

Audit of Kerbside Rubbish in Central Auckland and Manukau

Prepared for Auckland Council

May 2023

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1. INTRODUCTION

The Waste Minimisation Act 2008 (WMA) requires Territorial Authorities (TAs) to adopt a Waste Management and Minimisation Plan (WMMP) that promotes effective and efficient waste management and minimisation within their district, and to complete a formal review of their WMMP at least every six years. Auckland Council is due to adopt a new WMMP in 2024. The WMMP review must be consistent with the requirements of the WMA, including Section 50, which requires TAs to prepare a Waste Assessment prior to updating their WMMP.

To inform the Waste Assessment, and subsequently the WMMP, Auckland Council requested this Solid Waste Analysis to update existing data on the composition of domestic kerbside rubbish collected in the city.

On amalgamation of the seven territorial authorities in the Auckland region in 2010, the new Auckland Council inherited several different types of rubbish collection systems across the region. Since then, Auckland Council has standardised several of these collections and there are plans to standardise rubbish collections across most of the rest of the region within the next couple of years.

Table 1.1 shows the domestic rubbish collection services available at the time of amalgamation, and these services in 2023.

Table 1.1 – Domestic kerbside collection services in 2010 and 2023

Auckland Council legacy areas	2010	2023
Rodney	Privately collected rubbish bags and wheelie bins	Privately collected rubbish bags and wheelie bins
North Shore	Council pre-paid rubbish bags and privately collected rubbish bags and 120- and 240-litre wheelie bins	Council 80-, 120- and 240-litre wheelie bins with pre-paid tags and some remaining privately collected wheelie bins and pre-paid bags
Waitakere	Council pre-paid rubbish bags and privately collected 120- and 240-litre wheelie bins	Council 80-, 120-, 140- and 240-litre wheelie bins with pre-paid tags and some remaining privately collected wheelie bins
Auckland City	Council 120-litre rates funded wheelie bins	Council 120- and 240-litre rates funded wheelie bins
Manukau	Council rates funded rubbish bags	Council 120- and 240-litre rates funded wheelie bins, pre-paid bags in rural areas
Papakura	Council pre-paid rubbish bags	Council 120- and 240-litre wheelie bins with pre-paid tags and some remaining privately collected wheelie bins
Franklin	Council pre-paid rubbish bags and privately collected 120- and 240-litre wheelie bins	Council 40- or 60-litre pre-paid rubbish bags and privately collected wheelie bins

The last region-wide audit of domestic kerbside rubbish in Auckland was undertaken in 2016 by Waste Not Consulting, to feed into the 2017 Waste Assessment and 2018 WMMP. At that time, domestic kerbside rubbish collections remained largely as they were in 2010, and Waste Not recommended that these collection systems be grouped into the following four waste services, and that each of these waste services be audited for 5 days:

1. 120-litre rates funded wheelie bins from legacy Auckland City
2. Council pre-paid rubbish bags from legacy North Shore, Waitakere, Papakura, and Franklin areas
3. Rubbish bags from legacy Manukau area
4. Privately collected 120/140-litre wheelie bins from legacy Rodney, North Shore, Waitakere, and Franklin areas and privately-collected 240-litre wheelie bins from legacy Rodney, North Shore, Waitakere, and Franklin areas

For the purposes of the current Waste Assessment and the WMMP, Auckland Council has requested that an audit of domestic kerbside rubbish be undertaken from Central Auckland (legacy Auckland City) and Manukau (legacy Manukau City), as these areas currently have rates funded wheelie bin collections. This is the collection system that Council plans to implement across most of the rest of the region.

Separate audits of rubbish from Central Auckland and Manukau were last undertaken by Waste Not Consulting in 2010 for Auckland City Council and Manukau City Council respectively.

This report provides the results of two five-day sort-and-weigh audits of the composition of kerbside rubbish collected from Central Auckland and Manukau in March 2023.

1.1 Waste management services in Auckland

1.1.1 Waste services for the residential sector

Currently domestic waste services in Auckland remain largely based around the legacy council areas within which they occur. Though there has been much standardisation of these services since amalgamation in 2010, Auckland Council plans to undertake further standardisation as it launches its new domestic kerbside food scraps collections.

As outlined in Table 1.1, households in legacy Auckland City and Manukau can select to have either a 120- or 240-litre rates funded wheelie bin, collected from the kerbside weekly.

In legacy North Shore, Papakura and Waitakere, households have access to 80-, 120- and 240-litre wheelie bins for which they purchase pre-paid tags. Some households in Waitakere have 140-litre wheelie bins due to the previous repurposing of recycling bins into rubbish bins. Rural households in Waitakere have the option of using pre-paid rubbish bags.

Households in legacy Franklin can purchase 40-litre or 60-litre bags for weekly collection by Council's contractor, while in legacy Rodney, the waste collection is undertaken entirely by the private sector, offering rubbish bags and 120- and 240-litre wheelie bins.

On Waiheke island, residents have access to rates funded 120-litre wheelie bins, or to pre-paid 60-litre rubbish bags, and on Aotea Great Barrier island residents have access to rates funded 120-litre wheelie bins, or to pre-paid 40- and 60-litre rubbish bags.

There are no kerbside rubbish collections on Kawau island, but residents can drop rubbish to bins within an enclosure with a pin-code entry-gate at Sandspit.

Residents within the inner city business district are provided with rates-funded rubbish bags, and residents in Multi Unit Dwellings (MUDs) have a mixture of Council and private collections, provided either at the kerbside or onsite.

1.1.2 Recycling services for the residential sector

Council provides a kerbside comingled recycling service throughout the region. The service is rates funded, and households can select a fortnightly collection in one of three sizes of recycling wheelie bins – 120-, 240- or 360-litres.

The three recycling bin sizes are available to residents on Waiheke island, while on Aotea Great Barrier island the kerbside recycling collection is provided in 60-litre recycling crates. Kawau island residents must dispose of the recycling to recycling bins within an enclosure at Sandspit.

Residents within the inner city business district are provided with rates-funded recycling bags, and residents in MUDs have a mixture of Council and private recycling collections, provided either at the kerbside or onsite.

The kerbside comingled recycling collection accepts the materials outlined in Appendix 2.

2. METHODOLOGY

2.1 Audit design

The kerbside rubbish audit methodology used by Sunshine Yates Consulting Limited (SYCL) is based on Procedure One of the Ministry for the Environment's Solid Waste Analysis Protocol 2002 (SWAP). The methodology is the same as used by Waste Not Consulting in previous SWAP audits for Auckland Council and the legacy councils of the Auckland region.

2.1.1 Sampling strategy

Two weeks of sampling and auditing were undertaken. During the first week, rubbish was collected from Manukau and during the second week rubbish was collected from Central Auckland.

Only rubbish from residential properties was included in the samples. The composition and quantity of kerbside rubbish from residential properties varies according to several factors, including the nature of the housing stock, the socio-economic status and ethnicity of the householders, the number of inhabitants in a household and their stage of life, and the range of disposal and recycling services used. To obtain a representative sample of the kerbside rubbish, the sample was collected from as wide a geographic area as possible within each collection area.

According to Auckland Council, 83% of households in Manukau use 120-litre wheelie bins, and 17% use 240-litre wheelie bins. In Central Auckland, only 2% of households use 240-litre wheelie bins, and all other households use 120-litre bins.

During the first week, from Wednesday 15 March to Tuesday 21 March, SYCL collected the contents of 50 240-litre wheelie bins and 225 120-litre wheelie bins from across Manukau. During the second week, from Thursday 23 March to Wednesday 29 March, SYCL collected the contents of 300 120-litre wheelie bins from across Central Auckland. As only 2% of households in Central Auckland use 240-litre wheelie bins, these were not sampled.

The contents of the wheelie bins were emptied into large plastic bags during the sample collection. The bags were secured with cable ties before being loaded into the collection truck. In Manukau, where the contents of both 120-and 240-litre bins were being collected, different coloured cables ties were used to differentiate between the different sized bins.

The streets selected for the audit are mostly the same streets that were audited in the 2010 Auckland City and Manukau City waste audits. These streets were checked by Auckland Council to ensure that the demographics of these streets were representative of the demographics of Auckland region. A few streets in Manukau were substituted to ensure the sample was representative.

In some instances, it was found during the rubbish collection that the rubbish had already been collected from a selected street. In these instances, another street in close proximity was substituted. The streets from which the sample was collected are listed in Table 2.1 on the following page.

Table 2.1 - Kerbside rubbish collection schedule

Collection day	Collection Streets - Manukau	Collection day	Collection Streets - Central Auckland
Wednesday 15 March	Lebanon Crescent Norman Close Secretariat Place Shifnal Drive Myers Road McDougal Street Beeston Crescent Burbank Avenue Finlayson Avenue Barneys Farm Gibbons Road	Thursday 23 March	Athlone Road Mt Taylor Drive Walmsely Road Dingle Road Rawhitiroa Road Ngaiwi Street Douglas Street Hendon Avenue Canal Road Alford Street Oakley Avenue
Thursday 16 March	Clovelly Road Sea Spray Drive Sorrel Crescent Prince Regent Drive Studfall Street Johnstones Road Cobham Crescent Nola Crescent Tiraumea Drive	Friday 24 March	Swainston Road Harapaki Road Lucerne Road Rangitoto Avenue Manawa Road Aldred Road Bassett Road Rangitiki Crescent McFadzean Drive Bolton Street Mary Dreaver Street Marian Street
Friday 17 March	Gills Road Minaret Drive Hutchinson Road Beach Road Uxbridge Road Liston Crescent Evelyn Road Matterhorn Crescent Santa Ana Drive Santa Cruz Drive Broomfield Road Claremont Way Ridgefield Way	Monday 27 March	Armada Road Wheturangi Road Kawau Road Normas Hill Road Turama Road Gladwin Road Buckley Road Ellerton Road Keystone Avenue Melrose Road Belfast Road Whitmore Road
Monday 20 March	Taylor Road Claresholm Place Banbury Place Seaforth Avenue Kiwi Esplanade Sullivan Avenue Shortt Avenue McIntyre Road Church Road	Tuesday 28 March	Jolson Road Luke Street Felix Street Cardwell Street Windmill Road MtPleasant Road Marama Avenue Valley Road Commercial Road Kenneth Avenue

Collection day	Collection Streets - Manukau	Collection day	Collection Streets - Central Auckland
			Third Avenue
Tuesday 21 March	Charles Street Hoteo Place Ramsey Street Pah Road Arranmore Drive Broadhurst Road McKittrick Avenue John Broods Place	Wednesday 29 March	Allenby Road Coates Crescent Torrington Crescent Sackville Street Lincoln Street Wanganui Avenue Masons Avenue William Denny Avenue Kiwi Road

2.1.2 Audit execution

Each day the contents of the rubbish collection truck were taken to Waitākere Refuse and Recycling Transfer Station for the waste audit. The audit was undertaken in a large marquee erected for the purposes of the audit. A skip bin was located alongside the marquee to dispose of the waste after the audit.

On arrival at the transfer station, that day's sample of kerbside rubbish was emptied out of the truck.



Bags of rubbish emptied from collection truck

The 120-litre wheelie bins were sorted in units of five wheelie bins and 240-litre wheelie bins were sorted in samples of two bins.

Each of the bags in the sample unit was weighed in, one bag at a time, and then opened. The contents of all bags in the sample unit were spread on a sorting table, and the individual items sorted into the appropriate categories. When all of the items in the sample unit were sorted, the individual categories were weighed out and the material disposed of.

The rubbish was sorted into the 23 secondary categories described in Appendix 1. These categories are based on the 12 primary categories recommended by the SWAP. The secondary categories were chosen to identify the different types of recyclable materials present in the rubbish, with

'recyclability' being based on the information provided on Auckland Council's website (see Appendix 2).



Waste audit set up in marquee

2.1.3 Staff training and OSH issues

The rubbish collection was undertaken by a SYCL staff member with a Kerbside Collection Team Leader qualification (issued by Waka Kotahi). Two contract collection assistants also assisted with the collection and were provided with a full Health and Safety briefing. H&S documentation was emailed to them before the project began and reviewed and signed on the first morning of the collection.

The rubbish was sorted by a team of four, comprising three contract workers, and a SYCL staff member. Prior to the start of the audit, all team members received the requisite training on the requirements of the audit process and on occupational health and safety procedures.

As sensitive documents are occasionally present in residential rubbish, the importance of confidentiality was emphasised to all team members.

3. KERBSIDE RUBBISH AUDIT RESULTS

The following sections outline the results of the audit of kerbside rubbish. These results are presented separately for:

- 120-litre wheelie bins from Central Auckland
- 120-litre wheelie bins from Manukau
- 240-litre wheelie bins from Manukau

The composition of the 120- and 240-litre wheelie bins from Manukau are also combined in Section 3.4, to provide the overall composition of domestic kerbside rubbish from Manukau.

As 120-litre wheelie bins are used by 98% per households in Central Auckland, it was not deemed necessary to sample 240-litre bins in the area.

3.1 Primary composition of Central Auckland 120-litre wheelie bins

Over the five days of auditing, the contents of 300 x 120-litre wheelie bins of domestic kerbside rubbish from Central Auckland were sorted. The primary composition of this rubbish is presented in Table 3.1 and Figure 3.1.

The secondary composition, which includes all 23 categories, and a statistical analysis are given in Appendix 3. An analysis of the precision of the results is given in Section 4.5.

The average weight of the contents of a 120-litre wheelie bin of rubbish from Central Auckland was 9.00 kg.

Table 3.1 - Primary composition of Central Auckland 120-litre wheelie bins, by weight

Primary categories	Mean wt. per wheelie bin	Proportion of total
Paper	0.60 kg	6.7%
Plastics	0.97 kg	10.7%
Organics	4.96 kg	55.1%
Ferrous metals	0.23 kg	2.5%
Non-ferrous metals	0.10 kg	1.1%
Glass	0.20 kg	2.2%
Textiles	0.35 kg	3.8%
Nappies and sanitary	0.98 kg	10.9%
Rubble	0.28 kg	3.1%
Timber	0.19 kg	2.1%
Rubber	0.04 kg	0.4%
Potentially hazardous	0.12 kg	1.3%
Total	9.00 kg	100.0%

Organic material was the largest single component, by weight, of the Central Auckland 120-litre wheelie bin rubbish, comprising 55.1% of the total. ‘Nappies and sanitary’ was the second largest component, comprising 10.9% of the total, ‘Plastics’ represented 10.7% and ‘Paper’ 6.7%. The compositions of the major primary categories are discussed in the following sections.

The average bin weight of 9.00 kg can not necessarily be equated with an average weekly rubbish generation. Although many householders do set out their wheelie bin every week, some set them out fortnightly or less frequently.

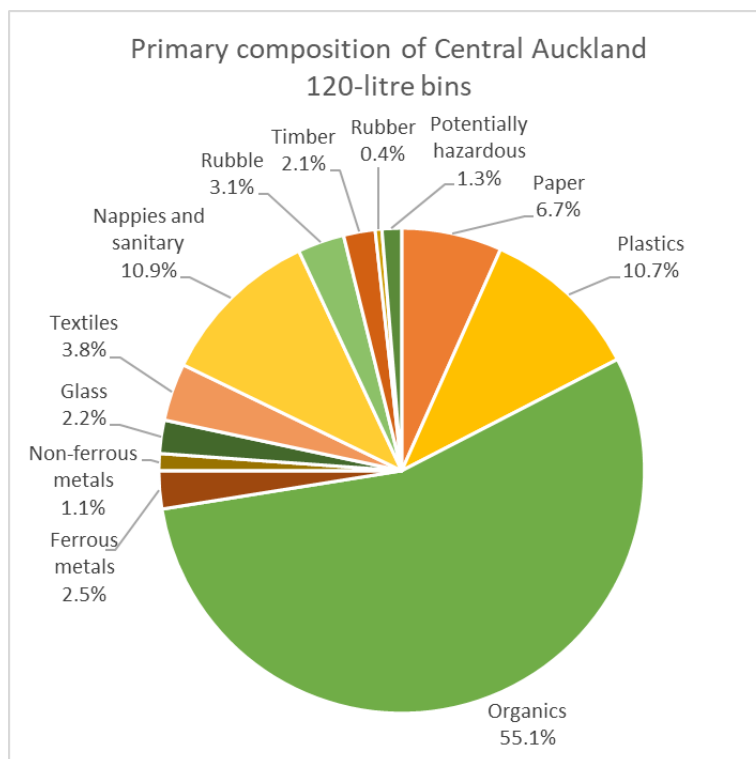


Figure 3.1 - Primary composition of Central Auckland 120-litre wheelie bins, by weight

3.1.1 Organics

Organic matter comprised 55.1% of the weight of 120-litre wheelie bin rubbish. The composition of the organic constituent of the rubbish is shown in Figure 3.2 below.

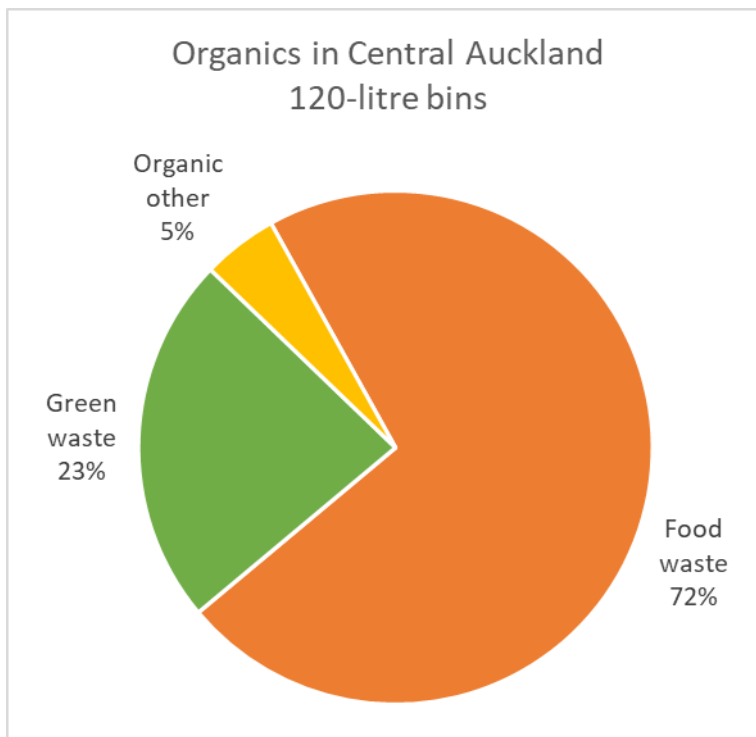


Figure 3.2 - Organic component of Central Auckland 120-litre wheelie bins, by weight

‘Food waste’ comprised 72% of the organic material. ‘Food waste’ included food preparation waste, left-over food waste, and substantial quantities of perished goods. ‘Green waste’, or garden matter, comprised 23% of the organic material. The ‘Green waste’ included tree and shrub prunings, leaves, weeds, and lawn clippings. The ‘Organic other’ category (5% of organic material) included vacuum cleaner dust, animal faeces and associated litter material, candles, fireplace ash, and human hair. Some of this material may be suitable for composting.

3.1.2 Plastics

'Plastics' comprised 10.7% of rubbish in kerbside 120-litre wheelie bins, by weight. The secondary components of plastic waste are shown in Figure 3.3.

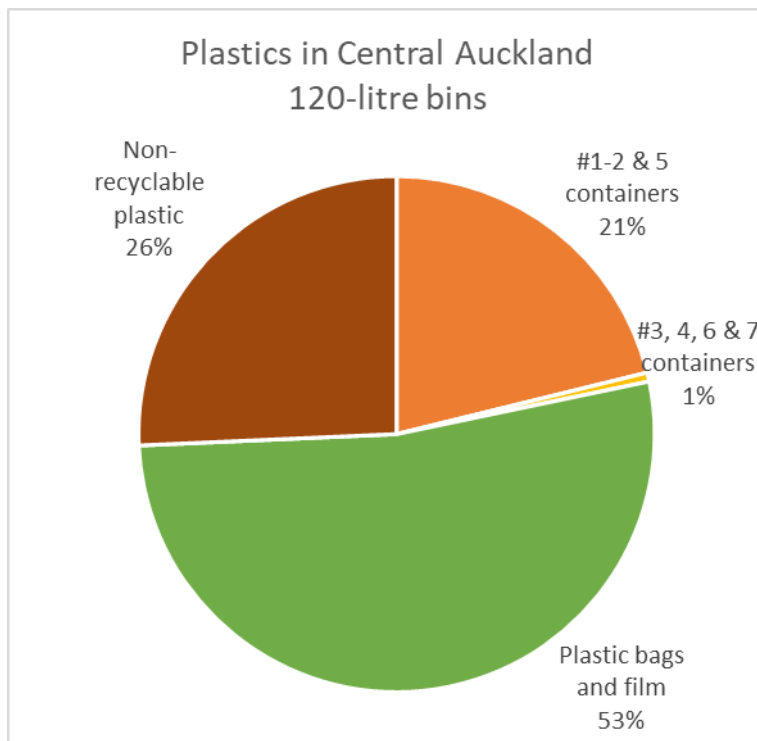


Figure 3.3 - Plastic component of Central Auckland 120-litre wheelie bins, by weight

'Plastic bags and film' comprised 53% of plastic waste, and 'Non-recyclable plastic' comprised 26%. Twenty-one per cent of plastic waste was '#1, 2 and 5 containers' and a further 1% of the plastic waste was '#3, 4, 6 & 7 containers'. Auckland Council accepts plastic household containers #1 – 7 in kerbside recycling, though currently only plastics # 1, 2 and 5 are able to be recycled.

3.1.3 Paper

'Paper' comprised 6.7% of the Central Auckland 120-litre wheelie bins, by weight. The composition of the paper constituent of wheelie bin rubbish is shown in Figure 3.4.

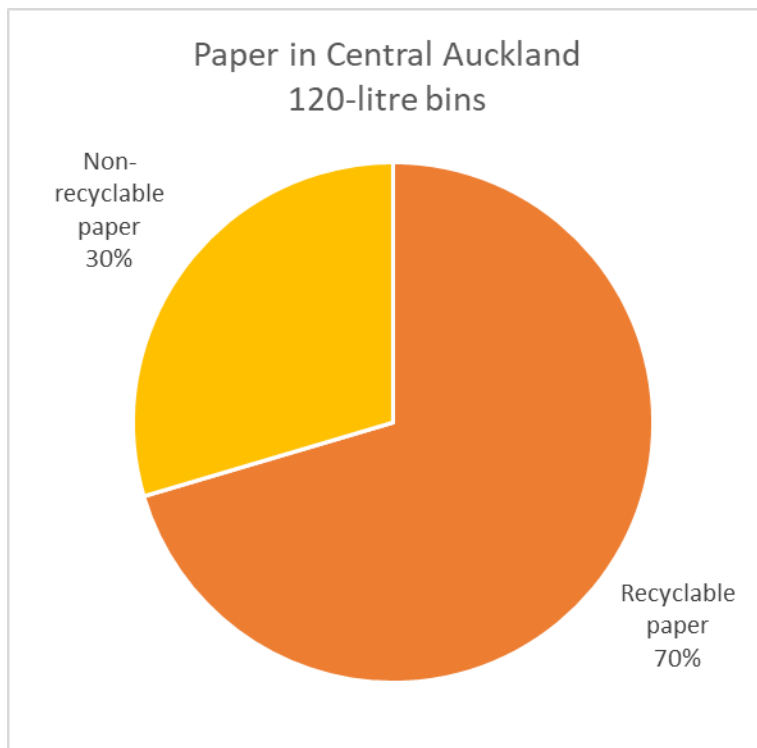


Figure 3.4 - Paper component of Central Auckland 120-litre wheelie bins, by weight

The largest component of the paper was 'Recyclable paper', which comprised 70% of paper. This component included office paper, newspapers, magazines, junk mail, paper packaging, liquid paperboard packaging, cardboard and envelopes. 'Non-recyclable paper' comprised 30% of paper waste. This category is not accepted for recycling and includes laminated paper, sandpaper, wallpaper, and food-contaminated paper.

A proportion of the recyclable paper was from takeaway food wrapping. Heavily food-contaminated paper was classified as 'Non-recyclable paper', but less contaminated paper was considered to be recyclable for the purposes of this research.

3.1.4 Distribution of Central Auckland 120-litre wheelie bin weights

The distribution of the weight of the contents of the 300 x 120-litre wheelie bins included in the audit is shown in Figure 3.5.

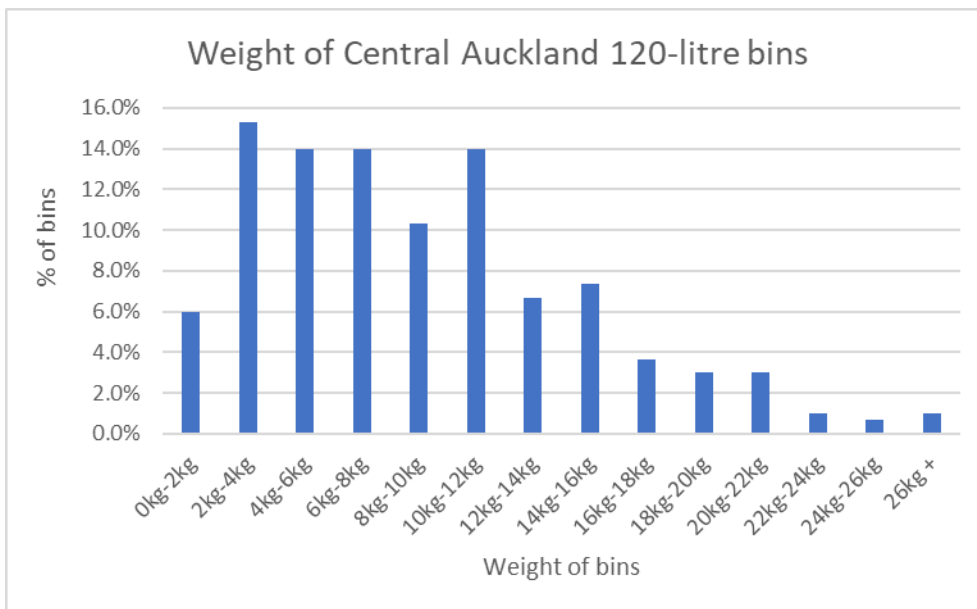


Figure 3.5 - Distribution of Central Auckland 120-litre wheelie bin weights

Figure 3.5 shows the proportion of 120-litre wheelie bins that fall within each weight range. Fifty-four per cent of 120-litre wheelie bins weighed less than 10 kg, 35% weighed between 10 kg and 20 kg, and 6% weighed more than 20 kg.

The average 120-litre wheelie bin weight was 9.00 kg. The lightest wheelie bin was 0.30 kg and the heaviest 41.28 kg.

3.2 Primary composition of Manukau 120-litre wheelie bins

Over the five days of auditing domestic kerbside rubbish from Manukau, the contents of 225 x 120-litre wheelie bins of rubbish were sorted. The primary composition of this rubbish is presented in Table 3.2 and Figure 3.6.

The primary composition of rubbish in 120-litre wheelie bins collected from residential premises in Manukau is presented in Table 3.2 and Figure 3.6.

The secondary composition, which includes all 23 categories, and a statistical analysis are given in Appendix 4. An analysis of the precision of the results is given in Section 4.5.

The average weight of the contents of a 120-litre domestic kerbside wheelie bin collected from Manukau was 9.03 kg. This average weight can not necessarily be equated with an average weekly rubbish generation. Although many householders do set out their wheelie bin every week, some set them out fortnightly or less frequently.

Table 3.2 - Primary composition of Manukau 120-litre wheelie bins, by weight

Primary categories	Mean wt. per wheelie bin	Proportion of total
Paper	0.64 kg	7.1%
Plastics	1.01 kg	11.2%
Organics	5.17 kg	57.2%
Ferrous metals	0.17 kg	1.9%
Non-ferrous metals	0.12 kg	1.4%
Glass	0.14 kg	1.5%
Textiles	0.28 kg	3.1%
Nappies and sanitary	1.12 kg	12.4%
Rubble	0.11 kg	1.2%
Timber	0.09 kg	1.0%
Rubber	0.03 kg	0.3%
Potentially hazardous	0.15 kg	1.7%
Total	9.03 kg	100.0%

Organic material was the largest single component, by weight, of the South Auckland 120-litre wheelie bins, comprising 57.2% of the total. 'Nappies and sanitary' was the second largest component, comprising 12.4% of the total, 'Plastics' represented 11.2% and 'Paper' 7.1%. The compositions of the major primary categories are discussed in the following sections.

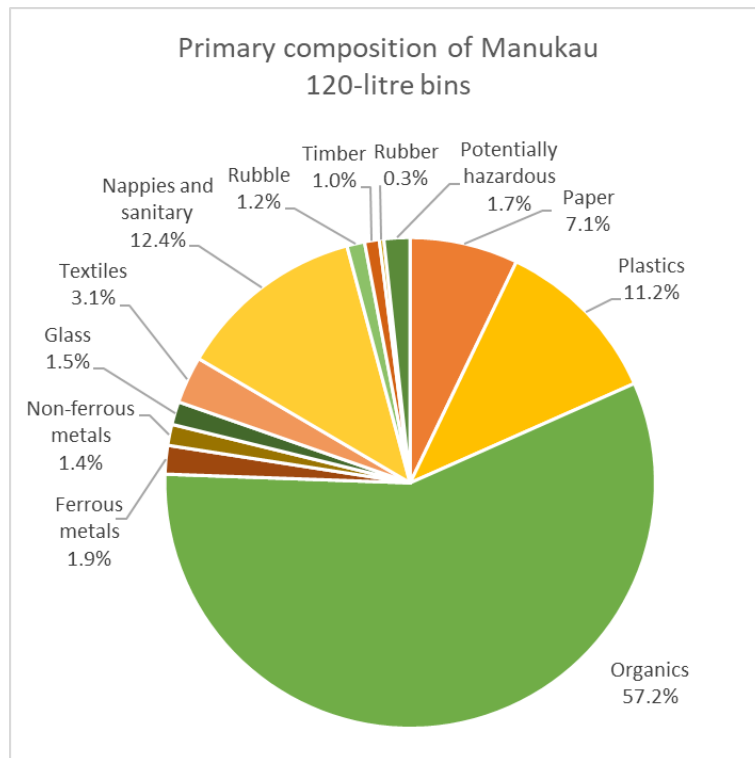


Figure 3.6 - Primary composition of Manukau 120-litre bins, by weight

3.2.1 Organics

Organic matter comprised 57.2% of the weight of Manukau 120-litre bins, by weight. The composition of the organic constituent of the Manukau 120-litre bins is shown in Figure 3.7 below.

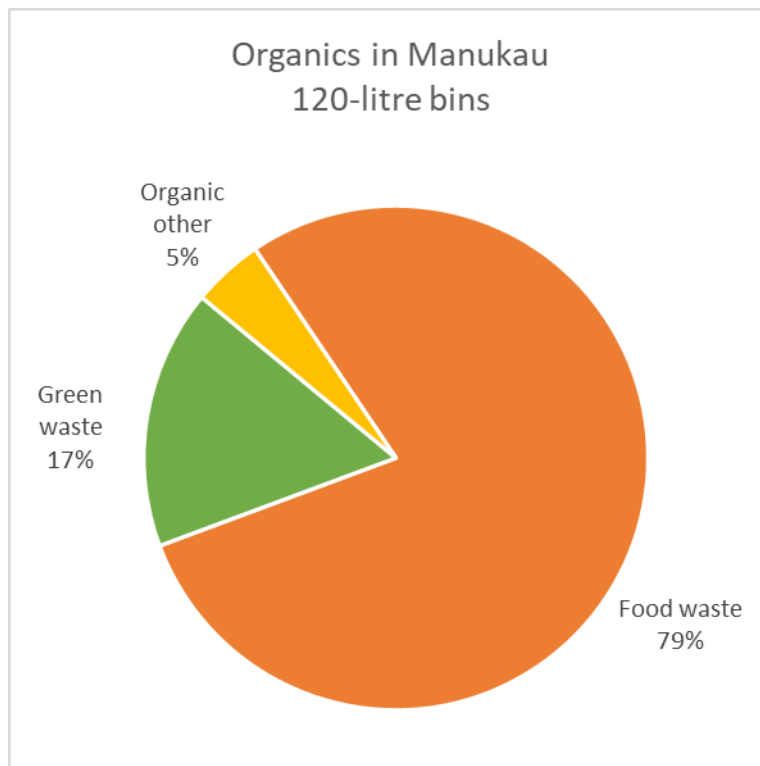


Figure 3.7 - Organic component of Manukau 120-litre bins, by weight

‘Food waste’ comprised 79% of the organic material. ‘Food waste’ included food preparation waste, left-over food waste, and substantial quantities of perished goods. ‘Green waste’, or garden matter, comprised 17% of the organic material. The ‘Green waste’ included tree and shrub prunings, leaves, weeds, and lawn clippings. The ‘Organic other’ category (5% of organic material) included vacuum cleaner dust, animal faeces and associated litter material, candles, and human hair. Some of this material maybe suitable for composting.

3.2.2 Plastics

'Plastics' comprised 11.2% of rubbish in Manukau 120-litre bins, by weight. The secondary components of plastic waste are shown in Figure 3.8.

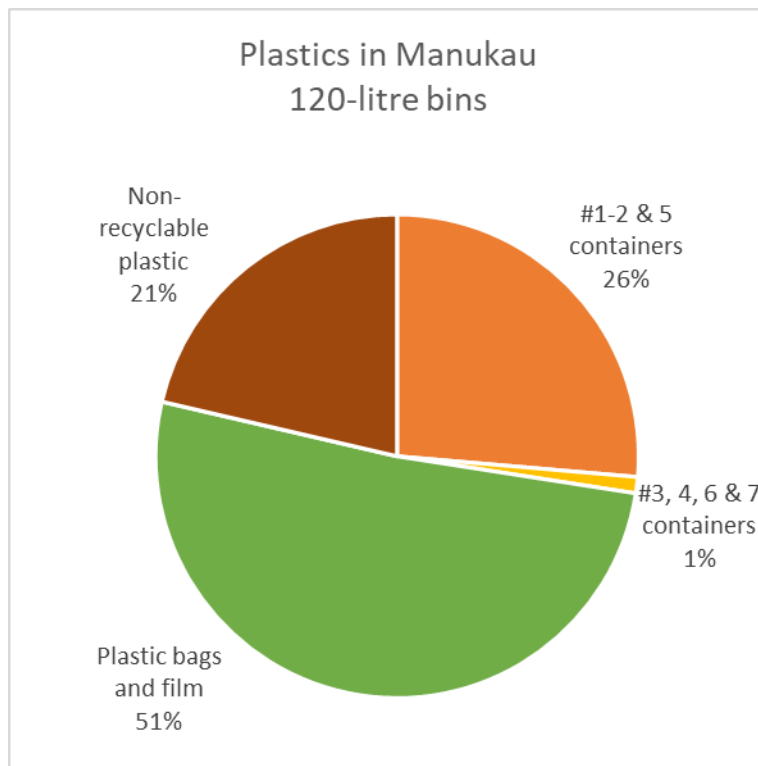


Figure 3.8 - Plastic component of Manukau 120-litre bins, by weight

'Plastic bags and film' comprised 51% of plastic waste, and 'Non-recyclable plastic' comprised 21%. Twenty-six per cent of plastic waste was '#1, 2 and 5 containers' and a further 1% of the plastic waste was '#3, 4, 6 & 7 containers'. Auckland Council accepts plastic household containers #1 – 7 in kerbside recycling, though currently only plastics # 1, 2 and 5 are able to be recycled.

3.2.3 Paper

'Paper' comprised 7.1% of Manukau 120-litre bins, by weight. The composition of the paper constituent of urban rubbish bags is shown in Figure 3.9.

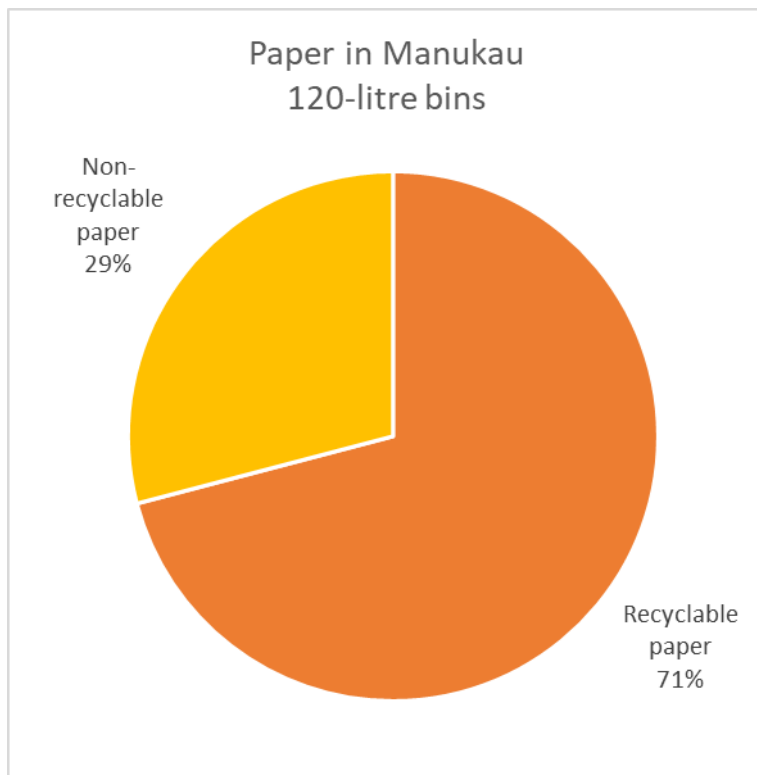


Figure 3.9 - Paper component of Manukau 120-litre bins, by weight

The largest component of the paper was 'Recyclable paper', which comprised 71% of paper. This component included office paper, newspapers, magazines, junk mail, paper packaging, liquid paperboard packaging, cardboard and envelopes. 'Non-recyclable paper' comprised 29% of paper waste. This category is not accepted for recycling, and includes laminated paper, sandpaper, wallpaper, and food-contaminated paper.

A proportion of the recyclable paper was from takeaway food wrapping. Heavily food-contaminated paper was classified as 'Non-recyclable paper' but less contaminated paper was considered to be recyclable for the purposes of this research.

3.2.4 Distribution of Manukau 120-litre bin weights

The distribution of the weight of the contents of the 225 x 120-litre wheelie bins included in the audit is shown in Figure 3.10.

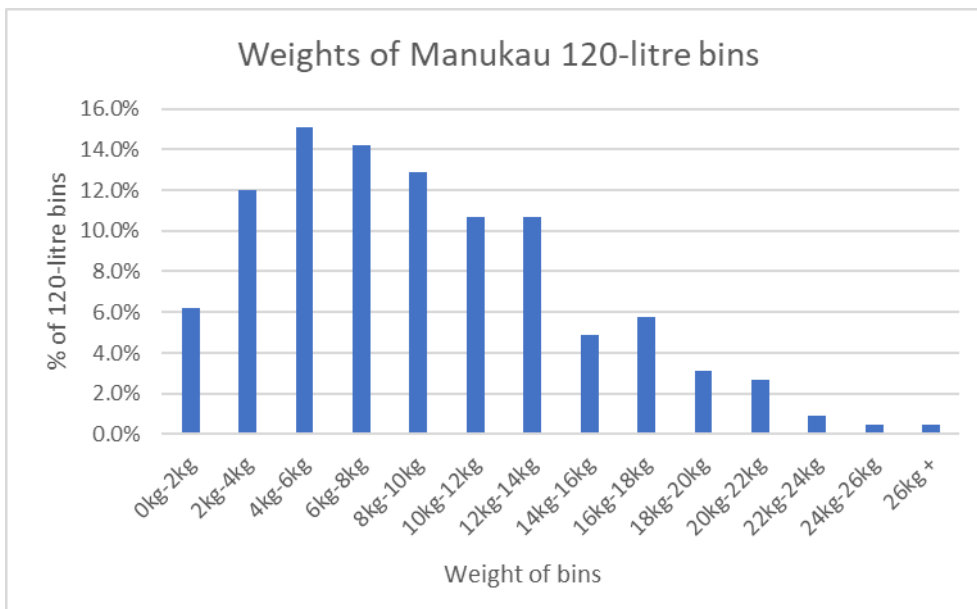


Figure 3.10 - Distribution of Manukau 120-litre bin weights

Figure 3.10 shows the proportion of South Auckland 120-litre bins that fall within each weight range. Six per cent weighed less than 2 kg, 76% weighed between 2 and 14 kg, and 18% weighed more than 14 kg.

The average 120-litre bin weight in Manukau was 9.03 kg. The lightest bin was 0.7 kg and the heaviest was 28.34 kg.

3.3 Primary composition of Manukau 240-litre wheelie bins

Over the five days of auditing kerbside rubbish from Manukau, the contents of 50 x 240-litre wheelie bins of domestic kerbside rubbish were sorted. The primary composition of this rubbish is presented in Table 3.3 and Figure 3.11.

The secondary composition, which includes all 23 categories, and a statistical analysis are given in Appendix 5. An analysis of the precision of the results is given in Section 4.5.

The average weight of the contents of a 240-litre wheelie bin was 19.04 kg. This average weight can not necessarily be equated with an average weekly rubbish generation. Although many householders do set out their wheelie bin every week, some set them out fortnightly or less frequently.

Table 3.3 - Primary composition of Manukau 240-litre wheelie bins, by weight

Primary categories	Mean wt. per wheelie bin	Proportion of total
Paper	1.46 kg	7.7%
Plastics	2.06 kg	10.8%
Organics	9.69 kg	50.9%
Ferrous metals	0.43 kg	2.3%
Non-ferrous metals	0.35 kg	1.9%
Glass	0.63 kg	3.3%
Textiles	0.78 kg	4.1%
Nappies and sanitary	2.87 kg	15.1%
Rubble	0.23 kg	1.2%
Timber	0.23 kg	1.2%
Rubber	0.04 kg	0.2%
Potentially hazardous	0.26 kg	1.4%
Total	19.04 kg	100.0%

Organic material was the largest single component, by weight, of the South Auckland 240-litre wheelie bins, comprising 50.9% of the total. 'Nappies and sanitary' was the second largest component, comprising 15.1% of the total, 'Plastics' represented 10.8% and 'Paper' 7.7%. The compositions of the major primary categories are discussed in the following sections.

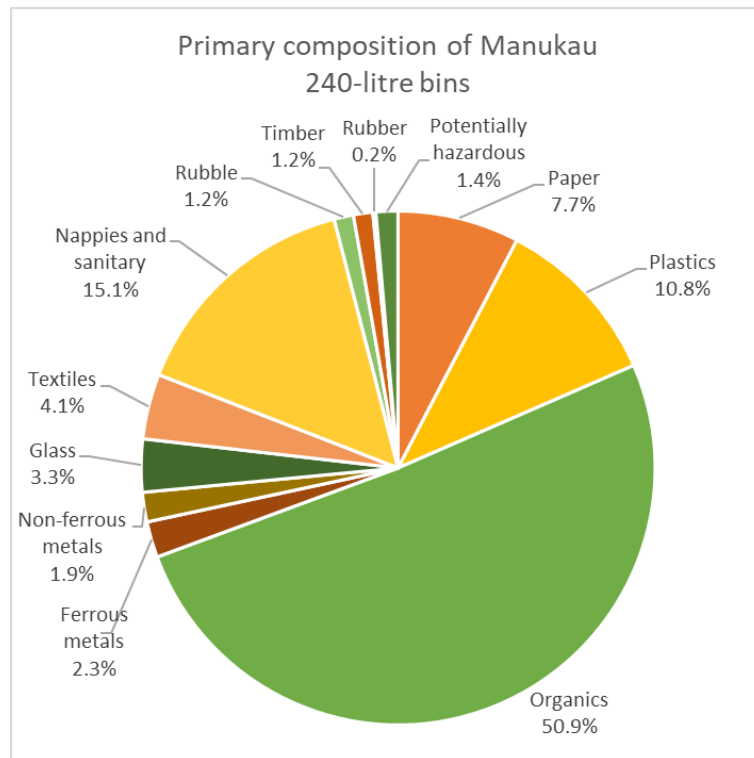


Figure 3.11 - Primary composition of Manukau 240-litre bins, by weight

3.3.1 Organics

Organic matter comprised 50.9% of the weight of Manukau 240-litre bins, by weight. The composition of the organic constituent of Manukau 240-litre bins is shown in Figure 3.12 below.

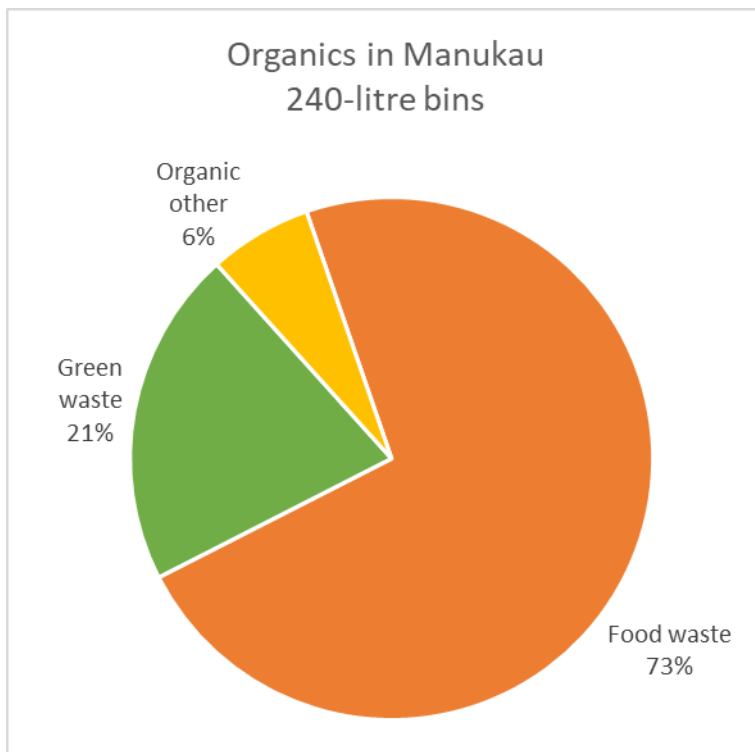


Figure 3.12 - Organic component of Manukau 240-litre bins, by weight

‘Food waste’ comprised 73% of the organic material. ‘Food waste’ included food preparation waste, left-over food waste, and substantial quantities of perished goods. ‘Green waste’, or garden matter, comprised 21% of the organic material. The ‘Green waste’ included tree and shrub prunings, leaves, weeds, and lawn clippings. The ‘Organic other’ category (6% of organic material) included vacuum cleaner dust, animal faeces and associated litter material, candles and human hair. Some of this material maybe suitable for composting.

3.3.2 Plastics

'Plastics' comprised 10.8% of rubbish in Manukau 240-litre bins, by weight. The secondary components of plastic waste are shown in Figure 3.13.

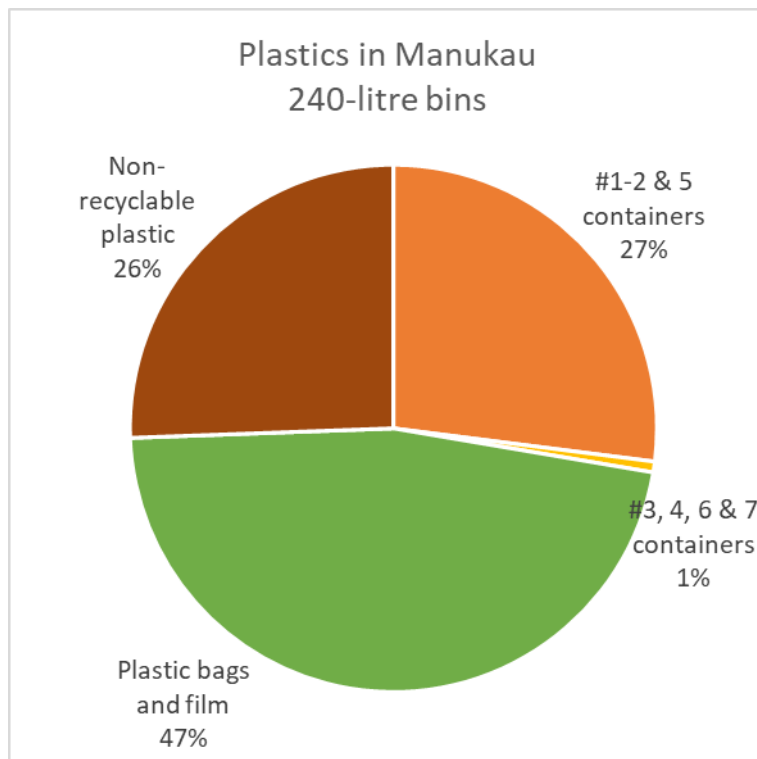


Figure 3.13 - Plastic component of Manukau 240-litre bins, by weight

'Plastic bags and film' comprised 47% of plastic waste, and 'Non-recyclable plastic' comprised 26%. Twenty-seven per cent of plastic waste was '#1, 2 and 5 containers' and a further 1% of the plastic waste was '#3, 4, 6 & 7 containers'. Auckland Council accepts plastic household containers #1 – 7 in kerbside recycling, though currently only plastics # 1, 2 and 5 are able to be recycled.

3.3.3 Paper

‘Paper’ comprised 7.7% of South Auckland 240-litre bins, by weight. The composition of the paper constituent of Manukau 240-litre bins is shown in Figure 3.14.

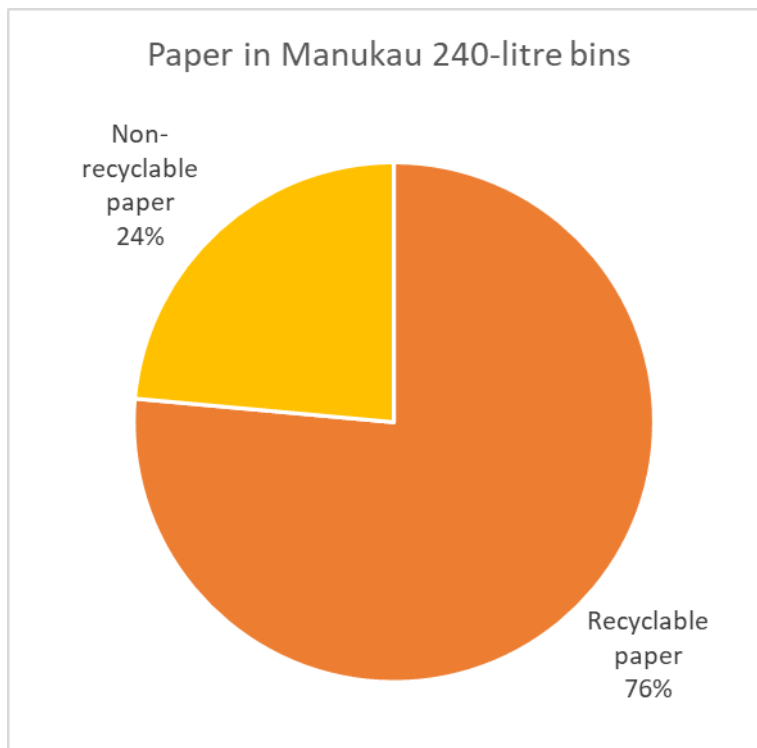


Figure 3.14 - Paper component of Manukau 240-litre bins, by weight

The largest component of the paper, at 76%, was ‘Recyclable paper’. This component included office paper, newspapers, magazines, junk mail, paper packaging, liquid paperboard packaging, cardboard and envelopes. ‘Non-recyclable paper’ comprised 24% of paper waste. This category is not accepted for recycling and includes laminated paper, sandpaper, wallpaper, and food-contaminated paper.

A proportion of the recyclable paper was from takeaway food wrapping. Heavily food-contaminated paper was classified as ‘Non-recyclable paper’ but less contaminated paper was considered to be recyclable for the purposes of this research.

3.3.4 Distribution of Manukau 240-litre bins weights

The distribution of the weight of the contents of the 50 x 240-litre wheelie bins included in the audit is shown in Figure 3.15.

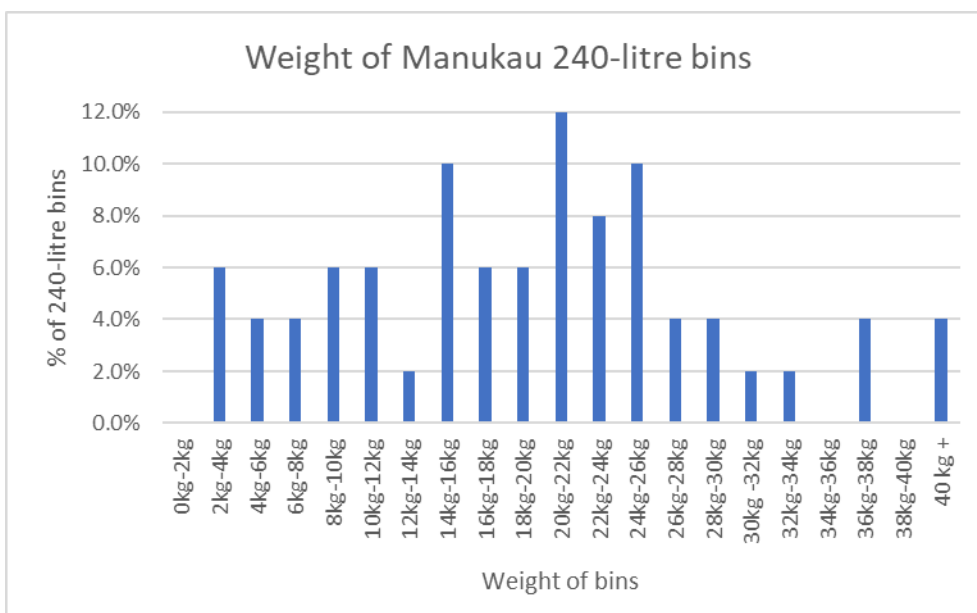


Figure 3.15 - Distribution of Manukau 240-litre bins

Figure 3.15 shows the proportion of Manukau 240-litre bins that fall within each weight range. Twenty per cent weighed less than 10 kg, 30% weighed between 10 and 20 kg, 38% weighed between 20 and 30 kg and 12% weighed more than 30 kg.

The average weight in Manukau 240-litre wheelie bins was 19.04 kg. The lightest bag was 2.12 kg and the heaviest was 43.82 kg.

3.4 Composition of combined Manukau kerbside rubbish

This section provides an analysis of the combined 120- and 240-litre wheelie bins from Manukau. According to Auckland Council, 83% of households in Manukau use 120-litre wheelie bins and 17% use 240-litre wheelie bins. The composition of the 120- and 240-litre bins have been combined proportionally in this section to provide the composition and average set out weight of domestic kerbside rubbish from households in Manukau.

It has been assumed that the set out rate of 120-litre and 240-litre bins is the same (i.e. that households with 120-litre wheelie bins set them out to kerbside at the same frequency as households with 240-litre wheelie bins).

The primary composition of the combined kerbside rubbish is presented in Table 3.4 and Figure 3.16. The secondary composition is presented in Appendix 6.

The average household set out weight of 10.74 kg can not necessarily be equated with an average weekly rubbish generation. Although many householders do set out their kerbside rubbish every week, some set them out fortnightly or less frequently.

Table 3.4 – Primary composition of Manukau 120- and 240-litre wheelie bins combined, by weight

Primary categories - combined Manukau kerbside waste	Kg per household set out	Proportion of total
Paper	0.78 kg	7.3%
Plastics	1.19 kg	11.1%
Organics	5.94 kg	55.3%
Ferrous metals	0.21 kg	2.0%
Non-ferrous metals	0.16 kg	1.5%
Glass	0.22 kg	2.1%
Textiles	0.37 kg	3.4%
Nappies and sanitary	1.42 kg	13.2%
Rubble	0.13 kg	1.2%
Timber	0.11 kg	1.0%
Rubber	0.03 kg	0.3%
Potentially hazardous	0.17 kg	1.6%
TOTAL	10.74 kg	100.0%

Organic material was the largest single component, by weight, of the combined kerbside rubbish, comprising 55.3% of the total. 'Nappies and sanitary' was the second largest component, comprising 13.2% of the total, 'Plastics' represented 11.1% and 'Paper' 7.3%. The compositions of the major primary categories are discussed in the following sections.

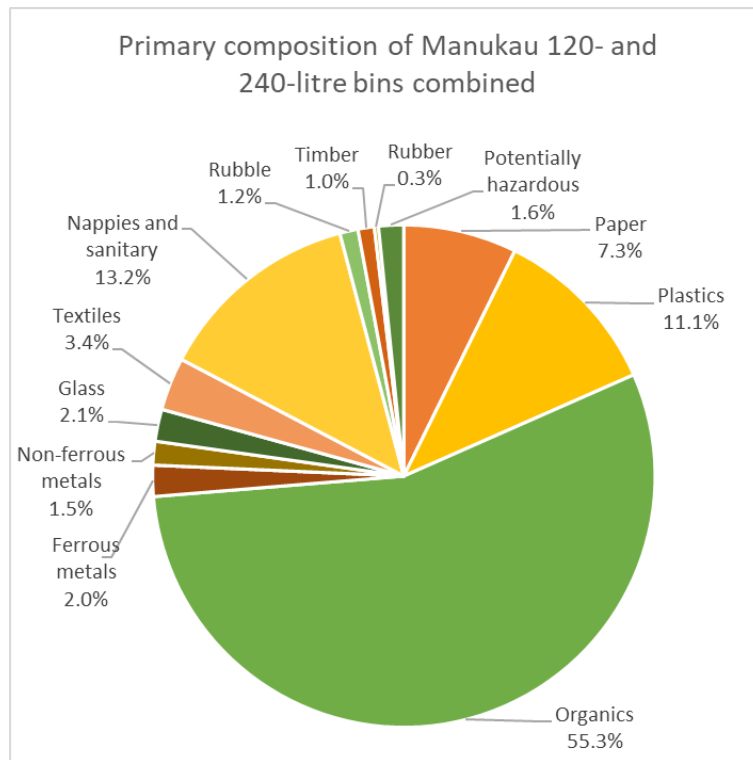


Figure 3.16 - Primary composition of Manukau 120- and 240-litre bins combined, by weight

3.4.1 Organics

Organic matter comprised 55.3% of the weight of Manukau’s combined kerbside rubbish. The composition of the organic constituent of the rubbish is shown in Figure 3.17 below.

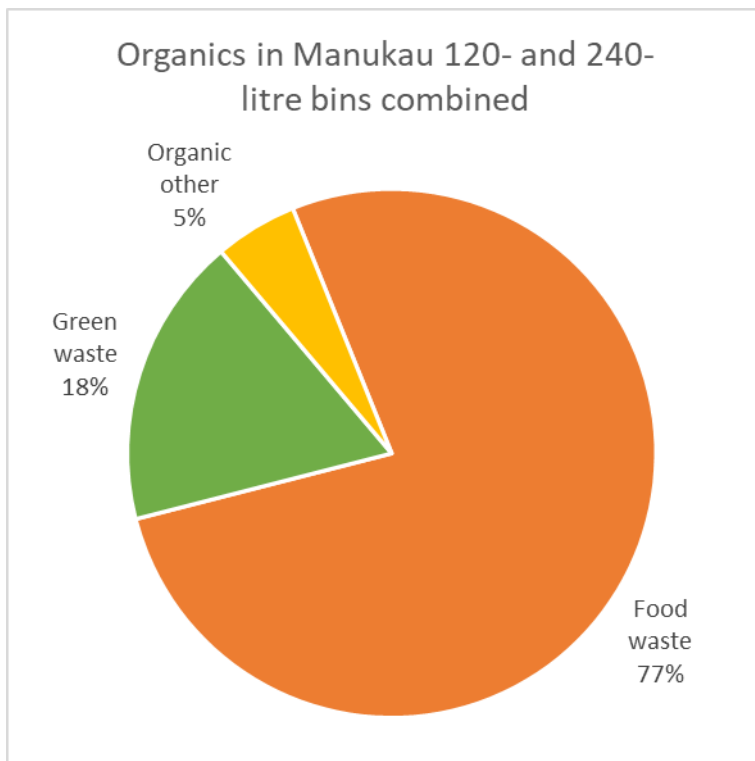


Figure 3.17 - Organic component of Manukau 120- and 240-litre bins combined, by weight

‘Food waste’ comprised 77% of the organic material. ‘Food waste’ included food preparation waste, left-over food waste, and substantial quantities of perished goods. ‘Green waste’, or garden matter, comprised 18% of the organic material. The ‘Green waste’ included tree and shrub prunings, leaves, weeds, and lawn clippings. The ‘Organic other’ category (5% of organic material) included vacuum cleaner dust, animal faeces and associated litter material, candles, fireplace ash, and human hair. Some of this material may be suitable for composting.

3.4.2 Plastics

'Plastics' comprised 11.1% of rubbish in Manukau's 120- and 240-litre bins combined, by weight. The secondary components of plastic waste are shown in Figure 3.18.

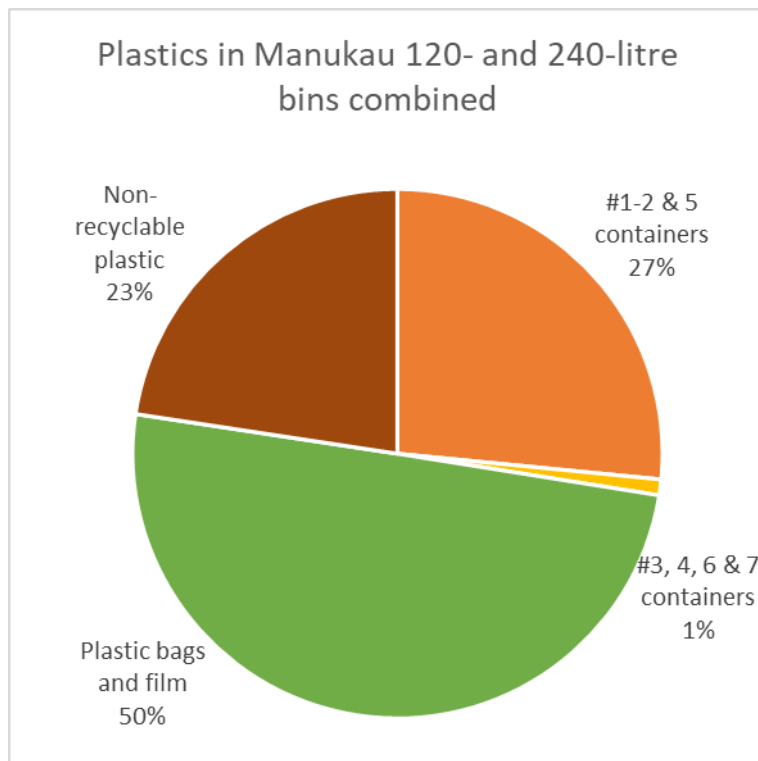


Figure 3.18 - Plastic component of Manukau 120- and 240-litre bins combined, by weight

'Plastic bags and film' comprised 50% of plastic waste, and 'Non-recyclable plastic' comprised 23%. Twenty-seven per cent of plastic waste was '#1, 2 and 5 containers' and a further 1% of the plastic waste was '#3, 4, 6 & 7 containers'. Auckland Council accepts plastic household containers #1 – 7 in kerbside recycling, though currently only plastics # 1, 2 and 5 are able to be recycled.

3.4.3 Paper

‘Paper’ comprised 7.3% of Manukau’s combined kerbside rubbish, by weight. The composition of the paper constituent of wheelie bin rubbish is shown in Figure 3.19.

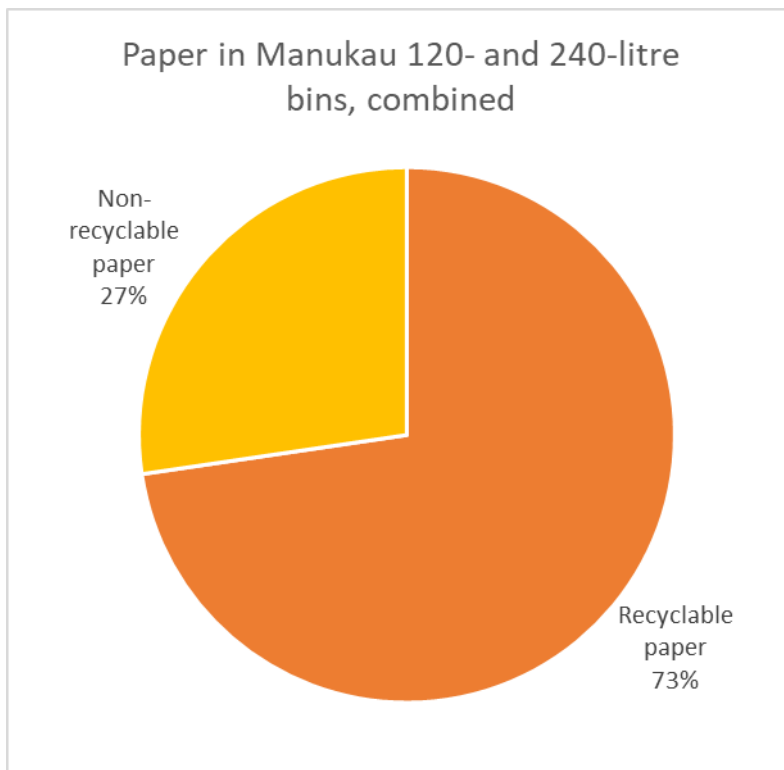


Figure 3.19 - Paper component of Manukau 120- and 240-litre bins combined, by weight

The largest component of the paper was ‘Recyclable paper’, which comprised 73% of paper. This component included office paper, newspapers, magazines, junk mail, paper packaging, liquid paperboard packaging, cardboard and envelopes. ‘Non-recyclable paper’ comprised 27% of paper waste. This category is not accepted for recycling and includes laminated paper, sandpaper, wallpaper, and food-contaminated paper.

A proportion of the recyclable paper was from takeaway food wrapping. Heavily food-contaminated paper was classified as ‘Non-recyclable paper’ but less contaminated paper was considered to be recyclable for the purposes of this research.

3.5 Composition of combined Central Auckland and Manukau kerbside rubbish

This section provides an analysis of the combined Central Auckland and Manukau domestic kerbside rubbish. This analysis is provided as a combined, or overall, rates-funded domestic kerbside rubbish composition.

The composition of domestic kerbside rubbish from Central Auckland has been combined with the composition of domestic kerbside rubbish from Manukau, proportionally, based on the number of households receiving a domestic kerbside collection in each area. It has been assumed that wheelie bin set out rates are the same in each area (i.e. that households in Central Auckland set their wheelie bins out at kerbside at the same frequency as households in Manukau). The composition of Manukau rubbish used in this analysis is as per Section 3.4, combining the composition of 120- and 240-litre wheelie bins.

The primary composition of the combined rates-funded kerbside rubbish is presented in Table 3.5 and Figure 3.20. The secondary composition is presented in Appendix 7.

The average household set out weight across Central Auckland and Manukau is 9.75 kg. This can not necessarily be equated with an average weekly rubbish generation. Although many householders do set out their kerbside rubbish every week, some set them out fortnightly or less frequently.

Table 3.5 – Primary composition of combined rates-funded domestic kerbside rubbish, by weight

Primary categories - combined Central Auckland and Manukau kerbside waste	Kg per household set out	Proportion of total
Paper	0.68 kg	7.0%
Plastics	1.06 kg	10.9%
Organics	5.38 kg	55.2%
Ferrous metals	0.22 kg	2.3%
Non-ferrous metals	0.13 kg	1.3%
Glass	0.21 kg	2.1%
Textiles	0.35 kg	3.6%
Nappies and sanitary	1.17 kg	12.0%
Rubble	0.21 kg	2.2%
Timber	0.16 kg	1.6%
Rubber	0.04 kg	0.4%
Potentially hazardous	0.14 kg	1.4%
TOTAL	9.75 kg	100.0%

Organic material was the largest single component, by weight, of the combined rates-funded kerbside rubbish, comprising 55.2% of the total. 'Nappies and sanitary' was the second largest component, comprising 12.0% of the total, 'Plastics' represented 10.9% and 'Paper' 7.0%. The compositions of the major primary categories are discussed in the following sections.

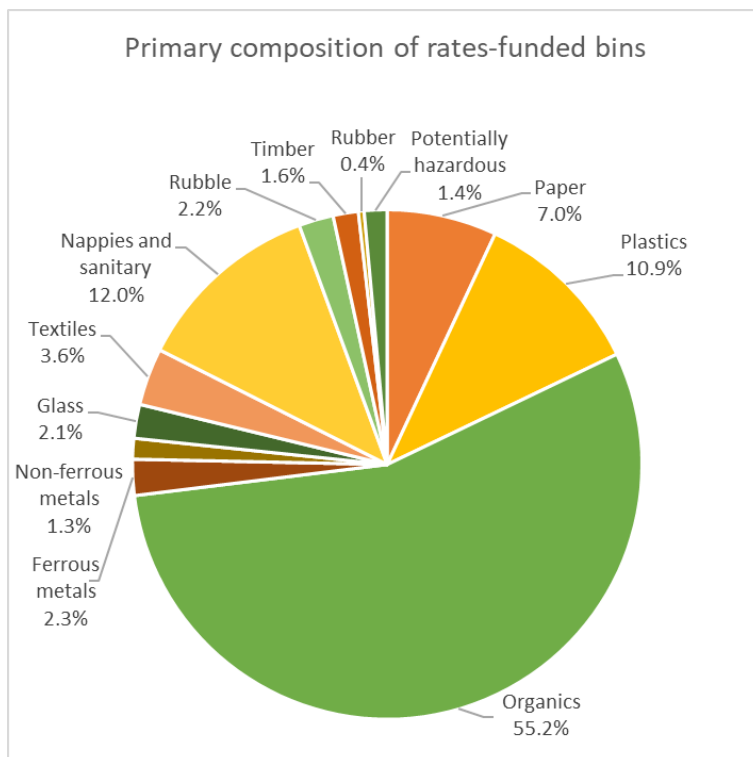


Figure 3.20 - Primary composition of rates-funded bins, by weight

3.5.1 Organics

Organic matter comprised 55.3% of the weight of the combined rates-funded kerbside rubbish. The composition of the organic constituent of the rubbish is shown in Figure 3.21 below.

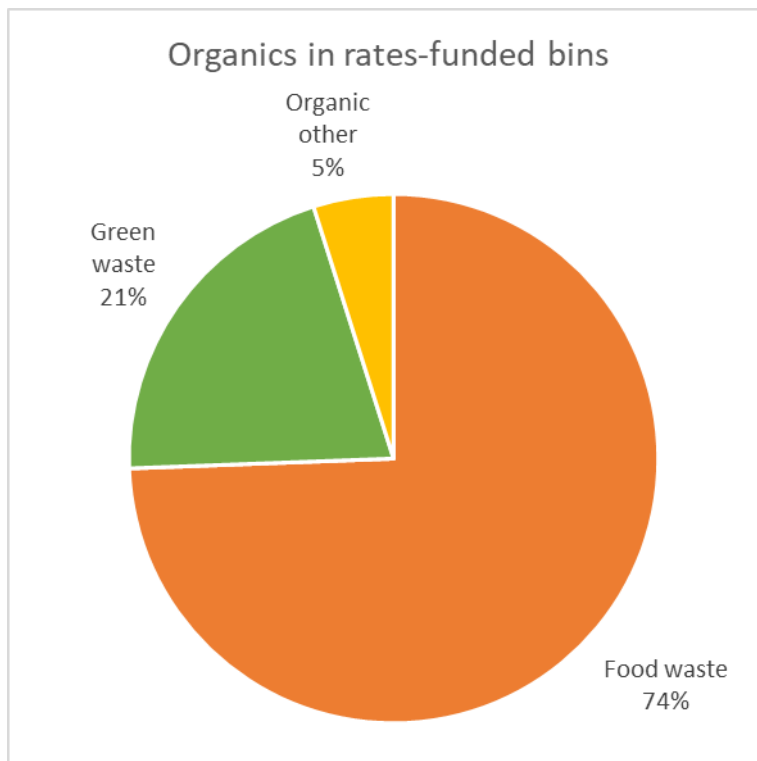


Figure 3.21 - Organic component of rates-funded bins, by weight

'Food waste' comprised 74% of the organic material. 'Food waste' included food preparation waste, left-over food waste, and substantial quantities of perished goods. 'Green waste', or garden matter, comprised 21% of the organic material. The 'Green waste' included tree and shrub prunings, leaves, weeds, and lawn clippings. The 'Organic other' category (5% of organic material) included vacuum cleaner dust, animal faeces and associated litter material, candles, fireplace ash, and human hair. Some of this material may be suitable for composting.

3.5.2 Plastics

'Plastics' comprised 10.9% of rubbish in combined rates-funded bins, by weight. The secondary components of plastic waste are shown in Figure 3.22.

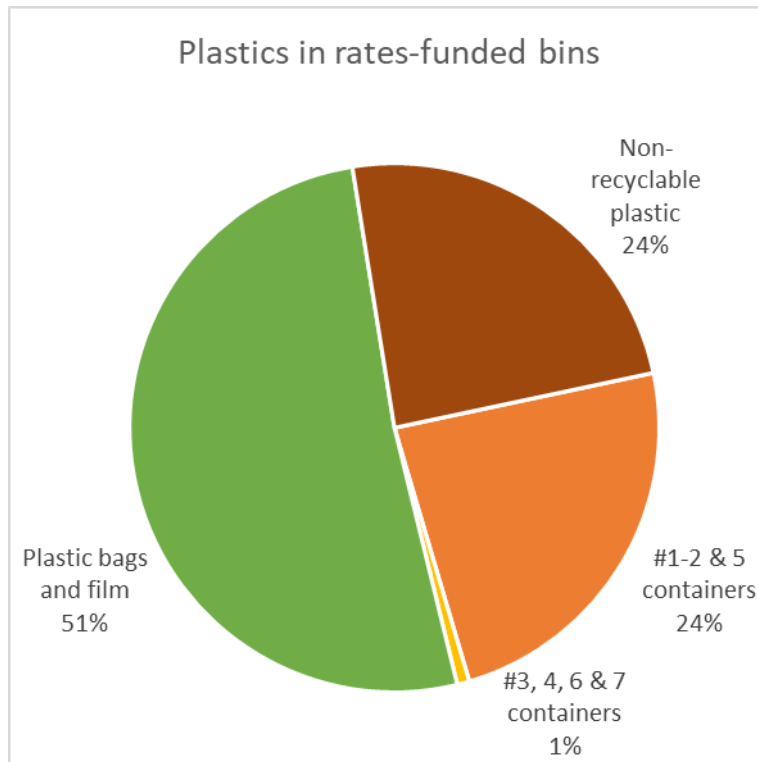


Figure 3.22 - Plastics component of rates-funded bins, by weight

'Plastic bags and film' comprised 51% of plastic waste, and 'Non-recyclable plastic' comprised 24%. Twenty-four per cent of plastic waste was '#1, 2 and 5 containers' and a further 1% of the plastic waste was '#3, 4, 6 & 7 containers'. Auckland Council accepts plastic household containers #1 – 7 in kerbside recycling, though currently only plastics # 1, 2 and 5 are able to be recycled.

3.5.3 Paper

'Paper' comprised 7.0% of combined rates-funded kerbside rubbish, by weight. The composition of the paper constituent of wheelie bin rubbish is shown in Figure 3.23.

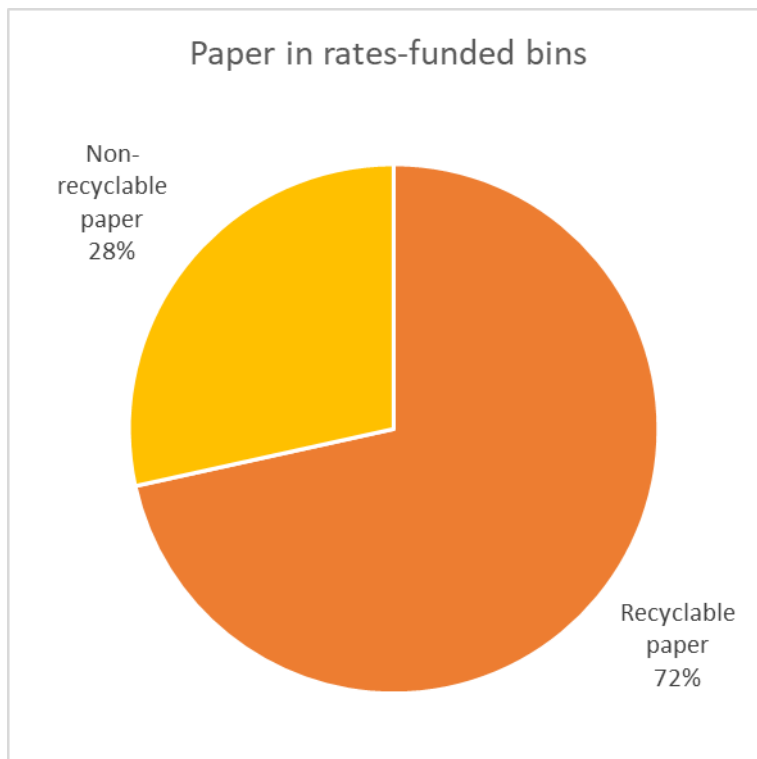


Figure 3.23 - Paper component of rates-funded bins, by weight

The largest component of the paper was 'Recyclable paper', which comprised 72% of paper. This component included office paper, newspapers, magazines, junk mail, paper packaging, liquid paperboard packaging, cardboard and envelopes. 'Non-recyclable paper' comprised 28% of paper waste. This category is not accepted for recycling and includes laminated paper, sandpaper, wallpaper, and food-contaminated paper.

A proportion of the recyclable paper was from takeaway food wrapping. Heavily food-contaminated paper was classified as 'Non-recyclable paper', but less contaminated paper was considered to be recyclable for the purposes of this research.

4. ANALYSIS OF RESULTS

4.1 Comparison of primary composition

A comparison of the primary composition of Central Auckland and Manukau 120-litre wheelie bins, Manukau 240-litre wheelie bins and Manukau’s combined 120- and 240-litre wheelie bins are provided in percentage terms in Table 4.1.

4.1 - Comparison of primary composition of domestic kerbside rubbish as % of total

Primary categories - comparison	Central Auckland 120-litre bins	Manukau 120-litre bins	Manukau 240-litre bins	Manukau combined kerbside
Paper	6.7%	7.1%	7.7%	7.3%
Plastics	10.7%	11.2%	10.8%	11.1%
Organics	55.1%	57.2%	50.9%	55.3%
Ferrous metals	2.5%	1.9%	2.3%	2.0%
Non-ferrous metals	1.1%	1.4%	1.9%	1.5%
Glass	2.2%	1.5%	3.3%	2.1%
Textiles	3.8%	3.1%	4.1%	3.4%
Nappies and sanitary	10.9%	12.4%	15.1%	13.2%
Rubble	3.1%	1.2%	1.2%	1.2%
Timber	2.1%	1.0%	1.2%	1.0%
Rubber	0.4%	0.3%	0.2%	0.3%
Potentially hazardous	1.3%	1.7%	1.4%	1.6%
TOTAL	100.0%	100.0%	100.0%	100.0%

The compositions of the four waste streams are similar. The main differences are a lower proportion of ‘Organics’ and a higher proportion of ‘Nappies and sanitary’ in the Manukau 240-litre wheelie bins than in the Central Auckland or Manukau 120-litre bins.

Table 4.2 provides the results for each kerbside rubbish stream per household set out. This information is also provided in Figure 4.1.

4.2 - Comparison of primary composition of domestic kerbside rubbish per household set out

Primary categories - comparison	Central Auckland 120-litre bins	Manukau 120-litre bins	Manukau 240-litre bins	Manukau combined kerbside
Paper	0.60 kg	0.64 kg	1.46 kg	0.78 kg
Plastics	0.97 kg	1.01 kg	2.06 kg	1.19 kg
Organics	4.96 kg	5.17 kg	9.69 kg	5.94 kg
Ferrous metals	0.23 kg	0.17 kg	0.43 kg	0.21 kg
Non-ferrous metals	0.10 kg	0.12 kg	0.35 kg	0.16 kg
Glass	0.20 kg	0.14 kg	0.63 kg	0.22 kg
Textiles	0.35 kg	0.28 kg	0.78 kg	0.37 kg
Nappies and sanitary	0.98 kg	1.12 kg	2.87 kg	1.42 kg
Rubble	0.28 kg	0.11 kg	0.23 kg	0.13 kg
Timber	0.19 kg	0.09 kg	0.23 kg	0.11 kg
Rubber	0.04 kg	0.03 kg	0.04 kg	0.03 kg
Potentially hazardous	0.12 kg	0.15 kg	0.26 kg	0.17 kg
TOTAL	9.00 kg	9.03 kg	19.04 kg	10.74 kg

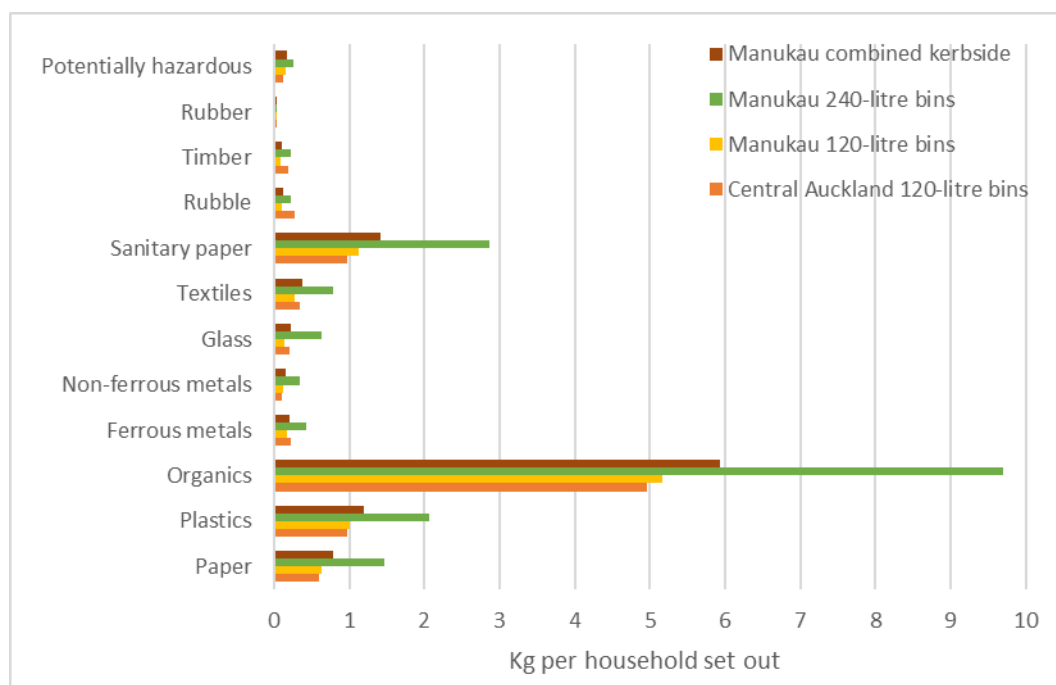


Figure 4.1 – Comparison of primary categories per household set out

Central Auckland and Manukau households that use 120-litre wheelie bins set out, on average, the same quantity of rubbish (9.00 and 9.03 kg). The composition of the rubbish is also very similar, though Manukau households using 120-litre wheelie bins set out slightly more ‘Paper’, ‘Plastics’,

'Organics' and 'Nappies and sanitary', while Central Auckland households set out slightly more 'Ferrous metal', 'Textiles', 'Rubble', and 'Timber'.

The 240-litre wheelie bins in Manukau held over twice as much rubbish, by weight, as the 120-litre bins. The doubling of material weights extended across almost all material categories.

When the 120-litre and 240-litre wheelie bins from Manukau are combined proportionally, the average waste set out per household in Manukau is 19% heavier than in Central Auckland (10.74 kg per household set out in Manukau versus 9.00 kg in Central Auckland).

4.2 Comparison of secondary composition

Table 4.3 provides the composition of the secondary categories of domestic kerbside rubbish for each of the waste streams, as proportions of the total. Table 4.4 provides the weight of secondary categories per household set out.

**Table 4.3 – Comparison of secondary categories of domestic kerbside rubbish -
by % of total**

Secondary categories - comparison		Central Auckland 120-litre bins	Manukau 120-litre bins	Manukau 240-litre bins	Manukau combined kerbside
Paper	Recyclable paper	4.7%	5.1%	5.9%	5.3%
	Non-recyclable paper	2.0%	2.1%	1.8%	2.0%
	Subtotal	6.7%	7.1%	7.7%	7.3%
Plastics	# 1, 2 and 5 containers	2.3%	3.0%	2.9%	2.9%
	# 3, 4, 6, 7 containers	0.1%	0.1%	0.1%	0.1%
	Plastic bags and film	5.6%	5.7%	5.1%	5.5%
	Non-recyclable plastics	2.8%	2.4%	2.8%	2.5%
	Subtotal	10.7%	11.2%	10.8%	11.1%
Organics	Food waste	39.6%	45.1%	37.0%	42.6%
	Green waste	12.8%	9.5%	10.6%	9.9%
	Organic other	2.6%	2.6%	3.2%	2.8%
	Subtotal	55.1%	57.2%	50.9%	55.3%
Ferrous metals	Steel cans	0.5%	1.0%	0.7%	0.9%
	Ferrous other	2.1%	0.9%	1.6%	1.1%
	Subtotal	2.5%	1.9%	2.3%	2.0%
Non-ferrous metals	Aluminium cans	0.4%	0.4%	0.5%	0.4%
	Non-ferrous other	0.7%	1.0%	1.4%	1.1%
	Subtotal	1.1%	1.4%	1.9%	1.5%
Glass	Bottles/jars	1.6%	1.1%	2.3%	1.5%
	Glass other	0.7%	0.4%	1.0%	0.6%
	Subtotal	2.2%	1.5%	3.3%	2.1%
Textiles	Clothing & rags	2.2%	1.8%	2.6%	2.0%
	Textile other	1.6%	1.3%	1.5%	1.4%
	Subtotal	3.8%	3.1%	4.1%	3.4%
Nappies and sanitary		10.9%	12.4%	15.1%	13.2%
Rubble		3.1%	1.2%	1.2%	1.2%
Timber		2.1%	1.0%	1.2%	1.0%
Rubber		0.4%	0.3%	0.2%	0.3%
Potentially hazardous	Household	0.7%	0.9%	1.3%	1.0%
	Other	0.6%	0.8%	0.1%	0.6%
	Subtotal	1.3%	1.7%	1.4%	1.6%
TOTAL		100.0%	100.0%	100.0%	100.0%

Table 4.4 – Comparison of secondary composition of domestic kerbside waste service types - by household set out

Secondary categories - comparison		Central Auckland 120-litre bins	Manukau 120-litre bins	Manukau 240-litre bins	Manukau combined kerbside
Paper	Recyclable paper	0.42 kg	0.46 kg	1.11 kg	0.57 kg
	Non-recyclable paper	0.18 kg	0.19 kg	0.34 kg	0.21 kg
	Subtotal	0.60 kg	0.64 kg	1.46 kg	0.78 kg
Plastics	# 1, 2 and 5 containers	0.20 kg	0.27 kg	0.56 kg	0.32 kg
	# 3, 4, 6, 7 containers	0.01 kg	0.01 kg	0.01 kg	0.01 kg
	Plastic bags and film	0.51 kg	0.52 kg	0.96 kg	0.59 kg
	Non-recyclable plastics	0.25 kg	0.22 kg	0.53 kg	0.27 kg
	Subtotal	0.97 kg	1.01 kg	2.06 kg	1.19 kg
Organics	Food waste	3.57 kg	4.07 kg	7.05 kg	4.58 kg
	Green waste	1.15 kg	0.86 kg	2.02 kg	1.06 kg
	Organic other	0.24 kg	0.24 kg	0.62 kg	0.30 kg
	Subtotal	4.96 kg	5.17 kg	9.69 kg	5.94 kg
Ferrous metals	Steel cans	0.04 kg	0.09 kg	0.13 kg	0.10 kg
	Ferrous other	0.19 kg	0.08 kg	0.30 kg	0.12 kg
	Subtotal	0.23 kg	0.17 kg	0.43 kg	0.21 kg
Non-ferrous metals	Aluminium cans	0.04 kg	0.03 kg	0.09 kg	0.04 kg
	Non-ferrous other	0.06 kg	0.09 kg	0.27 kg	0.12 kg
	Subtotal	0.10 kg	0.12 kg	0.35 kg	0.16 kg
Glass	Bottles/jars	0.14 kg	0.10 kg	0.44 kg	0.16 kg
	Glass other	0.06 kg	0.04 kg	0.19 kg	0.06 kg
	Subtotal	0.20 kg	0.14 kg	0.63 kg	0.22 kg
Textiles	Clothing & rags	0.20 kg	0.16 kg	0.50 kg	0.22 kg
	Textile other	0.14 kg	0.12 kg	0.28 kg	0.15 kg
	Subtotal	0.35 kg	0.28 kg	0.78 kg	0.37 kg
Nappies and sanitary		0.98 kg	1.12 kg	2.87 kg	1.42 kg
Rubble		0.28 kg	0.11 kg	0.23 kg	0.13 kg
Timber		0.19 kg	0.09 kg	0.23 kg	0.11 kg
Rubber		0.04 kg	0.03 kg	0.04 kg	0.03 kg
Potentially hazardous	Household	0.06 kg	0.08 kg	0.25 kg	0.11 kg
	Other	0.05 kg	0.07 kg	0.01 kg	0.06 kg
	Subtotal	0.12 kg	0.15 kg	0.26 kg	0.17 kg
TOTAL		9.00 kg	9.03 kg	19.04 kg	10.74 kg

The weight of the individual secondary categories are similar between the Central Auckland and Manukau 120-litre wheelie bins, though there is more food waste in the Manukau bins and more green waste in the Central Auckland bins. Several materials in the Manukau 240-litre wheelie bins are present in quantities more than double the quantity that is present in the 120-litre bins, including 'Paper', 'Non-ferrous other metal', 'Textiles' and 'Nappies and sanitary'.

It is likely that many of the 240-litre wheelie bins are used by larger households, and households with more children, resulting in the higher quantities of waste.

4.3 Diversion potential of kerbside rubbish

A common means of diverting household rubbish from landfill disposal is through the kerbside collection of recyclable and compostable materials. Auckland Council provides households in Central Auckland and Manukau with a comingled kerbside collection of recyclable paper and cardboard, recyclable plastic containers #1-7, aluminium and steel cans, and glass bottles and jars.

Table 4.5 shows the quantity, per household set out, of Central Auckland and Manukau's kerbside rubbish collections that could be diverted using these diversion methods. 'Plastics 3, 4, 6 and 7' have not been included as they are currently not able to be recycled.

Table 4.5 - Diversion potential of kerbside rubbish, by weight

Materials in kerbside rubbish	Central Auckland 120-litre bins	Manukau 120-litre bins	Manukau 240-litre bins	Manukau combined kerbside
Recyclable materials				
Recyclable paper	0.42 kg	0.46 kg	1.11 kg	0.57 kg
Recyclable plastics - #1, 2 and 5	0.20 kg	0.27 kg	0.56 kg	0.32 kg
Steel cans	0.04 kg	0.09 kg	0.13 kg	0.10 kg
Aluminium cans	0.04 kg	0.03 kg	0.09 kg	0.04 kg
Glass bottles and jars	0.14 kg	0.10 kg	0.44 kg	0.16 kg
Subtotal	0.85 kg	0.95 kg	2.33 kg	1.18 kg
Recyclable materials as % of total	9.4%	10.5%	12.2%	11.0%
Compostable materials				
Food waste	3.57 kg	4.07 kg	7.05 kg	4.58 kg
Green waste	1.15 kg	0.86 kg	2.02 kg	1.06 kg
Subtotal	4.72 kg	4.93 kg	9.07 kg	5.64 kg
Compostable materials as % of total	52.4%	54.6%	47.7%	52.5%
Total divertible				
Weight of divertible materials per household set out	5.57 kg	5.88 kg	11.40 kg	6.82 kg
Divertible materials as % of total	61.9%	65.1%	59.9%	63.5%

Almost 62% of Central Auckland rubbish and 65% of Manukau rubbish disposed of in 120-litre wheelie bins could be diverted through recycling or composting. Sixty per cent of Manukau 240-litre wheelie bins could be diverted, and almost 64% of Manukau's combined wheelie bin composition. The largest opportunity to divert waste from landfill is through the diversion of 'food waste' and 'green waste', which, when combined, comprise between 4.72 kg and 9.07 kg of the weight of each wheelie bin.

The Manukau 240-litre wheelie bins contained more recyclable materials, by weight and as a proportion of overall bin weight, than the 120-litre wheelie bins. However, the 120-litre bins contained slightly more compostable material, as a proportion of overall bin weight, than the 240-litre bins.

4.4 Comparison of results from 2023, 2016 and 2010 kerbside audits

The last kerbside audit undertaken for Auckland Council was in 2016. At the time, four five-day audits were undertaken as described in Section 1. One of these five day audits was of 120-litre rates funded wheelie bins from legacy Auckland City and another week of auditing was of rubbish bags from legacy Manukau City.

Prior to this, audits of domestic kerbside rubbish were undertaken in 2010 for Auckland City Council and Manukau City Council.

Table 4.6 provides a comparison of the results for the primary categories, per household set out, for Central Auckland rubbish in 2010, 2016 and 2023. There have been no changes to rubbish or recycling collections in Central Auckland over this time.

Table 4.6 also provides a comparison for Manukau of the composition of rubbish bags in 2010 and 2016 and of 120- and 240-litre bins, combined, in 2023.

A comparison of the composition of the secondary categories for Central Auckland and Manukau rubbish are provided in Appendices 8 and 9.

Table 4.6 – Comparison of results by household set out of Central Auckland rubbish, 2010, 2016, and 2023

Comparison of 2010, 2016 and 2023 kerbside waste audits	Central Auckland			Manukau		
	2023	2016	2010	2023	2016	2010
Paper	0.60 kg	0.79 kg	0.97 kg	0.78 kg	1.18 kg	1.38 kg
Plastics	0.97 kg	1.13 kg	1.04 kg	1.19 kg	1.52 kg	1.63 kg
Organics	4.96 kg	5.69 kg	4.65 kg	5.94 kg	7.34 kg	8.84 kg
Ferrous metals	0.23 kg	0.14 kg	0.20 kg	0.21 kg	0.15 kg	0.25 kg
Non-ferrous metals	0.10 kg	0.11 kg	0.07 kg	0.16 kg	0.14 kg	0.08 kg
Glass	0.20 kg	0.25 kg	0.20 kg	0.22 kg	0.19 kg	0.24 kg
Textiles	0.35 kg	0.34 kg	0.36 kg	0.37 kg	0.60 kg	0.69 kg
Nappies and sanitary	0.98 kg	1.04 kg	1.06 kg	1.42 kg	1.65 kg	1.85 kg
Rubble	0.28 kg	0.22 kg	0.34 kg	0.13 kg	0.07 kg	0.17 kg
Timber	0.19 kg	0.10 kg	0.12 kg	0.11 kg	0.03 kg	0.07 kg
Rubber	0.04 kg	0.05 kg	0.02 kg	0.03 kg	0.02 kg	0.01 kg
Potentially hazardous	0.12 kg	0.14 kg	0.12 kg	0.17 kg	0.08 kg	0.08 kg
TOTAL	9.00 kg	9.99 kg	9.14 kg	10.74 kg	12.96 kg	15.30 kg

Based on the results of the audits, the household set out of rubbish in Central Auckland has stayed between 9 kg and 10 kg between 2010 and 2023, while in Manukau the household set out has steadily declined from 15.30 kg in 2010 to 10.74 kg in 2023.

The results shown in Table 4.6 are shown separately for Central Auckland and Manukau in Figures 4.2 and 4.3.

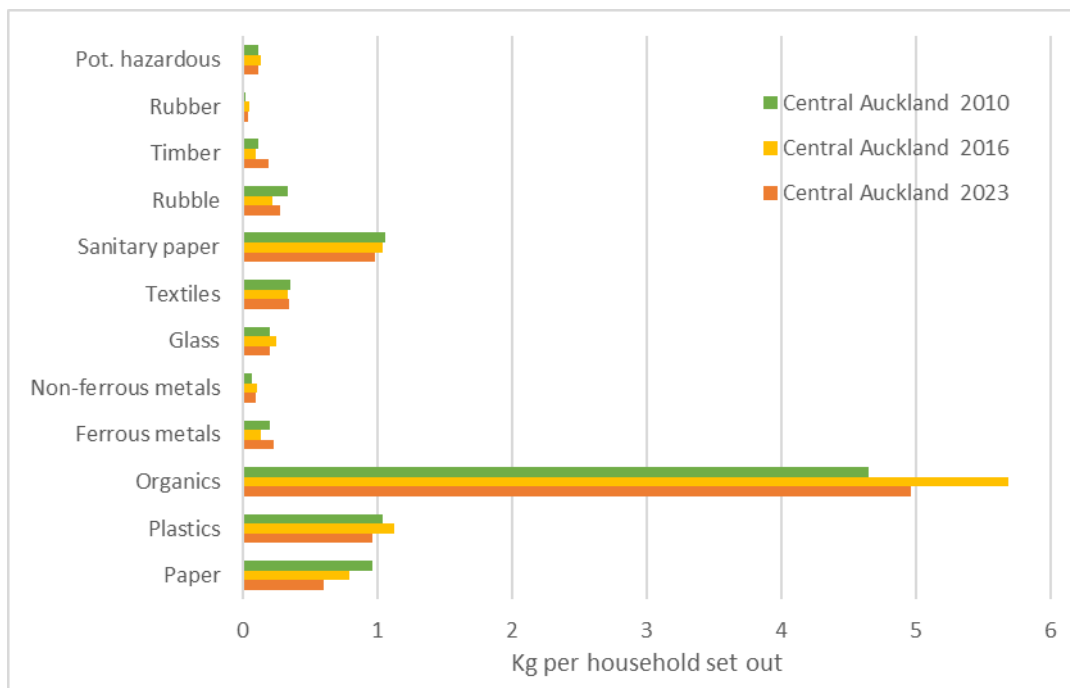


Figure 4.2 - Comparison of primary categories per household set out in Central Auckland, 2010, 2016 and 2023

The disposal of 'Paper' to kerbside rubbish has reduced across Central Auckland since 2010 and 'Organics' have decreased in Manukau since 2010. There was an increase in 'Organics' in Central Auckland's kerbside rubbish in 2016. This has reduced in 2023, but not back to 2010 levels.

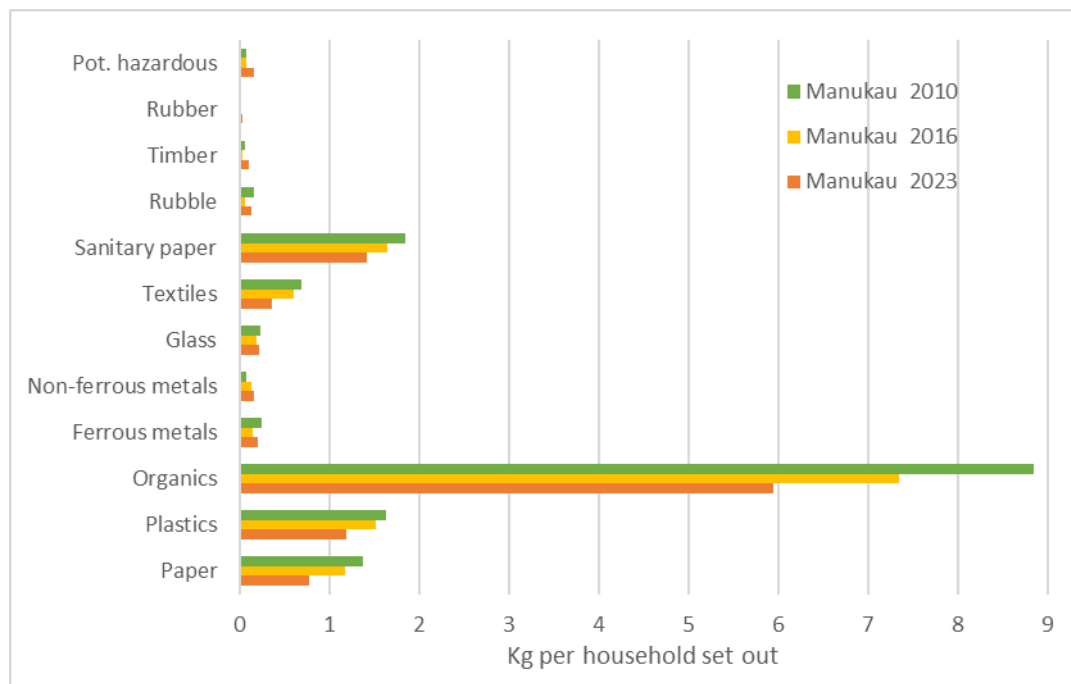


Figure 4.2 - Comparison of primary categories per household set out in Manukau, 2010, 2016 and 2023

‘Paper’, ‘Plastics’, ‘Organics’, ‘Textiles’ and ‘Nappies and sanitary’ have all reduced between each audit since 2010 in Manukau.

4.5 Precision of results of kerbside rubbish audits

The Ministry for the Environment’s Solid Waste Analysis Protocol 2002 (SWAP) defines a precision level (margin of error/mean) of $\pm 20\%$ as being a “reasonable level of accuracy”. The precision level of a result is directly related to the standard variation of the samples - in this case, how much the quantity of a particular material varies amongst the different samples. A material that is present in roughly similar quantities in all samples, such as ‘Plastic bags and film’, will have a better precision level than a material that is not common in household rubbish, such as ‘Timber’, or is present in highly variable amounts, such as ‘Rubble’.

Precision levels for the primary categories in the Auckland Council kerbside rubbish audit are given in Table 4.7.

Table 4.7 - Precision level of primary categories

Precision levels	Central Auckland 120-litre bins	Manukau 120-litre bins	Manukau 240-litre bins
Paper	10%	12%	19%
Plastics	9%	10%	15%
Organics	10%	9%	19%
Ferrous metals	40%	51%	61%
Non-ferrous metals	18%	24%	52%
Glass	29%	27%	47%
Textiles	27%	27%	43%
Nappies and sanitary	21%	21%	39%
Rubble	83%	76%	99%
Timber	58%	64%	83%
Rubber	61%	56%	94%
Potentially hazardous	60%	54%	99%

The precision levels for primary categories of ‘Paper’, ‘Plastics’ and ‘Organics’ are within the SWAP definition of a “reasonable level of accuracy” in all three samples. The Central Auckland 120-litre wheelie bin sample also had a fourth primary category within a “reasonable level of accuracy” – ‘Non-ferrous metals’.

The precision levels for all three samples are reasonable and in line with expected precision levels for samples of the size included in this audit.

4.6 E-waste in kerbside rubbish audits

Auckland Council requested that a separate classification be added for e-waste. E-waste is defined in this report as per the definition of Electrical and Electronic Products in the Ministry’s Declaration of Priority Products Notice 2020. E-waste includes:

- rechargeable batteries designed for use in electric or hybrid electric vehicles or household-scale and industrial renewable energy power systems, including but not limited to, lithium ion batteries;
- other re-chargeable and non-rechargeable batteries, including lead-acid batteries used in vehicles or stationary power systems; or
- categories of waste electrical and electronic equipment (WEEE) defined in Annex III and Annex IV of European Directive 2012/19/EU (see Appendix 10).

During the waste audit, these items were initially classified as per the SWAP classifications (e.g. toaster – ‘Ferrous metal’, battery – ‘Potentially hazardous household’), and then during weighing the items were individually counted and recorded. The weight of e-waste items was not recorded. The number of each type of e-waste found in each waste stream is listed in Table 4.8.

Table 4.8 – E-waste items in kerbside rubbish

Items of e-waste	Central Auckland 120-litre bins (300 hhs)	Manukau 120-litre bins (225 hhs)	Manukau 240-litre bins (50 hhs)	Total (575 hhs)
Battery	81	48	16	145
Vape	45	72	15	132
Cables/cords	21	12	15	48
Headphones	7	1	1	9
Phone charger	5	1		6
Battery charger	3			3
Computer/laptop		2		2
Motherboard	3	2	2	7
Hard drive	1			1
Power bank	1		1	2
Router		1		1
Mouse		1		1
Keyboard			1	1
Electric plug		1		1
Remote control			2	2
Multibox			1	1
Torch	2	1		3
Smoke alarm	2			2

Items of e-waste	Central Auckland 120-litre bins (300 hhs)	Manukau 120-litre bins (225 hhs)	Manukau 240-litre bins (50 hhs)	Total (575 hhs)
Fan	2			2
Kitchen blender	2			2
Clock	2			2
Toaster	1	1		2
Kettle		3		3
Mobile phone	1	2		3
Landline phone			1	1
VCR			1	1
Vacuum cleaner	1			1
Iron	1			1
Appliance (unknown)		1		1
Electronic scales	1			1
Electric razor	1		1	2
E toothbrush			1	1
Watch	1			1
Glucose monitor	1			1
Lighting item	7	2	1	10
Toy			1	1
Jump leads	1	1		2
Electric car charger	1			1
Car radio		1		1
Heated dog blanket	1			1
Metal detector	1			1
In-sink disposal unit		1		1
Plug-in bug spray		1		1
Motor for appliance			1	1
Chainsaw			1	1
Total	196	155	62	413

The audit team were not experts in identifying electronic items, and the above items have been classified as carefully as possible. Confusion remains around vape items, and which of these items contain e-waste. The above vape numbers include cylinders and pods.

APPENDIX 1 – AUDIT CLASSIFICATIONS

Kerbside rubbish categories

Primary categories	Secondary categories	Description
Paper	Paper recyclable	Newspapers, envelopes, magazines, junk mail, egg cartons, pizza boxes, cardboard boxes, liquid paperboard packaging
	Non-recyclable paper	Coffee cups, photographic paper, laminated paper, plastic coated paper and card
Plastic	#1, 2 & 5 containers	Rigid household plastic containers numbered 1, 2 and 5
	#3, 4, 6 & 7 containers	Rigid household plastic containers numbered 3, 4, 6 & 7
	Plastic bags and film	Plastic shopping bags, bread bags, non-rigid plastic packaging and film
	Non-recyclable plastics	All other non-recyclable items made primarily of plastic
Organics	Food waste	All food waste
	Green waste	Green waste (lawn clippings, plants, tree branches etc.)
	Organic other	Includes cat tray litter, hair, vacuum cleaner bags, candles etc
Steel	Steel cans	All steel cans
	Ferrous other	All non-packaging items made primarily of ferrous metal
Nonferrous metal	Aluminium cans	All aluminium cans
	Non-ferrous other	Items such as aluminium frying pans, aluminium foil, pots, electrical wire and aerosols
Glass	Glass bottles/jars	Bottles and jars, with the contents removed
	Glass other	All other items made primarily of glass, includes light bulbs, drinking glasses, and window pane
Textiles	Clothing & rags	All items primarily made of a fabric, such as clothes, curtains, which are suitable for rags
	Textile other	Includes shoes, backpacks, handbags, rugs, face masks
Nappies and sanitary		Includes disposable nappies, paper towels, tissues
Rubble		All concrete, ceramics, fibreglass, rubble, and soil
Timber		All items made primarily of timber
Rubber		All items made primarily of rubber (e.g. kitchen gloves)
Potentially hazardous	Household hazardous	Batteries, containers of medicines and cosmetics, cleaning agents, smoke detectors
	Hazardous other	Potentially hazardous items not associated with domestic activity, such as used oil and garden chemicals.

APPENDIX 2 – COUNCIL’S RECYCLING RULES

He aha ngā mea ka āhei koe ki te hangarua **What you can put in your recycling**

Items you can put in your recycling

- Glass bottles and glass jars
- Tin, steel and aluminium cans, including empty aerosols
- Plastic bottles from your kitchen, bathroom and laundry
- Clear plastic food containers
- Pizza boxes (remove any leftover food)
- Newspapers, magazines, advertising mail and envelopes
- Paper and cardboard packaging
- Egg cartons
- Milk and juice cartons, including Tetra Pak ® cartons (except on Great Barrier Island)

<https://www.aucklandcouncil.govt.nz/rubbish-recycling/bin-requests/Pages/what-put-your-recycling.aspx>

APPENDIX 3 – CENTRAL AUCKLAND 120-LITRE BINS

Central Auckland – 120-litre domestic kerbside wheelee bins		%		Mean wt. per bin	
		Margins of error for 95% confidence level			
Paper	Recyclable paper	4.7%	(±0.3%)	0.42 kg	(±0.03 kg)
	Non-recyclable paper	2.0%	(±0.1%)	0.18 kg	(±0.01 kg)
	Subtotal	6.7%	(±0.3%)	0.60 kg	(±0.03 kg)
Plastics	# 1, 2 and 5 containers	2.3%	(±0.1%)	0.20 kg	(±0.01 kg)
	# 3, 4, 6, 7 containers	0.1%	(±0.0%)	0.01 kg	(±0.00 kg)
	Plastic bags and film	5.6%	(±0.2%)	0.51 kg	(±0.02 kg)
	Non-recyclable plastics	2.8%	(±0.3%)	0.25 kg	(±0.03 kg)
	Subtotal	10.7%	(±0.5%)	0.97 kg	(±0.04 kg)
Organics	Food waste	39.6%	(±2.2%)	3.57 kg	(±0.20 kg)
	Green waste	12.8%	(±1.8%)	1.15 kg	(±0.16 kg)
	Organic other	2.6%	(±0.5%)	0.24 kg	(±0.05 kg)
	Subtotal	55.1%	(±2.8%)	4.96 kg	(±0.25 kg)
Ferrous metals	Steel cans	0.5%	(±0.1%)	0.04 kg	(±0.01 kg)
	Ferrous other	2.1%	(±0.5%)	0.19 kg	(±0.05 kg)
	Subtotal	2.5%	(±0.5%)	0.23 kg	(±0.05 kg)
Non-ferrous metals	Aluminium cans	0.4%	(±0.1%)	0.04 kg	(±0.00 kg)
	Non-ferrous other	0.7%	(±0.1%)	0.06 kg	(±0.01 kg)
	Subtotal	1.1%	(±0.1%)	0.10 kg	(±0.01 kg)
Glass	Bottles/jars	1.6%	(±0.3%)	0.14 kg	(±0.02 kg)
	Glass other	0.7%	(±0.1%)	0.06 kg	(±0.01 kg)
	Subtotal	2.2%	(±0.3%)	0.20 kg	(±0.03 kg)
Textiles	Clothing & rags	2.2%	(±0.4%)	0.20 kg	(±0.04 kg)
	Textile other	1.6%	(±0.3%)	0.14 kg	(±0.02 kg)
	Subtotal	3.8%	(±0.5%)	0.35 kg	(±0.05 kg)
Nappies and sanitary		10.9%	(±1.1%)	0.98 kg	(±0.10 kg)
Rubble		3.1%	(±1.3%)	0.28 kg	(±0.12 kg)
Timber		2.1%	(±0.6%)	0.19 kg	(±0.06 kg)
Rubber		0.4%	(±0.1%)	0.04 kg	(±0.01 kg)
Potentially hazardous	Household	0.7%	(±0.1%)	0.06 kg	(±0.01 kg)
	Other	0.6%	(±0.4%)	0.05 kg	(±0.03 kg)
	Subtotal	1.3%	(±0.4%)	0.12 kg	(±0.04 kg)
TOTAL		100.0%		9.00 kg	(±0.33 kg)

APPENDIX 4 – MANUKAU 120-LITRE BINS

Manukau – 120-litre domestic kerbside wheelie bins		%		Mean wt. per bin	
		Margins of error for 95% confidence level			
Paper	Recyclable paper	5.1%	(±0.4%)	0.46 kg	(±0.03 kg)
	Non-recyclable paper	2.1%	(±0.1%)	0.19 kg	(±0.01 kg)
	Subtotal	7.1%	(±0.4%)	0.64 kg	(±0.04 kg)
Plastics	# 1, 2 and 5 containers	3.0%	(±0.2%)	0.27 kg	(±0.02 kg)
	# 3, 4, 6, 7 containers	0.1%	(±0.0%)	0.01 kg	(±0.00 kg)
	Plastic bags and film	5.7%	(±0.3%)	0.52 kg	(±0.03 kg)
	Non-recyclable plastics	2.4%	(±0.4%)	0.22 kg	(±0.04 kg)
	Subtotal	11.2%	(±0.6%)	1.01 kg	(±0.05 kg)
Organics	Food waste	45.1%	(±2.8%)	4.07 kg	(±0.26 kg)
	Green waste	9.5%	(±1.5%)	0.86 kg	(±0.14 kg)
	Organic other	2.6%	(±0.9%)	0.24 kg	(±0.08 kg)
	Subtotal	57.2%	(±2.6%)	5.17 kg	(±0.24 kg)
Ferrous metals	Steel cans	1.0%	(±0.3%)	0.09 kg	(±0.03 kg)
	Ferrous other	0.9%	(±0.4%)	0.08 kg	(±0.03 kg)
	Subtotal	1.9%	(±0.5%)	0.17 kg	(±0.04 kg)
Non-ferrous metals	Aluminium cans	0.4%	(±0.0%)	0.03 kg	(±0.00 kg)
	Non-ferrous other	1.0%	(±0.2%)	0.09 kg	(±0.01 kg)
	Subtotal	1.4%	(±0.2%)	0.12 kg	(±0.01 kg)
Glass	Bottles/jars	1.1%	(±0.2%)	0.10 kg	(±0.02 kg)
	Glass other	0.4%	(±0.1%)	0.04 kg	(±0.01 kg)
	Subtotal	1.5%	(±0.2%)	0.14 kg	(±0.02 kg)
Textiles	Clothing & rags	1.8%	(±0.3%)	0.16 kg	(±0.03 kg)
	Textile other	1.3%	(±0.3%)	0.12 kg	(±0.02 kg)
	Subtotal	3.1%	(±0.4%)	0.28 kg	(±0.04 kg)
Nappies and sanitary		12.4%	(±1.3%)	1.12 kg	(±0.12 kg)
Rubble		1.2%	(±0.4%)	0.11 kg	(±0.04 kg)
Timber		1.0%	(±0.3%)	0.09 kg	(±0.03 kg)
Rubber		0.3%	(±0.1%)	0.03 kg	(±0.01 kg)
Potentially hazardous	Household	0.9%	(±0.2%)	0.08 kg	(±0.01 kg)
	Other	0.8%	(±0.4%)	0.07 kg	(±0.04 kg)
	Subtotal	1.7%	(±0.5%)	0.15 kg	(±0.04 kg)
TOTAL		100.0%		9.03 kg	(±0.37 kg)

APPENDIX 5 – MANUKAU 240-LITRE BINS

Manukau – 240-litre domestic kerbside wheelie bins		%		Mean wt. per bin	
		Margins of error for 95% confidence level			
Paper	Recyclable paper	5.9%	(±0.6%)	1.11 kg	(±0.11 kg)
	Non-recyclable paper	1.8%	(±0.2%)	0.34 kg	(±0.04 kg)
	Subtotal	7.7%	(±0.7%)	1.46 kg	(±0.14 kg)
Plastics	# 1, 2 and 5 containers	2.9%	(±0.3%)	0.56 kg	(±0.07 kg)
	# 3, 4, 6, 7 containers	0.1%	(±0.0%)	0.01 kg	(±0.00 kg)
	Plastic bags and film	5.1%	(±0.4%)	0.96 kg	(±0.08 kg)
	Non-recyclable plastics	2.8%	(±0.6%)	0.53 kg	(±0.10 kg)
	Subtotal	10.8%	(±0.8%)	2.06 kg	(±0.15 kg)
Organics	Food waste	37.0%	(±4.4%)	7.05 kg	(±0.83 kg)
	Green waste	10.6%	(±3.4%)	2.02 kg	(±0.66 kg)
	Organic other	3.2%	(±1.6%)	0.62 kg	(±0.31 kg)
	Subtotal	50.9%	(±4.8%)	9.69 kg	(±0.91 kg)
Ferrous metals	Steel cans	0.7%	(±0.1%)	0.13 kg	(±0.03 kg)
	Ferrous other	1.6%	(±0.7%)	0.30 kg	(±0.13 kg)
	Subtotal	2.3%	(±0.7%)	0.43 kg	(±0.13 kg)
Non-ferrous metals	Aluminium cans	0.5%	(±0.1%)	0.09 kg	(±0.02 kg)
	Non-ferrous other	1.4%	(±0.5%)	0.27 kg	(±0.09 kg)
	Subtotal	1.9%	(±0.5%)	0.35 kg	(±0.09 kg)
Glass	Bottles/jars	2.3%	(±0.7%)	0.44 kg	(±0.13 kg)
	Glass other	1.0%	(±0.4%)	0.19 kg	(±0.07 kg)
	Subtotal	3.3%	(±0.8%)	0.63 kg	(±0.15 kg)
Textiles	Clothing & rags	2.6%	(±0.8%)	0.50 kg	(±0.15 kg)
	Textile other	1.5%	(±0.4%)	0.28 kg	(±0.08 kg)
	Subtotal	4.1%	(±0.9%)	0.78 kg	(±0.17 kg)
Nappies and sanitary		15.1%	(±2.9%)	2.87 kg	(±0.55 kg)
Rubble		1.2%	(±0.6%)	0.23 kg	(±0.11 kg)
Timber		1.2%	(±0.5%)	0.23 kg	(±0.10 kg)
Rubber		0.2%	(±0.1%)	0.04 kg	(±0.02 kg)
Potentially hazardous	Household	1.3%	(±0.7%)	0.25 kg	(±0.13 kg)
	Other	0.1%	(±0.0%)	0.01 kg	(±0.01 kg)
	Subtotal	1.4%	(±0.7%)	0.26 kg	(±0.13 kg)
TOTAL		100.0%		19.04 kg	(±1.34 kg)

APPENDIX 6 – COMBINED MANUKAU BINS

Manukau – Combined 120- and 240-litre wheelie bins		%	Mean wt. per set out
Paper	Recyclable paper	5.3%	0.57 kg
	Non-recyclable paper	2.0%	0.21 kg
	Subtotal	7.3%	0.78 kg
Plastics	# 1, 2 and 5 containers	2.9%	0.32 kg
	# 3, 4, 6, 7 containers	0.1%	0.01 kg
	Plastic bags and film	5.5%	0.59 kg
	Non-recyclable plastics	2.5%	0.27 kg
	Subtotal	11.1%	1.19 kg
Organics	Food waste	42.6%	4.58 kg
	Green waste	9.9%	1.06 kg
	Organic other	2.8%	0.30 kg
	Subtotal	55.3%	5.94 kg
Ferrous metals	Steel cans	0.9%	0.10 kg
	Ferrous other	1.1%	0.12 kg
	Subtotal	2.0%	0.21 kg
Non-ferrous metals	Aluminium cans	0.4%	0.04 kg
	Non-ferrous other	1.1%	0.12 kg
	Subtotal	1.5%	0.16 kg
Glass	Bottles/jars	1.5%	0.16 kg
	Glass other	0.6%	0.06 kg
	Subtotal	2.1%	0.22 kg
Textiles	Clothing & rags	2.0%	0.22 kg
	Textile other	1.4%	0.15 kg
	Subtotal	3.4%	0.37 kg
Nappies and sanitary		13.2%	1.42 kg
Rubble		1.2%	0.13 kg
Timber		1.0%	0.11 kg
Rubber		0.3%	0.03 kg
Potentially hazardous	Household	1.0%	0.11 kg
	Other	0.6%	0.06 kg
	Subtotal	1.6%	0.17 kg
TOTAL		100.0%	10.74 kg

APPENDIX 7 – COMBINED RATES-FUNDED BINS

Central Auckland and Manukau bins combined – overall rates-funded bins		%	Mean wt. per set out
Paper	Recyclable paper	5.0%	0.49 kg
	Non-recyclable paper	2.0%	0.19 kg
	Subtotal	7.0%	0.68 kg
Plastics	# 1, 2 and 5 containers	2.6%	0.25 kg
	# 3, 4, 6, 7 containers	0.1%	0.01 kg
	Plastic bags and film	5.6%	0.55 kg
	Non-recyclable plastics	2.6%	0.26 kg
	Subtotal	10.9%	1.06 kg
Organics	Food waste	41.1%	4.00 kg
	Green waste	11.4%	1.11 kg
	Organic other	2.7%	0.26 kg
	Subtotal	55.2%	5.38 kg
Ferrous metals	Steel cans	0.7%	0.07 kg
	Ferrous other	1.6%	0.16 kg
	Subtotal	2.3%	0.22 kg
Non-ferrous metals	Aluminium cans	0.4%	0.04 kg
	Non-ferrous other	0.9%	0.09 kg
	Subtotal	1.3%	0.13 kg
Glass	Bottles/jars	1.5%	0.15 kg
	Glass other	0.6%	0.06 kg
	Subtotal	2.1%	0.21 kg
Textiles	Clothing & rags	2.1%	0.21 kg
	Textile other	1.5%	0.15 kg
	Subtotal	3.6%	0.35 kg
Nappies and sanitary		12.0%	1.17 kg
Rubble		2.2%	0.21 kg
Timber		1.6%	0.16 kg
Rubber		0.4%	0.04 kg
Potentially hazardous	Household	0.9%	0.08 kg
	Other	0.6%	0.06 kg
	Subtotal	1.4%	0.14 kg
TOTAL		100.0%	9.75 kg

APPENDIX 8 – COMPARISON OF CENTRAL AUCKLAND AUDITS – 2023, 2016, 2010

Central Auckland – comparison of household set out in 120-litre bins		2023	2016	2010
Paper	Recyclable paper	0.42 kg	0.68 kg	0.85 kg
	Non-recyclable paper	0.18 kg	0.11 kg	0.13 kg
	Subtotal	0.60 kg	0.79 kg	0.97 kg
Plastics	# 1, 2 and 5 containers	0.20 kg	0.05 kg	0.18 kg
	# 3, 4, 6, 7 containers	0.01 kg	0.12 kg	-
	Plastic bags and film	0.51 kg	0.66 kg	0.63 kg
	Non-recyclable plastics	0.25 kg	0.30 kg	0.23 kg
	Subtotal	0.97 kg	1.13 kg	1.04 kg
Organics	Food waste	3.57 kg	4.33 kg	3.68 kg
	Green waste	1.15 kg	1.11 kg	0.6 kg
	Organic other	0.24 kg	0.26 kg	0.37 kg
	Subtotal	4.96 kg	5.69 kg	4.65 kg
Ferrous metals	Steel cans	0.04 kg	0.06 kg	0.08 kg
	Ferrous other	0.19 kg	0.08 kg	0.12 kg
	Subtotal	0.23 kg	0.14 kg	0.20 kg
Non-ferrous metals	Aluminium cans	0.04 kg	0.02 kg	0.03 kg
	Non-ferrous other	0.06 kg	0.09 kg	0.04 kg
	Subtotal	0.10 kg	0.11 kg	0.07 kg
Glass	Bottles/jars	0.14 kg	0.20 kg	0.16 kg
	Glass other	0.06 kg	0.05 kg	0.04 kg
	Subtotal	0.20 kg	0.25 kg	0.20 kg
Textiles	Clothing & rags	0.20 kg	0.19 kg	0.16 kg
	Textile other	0.14 kg	0.15 kg	0.20 kg
	Subtotal	0.35 kg	0.34 kg	0.36 kg
Nappies and sanitary		0.98 kg	1.04 kg	1.06 kg
Rubble		0.28 kg	0.22 kg	0.34 kg
Timber		0.19 kg	0.10 kg	0.12 kg
Rubber		0.04 kg	0.05 kg	0.02 kg
Potentially hazardous	Household	0.06 kg	0.08 kg	0.06 kg
	Other	0.05 kg	0.06 kg	0.05 kg
	Subtotal	0.12 kg	0.14 kg	0.12 kg
TOTAL		9.00 kg	9.99 kg	9.14 kg

Note – Some secondary categories have changes slightly since 2010

APPENDIX 9 – COMPARISON OF MANUKAU AUDITS – 2023, 2016, 2010

Manukau – comparison of household set out – 2010 to 2023		2023 (wheelie bins)	2016 (rubbish bags)	2010 (rubbish bags)
Paper	Recyclable paper	0.57 kg	0.97 kg	1.17 kg
	Non-recyclable paper	0.21 kg	0.21 kg	0.21 kg
	Subtotal	0.78 kg	1.18 kg	1.38 kg
Plastics	# 1, 2 and 5 containers	0.32 kg	0.13 kg	0.27 kg
	# 3, 4, 6, 7 containers	0.01 kg	0.13 kg	-
	Plastic bags and film	0.59 kg	0.96 kg	0.96 kg
	Non-recyclable plastics	0.27 kg	0.31 kg	0.39 kg
	Subtotal	1.19 kg	1.52 kg	1.63 kg
Organics	Food waste	4.58 kg	6.24 kg	5.65 kg
	Green waste	1.06 kg	0.89 kg	2.84 kg
	Organic other	0.30 kg	0.21 kg	0.36 kg
	Subtotal	5.94 kg	7.34 kg	8.84 kg
Ferrous metals	Steel cans	0.10 kg	0.12 kg	0.13 kg
	Ferrous other	0.12 kg	0.04 kg	0.12 kg
	Subtotal	0.21 kg	0.15 kg	0.25 kg
Non-ferrous metals	Aluminium cans	0.04 kg	0.04 kg	0.03 kg
	Non-ferrous other	0.12 kg	0.10 kg	0.04 kg
	Subtotal	0.16 kg	0.14 kg	0.08 kg
Glass	Bottles/jars	0.16 kg	0.16 kg	0.18 kg
	Glass other	0.06 kg	0.04 kg	0.06 kg
	Subtotal	0.22 kg	0.19 kg	0.24 kg
Textiles	Clothing & rags	0.22 kg	0.33 kg	0.34 kg
	Textile other	0.15 kg	0.27 kg	0.35 kg
	Subtotal	0.37 kg	0.60 kg	0.69 kg
Nappies and sanitary		1.42 kg	1.65 kg	1.85 kg
Rubble		0.13 kg	0.07 kg	0.17 kg
Timber		0.11 kg	0.03 kg	0.07 kg
Rubber		0.03 kg	0.02 kg	0.01 kg
Potentially hazardous	Household	0.11 kg	0.06 kg	0.07 kg
	Other	0.06 kg	0.02 kg	0.02 kg
	Subtotal	0.17 kg	0.08 kg	0.08 kg
TOTAL		10.74 kg	12.96 kg	15.30 kg

Note – Some secondary categories have changes slightly since 2010

APPENDIX 10 – DEFINITION OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT IN EUROPEAN DIRECTIVE 2012/19/EU

Annex III and Annex IV of European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE) are provided below.

ANNEX III

CATEGORIES OF EEE COVERED BY THIS DIRECTIVE

1. Temperature exchange equipment
2. Screens, monitors, and equipment containing screens having a surface greater than 100 cm²
3. Lamps
4. Large equipment (any external dimension more than 50 cm) including, but not limited to:

Household appliances; IT and telecommunication equipment; consumer equipment; luminaires; equipment reproducing sound or images, musical equipment; electrical and electronic tools; toys, leisure and sports equipment; medical devices; monitoring and control instruments; automatic dispensers; equipment for the generation of electric currents. This category does not include equipment included in categories 1 to 3.

5. Small equipment (no external dimension more than 50 cm) including, but not limited to:

Household appliances; consumer equipment; luminaires; equipment reproducing sound or images, musical equipment; electrical and electronic tools; toys, leisure and sports equipment; medical devices; monitoring and control instruments; automatic dispensers; equipment for the generation of electric currents. This category does not include equipment included in categories 1 to 3 and 6.

6. Small IT and telecommunication equipment (no external dimension more than 50 cm)

ANNEX IV

Non-exhaustive list of EEE which falls within the categories listed in Annex III

1. Temperature exchange equipment

Refrigerators, Freezers, Equipment which automatically delivers cold products, Air conditioning equipment, Dehumidifying equipment, Heat pumps, Radiators containing oil and other temperature exchange equipment using fluids other than water for the temperature exchange.

2. Screens, monitors, and equipment containing screens having a surface greater than 100 cm²

Screens, Televisions, LCD photo frames, Monitors, Laptops, Notebooks.

3. Lamps

Straight fluorescent lamps, Compact fluorescent lamps, Fluorescent lamps, High intensity discharge lamps - including pressure sodium lamps and metal halide lamps, Low pressure sodium lamps, LED.

4. Large equipment

Washing machines, Clothes dryers, Dish washing machines, Cookers, Electric stoves, Electric hot plates, Luminaires, Equipment reproducing sound or images, Musical equipment (excluding pipe organs installed in churches), Appliances for knitting and weaving, Large computer-mainframes, Large printing machines, Copying equipment, Large coin slot machines, Large medical devices, Large monitoring and control instruments, Large appliances which automatically deliver products and money, Photovoltaic panels.

5. Small equipment

Vacuum cleaners, Carpet sweepers, Appliances for sewing, Luminaires, Microwaves, Ventilation equipment, Irons, Toasters, Electric knives, Electric kettles, Clocks and Watches, Electric shavers, Scales, Appliances for hair and body care, Calculators, Radio sets, Video cameras, Video recorders, Hi-fi equipment, Musical instruments, Equipment reproducing sound or images, Electrical and electronic toys, Sports equipment, Computers for biking, diving, running, rowing, etc., Smoke detectors, Heating regulators, Thermostats, Small Electrical and electronic tools, Small medical devices, Small Monitoring and control instruments, Small Appliances which automatically deliver products, Small equipment with integrated photovoltaic panels.

6. Small IT and telecommunication equipment (no external dimension more than 50 cm)

Mobile phones, GPS, Pocket calculators, Routers, Personal computers, Printers, Telephones.