

Composition of Waitomo District Kerbside Waste - Winter 2020

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1 Introduction

This report presents the results of an audit, conducted in July 2020, of the composition of kerbside waste collected by Waitomo District Council (Council).

In accordance with the Waste Minimisation Act 2008, in June 2018 Council adopted the *Solid Waste (Asset) Management and Minimisation Plan 2018-2028* (SWaMMP). The SWaMMP includes two strategic goals:

- Strategic Goal 1: To ensure the safe disposal of waste to protect our natural environment
- Strategic Goal 2: To minimise waste disposal within the district.

To achieve the strategic goal to minimise waste disposal, two of the performance measures included in the SWaMMP, shown in the table below, refer to the composition of kerbside rubbish bags.

Level of service	Performance measure
Reduce quantity of recyclables like paper and plastics in bag collection that goes to landfill.	Percentage reduction per annum achieved through continuing education (measured against the 2016 Waste Audit).
Reduce the quantity of organic waste like food scraps etc. in bag collection that goes to landfill.	Percentage reduction per annum achieved through continuing education and promotion of home composting (measured against the 2016 Waste Audit).

To identify changes in the composition of kerbside waste over time, Council has conducted biennial audits of the kerbside rubbish bag collection since 2008, including audits undertaken by Waste Not in 2018 and 2019.

The July 2020 audit described in this report, was undertaken in winter and will be followed by a summer audit, in February 2021. The results of previous waste audits are compared to the results of the July 2020 waste audit in section 4.3.

1.1 Waste services in Waitomo District

Council provides weekly collections of kerbside waste and recycling to designated properties in the District. These collections take place on Tuesday and Friday each week. The Tuesday collection takes place in Piopio, Mokau, Waitomo, and connecting roads and the Friday collection is in Te Kuiti township. The kerbside waste collection is based on user-pays rubbish bags, which residents may purchase from various outlets in the District. The weekly recycling collection uses 55-litre recycling crates. Council's recycling guide for residents is included in Appendix 5.

Refuse transfer stations are located in Maniaiti/Benneydale, Piopio, Marokopa, Kinohaku, Mokau/ Awakino and the District landfill is located in Te Kuiti. All of these transfer stations include recycling facilities, and there are also stand-alone public recycling facilities at Waitomo, Piopio, Mokau, and Marokopa.

A private waste operator offers kerbside waste collections to commercial properties that generate large quantities of waste, residents in rural areas not serviced by the Council collection, and residents who choose not to use the Council service.

2 Methodology

The kerbside waste audit methodology used by Waste Not Consulting is based on Procedure One of the Ministry for the Environment's Solid Waste Analysis Protocol 2002 (SWAP).

2.1 Sampling strategy

On Friday 3 July and Tuesday 7 July 2020, residential kerbside rubbish bags were collected from throughout the areas serviced by Council's kerbside waste collection services.

The sample included the contents of 205 rubbish bags, which contained a total of 1,190 kg of kerbside waste.

The sample was collected from the kerbside in the areas of Waitomo District in which Council's kerbside collection was operating. The Friday 3 July collection took place in Te Kuiti and the Tuesday 7 July collection in Waitomo, Piopio, Mokau, and connecting roadways. Collecting the sample on both days provided a wide geographic spread for the sample and ensured the sample included kerbside waste from a range of socio-economic areas and different types of housing.

2.2 Audit execution

Each day, the sample of kerbside waste was transported to Waitakere Refuse and Recycling Transfer Station in Auckland for sorting. The bags of kerbside waste were sorted in sampling units of eight bags.

Each of the rubbish bags in a sample unit was weighed in individually and then opened. The contents of all the 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 classifications were weighed out and the material disposed of.

The kerbside waste 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 classifications were chosen to identify the different types of recoverable materials present in the waste.

2.3 Staff training and OSH issues

The kerbside waste was sorted by a team of four, comprising three contract workers, employed by Waste Not, and a Waste Not 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 kerbside waste, the importance of confidentiality was emphasised to all team members.

2.4 Photos from audit



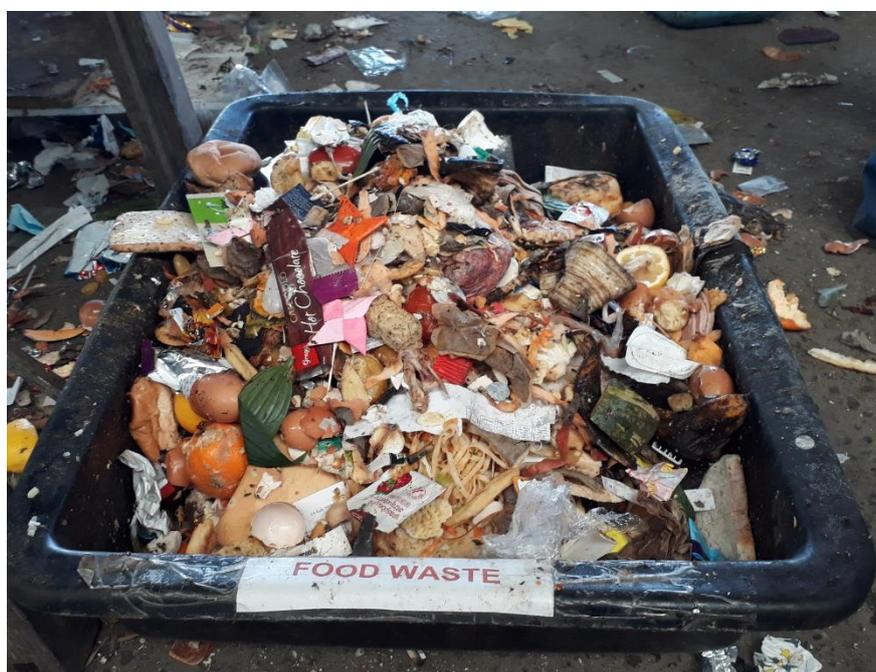
One day's sample of Waitomo District rubbish bags



Sorting waste from Waitomo District rubbish bags



24 kg of Sanitary paper from eight Waitomo District rubbish bags



Food waste from Waitomo District rubbish bags

2.5 Note on presentation of data in tables and figures

Subtotals in tables and figures do not always add to the total due to rounding. This is illustrated in the equations below. In the equation on the left, the subtotals are expressed to three decimal points and add up to the total, as shown. When the three decimal points are rounded to two, one, and no decimal points, the subtotals do not add up to the totals.

1.264	1.26	1.3	1
+ 1.264	+ 1.26	+ 1.3	+ 1
= 2.528	= 2.53	= 2.5	= 3

3 Results of kerbside waste audit

3.1 Sampling schedule

The streets from which the kerbside sample for the July 2020 audit was selected are shown in Table 3.1. The sample collection on all days was undertaken from the kerbside by Waste Not Consulting.

Table 3.1 - Kerbside waste collection schedule

Friday 3 July 2020 Te Kuiti urban	<ul style="list-style-type: none"> • Te Kuiti Rd • Hospital • Eketone St • Eketone Loop • Colin Brook Pl • Robin Azariah • Alsa • George • Duke 	<ul style="list-style-type: none"> • Ngatai • Hill • Mary • Edward • Tetet • King St W • John • South • Butler 	<ul style="list-style-type: none"> • Queen • William • Liverpool • Blackman • Anzac • Kiwi • Tammadge • Esplanade
Tuesday 7 July 2020 Mokau and Piopio rural	<ul style="list-style-type: none"> • Takarei Tce • Point • Tokopapa • Rererenga • Tainui • Rangī • Briscoe 	<ul style="list-style-type: none"> • Moa • Kaka • Kawana • Kea • Potu • Ruru • Tui 	<ul style="list-style-type: none"> • Kuratahi • Troopers • Oparure • Te Kumi Station • Sommerville • Hangatiki East • Mangarino

3.2 Composition of urban rubbish bags

The primary composition of rubbish bags collected from urban households in Waitomo District (Te Kuiti) is presented in Table 3.2 below and Figure 3.1 on the following page. The secondary composition, which includes all 23 categories and a statistical analysis of the results, is given in Appendix 2.

The mean weight per household set out presented in the table has been calculated from the average number of bags set out per urban household using Council rubbish bags, based on data collected during the sample collection, and an average bag weight from the audit data. The average weight of an urban kerbside rubbish bag was 5.47 kg. The average household set out 1.12 bags, giving an average household set out weight of 6.10 kg. As not all households set out kerbside waste every week, the average household set out weight cannot be regarded as equivalent to an average weekly kerbside waste generation.

The distribution of bag weights is analysed in section 3.2.4. An analysis of urban household bag set out rates is given in section 3.2.5.

Table 3.2 - Primary composition of Waitomo District urban rubbish bags - Winter 2020

Waitomo District - Urban rubbish bags - Winter 2020	Proportion of total	Mean wt. per urban rubbish bag	Mean wt. per household set out
Paper	11.2%	0.61 kg	0.69 kg
Plastics	14.3%	0.78 kg	0.87 kg
Organics	48.7%	2.66 kg	2.97 kg
Ferrous metals	1.6%	0.09 kg	0.10 kg
Non-ferrous metals	0.9%	0.05 kg	0.06 kg
Glass	2.3%	0.13 kg	0.14 kg
Textiles	3.4%	0.19 kg	0.21 kg
Sanitary paper	13.8%	0.75 kg	0.84 kg
Rubble	0.8%	0.04 kg	0.05 kg
Timber	0.4%	0.02 kg	0.03 kg
Rubber	0.1%	0.01 kg	0.01 kg
Potentially hazardous	2.3%	0.13 kg	0.14 kg
TOTAL	100.0%	5.47 kg	6.10 kg

Organic material, primarily kitchen waste, was the largest single component of Waitomo District urban rubbish bags, comprising 48.7% of the total or 2.66 kg in the average urban rubbish bag. Plastics, representing 14.3% of the total, was the second largest component. Sanitary paper was the third largest component, at 13.8%, and Paper the fourth largest, at 11.2%. The secondary compositions of the major primary categories are discussed in the following sections.

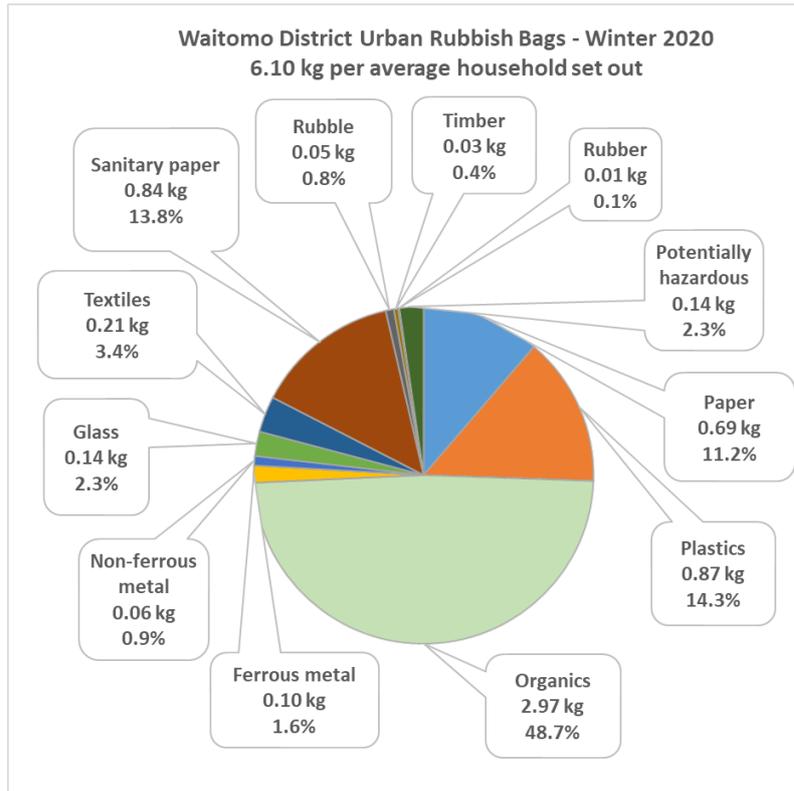


Figure 3.1 - Primary composition of Waitomo District urban rubbish bags - Winter 2020

3.2.1 Organics

Organic matter comprised 48.7% of the weight of urban rubbish bags. The composition of the organic constituent of the kerbside waste is shown in Figure 3.2.

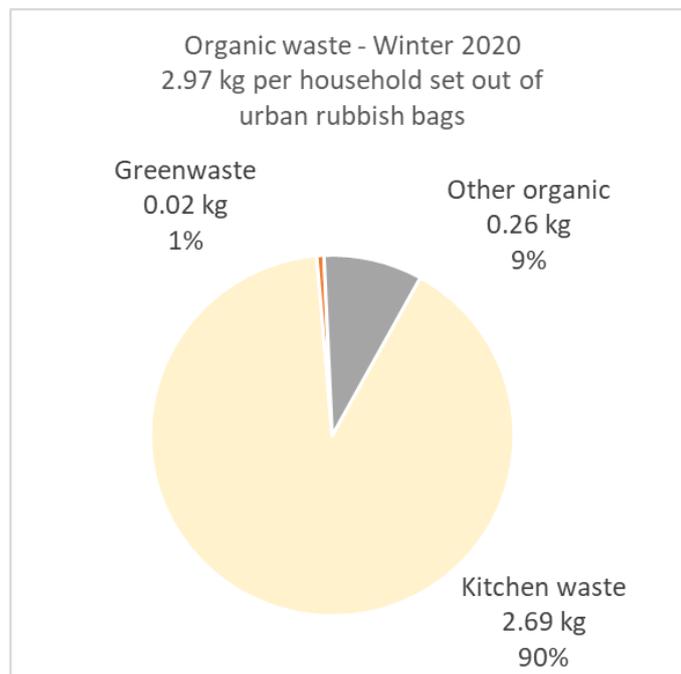


Figure 3.2 - Organic component of Waitomo District urban rubbish bags - Winter 2020

Kitchen waste compromised 90% of the organic material in urban rubbish bags. Kitchen waste included food preparation waste, left-over food waste, and substantial quantities of both perished goods and wasted food, which would have been fit for consumption.

Greenwaste, or garden matter, comprised 1% of the organic material. Most of the garden waste was prunings, leaves, and weeds.

The Other organic material (9%) included vacuum cleaner dust, dead animals, animal faeces, candles, and human hair. Much of this material would be suitable for composting.

3.2.2 Plastics

Plastic materials comprised 14.3% of the contents of urban rubbish bags. The secondary components of the plastic waste are shown in Figure 3.3.



Figure 3.3 - Plastic component of Waitomo District urban rubbish bags - Winter 2020

Plastic bags/film comprised 57% of the plastic waste in urban rubbish bags, or 0.50 kg per household set out. This material is not accepted by the Waitomo District Council kerbside recycling collection.

A further 16% of plastic waste in urban rubbish bags was #1-2 containers. These containers are accepted by Council’s kerbside recycling collection and at Council’s recycling centres.

Neither #3-7 containers (12%) nor Other non-recyclable plastics (15%) are accepted by Council’s kerbside recycling collection or at Council’s recycling centres.

3.2.3 Paper

Paper comprised 11.2% of the contents of Waitomo District urban rubbish bags. The composition of the paper constituent of the rubbish bags is shown in Figure 3.4.

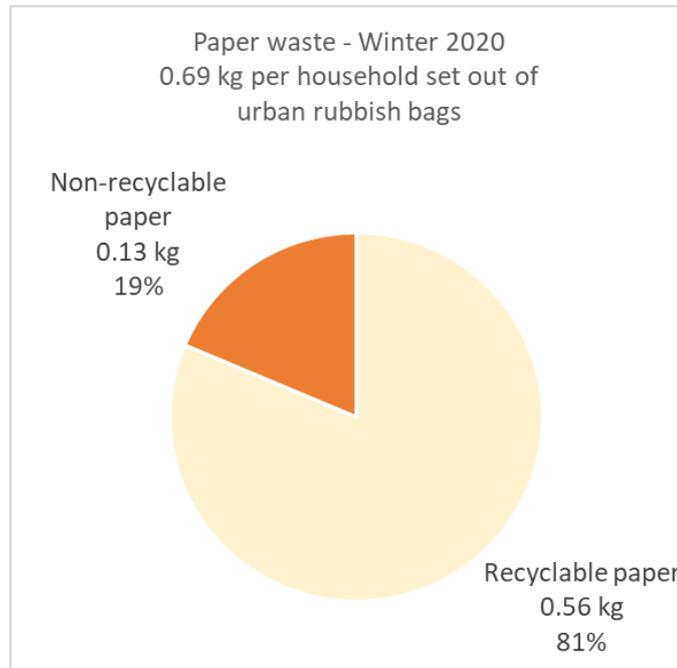


Figure 3.4 - Paper component of Waitomo District urban rubbish bags - Winter 2020

The largest component of the Paper waste in Waitomo District rubbish bags was Recyclable paper, which comprised 81% of the paper, or 0.56 kg per household set out. This component included packaging, junk mail, office paper, newspapers, magazines, paperboard, and cardboard and could have been recycled through Council’s kerbside recycling collection.

Non-recyclable paper comprised 19% of Paper. These types of paper are not accepted for recycling by the kerbside recycling collection, and included laminated paper, Tetra Pak containers, aseptic beverage containers, and multi-material and food-contaminated packaging. Heavily food-contaminated paper was classified as Non-recyclable paper, but lightly-contaminated paper was considered to be recyclable.

3.2.4 Distribution of urban rubbish bag weights

The average weight of waste in Waitomo District urban rubbish bags was 5.47 kg. The lightest bag was 1.04 kg and the heaviest, 13.08 kg. The distribution of bag weights is shown in Figure 3.5.

Eighty-one percent of urban rubbish bags weighed between 2 and 8 kg. Five percent of urban rubbish bags weighed over 10 kg.

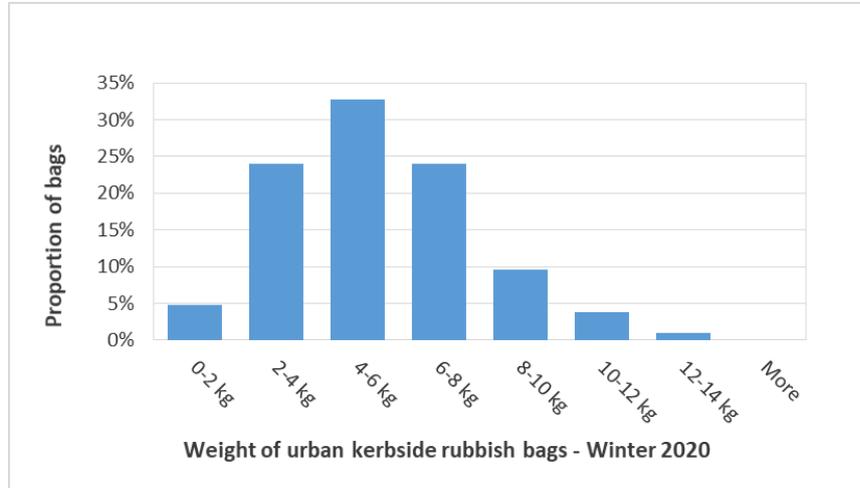


Figure 3.5 - Distribution of urban rubbish bags weights - Winter 2020

3.2.5 Distribution of urban rubbish bag set out

As the sample of urban rubbish bags was being collected, the total number of rubbish bags set out by each household was recorded. The average household bag set out was 1.12 bags. Figure 3.6 below shows the distribution of the bag set outs.

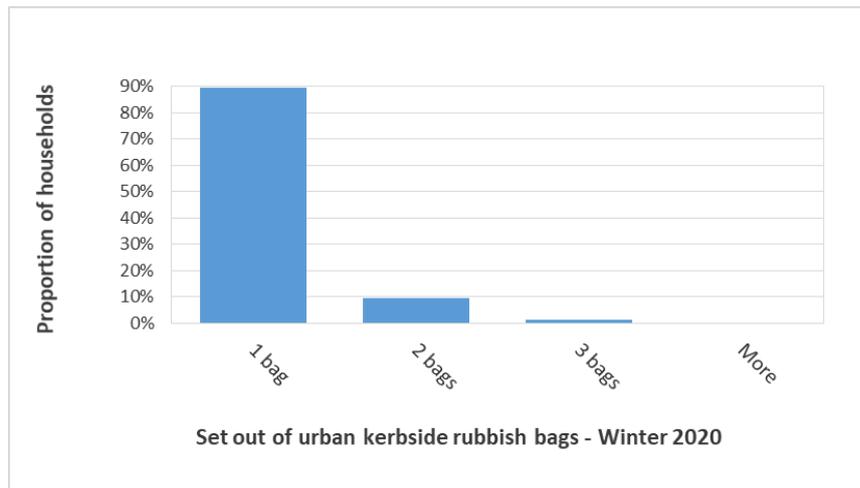


Figure 3.6 - Distribution of urban kerbside rubbish bag set out - Winter 2020

Eighty-nine percent of all urban households that set out rubbish bags set out a single bag. No urban households were recorded as setting out more than three bags.

3.3 Composition of rural rubbish bags

The primary composition of Waitomo District rural rubbish bags is presented in Table 3.3 below and Figure 3.7 on the next page. The secondary composition, which includes all 23 categories and a statistical analysis of the results, is given in Appendix 3.

The mean weight per household set out presented in the table has been calculated from the average number of bags set out per rural household using Council rubbish bags, based on data collected during the sample collection, and an average bag weight from the audit data. The average weight of a rural kerbside rubbish bag was 6.16 kg. The average household set out 1.21 bags, giving an average household set out weight of 7.46 kg. As not all households set out kerbside waste every week, the average household set out weight cannot be regarded as equivalent to an average weekly kerbside waste generation.

Rubbish bag weights are analysed in section 3.3.4. An analysis of rural household bag set out rates is given in section 3.3.5.

Table 3.3 - Primary composition of Waitomo District rural rubbish bags - Winter 2020

Waitomo District - Rural rubbish bags - Winter 2020	Proportion of total	Mean wt. per rural rubbish bag	Mean wt. per household set out
Paper	10.0%	0.61 kg	0.74 kg
Plastics	15.9%	0.98 kg	1.19 kg
Organics	39.9%	2.46 kg	2.98 kg
Ferrous metals	2.2%	0.14 kg	0.17 kg
Non-ferrous metals	1.2%	0.07 kg	0.09 kg
Glass	3.5%	0.21 kg	0.26 kg
Textiles	5.0%	0.31 kg	0.37 kg
Sanitary paper	20.0%	1.23 kg	1.49 kg
Rubble	0.8%	0.05 kg	0.06 kg
Timber	0.0%	0.00 kg	0.00 kg
Rubber	0.5%	0.03 kg	0.04 kg
Potentially hazardous	1.0%	0.06 kg	0.07 kg
TOTAL	100.0%	6.16 kg	7.46 kg

Organic material, primarily kitchen waste, was the largest single component of Waitomo District rural rubbish bags, comprising 39.9% of the total or 2.46 kg in the average rural rubbish bag. Sanitary paper, representing 20.0% of the total, was the second largest component. Plastics was the third largest component, at 15.9%, and Paper the fourth largest, at 10.0%. The secondary compositions of the major primary categories are discussed in the following sections.

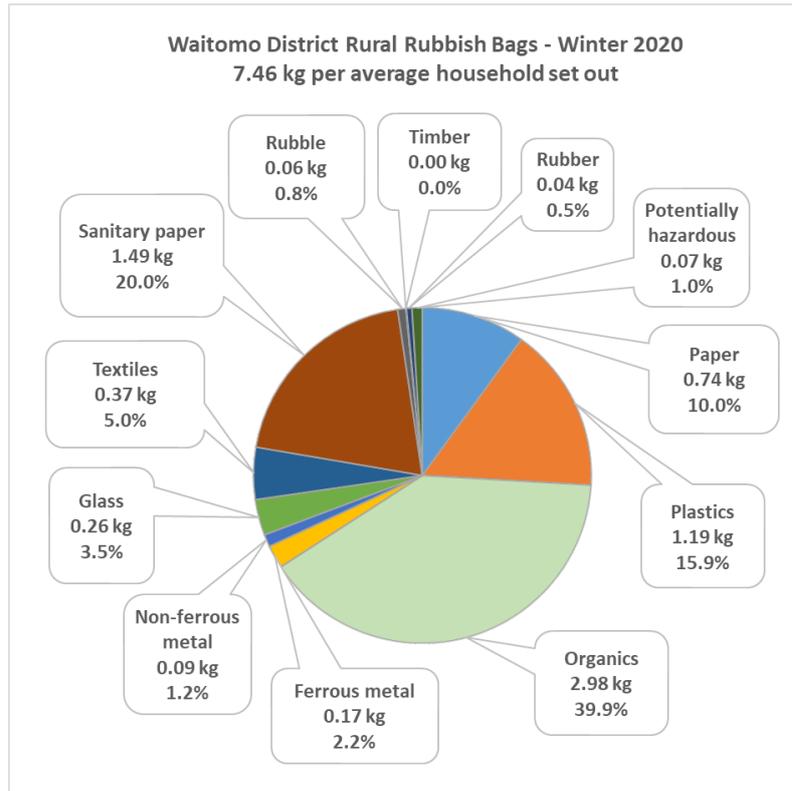


Figure 3.7 - Primary composition of Waitomo District rural rubbish bags - Winter 2020

3.3.1 Organics

Organic matter comprised 39.9% of the weight of rural rubbish bags. The composition of the organic constituent of the kerbside waste is shown in Figure 3.8.

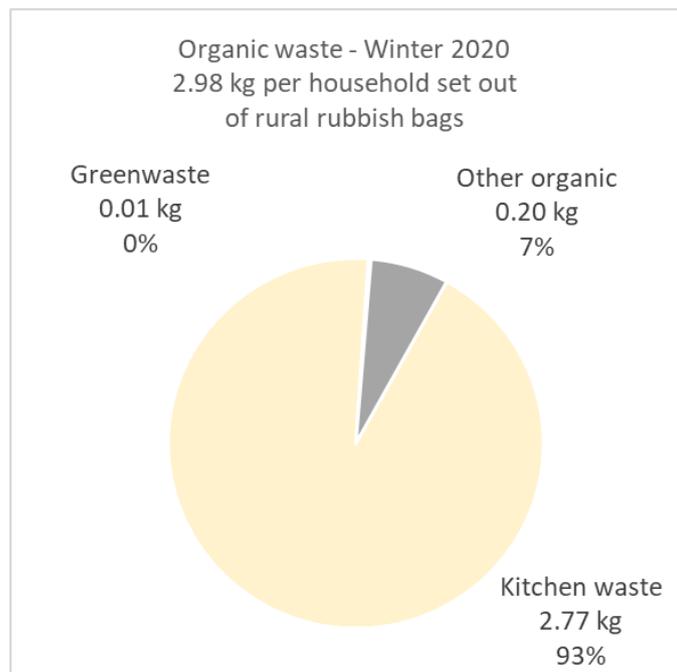


Figure 3.8 - Organic component of Waitomo District rural rubbish bags - Winter 2020

Kitchen waste comprised 93% of the organic material in Waitomo District rural rubbish bags. Kitchen waste included food preparation waste, left-over food waste, and substantial quantities of both perished goods and wasted food that was suitable for consumption.

Greenwaste, or garden matter, comprised 0.2% of the organic material.

The Other organic material (7%) included vacuum cleaner dust, dead animals, candles, and human hair. Much of this material would be suitable for composting.

3.3.2 Plastics

Plastic materials comprised 15.9% of the contents of rural rubbish bags, or 1.19 kg per household set out of rural rubbish bags. The secondary components of the Plastic waste are shown in Figure 3.9.



Figure 3.9 - Plastic component of Waitomo District rural rubbish bags - Winter 2020

Plastic bags/film comprised 60% of the Plastic in rural rubbish bags. This material is not accepted by the Waitomo District Council kerbside recycling collection.

A further 13% of Plastic waste in rural rubbish bags was #1-2 containers. These containers are accepted by Council’s kerbside recycling collection and at Council’s recycling centres.

Neither #3-7 containers (15%) nor Other non-recyclable plastics (12%) are accepted by Council’s kerbside recycling collection or at Council’s recycling centres.

3.3.3 Paper

Paper comprised 10.0% of the contents of rural rubbish bags. The composition of the paper constituent of the rubbish bags is shown in Figure 3.10.

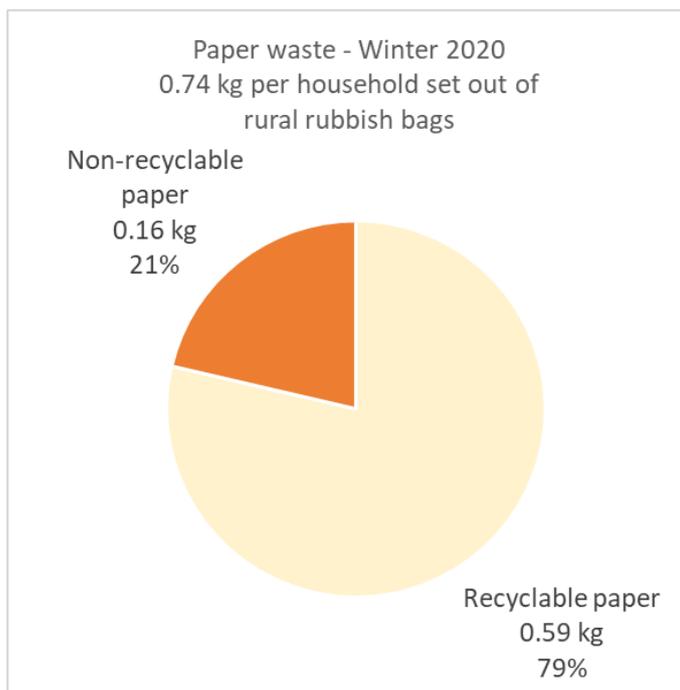


Figure 3.10 - Paper component of Waitomo District rural rubbish bags - Winter 2020

The largest component of Paper waste in rural rubbish bags was Recyclable paper, which comprised 79% of the paper. This component included packaging, office paper, newspapers, magazines, paperboard, and cardboard and could have been recycled through Council’s kerbside recycling collection.

Non-recyclable paper comprised 21% of Paper in rural rubbish bags. These types of paper are not accepted for recycling by the kerbside recycling collection, and included laminated paper, Tetra Pak containers, aseptic beverage containers, and multi-material and food-contaminated packaging. Heavily food-contaminated paper was classified as Non-recyclable paper, but lightly-contaminated paper was considered to be recyclable.

3.3.4 Distribution of rural rubbish bag weights

The average weight of waste in rural rubbish bags was 6.16 kg. The lightest bag was 1.56 kg and the heaviest 16.66 kg. The distribution of bag weights is shown in Figure 3.11.

Seventy percent of rural rubbish bags weighed between 2 and 8 kg. Thirteen percent of rural rubbish bags weighed over 10 kg.

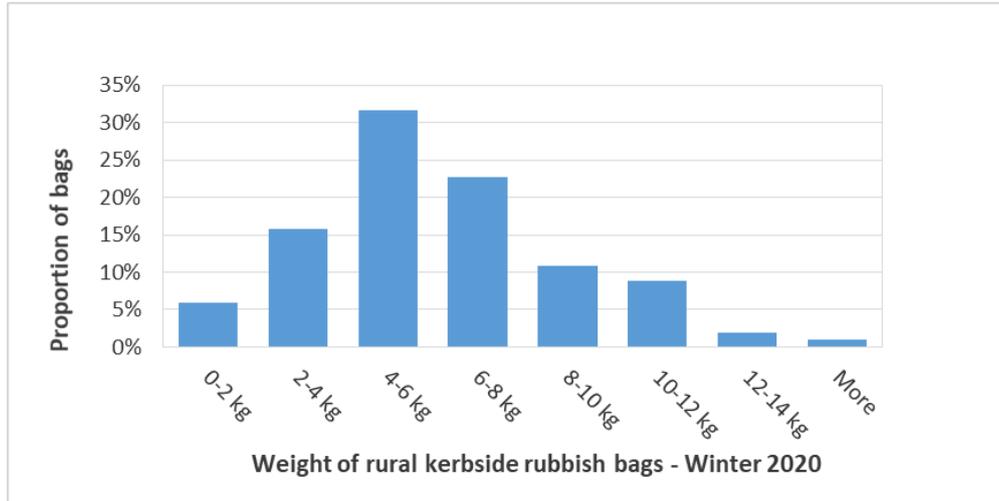


Figure 3.11 - Distribution of rural rubbish bags weights - Winter 2020

3.3.5 Distribution of rural rubbish bag set out

As the sample of rural rubbish bags was being collected, the total number of bags set out by each household was recorded. The average household bag set out was 1.21 bags. Figure 3.12 below shows the distribution of the bag set outs.



Figure 3.12 - Distribution of rural kerbside rubbish bag set out - Winter 2020

Eighty-five percent of all rural households that set out rubbish bags set out a single bag. One percent of rural households were recorded as setting out more than three bags.

3.4 Composition of all kerbside rubbish bags

3.4.1 Calculation of composition of all kerbside rubbish bags

The composition of all kerbside rubbish bags collected by Waitomo District Council has been calculated by averaging the composition of urban bags, presented in section 3.2, and the composition of rural rubbish bags, as presented in section 3.3. The weighted average of the two compositions has been based on tonnage records for June 2020, which were provided by Council. The calculations are shown in Table 3.4

Table 3.4 - Calculation of composition of all kerbside rubbish bags

Calculation of composition of all kerbside rubbish bags	Tonnes collected - June 2020	# of collections in July 2018	Mean tonnes/week	Proportion of total
Urban collections (Fridays)	20.46 tonnes	4	5.12 T/week	70.8%
Rural collections (Tuesdays)	10.57 tonnes	5	2.11 T/week	29.2%
TOTAL	-	-	7.23 T/week	100.0%

In the month of June 2020, Council's contractor reported disposing of 20.46 tonnes of waste from urban collections (Fridays) and 10.57 tonnes of waste from rural collections (Tuesdays). As there were five Tuesdays and four Fridays in July 2018, it was necessary to divide the monthly tonnages by five and four to calculate weekly tonnages, respectively, for rural and urban collections.

In total, Council's collections of kerbside waste averaged 7.23 tonnes/week. Urban collections averaged 5.12 tonnes/week, or 70.8% of kerbside waste collected. Rural collections averaged 2.11 tonnes/week, or 29.2% of kerbside waste collected.

New Zealand moved to Covid-19 Alert Level 1 on Monday 8 June. While kerbside waste tonnages were generally higher than normal during Alert Level 4, which involved a complete lockdown, the effect of Alert Level 1 on waste quantities and composition is uncertain. While the average weekly tonnage for urban kerbside waste collections in June was higher than the average for the nine months prior to lockdown, the average weekly tonnage for rural kerbside waste collections was lower. Overall, the average weekly tonnage was 18% higher in June 2020 than in July 2018, as calculated for the Winter 2018 audit.

3.4.2 Composition of all kerbside rubbish bags

The primary composition of all kerbside rubbish bags is presented in Table 3.5 and Figure 3.13 on the next page. The secondary composition, which includes all 23 categories, is given in Appendix 4.

Table 3.5 - Primary composition of all kerbside rubbish bags - Winter 2020

Waitomo District - All kerbside rubbish bags - Winter 2020	Proportion of total	Mean wt. per kerbside rubbish bag	Mean wt. per household set out	Mean tonnes/week
Paper	10.9%	0.62 kg	0.71 kg	0.79 T/week
Plastics	14.8%	0.84 kg	0.96 kg	1.07 T/week
Organics	46.2%	2.62 kg	3.00 kg	3.34 T/week
Ferrous metals	1.8%	0.10 kg	0.12 kg	0.13 T/week
Non-ferrous metals	1.0%	0.06 kg	0.06 kg	0.07 T/week
Glass	2.7%	0.15 kg	0.17 kg	0.19 T/week
Textiles	3.9%	0.22 kg	0.25 kg	0.28 T/week
Sanitary paper	15.6%	0.88 kg	1.01 kg	1.13 T/week
Rubble	0.8%	0.04 kg	0.05 kg	0.06 T/week
Timber	0.3%	0.02 kg	0.02 kg	0.02 T/week
Rubber	0.2%	0.01 kg	0.01 kg	0.02 T/week
Potentially hazardous	1.9%	0.11 kg	0.12 kg	0.14 T/week
TOTAL	100.0%	5.67 kg	6.50 kg	7.23 T/week

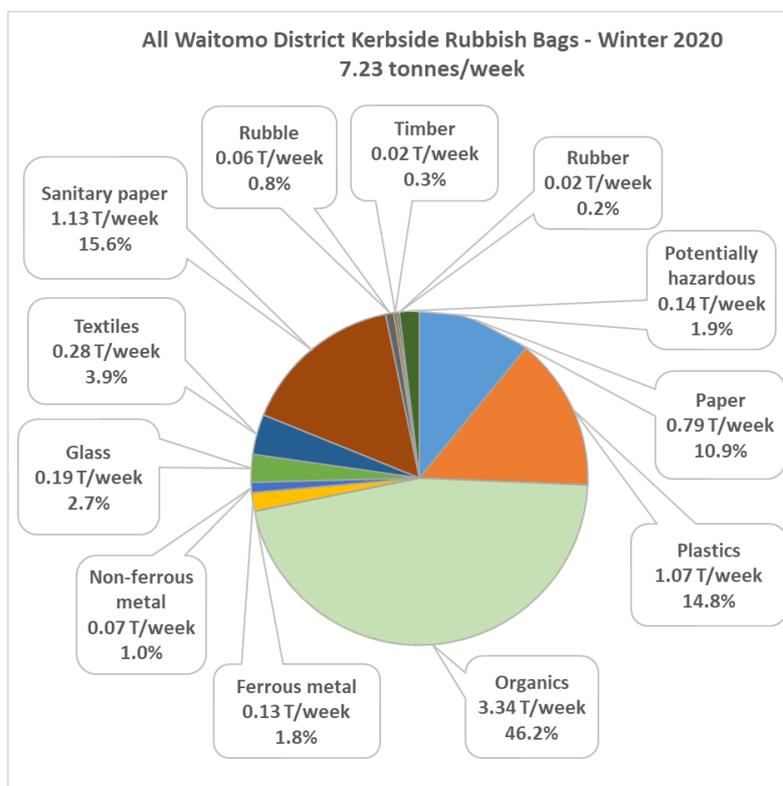


Figure 3.13 - Primary composition of Waitomo District kerbside rubbish bags - Winter 2020

Organic material, primarily kitchen waste, was the largest single component of kerbside rubbish bags, comprising 46.2% of the total or 3.34 T/week. Sanitary paper, representing 15.6% of the total, was the second largest component. Plastics was the third largest, at 14.8%, and Paper the fourth largest, at 10.9%.

3.4.3 Organics

Organic matter comprised 46.2% of the weight of all kerbside rubbish bags. The composition of the organic constituent of the kerbside waste is shown in Figure 3.14.

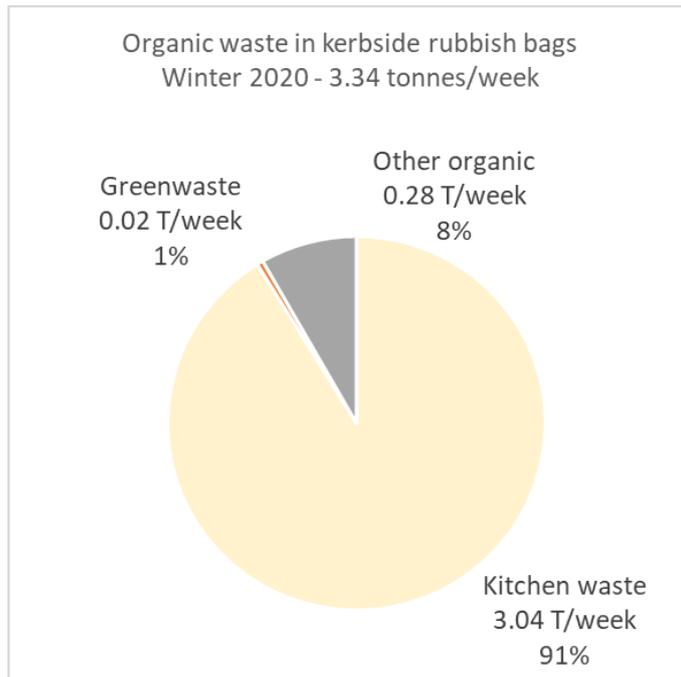


Figure 3.14 - Organic component of all kerbside rubbish bags - Winter 2020

Kitchen waste comprised 91% of the organic material in Waitomo District kerbside rubbish bags. Kitchen waste included food preparation waste, left-over food waste, and substantial quantities of both perished goods and wasted food, which was fit for consumption.

Greenwaste, or garden matter, comprised 1% of organic material.

Other organic material (8%) included vacuum cleaner dust, dead animals, animal faeces, candles, and human hair. Much of this material would be suitable for composting.

3.4.4 Plastics

Plastic materials comprised 14.8% of the contents of kerbside rubbish bags. The secondary components of Plastic waste are shown in Figure 3.15.

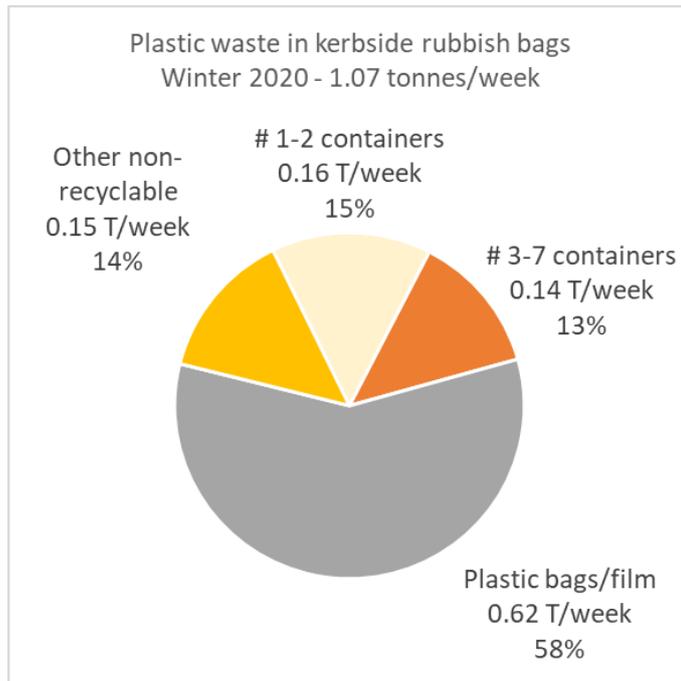


Figure 3.15 - Plastic component of all kerbside rubbish bags - Winter 2020

Plastic bags/film comprised 58% of Plastic waste in Waitomo District kerbside rubbish bags. This material is not accepted by the Waitomo District Council kerbside recycling collection.

A further 15% of Plastic in kerbside rubbish bags was #1-2 containers. This represents approximately 0.16 tonnes/week. These containers are accepted by Council’s kerbside recycling collection and at Council’s recycling centres.

Neither #3-7 containers (13%) nor Other non-recyclable plastics (14%) are accepted by Council’s kerbside recycling collection or at Council’s recycling centres.

3.4.5 Paper

Paper comprised 10.9% of the contents of Waitomo District kerbside rubbish bags. The secondary composition of Paper waste is shown in Figure 3.16.

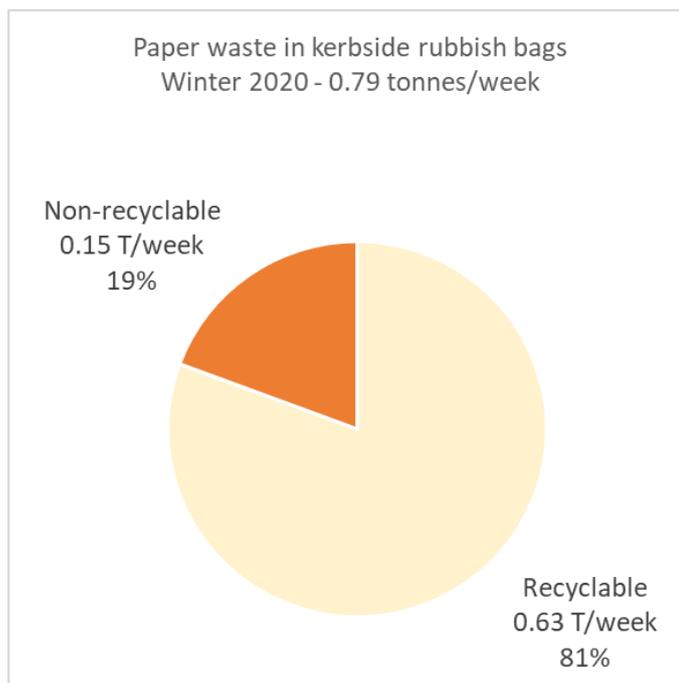


Figure 3.16 - Paper component of all kerbside rubbish bags - Winter 2020

The largest component of Paper waste in Waitomo District kerbside rubbish bags was Recyclable paper, which comprised 81% of Paper. This represents approximately 0.63 tonnes/week. This component included packaging, office paper, newspapers, magazines, paperboard, and cardboard and could have been recycled through Council’s kerbside recycling collection.

Non-recyclable paper comprised 19% of the paper. These types of paper are not accepted for recycling by Council’s kerbside recycling collection, and included laminated paper and multi-material and food-contaminated packaging. Heavily food-contaminated paper was classified as Non-recyclable paper, but lightly-contaminated paper was considered to be recyclable.

4 Analysis

4.1 Diversion potential

To reduce waste to landfill, Council provides households in Waitomo District with a weekly kerbside recycling collection, using a 55-litre plastic crate for containers, paper, and cardboard. Residents may also dispose of recyclable items at Council's landfill and transfer stations for no charge. Council's guide to recycling is included in Appendix 5. To further reduce waste to landfill, residents are able to home-compost kitchen waste and greenwaste. Alternatively, residents are able to dispose of greenwaste at transfer stations in the District.

Table 4.1 below shows the proportion of waste in kerbside rubbish bags that could have been diverted using these methods. Separate percentages are shown for urban, rural, and all kerbside rubbish bags. Weekly tonnages of each divertable material are also shown.

Table 4.1 - Diversion potential of Waitomo District rubbish bags - Winter 2020

Divertible materials in Waitomo District rubbish bags - Winter 2020	Urban rubbish bags	Rural rubbish bags	All kerbside rubbish bags	Tonnes per week
RECYCLABLE MATERIALS				
Paper - Recyclable	9.2%	7.8%	8.8%	0.63 T/week
Plastic - #1-2 containers	2.2%	2.1%	2.2%	0.16 T/week
Steel cans	0.7%	1.4%	0.9%	0.07 T/week
Aluminium cans	0.4%	0.2%	0.4%	0.03 T/week
Glass - Bottles/jars	2.1%	3.1%	2.4%	0.17 T/week
Subtotal	14.6%	14.6%	14.6%	1.05 T/week
COMPOSTABLE MATERIALS				
Kitchen waste	44.1%	37.1%	42.1%	3.04 T/week
Greenwaste	0.3%	0.1%	0.2%	0.02 T/week
Subtotal	44.5%	37.2%	42.3%	3.06 T/week
TOTAL DIVERTIBLE	59.0%	51.8%	56.9%	4.11 T/week

Approximately 14.6% of the materials in both urban and rural rubbish bags could have been recycled through Council's kerbside recycling collection or at transfer stations. Urban rubbish bags contained more recyclable paper than rural rubbish bags, but rural rubbish bags contained more steels cans and recyclable glass. Approximately 1.05 tonnes per week of recyclable material were disposed of in kerbside rubbish bags.

Urban rubbish bags contained a higher proportion of kitchen waste than rural rubbish bags, but neither contained significant quantities of greenwaste. Overall, the kerbside rubbish collection contained about 3.06 tonnes per week of compostable organic material, 42.3% of the total weight. In total, 56.9% of kerbside rubbish bags, or 4.11 tonnes per week, could have been diverted from landfill disposal.

4.2 Comparison with kerbside metrics from other areas

Table 4.2 compares kerbside waste metrics of Waitomo District kerbside waste in Winter 2018 and Winter 2020 with those of four other areas previously audited by Waste Not Consulting. The metrics are for combined council and private kerbside waste collections in those areas where both have a significant market share.

Table 4.2 - Comparison of kerbside waste metrics to other areas

Comparison to other areas - Weight per household set out	Hamilton City	Tauranga City	Former Auckland City	Undisclosed North Island district	Waitomo District	Waitomo District
Date of audit(s)	June & Nov. 2017	2016-17	Dec-10	Mar-18	Jul-2018	Jul-2020
Kerbside waste services audited	Rates-funded bags - 2/week max	User-pay bags and bins	Rates-funded weekly 120-litre bins	User-pays bags and 120-litre bins	User-pays bags	User-pays bags
Kerbside recycling services available	Rates-funded weekly 45-litre crate	User-pays bins or crates	Rates-funded fortnightly 240-litre bin	Rates-funded fortnightly crates	Rates-funded weekly crates	Rates-funded weekly crates
Average household set out weight	8.45 kg	12.21 kg	9.91 kg	8.99 kg	6.92 kg	6.50 kg
Recyclable materials						
Recyclable paper	0.76 kg	1.09 kg	0.98 kg	0.72 kg	0.64 kg	0.57 kg
Recyclable plastic	0.16 kg	0.23 kg	0.23 kg	0.22 kg	0.11 kg	0.14 kg
Steel cans	0.08 kg	0.11 kg	0.09 kg	0.11 kg	0.06 kg	0.06 kg
Aluminium cans	0.01 kg	0.05 kg	0.02 kg	0.02 kg	0.02 kg	0.02 kg
Bottles/jars	0.14 kg	0.55 kg	0.26 kg	0.21 kg	0.13 kg	0.15 kg
Subtotal	1.15 kg	2.03 kg	1.59 kg	1.28 kg	0.97 kg	0.95 kg
Compostable materials						
Kitchen waste	3.11 kg	4.28 kg	3.71 kg	3.57 kg	2.51 kg	2.73 kg
Greenwaste	0.77 kg	2.07 kg	0.90 kg	0.14 kg	0.16 kg	0.02 kg
Subtotal	3.87 kg	6.35 kg	4.62 kg	3.71 kg	2.67 kg	2.75 kg
TOTAL DIVERTABLE	5.03 kg	8.39 kg	6.20 kg	4.99 kg	3.63 kg	3.70 kg
% recyclable	13.7%	16.7%	16.0%	14.3%	14.0%	14.6%
% compostable	45.8%	52.1%	46.6%	40.9%	38.6%	42.3%
Total divertable	59.5%	68.7%	62.6%	55.3%	52.5%	56.9%

The average household set out weight of Waitomo District kerbside waste is substantially lower than in the other areas. However, as there is no data available on how frequently each household sets out kerbside waste, this does not necessarily indicate that Waitomo District householders set out less waste than in other areas.

The weight of recyclable materials per household set out is lower in areas that use rubbish bags rather than wheelie bins. The lowest weight of recyclables per household set out is in

Waitomo District. Waitomo District also has the lowest weights of compostable materials, per household set out.

4.3 Comparison with previous kerbside waste audits

The Waste Assessment incorporated in Council's SWaMMP includes the results of three previous audits of kerbside waste. Of the three kerbside waste audits (2012, 2014, and 2016), only the data from the 2016 waste audit is considered sufficiently reliable to be usefully compared with the results of Waste Not Consulting audits.

In Table 4.3, the results of the 2016 audit are compared with those from Waste Not's Winter 2018, Summer 2019, and Winter 2020 audits. No information is provided in the Waste Assessment as to the size of the 2016 audit or the season in which it was conducted.

Table 4.3 - Comparison of Waitomo District kerbside waste audits

Comparison of 2016 and July 2018 kerbside waste audits	2016	Winter 2018	Summer 2019	Winter 2020
Paper	12.8%	11.2%	11.1%	10.9%
Plastics	20.4%	14.6%	14.3%	14.8%
Organics	39.1%	41.5%	42.8%	46.2%
Ferrous metals	1.1%	1.8%	1.4%	1.8%
Non-ferrous metals	0.4%	1.0%	0.6%	1.0%
Glass	4.1%	2.4%	3.0%	2.7%
Textiles	4.9%	5.3%	6.2%	3.9%
Sanitary paper	16.1%	17.4%	16.5%	15.6%
Rubble	0.5%	3.4%	1.7%	0.8%
Timber	0.1%	0.2%	0.5%	0.3%
Rubber	0.3%	0.2%	0.2%	0.2%
Potentially hazardous	0.3%	1.1%	1.7%	1.9%
TOTAL	100.0%	100.0%	100.0%	100.0%

The results for most of the classifications were similar in all of the audits. The substantial difference in the proportion of plastics in 2016 may be anomalous and could be related to the 2016 sample size or differences in the sorting classifications. The differences in the proportions of rubble could be seasonal. A high proportion of the rubble in the Winter 2018 audit was fireplace ash, which may not be present at other times of the year. However, little ash was present in the Winter 2020 audit.

Two of the performance measures in Council's SWaMMP relate to reductions in the quantity of recyclable and compostable materials in the kerbside waste collection, as compared to the 2016 waste audit. These performance measures cannot be assessed reliably on the basis of the data available. To do so would require:

- annual tonnage data for 2016, 2018, and 2020
- more granular data from the 2016 waste audit than was published in the Waste Assessment. The 2016 data does not differentiate between recyclable and non-recyclable components of paper, plastic, glass, ferrous metal, or non-ferrous metal.

Appendix 1 - Waste classifications

Primary category	Secondary category	Definition
Paper	Recyclable paper	Cardboard packaging, newspapers, brochures, office paper, magazines, books,
	Non-recyclable paper	Non-recyclable paper packaging (wet-strength, food contaminated), photographic paper, playing cards, laminated paper, Tetra Pak, gabletop, pizza boxes
Plastics	# 1 & 2 containers	Household plastic containers with recycling # 1 or 2. No lids
	# 3-7 containers	Household plastic containers with recycling number 3, 4, 5, 6, or 7
	Plastic bags & film	All plastic bags and film
	Other non-recyclable	Non-recyclable plastic packaging, including polystyrene meat trays, paint, engine oil and chemical containers. All other non-packaging materials made primarily of plastic
Organics	Kitchen waste	All kitchen waste
	Greenwaste	All organic garden waste
	Other organic	All other primarily organic items – includes cat tray litter, hair, vacuum cleaner bags
Ferrous metals	Steel cans	All steel cans
	Other steel	All other items, including aerosol cans, made primarily of ferrous metal
Non-ferrous metals	Aluminium cans	All aluminium cans, plates, and trays.
	Other non-ferrous	All other items, including aerosol cans, made primarily of non-ferrous metal
Glass	Bottles/jars	All bottles and jars, emptied with the lids and contents removed
	Other glass	All other items made primarily of glass, includes light bulbs, drinking glasses, and window glass
Textiles	Clothing & rags	All items primarily made of a fabric, such as clothes, curtains, suitable for rags
	Other textile	Includes shoes, backpacks, handbags, rugs, not suitable for rags
Sanitary paper		Includes disposable nappies, paper towels, tissues, disposable menstrual products
Rubble		All concrete, 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, aerosol cans, medicines and cosmetics, cleaning agents
	Other hazardous	Potentially hazardous items not associated with domestic activity, such as used oil and garden chemicals.

Appendix 2 - Urban rubbish bags

Waitomo District Urban rubbish bags Winter 2020 <small>(Margins of error for 95% confidence level)</small>		% of total	Mean wt. per rubbish bag	Mean wt. per household set out
Paper	Recyclable paper	9.2% (±1.0%)	0.50 kg (±0.06 kg)	0.56 kg (±0.06 kg)
	Non-recyclable paper	2.1% (±0.4%)	0.11 kg (±0.02 kg)	0.13 kg (±0.02 kg)
	Subtotal	11.2% (±1.0%)	0.61 kg (±0.05 kg)	0.69 kg (±0.06 kg)
Plastics	# 1-2 containers	2.2% (±0.4%)	0.12 kg (±0.02 kg)	0.14 kg (±0.02 kg)
	# 3-7 containers	1.8% (±0.2%)	0.10 kg (±0.01 kg)	0.11 kg (±0.01 kg)
	Plastic bags/ film	8.2% (±1.1%)	0.45 kg (±0.06 kg)	0.50 kg (±0.06 kg)
	Other non-recyclable	2.1% (±0.7%)	0.12 kg (±0.04 kg)	0.13 kg (±0.04 kg)
	Subtotal	14.3% (±1.6%)	0.78 kg (±0.09 kg)	0.87 kg (±0.09 kg)
Organics	Kitchen waste	44.1% (±7.6%)	2.41 kg (±0.42 kg)	2.69 kg (±0.46 kg)
	Greenwaste	0.3% (±0.3%)	0.02 kg (±0.01 kg)	0.02 kg (±0.02 kg)
	Other organic	4.3% (±2.5%)	0.23 kg (±0.14 kg)	0.26 kg (±0.15 kg)
	Subtotal	48.7% (±7.9%)	2.66 kg (±0.43 kg)	2.97 kg (±0.48 kg)
Ferrous metals	Steel cans	0.7% (±0.3%)	0.04 kg (±0.02 kg)	0.04 kg (±0.02 kg)
	Other steel	0.9% (±0.4%)	0.05 kg (±0.02 kg)	0.05 kg (±0.03 kg)
	Subtotal	1.6% (±0.6%)	0.09 kg (±0.03 kg)	0.10 kg (±0.03 kg)
Non ferrous metals	Aluminium cans	0.4% (±0.2%)	0.02 kg (±0.01 kg)	0.03 kg (±0.01 kg)
	Other non-ferrous	0.5% (±0.2%)	0.03 kg (±0.01 kg)	0.03 kg (±0.01 kg)
	Subtotal	0.9% (±0.2%)	0.05 kg (±0.01 kg)	0.06 kg (±0.01 kg)
Glass	Bottles/jars	2.1% (±0.7%)	0.11 kg (±0.04 kg)	0.13 kg (±0.04 kg)
	Other glass	0.3% (±0.4%)	0.02 kg (±0.02 kg)	0.02 kg (±0.02 kg)
	Subtotal	2.3% (±0.9%)	0.13 kg (±0.05 kg)	0.14 kg (±0.06 kg)
Textiles	Clothing & rags	1.7% (±0.7%)	0.09 kg (±0.04 kg)	0.11 kg (±0.04 kg)
	Other textile	1.7% (±1.1%)	0.09 kg (±0.06 kg)	0.10 kg (±0.07 kg)
	Subtotal	3.4% (±1.3%)	0.19 kg (±0.07 kg)	0.21 kg (±0.08 kg)
Sanitary paper		13.8% (±4.9%)	0.75 kg (±0.27 kg)	0.84 kg (±0.30 kg)
Rubble		0.8% (±0.9%)	0.04 kg (±0.05 kg)	0.05 kg (±0.05 kg)
Timber		0.4% (±0.5%)	0.02 kg (±0.03 kg)	0.03 kg (±0.03 kg)
Rubber		0.1% (±0.2%)	0.01 kg (±0.01 kg)	0.01 kg (±0.01 kg)
Potentially hazardous	Household hazardous	2.1% (±1.3%)	0.11 kg (±0.07 kg)	0.13 kg (±0.08 kg)
	Other hazardous	0.2% (±0.4%)	0.01 kg (±0.02 kg)	0.01 kg (±0.03 kg)
	Subtotal	2.3% (±1.3%)	0.13 kg (±0.07 kg)	0.14 kg (±0.08 kg)
TOTAL		100.0%	5.47 kg (±0.60 kg)	6.10 kg (±0.67 kg)

Appendix 3 - Rural rubbish bags

Waitomo District Rural rubbish bags Winter 2020 <small>(Margins of error for 95% confidence level)</small>		% of total	Mean wt. per rubbish bag	Mean wt. per household set out
Paper	Recyclable paper	7.8% (±1.5%)	0.48 kg (±0.09 kg)	0.59 kg (±0.11 kg)
	Non-recyclable paper	2.1% (±0.8%)	0.13 kg (±0.05 kg)	0.16 kg (±0.06 kg)
	Subtotal	10.0% (±1.4%)	0.61 kg (±0.09 kg)	0.74 kg (±0.10 kg)
Plastics	# 1-2 containers	2.1% (±0.7%)	0.13 kg (±0.04 kg)	0.16 kg (±0.05 kg)
	# 3-7 containers	2.3% (±0.4%)	0.14 kg (±0.03 kg)	0.17 kg (±0.03 kg)
	Plastic bags/ film	9.6% (±1.2%)	0.59 kg (±0.08 kg)	0.72 kg (±0.09 kg)
	Other non-recyclable	1.9% (±0.5%)	0.12 kg (±0.03 kg)	0.14 kg (±0.04 kg)
	Subtotal	15.9% (±1.5%)	0.98 kg (±0.09 kg)	1.19 kg (±0.11 kg)
Organics	Kitchen waste	37.1% (±5.1%)	2.29 kg (±0.31 kg)	2.77 kg (±0.38 kg)
	Greenwaste	0.1% (±0.1%)	0.01 kg (±0.01 kg)	0.01 kg (±0.01 kg)
	Other organic	2.7% (±2.7%)	0.17 kg (±0.17 kg)	0.20 kg (±0.20 kg)
	Subtotal	39.9% (±4.0%)	2.46 kg (±0.25 kg)	2.98 kg (±0.30 kg)
Ferrous metals	Steel cans	1.4% (±0.6%)	0.08 kg (±0.04 kg)	0.10 kg (±0.05 kg)
	Other steel	0.9% (±0.7%)	0.05 kg (±0.04 kg)	0.06 kg (±0.05 kg)
	Subtotal	2.2% (±0.8%)	0.14 kg (±0.05 kg)	0.17 kg (±0.06 kg)
Non ferrous metals	Aluminium cans	0.2% (±0.1%)	0.01 kg (±0.01 kg)	0.02 kg (±0.01 kg)
	Other non-ferrous	1.0% (±0.9%)	0.06 kg (±0.05 kg)	0.07 kg (±0.06 kg)
	Subtotal	1.2% (±0.8%)	0.07 kg (±0.05 kg)	0.09 kg (±0.06 kg)
Glass	Bottles/jars	3.1% (±1.7%)	0.19 kg (±0.10 kg)	0.23 kg (±0.13 kg)
	Other glass	0.3% (±0.2%)	0.02 kg (±0.01 kg)	0.02 kg (±0.02 kg)
	Subtotal	3.5% (±1.7%)	0.21 kg (±0.10 kg)	0.26 kg (±0.13 kg)
Textiles	Clothing & rags	2.7% (±1.8%)	0.17 kg (±0.11 kg)	0.21 kg (±0.14 kg)
	Other textile	2.3% (±1.0%)	0.14 kg (±0.06 kg)	0.17 kg (±0.07 kg)
	Subtotal	5.0% (±2.3%)	0.31 kg (±0.14 kg)	0.37 kg (±0.18 kg)
Sanitary paper		20.0% (±7.7%)	1.23 kg (±0.47 kg)	1.49 kg (±0.57 kg)
Rubble		0.8% (±0.4%)	0.05 kg (±0.03 kg)	0.06 kg (±0.03 kg)
Timber		0.0% (±0.0%)	0.00 kg (±0.00 kg)	0.00 kg (±0.00 kg)
Rubber		0.5% (±1.0%)	0.03 kg (±0.06 kg)	0.04 kg (±0.08 kg)
Potentially hazardous	Household hazardous	0.5% (±0.4%)	0.03 kg (±0.02 kg)	0.04 kg (±0.03 kg)
	Other hazardous	0.4% (±0.4%)	0.03 kg (±0.03 kg)	0.03 kg (±0.03 kg)
	Subtotal	1.0% (±0.6%)	0.06 kg (±0.03 kg)	0.07 kg (±0.04 kg)
TOTAL		100.0%	6.16 kg (±0.61 kg)	7.46 kg (±0.74 kg)

Appendix 4 - Kerbside rubbish bags

Waitomo District Kerbside rubbish bags Winter 2020 <small>(Margins of error for 95% confidence level)</small>		% of total	Mean wt. per rubbish bag	Mean wt. per household set out	Tonnes/week
Paper	Recyclable paper	8.8%	0.50 kg	0.57 kg	0.63 T/week
	Non-recyclable paper	2.1%	0.12 kg	0.14 kg	0.15 T/week
	Subtotal	10.9%	0.62 kg	0.71 kg	0.79 T/week
Plastics	# 1-2 containers	2.2%	0.12 kg	0.14 kg	0.16 T/week
	# 3-7 containers	1.9%	0.11 kg	0.13 kg	0.14 T/week
	Plastic bags/ film	8.6%	0.49 kg	0.56 kg	0.62 T/week
	Other non-recyclable	2.1%	0.12 kg	0.13 kg	0.15 T/week
	Subtotal	14.8%	0.84 kg	0.96 kg	1.07 T/week
Organics	Kitchen waste	42.1%	2.39 kg	2.73 kg	3.04 T/week
	Greenwaste	0.2%	0.01 kg	0.02 kg	0.02 T/week
	Other organic	3.8%	0.22 kg	0.25 kg	0.28 T/week
	Subtotal	46.2%	2.62 kg	3.00 kg	3.34 T/week
Ferrous metals	Steel cans	0.9%	0.05 kg	0.06 kg	0.07 T/week
	Other steel	0.9%	0.05 kg	0.06 kg	0.06 T/week
	Subtotal	1.8%	0.10 kg	0.12 kg	0.13 T/week
Non ferrous metals	Aluminium cans	0.4%	0.02 kg	0.02 kg	0.03 T/week
	Other non-ferrous	0.6%	0.04 kg	0.04 kg	0.05 T/week
	Subtotal	1.0%	0.06 kg	0.06 kg	0.07 T/week
Glass	Bottles/jars	2.4%	0.13 kg	0.15 kg	0.17 T/week
	Other glass	0.3%	0.02 kg	0.02 kg	0.02 T/week
	Subtotal	2.7%	0.15 kg	0.17 kg	0.19 T/week
Textiles	Clothing & rags	2.0%	0.11 kg	0.13 kg	0.15 T/week
	Other textile	1.9%	0.11 kg	0.12 kg	0.14 T/week
	Subtotal	3.9%	0.22 kg	0.25 kg	0.28 T/week
Sanitary paper		15.6%	0.88 kg	1.01 kg	1.13 T/week
Rubble		0.8%	0.04 kg	0.05 kg	0.06 T/week
Timber		0.3%	0.02 kg	0.02 kg	0.02 T/week
Rubber		0.2%	0.01 kg	0.01 kg	0.02 T/week
Potentially hazardous	Household hazardous	1.6%	0.09 kg	0.11 kg	0.12 T/week
	Other hazardous	0.3%	0.02 kg	0.02 kg	0.02 T/week
	Subtotal	1.9%	0.11 kg	0.12 kg	0.14 T/week
TOTAL		100.0%	5.67 kg	6.50 kg	7.23 T/week

Appendix 5 - Council recycling guide

A Guide to Transfer Station fees and recycling

Waitomo District Council provides a range of waste management services to the community, including five Waste Transfer Stations located at Marokopa, Kinohaku, Piopio, Benneydale and Mokau.

Transfer Station Disposal fees

Charges are per refuse item: Van (each). If the amount of general refuse is over and above the standard item, additional charges will be applied.

Disposal of Unofficial rubbish bags	\$9.00
Wheeler Bin	\$25.00
Car boot	\$28.00
Van	\$52.00
Ute	\$59.00
Trailer	\$59.00
Special Refuse (E.g. Whiteware)	\$17.50
Televisions - each	\$25.80
Computer - each	\$15.50
Toaster/ kettle/ video recorder	\$5.20

You can recycle the following:

Plastic (types 1 and 2)

Any plastics types 1 and 2 will be accepted for recycling.



This can include soft drink bottles, milk bottles, ice cream containers and food packets such as biscuit trays or salad domes.



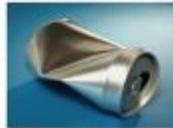
Remove the lids from all containers. Rinse all items thoroughly in warm water. Flatten as much as possible these can be placed in the plastic collection containers at all transfer Stations.

Remember, not all plastic items are types 1 and 2. The recycling number is printed on the underside of the bottle/ container.

Plastic items such as icecream containers and milk bottle lids cannot be re-used but can make great craft materials.

Tin and Aluminium Cans

Tin and aluminium cans will be accepted at all transfer Stations.



Paper and cardboard

- Newspapers
- Household paper and card
- Packaging cardboard
- Food boxes, ie: cereal boxes
- Egg cartons and trays
- Corrugated cardboard



Do not include paper items that have food contamination, ie: fish and chip wrappers, pizza boxes.



Large amounts of cardboard can be recycled at the Waitomo District Landfill for free.

Glass

The Transfer Stations will accept glass bottles and jars. This includes clear, green and brown coloured glass.

DO NOT INCLUDE: light bulbs, glass plates or bowls, drinking or beer handles, ash trays, or broken glass.



Broken glass should be well wrapped in newspaper and put in a WDC Rubbish Bag.