increased promotion of penalties for rubbish dumping, reviewing existing local laws, penalties and their enforcement, installation of signage and increased monitoring at known rubbish dumping hot spots.

Developing litter prevention task forces with residents and businesses and combining education and enforcement initiatives with the provision of infrastructure, such as improved lighting, can help combat issues of rubbish dumping in some areas.

Street Sweepings

Street sweepings represent more than 5,000 tonnes of waste collected in the City of Melbourne. However when it comes to waste reduction, there are not too many alternatives for street sweepings due to the contaminated nature of the material. Currently Council's street sweepings are used as daily cover for landfill.

Two organics processing companies in South Australia; Jefferies and Peats, are collecting and processing street sweepings collected from a number of South Australian Councils. Sawdust is added to the collected street sweepings. The material is then screened through a series of magnets, tubular screens and wind tunnels to remove contaminants. Some plastics are removed by hand. The material is then ground and blended with other collected organic materials and composted into a range of organic products. The end product is tested to ensure that hydrocarbons and other toxins are within EPA limits.

Drawing on this South Australian experience, there is the potential for the City of Melbourne to divert as much as 5 000 tonnes of garbage from landfill by investigating the potential for the screening and composting of street sweepings.

Waste Wise Council

In 2000 Melbourne City Council was the first Council in Victoria to be certified as *Waste Wise*. Council also developed an Environmental Champions Program to promote environmental issues, such as recycling and paper use to staff across the organisation.

Council is not currently certified as *Waste Wise*. Council should undertake the necessary steps to re-certify as *Waste Wise* if council is committed to leading by example. Council's *Waste Wise* status should continue to be communicated to residents and commercial properties and in other official communications.

An audit of council buildings conducted in 2002 resulted in implementation of a range of initiatives to reduce waste; including promoting double sided printing, implementation of a uniform recycling system, improved communications with cleaning staff, increased staff education and ongoing program evaluation.

Council is currently in the process of conducting a waste audit of council buildings; a process that is a key part of the *Waste Wise* certification process. This year Child Care centres will be included in the audit. Council needs to communicate the results of the audit to staff, to provide feedback on successful waste reduction programs to date and provide actions for continued improvement.



Council's Parks and Gardens unit has developed the *Growing Green Strategy*, which along with setting objectives on developing Melbourne's Parks and Gardens, sets an objective for parks operations to be *Waste Wise*, including goals for monitoring waste and recycling levels.

At this stage there is little information on the total levels of waste from council buildings, facilities and council operations as waste is collected and subsequently counted as part of residential and commercial waste collections and not collected by a separate vehicle. Audit of waste and recycling from council offices conducted in 2002 provides a profile of the current waste stream. Monitoring the total amount of waste generated is an essential part of monitoring waste reduction efforts and programs. Council should work with CityWide to develop a monitoring program of waste and recyclables collected from council facilities, buildings and services to gauge current levels of waste and implement monitoring programs.

Council has developed a draft Environmental Management System Plan for Childcare Centres, including strategies for waste and recycling management. This is a positive initiative that could be extended to other council facilities such as libraries and community centres.

Looking beyond waste and recycling services and looking at services and processes. Council could require all contractors using council facilities to develop a waste management plan as part of an environmental management plan addressing waste, water and energy issues. For example the catering contract for the Melbourne Town Hall could include conditions for food organics collection services. Council is a member of the *EcoBuy* Program that works with councils across Victoria to assist purchasing of recycled and environmentally friendly products – closing the loop. This is a positive program that will help with the long term establishment of markets for recycled materials and 'closing the loop' with kerbside recycling. Council should assess its current level of purchasing of recycled products and identify further opportunities to purchase more recycled products. Going beyond recycled products there is an opportunity for council to explore sustainable purchasing and assessing the whole lifecycle of products and services purchased by the City; setting an example for residents and the community in sustainable consumption.

Council is acting as an environmental leader in the development of the new building at 200 Collins Street. Council House 2 (CH2) will be a world class green building incorporating energy, waste and water initiatives to create a pleasant, safe and productive environment for staff as well as being a landmark building. Waste initiatives include the use of recycled materials, recycling facilities in kitchen areas and potential for organics collection.

Examples of Council's initiative in this area can be used as an important leadership example for other businesses in the city, to not only employ a green building model, but to incorporate waste and recycling initiatives into buildings. Case studies of the building and examples of the materials used will provide invaluable reference points for businesses in the city. CH2 and green buildings are further outlined in Chapter 8.

Waste Wise Events

Council has been actively working with event organisers in the city to ensure that major events are Waste Wise Events. Moomba 2004 was a Waste Wise event with over 50 recycling stations throughout the festival site and plans are in place for Waste Wise New Years Eve celebrations.

There are a variety of events in the City of Melbourne which range from official Council events, Council sponsored events and private events and functions in Council parks, gardens and facilities.

Opportunities for waste diversion from these events is crucial to both diverting waste to landfill and promoting Melbourne as a sustainable city. However there are a number of challenges associated with events, including lead time, co-operation of stall holders, co-ordination of activities on the day, servicing of bins on the day, contamination of the recycling stream by festival goers and bin placement.



There are a number of other events in the City that are not run or sponsored by the City of Melbourne. Major events such as the Melbourne International Festival, Melbourne Film Festival, Fashion Week, Australian Open and weekly sporting events at Telstra Dome and the MCG. While not official City of Melbourne events, they are focused within the City's boundaries and are high profile. Council in conjunction with EcoRecycle could work closely with organising committees to plan for less waste and provide waste and recycling facilities. The Guidelines for public place recycling discussed earlier in this chapter could be expanded to include information on recycling for events and festivals and the services and advice available from Council.

Council should continue to work with event organisers and EcoRecycle to encourage and support the development of further Waste Wise events in the city.

Options – Short term

Public Place Recycling

- Council to extend the network of public place recycling bins to all high volume sites in the city and to work with cultural institutions and tourist destinations to ensure that facilities are provided.
- Council to develop guidelines for commercial building managers and developers in provision of public place litter and recycling bins to better inform developers on providing effective public place litter and recycling facilities.
- Council to develop a promotional program on public place recycling targeting shoppers and city workers.
- Council to work with train and tram operators to develop paper and bottles and can recycling facilities at train stations.
- Council to develop a data collection program to monitor the amount of material collected in public place recycling bins.

Litter, Cigarette Butts, Dumped Rubbish

- Council to continue the successful litter and cigarette butt education and enforcement programs.
- Council to continue to rationalise the number and locations of litter bins in public places and continually monitor their use.
- Council to work with EcoRecycle and VLAA to develop and implement a Melbourne focused litter education program in the lead up to the Commonwealth Games.
- Council to use the Litter Prevention Task Force approach to litter hotspots and work with the local community and business groups to develop local responses.
- Council to review existing local laws, penalties and their enforcement.

Waste Wise Melbourne

- Council to develop a program to re-certify as Waste Wise and promote its Waste Wise status in all communications with residents and commercial properties.



- Council to continue to monitor waste from its buildings and operations and develop strategies based on the results of the monitoring to reduce waste.
- Council to promote its waste reduction efforts to local business community through developing cases studies and information on successful programs, such as CH2.

Waste Wise Events

- Major Council events to be Waste Wise in the next two years – all council sponsored events to be Waste Wise and smaller events to have basic recycling facilities in the next three years.

Options – Long Term

Public Place Recycling and Litter

- The number of opportunities for public place recycling will be equal to the opportunities to disposal.
- Material collected in street litter bins to be sent for processing to remove recyclables prior to its disposal.

Council Building and Events

- The City of Melbourne will develop programs to ensure waste from any council building, venue or event achieves and exceeds EcoRecycle targets in working towards zero waste.

Personal Actions for Residents to Reduce Litter

- Never over fill your garbage bin – rubbish can spill out, enter drains and wash into the Yarra River.
- If you're a smoker always use an ashtray or carry your own; cigarette butts are litter too.
- Take your own bags when shopping, if there's less plastic, there's less chance for plastic bags to become litter.
- Always use a litter bin for your rubbish, if there's no bin, take your rubbish home with you.

FOR FURTHER INFORMATION

Public Place Recycling and Event Guidelines www.ecorecycle.vic.gov.au

Victorian Litter Action Alliance www.litter.vic.gov.au

Clean up Australia Day www.cleanup.com.au

COMMERCIAL AND INDUSTRIAL

Current Programs and Services

Over 102,000 tonnes of waste from commercial and industrial sources are generated in the City of Melbourne each year. The sectors with the largest waste generation rates are accommodation, cafes and restaurants, manufacturing, hospitals and community services and retail sectors.

Council currently provides a standard commercial recycling service to all businesses of 0.5m³ a week of cardboard and a recycling crate for bottles and cans (not applicable to the CBD businesses).

Recycling of larger amounts is available through CityWide and other waste collection companies at commercial rates.

The biggest challenge for Council to promote waste reduction in this sector is that there is little council control over the waste generation, recycling and collection of waste from businesses.

However council does have some degree of control through the Environmental Local Law (in regards to bin placement and storage) and contact with businesses through Compliance Officers and Environmental Health Officers.

City of Melbourne has worked successfully with businesses in the past on waste issues. In 2002 Council in conjunction with BP established an organic waste collection trial from commercial premises in the CBD.

EcoRecycle's Waste Wise Program, delivered through Regional Education Officers and the Waste Wise Melbourne network developed as a partnership between Council and EcoRecycle, are working with businesses in the CBD to encourage waste reduction.

While not having a major direct service provision role, Council can provide environmental leadership, facilitating networks and providing information about waste reduction to businesses.

More work needs to be done to work towards EcoRecycle's Zero Waste Strategy goal of 65% recovery rate in solid industrial waste by 2008 and 80% by 2013. To achieve this it is proposed that, by 2009 all commercial and industrial waste will be processed for resource recovery prior to landfill. Identifying how City of Melbourne can play a role in facilitating resource recovery, now and in the long term, is discussed in this chapter.

In the long term, collection of commercial waste in the City of Melbourne presents an opportunity, as is the potential to recover large amounts of material from a small geographic area.

Priorities, Programs and Issues

Commercial Waste and Recycling Collection Services

Council provides limited level of services to commercial properties providing the same service to households as residential properties, servicing businesses with low waste needs.

There are a large number of waste and recycling collection companies in operation in the city. An inspection of any laneway in the inner city reveals a number of bins, in different sizes and with bins and lids in a variety of colours. The large number of collection companies requires different trucks, resulting in large amounts of noise and strict adherence to collection times. Council is currently involved in a trial program to have these contractors collection in an agreed time and method.

One issue for consideration is that as Council is to upgrade household recycling services and provide a bin based collection service and its policy is to provide the same level of recycling to commercial properties. Will a mobile bin for commingled recycling be provided to businesses? And if so, will it meet the need of businesses?

Businesses traditionally have larger volumes of cardboard than residential properties, currently council addresses this by providing a weekly cardboard collection of .05 M³. However by moving to a bin based collection service, cardboard cannot be collected as easily – cardboard becomes jammed in the bin making it difficult for collection and cannot fit easily into a 120 L mobile bin.

Council needs to address the issue of service provision to commercial properties separately and develop service standards that address all elements of the waste and recycling stream and meet the needs of traders.

Council could provide increased services to businesses, however this needs careful consideration of business size, waste types and recycling needs. If council was to expand services, it needs to evaluate what level of service would be provided, matched with the servicing needs of businesses in the city and the business types – as different businesses generate different types of waste.

Figure 7.1 Commercial Waste and Recycling Servicing and Business Size

Business size	Description	Typical Collection Frequency
Small	Laneway coffee shop, small clothing store	120 or 240 L bin collected weekly or 2-3 240 L bins collected weekly limited recycling
Medium	Larger coffee shop, restaurants mid sized retail stores	1100L or 660 L garbage skips Some recycling – 240 L bins
Large	Hospitals, hotels, shopping centres, department stores	Garbage compactors and skip. Daily collections of waste and recyclables (if provided)

(Source: City of Melbourne, 2004)

One option for Council to consider is the expansion of its current standard service to commercial properties (the same as residential services) to provide expanded waste and recycling services to meet the needs of small to medium sized enterprises (SME's) especially with recycling services. Engaging a recycling collection can be prohibitive for smaller businesses. Larger businesses can negotiate cost effective collections due to the volume of materials collected, while smaller business without the volumes of materials and often face large collection costs for recycling, making recycling more expensive than waste disposal. It is in this sector that council can play a major servicing role in increasing access to recycling services to SME's.

At times there have been calls for council to provide all waste collection services to businesses in the city, regardless of the business size, resulting in increased service co-ordination and opportunities to promote recycling. This option requires considerable investment in infrastructure and could present issues with the Trade Practices Act and loss of business from waste collection companies currently operating in the CBD. It is not recommended that City of Melbourne pursue this option at this time. One fact is certain, where commercial waste is concerned, one size does not fit all. Waste generation levels and waste composition vary considerably. Expansion of services to meet the changing needs of the businesses need to take this into account.

There are however other measures that council could implement to improve recycling service provision to commercial properties, particularly with SME's. Council could develop guidelines for commercial waste collection services in the CBD, requiring collection contractors to promote and provide recycling services to businesses they collect from in the CBD.

To increase use of current user pays commercial recycling services, council could increase the promotion of recycling services provided by CityWide and provide information about waste reduction to encourage the diversion of waste from the SME's.

There is potential for council in the medium to long term, through its Environmental Local Law, to require all businesses to utilise recycling collections or send commercial waste for recovery before landfilling; thereby diverting waste from landfill and working towards the Zero Waste Goal of a 65% recovery rate by 2008.

Monitoring waste reduction progress requires data, to accurately measure progress in commercial and industrial waste reduction. City of Melbourne should establish a regular commercial waste data collection program. This should also include monitoring reduction in greenhouse gas and water consumption, as recycling (and waste reduction) provides strong greenhouse and water saving gains.

Materials

In assisting commercial and industrial sites to divert significant waste, Council should understand the commercial waste stream and frame information and services to the business profile of each.

Materials such as cardboard, paper, and plastics are common across most commercial sites:

- Cardboard is present at almost all sites and recovered in the central city by a council contracted service and private operators.
- The level of recycling of printing and writing paper is likely to be higher in the City of Melbourne, as collection companies have concentrated their efforts on recovery from large corporates in central city.
- Flexible plastics and outer packaging film is a lightweight but bulky waste material at many sites.
- Beverage containers; there are existing collection opportunities for a range of beverage containers to be recycled from large generating sites (hotels, restaurants, large corporates).
- Food; significant volumes food waste are generated by food retail, cafes, restaurants and some large corporates.

Beyond these wastes, Council has an important role in identifying opportunities to increase diversion, facilitate collections and provide information about the disposal and recovery of other waste items such as:

- computers;
- printer cartridges;
- furniture;
- carpet;
- cooking oil;
- telephone directories; and
- mobile phones.

Organic waste recycling programs in food premises

In 2001, council facilitated the implementation of an organic waste collection trial program in the city. The trial program collected food waste from 10 sites in the city and developed recommendations on the expansion of food waste collection services. The food waste collection service is now provided to approximately 31 business in the CBD. Council provides information about the service in new business kits and conducts mailouts to food premises to promote the service. The current take up rate is low.

Issues of space, time, access, cost and staff training are barriers to the introduction of food organic collections in food premises. The results of the trial identified staff education and contamination, lack of space in kitchens and high staff turn over as barriers to expanded service implementation.

Big picture issues include the lack of viable processing opportunities and the volatility of the organics recycling market from both residential and commercial sources. EcoRecycle Victoria has identified organics as the major focus for its 2004-2005 business planning process.

The accommodation, cafes and restaurants sectors have been identified a priority sector, in EcoRecycle Victoria's Draft *Towards Zero Waste Strategy*. This sector is currently estimated to be generating over 20,000 tonnes of waste per year.



Council, although it cannot require the collection of organic waste, can encourage the service through regular visits of Environmental Health Officers. Opportunity also exists to further develop the relationship with Green Collect, a community organisations currently collecting wine corks from 130 businesses in the city, to further promote the food organics service to restaurants.

Council can consider developing guidelines and planning permit conditions for new and redeveloped restaurants and other food service businesses to include both adequate storage and separated systems in kitchens to enable the easy recycling of food waste and bottles and cans.

Plastic Bags

Australians use 6.9 billion bags per year⁸ and the last 12 months there has been an increased focus on reducing the number of plastic carry bags we use. Retailers through the Australian Retailers Association are aiming to reduce plastic bag consumption by 50% by the end of 2005.

What role does City of Melbourne have to play in reducing the use of plastic bags? Using its role to advocate and educate City of Melbourne could work in conjunction with major retailers to develop a program to advocate 'bring a bag' when shopping in the city. The program could use advertising in trams and trains and newspapers.

With the growing number of supermarkets in the City of Melbourne, Council could use its role as a leader and facilitator, to encourage supermarkets and other retailers away from free of charge plastic bags, reducing the number of supermarket carry bags. Council could require future supermarket developments in the city to identify how they will reduce the number of plastic bags used in the store. There is also an opportunity to work with the community to develop community driven programs to address the issue. There are examples from across Australia where local communities have worked together with local businesses to effectively ban plastic bags in local areas. Coles Bay, Tasmania has become Australia's first plastic bag free town, providing shoppers with reusable paper bags at a charge of \$.25c and promoting calico bags. EcoRecycle Victoria announced funding earlier this year for communities and councils to address plastic bag issues and Angelsea is the first Victorian town to tack up the challenge. This kind of program could be applicable to some of the city's local areas and could build upon the work already carried out by residents participating in Sustainability Street programs.

Waste Wise Business Program

The EcoRecycle Victoria's *Waste Wise* Program, has been operating through Regional Education Officers, EcoRecycle and Councils since 1998 and encourages businesses to become *Waste Wise*. The program works with larger businesses (generating more than 100 tonnes per year) as part of the Waste Wise Business Program and all other businesses as part of the Waste Wise Community Program.

The Waste Wise Melbourne Network was established in 2003 in partnership with EcoRecycle Victoria and the City of Melbourne, to reduce waste from city based businesses in the lead up to the Commonwealth Games. The program aims to have 50 businesses certified as Waste Wise in time for the games. Currently 40 businesses are part of the network.

City of Melbourne in conjunction with EcoRecycle could identify sectors such as hospitals, hotels and restaurants (sectors generating the largest amounts of waste in the city) and to work closely with businesses, providing information and advice and assisting in problem solving and implementation of Waste Wise initiatives.

⁸ Nolan-ITU (2002), *Plastic Shopping Bags in Australia*, Report for the Department of Environment and Heritage, Nolan-ITU Melbourne.

One of the largest business sectors in the city are offices. There have been a number of programs that have worked to reduce waste from the CBD office sector. The *Waste Wise Office Project* conducted by the Metro West Waste (formerly the Western Region Waste Management Group) in 2001 identified that on average 200 kgs of waste is generated per office worker per year, consistent with the commercial waste profile developed for this discussion paper. The project worked with businesses to reduce waste and encourage businesses to become *Waste Wise*.

Increasingly office based waste programs are also incorporating energy and water consumption and reduction. Working in with its existing greenhouse and water strategies, the City of Melbourne could develop an education and support program that covers the issues of waste, energy and water under the banner of a Sustainable Business or a Sustainable Office Program.

There is also potential for council to support social and environmental initiatives through the support of business models that have both environmental and social benefits, such as Green Collect. Green Collect is a Melbourne based business providing a wine cork collection service and other green office services in the CBD and providing jobs to people facing barriers to employment. It is both a business and a support service for staff and aims to bring community business and the environment together. There is potential through Council's Sustainability and Innovation Division to investigate fostering social and environmental enterprise models; either through supporting existing businesses or researching the potential for businesses to develop around particular environmental or social issues. There is also an opportunity to foster the development of businesses focusing on reuse and recycling of waste, and supporting their development through grants, seminars, marketing services and providing information and advice. Council's own business small development program, Business Melbourne, could have a special focus or sub program on developing and fostering these types of businesses and ensuring that guidelines and criteria encourage the development of small businesses in the field.

Education and Cultural Institutions

The City of Melbourne is home to a large number of education and cultural institutions; universities, libraries, museums, galleries and sporting venues. As key tourism and visitors destinations, they are important places to establish the City of Melbourne's green profile and demonstrate council's commitment to sustainability. But most importantly they offer significant opportunity for waste reduction and diversion.

Council should work with key education and cultural institutions in the CBD to ensure that public place recycling systems and services are provided and that the organisation are also working on their own waste reduction programs. Council needs to work with EcoRecycle to identify a role for council and work with EcoRecycle on developing further programs in the area.

Data Collection

Developing a waste profile from the commercial and industrial sector presents some difficulties, as there is no consistent data on waste generation or recycling activity. For the purpose of this discussion paper, waste generation rates were calculated using employment data and waste generation rates per industry. To measure the future waste diversion of the commercial sector in the city Council needs to continually monitor the amount of waste generation and recycling activity in the city. This could be best carried out in partnership with EcoRecycle Victoria, using existing and expanded data collection programs.

Options – Short term

Recycling Services and SME's

- Council to review the garbage and recycling services currently available to SME's in the city (both council and private) to identify needs and opportunities for expanding recycling services to SME's.



- Council to work with CityWide to monitor the number of SME's currently engaging in commercial recycling services and develop a communication program to promote the range of commercial services available through CityWide.
- Council to educate and enforce the Environmental Local Law requiring all businesses to separate wastes for recycling services.

Food Waste Collection

- Council to develop a relationship with Green Collect to promote the CBD food waste collection service and build on their relationship with over 130 city restaurants.

Plastic Bags

- Council to work with local retailers groups to develop a 'bring your own bag when shopping' campaign for the city.
- Council to invite local communities to develop and participate in a project to address plastic bag issues in the city's local areas.

Waste Wise Businesses

- Council to continue to develop the Waste Wise Melbourne Network in conjunction with EcoRecycle Victoria.
- Council to identify major waste producers in the city and develop an information, resources and events specifically targeted to particular sectors under the Waste Wise Melbourne banner.
- Council to integrate the benefits of waste, energy and water programs into one overarching program – Sustainable Business - which aims to improve sustainability of businesses in Melbourne.
- Council to foster the development of local businesses addressing waste issues in the city through the Business Melbourne.
- Council in conjunction with EcoRecycle Victoria to develop baseline data to measure recycling activity of commercial properties.

Options – Long Term

- Council to require all commercial premises in the CBD to have recycling services or to send waste for recovery before landfill.
- Council to co-ordinate the provision of a comprehensive range of recycling services for all key materials.
- Council to require regular reporting of waste generation and diversion from commercial and industrial sites and to monitor opportunities for further reduction.

Case Studies

The Grand Hotel, Spencer Street

The Grand Hotel in Spencer Street Melbourne is a five star hotel and part of the ACCOR hotels group. The hotel has undertaken a number of waste reduction initiatives, providing recycling facilities and reducing waste and energy consumption. Information about environmental initiatives is supplied to guests in the rooms. While not currently certified as Waste Wise, the Hotel is a member of the Waste Wise Melbourne Network and considering certification for the future.

According to staff, one of the largest source of waste is from bathroom amenities and individually packaged bathroom products. Staff have looked into the use of bulk pack dispensers, however the expectations of guests are that at five star hotel individual bathroom amenities will be provided. Balancing guests expectations with further waste reduction initiatives is a challenge for the hotel. Staff from the hotel suggested that council could play a role in providing information about services and solutions to issues. Such issues faced by the hotel is the need for dual bins for hotel rooms; tastefully designed bin systems that can be installed in the rooms. Currently recycling bins are not provided as there are issues with aesthetics and odour in hotel rooms. Once trialled the dual bin could be used at other hotels across the city. With Melbourne's 11, 500 hotel rooms, that presents a great opportunity to collect recyclables and divert waste from landfill.

RMIT, City Campus

Staff at RMIT City campus in Swanston Street have undertaken a number of environmental initiatives over the past ten years. Recycling programs and activities are provided across campus for paper, cardboard and toner cartridges and the university has been involved further in the Waste Wise Program. Public place recycling is provided in public areas around campus. Old furniture is provided for staff and students to reuse. RMIT was certified as Waste Wise in 2000 and are required to reapply for certification.

Staff identified education as an area where council could partner with RMIT to develop education programs about recycling – to encourage students to recycle on campus.

This partnership has the added benefit of promoting recycling at home – due to the large number of students living in the City of Melbourne. Potential exists for a generic education program consisting of posters around campus, corresponding bin stickers/signage on recycling bins and advertising in student newspapers to promote both recycling on campus and recycling at home.

BP Australia, Melbourne Central Tower.

BP Australia have had a successful Green Office program since 1998 and have been involved in a number of waste management initiatives in the central city such as food waste collection services in partnership with the City of Melbourne and most recently the development of Green Collect in partnership with Urban Seed.

The program has achieved estimated financial savings of up to \$900,000 in paper and electricity usage, and reduced waste to landfill by 85%, paper consumption by 81% and reduced energy consumption by 47%.⁹

Green Collect, Melbourne

Established in 2002 with the support of BP and Urban Seed, this unique project, brings together environmental initiatives and social objectives by providing employment to homeless persons to collect cork from locations in Melbourne's CBD.

Green Collect services have now expanded to include green office services, collection of printers and mobile phones and green cleaning. So far the program has provided over 800 hours of employment and collected over half a million corks from 140 businesses.¹⁰

⁹ www.bp.com.au

¹⁰ www.greencollect.org



This project model, that benefits both the environment and the community is one that City of Melbourne could foster and encourage; reducing waste while creating employment opportunities for people facing barriers to employment in the city.

FURTHER INFORMATION

Reducing Plastic Bags and Plastic Bag Free Towns www.planetark.com

Starting a commercial recycling service www.citywide.com.au

EcoRecycle Victoria's' Waste Wise Program www.ecorecycle.vic.gov.au



CONSTRUCTION AND DEMOLITION

Current Programs and Services

Based on the current level of building activity in the City of Melbourne, the volume of construction and demolition waste generated is estimated at 420,000 tonnes. The volume of this materials that is diverted for recycling is estimated at 70% of 29,000 tonnes.

Building and construction waste in the CBD comes from two sources: residential and commercial development. Due to the nature of the CBD and the current strength in the building cycle, the percentage of building activity focused on commercial buildings is higher than other Victorian Councils.

Traditionally commercial and residential development generate different levels and types of waste. EcoRecycle's Zero Waste Strategy states that by 2006 all construction and demolition will be processed for resource recovery prior to disposal to landfill.

Priorities, Programs and Issues

Residential Construction and Demolition Waste

The City of Melbourne does not have the large green field developments of outer suburban councils. Residential development occurs in apartment towers, renovations and demolition and construction of blocks in built up areas.

Through the stormwater management planning process, some councils have developed sediment and waste control local laws and enforcement programs for residential building sites. The City of Yarra requires the develop a waste management plan for new residential properties to identify how wastes will be controlled, processed and stored on site.

The Building Commission and EcoRecycle have been working with councils to develop a model local law covering issue of litter and stormwater protection that will provide a consistent framework for enforcing litter, waste and stormwater issues.

Waste Generation and Building Cycle

The construction of a building has four phases; the design, construction (which may also include demolition), fit out stage and management stage. Waste issues, generation levels and waste composition vary at all stages of the construction cycle.

Consideration of waste management and recycling issues must be incorporated into the design stage of a building in the materials selection and allocation of space for recycling systems.

The demolition stage generates a range of materials, depending upon the type of buildings demolished. Some demolition projects have extremely high recycling rates of demolished materials. During pre-construction (depending upon the excavation works required), clean fill or on some sites contaminated soil is generated in large volumes.

The construction stage generates waste materials from the construction process such as concrete, bricks, steel and timber. At the fit out stage plaster, packaging, electrical wiring, paint and paint cans are common waste items. The management stage generates the daily waste from the buildings operation.

Construction Waste Diversion – on and off site

Currently a number of construction sites have facilities for onsite diversion of waste material – e.g. Multiplex at the Southern Cross Hotel Site and Mirvac at Yarra’s Edge. Multiplex and Mirvac employ on site separation for concrete, cardboard, timber, plaster, bricks and steel. Collection of hazardous materials such as paints, thinners and paint containers is also used. Both companies are now receiving monthly reports on the amount of waste collected and diverted from landfill and currently divert between 60 and 65% of construction waste from sites in the City of Melbourne from landfill. Inner city sites, due to the limited room for separated containers, report lower levels of diversion than green field sites where space is available.

Current off site sorting systems are diverting as much as 95% of waste from construction and demolition projects. An off site sorting service provided by Alex Fraser Pty Ltd and currently on trial at Aurora Estate in North Epping, where all waste produced on building sites in the development is disposed of in a large bulk bin and taken to Alex Fraser Pty Ltd for off site sorting.

There is large potential for off site sorting at inner city construction sites where lack of storage space may prevent on site separation of wastes.

Green Buildings

There is a growing trend in both the environment and construction industry for the development of green buildings; buildings that use recycled and or reused materials and address long term energy and water consumption, to design and construct buildings that use less resources and energy and provide a healthy environment for staff.

Development of the 60L building in Leicester Street in Carlton is a recent example. The building used recycled and reused materials and employed waste reduction strategies in materials selection. The original building was partly reused, recycled timber was used for doors and windows and concrete used in construction has recycled content.

The City of Melbourne has also undertaken to construct a landmark green building in Little Collins Street. Council House 2 will be a leading building, incorporating energy, water and water reduction features in the building’s design and materials selection.

These are great examples of green buildings and construction waste reduction in action and have an important educational role for commercial development in the city.

Rating tools such as Green Star developed by the Green Building Council provide a tool to rate the environmental features of a building. City of Melbourne through its draft Sustainable Buildings Policy will require a four star green star rating for all new commercial buildings. Council House 2 will have a six star green star rating.

The tools are currently in production and eventually a Green Star tool will be developed for four stages of the building cycle, design, construction, fit out and ongoing management. While Green Star provides the framework and assessment tool, there is an opportunity for Council to provide information to developers and builders to feed into the design and decision making process.

Design of waste and recycling systems in new buildings

In new buildings, consideration must be made for adequate waste and recycling facilities and storage of waste collection containers. In some situations, recycling and waste collection are not considered until the building is completed, resulting in issues of storage, collection and management of waste and recycling systems, and in some cases making separated collections of recyclables prohibitive.

As previously discussed, this is a particular issue at flats, units and apartments, insufficient space for recycling containers and inappropriate systems mean that residents in some developments do not participate in recycling services.

Space for recycling and waste collections and consideration for daily waste management must be accounted for at the design stage of a development. Calculating the required space in commercial and residential building requires consideration of the size of the building, number of tenants/residents and the type of commercial tenants in determining amount of waste and the type of materials to be generated. Consideration also needs to be made for access of collection vehicles, type of waste containers, garbage compaction units and recycling systems.

To ensure that space for garbage and recycling facilities is incorporated into the design stage of a development council needs to develop guidelines for developers, architects and planners to allocated sufficient space. Guidelines also need to cover the management and servicing aspects of waste collection such as truck storage, garbage chutes and recycling systems.

Monitoring waste generation and diversion in the CBD

Monitoring outputs and waste generation is key to measuring the success of waste reduction initiatives. Rather than reporting total tonnes generated and recycled, due to the cyclical nature of the building industry and the different types of waste generated at different stages of a building's development, reporting of a diversion figure is more applicable.

Data Collection

Developing a waste profile from the construction and demolition sector presented some difficulties, as there is no consistent data on waste generation or recycling activity. For the purpose of this discussion paper, data from Multiplex and Mirvac constructions was used, and measure against data compiled for EcoRecycle Victoria's industrial waste strategy. Although an indicative figure, waste generation and diversion rates fluctuate and are dependent upon the building cycle, site conditions and building activity.

Through the discussion paper it was identified that some commercial builders are now collecting a range of information on waste generation and diversion and compiling monthly reports. City of Melbourne in conjunction with EcoRecycle Victoria and building organisations could develop a partnership with commercial builders to develop a data collection methodology to fulfil both Green Star reporting requirements and record and monitor waste generation and diversion levels. While in the long term this could be achieved through a formal partnership process. Council could initiate a dialogue on waste issues with commercial builders in the city, to identify current data collection avenues, materials recycled and other waste issues from building sites.

Options – Short Term

- Council to require a minimum of a 4 star Green Star rating, with an increased emphasis on waste management during the construction process and in the buildings design.
- For residential and commercial developments, Council should require the development of a waste management plan addressing waste issues during the construction and demolition stage of the development and ongoing management.
- Council to develop guidelines for waste and recycling collections from flats and apartments to incorporate waste and recycling into the design stage of construction.
- Council to consider requiring all developments to demonstrate and report the diversion results of on and off site storage.
- Council to initiate a dialogue with commercial builders on waste issues.
- Council in conjunction with EcoRecycle Victoria, commercial builders and industry groups to develop a data collection program to monitor waste generation and diversion rates from construction sites in the city.



Options – Long term

- Council to require all developments to divert more than 80% of construction and demolition waste from landfill by 2006.
- Council to work with EcoRecycle and building authorities to identify construction and demolition materials currently not diverted from landfill and develop a diversion strategy to facilitate the recycling and recovery of these items.
- Council to require that all material sent from construction sites be sent to off site sorting facilities.
- Council to investigate developing a ‘green badge’ system – for buildings that meet the four star green building status and display the environmental and waste management features on the front of a building.

Case studies

Green Star – Ratings for Green Buildings

The green star rating program developed by the Green Buildings Council, is a four step process that assigns a rating to a building for its ‘green’ credentials. Issues such as water, waste, energy, materials transport and innovation are all considered in the guidelines. Four guidelines are available for the four stages of a buildings development; design, construction, fit out and management.

Waste issues are considered in all four tools and ratings are assigned for different waste and recycling initiatives; reuse of building facades and building structures, use of recycled materials such as concrete, development of a waste management plan, diversion of 60%+ of waste from landfill and provision of storage of recycling bins for paper, glass, plastics, metals, and organics.

City of Melbourne is currently planning to use these guidelines and require all new commercial buildings in the city to have the minimum of a four star Green Star rating.

For further information or to download the Green Star Rating tools visit www.gbcaus.org

City of Melbourne Council House 2 – Melbourne’s Greenest Building

City of Melbourne is constructing a new building in Little Collins Street that is set to become a landmark Green Building. The building has been assigned a six star Green Star rating. The building with its range of green features will provide a healthy working environment and promote organisational well being.

Recycling facilities for bottles cans and plastics have been incorporated into the design of the building. A vacant site next to the existing council building will be used, allowing for the efficient use of the existing building after staff move to the new building and access to public transport services.

The building has a range of water saving features, rainwater will be collected and used within the building, grey water will be recycled.



The building's interior design and a louvre design for the building exterior will maximise sunlight and allow for air flow to heat and cool the building throughout the year. Solar panels affixed to the buildings exterior and gas fired plan on the roof of the building will supply energy to the building. The design of workstations and the choice of computer equipment and lighting will require significantly less energy.

For further information visit www.melbourne.vic.gov.au

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- RMIT University
- Royal Botanical Gardens
- Sulo
- The Grand Hotel
- Vic Urban
- Western Region Waste Management Group



REPORT LIMITATIONS

This report has been prepared in accordance with an agreement between City of Melbourne and Nolan-ITU.

The services performed by Nolan-ITU have been conducted in a manner consistent with the level of quality and skill generally exercised by members of its profession and consulting practices.

This report is solely for the use of City of Melbourne and any reliance of this report by third parties shall be at such party's sole risk and may not contain sufficient information for purposes of other parties or for other uses. This report shall only be presented in full and may not be used to support any other objectives than those set out in the report, except where written approval with comments are provided by Nolan-ITU.

Appendix A

Commercial and Industrial Waste Generation.

Commercial and Industrial Waste Generation.

Total breakdown of waste generation by each commercial and industrial sector (not including C&D).

Appendix A: Commercial Waste Generation by Sectors and Total EFT.

Industry and ANZSIC Code	Total EFT	T/EFT/Yr.	TOTAL T/EFT/Yr.
01 Agriculture	325.5	0.2	65
02 Services to Agriculture; Hunting and Trapping	61	0.1	6
03 Forestry and Logging	75	0.1	3
04 Commercial Fishing	11.5	0.3	3
A0 Agriculture, Forestry and Fishing, undefined	13.75	0.1	1
11 Coal Mining	32.5	0.1	3
12 Oil and Gas Extraction	303.25	0.1	30
13 Metal Ore Mining	245.25	0.1	25
14 Other Mining	21.25	0.1	2
15 Services to Mining	255	0.1	26
B0 Mining, undefined	299	0.1	30
21 Food, Beverage and Tobacco Manufacturing	2035.75	2.5	5089
22 Textile, Clothing, Footwear and Leather Manufacturing	443	1	443
23 Wood and Paper Product Manufacturing	148.5	2	297
24 Printing, Publishing and Recorded Media	4050	0.6	2430
25 Petroleum, Coal, Chemical and Associated Product Manufacturing	1951	1.8	3512
26 Non-Metallic Mineral Product Manufacturing	305	1	305
27 Metal Product Manufacturing	364.25	1	364
28 Machinery and Equipment Manufacturing	4791.25	0.82	3929
29 Other Manufacturing	506	1.8	911
C0 Manufacturing, undefined	635.25	1.5	953
36 Electricity and Gas Supply	1883.25	0.3	565
37 Water Supply, Sewerage and Drainage Services	104.75	0.3	31
D0 Electricity, Gas and Water Supply, undefined	18.25	0.2	4
41 General Construction	3005.75		N/A
42 Construction Trade Services	2217	0.1	N/A
E0 Construction, undefined	305.75	0.1	N/A
45 Basic Material Wholesaling	1274	0.8	1019
46 Machinery and Motor Vehicle Wholesaling	2472.5	0.8	1978
47 Personal and Household Good Wholesaling	2946.75	0.74	2181
F0 Wholesale Trade, undefined	369	0.5	185
51 Food Retailing	2796.5	1.8	5034
52 Personal and Household Good Retailing	9326.5	0.5	4663
Industry and ANZSIC Code	Total EFT	T/EFT/Yr.	TOTAL T/EFT/Yr.
53 Motor Vehicle Retailing and Services	2091.25	0.73	1527
G0 Retail Trade, undefined	553.25	0.5	277
57 Accommodation, Cafes and Restaurants	12512	1.7	21270

61 Road Transport	1717.25	1.1	1889
62 Rail Transport	1462.75	1.1	1609
63 Water Transport	441.5	1.1	486
64 Air and Space Transport	2217	1.1	2439
65 Other Transport	5	1.1	6
66 Services to Transport	3908.75	0.3	1173
67 Storage	282.25	0.5	141
I0 Transport and Storage, undefined	807.25	0.1	807
71 Communication Services	13467.5	0.2	2694
73 Finance	20428.25	0.1	2043
74 Insurance	10009.25	0.1	1001
75 Services to Finance and Insurance	7848.5	0.1	785
K0 Finance and Insurance, undefined	221	0.1	22
77 Property Services	3417.25	0.2	683
78 Business Services	56234.5	0.1	5623
L0 Property and Business Services, undefined	78.5	0.2	16
81 Government Administration	13117.75	0.1	1312
82 Defence	1481.5	0.25	370
M0 Government Administration and Defence, undefined	10	0.1	1
84 Education	11867	0.5	5934
86 Health Services	14574.25	0.73	10639
87 Community Services	2161	0.73	1578
O0 Health and Community Services, undefined	473.25	0.1	47
91 Motion Picture, Radio and Television Services	1577.25	0.4	631
92 Libraries, Museums and the Arts	2429.75	0.2	486
93 Sport and Recreation	4205.25	0.4	1682
P0 Cultural and Recreational Services, undefined	202.75	0.3	61
95 Personal Services	1243.25	0.2	249
96 Other Services	5696	0.15	854
97 Private Households Employing Staff	3	0	0
Q0 Personal and Other Services, undefined	9.5	0.15	1
99 Non-Classifiable Economic Units	909	0.1	91
& Not stated	440.5	0.1	44
Total (Tonnes per year for C&I)			102557

FINANCE ATTACHMENT

2020 VISION FOR SUSTAINABLE WASTE MANAGEMENT – DISCUSSION PAPER

Funding of \$15,000 has been provided in the 2004/2005 budget for the waste strategy (activity 47403).

Kerrie Jordan
Acting Manager Finance Services

LEGAL ATTACHMENT

2020 VISION FOR SUSTAINABLE WASTE MANAGEMENT – DISCUSSION PAPER

Section 3C of the *Local Government Act 1989* (“the Act”) provides that the primary objective of a Council:

“is to endeavour to achieve the best outcomes for the local community having regard to the long term and cumulative effects of decisions.”

Section 3C of the Act goes on to state that in seeking to achieve its primary objective, a Council must have regard to facilitating objectives, including —

“(a) to promote the social, economic and environmental viability and sustainability of the municipal district; and

(b) to ensure that resources are used efficiently and effectively and services are provided in accordance with the Best Value Principles to best meet the needs of the local community;”

Under section 3F of the Act, Council also has the power to do all things necessary and convenient to be done in connection with the achievement of its objectives and performance of its functions.

The recommendation is therefore made in accordance with the Council's functions and powers as set out in the Act.

Alison Lyon
Manager Legal & Governance