Western Sydney Regional Waste Avoidance and Resource Recovery Strategy

2017 - 2021

Blacktown City Council
blue mountains City Council
CUMBERLAND COUNCIL
FairfieldCity Celebrating diversity
Hawkesbury City Council
THE HILLS Sydney's Garden Shire
LIVERPOOL CITY COUNCIL
CITY OF PARRAMATTA
PENRITH CITY COUNCIL

This document has been prepared on behalf of, and for the exclusive use of WSROC, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and WSROC. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

Jacobs
Level 7, 177 Pacific Highway, North Sydney
Ph: +61 2 9928 2100
www.jacobs.com

This Strategy is supported by the NSW EPA Waste Less, Recycle More initiative funded from the waste levy.

Printed on 100% recycled paper.

Executive Summary

The NSW Environment Projection Authority through its Waste Less, Recycle More initiative has funded Regional Organisations of Councils to develop regional waste strategies to outline future directions for resource recovery practices across the region. Nine councils have come together to develop the Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2017-21 (herein, referred to as 'the Strategy'), which explores options for addressing waste management challenges into the future and seeks to maximise funding opportunities for the region.

Close to 739,600 tonnes of domestic waste and recycling was collected from Western Sydney households in 2015/16 through kerbside bin services, kerbside bulky waste collections, and council drop-off and mobile services. Just over half of this waste was diverted from landfill and recovered. The region achieved an overall domestic recycling rate of 54%, which is higher than the NSW recycling rate of 47.5%. Recycling rates in the region have continued to improve from 53% in 2010/11 and 44% in 2007/08.

To ensure that the region is contributing towards achieving state-wide objectives, it has chosen to develop regional objectives and targets that sit within each of the NSW Waste Avoidance and Resource Recovery Strategy's key result areas:

- Avoid and reduce waste generation;
- Increase recycling and divert more waste from landfill;
- Manage problem wastes better;
- Reduce litter;
- Reduce illegal dumping; and
- Improve regional governance.

The regional targets identified in the development of this Strategy are to:

- Increase opportunities for waste avoidance and reuse in the region by 2021.
- Work towards a domestic waste resource recovery rate of 70% by 2025.
- Reduce the amount per capita of recyclable material in the kerbside residual waste bin by 2021.
- Waste planning is strengthened at a state department level by 2021 and is considered in all significant development and strategic planning.
- Increase opportunities for the responsible disposal of household problem waste by 2021.
- All programs maintain majority participation by councils across the life of the Regional Litter Plan.
- Deliver projects that address illegal dumping in five council areas by 2021.
- Identify five new opportunities for regional collaboration by 2021.

The Strategy details regional actions to contribute to the achievement of the targets. Each action has been analysed to identify priority actions. WSROC will work with participating councils to develop these regional actions towards achievement of these targets and to build a future capacity for increased resource recovery for a growing population in the region.

Contents

1. Introduction 5
- 1.1 The Region 5
- 1.2 The Strategy 7
- 1.3 Learnings and Achievements from the Previous Strategy 8
  - 1.3.1 Background to the 2014-17 Strategy 8
  - 1.3.2 2014-17 Strategy Outcomes 8
  - 1.3.3 Stakeholder Engagement 8

2. Where Are We Today? 9
- 2.1 Population and Demographic Information 9
- 2.2 Kerbside Bin Collection Services 11
  - 2.2.1 Main Kerbside Bin Collection Services 11
  - 2.2.2 Waste Processing and Disposal 12
- 2.3 Kerbside Clean-Up Services 12
- 2.4 Drop-Off and Mobile Household Waste Services 12
  - 2.4.1 Council Waste and Resource Recovery Drop-Off Facilities 12
  - 2.4.2 Community Recycling Centres and Mobile Services 13
- 2.5 Domestic Waste and Recycling Generation 14
- 2.6 Domestic Recycling Performance 15
- 2.7 Waste Composition 16
- 2.8 Waste Trends and Projections 17
- 2.9 Waste Management Options Analysis 18
- 2.10 Waste and Recycling Collection, Processing and Disposal Contracts 19
- 2.11 Waste Levy Regulated Areas 20
- 2.12 Waste and Recycling Disposal and Processing Infrastructure 20
  - 2.12.1 Current Waste Infrastructure 20
  - 2.12.2 Waste Processing and Disposal Infrastructure Needs 22
  - 2.12.3 Household Problem Waste Infrastructure Needs 23
- 2.13 Additional Council Waste Services 25
- 2.14 Community Programs 25

3. Where Do We Want to Get To? 27
- 3.1 Drivers for Regional Collaboration on Waste Issues 27
- 3.2 Vision 27
- 3.3 Strategy Outcomes 27
- 3.4 Strategy Themes, Objectives and Targets 27

4. How Will We Get There? 29
- 4.1 Identifying Regional Actions 29
  - 4.1.1 Theme 1: Avoid and Reduce Waste Generation 29
  - 4.1.2 Theme 2 & 3: Increase Recycling and Divert More Waste from Landfill 29
  - 4.1.3 Theme 4: Manage Problem Wastes Better 30
  - 4.1.4 Theme 5: Reduce Litter 31
  - 4.1.5 Theme 6: Reduce Illegal Dumping 32
  - 4.1.6 Theme 7: Improve Regional Governance 32

5. How Will the Strategy Be Implemented? 33
- 5.1 Strategy Framework 33
- 5.2 Strategy Budget and Delivery 33
- 5.3 Periodic Review and Prioritisation 33
- 5.4 Action Plan 34

Appendices

Appendix A. Key Learnings 2014-17 Regional Waste Program 40
Appendix B. Additional Council Data 41
Appendix C. Methodology for Diversion Achievement Options Analysis 45
Appendix D. Waste Contracts 46
Appendix E. Regional Waste Facilities List 48
Appendix F. Drivers for Regional Collaboration on Waste Issues 49
Appendix G. Legislative and Policy Framework 50
Appendix H. Options Assessment 55
Glossary 57

List of Tables

Table 1: Demographic Profile of the Region 9
Table 2: Main Kerbside Bin Collection Services 12
Table 3: Kerbside Clean-Up and Chipping Services 13
Table 4: Kerbside Waste Generation Yields, 2015/16 (Kg/Capita/Week) 14
Table 5: Strategy Objectives and Targets 28
Table 6: Strategy Action Plan, 2017 – 2021 34
Table 7: 1 Year Strategy Action Plan, 2017/18 38

List of Figures

Figure 1: Western Sydney Region – Councils Participating in the Western Sydney Regional Strategy 6
Figure 2: Key Stakeholder Engagement 8
Figure 3: Future Population Growth, 2011/12 to 2030/31 11
Figure 4: Total Domestic Waste Generation from the Region, 2011/12 to 2015/16 15
Figure 5: Total Recovery Across Domestic Waste Streams, 2015/16 15
Figure 6: Domestic Recycling Rates, 2015/16 16
Figure 7: Potentially Recoverable Materials Present in the Kerbside Residual Waste Bin (% by Weight) 17
Figure 8: Contamination Present in Kerbside Co-Mingled Recycling Bin (% by Weight) 17
Figure 9: Projected Total Domestic Waste Tonnes, 2016/17 to 2030/31 17
Figure 10: Projected Domestic Waste Tonnes for the Region, 2016/17 to 2030/31 18
Figure 11: Summary of Potential Resource Recovery Performance in 2020/21 19
Figure 12: Timeframes for Current Council Processing and Disposal Contracts 20
Figure 13: Current Disposal and Processing Infrastructure 21
Figure 14: Access to Community Recycling Centres and Mobile Services for Problem Household Wastes 24
Figure 15: Strategy Framework 33
Figure 16: Common Elements of Each Theme 33

Acronyms

ABS	Australian Bureau of Statistics
AWT	Alternative Waste Treatment
CBD	Central Business District
CALD	Culturally and Linguistically Diverse
CDS	Container Deposit Scheme
CRC	Community Recycling Centre
CRM	Customer Relationship Management
DCP	Development Control Plan
EfW	Energy from Waste
EPA	Environment Protection Authority
EPR	Extender Producer Responsibility
EPS	Expanded Polystyrene
ERA	Extended Regulated Area
FOGO	Food Organics And Garden Organics
GO	Garden Organics
LGA	Local Government Area
MGB	Mobile Garbage Bins
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
MUDs	Multi-Unit Dwellings
NSW	New South Wales
POEO Act	Protection of Environmental Operations Act
RFB	Residential Flat Buildings
RID	Regional Illegal Dumping
RRA	Regional Regulated Area
ROC	Regional Organisation Of Councils
SMA	Sydney Metropolitan Area
SME	Small to Medium Enterprise
SAWT	SITA (now SUEZ) Advanced Waste Treatment
SUDs	Single Unit Dwellings
WARR	Waste Avoidance and Resource Recovery
WLRM	Waste Less Recycle More
WSROC	Western Sydney Regional Organisation Of Councils

Definitions

For clarity, a few key definitions relevant to the context of this Strategy are presented below in order to ensure consistent understanding throughout this document.

The NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014 states the following:

- **Municipal solid waste (MSW)** – solid waste from households and local government operations, including waste placed at the kerbside for local council collection and waste collected by councils from municipal parks and gardens, street sweepings public council bins, and formerly (until July 2016) council engineering works. This also includes self-haul waste dropped off by residents to either council facilities or at council events.
- **Recycling rate** – The proportion of all recycled materials compared to the total amount of waste generated – this includes processing of residual waste via an alternative waste treatment (AWT) facility but does not include energy from waste (EfW).
- **Diversion rate** – The proportion of all recycled materials or materials otherwise recovered through an EfW facility compared to the total amount of waste generated.
- **Resource recovery rate** – The proportion of materials which are recycled and diverted from landfill compared to the total amount of waste generated.

The NSW Local Government Annual WARR Data Report, which is based on survey responses from local councils, reports data on domestic waste and recycling in NSW. It states the following:

- **Domestic waste** – All waste created by households which includes residual waste, recyclables and organics that councils collect and receive from households. Council collection services include kerbside bin collections, kerbside clean-up collections and household drop-off facilities/mobile services.

Domestic waste is the main component of the MSW stream (comprising over 95% of MSW). The recycling rate targets identified in this document have been specified for the domestic proportion of the MSW stream.

The data reported in this document is based on the information councils have reported in their WARR surveys, as this is the most comprehensive comparable data set available.

1. Introduction

1.1 The Region

The Western Sydney region brings together the members of WSROC, which are the LGAs of Blacktown, Blue Mountains, Cumberland, Fairfield, Hawkesbury, Liverpool, Parramatta and Penrith, and neighbouring non-member council of The Hills Shire. These nine councils participating in the Regional Waste Strategy represent a significant geographical portion of the Sydney Metropolitan Area (see Figure 1), covering over 5,400 square kilometres and comprising a mix of regional centres and large cities.

The region stretches from the heavily urbanised and multicultural areas of Cumberland, Fairfield and Parramatta in the east and the greenfield growth centres around The Hills, Blacktown, Penrith and Liverpool, to the semi-rural areas of the Hawkesbury and the World Heritage-listed areas of the Blue Mountains.

The region's population comprises more than one third of the total Sydney population and contains a diverse cultural and ethnic mix of people. The region is home to the Indigenous Darug, Tharawal and Gandangarra peoples, and Blacktown has one of the largest populations of Aboriginal people relative to other LGAs in NSW and in Australia[1]. The majority of Australia's migrants settle in the region and an additional 12,000 people will be located in the region from January 2016 onwards under Australia's Refugee and Humanitarian Program.

The economy is worth approximately $104 billion annually – making it the third largest regional economy in Australia behind the Sydney and Melbourne central business districts (CBDs)[2]. It is also a region encompassing a diverse range of socio-economic backgrounds with areas of great socio-economic disadvantage as well as areas of affluence.

The NSW Government's Metropolitan Strategy for Sydney 2031 *(A Plan for Growing Sydney)* has identified Western Sydney as home to a number of designated priority growth areas involving significant development of housing and new infrastructure (including a new airport, road and rail networks), and urban renewal around strategic centres. The Western Sydney region sits at the forefront of Sydney's future challenges and opportunities. Regional collaboration on waste management issues and the development of a regional waste strategy needs to ensure the region's future direction maximises waste avoidance and resource recovery outcomes to address the significant and growing population of the region.

[1] Somerville, et al, (2013) Our Place Western Sydney, Project report, Stage 1: Community Environmental & Sustainability Educators, University of Western Sydney and Australian Bureau of Statistics, Estimates of Aboriginal and Torres Strait Islander Australians, June 2011.

[2] National Institute of Economic and Industry Research (2016)

Figure 1: Western Sydney Region – Councils Participating in the Western Sydney Regional Strategy

1.2 The Strategy

WSROC and the nine participating councils have come together to develop the Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2017-21. The Strategy incorporates learnings from the previous strategy delivery period 2014-17. It provides a clear direction for improving sustainable waste avoidance and resource recovery practices across the region and demonstrates the regions' commitment to adopting a strategic approach to waste management.

To provide alignment with the State Government's NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-21, the Strategy has been developed in accordance with the NSW Environment Protection Authority's (EPA) guidelines. It also fits within the wider policy context set by the state and federal governments and seeks to maximise funding opportunities under the Waste Less, Recycle More (WLRM) Initiative.

The Strategy has been developed in consultation with representatives from each of the participating councils to ensure it supports individual councils in improving resource recovery, diverting waste away from landfill and to address the increased costs associated with waste management.

Implementation of this Strategy can assist individual councils to:

- improve recycling and diversion rates;
- reduce contamination of recycling streams;
- divert more waste from landfill;
- plan for future waste infrastructure requirements;
- improve the management of litter, illegal dumping and problem waste;
- deliver educational campaigns to improve waste management behaviour;
- achieve cost savings; and
- share resources with, and learn from other councils.

In supporting the delivery of this Strategy, councils will seek to take a holistic approach to waste management activities, promoting sustainable and economic opportunities in Western Sydney to realise benefits for the region.

The regional focus provided by this Strategy will provide an opportunity to work with other Regional Organisations of Councils (ROCs) and regional waste groups to progress common actions and address shared challenges identified through the regional strategies. There will also be opportunities for councils to participate in regional partnerships with those councils adjoining the Western Sydney region.

1.3 Learnings and Achievements from the Previous Strategy

1.3.1 Background to the 2014-17 Strategy

The first Western Sydney Regional Waste Avoidance and Resource Recovery Strategy was developed in 2014. At this time there were ten Western Sydney councils participating in the Regional Waste Strategy program. However, in 2016 council amalgamations were announced and two councils in the region were amalgamated, with boundary changes made to an additional two councils. This resulted in a reduction of the total number of councils to nine, covering a very similar geographic area.

Regional Coordinators were employed by WSROC in 2014 to deliver the strategy with council staff through to 2017. A number of councils have aligned their subsequent waste strategies to the Regional Waste Strategy. The relationship between regional coordinators, councils, the NSW EPA and the waste industry has been identified as being fundamental to the success of regional collaboration and advancement of sustainable waste management outcomes across the Sydney Metropolitan Area.

1.3.2 2014-17 Strategy Outcomes

The 2014-17 Strategy program developed and delivered 66 projects to fulfil the 26 actions listed in the strategy document. Key achievements include:

- Development of a Waste Planning Forum, to specifically discuss and address issues related to planning waste services for new and increasing housing development and population growth. This forum created a pathway for inter-council sharing of knowledge and regional advocacy for consideration of waste and resource recovery in planning policy.
- Delivery of the Shop.Cook.Save regional grant to educate residents across seven councils with skills to avoid food waste, and provide education resources for ongoing use in councils.
- Research into opportunities and barriers for local government in reuse of household bulky wastes, predominately from the kerbside clean-up stream.
- Development of a methodology to measure the extent and cost of litter and illegal dumping across LGAs, and calculation of potential cost and resource impact on councils and the region.
- Delivery of regional asbestos collection and disposal services.
- Research and guidance for councils on successful engagement of CALD communities in the region.
- Delivery of a regional roadside litter prevention program across ten councils in partnership with Roads and Maritime Services.
- Improved communication and partnerships between councils.

Key learnings and achievements delivered by the previous Strategy are outlined in Appendix A and have informed the redevelopment of the new Strategy 2017-21 and Strategy Action Plan.

1.3.3 Stakeholder Engagement

Stakeholder engagement is an important process in planning for regional waste management and infrastructure. During the delivery of the 2014-17 program, a range of stakeholders were engaged as part of the development and implementation stages of the Strategy. Key stakeholders from this consultation process are identified in Figure 2.

Key stakeholders, such as the nine participating councils and the NSW EPA, will be greatly involved in the update and delivery of this Strategy.

Figure 2: Key Stakeholder Engagement

2. Where Are We Today?

The region's baseline position as it relates to waste and resource recovery for the year 2015/16 is outlined in the following section.

A number of councils within the region have undergone boundary changes since the 2015/16 baseline year. Prior to amalgamations the region comprised of ten councils; it now comprises nine councils. This means that the number of people and households associated with each of these council LGAs have also changed, and consequently, total waste and recycling amounts attributed to these councils. The information presented therefore reflects both the (actual) situation prior to the amalgamations taking place, and the likely (indicative) situation arising from the amalgamations. Future projections of population and households are based on indicative information established for the newly formed and boundary adjusted councils.

2.1 Population and Demographic Information

In 2015/16, the region had a population of more than 1,684,000 people. However, since this time the region's population has increased to close to 1,738,000 people spread across an area of approximately 5,800 square kilometres. Approximately 20% of the region's population lives in the Blacktown LGA. The least densely populated local government area (LGA) is Hawkesbury, which has the largest area (2,776 square kilometres) and the smallest population (over 66,000 people). The Blue Mountains is also characterised by a relatively low population density comprising of close to 80,000 people spread over a large area (1,432 square kilometres).

Council amalgamations announced in 2016 resulted in council boundary changes within the region. Most of the pre-amalgamated Auburn and Holroyd LGAs were combined with the Woodville ward of Parramatta to form the new Cumberland LGA, and segments of the Auburn, Holroyd, The Hills and Hornsby LGAs were transferred to the Parramatta LGA (a net transfer to Parramatta of close to 17,230 new households). The resultant increase in households to the Western Sydney region from the former Hornsby LGA was approximately 8,116 households, a 1.7% increase overall. Changes to population and household numbers in each of these council LGAs are detailed in Table A, Figure A and Figure B of Appendix B.

Table 1: Demographic Profile of the Region

Council	Population[a]	No. of Households[a]	% SUDs	% MUDs	Average Persons per Household	Socio-Economic Index (Rank[b])
Blacktown	339,328	108,953[c]	82%	18%	3.11	77
Blue Mountains	79,812	34,999	100%	0%	2.28	128
Cumberland (Auburn)	88,059	21,400	45%	55%	4.11	17
Cumberland (Holroyd)	113,294	37,465	60%	40%	3.02	74
Fairfield	204,442	65,418	83%	17%	3.13	3
Hawkesbury	66,134	25,461	96%	4%	2.60	121
The Hills	192,230	65,352	84%	16%	2.94	148
Liverpool	204,594	65,437	79%[c]	21%[c]	3.13	51
Parramatta	194,448	67,057	52%	48%	2.90	96
Penrith	201,880[c]	72,264[c]	87%	13%	2.79	110
Region Totals	**1,684,221**	**563,806**	**80%**	**20%**	**2.99**	

Source/Notes:

a) NSW Local Government WARR data (draft) as reported by councils for 2015/16.

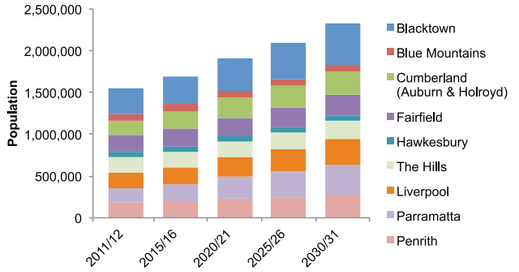
b) Based on 2011 Census data (Australian Bureau of Statistics) with all NSW areas are ordered from the lowest to highest score, then the area with the lowest score is given a rank of 1, highest rank is 153.

c) Council updated information.

The Metropolitan Strategy for Sydney 2031 *(A Plan for Growing Sydney)* forecasts that over half of Sydney's population growth to 2031 will occur in Western Sydney, with nearly 1 million people settling in the region between 2011/12 and 2030/31 (see Figure 3). Western Sydney is home to four NSW Government Priority Growth Areas, which are:

- The North West Growth Area, stretching through The Hills, Blacktown and Hawkesbury LGAs, anticipates the development of 33,000 new dwellings over the next 10 years and up to 90,000 new dwellings over the next 30 to 40 years.
- The South West Priority Growth Area will see development of a number of new suburbs and expanded development within existing suburbs of the Liverpool LGA.
- The Greater Parramatta Priority Growth Area, which plans to deliver 72,000 new homes over the next 20 years.
- The Western Sydney (Airport) Priority Growth Area, which seeks connect new suburbs with the planned second Sydney airport.

Figure 3: Future Population Growth, 2011/12 to 2030/31



Currently, 80% of residents live in single unit dwellings (SUDs) with 20% of residents living in multi-unit dwellings (MUDs). It is anticipated that additional growth in housing will comprise primarily of MUDs in medium to high density areas with SUDs planned for greenfield growth areas. Six LGAs have had an increase in the proportion of housing that is now MUDs, with increases of up to 19%. The types of housing growth expected needs to be taken into account for when considering future waste infrastructure and service requirements as the waste management needs for each housing type can vary considerably.

The regional population is highly multicultural with residents speaking 215 different languages. Over 35% of residents were born overseas and over 143,000 residents across the region reported difficulty speaking English. The top languages spoken in Western Sydney are Arabic, Mandarin and Vietnamese, with over 95,000 Arabic speakers in the region. Over 35,000 residents have no English proficiency, with an additional 216,000 residents not able to understand English well. Established migrant groups (including those from European and some Asian nations) see more elderly people report lower English proficiency, with newer arrivals speaking Arabic, Turkish and Aramaic languages featuring in younger age groups.

The region has a higher concentration of non-English speakers than the Greater Sydney area. This trend is likely to continue as the majority of new migrants to NSW settle in Western Sydney.

2.2 Kerbside Bin Collection Services

2.2.1 Main Kerbside Bin Collection Services

All councils provide kerbside residual waste and co-mingled recycling collection services in their urban areas.

Each council provides a fortnightly co-mingled recycling service. In 2015/16, five councils provided a fortnightly garden organics service (GO) to their residents. This number increased to six councils in 2016/17. Liverpool and Parramatta provide both a GO service and alternative waste treatment (AWT) processing of residual waste. Penrith provides a weekly food and garden organics (FOGO) collection service. Councils without a GO or FOGO service send their residual waste to an AWT for processing.

Table 2 (see next page) summarises the waste collection services currently provided by the councils. Parramatta and Cumberland will progress consolidation of services across their newly formed LGAs following council amalgamations and LGA boundary changes.

Kerbside residual waste and co-mingled recycling collection services are provided to over 95% of all households. Households not receiving kerbside bin waste collection services comprise primarily of rural properties, which must transport their waste and recycling to an appropriate facility. All councils have

rolled out, or are in the process of rolling out, bins with bin lid colours which comply with the relevant Australian Standard (see Table 2).

2.2.2 Waste Processing and Disposal

Six councils send their residual waste to AWT facilities[4]. Various processes are used for residual waste treatment in order to separate organic and some recyclable materials from the residual waste stream, thereby reducing the volume of waste disposed to landfill.

Kerbside co-mingled recyclables are collected and transported to a material recovery facility (MRF) to be sorted into different material types (e.g. glass, metal, plastic, paper/cardboard) which are then reprocessed into new products.

Organic waste is processed at composting facilities with the outputs used for various applications (e.g. as a substrate in council parks). Kerbside green waste chipping, mulching services and drop-off green waste services are offered by some councils in place of, or in addition to, kerbside bin organics services.

Table 2: Main Kerbside Bin Collection Services[3]

Council	Residual Waste			Co-Mingled Recycling		Organics	
	Bin Size	Frequency	Disposal/ Processing	Bin Size	Frequency	Bin Size	Frequency
Blacktown	240L	Weekly	AWT	240L	Fortnightly	No Service	
Blue Mountains	140L	Weekly	Landfill (In-house)	240L	Fortnightly	240L	Fortnightly GO[a]
Cumberland (Auburn)[b]	120L	Weekly	Landfill	240L	Fortnightly	240L	Fortnightly GO
Cumberland (Holroyd)[b]	240L	Weekly	AWT	240L	Fortnightly	No Service	
Fairfield	240L	Weekly	AWT	240L	Fortnightly	No Service	
Hawkesbury	240L	Weekly	Landfill (In-house)	240L	Fortnightly	240L	Fortnightly GO
The Hills	140L	Weekly	Landfill	240L	Fortnightly	240L	Fortnightly GO
Liverpool	140L	Weekly	AWT	240L	Fortnightly	240L	Fortnightly GO
Parramatta[c]	140L	Weekly	AWT	240L	Fortnightly	240L	Fortnightly GO
Penrith	140L	Fortnightly	Landfill[d]	240L	Fortnightly	240L	Weekly FOGO

Source/Notes:
a) Blue Mountains introduced a fortnightly GO service in 2016/17.
b) Amalgamated to form Cumberland. Council will look to undertake consolidation of services following amalgamations and LGA boundary changes.
c) Council will look to undertake consolidation of services following amalgamations and LGA boundary changes.
d) Organics depleted waste. Penrith sends waste from some rural and multi-unit dwellings to AWT.

[3] Alternate services are offered by some councils to MUDs, rural properties and other property types.
[4] Penrith sends waste from some rural and MUD properties to AWT.

2.3 Kerbside Clean-Up Services

All councils provide residents with a kerbside clean-up service for the disposal of bulky household waste (see Table 3). The provision of safe and effective services to MUDs as urban density increases is a challenge to all councils, particularly for bulky waste collection services.

2.4 Drop-Off and Mobile Household Waste Services

2.4.1 Council Waste and Resource Recovery Drop-Off Facilities

Residents of some LGAs can self-haul additional household garbage, recycling and/or garden waste to their local drop-off facility for disposal or recycling. The Blue Mountains operates their Katoomba and Blaxland Resource Recovery and Waste Management Facilities for residents of the Blue Mountains. Hawkesbury also operates a drop-off facility for residents at the Hawkesbury Waste Management Facility. Cumberland (previously Holroyd) and Fairfield operate recycling drop-off facilities in their LGAs on certain days. There was 17,500 tonnes of waste dropped off by residents at these facilities in 2015/16.

Table 3: Kerbside Clean-Up and Chipping Services

Council	Kerbside Clean-Up Service			Chipping/Mulching Service		
	Frequency per Annum	On Call/ Pre-Booked	Scheduled	Frequency	Kerbside Service	Drop-Off
Blacktown	12	✓				
Blue Mountains	2[ab]	✓		2 per year	✓	
Cumberland (Auburn)	4	✓				
Cumberland (Holroyd)	2[b]		✓	1 per week/ 2 per month[c]		
Fairfield	2		✓	2 per year	✓	
Hawkesbury	1[b]	✓				
The Hills	2	✓				
Liverpool	2[b]	✓				
Parramatta	4[d]	✓	✓			
Penrith	4	✓				

Source/Notes:
a) Residents are entitled to two on call services of their choice per year (bulky waste collection, kerbside chipping service or one of both)
b) Additional services can be provided to residents for a fee
c) Service is open every Sunday during daylight savings time and opened bimonthly during non-daylight savings time
d) Residents are entitled to two on call services and two scheduled services

2.4.2 Community Recycling Centres and Mobile Services

Councils provide opportunities for residents to recycle or safely dispose of household problem waste materials through local permanent drop-off sites and mobile services. As part of the NSW Government's recent WLRM Community Recycling Centre (CRC) grant program, funding support was provided to six councils in the region for the development of new household problem waste recycling services.

Current and planned council-operated community recycling services are listed below:

- Liverpool Recycling Drop-Off Centre;
- Katoomba Resource Recovery and Waste Management Facility;
- Mobile Community Recycling Service (Cumberland and Parramatta);
- Penrith Community Recycling Centre;
- Hawkesbury Community Recycling Centre (opening November 2017); and
- Fairfield Community Recycling Centre (opening 2018).

A standard range of problem waste types are accepted by all community recycling centres. This range currently includes:

However, the collection and recovery of additional household problem waste materials can change according to the host council given varying storage space on site and current contractual arrangements.

2.5 Domestic Waste and Recycling Generation

Close to 739,600 tonnes of domestic waste and recycling was collected from Western Sydney households in 2015/16 through kerbside bin services, kerbside bulky waste clean-up collections and council drop-off and mobile services. More than half of this waste was diverted from landfill and recovered with the region achieving an overall domestic recycling rate of 54%; which is higher than the NSW rate of 47.5%. Historical data shows that domestic waste recycling rates in the region increased between 2007/08 and 2011/12 from 44% in 2007/08 to 53% in 2011/12. A slight decrease was reported during 2013/14 and 2014/15 however recycling rates have increased overall between 2010/11 and 2015/16 by 2%. *Refer to Table C in Appendix B for a breakdown of total domestic tonnes by council.*

Data in Table 4 below shows the waste generation rates for the various kerbside services offered by councils and indicates that residents in the region disposed of an average of 7.4 kilograms per person per week of waste and recycling via the kerbside bin collection service. This is slightly higher than the NSW average of 7.1 kilograms per week. *Refer to Table B in Appendix B for historic kerbside bin waste generation rates for the region.*

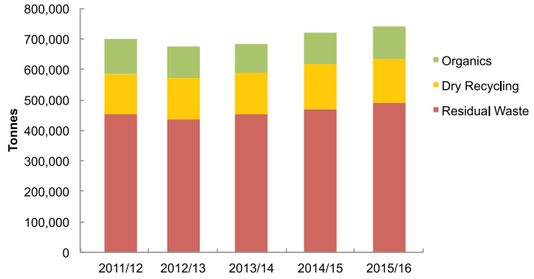
Total generation of domestic waste and recycling in the region has increased overall in the past five years. This is detailed in Figure 4, which shows the tonnage of waste composted, recycled and sent to landfill from domestic waste services between 2011/12 to 2015/16. Waste generation levels decreased during 2012/13 and 2013/14, and increased again from 2014/15 to 2015/16 during the 5 year period. Population growth also contributed to this increase. There has been a marginal increase (3.2%) in the proportion of waste recycled from 2013/14 to 2015/16 due to improved education, improved recycling practices and improved recovery from AWT processing of residual waste.

The introduction of new collection services in Hawkesbury in 2013/14 contributed to the decrease in waste sent to landfill in the following years, and an increase in organic waste processed at this time. The recovery rates for AWT processing of kerbside residual waste from Fairfield dropped significantly in 2013/14 and 2014/15, and then increased again in 2015/16. This contributed to a decrease in the region's average domestic waste recycling rate from 53% in 2012/13 to 51% in 2013/14.

Table 4: Kerbside Waste Generation Yields, 2015/16 (kg/capita/week)

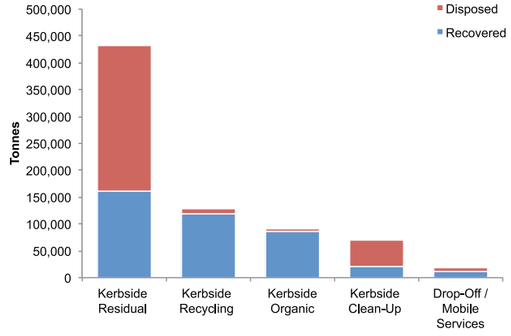
Council	Kerbside Residual	Kerbside Recycling	Kerbside Organic	Total Kerbside Bins	Clean-Up
Blacktown	5.9	1.3	-	7.2	0.7
Blue Mountains	5.8	2.2	-	8.0	1.0
Cumberland (Auburn)	5.4	0.9	0.6	6.9	1.3
Cumberland (Holroyd)	5.5	1.3	-	6.8	0.6
Fairfield	6.5	1.2	-	7.7	1.21
Hawkesbury	5.2	1.9	1.1	8.2	0.2
The Hills	4.3	1.7	2.1	8.1	1.2
Liverpool	4.4	1.6	1.5	7.5	0.5
Parramatta	3.7	1.2	1.3	6.1	0.7
Penrith	3.1	1.9	3.1	8.1	0.6
Region Average	**4.9**	**1.5**	**1.0**	**7.4**	**0.8**

Figure 4: Total Domestic Waste Generation from the Region, 2011/12 to 2015/16



Average recycling rates for the region vary across the different waste streams collected by the councils as shown in Figure 5. The majority of materials collected via the kerbside co-mingled recycling bin and organics streams are recycled (over 92%). A substantial quantity of kerbside residual waste (37%) is also recycled through AWT processing systems and recycling of kerbside clean-up waste services (32%). Drop-off facilities offered by some councils provide the community with further opportunities to dispose of or recycle waste at specific locations. These drop-off centres, particularly those located in the Blue Mountains and Hawkesbury, collect significant quantities of waste and recyclable materials from residents of these councils.

Figure 5: Total Recovery Across Domestic Waste Streams, 2015/16



2.6 Domestic Recycling Performance

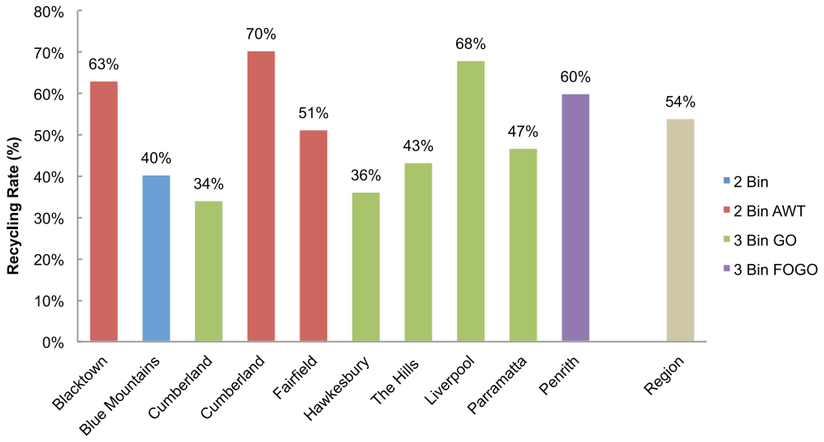
The range of kerbside bin collection systems, kerbside clean-up services, drop-off and mobile household waste services and associated educational and engagement programs provided by the councils results in variable levels of recycling and landfill diversion.

Figure 6 (see next page) shows the variation of domestic recycling rates in 2015/16 across Western Sydney. These recycling rates take into account kerbside bin, kerbside clean-up and drop-off services. While this comparison is useful for tracking progress against regional and state targets, direct comparison of recycling rates at the council level is not necessarily useful as councils who are able to offer different services do not sit on a level playing field.

Review of council recycling rates in 2015/16 indicates the following:

- Cumberland (Holroyd) has the highest recycling rate at 70%, followed by Liverpool with 68%. Both councils send residual waste for processing and additional recovery of resources at an AWT facility. Liverpool also provides a 3-bin service which includes a GO kerbside bin collection.
- Penrith has a 3 bin FOGO service resulting in a recycling rate of 60%. Blacktown is also performing above the State and region average with a recycling rate of 63%.
- City of Parramatta commenced AWT processing of 100% of collected garbage waste in July 2016, which is expected to lead to a recycling rate of over 70%.
- Blue Mountains commenced a new 3-bin GO kerbside collection in July 2016. The new service has resulted in an approximate 30% decrease in the amount of kerbside bin residual waste going to landfill. Kerbside bin recycling rates have increased (above 55%) and this will be reflected in future annual reporting. Bushfires and bushfire safety maintenance practices have also impacted waste generation and recycling rates in the Blue Mountains, following the significant bushfire disaster in 2013.

Figure 6: Domestic Recycling Rates, 2015/16



- Blue Mountains and Hawkesbury each operate their own full-time drop-off sites. Drop-off sites receive a range of waste materials which are sometimes difficult to report to discrete MSW, C&I and C&D waste types. This can decrease the recycling rates reported for the MSW fraction. This factor impacts on the overall recycling rates for these councils.
- The newly formed Cumberland LGA (comprising parts of the Parramatta LGA and the pre-amalgamated councils of Auburn, Holroyd) will result in a recycling rate of over 50%.

It is noted that the EPA's preferred resource recovery practice for local councils is to use a smaller (80, 120 or 140 litre) residual waste bin alongside a 240 litre yellow-top co-mingled recycling collection bin[5], which aims to encourage and reinforce recycling and waste avoidance behaviour. Five councils including Cumberland (Auburn) had employed this practice in 2015/16. Blue Mountains have since rolled out a GO kerbside bin collection service and 120 litre residual waste bins. A range of issues, including factors such as the potential for bin contamination, are considered by councils when selecting appropriate bin sizes and services for their residents.

2.7 Waste Composition

All councils are encouraged to carry out kerbside bin audits once every two years as part of routine monitoring and evaluation of kerbside service usage and compliance with source separation requirements. A number of Western Sydney councils have undertaken waste audits in recent years, although not necessarily at the same time. A review of council audit data within the region indicates the following:

- Considerable quantities of recyclable materials and organics are lost to landfill through inefficient source separation by residents. On average, 15% (by weight) of the residual waste bin comprising of co-mingled recyclable materials (rigid plastics, paper and cardboard, metals and glass) and 51% (by weight) of the residual waste bin is made up of garden and food organics could be potentially recovered from AWT (see Figure 7).
- The contamination levels (see Figure 8) of the co-mingled recycling bin in the region show reasonably high rates of contamination (14% by weight) compared to the Sydney Metropolitan Area (9%). Some councils have low average contamination rates (less than 7% by weight) while other councils have higher average contamination rates (greater than 24%) and require further attention.
- The contamination levels of the co-mingled recycling bin are likely to be higher for MUDs and social housing (SUDs and MUDs) compared to SUDs. Three audits undertaken in the region indicate higher contamination rates for recycling bins provided to MUDs, particularly when compared to urban SUDs, while one audit undertaken in the region shows higher contamination rates were present for recycling bins used by social housing MUDs and SUDs.

It should be noted that councils with a 2-bin kerbside collection system which send their residual waste to an AWT facility for processing rely on a proportion of the residual waste stream comprising of food and garden organics to enable the facility to generate a suitable output or product for onward use.

Figure 7: Potentially Recoverable Materials Present in the Kerbside Residual Waste Bin (% By Weight)

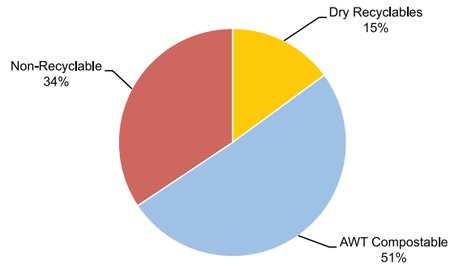
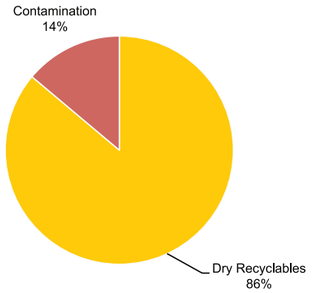


Figure 8: Contamination Present in Kerbside Co-mingled Recycling Bin (% By Weight)

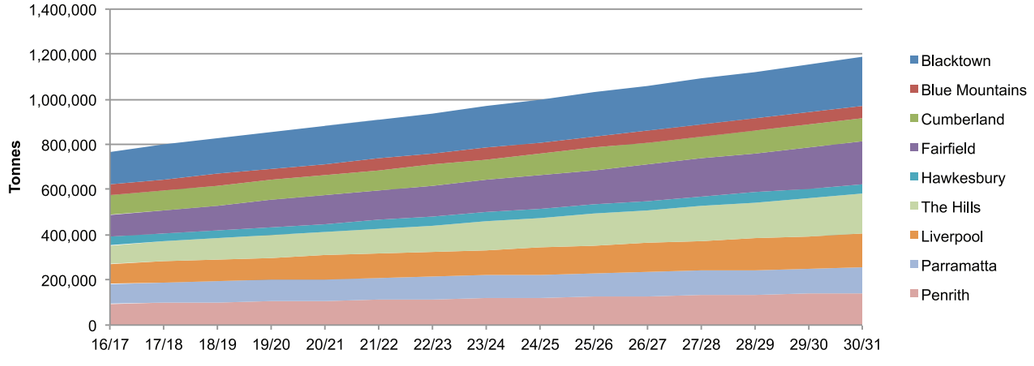


2.8 Waste Trends and Projections

Waste generation per capita in Western Sydney has increased overall over the past five years (2011/12 to 2015/16), and has increased year on year from 2012/13. Decreases in per capita rates have been recorded for three LGAs however an equal number of LGAs have also recorded increases. Total waste generation has also been shown to have positive correlation to increasing population levels. As all nine councils are expected to experience a significant increase in population in the future, councils are likely to see a corresponding increase in waste generation, in addition to the per capita generation increases, assuming the current trend continues.

Figure 9 presents the projected waste generation tonnages to 2031 modelled on anticipated population or household growth and increases in waste generation.

Figure 9: Projected Total Domestic Waste Tonnes, 2016/17 to 2030/31



[5] Environment Protection Authority (2012) Best bin systems – Preferred resource recovery practices by local councils

The projection shows that the total domestic waste generation for the region is expected to continue growing to approximately 882,500 tonnes per annum in 2020/21, and to over 1.19 million tonnes in 2030/31. *Refer to Table D in Appendix B for a breakdown of the projected tonnes by council.*

Figure 10 shows a breakdown of the projected domestic waste stream tonnes for the region. Figure C and D in Appendix B provide a breakdown of the projected kerbside bin and clean-up collection tonnages by council. The projected increase in kerbside clean-up tonnages is significant relative to the other waste streams and reflects data and anecdotal evidence reported by the councils. Section 2.8 outlines the likely impact that different waste collection and processing scenarios on the region's future recycling and diversion performance.

2.9 Waste Management Options Analysis

Modelling of future population levels, domestic waste tonnages and potential service and processing options, shows a range of options to increase recycling and diversion of waste from landfill by 2021. In order to reach a recycling rate of 70% by 2021 (the NSW WARR strategy target), a combination of changes are required.

The modelling considered the impact of likely and potential changes by councils in the 2017-2021 period including:

- Introducing or expanding organics services;
- Increased recovery from the clean-up waste stream;
- Improved education leading to reduced generation of waste and improved source separation in the household;
- Increased proportion of waste sent to AWT for processing; and
- Thermal processing of eligible organics depleted residual waste.

A summary of domestic waste recycling and landfill diversion performance from each of the scenarios is presented in Figure 11 and highlights the varying potential for the region to reach the State recycling target by 2021.

Figure 10: Projected Domestic Waste Tonnes for the Region, 2016/17 to 2030/31

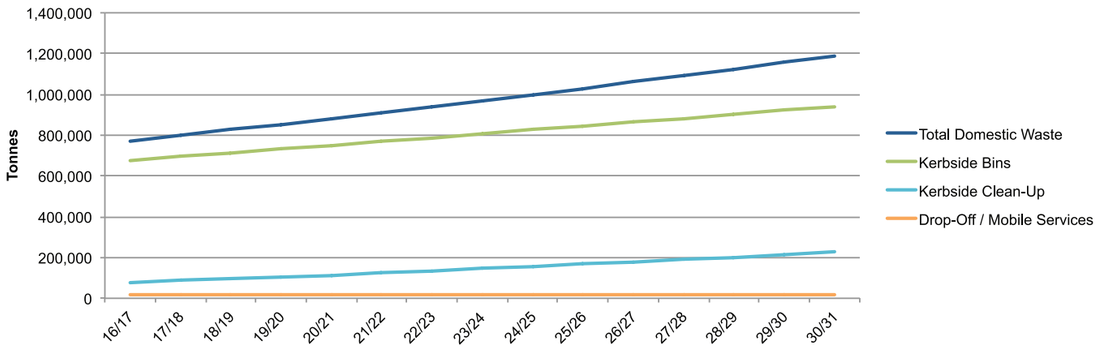
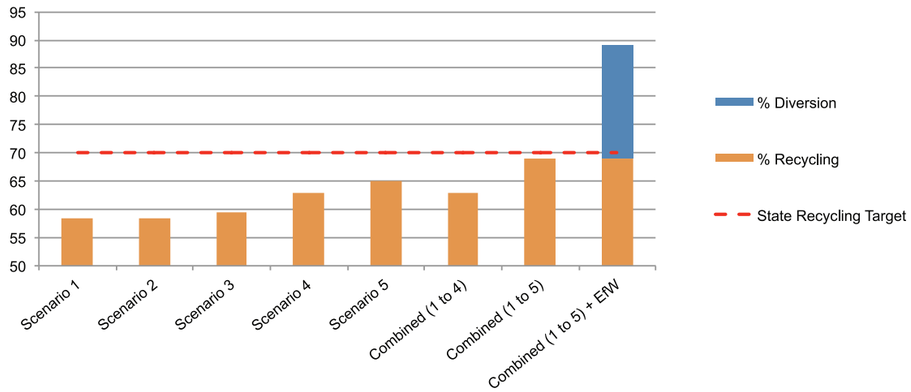


Figure 11: Summary of Potential Resource Recovery Performance in 2020/21



Scenario 1	Business as usual	**Scenario 5**	Additional residual waste sent at AWT facility
Scenario 2	Regional education for improved waste avoidance and recycling by residents	**Combined (1 to 4)**	Combined Scenarios 1 to 4
Scenario 3	Introduction of additional garden organics services	**Combined (1 to 5)**	Combined Scenarios 1 to 5
Scenario 4	Maximum recovery of clean-up waste stream	**Combined (1 to 5) + EfW**	Combined Scenarios 1 to 5 plus thermal processing of residual waste at EfW facility

It has to be noted that the future projected increase in kerbside clean-up waste tonnages has a marked effect on the performance of all modelled options. The net impact of rising kerbside clean-up waste tonnages is a long term decline in recycling rates irrespective of the action taken elsewhere to other waste streams. This highlights the need for the region to investigate solutions for improved recovery of clean-up wastes in order to combat this projected decrease in the region's overall performance. *Further information on the options analysis method is detailed in Appendix C.*

2.10 Waste and Recycling Collection, Processing and Disposal Contracts

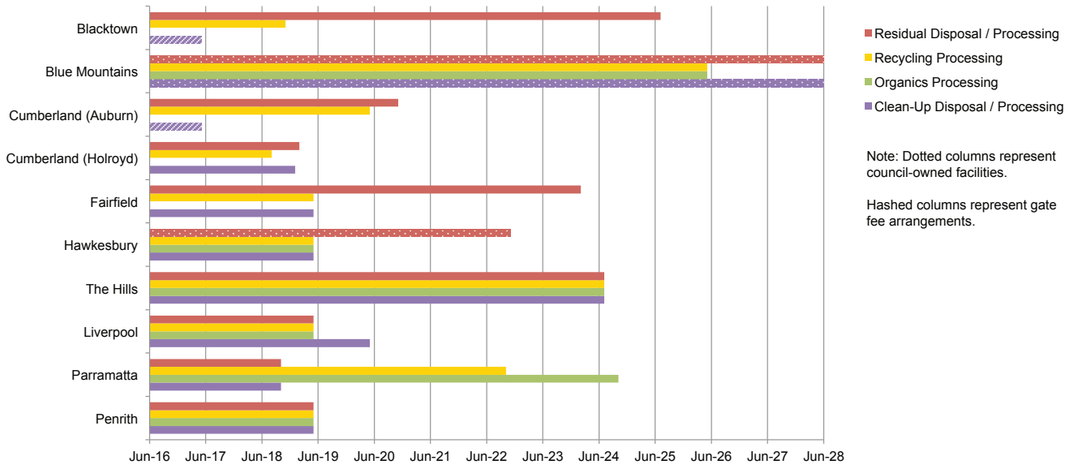
Western Sydney councils use a combination of council staff and external contractors to carry out the collection of various waste streams from the household. In-house collection services are most commonly used to collect kerbside residual waste and kerbside clean-up waste streams, with some councils also using in-house services to collect recycling streams.

Blue Mountains (kerbside residual and clean-up) and Hawkesbury (kerbside residual) own landfills and manage the disposal of the residual waste stream in their LGAs. Processing and disposal contracts are used by all other councils for the management of residual waste. All councils use contractors for the processing of co-mingled recycling and organics. Appendix D presents contractual information for all council kerbside bin and kerbside clean-up contracts.

Figure 12 shows the expiry dates of waste processing and disposal contracts of the councils through to 2028. Alignment of expiry dates in year 2019 and 2022 could offer an opportunity for joint tendering by councils. Opportunities for waste disposal and processing joint tenders and contracts are reviewed on a regular basis by councils situated both within and sharing borders with the Western Sydney region.

Additional minor waste collection services supported by councils are outlined in Table E of Appendix B and include bulky cardboard, white goods and medical 'sharps' waste. There is also a joint contract managed by WSROC that provides for mattress recycling across nine (formerly ten) councils in the region. There is scope to investigate joint contract opportunities for some of these waste streams in the future.

Figure 12: Timeframes for Current Council Processing and Disposal Contracts



Notes: Contract extension periods are not indicated. Blue Mountains Blaxland Waste Management Facility has approval for extensions equivalent to capacity until approximately 2033. Hawkesbury City Waste Management Facility has capacity until approximately 2023. Parramatta and Cumberland (formerly Auburn and Holroyd) are consolidating services following council amalgamations and boundary changes announced in 2016. Parramatta and The Hills have recently undergone tendering for various collection contracts.

2.11 Waste Levy Regulated Areas

The waste levy applies in regulated areas of NSW. All of the councils participating in this strategy are located within the Metropolitan Levy Area (MLA), with the exception of the Blue Mountains LGA which is located within the Regional Levy Area (RRA).

Councils in the MLA currently pay $138.20 in 2017/18, while in the RRA a lesser rate is required ($79.60 in 2017/18). The levy rate in these regions needs to be considered when planning waste management programs.

2.12 Waste and Recycling Disposal and Processing Infrastructure

2.12.1 Current Waste Infrastructure

Waste management facilities within Western Sydney include landfills, AWT facilities, MRFs and organics processing facilities. Commercial operators manage the majority of these facilities. Council-owned landfills are in operation in the Blue Mountains (Blaxland) and Hawkesbury (South Windsor).

Collectively, the nine councils send their domestic waste to 19 waste and recycling facilities for transfer, processing or disposal. Most of these facilities are located within the region (see Figure 13).

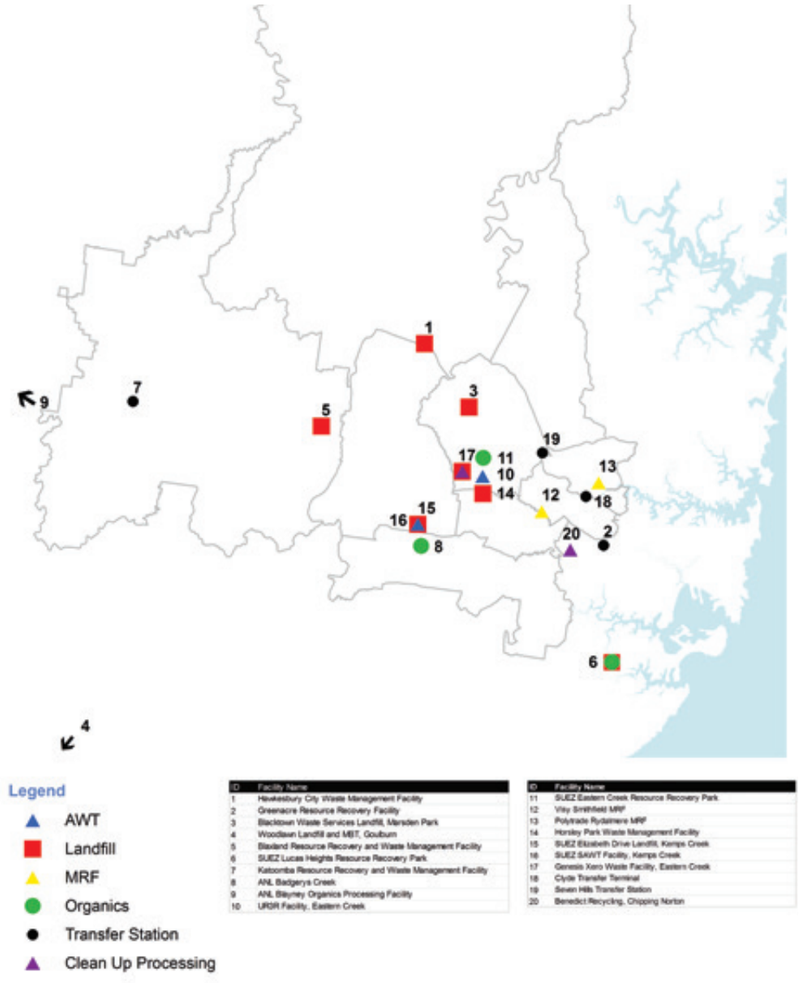
Most landfills in the region are large sites with disposal capacity in excess of 20,000 tonnes per annum. Resource recovery practices at landfills and transfer stations vary across the region. Two AWT facilities are used by councils to process residual waste. The UR-3R facility processes residual waste from Blacktown, Fairfield, Parramatta and Cumberland (Holroyd), and the SAWT facility processes residual waste from Liverpool. Penrith also sends a proportion of residual waste (generated by MUDs) to the SAWT facility for processing.

The remaining councils send their kerbside residual bin waste directly to landfill. Blue Mountains and Hawksbury dispose of residual waste at their council-owned landfills. The Hills send their residual waste to Lucas Heights Landfill via Seven Hills Transfer Station and Cumberland (Auburn) sends its residual waste to Woodlawn Landfill via the Clyde Transfer Station. Penrith sends organics depleted residual waste to SUEZ Kemps Creek Landfill.

Most recyclable material is sent for processing to the VISY Smithfield MRF, with recyclables from one council processed at the Polytrade Rydalmere MRF. Source separated food and garden organics (Penrith) is composted at the SAWT facility. Garden organics are sent for processing to SUEZ Eastern Creek Resource Recovery Park (The Hills, Hawkesbury, Cumberland (Holroyd) and Parramatta), SUEZ Kemps Creek (Penrith), ANL Badgerys Creek (Liverpool), ANL Blayney (Blue Mountains) or Greenacre Resource Recovery Park (Cumberland (Auburn)).

Bulky household materials collected through the kerbside clean-up service are processed to recover recyclable material at Genesis Xero Waste Facility (Parramatta and Cumberland (Holroyd)) and Benedict Recycling (Liverpool). Clean-up waste is disposed to landfill at Veolia Horsley Park Landfill (Blacktown), Blaxland Landfill (Blue Mountains) SUEZ Lucas Heights Landfill (Fairfield), Marsden Park Landfill (Hawkesbury), SUEZ Kemps Creek (Hills, Penrith) and Greenacre Resource Recovery Park (Cumberland (Auburn)). *Further details on waste facilities utilised by councils are included in Appendix E.*

Figure 13: Current Disposal and Processing Infrastructure



2.12.2 Waste Processing and Disposal Infrastructure Needs

The region needs to consider the capacity of existing waste disposal and processing infrastructure when planning the management of waste and recoverable streams. It is noted that the EPA is scheduled to release its NSW Waste and Resource Recovery Infrastructure Strategy in 2018, which may provide further assistance with information for infrastructure needs planning.

In the Sydney Metropolitan Area, limited waste processing capacity, the increase of the landfill levy, and the release of the NSW Energy from Waste (EfW) Policy are contributing market interest in AWT.

Recent changes in the waste infrastructure sector include:

- SUEZ's Eastern Creek Landfill closed in August 2017.
- In 2017, Veolia brought on line an additional 240,000 tonnes per annum of processing of residual waste through their Woodlawn MBT plant.
- In 2015, SUEZ announced a proposal to expand their Lucas Heights landfill facility increasing its landfill capacity by 410,000 tonnes per year to 1,140,000 tonnes per year, and extending the life of the landfill from 2025 to 2037. The proposal included the relocation of the existing garden organics processing facility (to increase its capacity to 80,000 tonnes per year) and the construction of an advanced resource recovery technology (MBT) facility to recover additional resources. This proposal received planning approval in late 2016.
- In 2015, Dial-A-Dump Industries lodged a submission for planning approval for its proposed 'Genesis' Energy from Waste plant at Eastern Creek. An amended proposal was submitted in late 2016 and is currently being evaluated.
- SUEZ is investigating an expansion of their SAWT facility to process up to 220,000 tonnes per annum (i.e. an additional 86,000 tonnes per annum) of residual waste.
- Global Renewables Australia plan to build a new refuse derived fuel (RDF) facility at its Eastern Creek UR 3R site as part of the EPA's 2013 major resource recovery infrastructure grant program. The RDF facility would turn residual waste which is currently landfilled into an alternative fuel. The proposal is still in the investigation stages.

When comparing future waste generation with existing and planned future waste infrastructure capacity, a needs analysis can assist to plan future infrastructure needs for the region. The outcomes of an infrastructure needs analysis commissioned to inform the region are outlined below:

- It is forecast that over 1,150,000 tonnes per year of MSW will be generated by the nine councils in 2021. The available capacity (actual throughput in 2015) of various facilities located within the Western Sydney region that process MSW was 2,172,000 tonnes.
- If the demands of adjacent regions are ignored, the waste processing facilities located in the region and facilities accessible to these councils outside the region would meet the projected 2021 waste processing requirements.
- However, given Western Sydney is home to many waste processing and disposal facilities managing waste for all of the Sydney Metropolitan Area, the demands of the Western Sydney region cannot be looked at in isolation. Councils do, however, need to consider reasonable travel distances to transfer or disposal sites when planning waste disposal and processing needs.
- Modelling indicated the need for three additional mixed waste treatment facilities by 2021, additional organics processing and EfW facilities and additional co-mingled recycling capacity at existing facilities, to cater for the processing and disposal of Sydney's MSW.
- SUEZ's plans for a 200,000 tonnes per year mixed waste treatment facility at Lucas Heights, or Hawkesbury City Council's preliminary investigation into a mixed waste treatment facility at South Windsor (The Driftway) may partially meet this need.
- Landfilling at either (or both) SUEZ's Lucas Heights and Veolia's Woodlawn facilities may need to be agreed as an interim solution following closure of Eastern Creek Landfill, despite transport logistics challenges and increased costs for waste generators north of the Parramatta River.

This modelling and the previous Western Sydney 2014-17 Strategy indicated similar conclusions in that more residual waste and organics processing facilities would be required for the region to achieve the NSW WARR recycling target by 2021.

In addition to the lack of residual waste and organics processing capacity, there are a number of considerations for Western Sydney councils, including:

- Where a council's only option is to utilise a transfer station (i.e. due to no proximate landfill) there will be a large cost implication (approximately 20% premium).
- Sufficient time must be allowed for planning approval and construction of facilities (2 or more years) in addition to the 12 to 18 month procurement process, and allowing sufficient time for community consultation.
- Organisations likely to invest in waste infrastructure will need a well-planned, long term and secure waste supply agreements.

The Hawkesbury landfill is a key strategic asset for councils in the north and west of this region and could be a priority for sub-regional waste planning and cooperation.

The waste projection modelling study concluded that a combination of both AWT and EfW facilities would be required for the region to treat residual waste in order to meet the State's 2021 recycling target.

It is noted that the Hawkesbury City Waste Management Facility (landfill) will reach capacity in 2022, while the Blue Mountains Blaxland landfill has approval for extensions equivalent to landfill life of 2033.

2.12.3 Household Problem Waste Infrastructure Needs

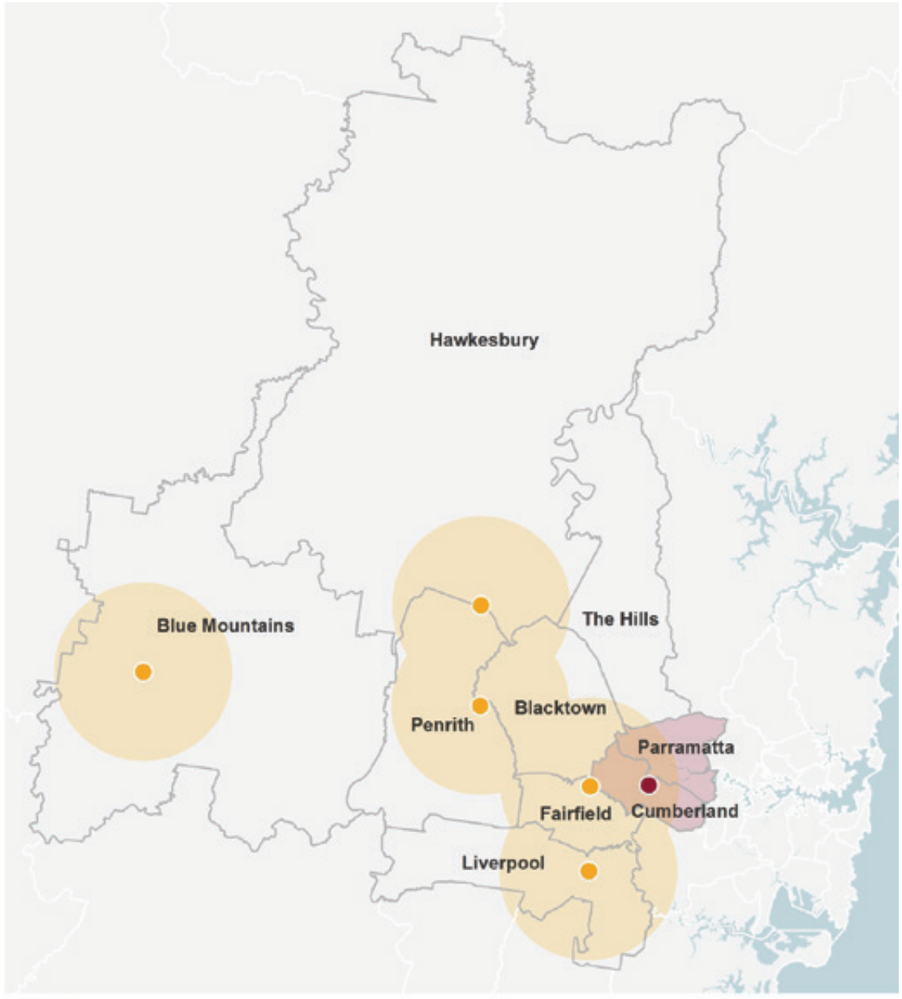
Figure 14 shows the current and planned community recycling (drop-off) centres in the region to assist in determining additional regional needs for household problem waste solutions.

This shows the current availability of these centres to residents based on the assumption that residents will travel an average of 11 kilometres[6] to drop-off household waste for resource recovery purposes. Cumberland and Parramatta's mobile service is available to all residents of these two LGAs (in purple below) and is therefore not available for residents in other LGAs willing to travel. Based simply on travel distance, the map shows that additional infrastructure is needed in parts of the Blue Mountains, Hawkesbury, Blacktown and The Hills.

[6] Improved Systems for Household Problem Wastes- Community Recycling Centre (Drop-Offs) Round 1 Funding Guidelines 2014.

There are also product stewardship schemes, such as Paintback, which accept specific problem wastes. A number of privately-owned drop-off sites and resource recovery centres also operate throughout the region which will accept some problem household wastes. Privately-operated sites have not been mapped as fees may apply at some sites for accepted waste items and are subject to change.

Figure 14: Access to Community Recycling Centres and Mobile Services for Problem Household Wastes



Note: An 11km radius has been provided around each recycling drop-off centre to indicate the average distance that residents may travel to drop-off household problem wastes for recycling

2.13 Additional Council Waste Services

Councils provide a range of additional waste services to the public. These include:

- routine street sweeping to keep streets clean and tidy;
- maintenance of a network of public place litter bins to collect waste and recycling generated in public places;
- maintenance of a network of Gross Pollutant Traps (GPTs) to help prevent pollution, such as littered items, from entering our waterways;
- management of e-waste and household chemical clean out events; and
- management of illegally dumped waste within council jurisdictional areas.

Waste collected from these council operations forms part of the MSW stream and is reported on a regular basis to the EPA.

2.14 Community Programs

Councils are engaging their communities with a number of waste education programs and services that increase waste avoidance and improve waste and recycling practices in the community. Common programs offered in the region include:

- School education programs, informing students about the environmental impacts of waste and the benefits of recycling;
- Contamination management programs, seeking to improve the community's understanding of what can be placed into recycling and organics bins;
- Food waste avoidance programs, seeking to reduce the volume of avoidable food waste disposed at the household level;
- Managing food and garden organics at home through composting and worm farming;
- Delivering education activities to specifically engage with culturally and linguistically diverse and transient communities;
- Waste reuse programs, often in partnership with social enterprise groups to repair or repurpose waste items avoiding disposal; and
- Electronic waste collection services, reducing electronic waste disposed of in kerbside bins and clean-up services.

Many councils have noted that contextually based/ targeted education programs and initiatives are generally more successful in bringing about behaviour change at the household level than high-level mass produced educational materials. There is greater scope for successful programs to be replicated across the region.

The EPA sees regional waste groups ideally placed to increase engagement with Aboriginal communities to strengthen relationships and tailor and improve services if needed. Although the region is home to areas of great Aboriginal heritage and a significant population of Aboriginal and Torres Strait Islanders reside in the region, there are no Discrete Aboriginal Communities[7] (as defined by the EPA) located within the Western Sydney region and the Western Sydney councils do not currently provide additional or differing waste collection services to their Aboriginal communities. Some Western Sydney councils provide specific community engagement activities as guided by their individual Aboriginal Community Development Workers or Liaison Officers.

[7] Discrete Aboriginal Communities are defined by the EPA as those formerly known as 'missions', 'reserves' or 'stations' as per the EPA's Aboriginal Communities Waste Management Program.

3. Where Do We Want to Get To?

3.1 Drivers for Regional Collaboration on Waste Issues

Councils work together on joint programs, grants and contracts, and regularly share knowledge to help tackle common challenges. Key drivers for strategic waste management at the regional level are detailed in Appendix F and Appendix G, and include common challenges faced by the councils, changes to NSW Government policy and opportunities for funding. The EPA supports councils working together by funding regional strategies and programs to tackle regional waste and resource recovery issues specific to the region.

3.2 Vision

The vision for this Strategy is:
A strategic and collaborative approach to waste avoidance and resource recovery, which is supportive of our communities and the economy, and reduces waste generation.

3.3 Strategy Outcomes

The key outcomes that councils are aiming to achieve through development of this Strategy are to:

1) Contribute to the achievement of the NSW 2021 WARR targets through regional collaboration;
2) Support councils where services can be improved;
3) Identify and promote best practice community engagement to raise awareness of waste avoidance and resource recovery;
4) Improve services for problem household waste, reducing illegal dumping and littering; and
5) Work collaboratively to deliver innovative waste management and resource recovery initiatives that maximise regional benefits.

3.4 Strategy Themes, Objectives and Targets

By working together to create a regional waste strategy, councils are committed to improving regional cooperation and identifying opportunities to improve the economic viability of recycling and resource recovery practices in the region.

To ensure that the region is contributing towards achieving state-wide objectives, it has chosen to develop regional objectives and targets that sit within each of the NSW WARR Strategy themes. Themes 2 & 3 have been combined to better reflect the interrelated nature of recycling and diversion in the region's focus. An additional theme has been maintained to capture the governance and collaboration elements necessary for delivery of a regional strategy.

The Strategy themes are:

- **Theme 1**: Avoid and reduce waste generation;
- **Theme 2 & 3**: Increase recycling and divert more waste from landfill;
- **Theme 4**: Manage problem wastes better;
- **Theme 5**: Reduce litter;
- **Theme 6**: Reduce illegal dumping; and
- **Theme 7**: Improve regional governance.

Strategy targets have been developed to allow progress against the Strategy Action Plan to be measured and to provide further direction to the region over the four year Strategy time period.

Table 5: Strategy Objectives and Targets

Theme	Objective	Target
Theme 1: Avoid and reduce waste generation	• To increase opportunities for waste avoidance and reuse in the region.	• Increase opportunities for waste avoidance and reuse in the region by 2021.
Theme 2 & 3: Increase recycling and divert more waste from landfill	• To improve resource recovery rates across the region. • To better plan for, and deliver, improved waste and resource recovery infrastructure.	• Work towards a domestic resource recovery rate of 70% by 2025. • Reduce the kg/capita of recyclable material in residual waste bin by 2021 (compared to baseline 2015/16). • Waste planning is strengthened at a State department level by 2021 and is considered in all significant development and strategic planning.
Theme 4: Manage problem wastes better	• To improve the capture of problem waste and other targeted household wastes across the region.	• Increase opportunities for the responsible disposal of household problem waste by 2021.
Theme 5: Reduce litter	• To deliver programs that address litter in the community.	• All programs maintain majority participation by councils across the life of the Regional Litter Plan.
Theme 6: Reduce illegal dumping	• To deliver programs that address illegal dumping in the community.	• Deliver projects that address illegal dumping in 5 council areas by 2021.
Theme 7: Improve regional governance	• To foster enhanced regional collaboration.	• Identify 5 new opportunities for regional collaboration by 2021.

4. How Will We Get There?

4.1 Identifying Regional Actions

The actions identified for implementation at a regional level are centred around the NSW WARR Key Result Areas (KRAs) or 'themes' of avoiding and reducing waste generation, increasing recycling, diverting more waste from landfill, managing problem wastes better, reducing litter and illegal dumping, and an additional theme specific to this region of 'enhancing regional cooperation'. The Strategy focuses on delivery of regional actions and programs from which council level actions can be implemented where appropriate. The actions listed below make up the 4 Year Action Plan. These actions will be coordinated by WSROC staff at a regional level on behalf of participating councils, taking guidance from councils, with councils participating in project formulation and delivery as required.

4.1.1 Theme 1: Avoid and Reduce Waste Generation

Actions:

1. Investigate opportunities to reduce packaging waste
2. Measure, monitor and promote waste avoidance and reuse activity across the region

Promoting waste avoidance and minimisation is notoriously problematic for councils and regional groups of councils. Generation of waste is inherent to an economic system premised on growth and consumerism. Reducing waste generated in the first place reduces consumption of resources (such as energy, water, transport) required to produce and transport products. Education is a core tool used by councils and regional groups of councils to promote waste avoidance and minimisation, and to reduce the volume of waste required to be managed by councils.

Developing metrics which enable waste avoidance and reuse activities in the community to be monitored and reported on in a consistent manner will improve our understanding of the impacts that these activities have on overall waste generation, and assist in demonstrating the importance of waste avoidance and the principles of responsible consumption to external stakeholders. Information sharing across NSW and interstate will be undertaken to determine existing measures or metrics for benchmarking purposes.

4.1.2 Theme 2 & 3: Increase Recycling and Divert More Waste from Landfill

Actions:

1. Deliver region-wide communication campaigns and resources to support consistent educational messaging.
2. Work with stakeholders to undertake regional waste and resource recovery infrastructure planning.
3. Work with waste processing contractors to improve resource recovery at facilities.
4. Provide access to procurement and contract tender support.
5. Improve recovery of waste from kerbside clean-up services.
6. Facilitate improved residential waste planning and policy initiatives.
7. Investigate opportunities for better management of waste from multi-unit dwellings and residential flat buildings.

Consistent educational messaging is important to make it easier for residents and the community to understand the importance of separating recyclable materials from residual waste streams. However, council services can vary significantly from one LGA to another (e.g. different bin sizes or frequencies of kerbside collections, different waste acceptance criteria for recycling bins) and for different housing types which can lead to a confusion of what is required from the individual. While these variations in council waste collection schemes generally exist for good reasons given the range of urban and regional characteristics, transport distances and market conditions, there is significant scope for councils to identify commonalities between activities that sit above the council service level for targeting at the regional scale. Sharing of educational and marketing collateral and campaign materials across the region will also provide significant opportunities for councils to reduce costs associated with these activities, and help to reduce confusion for residents in understanding recycling services as they move between different LGAs. Opportunities may also result from the EPA's forthcoming state wide recycling education campaign.

WSROC and the councils have an essential role to play in terms of identifying and laying the groundwork to address waste infrastructure needs and resource recovery priorities. Identifying appropriate infrastructure and additional waste materials to be targeted for recycling is a top priority for the region. This is both due to the recent closure of landfill facilities and the need to secure waste management solutions to cater for the significant population growth and needs amongst councils to encourage, develop and utilise AWT and EfW infrastructure for increased waste processing capacity and improved resource recovery. Investment in additional resource recovery solutions to mitigate the projected growth of kerbside bulky waste amounts must be addressed in order to achieve the region's recycling target.

A key aspect of securing the required waste processing infrastructure will be strategic land use planning whereby a coordinated approach is developed among councils. This will also require action by the State to facilitate appropriate planning and approvals processes and to develop a favourable context for the establishment of waste infrastructure. More work needs to be done to ensure waste is considered alongside any other utility or essential service when planning for the region's growth.

To build upon the infrastructure projects undertaken as part of the previous Strategy, WSROC will work with the State Government for strategic waste and resource recovery infrastructure planning, and coordinate regional infrastructure planning with councils with a focus on identifying potential sites for needed infrastructure. WSROC will also seek to provide access to procurement and contract tender support, and explore a joints contract framework which investigates outcomes-based waste processing and market-led infrastructure delivery of cost effective solutions.

WSROC will engage with private waste and resource recovery infrastructure investors and operators to discuss challenges and solutions within the region in the next 5 to 10 years and monitor changes composition and capacity of kerbside recycling bins following the introduction of CDS to support investigations for additional capture of recyclables.

WSROC has been successful over the last few years in raising awareness of residential waste planning policy requirements in NSW and will continue to advocate on behalf of councils and work with key stakeholders to deliver improvements in this area. It has also been identified that waste management for buildings commonly experiencing short term tenancies could be more appropriately addressed at the regional scale.

4.1.3 Theme 4: Manage Problem Wastes Better

Actions:

1. Improve the availability of drop-off and pick-up facilities for problem waste.
2. Continue the regional household asbestos collection and disposal project (subject to grant funding).
3. Investigate better management of clinical waste in households.

Under the previous Strategy, the region established a number of community recycling centres with funding support from the WLRM initiative. However there is a need for additional sites and innovative solutions to provide suitable coverage for management of household problem wastes, and as a proactive measure focussed on prevention of illegal dumping. WSROC will expand on the work undertaken to date, and investigate the expansion of the range of household wastes accepted by these community recycling centres.

WSROC will also look to continue and enhance the Western Sydney Residential Asbestos Disposal Scheme (WSRADS) subject to grant funding being made available and work with council to investigate challenges caused by advanced waste processing of clinical waste in the domestic waste stream.

4.1.4 Theme 5: Reduce Litter

Actions:

1. Coordinate/deliver projects detailed in Western Sydney Regional Litter Plan 2016-2021.
2. Coordinate litter research programs.

As part of the NSW Government's Litter Regional Implementation Plan (L-RIP) grant program, ROCs developed Regional Litter Plans to support ongoing litter prevention measures, including the Premier's Priority for a 40% reduction by 2021 in the volume of litter in NSW compared to 2011/12 levels. Projects undertaken by WSROC to date have been effective in raising awareness of the costs, public health and environmental impacts of litter. Projects identified for implementation during the remainder of the 2016-2021 Regional Litter Plan will be coordinated by WSROC and ensure that the councils will benefit from joint resourcing. The impact of the NSW Container Deposit Scheme on litter in public places will also be monitored.

4.1.5 Theme 6: Reduce Illegal Dumping

Actions:

1. Deliver projects to reduce illegal dumping.

Illegal dumping is an issue that most councils within the region find challenging due to the magnitude of the problem across the Sydney Metropolitan Area. The region is particularly vulnerable to large scale illegal dumping in rural areas, with much of the waste originating from more urban areas of Sydney. Some councils are members of the Western Sydney RID Squad however this does not address all illegal dumping incidents within the LGAs. Illegally dumped waste can often include hazardous wastes such as asbestos, household bulky wastes and incidences of construction and demolition wastes (including contaminated soils and green waste).

The occurrence of illegally dumped asbestos is recognised to be largely due to convenience and cost factors, related to safe and legislated handling and management of asbestos waste. Access to disposal sites that can legally accept asbestos waste is limited. WSROC will work with external stakeholders including the EPA to increase access to convenient services for asbestos waste management, and to reduce a range of contributing cost factors to make it easier for the public to dispose of asbestos responsibility and to ultimately deter illegal dumping.

Programs targeted at reducing the incidence of illegal dumping around MUDs is also a priority for the region. MUDs in densely populated areas have previously been built with insufficient storage space needs and street frontages required to facilitate collections. The transient nature of residents living in MUDs and the difficulties faced in identifying ownership of illegally dumped materials has also contributed to significant increases in kerbside dumping of bulky household wastes (such as furniture and whitegoods). Programs to address this issue will be developed.

4.1.6 Theme 7: Improve Regional Governance

Actions:

1. Assist councils to identify opportunities for joint collaboration and increased funding.
2. Maintain a network of Western Sydney councils to share information.
3. Advocate for better resource recovery outcomes for councils.
4. Implement and monitor the regional waste strategy.

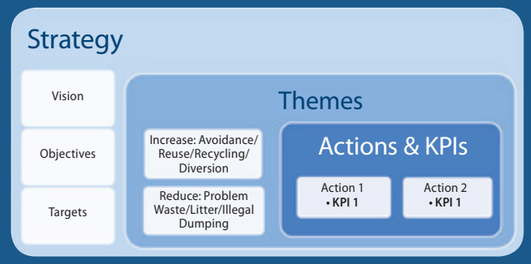
WSROC will continue to support information sharing and collaboration across the region by coordinating forums for councils to exchange learnings and experiences, supporting updates on infrastructure, innovation and policy, and compiling submissions to advocate for the needs of the region. These actions are a core function of the Regional Coordination Support Program.

5. How Will The Strategy Be Implemented

5.1 Strategy Framework

The Strategy framework below illustrates how the Strategy actions tie into the overall vision and themes underlying the Strategy. Key Performance Indicators (KPIs) for each of the actions allow monitoring and evaluation of progress and achievements. The KPIs align with the monitoring and evaluation framework issued by the EPA.

Figure 15: Strategy Framework



Although the Strategy has established themes which provide a useful framework for setting out the objectives and targets across the Key Result Areas (KRAs) of the NSW WARR Strategy, there are also overarching activities which can apply across the themes. These are detailed below. These key overarching elements should be considered holistically and delivered as coordinated packages.

Figure 16: Common Elements of Each Theme

Education and Awareness Programs	Collaboration/ Working Together	Maximising Infrastructure Efficacy	Advocating for Improved Outcomes
• Coordinating and standardising education materials avoids confusion across all resource recovery projects.	• Cooperation between councils will result in regional solutions benefitting many residents across all focus areas.	• Many actions across themes will rely on infrastructure inprovements or developments to be able to be successful.	• Represent the views of councils to deliver improved policy and programs addressing targeted regional priorities.

5.2 Strategy Budget and Delivery

WSROC has received a grant from the EPA through the WLRM Initiative to employ Regional Waste Coordination staff to deliver this regional strategy. Additional funding will be provided each year from 2017-2021 through the Better Waste and Recycling Fund to deliver regional actions identified in the Strategy. Further funding will be sought from the WLRM grants program, where further funding is required to deliver actions. Additional in kind support and assistance is provided by WSROC.

5.3 Periodic Review and Prioritisation

The implementation of the actions in the Action Plan will be reported on by WSROC to the EPA and the councils on an annual basis, which will also trigger a review and re-prioritisation of remaining actions through an annual workshop with councils. This annual review will enable councils to input to the activities planned for the forthcoming year, and will adapt the Action Plan to take into account relevant funding opportunities, changing legislation or relevant conclusions from previous studies. WSROC will facilitate a range of working groups to develop and deliver the regional projects. The Action Plan will remain flexible to meet the changing needs of the participating councils over the life of the Strategy.

5.4 Action Plan

A Strategy Action Plan, detailed in Table 6, has been developed by the councils to deliver on the Strategy themes, objectives and targets. To determine regional priorities, an options assessment was undertaken to rank potential actions, from which councils resolved actions most appropriate for implementation. *More detail on this process can be found in Appendix H.*

Projects with delivery commencing in the first year are detailed 2017/18 Action Plan (Table 7). Some projects will be delivered over more than one year. Governance actions detailed in Theme 7 are ongoing and will appear in each year's action plan.

Table 6: Strategy Action Plan, 2017 - 2021

Objectives	Targets	Actions	Sub-Actions	Key Performance Indicator	Timeframe for delivery
Theme 1: Avoid and Reduce Waste Generation					
To increase opportunities for waste avoidance and reuse in the region.	Increase opportunities for waste avoidance and reuse in the region by 2021.	1.1 Investigate opportunities to reduce packaging waste.	1.1.1 Develop a partnership project with Sydney Water to install bottle refill stations for reduction of single-use plastic bottles, where project is majority-funded by Sydney Water.	Number of opportunities delivered	2020
		1.2 Measure, monitor and promote waste avoidance and reuse activity across the region.	1.2.1 Identify and develop methods to measure, monitor and evaluate waste avoidance activities.	Number of projects delivered	2019
			1.2.2 Deliver a regional waste avoidance education campaign.		2019
Theme 2 & 3: Increase Recycling and Divert More Waste from Landfill					
To improve resource recovery rates across the region. To better plan for, and deliver, improved waste and resource recovery infrastructure.	Work towards a domestic resource recovery rate of 70% by 2025. Reduce the kg/capita of recyclable material in residual waste bin by 2021 (compared to baseline 2015/16). Waste planning is strengthened at a State department level by 2021 and is considered in all significant development and strategic planning.	2.1 Deliver region-wide communication campaigns and resources to support consistent educational messaging.	2.1.1 Councils apply consistent messaging in education across the region, (eg. for source separation of recyclables and appropriate disposal in MUDs).	Number of education programs developed	2020
			2.1.2 Develop CDS information packs.		2018
		2.2 Work with stakeholders to undertake regional waste and resource recovery infrastructure planning.	2.2.1 Engage with the private waste and resource recovery infrastructure investors and operators to discuss challenges and solutions within the region in next 5-10 years.	Number of activities documented Number of stakeholders engaged	2018
			2.2.2 Coordinate regional waste and resource recovery infrastructure planning with councils at a senior management level, with a focus on identifying sites for this infrastructure.		
			2.2.3 Advocate to the State Government for strategic waste and resource recovery infrastructure planning.		
		2.3 Work with waste processing contractors to improve resource recovery at facilities.	2.3.1 Lobby industry stakeholders and existing facilities to support improved performance and expanded operations.	Number of activities documented	2021
			2.3.2 Monitor changes to the composition and capacity of kerbside recycling bins after introduction of the CDS, to investigate opportunities for additional capture of recyclables.		2019
		2.4 Provide access to procurement and contract tender support.	2.4.1 Provide training and professional development opportunities to support contract management.	Number of research document providd to councils	Ongoing
			2.4.2 Explore a joint contracts framework which investigates outcomes-based waste processing, market-led infrastructure delivery and cost effective solutions.		2018
		2.5 Improve recovery of materials from kerbside clean-up services.	2.5.1 Investigate opportunities to manage kerbside clean-up services and improve recycling and diversion.	Number of opportunities identified	2019
		2.6 Facilitate improved residential waste planning and policy initiatives.	2.6.1 Provide continued advocacy on waste planning policy and work with key stakeholders to deliver improved policy.	Number of submissions	Ongoing
		2.7 Investigate opportunities for better management of waste from multi-unit dwellings and residential flat buildings.	2.7.1 Work with the relevant entities to develop standard clauses to integrate waste and resource recovery into lease agreements, property by-laws and the like.	Number of resources developed	2018

Table 6: Strategy Action Plan, 2017 - 2021 (Cont'd)

Theme 4: Manage Problem Waste Better					
To improve the capture of problem waste and other targeted household wastes across the region.	Increase opportunities for the responsible disposal of household problem waste by 2021.	4.1 Improve the availability of drop-off and pick-up facilities for problem waste.	4.1.1 Conduct a gap analysis to determine resident access to CRCs/problem waste services across the region, and outline potential additional sites/services or innovative solutions.	Number of reports provided to councils	2018
			4.1.2 Work with the EPA to expand the range of targeted household wastes accepted at CRCs.		2021
		4.2 Continue the regional household asbestos collection and disposal project (subject to grant funding).	4.2.1 Continue to coordinate and enhance the Western Sydney Residential Asbestos Disposal Scheme (WSRADS) (subject to grant funding).	Quantity of waste collected	2021
		4.3 Investigate better management of clinical waste in households.	4.3.1 Prepare feasibility paper for tackling clinical waste management in households, with consideration to garbage processed through AWTs and community sharps services.	Number of reports provided to councils	2020
Theme 5: Reduce Litter					
To deliver programs that address litter in the community.	All programs maintain majority participation by councils across the life of the Regional Litter Plan.	5.1 Coordinate/deliver projects detailed in Western Sydney Regional Litter Plan 2016-2021.	5.1.1 Deliver regional litter projects as per Regional Litter Plan 2016-2021. Projects for 2017-2021: - 17/18 Reduce cigarette butt litter in shopping strips. - 18-21 Reduce food packaging in recreational parks. - 20/21 Repeat litter and ID baseline. - Promote litter management as challenge to senior staff and elected representatives and the community.	KPIs as detailed in Regional Litter Plan	Timeframes as per Regional Litter Plan
		5.2 Coordinate litter research programs.	5.2.1 Monitor the impact of CDS on litter in public places (e.g. around RVMs, bins and litter hotspot locations).	Number of reports provided to councils	2018
Theme 6: Reduce Illegal Dumping					
To deliver programs that address illegal dumping in the community.	Deliver projects that address illegal dumping in 5 council areas by 2021.	6.1 Deliver projects to reduce illegal dumping.	6.1.2 Advocate for reduced costs for removal and disposal of asbestos waste to deter illegal dumping.	Number of projects delivered	Ongoing
			6.1.3 Implement programs to reduce the incidence of illegal dumping occurring outside MUDs.		2019
Theme 7: Improve Regional Governance					
To foster enhanced regional collaboration.	Identify 5 new opportunities for regional collaboration by 2021.	7.1 Assist councils to identify opportunities for joint collaboration and increased funding.	7.1.1 Compile council's Better Waste and Recycling Project tables annually to identify opportunities for councils to collaborate on similar projects.	Number of hours assisting councils	Ongoing
			7.1.2 Assist councils with identifying and developing grant funding applications that work towards regional targets and maximise regional benefits.		Ongoing
		7.2 Maintain a network of Western Sydney councils to share information.	7.2.1 Maintain the Western Sydney Waste Managers meetings (WSWM).	Number of people in network	Ongoing
			7.2.2 Coordinate forums for councils to exchange learnings and experiences, and deliver updates on infrastructure, innovation and policy.		Ongoing
			7.2.3 Maintain a regular Western Sydney Regional Waste Strategy Newsletter.		Ongoing
		7.3 Advocate for better resource recovery outcomes for councils.	7.3.1 Compile regional submissions to advocate for the needs of councils, and represent councils in the delivery of waste management programs.	Number of submissions	Ongoing
		7.4 Implement and monitor the regional waste strategy.	7.4.1 Coordinate appropriate meetings, forums and working groups, to implement the regional waste strategy.	Number of events held	Ongoing
			7.4.2 Review and report annually on the progress of the action plan.		Ongoing

Table 7: 1 Year Strategy Action Plan, 2017/18

Themes	Objectives	Targets	Actions	Sub-Actions	Key Performance Measure	Timeframe
Theme 1: Avoid and Reduce Waste Generation	To increase opportunities for waste avoidance and reuse in the region.	Increase opportunities for waste avoidance and reuse in the region by 2021.	Actions in this theme to commence in 2018/19.			
Theme 2 & 3: Increase Recycling and Divert More Waste from Landfill	To improve resource recovery rates across the region. To better plan for, and deliver, improved waste and resource recovery infrastructure.	Work towards a domestic resource recovery rate of 70% by 2025. Reduce the kg/capita of recyclable material in residual waste bin by 2021 (compared to baseline 2015/16). Waste planning is strengthened at a State department level by 2021 and is considered in all significant development and strategic planning.	2.1 Deliver region-wide communication campaigns and resources to support consistent educational messaging.	2.1.2 Develop CDS information packs.	Number of education programs developed	March 2018
			2.2 Work with stakeholders to undertake regional waste and resource recovery infrastructure planning.	2.2.3 Advocate to the State Government for strategic waste and resource recovery infrastructure planning.	Number of activities documented	Ongoing
			2.4 Provide access to procurement and contract tender support.	2.4.2 Explore a joint contracts framework which investigates outcomes-based waste processing, market-led infrastructure delivery and cost effective solutions.	Number of research documents provided to councils	June 2018
			2.5 Improve recovery of materials from kerbside clean-up services.	2.5.1 Investigate opportunities to manage kerbside clean-up services and improve recycling and diversion.	Number of opportunities identified	June 2019
			2.7 Investigate opportunities for better management of waste from multi-unit dwellings and residential flat buildings.	2.7.1 Work with the relevant entities to develop standard clauses to integrate waste and resource recovery into lease agreements, property by-laws and the like.	Number of resources developed	December 2018
Theme 4: Manage Problem Waste Better	To improve the capture of problem waste and other targeted household wastes across the region.	Increase opportunities for the responsible disposal of household problem waste by 2021.	4.1 Improve the availability of drop-off and pick-up facilities for problem waste.	4.1.1 Conduct a gap analysis to determine resident access to CRCs/problem waste services across the region, and outline potential additional sites/services or innovative solutions.	Number of reports provided to councils	January 2018
Theme 5: Reduce Litter	To deliver programs that address litter in the community.	All programs maintain majority participation by councils across the life of the Regional Litter Plan.	5.1 Coordinate/deliver projects detailed in Western Sydney Regional Litter Plan 2016-2021.	5.1.1 Deliver the 2017/18 regional litter project to reduce cigarette butt litter in shopping strips, as per Regional Litter Plan 2016-2021.	KPIs as detailed in Regional Litter Plan	November 2018
			5.2 Coordinate litter research programs.	5.2.1 Monitor the impact of CDS on litter in public places (e.g. around RVMs, bins and litter hotspot locations).	Number of reports provided to councils	June 2018
Theme 6: Reduce Illegal Dumping	To deliver programs that address illegal dumping in the community.	Deliver projects that address illegal dumping in 5 council areas by 2021.	6.1 Deliver projects to reduce illegal dumping.	6.1.2 Advocate for reduced costs for removal and disposal of asbestos waste to deter illegal dumping.	Number of projects delivered	Ongoing
				6.1.3 Implement programs to reduce the incidence of illegal dumping occurring outside MUDs.		June 2019
Theme 7: Improve Regional Governance	To foster enhanced regional collaboration.	Identify 5 new opportunities for regional collaboration by 2021.	7.1 Assist councils to identify opportunities for joint collaboration and increased funding.	7.1.1 Compile council's Better Waste and Recycling Project tables annually to identify opportunities for councils to collaborate on similar projects.	Number of hours assisting councils	Ongoing
				7.1.2 Assist councils with identifying and developing grant funding applications that work towards regional targets and maximise regional benefits.		Ongoing
			7.2 Maintain a network of Western Sydney councils to share information.	7.2.1 Maintain the Western Sydney Waste Managers meetings (WSWM).	Number of people in network	Ongoing
				7.2.2 Coordinate forums for councils to exchange learnings and experiences, and deliver updates on infrastructure, innovation and policy.		Ongoing
				7.2.3 Maintain a regular Western Sydney Regional Waste Strategy Newsletter.		Ongoing
			7.3 Advocate for better resource recovery outcomes for councils.	7.3.1 Compile regional submissions to advocate for the needs of councils, and represent councils in the delivery of waste management programs.	Number of submissions	Ongoing
			7.4 Implement and monitor the regional waste strategy.	7.4.1 Coordinate appropriate meetings, forums and working groups, to implement the regional waste strategy.	Number of events held	Ongoing
				7.4.2 Review and report annually on the progress of the action plan.		Ongoing

Appendix A. Key Learnings 2014-17 Regional Waste Program

Program Area	Evaluation Outcomes	Key Learnings
Waste Infrastructure	• Infrastructure, joint partnerships and capacity building around these focus areas should be further explored as a priority agenda item at both Waste Manager and General Managers meetings. • Education should be concentrated on creating awareness that new cities and growth areas require suitable waste infrastructure, which in turn requires critical tonnages and suitable contracts.	• Action plan to highlight the importance of joint partnerships for improved waste management outcomes and potential cost savings. • Action plan to also highlight the importance of appropriate planning and zoning for waste infrastructure. • WSROC to undertake a facilitator role and provide leadership in this area.
Waste Avoidance	• Further projects needed to deliver 'avoidance' and 'reduction' of waste, with this key result area identified as a priority for the region given its position in the waste hierarchy[8].	• A method for navigating the contradictory nature of 'waste avoidance' policies and the promotion of 'economic growth' is needed given the supply and demand of goods is directly linked to the sale and purchasing of goods.
Information Sharing	• Case studies and documents identifying lessons learnt are important to share across the region to increase efficiencies, advance innovation and promote a more strategic and holistic approach to waste management.	• WSROC to facilitate information sharing and capacity building as a priority for the region through appropriate forums. • Council case studies and educational resources to be accessible by all NSW councils to promote constant improvement and improve efficiencies.
Advocacy	• Providing feedback to the State Government on improved planning and strategic controls, as well as the preparation of submissions on behalf of the region, were considered to be highly valuable and necessary to address at the regional level. • These actions were considered to have gained traction in raising the profile of waste at the State level, providing a conduit for communication between the State and the councils.	• WSROC to continue to provide support to the councils on regional waste issues through regional approaches to forums, discussion papers and submissions.
Strategy Action Plan	• Actions falling under the regional governance category (i.e. actions requiring minimal promotion and council staff time resources such as the writing of regional submissions) as well as actions delivering tangible outcomes (e.g. the WSRADs household asbestos program) were considered to be the most relevant to the region. • Actions focussed at the council service level were considered to have the least relevance to the region by the majority of councils.	• Actions to rise above 'service offerings' provided by councils and target common issues across councils to better address the region's needs. • Future actions to focus on achieving tangible and measurable outputs, ideally with on-ground outcomes and greater outreach, to drive further action. • Regional education actions to be continued with the aim of employing consistent educational messaging across the region and for reduced costs associated with marketing collateral. • Action plan to provide for some flexibility to enable follow on actions to be progressed and revised priorities to be assessed and communicated on a regular basis.
Strategy Targets	• Some of the targets established were considered to be unrealistic and disconnected from the Action Plan, or were difficult to measure, and as such did not help to incentivise the region to progress change.	• Newly established targets to incorporate 'SMART' (Specific, Measurable, Actionable/Achievable, Realistic/Relevant and Time-Bound) principles and consider baseline measurement requirements to facilitate progress tracking. • Key performance measures to provide achievable measures within shorter timeframes to demonstrate progress over time.

[8] The international waste hierarchy is described in Appendix G.

Appendix B. Additional Council Data

Table A: Indicative Population and Households for Amalgamated Councils, 2016/17[a]

Council	Population	No. of Households	Description of Changes to LGAs Post Amalgamations
Cumberland	218,801	71,435	• Gain of residents and households from the Woodville Ward of Parramatta and the amalgamated councils of Auburn and Holroyd. • Loss of residents and households to Parramatta.
The Hills	162,863	55,368	• Loss of residents/households to Parramatta.
Parramatta	235,000	84,285	• Gain of residents and households from The Hills, Hornsby and the amalgamated councils of Auburn and Holroyd. • Loss of residents and households to newly formed Cumberland.

Source/Notes:

a) Based on council-provided data

Figure A: Population by LGA – Prior to Amalgamations, 2015/16[a]

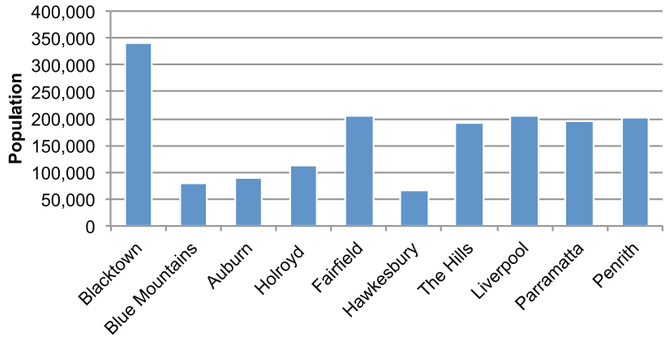
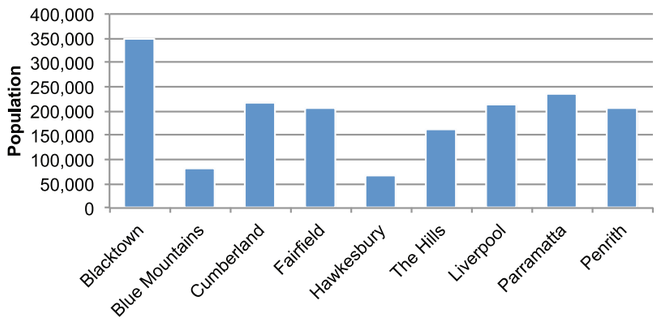


Figure B: Population by LGA – Post Amalgmations, 2016/17



Appendix B. Additional Council Data (Cont'd)

Table B: Kerbside Bin Waste & Recycling Generation Yields, 2011/12 - 2015/16 (kg/capita/wk)

Council	11/12	12/13	13/14	14/15	15/16
Blacktown	7.7	7.3	7.0	7.3	7.2
Blue Mountains	7.9	7.7	7.6	7.8	8.0
Cumberland (Auburn)	6.8	6.4	6.3	6.6	6.9
Cumberland (Holroyd)	7.7	7.1	6.7	7.0	6.8
Fairfield	7.6	7.3	7.2	7.1	7.7
Hawkesbury	8.3	7.9	8.3	8.3	8.2
The Hills	8.5	8.0	7.7	7.9	8.1
Liverpool	7.7	7.3	7.4	7.4	7.5
Parramatta	6.8	6.3	6.3	6.3	6.1
Penrith	8.7	8.1	7.9	8.3	8.1
Region	**7.8**	**7.3**	**7.2**	**7.4**	**7.4**

Table C: Total Domestic Waste Generation, Recovery and Disposal Tonnes, 2015/16[a]

Council	Total Recovered (t)	Total Disposed (t)	Total Domestic Generation (t)	Recovery Rate (%)
Blacktown[b]	88,195	51,975	140,170	63%
Blue Mountains	19,300	28,478	47,778	40%
Cumberland (Auburn)	12,857	24,783	37,640	34%
Cumberland (Holroyd)	31,606	13,267	44,873	70%
Fairfield	48,764	46,292	95,056	51%
Hawkesbury	12,307	21,669	33,976	36%
The Hills	40,509	52,923	93,432	43%
Liverpool[b]	57,715	27,094	84,809	68%
Parramatta	32,615	37,035	69,650	47%
Penrith	55,371	36,839	92,210	60%
Region	**399,238**	**340,355**	**739,593**	**54%**

Source/Notes:

a) NSW Local Government Waste and Resource Recovery Data as reported by councils.

b) Updated information provided by council.

Table D: Projected Domestic Waste Tonnes, 2016/17 - 2030/31

Council	2016/17	2020/21	2025/26	2030/31
Blacktown	145,705	167,251	194,192	221,088
Blue Mountains	48,536	50,267	51,171	52,091
Cumberland	85,292	90,045	96,360	103,117
Fairfield	100,293	125,043	155,949	187,048
Hawkesbury	34,757	37,124	40,454	44,247
The Hills	82,637	105,555	138,931	178,361
Liverpool	87,722	102,643	123,149	147,051
Parramatta	86,093	96,578	105,561	116,045
Penrith	95,345	107,974	124,044	140,439
Region	**766,381**	**885,171**	**1,031,619**	**1,193,590**

Table E: Additional Resource Recovery Services Offered by Councils

Council	Bulky Cardboard	E-waste	Medical Waste	Mattresses	Tyres	Scrap Metal	C&D Waste	White Goods	EPS	Mobile Phones	Cartridges	Batteries
Blacktown			✓	✓								
Blue Mountains	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓
Cumberland (Auburn)		✓	✓	✓				✓				✓
Cumberland (Holroyd)		✓	✓	✓								✓
Fairfield		✓	✓	✓		✓	✓	✓		✓		✓
Hawkesbury	✓	✓		✓	✓	✓		✓		✓	✓	✓
The Hills		✓	✓					✓		✓		✓
Liverpool	✓	✓	✓						✓	✓	✓	✓
Parramatta	✓	✓	✓							✓		✓
Penrith	✓	✓							✓	✓		✓

Appendix B. Additional Council Data (Cont'd)

Figure C: Projected Kerbside Bin Collection Tonnes, 2015/16 to 2030/31

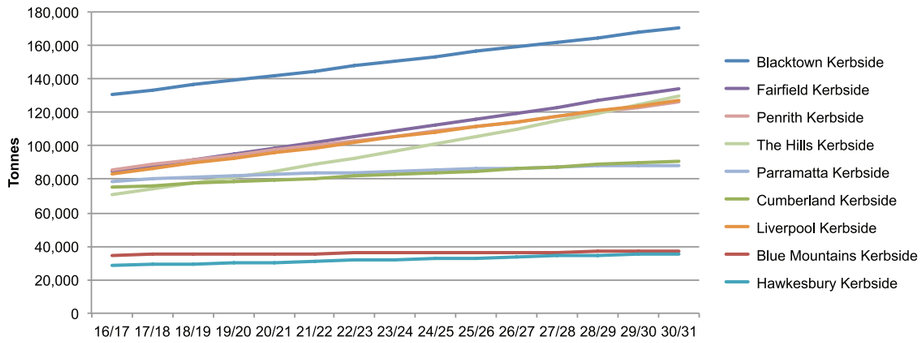
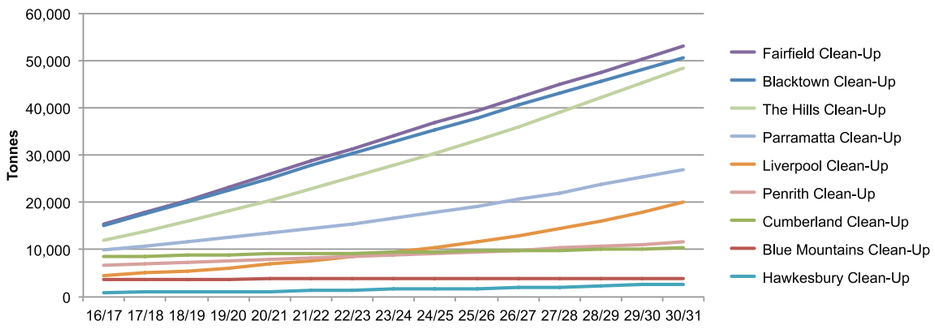


Figure D: Projected Kerbside Clean-up Waste Tonnes, 2015/16 to 2030/31



Appendix C. Methodology for Diversion Achievement Options Analysis

An Options Analysis was undertaken in 2016, and then updated in 2017 as part of the Strategy review, to develop waste projections based on three years of reported waste data (2013/14 to 2015/16) and to identify waste streams or materials to target for short, medium and long term performance improvements in the region.

The original 2016 Options Analysis considered four collection scenarios (kerbside GO and FOGO collections, recovery of kerbside clean-up waste, and regional education) linked to two residual waste treatment scenarios (AWT and Energy from Waste). Each of the scenarios were evaluated, with selected scenario types combined to develop a number of combined options pathways capable of achieving the region's 2021 recycling and diversion targets. Two defined options pathways were identified as being able to meet the region's required performance improvements.

As part of the 2017 Options Analysis revision, the region's baseline position was updated to reflect changing council boundary information and current and committed service changes. Updates were made to projected population and household numbers, and projected domestic waste tonnages. The new baseline dataset was then mapped to the preferred options pathway established during the 2016 study to determine the relative impact of the updated data on the region's recycling and diversion performance.

Outcomes of the diversion achievement options analysis:

- If all member councils were to move to AWT for post-collection treatment of kerbside residual waste by 2021, the region is likely to reach 65% based on current facility performance levels.
- Addition of new or expanded kerbside GO collections is likely to contribute an additional 2% to regional recycling rates by 2021.
- Recovery of recyclables from kerbside clean-up waste could contribute an additional 4% to regional recycling rates by 2021.
- The development of a regional education campaign is projected to contribute to less than 1% improvement to recycling rates.

The modelling also shows that the future projected kerbside clean-up waste tonnages have a marked effect on all modelled options. This highlights the need for the region to investigate solutions for improved recovery of clean-up wastes in order to combat this projected decrease in the region's overall performance.

Appendix D. Waste Contracts

Council	Contract Details			
	Service	Service Provider	Processing/Disposal Location/Facility	Contract Expiry Date
Blacktown	Residual collection (SUDs)	Council		
	Residual collection (MUDs)	Remondis, JJ Richards and SUEZ		
	Residual disposal/processing	SUEZ	UR-3R Eastern Creek	2025
	Recycling collection	Cleanaway		2018
	Recycling processing		VISY Smithfield MRF	2018
	Clean-up collection	Council		N/A
	Clean-up disposal/processing	Veolia	Horsley Park Landfill	no formal contract
Blue Mountains	Residual collection	Council		N/A
	Residual disposal/processing	Operated by Remondis/Theiss on behalf of Council	Blaxland Landfill	2033
	Recycling collection	JJ Richards		2026
	Recycling processing	VISY	Smithfield MRF	2026
	Garden organics collection	JJ Richards		2026
	Garden organics processing	ANL	ANL Blayney	2026
	Clean-up collection	Council (including chipping)		N/A
	Clean-up disposal/processing	Council	Blaxland Landfill	N/A
Cumberland (Auburn)	Residual collection	URM		2023
	Residual disposal/processing	Veolia	Woodlawn Landfill, Goulburn	2020
	Recycling collection	URM		2023
	Recycling processing	VISY	Smithfield MRF	2020
	Garden organics collection	URM		2023
	Garden organics processing	Veolia	Greenacre Resource Recovery Centre	no formal contract
	Clean-up collection	URM		2023
	Clean-up disposal/processing	Veolia	Greenacre Resource Recovery Centre	no formal contract
Cumberland (Holroyd)	Residual collection	URM		2023
	Residual disposal/processing	SUEZ	UR-3R Eastern Creek	2019
	Recycling collection	URM		2023
	Recycling processing	VISY	Smithfield MRF	2018
	Clean-up collection	URM		2023
	Clean-up disposal/processing	DADI	Eastern Creek Genesis	2019
Fairfield	Residual collection	Council		N/A
	Residual disposal/processing	SUEZ	Lucas Heights Landfill	2024
	Recycling collection	Council		N/A
	Recycling processing	Polytrade	Rydalmere MRF	2019
	Clean-up collection	SUEZ		
	Clean-up disposal/processing	Veolia		

Council	Contract Details			
	Service	Service Provider	Processing/Disposal Location/Facility	Contract Expiry Date
Hawkesbury	Residual collection	Council		N/A
	Residual disposal/processing	Council	Hawkesbury City Waste Management Facility	2023
	Recycling collection	JJ Richards		2019
	Recycling processing		VISY Smithfield MRF	2019
	Garden organics collection	JJ Richards		2020
	Garden organics processing	SUEZ	Eastern Creek	2019
	Clean-up collection	Cleanaway		2019
	Clean-up disposal/processing	Blacktown Waste Services	Marsden Park Landfill	2019
The Hills	Residual collection	Cleanaway		2024
	Residual disposal/processing	SUEZ	Lucas Heights Landfill	2022
	Recycling collection	Cleanaway		2024
	Recycling processing	VISY	Smithfield MRF	2024
	Garden organics collection	Cleanaway		2024
	Garden organics processing	SUEZ	Eastern Creek	2024
	Clean-up collection	Cleanaway		2024
	Clean-up disposal/processing	SUEZ	Elizabeth Drive Landfill	2022
Liverpool	Residual collection	JJ Richards		2019
	Residual disposal/processing	SUEZ	Kemps Creek SAWT	2019
	Recycling collection	JJ Richards		2019
	Recycling processing	VISY	Smithfield MRF	2019
	Garden organics collection	JJ Richards		2019
	Garden organics processing	ANL	ANL Badgerys Creek	2019
	Clean-up collection	Council		
	Clean-up disposal/processing	Benedict Recycling	Chipping Norton	2020
Parramatta	Residual collection	SUEZ		2024
	Residual disposal/processing	SUEZ	UR-3R Eastern Creek	2018
	Recycling collection	SUEZ		2024
	Recycling processing	VISY	Smithfield MRF	2022
	Garden organics collection	SUEZ		2024
	Garden organics processing	SUEZ	Eastern Creek	2024
	Clean-up collection	SUEZ		2024
	Clean-up disposal/processing	DADI	Eastern Creek Genesis	2018
Penrith	Residual collection	SUEZ		2019
	Residual disposal (SUDs)	SUEZ	Elizabeth Drive Landfill	2019
	Residual processing (MUDs + Rural)	SUEZ	Kemps Creek SAWT	2019
	Recycling collection	VISY		2019
	Recycling processing	VISY	Smithfield MRF	2019
	Food organics & garden organics collection	SUEZ		2019
	Organics processing	SUEZ	Kemps Creek SAWT	2019
	Clean-up collection	SUEZ		2019
	Clean-up disposal/processing	SUEZ	Elizabeth Drive Landfill	2019

Appendix E. Regional Waste Facilities List

Transfer Stations	Facility Location
Katoomba Waste Management Facility	Woodlands Road, Katoomba
SUEZ Seven Hills Transfer Station	29 Powers Road, Seven Hills
Veolia Clyde Transfer Terminal	322 Parramatta Road, Clyde
Veolia Greenacre Resource Recovery Facility	75 Anzac Street, Greenacre
Resource Recovery Facilities	**Facility Location**
ANL Badgerys Creek	210 Martin Road, Badgerys Creek
ANL Blayney Organics Processing Facility	755 Browns Creek Rd, Blayney
Genesis Xero Waste Facility	Honeycomb Drive, Eastern Creek
Global Renewables UR-3R Facility	Wallgrove Road, Eastern Creek
Polytrade MRF Rydalmere	32 South Street, Rydalmere
Visy MRF Smithfield	6 Herbert Place, Smithfield
SUEZ Eastern Creek Organics Recovery Facility	Wallgrove Road, Eastern Creek
SUEZ SAWT Facility	1725 Elizabeth Drive, Kemps Creek
Benedict Recycling	37-39 Riverside Drive, Chipping Norton
Landfills	**Facility Location**
Blacktown Waste Services Landfill	920 Richmond Road, Marsden Park
Blaxland Waste Management Facility	Attunga Road, Blaxland
Hawkesbury City Waste Management Facility	1 The Driftway, South Windsor
SUEZ Kemps Creek Landfill	1725 Elizabeth Drive, Kemps Creek
SUEZ Lucas Heights Landfill	New Illawarra Road, Lucas Heights
Veolia Horsley Park Landfill	Wallgrove Road, Horsley Park
Veolia Woodlawn Landfill	617 Collector Road, Tarago
Community Recycling (Drop-Off) Centres	**Facility Location**
Cumberland Mobile Community Recycling Service	(Cumberland and Parramatta)
Katoomba Waste Management Facility	49 - 89 Woodlands Road, Katoomba
Fairfield Recycling Drop-Off Centre	Corner of Davis Road and Widemere Rd, Wetherill Park
Hawkesbury Community Recycling Centre	The Driftway, South Windsor
Liverpool Recycling Drop-Off Centre	99 Rose St Liverpool
Penrith Community Recycling Centre	46 Charles St, St Marys (entry via Gate 3, 96 Dunheved Circuit North)

Appendix F. Drivers for Regional Collaboration on Waste Issues

Drivers	Description
Alignment with NSW legislation and policy	Councils are required to provide waste services in compliance with a range of legislation and policy (see Appendix G for recent changes to legislation in NSW).
Reduced waste disposal and processing capacity in the Sydney Metropolitan Area	For those councils not operating their own landfills, reduced landfill and processing capacity for residual waste present several challenges including increased waste transfer distances and risks of increased costs.
Population growth and major residential and transport infrastructure development in and around the region	Western Sydney has been earmarked as an area for significant growth with new urban release areas, accelerated residential precincts, new buildings and urban renewal occurring throughout the region and close to transport interchanges. The change in housing types from SUDs to MUDs, and from low to medium and high-density must be strategically planned to ensure buildings can be serviced efficiently for long term amenity provision, human health and safety, reduced congestion on roads and for greater recycling performance. Major transport infrastructure projects such as airports, rail and road networks also need to be effectively planned during construction and demolition phases to reduce stresses on existing waste management and transport infrastructure in the region.
Provision of consistent messaging, and safe and cost-effective services to residents and visitors to the region	Councils are required to provide safe and cost-effective services in order to pass on efficiencies to the rate payer. As councils across NSW provide a range of waste services which can change from one LGA to another, consistent educational messaging is imperative to ensure waste services are appropriate and easy to use by local residents, short term tenants, culturally diverse communities and tourists.
Implementing a sustainable and holistic approach to waste management for reduced amenity and climate change impacts	Waste avoidance sits at the top of the international Waste Hierarchy. Responsible consumption by the public is needed to mitigate the impacts of the increasing waste generation rates. Sustainable waste management is also needed to reduce greenhouse gas emissions associated with landfill and waste transport. Climate changes and widespread changes in weather patterns have the potential to generate large amounts of disaster waste. Regional planning and resilient infrastructure and services are needed to mitigate these impacts.
Promotion of reuse and recycling markets and increased employment opportunities for local residents	The introduction of new businesses in the waste sector will support the growing need for employment in the growing region.
Improved technology and innovation through public-private partnerships	Trialling and promoting new technologies and innovation aligned with Smart Cities principles for improved measurement, evaluation and reporting and safer, more efficient services.

Appendix G. Legislative and Policy Framework

The development of the Strategy and the Strategy Action Plan has taken into account relevant National and State legislation, policies and targets.

Key legislation governing the way in which councils manage waste within their jurisdictions include the:

- Essential Service Act 1988
- Local Government Act 1993
- Protection of the Environment Operations (POEO) Act 1997
- Protection of the Environment Administration Act 1991
- Waste Avoidance and Resource Recovery (WARR) Act 2000
- Product Stewardship Act 2011

Recent changes to waste legislation and policy impacting the direction of the Strategy are described below.

Key Legislation/Policy	Recent Changes Impacting the Strategy
POEO (Waste) Regulations 2014[9]	The Waste Regulation sets out provisions dealing with the operational characteristics of waste facilities, including waste storage and transportation, waste tracking and record-keeping, payment of the waste and environment levy, and exemptions to the levy[10]. It also sets requirements for the management of hazardous wastes such as asbestos. Recent changes to the Waste Regulation include: • lower thresholds for the amount of waste that a facility can store or process before it must hold an environment protection licence. • requirements for facilities recovering, recycling, processing or storing wastes and which are liable for the waste levy to have a weighbridge to accurately record waste movements. • new interstate tracking requirements and new limits on waste transportation distances making it an offence to dispose of waste more than 150 kilometres for where it was generated (proximity principal) – it should be noted that the EPA has since proposed the removal and replacement of the proximity principle. • reform to the resource recovery exemption system as a measure to support the waste levy framework, by shifting the point at which the levy is paid from the landfill gate to the recycling gate, and removing the incentive to stockpile, misclassify or illegally dump non-recyclable residuals. • change was also made to how raw mulch is managed through the introduction of the Raw Mulch Order (EPA, 2016) and the Raw Mulch Exemption (EPA, 2016) which has led to extensive investment in improved composting facilities across NSW and better product standards – however, flexibility to the revised legislation is being sought to facilitate council mulching services. • revised provisions addressing the immobilisation of high-risk contaminants through better classification of waste and clarification of what treatment must be undertaken to reclassify waste under an immobilised contaminants approval.
Waste Less, Recycle More (WLRM) Funding Initiative	The NSW Government's WLRM funding initiative commenced in 2014-17 and was extended another 4 years for the period 2017-21, using money contributed by the NSW waste levy. It provides funding for regional coordination and strategy for the greater Sydney region, as well as new waste and recycling infrastructure, organics collections, local council projects and programs tackling illegal dumping and litter. A number of areas targeted by the extended funding program are discussed below: • The Aboriginal Communities Waste Management Program aims to develop effective waste management systems through delivery agreements and improved infrastructure (see additional detail provided below). • The Illegal Dumping Strategy 2017-20 (draft) aims to reduce illegal dumping adopting a stakeholder engagement and capacity building approach. Focus areas include improved waste management from construction, demolition and infrastructure sites, partnering with planning authorities and services to ensure approvals lead to lawful waste management, providing operational support for illegal dumping prevention and clean-up, development of a communication plan and educational materials for stakeholders, and behaviour change programs to target illegal dumping in medium- to high- density residential areas. • The Litter Prevention Strategy 2017-20 (draft) addresses the Premier's Priority objective for reducing litter volume. It highlights five approaches that will be undertaken to work towards the state's litter target, including rewarding responsible behaviour through a NSW container deposit scheme, education and awareness, support for renewed infrastructure and clean-up through Community and Council Litter Prevention Grants, regulation and enforcement, and evaluation and monitoring. • The Waste Less, Recycle More Education Strategy 2016-21 has been introduced to drive education and behaviour change initiatives to help achieve NSW waste and recycling targets. An updated plan will be developed for 2017-21. Further information on the WLRM initiative is available on the EPA's website[12].
Aboriginal Communities Waste Management Program and State Waste Strategy and Implementation Plan for Discrete Aboriginal Communities.	This 4-year program aims to provide an integrated approach to address the issue of waste across discrete Aboriginal communities in NSW. It follows on from important work delivered by Waste Aid with funding support from WLRM initiative, to develop the first waste strategy for discrete NSW Aboriginal communities. The State-wide strategy was developed to provide a long-term, sustainable approach to waste management while raising the level of understanding of the issues and challenges facing many NSW Aboriginal communities. It makes practical and realistic recommendations regarding appropriate service standards for household waste, litter reduction and methods to address the problems of illegal dumping.
Premier's Priorities and the NSW Container Deposit Scheme	In September 2015, the NSW Government replaced *NSW 2021: A plan to make NSW Number One* with a new state plan *NSW: Making It Happen and a list of Premier's Priorities*. Focus areas for the waste sector previously included illegal dumping and increasing recycling. Under the new State Plan, litter has been identified as 1 of the 12 priority areas and sets a target to reduce the volume of litter by 40% by 2020. To support this priority objective, NSW will introduce a container deposit scheme to help tackle litter in NSW from July 2017. Under the scheme, 10c will be awarded on the return of empty eligible beverage containers to an approved NSW collection depot or reverse vending machine.
NSW Energy from Waste (EfW) Policy Statement 2016[13] **and the Eligible Waste Fuels Guidelines 2016**[14]	The Policy Statement sets out a framework and overarching criteria in NSW which apply to facilities proposing to thermally treat waste or waste-derived materials for the recovery of energy (referred to as 'Energy from Waste' facilities or 'Waste to Energy' facilities). Based on the EPA's definitions for the NSW WARR targets, the recovery performance from an EfW cannot be included in the EPA target of 70% recycling but can contribute to the diversion from landfill target of 75%. As a consequence where an EfW facility is being considered and there will be a movement of residual waste away from an AWT facility, there will be a decrease in recycling rate reported. Eligible waste fuels are those materials considered by the EPA to pose a low risk of harm to the environment and human health due to their origin, composition and consistency. The Guidelines have been designed to support the EfW Policy Statement. Any facility proposing to thermally treat a waste or waste-derived material that is not listed as an eligible waste fuel must meet the requirements of an EfW.

[9] Main provisions of the 2014 Waste Regulations, Environment Protection Authority video and factsheet webpage http://www.epa.nsw.gov.au/wasteregulation/poeo-reg-2014.htm

[10] Payment of waste contributions (also referred to as a waste and environment levy) by the occupiers of licensed waste facilities for each tonne of waste received at the facility or generated in a particular area.

[11] Consultation paper: New minimum standards for managing construction and demolition waste in NSW (October 2016)

[12] For details on WLRM funding initiative, visit the EPA website at http://www.epa.nsw.gov.au/wastestrategy/index.htm

[13] NSW Energy from Waste Policy Statement, Environment Protection Authority (2015) http://www.epa.nsw.gov.au/resources/epa/150011enfromwasteps.pdf

[14] NSW Eligible Waste Fuels Guidelines, Environment Protection Authority (2016) http://www.epa.nsw.gov.au/resources/waste/waste-fuels-guide-160756.pdf

Appendix G. Legislative and Policy Framework (Cont'd)

Key Legislation/Policy	Recent Changes impacting the Strategy
NSW WARR Strategy 2014-21	The WARR Strategy 2014-21 provides a high level framework for setting priorities and a long term direction for improved management of wastes and recycling. NSW WARR Strategy 2014–21 has six key result areas to enable targeted action: • Key Result Area 1: Avoid and reduce waste generation • Key Result Area 2: Increase recycling • Key Result Area 3: Divert more waste from landfill • Key Result Area 4: Manage problem wastes better • Key Result Area 5: Reduce litter • Key Result Area 6: Reduce illegal dumping Councils are required to contribute to meeting State targets provided for each Key Result Area by 2021/22. The NSW 2021 plan sets the governments agenda for change in NSW through the 'NSW 2021: A plan to make NSW number one', and provides a mandate for developing regional waste strategies and collaboration to deliver the 'Waste Less Recycle More' initiative: $802 million of funding overall to transform waste and recycling in NSW.
National Product Stewardship Schemes and Australian Packaging Covenant	New product stewardship schemes include Australia's Paintback[15] recycling scheme founded by members of Australia's paint industry. It comprises of a new waste collection and treatment service offering professional and home painters a convenient option for disposing of unwanted paint and packaging. The scheme aims to have a collection service within 20 to 40 kilometres of 85% of the population within five years. The National Television and Computer Recycling Scheme was established in 2011 and aims to achieve a 80% recycling rate by 2021. The Australian Packaging Covenant is a voluntary scheme focussed on sustainable packaging design, recycling of used packaging and reduction of litter from packaging. It is an agreement between government and industry (with organisations signing up to a range of commitments) to find and fund solutions to address packaging sustainability issues. It has finalised its first 5 year strategy and will relaunch an enhanced covenant strategy in 2017.
The Greater Sydney Region Plan, *A Metropolis of Three Cities*	The NSW Government's Greater Sydney Region Plan, *A Metropolis of Three Cities* divides the Greater Western Sydney area into two sub-regions: Western City (including Blue Mountains, Hawkesbury, Penrith, Camden, Campbelltown, Fairfield, Liverpool and Wollondilly), and Central City (including Blacktown, Cumberland, Parramatta and The Hills). It has identified Western Sydney as a significant growth area. The Plan notes the need for additional waste and recycling facilities to help manage demand as Greater Sydney grows.

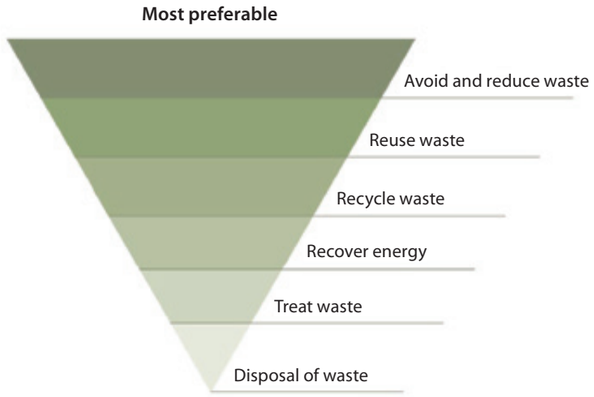
[15] More information available on the Paintback recycling scheme at http://www.paintback.com.au/

Key Legislation/Policy	Recent Changes impacting the Strategy
The Greater Sydney Commission's District Plans	In 2018 the Greater Sydney Commission released a series of five District Plans. The plans set out the opportunities, priorities and actions for integrated planning for land use, transport and infrastructure, and intend to link the State Government's Greater Sydney Region Plan (A Plan for Growing Sydney) with councils' Local Environmental Plans (LEPs). The councils of the Western Sydney region are spread across two districts[16]: Western City (including Blue Mountains, Hawkesbury, Penrith, Camden, Campbelltown, Fairfield, Liverpool and Wollondilly), and Central City (including Blacktown, Cumberland, Parramatta and The Hills). The District Plans identify waste management as a Sustainability Priority with the following focus areas: • Identifying land for future waste management, reuse and recycling (with the DPE and EPA departments identified as lead agencies). • Identifying where innovative precinct-based waste collection, reuse and recycling services could operate within Greater Sydney. • Protecting precincts that have functioning waste management facilities from encroachment by residential and other sensitive development. • Use of appropriate land use zones to minimise the potential for conflict with the operation and expansion of existing waste facilities. • Supporting councils to design resilience strategies to provide district-wide alternatives to solid waste engineering to generate energy and reduce landfill. • Supporting and growing the clean technology sector, building on existing essential waste and resource recovery. • Shared services for multiple buildings within a street frontage (e.g. waste, access, recycled water). • Delivery of alternative transport strategies to reduce unnecessary vehicle movements (including waste handling vehicles) to reduce excessive congestion. • Support progressive reduction in carbon emissions, potable water use and waste, and to upgrade ageing infrastructure with a focus on urban renewal areas, priority precincts and Priority Growth Areas. • Investigating ways to define environmental performance targets and benchmarks for areas and projects, and implementation measures to help reach these targets. • Investigating ways to increase sharing of open source data to support better environmental performance. The Districts' industrial precincts have been identified as potential locations for waste and recycling management facilities.

[16] https://www.greater.sydney/district-plans

International Waste Hierarchy

National Policy and NSW Strategy are based on the concept of sustainable waste management and guided by the principles of the waste hierarchy. The waste hierarchy below sets out the preference for waste management solutions; stressing the importance of waste avoidance and minimisation and seeking to recover the highest value from materials. Producing recyclable material of a high quality is important so that further processing or disposal is minimised or avoided.



Source: NSW WARR Strategy 2014-21

Appendix H. Options Assessment

The Strategy review process sought the input from all participating councils.

A list of possible delivery options (56 options) was generated using information and ideas obtained during interviews with waste managers and officers. These sub-actions were grouped under common themes to develop the long list of actions (20 actions). An options assessment of this long list of actions was then undertaken to identify a draft shortlist of priority actions for consideration by the Western Sydney councils.

An overview of the options assessment methodology applied is shown in the diagram below.

The draft priority list of actions was presented as a handout during the Strategy Review Workshop (Workshop 1) to attendees. An arbitrary line was provided to delineate the draft 'short list of actions' (the top 13 actions) that might reasonably be undertaken as part of the 1 year action plan given resource availability. The arbitrary line functioned as a 'talking point' around which workshop attendees could determine what actions might need to fall below the line in order that other actions could be promoted above the line.

Jacobs explained the rationale behind the scoring of the top three actions. Those actions which had been 'passed through' without assessment were also identified – these actions were noted by WSROC to form a necessary part of the action plan. Attendees were then asked to review the prioritised list of actions and provide feedback responding to the following questions:

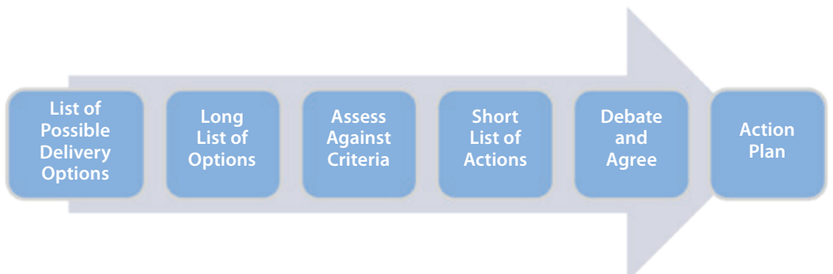
- What actions are ranked higher than expected and why?
- What actions are ranked lower than expected and why?
- Are there any actions missing from the priority listing?

Workshop attendees identified actions to be prioritised and demoted or deleted, and suggested a number of additional actions to add to the long list of actions. Wording changes and a rearrangement of the actions (as well as the sub-actions assigned to each action) were discussed and incorporated. The outcomes of this process led to the development of the draft 4 year Strategy Action Plan.

A second workshop was organised to discuss each action and sub-action in the context of the Strategy Themes, objectives and draft targets. The final 4 year Strategy Action Plan was developed based on detailed feedback provided by the workshop attendees.

As a final step in the process, councils were sent a list of actions making up the final 4 year Action Plan and asked to nominate their top five actions that they would like to see prioritised for the 1 year Action Plan. Council responses were collated to determine projects to be delivered as the 1 year Action Plan.

The assessment criteria set out below were used to score the actions. Assessment criteria were modified from those used as part of the previous strategy incorporating council comments.



Appendix H. Options Assessment (Cont'd)

Criteria	Score	Assumptions
Cost Effectiveness	3	Action to be funded centrally by WSROC
	2	Action to be funded mainly by WSROC but still some costs will need to be covered externally
	1	High price outsourcing for specialist skills to complete action and see return on investment
Timeframe for Implementation	3	Will realistically be delivered within the process < 1 year for completion
	2	May be delivered within the process 2 - 3 years for completion
	1	Will not realistically be delivered within the process > 4 years to completion
Ability to Influence	3	High influence (tonnage, population, reach, number of councils)
	2	Medium influence
	1	Low influence
Achievability	3	Action to be conducted centrally by WSROC Low reliance on stakeholders Low reliance on State Government Low reliance on other factors such as grant funding or political outcomes
	2	Action to be conducted mainly by WSROC but still some reliance on external stakeholders
	1	Action almost entirely dependent on external factors and stakeholders Low degree of WSROC control High reliance on State Government High reliance on commercial operators, grant funding or political outcomes
Progress Toward State Targets	3	Significant progress (where it has measureable outcomes) Contributes to 3 or more targets
	2	Moderate progress Contributes to 2 targets
	1	Minimal progress Contributes to 1 target

Glossary

Glossary Term	Description
Alternative waste treatment (AWT)	Generally a facility that applies to a combination of mechanical, biological and (sometimes) thermal processes to separate organic materials form mixed residual waste stream (usually household waste).
Commercial and industrial waste (C&I waste)	Solid waste generated by businesses, industries (including shopping centres, restaurants and offices) and institutions (such as schools, hospitals and government offices) but not C&D waste or MSW.
Construction and demolition waste (C&D) waste)	Solid waste sourced form construction and demolition works, including building and demolition waste, asphalt waste and excavated natural material.
Contamination rate	The percentage of the bin which is contaminated by materials not suitable for its stream.
Diversion rate	The proportion of all recycled materials or materials otherwise recovered through thermal processing (i.e. EfW facilicy) compared with total amount of waste generated.
Energy from waste (EfW)	The process of recovering energy from waste materials: the energy is used to produce useable heat, steam, electricity or a combination of these.
E-waste	End-of-life electronic equipment, such as televisions, computers, mobile phones, stereos and small electrical appliances (but not whitegoods).
Feedstock	The raw material used to supply a process.
Gap analysis	An assessment of current performance against required performance (targets) and quantification of the shortfall. As part of gap analysis, there is an identification of what measures need to be implemented to address the gap in performance.
Household problem wastes	Household products and materials in the waste and recycling stream that pose potential harm to the environment and human health and/or more difficult or uneconomic.
Industrial ecology	Using the by-products from the production process of one company as a resource in another.
Materials recovery facility (MRF)	A materials recovery facility handles a range of recyclables which typically have already been separated from other waste streams (e.g. by householders or businesses at the collection stage). At the MRF the materials are sorted into individual streams before being sent for recycling. Any components of the incoming material not suitable for recycling will be separated as 'contaminants' at the MRF.
Multi-unit dwellings (MUDs)	Multi-unit dwellings refers to both medium density housing and residential flat buildings.
Municipal solid waste (MSW)	Solid waste from households and local government operations, including waste placed at the kerbside for council collection, self-haul waste dropped off by residents to either council facilities or at council events, and waste collected by councils from municipal parks and gardens, street sweepings, and public council bins.
Recycling rate	Proportion of an overall waste stream which is reprocessed, recycled and put back into the economy. Note: This includes residual waste processing at an AWT facility.
Reducing waste	Reducing waste generation by avoiding or preventing the creation of waste, where possible, along the various parts of the supply chain. The aim is to use less material to achieve the same or equivalent outcome.
Residual waste	Residual garbage waste disposed of in the red-lidded bin for either disposal to landfill or further processing by an AWT.
Resource recovery	Recycling waste material. Recovery may also include extracting embodied energy form waste through thermal processes.
Solid waste	Unwanted solid materials (does not include liquid waste).
Waste avoidance	Waste that does not enter the waste-management system.

WSROC

Western Sydney Regional Organisation of Councils Ltd
Street Address: Level 1, WSROC House
49 Campbell Street Blacktown NSW 2148
Postal Address: PO Box 63 Blacktown NSW 2148

Phone: (02) 9671 4333

Email: info@wsroc.com.au