

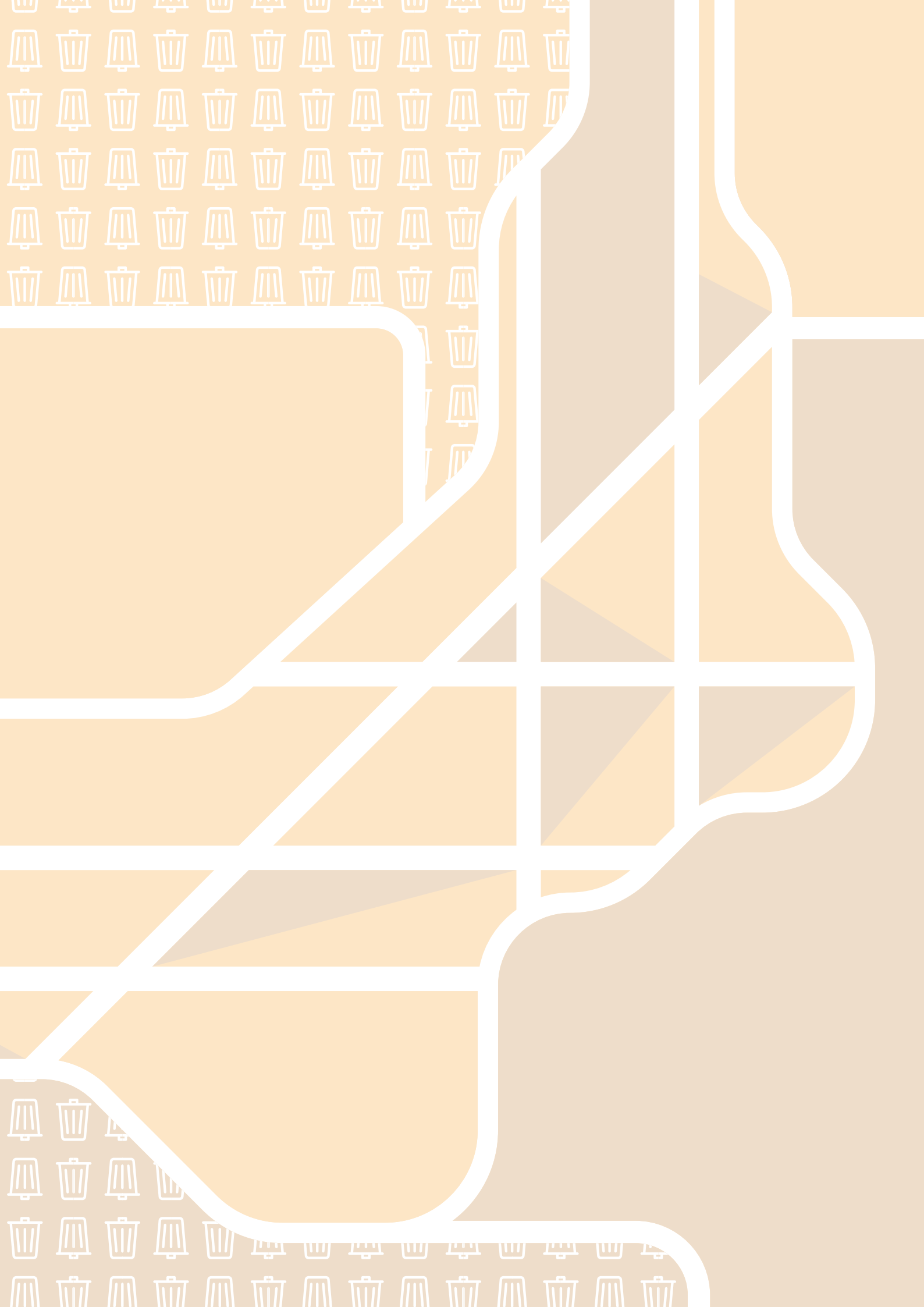


SUSTAINABLE WASTE STRATEGY

2015-2020

second
nature





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INTRODUCTION

There are currently around 71,000 residents living in the Waverley Local Government Area (LGA). Waverley is unique in that it has a thriving business community, the vibrant commercial hub of Bondi Junction, unique village precincts, our many parks, beaches and protected coastal areas.

Valued for its natural beauty and the lifestyle it offers by locals, Waverley LGA is also a popular destination for tourists from overseas, interstate and regional visitors. During the summer months, the population can often more than double with up to 50,000 people per day visiting the world famous Bondi Beach alone.

As a result of Waverley's unique demographics and dynamic population, Council faces various

challenges and opportunities with regard to waste management from kerbside collection services, recycling in the public domain, illegal dumping issues and litter.

Waverley Council is committed to managing waste from households and businesses as well as in the public space in a sustainable way. We recognise that waste sent to landfill has long-term environmental impacts on habitat, wildlife, and biodiversity, and that there is an opportunity to divert waste from landfill through reuse and recycle options that benefit the community.

Based on research and best-practice considerations, our Sustainable Waste Strategy outlines the approach and steps Waverley Council is taking to address the following key focus areas:

1. Reduce waste generation
2. Maximise resource recovery
3. Reduce greenhouse emissions
4. Clean and attractive Waverley
5. Solutions to problem wastes
6. Green infrastructure integration

The Strategy also lays out:

- the state of play on waste from a regulatory and policy context at regional to federal levels,
- the status of waste in our local government area
- the issues and opportunities for sustainable waste and recycling services for the next five years,
- our goals in each focus area.



Our community profile

Waverley is the most densely populated LGA in Australia after the City of Sydney.



9.2km²



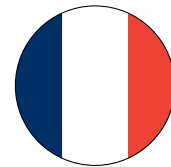
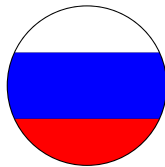
population = 70,706

How is our land used?

Land use is a highly developed mix of commercial, residential, and public recreation spaces. Additionally, there are mixed-use buildings where residents reside above a commercial business.

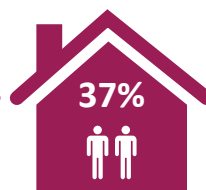
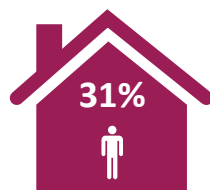
Who are we?

Waverley's population comprises a majority of English speaking residents, with 18 percent from non-English speaking backgrounds, including Russian, Hebrew, Italian, Spanish, and French. The majority of residents fall between the ages of 25 and 45 years old.



How do we live?

There are 28,028 households, with most occupied by one or two persons.



43% of our population are renters while 44% own or are paying off a mortgage.



40% of residential dwellings are houses or single-unit dwellings (SUDs) and 60% are apartments or multi-unit dwellings (MUDs). 81% of our population live in MUDs.

STRATEGIC CONTEXT

Regulatory environment

- **The Local Government Act 1993** (amended 1997) requires councils to take responsibility for residential waste and has mandated a Domestic Waste Management Charge for residential properties. It also requires councils to implement principles of Ecologically Sustainable Development.
- **The NSW Waste Avoidance and Resource Recovery (WARR) Act 2001** established resource recovery targets for NSW. The major policy tool for encouraging investment in resource recovery and waste diversion is the Section 88 Waste and Environment Levy. The Act provides for the introduction of extended producer responsibility (EPR) schemes in NSW. These Schemes extend manufacturers' and suppliers' responsibility for their products at end of life. These include: computers, televisions, mobile phones, other electrical product, batteries, tyres, plastic bags, oils and lubricants, and cigarette butts.
- **The Protection of the Environment Operations Act 1997** and subsequent Protection of the Environment Operations Amendment Act 2005 are the principal tools in litter and illegal dumping enforcement.

The POEO Act established the Waste Levy, as well as licensing requirements for waste facilities and activities, offences for illegal dumping and littering, and a pathway for recovered resources to be used on land and for fuel.

- **The POEO (Waste) Regulation 2014** ensures local communities play an active role in waste management by taking greater responsibility for the waste they generate.
- **Federal Government released the National Waste Policy in 2010**, which is designed to provide a holistic approach to waste issues, address ad hoc governance issues, and ensure climate change and sustainability are key drivers. The Implementation Plan will initially focus on Extended Producer Responsibility (EPR).

State/regional approach

- **The NSW Waste Avoidance and Resource Recovery Strategy 2014-21** encourages waste diversion through two state-wide targets – to increase the recycling rate of household material to 70%, and to increase the overall waste diverted from landfill to 75% across household and commercial waste streams. It also includes targets for litter and illegal dumping.

- **NSW Government's Waste Less, Recycle More initiative** supports the NSW WARR strategy 2014-2021, providing funding for new recycling and waste infrastructure, litter programs and illegal dumping strategies across the state.
- **The NSW Government's Better Waste and Recycling program** provides \$70 million over four years to local councils to make it easier for their communities to recycle more and decrease the amount of waste sent to landfill. The NSW Environment Protection Authority (EPA) distributed a total of \$34.4 million to local councils in 2013–14 and 2014–15.
- **NSW Energy from Waste Policy (2015)** sets out a policy framework and criteria for NSW facilities proposing to recover energy from waste.
- **SSROC Regional Waste Avoidance & Resource Recovery Strategy (2014-2021)** sets out an overarching regional strategy and cost-effective actions for Waverley Council and 15 other member councils of the South Sydney Regional Organisation of Councils (SSROC) to reduce and manage 655,000 tonnes of household waste across the region annually. The NSW EPA supports this strategy.

Our local ambitions

Waverley Council is committed to delivering community waste targets and contribute to greenhouse gas emissions reduction, as set out in our **Environment Action Plan (2012-2020)**.

Relevant targets:

- No net increase of 2004/05 waste generation levels by 2020
- 75% resource recovery of residential and commercial waste by 2020
- 30% reduction in greenhouse gas emissions of 2003/04 levels by 2020

Our targets are in-line with Waverley Council's community strategy, **Waverley Together 3 (2013-2025)** which sets directions for how Council will work with the

community on waste and related sustainability issues. This strategy has been developed from extensive community consultation.

Directions:

E1 Waverley's community contributes to the reduction of greenhouse gas emissions

E3 Waverley's community, including its visitors, reduces the amount of waste it generates and increases the amount it reuses and recycles

As part of this strategy, we identify targets in the six focus areas which reflect those above and other goals that cover our aspirations relating to social, community, amenity plus infrastructure aspects and benefits of sustainable waste management.



Protecting our place - Let's make it Second Nature

We live in a unique and beautiful corner of the world. At Waverley Council, we're committed to keeping it this way.

As part of our broad environmental vision, we're working together with our local community and local businesses to make sustainability more than just an occasional concern. We want it to be Second Nature.

Together we've already taken very positive steps with waste management. However, we still need to improve recycling rates, reduce street litter and find more effective ways to eliminate and manage dumped rubbish. With continued reuse and recycling efforts, and by exploring new technologies, we can lead the way in sustainable waste management.



**second
nature**

Our environment plan
for a sustainable future

OUR SERVICES

There are currently around 71,000 residents living in the Waverley Local Government Area (LGA), in around 28,000 homes. We also have a thriving business community and thousands of visitors daily to our iconic beaches, the vibrant commercial hub of Bondi Junction, our parks and other precincts.

Council's waste services for the community cover a broad scope of waste items including recyclable paper and containers, garden organics, food waste, construction waste, electronic waste, used oil and lubricants and general rubbish. To manage the waste in our community, we currently offer a range of kerbside collection, recycling and problem waste operational services and engagement programs.

Council monitors the tonnage of general waste and recycling collected from the kerbside, illegally dumped rubbish, as well as electronic waste, and household chemical waste collected through drop off events. Additionally, kerbside waste and recycling audits are conducted every four years by SSROC as specified by the EPA regulations.

Residential kerbside collection

Waverley Council's waste collection services cover all residential dwellings (multi-unit, single-unit and semi-detached) via operations managed in-house every week. Council also collects waste from commercial properties where large commercial trucks have access constraints.

We currently have 60 driver and loader positions (two runners and one driver per truck), with 15 trucks in the fleet (for garbage, recycling and garden organics).

Details of the standard waste service offering for each waste stream according to property type are provided in Table 1.



Table 1 Current Waverley Council kerbside collection standard service (as at September 2015)

| Property type | General waste | Container recycling | Paper and cardboard recycling | Garden organics |
|---|---------------------------------------|--------------------------------|--------------------------------|-------------------------------|
| Single-unit dwellings and semi-detached | 140L bin weekly | 140L bin fortnightly | 140L bin fortnightly | 80, 140, 240L bin fortnightly |
| Multi-unit dwellings | 240L bin / 3 units weekly | 240L bin / 8 units fortnightly | 240L bin / 8 units fortnightly | Max 2 x 240L bins fortnightly |
| Business/ Commercial properties | 240 or 660 L bin(s) up to 7 days/week | N/A | N/A | N/A |

Estimated Residential Population (ERF), 2014

New kerbside collection service in 2016

As of July 2015, following an extensive Domestic Waste Study, Council has agreed to transition to a three-bin system with a fortnightly comingled kerbside collection system for dry recyclables (i.e. paper/ cardboard plus containers in a yellow bin). This will replace the current four-bin system for domestic kerbside collections (general waste, container

recycling, paper and cardboard recycling and garden organics).

The new service applies to all residential dwellings (single households and multi-unit dwellings). Comingled recycling is recommended by the EPA and has proven to boost recycling rates. Many LGAs, including the Councils with the highest

recycling rates in Sydney employ a three-bin service. The new system will be rolled out by the end of 2016.

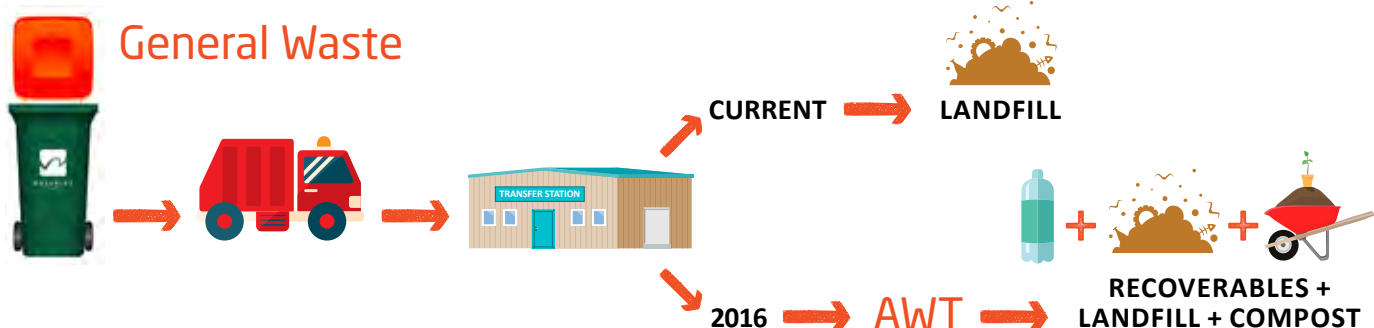
Table 2 below shows the general waste, comingled recycling and garden organics kerbside collection system to be provided by Waverley Council for each property type.

Table 2 Waverley Council three-bin kerbside collection service (implemented by end of 2016)

| Property type | General waste | Garden organics | Comingled recycling |
|---|---------------------------------------|-------------------------------|---------------------------------------|
| Single-unit dwellings and semi-detached | 140L bin weekly | 80, 140, 240L bin fortnightly | 240L or 360L bin fortnightly |
| Multi-unit dwellings | 240L bin / 3 units weekly | Max 2 x 240L bins fortnightly | 240L bin fortnightly |
| Business/Commercial properties | 240 or 660 L bin(s) up to 7 days/week | N/A | 240 or 660 L bin(s) up to 7 days/week |



WHERE DOES IT ALL GO?



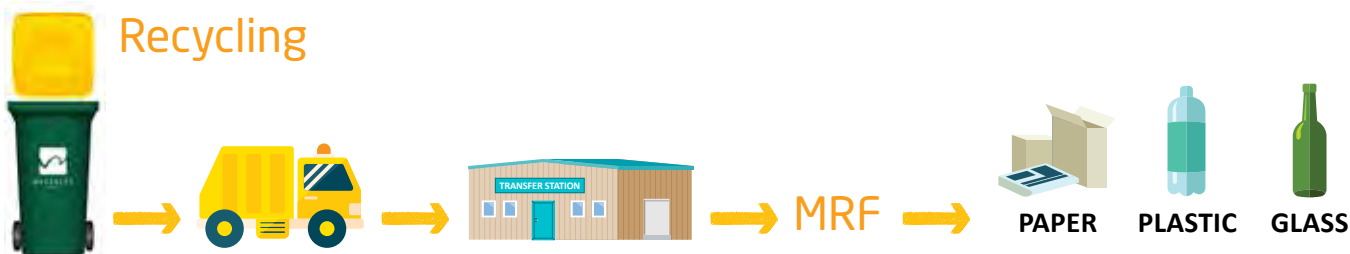
Currently our LGA's general waste is trucked to a transfer station at Rockdale with disposal at the Lucas Heights Landfill Facility.

In July 2016, the general waste will go to the Woodlawn Facility in Goulburn.

In the future, as part of a SSROC initiative, Council will send general waste to an Advanced Waste Treatment (AWT) facility in Goulburn once the system has been constructed in 2017. We expect the AWT system to convert the majority of general waste into compost-type

products, which results in less waste being sent to landfill. The remaining waste that is not processed through the AWT (residual waste) will go to a landfill at Woodlawn.

We sent a total of 24,790 tonnes of waste to landfill in 2014/15, down by 0.2% from the previous year.



Paper, cardboard and containers from household recycling bins sent to Materials Recovery Facility (MRF) in Smithfield where the materials are sorted by type (paper

and cardboard, plastics, glass and metals), ready for further reprocessing and reuse.

The volume of recycling collected

from households has increased over the last decade. In 2014/15, Council collected about 6400 tonnes, up from 4150 tonnes in 2004/05.



Domestic garden waste is sent to Lucas Heights Landfill Facility to be used as mulch.

The volume of garden waste collected is one-third of the volume of other recyclables collected,

but has increased four-fold since 2004/05 (around 2200 tonnes collected in 2014/15).

Public place recycling

We also offer public place recycling at beachside parks and promenades. Public place recycling audits have identified contamination rates vary between 6-14 percent across Waverley's beaches. Council continues to research and implement waste management and infrastructure solutions that improve the recycling rates in public spaces.

Household clean-up collections

Council offers households two 'Your Call' clean-up collections plus one scheduled collection each calendar year for bulky waste goods. Council promotes various options for reuse on our website.

Street, beach and gutter cleaning

We have has a dedicated public place cleansing team of 36 staff to clean streets, gutters and our beaches, collecting litter as well as removing graffiti and collecting illegally dumped rubbish. This includes two compactor trucks, a beach rake, graffiti removal truck and six sweepers.



Litter and dumped rubbish

It is illegal in Waverley LGA to leave waste on public land such as streets, laneways, parks, footpaths, car parks or waterways. Illegal dumping and littering can incur a fine of up to \$1500. Council currently employs a Waste Enforcement Officer to address illegal dumping and offenders. We have a program to inspect a street every day in order to identify illegally dumped rubbish and offenders. Council has been working together with the Southern Sydney Regional Organisation of Councils (SSROC) and Bankstown City Council to establishment of a Regional Illegal Dumping Squad (RID) for the Sydney Metropolitan Area. The two-year pilot is intended to provide significant support and compliment Waverley Council's established illegal dumping programs.

Every summer, we provide an anti-litter campaign at Bondi Beach that includes an intensive litter audit, additional litter removal events, and a targeted community engagement campaign.

As cigarette butts are a significant litter and pollution issue for Council, especially at the beaches, we introduced a ban on smoking on the beach in 2004. We've run communication and engagement programs, and new initiatives are underway to encourage the community to butt-out in designated locations with cigarette butts to be collected and recycled. These initiatives will mitigate the expected increase in smoking in public places following the introduction of the Smoke-free Environment Act 2000, which includes a ban on smoking in seated outdoor dining areas where food is being served (from July 2015).

Council waste

Recycling and reuse initiatives at Council include:

- Sustainable purchasing policy to encourage recyclable materials
- Sustainable events policy to encourage waste recycling at events
- Access to paper and container recycling in offices and community facilities
- Composting and worm farming at several locations
- Mulching and reuse of mulch
- Employee engagement activities
- Reuse of construction waste as fill on construction operations



PROBLEM WASTES

Electronic waste collections (E-waste)

E-waste, including televisions, computers, and other electronic appliances contain hazardous waste components. Waverley Council and Woollahra Councils jointly run local e-waste collections events twice per year where the community can drop off e-waste for recycling. Council currently collects around 50 tonnes of e-waste each year that is recycled.



Household Chemical CleanOut events

Household chemical waste such as paint, car batteries and compact fluorescent lights is collected through the NSW EPA sponsored household CleanOut program which provides drop off days at locations throughout NSW.

Mobile phones and accessories

Mobile phones and accessories such as their chargers, batteries and cords are dropped at Council's Customer Service Centre to be recycled through Mobile Muster, a product stewardship program. In 2014, 7kg of mobile phone e-waste was collected at the Customer Service Centre and recycled into their constituent parts (metals and plastic). The recovery of

each of these components creates a reusable material, thereby keeping this e-waste out of the landfill.

There are additional Mobile Muster drop-off locations throughout the Waverley community to promote the recovery of these valuable materials.

Battery recycling

Small batteries such as those used in cameras, torches, toys, tools and appliances can be dropped in the battery recycling container at Council's Customer Service Centre, where they are collected and recycled into their constituent parts (lead, plastic and sulphuric acid), and the recovery of each of these components into reusable materials. In 2014, Council collected and recycled just over 200kg of small batteries.

Mattresses

Mattresses are items of concern with respect to illegally dumped rubbish and are prevalent in "Your Call" clean-up collections. Since 2011, Council has arranged mattresses to be collected by either Mission Australia or other contractors, separated into their constituents of wood, metal and foam, and the recovery of each of these components into reusable materials. In 2014/15, over 2200 mattresses were collected and recycled through Council's service.

MobileMuster is a not for profit program funded voluntarily by the majority of handset manufacturers and all network carriers

Hand 'em in or organise a muster

Mobile phone recycling
"I can do that!"

NOKIA



LG

HTC

Telstra



Sony Ericsson



PERFORMANCE

i-mate

yes OPTUS



The program has also been supported in the past by Sharp, NEC, Panasonic.

The Australian mobile phone industry is committed to increasing collections, maintaining the highest environmental standards and providing a free recycling services to all mobile phone users.

If you are a business, school or local council why not organise your own MobileMuster? We will provide you with a collection bin, tools to help you promote your muster and free pick up service.

To register your interest in running your own MobileMuster or to locate your nearest drop off point go to www.mobilemuster.com.au or call 02 8920 3555 or 1300 730 070.

By recycling you will be:

- Avoiding future greenhouse gases
- Saving energy
- Protecting our environment
- Saving scarce natural resources

How to book a pick up

Registered collection points can book a free pick up online at www.mobilemuster.com.au or by calling 1800 248 113. Remember to have your AMTA ID ready.



mobilemuster
Official recycling program of the mobile phone industry
An initiative of the Australian Mobile Telecommunications Association.
AMTAT 1000000



mobilemuster
Official recycling program of the mobile phone industry

ADDITIONAL SERVICES AND PROGRAMS

Council leads on, or participates in, a range of waste services and programs that encourage avoidance, reuse and recycling. While they do not generally make a significant contribution to waste diversion, these initiatives are important for work health safety reasons and community engagement.

White goods

We provide in-kind support for the Fridge Buyback program as part of the NSW Government's Energy Savings Scheme for the collection and disposal of obsolete fridges and freezers. These items are professionally degassed and the metals recycled. Since the commencement of the program in 2008 a total of 421 fridges have been collected.

Sharps

Council coordinates collection of community sharps (needles, syringes, lancets) by liaising with local participating pharmacies and the disposal service provider, Pro-Opt.

Compost Revolution

Founded in 2009 by Waverley Council, Woollahra and Randwick Councils as a local household composting and wormfarming

program, Compost Revolution provides discounted compost bins and wormfarms to local residents plus training sessions for communities.

To date, there have been close to 6000 local active participants with an estimated 986 tonnes of food waste diverted from landfill and 1600 tonnes CO2e avoided. The award-winning initiative has been licensed to 33 councils nationally.

Garage Sale Trail

Garage Sale Trail is an independently run national initiative to promote reuse, enhance community and

educate the public about waste reuse and recycling through an annual garage sale event. First to run in partnership with Waverley Council in 2009, it is now a national and global run campaign held annually.

Waverley typically has a high participation rate for this event, amounting to approximately 20 tonnes of unwanted items being redistributed throughout the community instead of going to landfill. The event has the potential to lead to social change regarding reuse, recycling and waste avoidance.



WAVERLEY'S WASTE

WHERE IT'S AT CURRENTLY

Overall waste generation

In total, 36,180 tonnes of general waste and recycling were generated in the Waverley LGA in 2014/15, including dumped rubbish, litter, kerbside collections, and other Council recycling services (excluding larger commercial properties that use other services).

A further four percent reduction is required to achieve Council's waste generation target (of zero increase on 2004/05 levels).

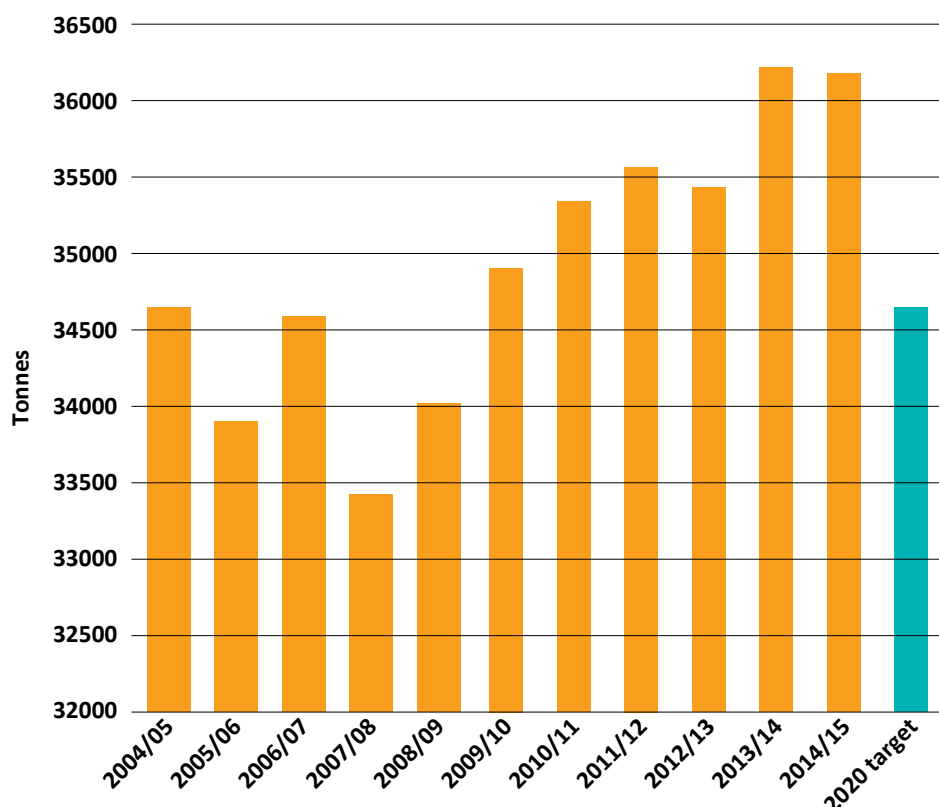


Fig 1 Total waste and recycling collected by Council in Waverley LGA

Kerbside, we are collecting a total of almost 32,100 tonnes of general waste and recycling (2014/15), around three-quarters from household wheelie bins.

Our LGA's population is forecast to grow by 15-17 percent in the next 15 years to around 80,000. This could potentially lead to increased waste generation, if not managed appropriately with waste avoidance strategies.

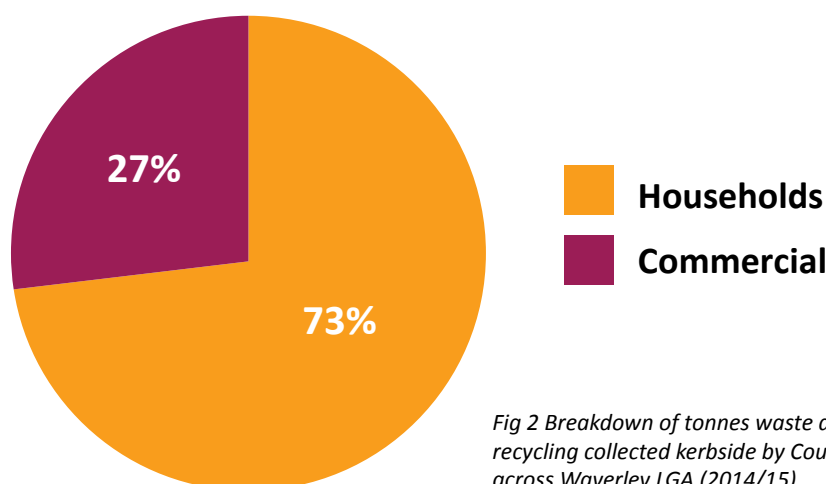


Fig 2 Breakdown of tonnes waste and recycling collected kerbside by Council across Waverley LGA (2014/15)

Residential waste

In 2014/15, total residential waste accounted for approximately 27,560 tonnes, including waste from public place cleansing, clean up collections, organics collections, e-waste drop off days, and recycling. The overall amount of waste collected has remained relatively steady in recent years.

While existing residential and public place waste diversion from landfill has increased from 20 percent in 2004/05 to 34 percent in 2014/15, it falls well short of our 75 percent resource recovery target to be achieved by 2020.

Recycling of paper, containers and recovery of garden organics is significant, whilst electronic waste recycling and food organics recovery from Compost Revolution make minor contributions.

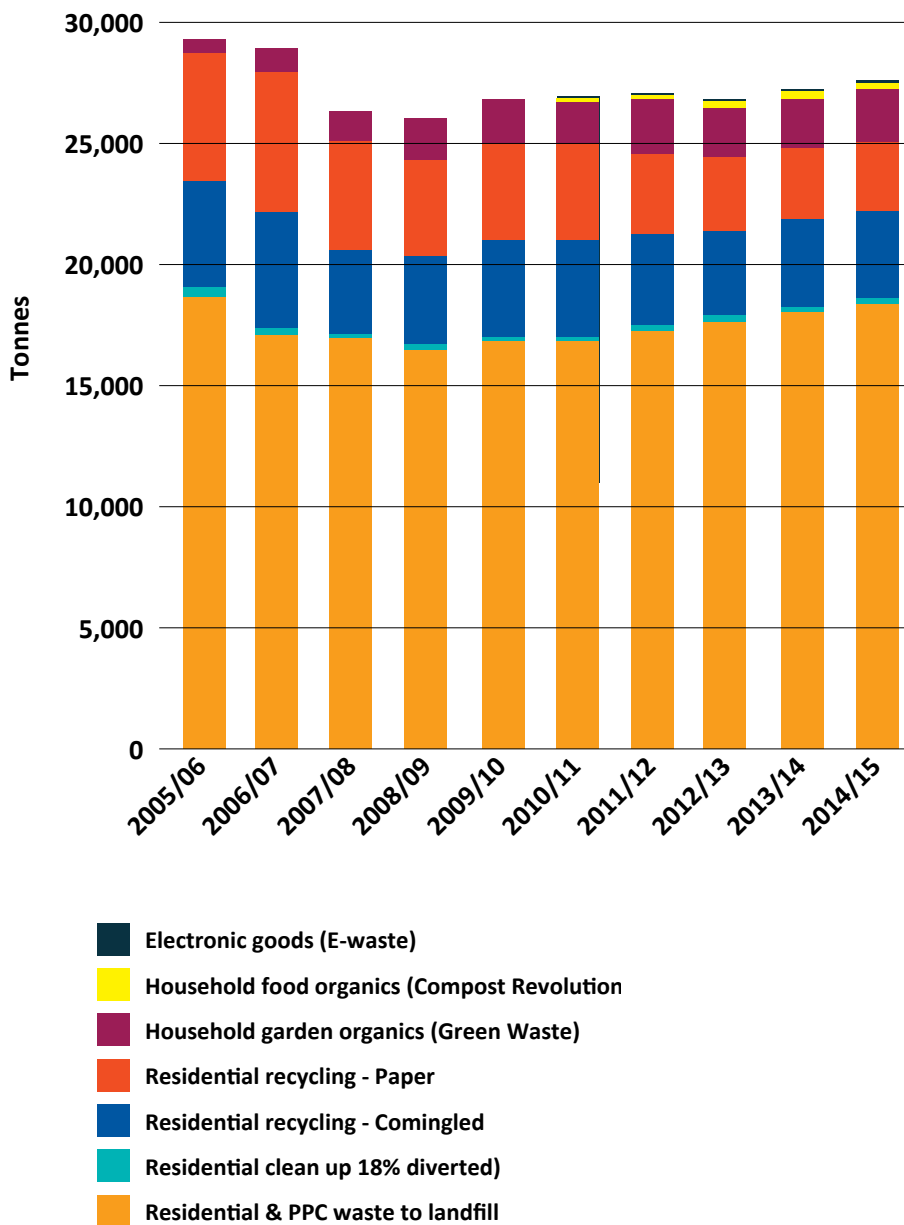


Fig 3 Waverley LGA residential and public place cleansing (PPC) waste and recycling

What's in my bin?

Organic waste accounts for around 60 percent of the LGA's residential general waste (red bin) which currently goes to landfill. This includes food and garden organics waste, and other organics such as textiles, wood and soiled paper. With general waste destined for AWT in 2016, there are significant opportunities to recover these resources.

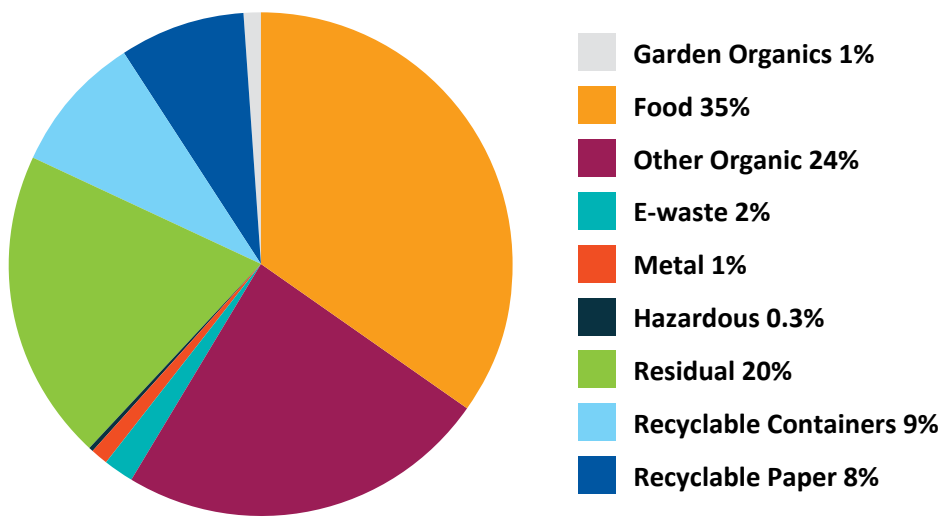


Fig 4 Waverley LGA residential waste composition by weight (Data source APC 2011)

Data from Waverley Council's multi-unit dwelling (MUD) bin audits (2014) showed that paper, cardboard and hard plastics were the predominant contaminants in the red bin (Figure 5).

In general, the main contaminants in the MUDs yellow container

recycling bins included plastic bags and soft plastic/cling wrap. The main contaminants in the blue paper/cardboard recycling bin included plastic bags and disposable coffee cups. These indicates significant opportunity for programs to improve recycling and minimise contamination in MUDs.

These are interesting results, however may not be totally representative of all apartment buildings (only 14 randomly selected MUDs in the Bondi Basin area were audited).

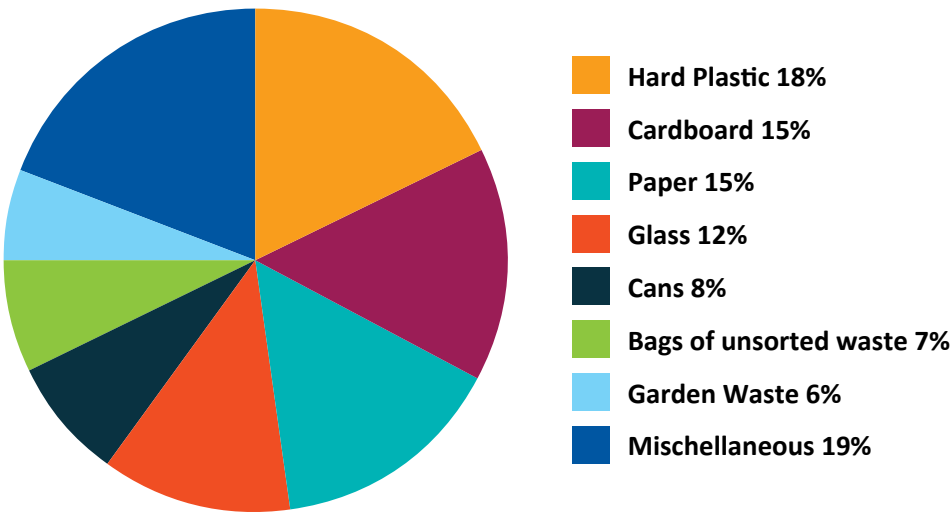


Fig 5 Contents of red bins from Waverley Council MUDs 'Sort it Out' study (2014)

Waste to landfill

The total waste to landfill from residents and public places has remained relatively steady for the last seven years. In 2014/15, a total 18,600 tonnes of this waste went to landfill, up by 3.8 percent from

the preceding year. Approximately 6,150 tonnes of commercial waste collected by Council went to landfill, which is a reduction of 10.8 percent compared to previous year.

The breakdown of residential and public place waste to landfill is shown below in Figure 6. Waste collected from dumped rubbish, streets and gutters contributes a small proportion.

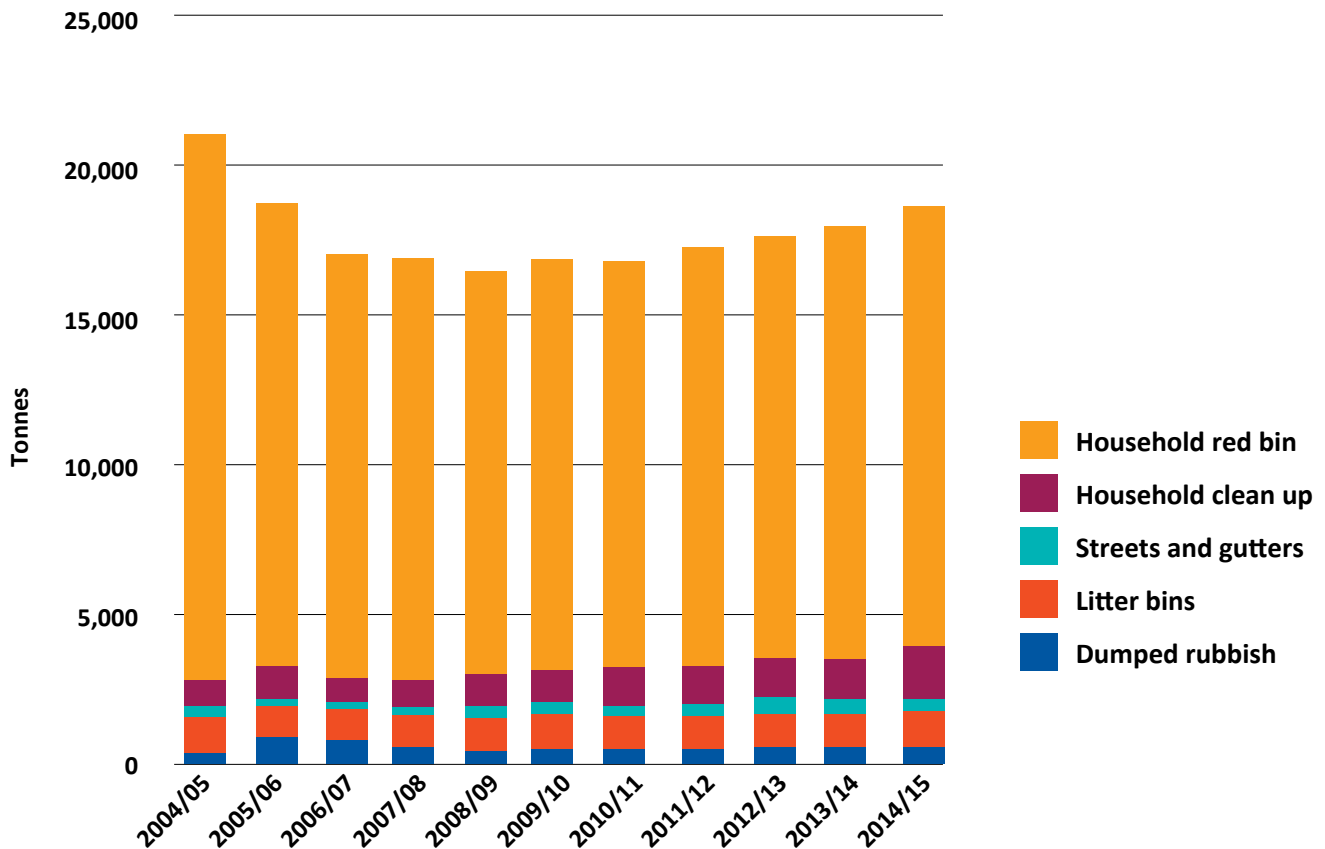


Fig 6 Waverley LGA residential and public place cleansing waste to landfill by type



Pressures on our waste system

- Increased economic growth and consumption of goods
- Population growth
- Reduced lifespan of goods e.g. electronic
- Increased products packaging
- Reduction in availability of landfill space
- Increase in landfill disposal costs



Commercial waste

Waverley Council’s commercial waste service provides general waste collection and commingled recycling for all local business clients (830 currently). Commercial properties include restaurants, cafes, food outlets, retailers and offices as well as schools, pre-schools and surf lifesaving clubs. No industrial land use occurs in the Waverley LGA.

No local data is available for construction and demolition (C&D) waste, which includes waste from building sites and renovations.

However NSW-wide data shows that 75 percent of C&D waste was recycled in 2010/11.

In 2014/15 businesses produced a total of 8,600 tonnes of waste and recycling (paper/comingled), with 29 percent of resources recovered. This is up from 24 percent in 2013/14, however well short of our 75 percent diversion target.

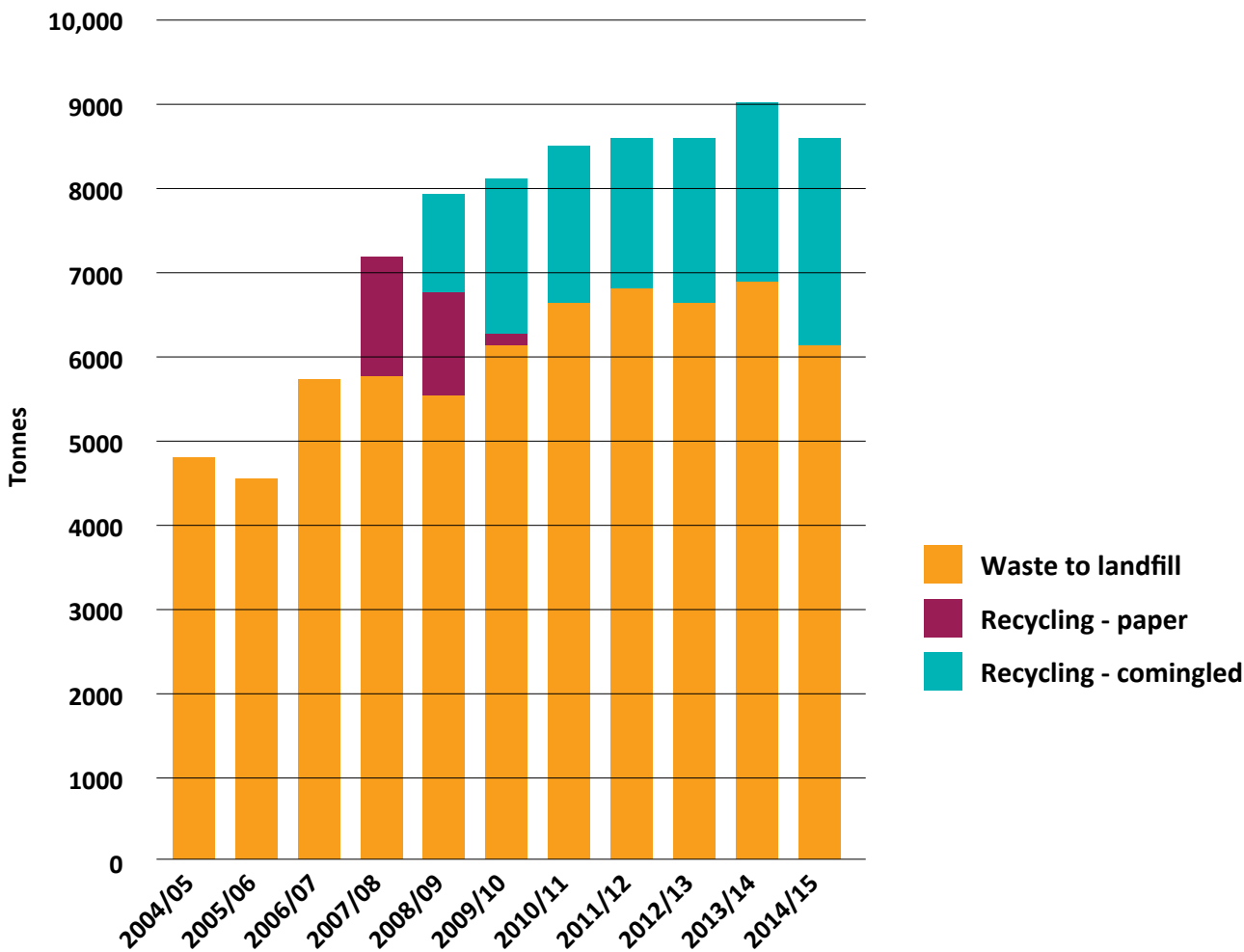


Fig 7 Waste and recycling from commercial properties serviced by Waverley Council

WHAT ARE THE OPPORTUNITIES?

There are significant opportunities to deliver on our environmental targets and improve waste management through a combination of infrastructure, operational, financial and community engagement solutions.

Targets

- 75% resource recovery of residential and commercial waste by 2020
- No net increase on 2004/05 levels of waste generation by 2020

(Environmental Action Plan, 2012-20)

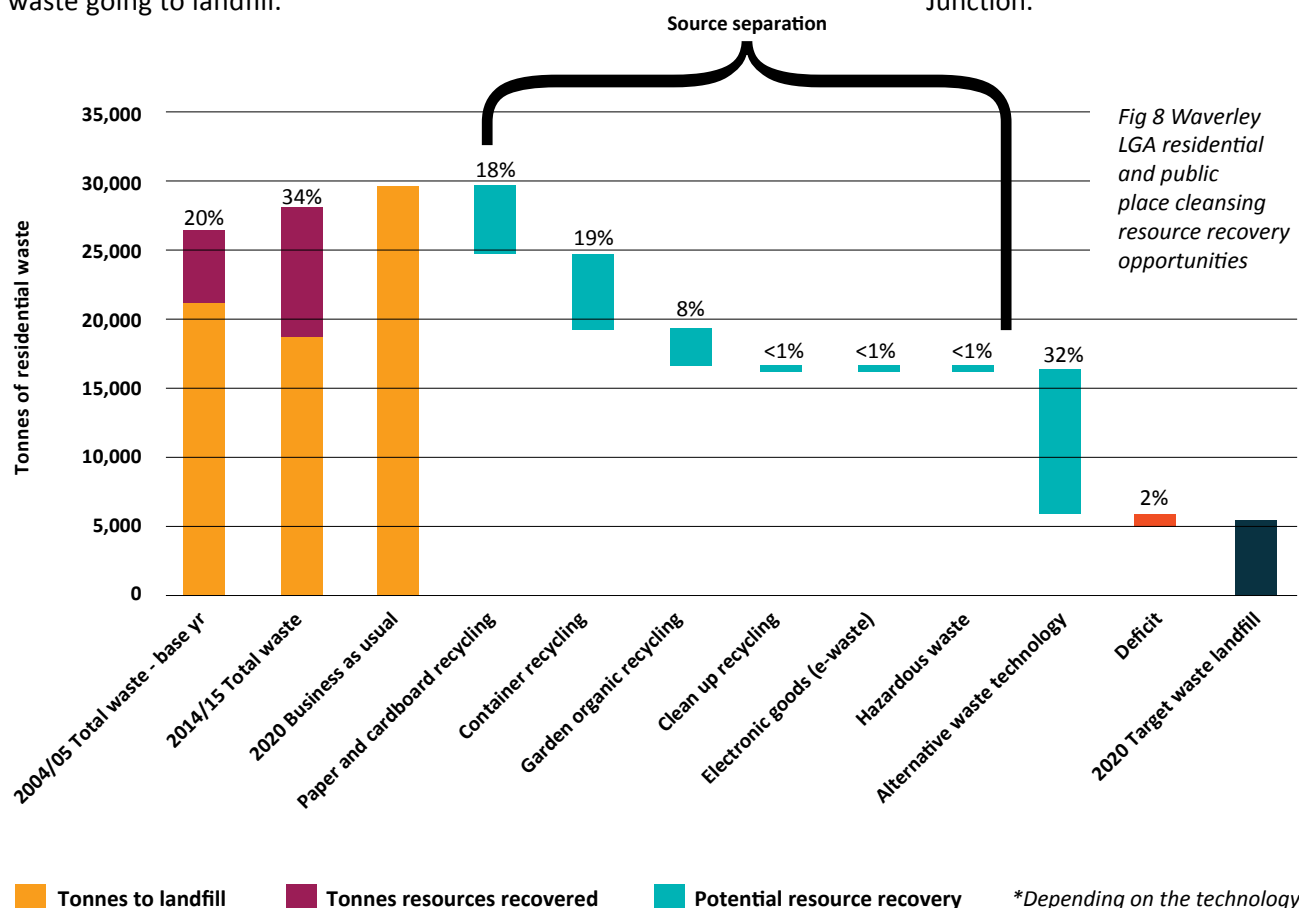
INCREASED RESOURCE RECOVERY

Residential

Potential strategies for waste diversion exist to deliver our target of 75 percent resource recovery by 2020. These are shown below (Fig 8). The greater the diversion, the better the resource recovery and less residual waste that requires treatment (through the AWT). Ultimately, this will mean less waste going to landfill.

There is a potential to recover a maximum of 48 percent of business-as-usual (BAU) waste through better source separation, by utilising effective bin configurations, collection systems and through targeted community engagement and education.

We have conducted extensive independent research for the Bondi Beach area to identify the optimal infrastructure and waste management solutions for public place recycling, the Pavilion, and the commercial businesses along Campbell Parade. A similar study is currently underway for Bondi Junction.

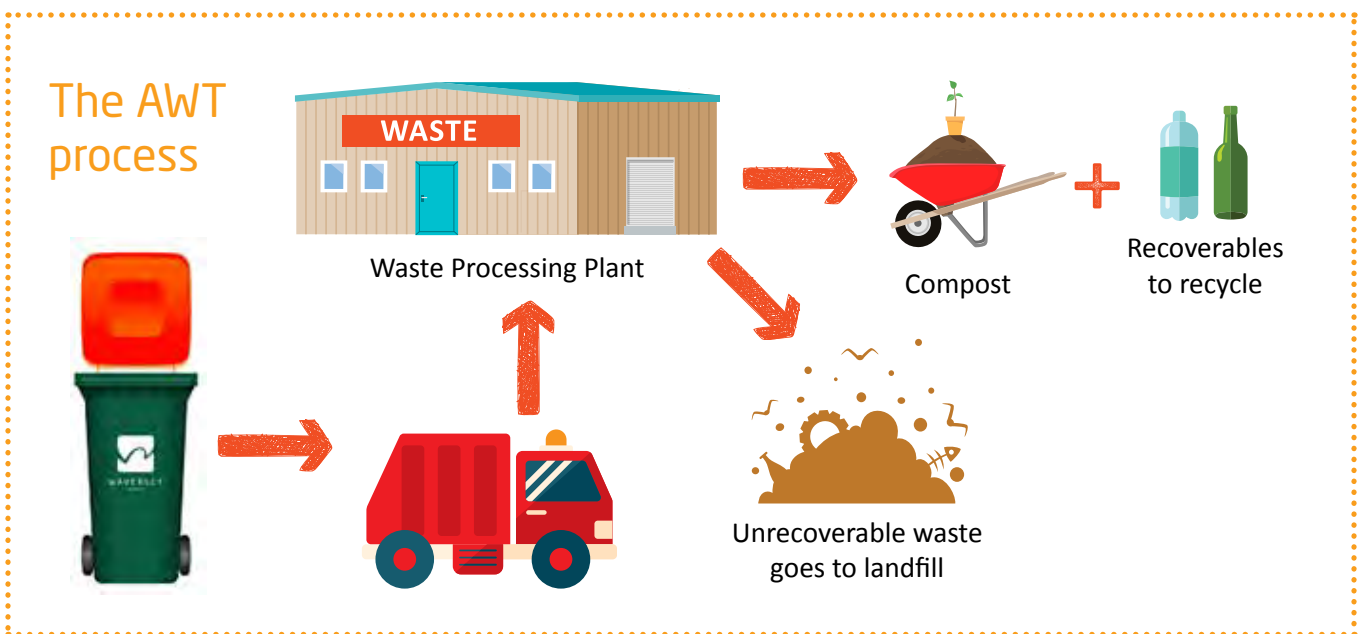


Advanced Waste Treatment (AWT)

Recovery rates will also be improved through the use of Advanced Waste Treatment (AWT) system. This system takes all the general waste that goes in the red bin, processes it in a closed system under high heat and pressure and creates a compost/soil conditioner product and minimal residual waste. The compost/soil conditioner can be applied to various agricultural crops whilst the much reduced residual waste tonnage goes to landfill.

Council has joined into a contract agreement, developed by SSROC, for the provision of Advanced Waste Treatment services for our general waste stream. General waste will be processed via an AWT system upon completion of its construction (expected mid-2017). The success of the AWT process requires a large percentage of organics, mainly from the food waste that goes in the general waste bin.

Presently Council has a 34 percent diversion rate overall (business as usual), however, once waste goes through the AWT, the recovery rate will increase to 65 percent (MRA, 2015), still below the 75 percent resource recovery target by 2020.



To achieve Council's target, an Energy-from-Waste (EfW) solution would be the best option. If an Energy-from-Waste (EfW)/processed engineering fuel facility becomes available, up to 5,700 tonnes per year

of Council's residual waste (under the new three-bin system) could be recovered for energy generation, **increasing Council's diversion rate to approximately 90 percent** (Fig 9).

We continue to investigate EfW technology options and are confident in the likelihood of such a facility being available in the short to medium term (3-5 years).

If all goes to plan, recent studies show that AWT combined with source separation could more than achieve the target (Fig 9) which includes the AWT introduced in two years followed by an Energy-from-Waste (EfW) policy.

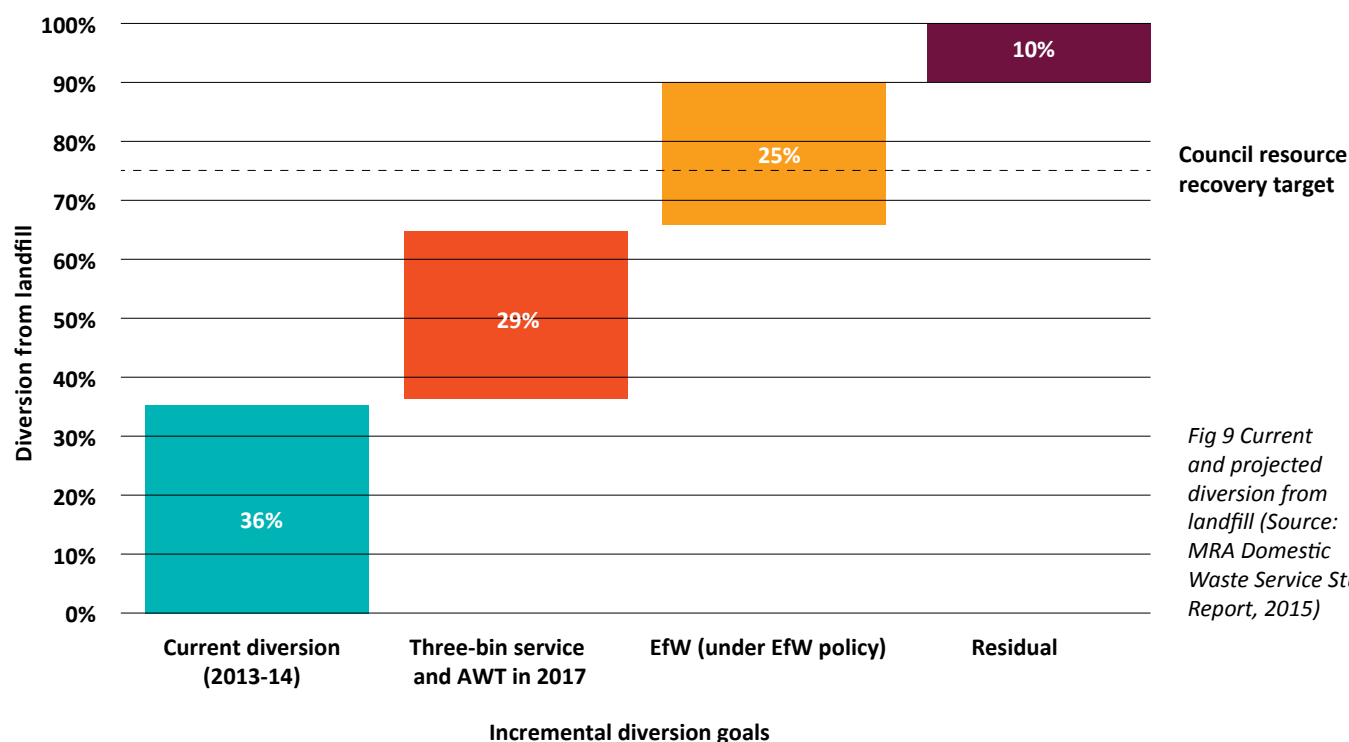


Fig 9 Current and projected diversion from landfill (Source: MRA Domestic Waste Service Study Report, 2015)

Container deposit legislation (CDL)

What is CDL?

The NSW government is introducing a container deposit scheme in July 2017 as part of a raft of new policies aimed at protecting the environment and doing more to prevent litter from containers. The scheme has strong support from the public, NSW councils, and various environmental groups.

The CDL scheme may add a small fee (like 10 cents) to each container that's returned to the purchaser when it is disposed of at an appropriate station. The details of implementation are still to be determined.

What will the CDL mean for Council?

Research predicts that with CDL fewer recyclables will be found in the red bin, which means that there is less waste going to landfill, helping Council to meet our resource recovery target.

Since containers will be highly valued, there will also be cost savings for Council, as our contractor responsible for processing the recyclables will do so at a reduced cost.

Energy from Waste

Energy-from-Waste (EfW) technologies can potentially recover greater amounts of residual waste, increasing overall diversion of waste collected by Council to 90 percent (depending on the facility). These technologies are not yet proven in Australia. We are looking into EfW technology options and will continue to explore and investigate their potential and cost-effectiveness into the future.



Commercial

As of 2014/2015, 29 percent of resources were recovered from commercial properties using Waverley Council’s commercial waste service.

There is a potential to recover 64 percent of BAU waste with:

- Source separation: via infrastructure (e.g. bin configurations, better collection systems), operational and financial changes, as well as community engagement and education (32 percent).
- Treatment of residual waste including food, textiles, wood and vegetation with AWT (31 percent).
- Another 26 percent resource recovery is required to meet Council’s internal target of 75 percent by 2020 from BAU. This could be achieved through an Energy-from-Waste scheme (EfW) as described above.

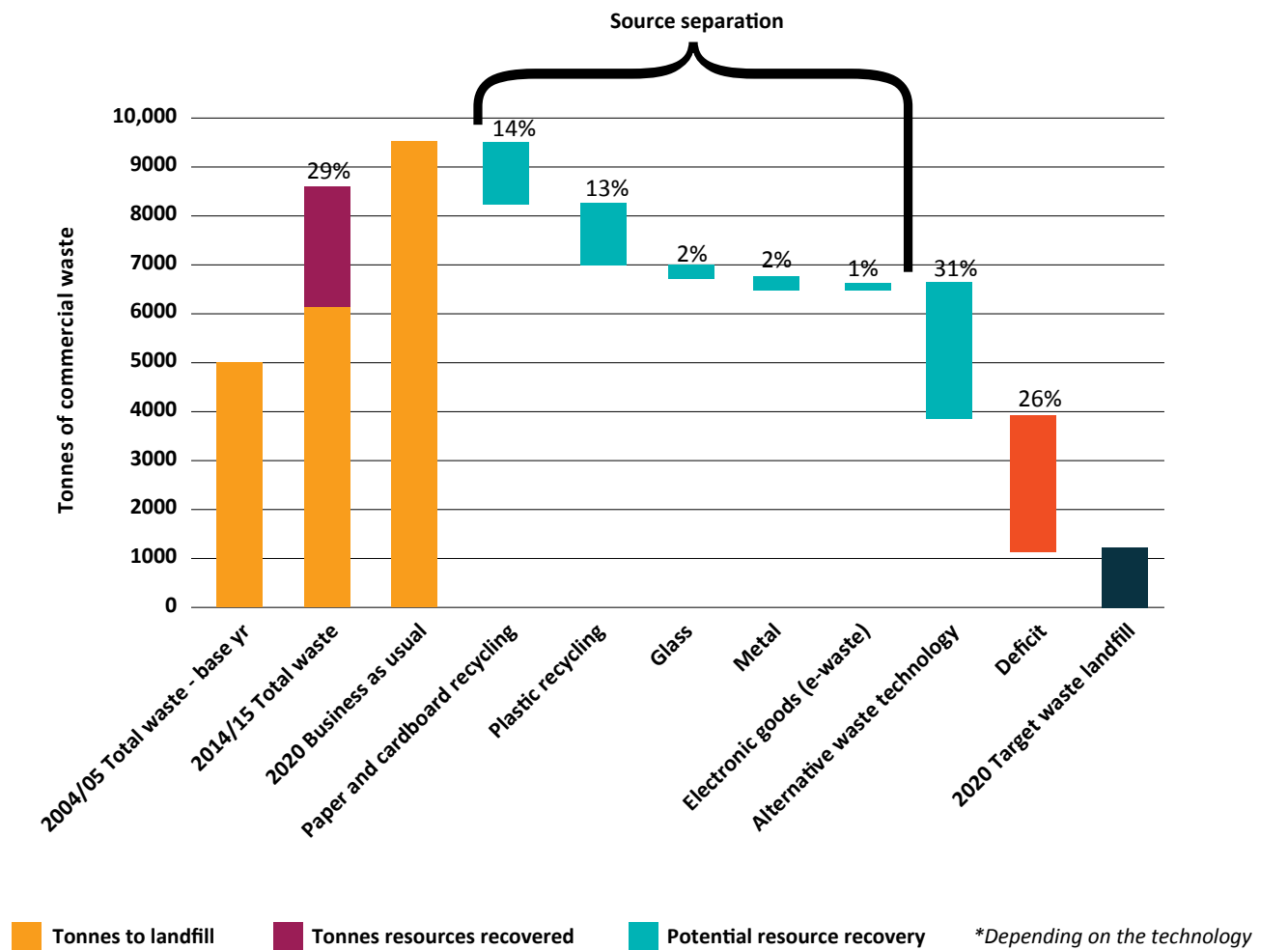


Fig 10 Waverley Council commercial waste service recovery opportunities (Data source DECCW 2009 Disposal Waste Survey C & I Stream Sydney) and Council waste data

We have already begun extensive independent research studies in Bondi Junction and Bondi Beach to investigate alternative collection systems to manage business waste and recycling more effectively. These include laneway compactors, underground hydraulic compactors and pneumatic underground collection systems.

Greenhouse gas emission reductions

Strategies in residential waste reduction and resource recovery have been forecast to deliver two percent emissions reduction potential to help meet Council's greenhouse gas emissions target for the LGA. Combined with other improvements, such as energy efficient appliances, lighting hot water systems, vehicles, and co-generation energy sources this could deliver a 36 percent reduction of greenhouse gas emissions.

The three-bin waste collection with a comingled recycling service will reduce the number of truck

movements required to collect the kerbside recycling and therefore also contribute to a reduction in greenhouse gas emissions. Alternative collection solutions in Bondi Junction and Bondi Beach areas also have the potential to reduce greenhouse gas emissions as a result of fewer truck movements.

AWT and Energy-from-Waste (EfW) policies could deliver further emissions reductions as a result of reduced volumes of waste to landfill, stabilisation of waste and extraction of energy from waste.

Target

30% reduction in greenhouse gas emissions of 2003/04 levels by 2020
(Environment Action Plan, 2012-20)



A SUSTAINABLE WASTE STRATEGY

AN OVERVIEW

Our strategy is informed by the waste hierarchy, which most Australian states have adopted as a core guiding principle for waste management and related environmental protection.

It ranks approaches in managing waste, from avoidance and reduction as the most preferred option, to disposal as least preferred.

Waverley Council and the community have different levels of control in managing waste along this hierarchy, and actions in our strategy will reflect this.

As a council, we have limited direct control over the top option (waste avoidance) in terms of what people buy and throw away. However, we can influence the community to minimise unnecessary waste, such as our current community partnership program to reduce use of plastic bags in Bondi.

We have greater control over the lower segments of the hierarchy (recycling to treating waste), but rely on the community to use our systems effectively (e.g. kerbside collections and public place recycling).

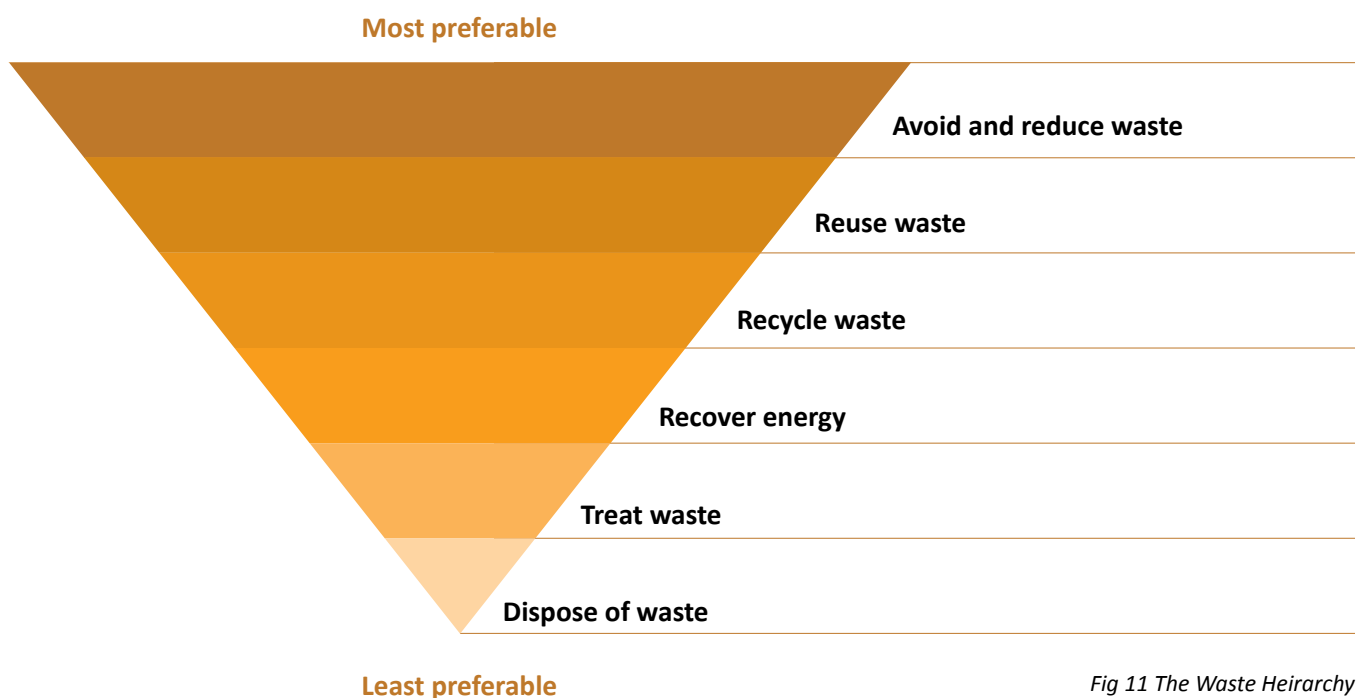


Fig 11 The Waste Hierarchy

Based on this framework and boundaries of our influence, Waverley Council's strategic aims are to:

- Provide targeted systems, infrastructure, and support for improving ease of use and access for customers so that they can responsibly manage their waste, at all levels of the hierarchy.
- Build on existing engagement programs and develop new ways to engage with our community to encourage and enable people to make better recycling and reuse choices, and use available waste systems effectively.
- Continue to explore options in energy recovery from waste and further reduce waste to landfill.

Our overall approach is to conduct appropriate research, collect the representable data to measure how we're tracking against our environmental targets, apply best-practice, learn from and improve our projects, learn from other councils (local and overseas), partner with key stakeholders, and be innovative with our implemented solutions.

What the community has told us about waste

Community surveys conducted since 2009 consistently show that waste reduction, recycling and illegal dumping are key priority issues for Waverley Council residents.

More recently, we conducted a "Let's Talk about Waste" community survey (170 responses, early 2015) to help us better understand people's experiences and ideas around recycling and rubbish disposal and inform our engagement strategies. Main points from residents' feedback:

- Reducing waste to landfill and reducing illegal dumping are priority issues.

- Face-to-face recycling education programs and initiatives are preferred.
- Most residents are familiar with general recycling but need more information about "tricky" or unusual items.
- A range of creative education programs could help to "spread the word" about recycling.

In a subsequent Community Sustainability Survey (June 2015, 493 responses), recycling and minimising waste received the highest response rate to the statement 'what environmental sustainability means to me'.

Respondents would also like to see Council working with the community to improve recycling.

Our community surveys help to inform our future waste engagement strategies and programs, and allow us to benchmark our performance and community awareness levels.



OUR PLAN

Our plan has six key focus areas:

- 1

Reduce waste generation
- 2

Maximise resource recovery
- 3

Reduce greenhouse emissions
- 4

Green infrastructure integration
- 5

Clean and attractive Waverley
- 6

Solutions to problem wastes



A summary of strategies, as well as descriptions and actions for each focus area are provided below.

Key to priority actions

Detailed actions in each focus area are divided into the following priorities:

| | |
|---------|---------------------------------------|
| HIGH | 1-3 years |
| MEDIUM | 3-6 years |
| LOW | 6-10 years |
| ONGOING | Continued actions now and into future |

SUMMARY

| Focus area | Target Areas | Strategies |
|-------------------------------------|---|--|
| 1. Reduce waste generation | Zero increase in waste generation on 2004 | <ul style="list-style-type: none"> • Encourage and enable the community via targeted education and engagement programs to reduce waste generation and increase recycling capabilities. • Design targeted programs and explore partnerships with the community to reduce waste generation and promote reuse initiatives. • Continue to support Extended Producer Responsibility schemes that help reduce waste and increase opportunities for resource recovery. • Research new technology that would support initiatives for waste reduction. |
| 2. Maximise resource recovery | Increase resource recovery of residential and commercial waste to 75% by 2020 | <ul style="list-style-type: none"> • Implement improved household bin configurations and public place collection systems • Implement new waste management infrastructure solutions that encourage improved recycling behaviour • Optimise the new AWT processing of waste to maximise resource recovery • Targeted engagement and education programs for staff and the community • Providing and supporting targeted recycling and problem waste collection programs • Promote and investigate effective reuse and recycling solutions for materials from clean-up services. |
| 3. Reduce greenhouse gas emissions | Maximise contribution from waste treatment and recycling to Council's 30% greenhouse gas reduction target | <ul style="list-style-type: none"> • Implement resource recovery infrastructure, partnership and engagement programs for residents and commercial clients • Enable smooth transition to AWT to maximise effectiveness and recovery of organic waste • Investigate Energy-from-Waste opportunities |
| 4. Green infrastructure integration | Alternative waste collection solutions are integrated with other precinct green infrastructure projects | <ul style="list-style-type: none"> • Finalise Bondi Junction waste management plan as part of Bondi Junction Green Infrastructure Masterplan • Finalise Bondi Beach Waste management and infrastructure solutions |
| 5. Clean and attractive Waverley | <ul style="list-style-type: none"> • Reduced incidence of littering and dumping • Increased reuse/recycling of household clean-up items • Provide a waste service that is effective and simple | <ul style="list-style-type: none"> • Employ efficient and effective infrastructure for public place litter and recycling • Improve waste and recycling collection services • Streamline access and use of household clean-up service • Engagement for target audiences on increasing reuse, better disposal, bulky waste solutions • Investigation and enforcement of illegal dumping • Improve data collection • Partner in regional initiatives, including RID Squad. |
| 6. Solutions to problem waste | Increase collection and treatment options for problem waste items | <ul style="list-style-type: none"> • Deliver community engagement programs to increase awareness and uptake of correct disposal options • Provide appropriate collection facilities for problem waste • Provide and support of appropriate collection services for the community • Support Extender Producer Responsibility approaches • Seek partnerships to maximise resource recovery opportunities |

1. REDUCE WASTE GENERATION

Target: Zero increase in waste generation from 2004/05 levels by 2020

Waste avoidance is the top priority in the waste management hierarchy. Increasing consumption combined with population growth over recent decades has led to more rubbish produced. This has placed additional pressure on waste management systems and the environment, and increased costs to councils and the community.

Managing waste generation is a diverse and complex topic involving an array of stakeholders and issues.

While Waverley Council has limited influence, we are committed to reducing waste across the LGA, with focus on those areas we do have influence.

We will:

- Encourage and enable the community via targeted education and engagement programs to reduce waste generation and increase recycling capabilities.
- Design targeted programs and explore partnerships with the community to reduce waste generation and promote reuse initiatives.
- Continue to support Extended Producer Responsibility schemes that help reduce waste and increase opportunities for resource recovery.
- Research new technology that would support initiatives for waste reduction.

Action Plan

| Priority | Action |
|----------|---|
| High | Develop and deliver residential education and engagement programs to reduce waste generation and litter, make knowledge-based consumption choices, on minimising illegal dumping and reusing or upcycling products. These programs could include community 'TEDx' type event, interactive pop-ups, partnership approaches with key stakeholders including real estate agencies, backpacker hostels and community groups |
| High | Develop and distribute communication materials to promote waste reduction and recycling tips |
| High | Continue Compost Revolution to educate the community about how to recycle food scraps, make soil and fertiliser at home whilst reducing the volume of food waste in the kerbside collection |
| Medium | Partner with businesses to reduce waste and promote reuse e.g. plastic bag free trial at Bondi |
| Medium | Investigate ways to improve recovery of items for reuse |
| Ongoing | Support and promote Extended Producer Responsibility schemes |

2. MAXIMISE RESOURCE RECOVERY

Target: 75% resource recovery of residential and commercial waste by 2020

A key priority for Council is to divert waste from landfill and recover useful resources (materials and energy). Benefits of resource recovery include:

- Reducing landfill levy liabilities which are steadily increasing (and are now at a level which means landfill disposal is no longer the cheapest option).
- Offsetting the need to extract virgin materials and fossil fuel resources.
- Reducing environmental impacts associated with making new products.

- Reducing the impacts associated with landfills.
- Improving soil quality and enabling rehabilitation of degraded land (in the case of compost).

With a total resource recovery rate of 33 percent currently, there is significant potential to increase our efforts in this area. This is further shown by Council audits which identified significant amounts of recyclables in the red bin. We will focus on making the systems easier for people to use, increasing awareness and behaviour change on recycling and providing effective resource recovery and source separation infrastructure.

This will include:

- Implementing an improved household bin configuration system for recycling.
- Developing public place collection infrastructure solutions that encourage improved recycling behaviour.
- Optimising AWT processing of waste to maximise resource recovery.
- Designing educational tools and engagement programs for staff and the community.
- Developing and implementing targeted recycling and problem waste programs.
- Promoting and investigating effective reuse and recycling solutions for materials recovered from clean-up services.



Action Plan

| Priority | Action |
|----------|--|
| High | Implement a NSW best practice three-bin collection system for households with a comingled bin for container and cardboard recyclables |
| High | Develop and distribute communication materials to promote recycling and tips for trickier items e.g. coffee cups, mixed plastics, composite packaging |
| Medium | Work with regional councils, the waste industry and state government to provide and support permanent regional collection points and mobile solutions for recovering problem waste e.g. chemicals, e-waste, batteries etc. |
| Medium | Work with SSROC to investigate and implement Energy-from-Waste opportunities to complement existing AWT processing contract |
| Medium | Develop and deliver commercial client engagement programs to maximise commercial recycling and minimise commercial contamination |
| Medium | Design and implement improved and more accurate data measurement infrastructure for waste and recycling collections on collection vehicles |
| Medium | Implement improved methodology and infrastructure for reporting and evaluation of waste and recycling data by developing new accurate record keeping and reporting systems to complement new data collection infrastructure |
| Medium | Install improved public place recycling infrastructure in Tamarama and Bronte and Bondi |
| Low | Deliver a business engagement program to help minimise packaging for takeaway food and increase use of recyclable or bio-degradable materials |
| Low | Develop and deliver an engagement program to maximise the number of schools, childcare centres and surf lifesaving clubs utilising Council's commercial recycling service |
| Ongoing | Continue to deliver residential engagement programs to maximise residential recycling, minimise contamination and reduce problem wastes with an initial focus on multi-unit dwellings and tenants, partnerships with real estate agencies and strata managers, as well as Adopt-a-Street program |
| Ongoing | Continue to deliver staff engagement programs to increase resource recovery |
| Ongoing | Continue to develop and deliver a Council staff engagement programs to reduce contamination |
| Ongoing | Continue to engage with community to promote recycling and reuse waste services e.g. mattress recycling, battery recycling, e-waste collections, Compost Revolution |
| Ongoing | Conduct regular kerbside audits for all waste streams every four years in line with EPA recommendations to monitor resource recovery rates, contamination and other relevant information |

Award-winning Multi-Unit Dwelling 'Sort it out' Project

In 2014, we launched a research and engagement project as the first step in understanding the current recycling habits and challenges of people residing in multi-unit dwellings (MUDs). Research was undertaken at 14 randomly selected properties in the Bondi Basin area and involved:

- A desktop analysis of similar projects at a local, national and international level.
- Face-to-face surveying of MUDs residents about current recycling habits, observations and frustrations.
- Visual audits of the kerbside collection bins prior to collection.
- Audits of the bin storage areas at each MUD to assess storage capacity, accessibility, number of bins and presence of appropriate signage.

Results from this research, combined with subsequent internal staff consultations, 'Brains Trust' external workshops and a best-practice evaluation process has helped us develop more effective strategies to increase recycling rates - including pricing changes and incentives, operational changes, infrastructure recommendations, and educational and behaviour change strategies. Receiving high praise across the local government sector, the project has set a high standard for community engagement on waste and recycling management.

The project recently received the Local Government NSW Excellence in the Environment Resource Recovery Award (2013/14) and was a finalist in the Keep Australia Beautiful NSW Blue Star Sustainability Awards (2015) for the Waste Less, Recycle More Category.



3. GREENHOUSE GAS EMISSION REDUCTIONS

Target: Maximise contribution of waste to delivering Council's greenhouse emissions target of 30% by 2020 on 2003/04 levels

Waverley Council is committed to reducing our LGA's contribution to the climate change issue. As at 2011, domestic and non-residential waste contributed four percent (35,730 tonnes) to Waverley LGA's carbon footprint. This is generally related to greenhouse gas emissions produced from waste in landfill (methane).

This contribution is forecast to grow to 38,515 tonnes in 2020 according to BAU calculations (CCAP, Kinesis).

Analysis shows that there is potential to reduce emissions related to waste by two percent with residential recycling by 2020, but greater potential exists to reduce emissions via AWT and new Energy-from-Waste technologies.

In our efforts to cut our carbon footprint with regards to waste, we will:

- Implement resource recovery infrastructure, partnership and engagement programs for residents and commercial clients.
- Enable smooth transition to AWT to maximise recovery of organic waste, reduce volumes of waste to landfill, stabilise waste and towards extraction of energy from waste.
- Work to reduce waste generation through community engagement programs.

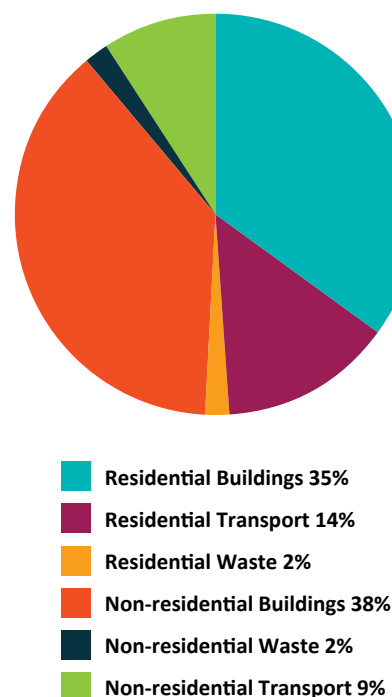


Fig 12 Waverley LGA greenhouse gas emissions by sector 2011/12 (tonnes CO₂-e) (Data source: CCAP)

Action Plan

| Priority | Action |
|----------|---|
| High | Implement infrastructure, partnership and engagement programs for residents and commercial clients for resource recovery and waste avoidance |
| High | Partner with SSROC and waste processing contractor to enable smooth transition to AWT to maximise effectiveness and recovery of organic waste from landfill |
| High | Continue to maximise fuel efficiency of waste collection fleet |
| Medium | Investigate opportunities to adopt Energy-from-Waste practices to further reduce waste to landfill |

4. CLEAN AND ATTRACTIVE WAVERLEY

Targets:

- Reduce incidence of littering and dumping
- Increase reuse of household clean-up items
- Provide waste service that is effective and simple to use

Waverley Council's overall community vision is about making our area a better place to live, work, play and visit. As part of this, we aspire for our community to take pride in our clean streets, parks and beaches. Key waste issues include litter, illegal dumping and the way residents access services and put out waste for collection.

Litter

Visitors, residents and businesses all contribute to litter in the Waverley LGA. This generally includes cigarette butts, plastic bags and food

packaging. While it accounts for a small proportion of waste generation in the LGA, it is a significant environmental and safety problem for our beaches and waterways.

Council has an in-house public place cleansing service, which cleans streets, malls and other public places (of litter and graffiti). We will continue to support this existing service to manage litter and keep public places clean by:

- Investigating and implementing better solutions for waste collection and resource recovery at public places.
- Providing community engagement programs to encourage behaviour change regarding litter.
- Delivering a commercial business engagement program to reduce the generation of packaging and other potential litter items such as plastic bags.
- Providing and maintaining infrastructure to help the community dispose of waste correctly.



Action Plan

| Priority | Action |
|----------|---|
| High | Identify priority zones within Waverley for targeted cleansing programs |
| High | Install public place compactor waste collection systems at Bondi Beach to allow for greater capacity of waste and recycling storage and reduce likelihood that bins overflow |
| High | Install improved recycling and waste management infrastructure in Bondi Junction, Bondi Beach area, Tamarama and Bronte at high traffic public places |
| Medium | Undertake review of public place cleansing operations and existing public waste and recycling infrastructure to identify current and optimal service levels for litter management |
| Medium | Install long-term solutions for an alternative waste collection system at Bondi Junction and Bondi Beach |
| Medium | Investigate reuse opportunities for leaf litter and garden waste collected by Council street sweepers |
| Ongoing | Carry out litter audits and improve data collection and reporting capabilities for litter and public place cleansing operations |
| Ongoing | Continue to develop and implement targeted community engagement programs for litter prevention and management e.g. Summer Litter Campaign |
| Ongoing | Continue to implement key actions set out in Council's Illegal Dumping and Littering Action Plan to integrate infrastructure, education, management and enforcement |

Litter and dumped rubbish high on public agenda

Litter and illegal dumping were two of the four environmental issues that concern residents the most according to a 2015 Waverley Council Community Sustainability Survey (493 responses). This confirmed results from the earlier waste-specific 'Let's Talk about Waste' community survey which showed these as top issues on the public agenda.

There was a high level of positive feedback in the waste-specific survey regarding Waverley Council's role in managing litter and rubbish in public places; over 55 percent thought that Council was doing "very well" or "well" in this area. Residents mentioned the need for more public place recycling, review and optimising bin configurations and placement on beach promenades and in

parks, along with more efficient management of dumped items including mattresses.



Illegal dumping

Dumped rubbish is a significant issue for councils across Sydney, particularly areas of high population density like Waverley LGA.

Each year, Waverley Council provides one scheduled clean-up collection and two free 'your call' clean-up collection services to residents for disposal of large household items. However, outside of these collections, there is still a significant problem of dumped rubbish in our streets and parks (illegal in our LGA). Materials dumped vary, but primarily comprise bulky household items including furniture. Cases of dumped building waste and

asbestos are reported to a much lesser extent.

In 2014/15, Council collected 446 tonnes of dumped material from kerbsides and public land. The disposal for these materials cost more than \$100,000 in total.

The reasons for dumped rubbish are wide-ranging. They include lack of awareness about Council's waste services and reuse options, limitations surrounding existing clean-up collection services and a transient population in key areas of Waverley.

To minimise illegal dumping, we will focus on:

- Improving clean-up collection service booking capabilities.
- Investigating additional/differential services for collections of commonly dumped items.
- Better internal reporting and data collection and operational procedures.
- Encouraging reuse of bulky household items.
- Engagement and education programs to promote Council's services and other opportunities to avoid waste.

Action Plan

| Priority | Action |
|----------|--|
| High | Streamline and improve clean-up collection service booking capabilities, operational procedures and customer service procedures |
| High | Investigate and implement alternative and additional services for residential bulky waste collections (clean-up services) to maximise material recovery |
| High | Work with SSROC to establish a Sydney Metropolitan Regional Illegal Dumping Squad to complement Council's waste enforcement activities |
| High | Improve data collection, measurement tools and reporting systems (internal and external) for residential clean-ups and illegally dumped rubbish |
| High | Further develop partnerships with key stakeholders (e.g. community groups, real estate agents, strata management bodies, backpackers) to better manage dumping issues and help promote reuse and appropriate disposal of bulky waste |
| Medium | Work with SSROC to implement regional waste reuse, recovery and disposal opportunities |
| Medium | Implement Real Estate Engagement Plan to assist in improving waste and recycling management practices at multi-unit dwellings in Waverley |
| Medium | Develop and support commercial business initiatives and community led programs to reduce the generation of packaging and other potential litter items e.g. plastic bags |
| Ongoing | Continue to implement targeted residential community engagement and education programs for dumping prevention, appropriate reuse and responsible disposal of bulky waste items |



Keeping Our Beaches Beautiful

Waverley Council works hard to reduce litter on our beaches, particularly over the busy summer period. We conduct annual litter audits of the sand to identify litter types and hot-spots. By identifying trends, we are able to develop educational and operational strategies to assist in keeping our beaches clean. A beach rake also operates on the sand every evening to ensure that other litter is collected and disposed of. Each year, we run educational programs and campaigns over the summer period to communicate the many ways in which visitors and residents can help to “Keep

Bondi Beautiful”. These include interactive workshops, videos and communications campaigns at transport centres.

Over summer 2014/15, our Keeping Our Beaches Beautiful (KOB) Campaign helped to raise awareness and action on litter prevention. The successful campaign included a range of initiatives: “Did You Pick Up Today?” communications; video; face-to-face visitor experience surveys on Bondi Beach; creative children’s activities; litter audits, and extra Clean-Up Crew members on the sand (who collected more than 1000 litter items over the period).

The KOB Campaign contributed to us winning the Keep Australia Beautiful Overall NSW Clean Beaches Award Winner (2014) and the 2015 National Environmental Sustainability Award in the Keep Australia Beautiful Clean Beaches Awards. We won a Highly Commended award for 2015 Keep Australia Beautiful NSW Blue Star Hey Tosser Litter Action Award.

Bins on footpaths

Council provides residents with kerbside services for collecting general waste, recyclables, garden organics and large household items. Waste and recycling is currently contained in bins, collected by Council trucks. Issues arising from this system include placement of bins that are put out for collection (weekly/fortnightly) and bins left on footpaths after collection.

Council is continually working to limit the storage of mobile ('wheelie') garbage bins on public land outside of collection periods. We are currently being more direct

and proactive using community liaison, development controls and on-ground enforcement to reduce bins on footpaths, laneways and public land in Waverley.

We have been targeting hotspot areas in Bondi, Bronte and Bondi Junction for bins on footpaths with education and engagement, compliance action and an extensive follow-up inspection program. Council staff provide face-to-face liaison to work with business owners and residents to ensure bin presentation times and storage arrangements are acceptable. In

addition, educational material will be delivered to outline the problematic issues caused by bins on footpaths and a notice of action to be taken by Council.

Additionally, we set strict design requirements for new developments in Waverley to ensure that bins are stored correctly on private land and bin presentation on the kerbside is minimised to de-clutter of urban areas from reducing bins on footpaths.

Action Plan

| Priority | Action |
|----------|---|
| High | Implement targeted inspection and enforcement program for bins on footpaths to identify hotspots in Waverley |
| High | Implement targeted residential and business engagement for appropriate presentation and storage arrangements for mobile garbage bins |
| High | Partner with key stakeholders (e.g. community groups, real estate agents, strata management bodies, backpackers) to improve waste and recycling management practices and reduce the storage of mobile garbage bins on public land outside of collection periods at multi-unit and mixed-use dwellings |
| Ongoing | Continue to set strict design requirements for new developments to ensure bins are stored correctly on private land and minimise occasions of bins left on the kerbside outside collection times |



Solar compactors at Bondi Beach

Solar compactor bins are one option that Council is considering for reducing litter, and improving waste and recycling management at key locations in the Bondi Beach area.

The bins include a station with one general waste bin and one recycling bin. Each

has a compactor inside that compacts to a ratio of 5:1. The bins also have sensors that notify Council when they are ready for collection. By implementing this infrastructure, Council could streamline its service by collecting the waste and recycling only when necessary (as notified by the smart system).

As the bins are solar powered, there wouldn't be any energy costs incurred by Council to run the system. With fewer truck movements, this solution can contribute to reduced greenhouse gas emissions associated with waste transportation, and improved operational efficiencies.



5. SOLUTIONS TO PROBLEM WASTES

Target: Increase collection and treatment options for problem wastes

Problem wastes include gas bottles, medical waste and needles, electronic waste (e-waste), tyres, light bulbs and household chemicals. Materials in the waste stream from these products can pose serious risks to human health and the environment. Chemicals and toxins from problem wastes that are not disposed of (or recycled) properly can leach into water supplies and land, and negatively impact wildlife and people.

They also pose a safety risk for waste operators, lead to sorting issues at waste treatment facilities

and contaminate recyclable materials, thereby decreasing their quality. Finding ways to deal with problem waste will help us increase resource recovery.

These wastes cannot be safely managed through standard kerbside collections. For some materials, schemes involving all key stakeholders - producers, retailers and consumers - can deliver more sustainable outcomes than traditional 'end-of-pipe' waste management approaches.

We will work on solutions to problem waste, including:

- Community engagement programs to increase awareness and uptake of correct disposal options.
- Providing appropriate collection facilities for problem waste.
- Ongoing provision and support of mobile and other collection services.
- Supporting Extender Producer Responsibility approaches.
- Seeking partnerships to maximise resource recovery opportunities.



6. INTEGRATION WITH GREEN INFRASTRUCTURE

Target: Alternative waste collection solutions are integrated with other precinct green infrastructure projects

A key focus of Waverley Council's environmental strategy is to investigate and facilitate implementation of green infrastructure projects in key precincts. Green infrastructure projects include integrated energy, water and waste systems for existing and new buildings as well as public places.

We are currently developing a Green Infrastructure Masterplan for the Bondi Junction centre, as our main commercial, high-density residential and retail hub with significant development potential and opportunities to deliver positive environmental outcomes. The Green Infrastructure Masterplan establishes the energy, waste and water component of the Bondi Junction Heartbeat of the East vision. We are committed to demonstrating environmental excellence and leadership, and deliver ambitious environmental targets through low carbon energy, efficient waste management, and recycled water infrastructure.

We are aiming to conduct detailed independent studies to explore better energy, water and waste management in Bondi Junction including measurements,

methodologies, generation rates, solutions (technology, policy and engagement), case studies and implementation plans. The Green Infrastructure Masterplan will look at opportunities to integrate recommended solutions to optimise efficiency in delivery and minimise cost and disturbance cost (in particular with underground systems).

We are working in partnership with key commercial stakeholders in the Building Futures Partnership and independent technical experts on the Technical Working Group to help steer the research and provide support in developing the Masterplan.

To manage waste more effectively in the precinct, we have commenced in-depth studies with expert waste consultants. As part of this, we assessed two different scenarios for alternative waste collection solutions compared to Business-As-Usual kerbside bin collections: (1) Pneumatic Underground and (2) Hydraulic compactors + laneway compactors. From assessment, the Pneumatic Underground rank highest. Case studies and implementation plan are now in development.

We are also investigating collection solutions, including those above and solar bins for roll-out to the Bondi Beach area, to integrate into future proposed developments in the area.



Action Plan

| Priority | Action |
|----------|--|
| High | Finalise Bondi Junction waste management plan as part of Bondi Junction Green Infrastructure Masterplan |
| High | Finalise plan for Bondi Beach waste management and infrastructure solutions |
| Medium | Establish relevant design requirement for Council's Development Control Plan to complement installation of long-term alternative waste collection solutions throughout Waverley including Bondi Junction and Bondi |

Potential benefits for alternative waste collection systems in Bondi Junction:

- Reduce number of bins and general waste spills
- Improve visual amenity
- Reduce truck collections and traffic congestion
- Reduce noise, smells and air pollution
- Improve traffic safety
- Improved service for users
- Increase development space by removing need for bin storage areas

- Increase capacity when and if required
- Increase recycling rates

Pneumatic Underground:

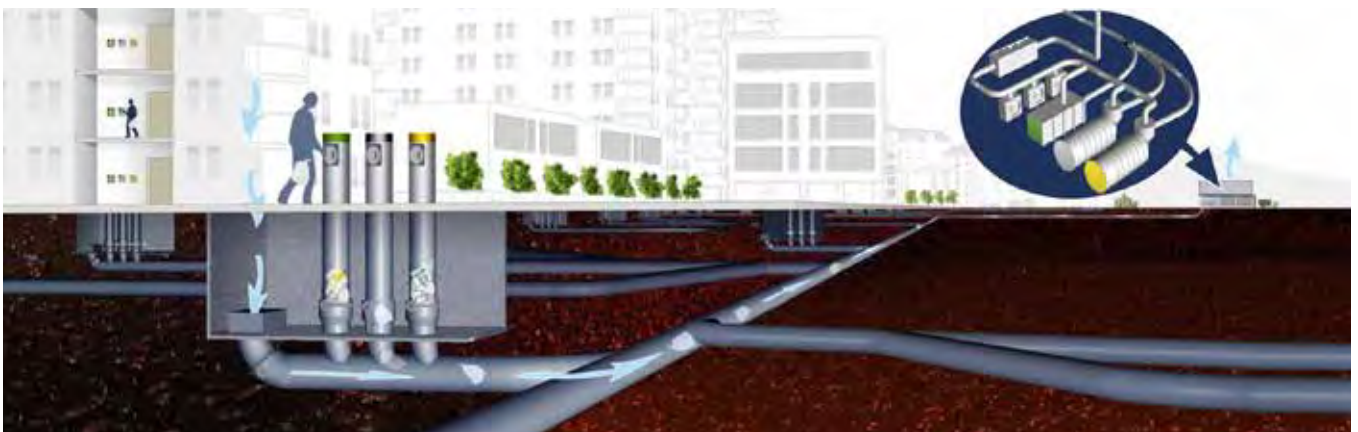
Offers an automated waste collection system via separate chutes for general waste and recycling. Already established in Europe and Asia, this system is particularly suited to high-density developments. Waste collected via the chute is sucked through an underground vacuum

tube to a central collection point. This system is also being considered for Bondi Beach and surrounds. See image below.

Hydraulic compactors + laneway compactors:

Provides collection points for general waste and recycling at strategic locations. Allows compaction of up to 5:1.

Both systems are compatible with a pin access system.



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- Community Profile, profile.id (2011)
- Community Sustainability Survey results, Mesch Engagement (2015)
- Domestic Waste Service Study, MRA Consulting (2015)
- Environment Action Plan 3 (2012-2020)
- Garage Sale Trail post-event report for Waverley Council (2014)
- Internal EAP3 Waste Briefing Paper, Wileco Consulting (2012)
- Keeping Our Beaches Beautiful Campaign Operations Committee Report (2015)
- Litter and Illegal Dumping Strategy (2011)
- Multi-Unit Dwelling Recycling Audit and Survey Research - Progress Report (2014)
- Top 10 Resource Recovery Performers Study (2015)
- Waste and Resource Recovery Plan 2007-2017
- Waste statistics and data (2003-2015), Wileco Consulting and internal sources
- Waverley Together 3 Community Strategy 2013-2025

External:

- City of Sydney Interim Sustainable Waste Strategy
- SSROC Regional Waste Strategy 2014-2021

