

# Hawke's Bay Solid Waste Surveys



Prepared for  
Hastings District Council and  
Napier City Council  
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# 1 Introduction

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The Waste Minimisation Act 2008 requires territorial authorities to promote effective and efficient waste management and minimisation within their districts. As part of fulfilling these responsibilities, Hastings District Council and Napier City Council (the councils) provide a range of waste management and minimisation services to their residents. These services include kerbside waste and recycling collections and the ownership of refuse transfer stations and Omarunui Landfill.

Section 43 of the Act requires territorial authorities to adopt a waste management and minimisation plan (WMMP) that provides objectives, policies, and methods for achieving effective and efficient waste management and minimisation. In accordance with these requirements, in 2018 the councils adopted a new WMMP, *Joint Waste Management and Minimisation Plan 2018-2024*.

The 2018 WMMP recognises the importance of waste data, and includes a goal “to improve information on waste generation and movements in Napier and Hastings”. One of the actions in the WMMP that will achieve this goal is to “Continue to undertake a solid waste survey of waste in Hastings District and Napier City at least every three years”.

This report provides the results of a solid waste survey undertaken in 2019. Previously, solid waste surveys were contracted to Waste Not Consulting in 2007, 2009, 2012, and 2016.

For the 2019 solid waste survey, nine days of visual surveying were conducted at disposal facilities, with three days of surveying each at Redclyffe Refuse Transfer Station, Henderson Rd Refuse Transfer Station, and Omarunui Landfill. These visual surveys were augmented with a five-day sort-and-weigh audit that analysed the composition of domestic kerbside rubbish bags from Hastings and Napier. The kerbside waste audit also included the contents of privately collected 240-litre wheelie bins, as it had in 2016.

This report is structured as follows:

- Section 1.1 describes waste management services currently available in Hawke's Bay
- Section 2 provides the methodologies that were used for the kerbside waste audit and visual surveys at the transfer stations and landfill
- Section 3 presents the results of the kerbside waste audit of Hastings District Council's kerbside rubbish bag collection and the visual survey of waste being disposed of at Henderson Road Refuse Transfer Station
- Section 4 presents the results of the kerbside waste audit of Napier City Council's kerbside rubbish bag collection and the visual survey of waste being disposed of at Redclyffe Refuse Transfer Station
- Section 5 presents the results of the kerbside waste audit of privately-collected 240-litre mobile garbage bins (MGBs)
- Section 6 includes several waste metrics and compares the results of the 2019 solid waste survey with previous surveys.

## **1.1 Waste management services in Hawke's Bay**

### **1.1.1 Services for the residential sector**

Both Hastings District and Napier City Councils provide kerbside waste collections for residential and commercial properties. Both Councils also operate refuse transfer stations for use by the public and commercial waste collectors. The Councils jointly own and manage Omarunui Landfill.

The Napier residential kerbside waste collection is funded through a Uniform Annual Charge and does not use an official rubbish bag. The collection is for domestic waste only and is not intended for the disposal of garden waste. A maximum of two bags per household are collected from outside each property on a weekly basis. Bags may be plastic or paper, no more than 60 litres in volume, and not weigh more than 10 kg. The collection services are currently contracted to Waste Management NZ Ltd. Council staff collect a small amount of kerbside waste from rural areas.

Hastings District Council operates a user-pays system for the residential kerbside collection of domestic waste, using an official orange rubbish bag. Two sizes of bags are available - 60-litre bags have a recommended retail price of \$2.40 each, smaller 40-litre bags have a RRP of \$1.60 each. There is no limit to the number of official bags a property may set out for collection, but bags are not to weigh more than 10 kg. The bags are not to be used for the disposal of garden waste. The kerbside waste collection is currently contracted to Waste Management NZ Ltd. Collection from a small number of households in Waimarama community is contracted to DJ Monty Holdings Ltd, trading as Bin Hire Co. The contractor collects private subscription MGBs at the same time as Council orange bags.

Both Councils provide a kerbside recycling service for residential properties. Hastings' collection is weekly; Napier City's is fortnightly. Residents may set the following materials out in either plastic bags or cardboard boxes:

- Napier's recycling collection accepts all plastics with recycling symbols #1-2. Hastings' collection only accepts plastic bottles with recycling symbols #1-2 (the acceptance of #3-7 was discontinued in March 2019 by both councils).
- glass bottles and jars
- steel and aluminium cans
- paper and cardboard.

The kerbside recycling collection and the processing of materials is jointly contracted by the Councils to Green Sky Waste Solutions Ltd.

Kerbside collections of domestic waste or greenwaste, using mobile garbage bins (MGBs), are available throughout the region from private waste operators on a user-pays subscription basis. The proportion of households that make use of these services has been investigated by the Councils. Several sizes of MGBs are available for residential use, ranging from 80-litres to 240-litres.

For occasional removal of large quantities of waste, residents have the option of using the services of a large number of private waste operators. Some of the waste operators provide gantry bins, of various sizes, for the householder to load themselves. Other waste operators remove waste from residential premises.

### 1.1.2 Services for the commercial sector

Hastings District Council operates a twice-weekly collection of rubbish bag, using the official Council user-pays orange bags, from the central business areas of Hastings and Havelock North. Napier City Council also operates a commercial rubbish bag collection in Napier business districts between two and four times per week, depending on the area. Neither Council collects rubbish bags from industrial areas.

Outside of the central business districts, the Councils' kerbside recycling collection services are available to those businesses that are rated for the Council's kerbside collection services. For businesses that are not eligible for the Council service or that generate large quantities of recycling, recycling collections are available from private service providers.

Most trade waste generated by the commercial sector is removed by private waste operators or transported to a disposal facility by the business itself. Private waste operators offer a wide range of collection systems to meet the requirements of each business. MGBs, front-loader bins, gantry skips, and hook bins are all available.

Commercial waste collected by private waste operators is disposed of at one of the three main waste disposal facilities - Henderson Rd Refuse Transfer Station, Redclyffe Refuse Transfer Station, or directly to Omarunui Landfill.

### 1.1.3 Waste disposal facilities

There are three refuse transfer stations (RTS) operating in the region. Henderson Rd and Blackbridge RTSs are owned by Hastings District Council. Henderson Rd is the main transfer station for Hastings, and accepts both domestic and commercial waste seven days per week. Most of the Hastings kerbside waste collection is taken to Henderson Rd RTS for consolidation and transport to landfill. A small amount from the Waimarama community is taken directly to Omarunui Landfill.

All waste loads at Henderson Rd RTS are weighed and charges are based on the weight of waste disposed of. Rubbish is charged at a rate of \$174.80/tonne, and greenwaste at a rate of \$93.15/tonne. Cartage and aspects of the site operation are contracted to Phoenix Contracting Ltd.



**Photo 1.1 - Henderson Rd RTS**



Blackbridge RTS is open three days per week and accepts only domestic waste. The facility is managed and operated under contract by Phoenix Contracting Ltd. As of July 2019, Phoenix Contracting has provided notice to end the current contract at the Henderson Road and Blackbridge RTSs. These contract works will be procured as described in the HDC Procurement Manual over the coming months.

Both Henderson Rd and Blackbridge RTS have separate drop-off points for scrap metals, engine oil, car batteries, and greenwaste. Henderson Rd RTS includes a resource recovery centre that provides a drop-off area for recyclable materials and Council orange rubbish bags and accepts and sells recovered household goods. Staff at Henderson Rd RTS recover waste materials, primarily scrap metal, from loads of waste dumped on the tipping floor.

Redclyffe RTS is the only transfer station in Napier City and accepts both domestic and commercial waste seven days per week. The Napier City Council kerbside waste collection (other than rural waste collected by Council staff) is taken directly to Omarunui Landfill, and does not go through the transfer station.

Redclyffe RTS is owned by Napier City Council, with RTS operation and haulage of waste to Omarunui Landfill being contracted to Doug Gerrard Ltd. Rubbish disposal is charged at a rate of \$206/tonne, and greenwaste and untreated wood at a rate of \$100/tonne.

Before the weighbridge kiosk, there is a drop-off facility that accepts glass and plastic bottles, paper/cardboard, scrap metals, and steel/aluminium cans. The main facility has separate drop-off points for hardfill, greenwaste, scrap metals, engine oil, LPG containers, batteries, computers, and paint. Staff recover scrap metals, tyres, and hard fill from the tipping floor.



**Photo 1.2 - Redclyffe RTS**

Omarunui Landfill is the principle waste disposal facility for Hastings and Napier regions. The Class 1 landfill is jointly owned by Napier City and Hastings District Councils. It is closed to the public, and accepts waste from the three transfer stations and the commercial sector. All



vehicles are weighed and charged on a per tonne basis. The notified gate charge is \$110.40/tonne for municipal waste. A minimum charge for municipal waste is currently \$197.80/load. Special wastes are charged at \$149.50/tonne, with a minimum charge of \$224.25/load.

From 1 July 2019 there were price increases at all of the above mentioned facilities.

## 2 Methodologies

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### 2.1 Audit of domestic kerbside waste

The audit of domestic kerbside waste was designed to determine the following:

- domestic kerbside rubbish bag weight and composition for Hastings
- domestic kerbside rubbish bag weight and composition for Napier
- household set out weight of kerbside waste for Hastings and Napier
- domestic kerbside waste composition and weight for privately-collected 240-litre MGBs.

The audit methodology was based on Procedure One of the Ministry for the Environment's Solid Waste Analysis Protocol 2002 (SWAP). Conducted over a five-day period, the audit included 300 council-collected rubbish bags and the contents of 54 privately-collected 240-litre MGBs.

#### 2.1.1 Classification of kerbside waste

Classification of the rubbish bag was into the 12 primary categories identified in the SWAP and 25 secondary categories. The categories are detailed in Appendix 8. The classifications were chosen to identify the different types of recyclable and potentially recyclable materials present in kerbside waste.

#### 2.1.2 Sample size

The audit was undertaken over a five-day period and designed to include:

- 150 bags of domestic kerbside waste each from both Napier and Hastings
- approximately 1200 kg of kerbside waste from 240-litre MGBs (approximately 60 MGBs).

#### 2.1.3 Sampling strategy

The composition and quantity of domestic kerbside waste varies according to a number of factors, including the socio-economic status and ethnicity of the householder, the nature of the housing stock, and the range of disposal and recycling services available. To obtain a representative sample of domestic kerbside waste from Hastings and Napier, it was considered necessary to sample from as wide a geographic area as possible. Accordingly, the kerbside waste sample was collected in a different area of Hastings and Napier each day for five days.

Only dwellings to which a distinct quantity of rubbish bags could be attributed were chosen for the rubbish bag sample collection. Rubbish bags were not taken, for example, from beside shared driveways as it may have represented the waste output of several households. When rubbish bags were taken from a dwelling, the total number of bags set out by that dwelling was recorded. This allowed the calculation of the average number of bags set out per household, which, when combined with an average bag weight, allowed the calculation of the average weight of kerbside waste set out per household. Note that this does not necessarily equate to an average weekly household waste generation, as not all households set out kerbside waste each week.

#### 2.1.4 Audit execution

The sample collection was undertaken each morning by a Waste Not staff member, accompanied by a contract worker in a truck rented and driven from Auckland for the purpose. The collected sample was transported to Omarunui Landfill each day for sorting. A six-by-six metre marquee was erected at the landfill for the purpose.

A team comprising the Waste Not supervisor and three contract staff was used for the sorting process. All contract staff had received the requisite training on the requirements of the audit process and on health and safety procedures. All personal protective equipment was provided to contract staff.



**Photo 2.1 - Sorting Napier kerbside rubbish bags**

Rubbish bag samples from Hastings and Napier and the contents of 240-litre MGBs were sorted separately. The collected bags were sorted in sampling units of ten bags. Each of the ten bags in the unit was weighed in, the weight recorded, and then the bags were opened, the contents spread on a sorting table, and the individual items sorted into the appropriate categories. When all of the items were sorted, the individual classifications were weighed out and the material disposed of. The contents of one or two 240-litre MGBs were sorted together in the same manner. These sorting techniques are consistent with Section 4.5 of the SWAP.

## 2.2 Surveys of transfer stations and landfill

As 20% of the waste being disposed of at Omarunui Landfill comes from the two main refuse transfer stations, Henderson Rd and Redclyffe, three days were spent surveying at each of the main transfer stations and three days at the landfill. As the tonnage being disposed of at Blackbridge RTS is markedly lower by comparison, no surveying was undertaken at the facility.

Visual surveying, as undertaken by Waste Not Consulting, provides information on vehicle loads of waste entering a disposal facility in terms of composition of the waste load and the activity source of the waste load - the activity that generated the waste. The composition of waste is based on the 12 primary categories (e.g. paper, plastics etc) recommended by SWAP.

Further secondary categories were decided upon in conjunction with the Councils. A description of the categories is provided in Appendix 9.

### 2.2.1 Visual assessment of waste composition

While each vehicle was being unloaded at a disposal facility, the surveyor assessed the relative weight of each constituent present in the load on the basis of volume and density. Absolute weights were not estimated; rather, the proportion of weight represented by each material was estimated. This data was recorded as a proportion, by weight, for each constituent present in the load.

For vehicle loads in which it was difficult to distinguish the individual constituents, a generic composition, based on previous surveys of that type of vehicle load, were used as a template for the composition and were adjusted according to the materials that were visible.

At both of the transfer stations, some recoverable materials are removed from the waste stream by facility staff. In such instances, the recovered materials were *not* recorded as being a constituent of the waste and an estimate was made of the proportion, by weight, of the load that has been recovered.

Survey data was then combined with weighbridge records of the weight of the load, and a weight for each of the individual materials was calculated. For small loads that were not weighed at a weighbridge, an estimate of the load weight was made based on known averages for the specific vehicle and load activity source.

The surveyor undertook visual assessments of vehicles for nine hours per day (including breaks) for three days in each facility. Except during very busy periods, the surveyor was able to gather data on all vehicles disposing of waste during the survey hours at the facility.

### 2.2.2 Activity sources of waste loads entering disposal facilities

During the survey, the activity source of each waste load was assessed and recorded by the surveyor at the same time as the composition was being assessed and recorded. The activity source categories in the National Waste Data Framework were used. These are defined as follows:

1. **Domestic kerbside** - Domestic-type waste collected from residential premises by the local council (or by a contractor on behalf of the council), or by private waste collections (through kerbside or similar collection). The split between residential and commercial kerbside waste was made during the data analysis phase.
2. **Residential** - All waste originating from residential premises, other than that covered by any of the other activity source categories. For example, a person arriving with a trailer load after cleaning out the garage would classify as residential waste.
3. **Industrial/commercial/institutional (ICI)** - Waste from industrial, commercial and institutional sources (i.e. supermarkets, shops, schools, hospitals, offices). For the purposes of the protocols illegal dumping and litter should be classified under ICI.
4. **Construction and demolition (C&D)** - Waste produced directly or incidentally by the construction and demolition industries. This includes building materials such as insulation, nails, plasterboard and timber, roofing materials, as well as waste originating from site preparation, such as dredging materials, tree stumps, and rubble.

5. **Landscaping** - Waste from landscaping activity and garden maintenance (including public gardens), both domestic and commercial, as well as from earthworks activity, unless the waste contains only VENM, or unless the earthworks are for purposes of construction or demolition of a structure.
6. **Special wastes** - Waste that fits into significant, identifiable waste streams, usually from a single generator. Special wastes are those that cause particular management and/or disposal problems and need special care. This includes, but is not restricted, to hazardous and medical wastes (including e-wastes). It also includes any substantial waste stream (such as biosolids, infrastructure fill or industrial waste) that significantly affects the overall composition of the waste stream, and may be markedly different from waste streams at other disposal facilities.
7. **Virgin excavated natural materials (VENM)** - Material that when discharged to the environment will not have a detectable effect relative to the background and comprising virgin excavated natural materials, such as clay, soil, and rock that are free of:
  - manufactured materials such as concrete and brick, even though these may be inert
  - combustible, putrescible, degradable, or leachable components
  - hazardous substances or materials (such as municipal solid waste) likely to create leachate by means of biological breakdown
  - any products or materials derived from hazardous waste treatment, stabilisation or disposal practices
  - materials such as medical and veterinary waste, asbestos, or radioactive substances that may present a risk to human health if excavated
  - contaminated soil and other contaminated materials
  - liquid waste.

Using the weighbridge records for each load, the data collected during the survey was analysed to quantify the proportion of the waste stream in terms of each activity source of load and the composition of the waste originating from each activity source.

As it was not possible for a visual surveyor to differentiate between domestic and commercial kerbside waste (most truckloads contain a mixture of both), additional sources of data were required. To source this data, in 2016 the private kerbside waste collectors operating in Hastings and Napier were approached directly and asked for this information.

At Omarunui Landfill, spoil from on-site excavations is used as a daily cover over the exposed waste mass. This cover material has not been considered to be a waste material, as the waste levy is not paid on this material. This cover material has **not** been included in the survey.

### 2.2.3 Identification of vehicle types

As loads carried by different vehicle types are not affected in similar ways by waste reduction initiatives, vehicles carrying waste were classified according to the system shown in Table 2.1 on the next page. Photos and more detailed explanations of the truck types are provided in Appendix 10.

**Table 2.1 - Vehicle classification system**

Vehicle type	Uses
<b>Car-sized loads</b>	Small loads, generally from a single source, can be of either commercial or residential origin. Includes vehicles other than cars carrying very small loads, such as a van carrying a few rubbish bags.
<b>Trailer-sized loads - including vans, small trucks, and utes</b>	Small-medium sized loads, usually from a single source, either commercial or residential, some may be from multiple sources (i.e. a garden contractor)
<b>Kerbside collection compactors</b>	Large load usually from multiple regular sources, either residential or commercial or both combined
<b>Front-loader trucks</b>	Large loads, usually from numerous commercial sources that are regular users
<b>Gantry trucks</b>	Medium-large loads, usually from a single source, may be one-off disposal for residential or commercial waste, or regularly used by a commercial waste generator
<b>Hook truck</b>	Large loads, usually from a single source, may be one-off loads or regularly used by a large-scale waste generator.
<b>Other trucks - including tip, box, and flat-deck</b>	Medium to large loads, usually commercial, may be one off - loads or regular waste generators

## 2.3 Assumptions made regarding data and analysis

As not all householders set out rubbish each week, it can not be assumed that the kerbside waste collected from each household correlates to the weekly waste generation for that household. To determine a weekly kerbside waste generation figure, it is necessary to know how frequently, on average, households set out kerbside waste.

Waste generation is seasonal in terms of both quantity and composition. This is of particular significance for greenwaste. Care must be taken when comparing audit results from different seasons of the year.

Domestic kerbside waste generation and waste management behaviour may be related in an unquantified manner to the socio-economic status, property type, and ethnicity of the household. It is assumed that the sample that was collected in each area was representative of the overall population of the area.

Occurring as it did in late summer, the composition and quantity of waste entering the refuse transfer stations and landfill can not be considered to be representative of waste at other times of the year. This is particularly relevant to waste generated by the primary industries in the area. Seasonal effects are also relevant to C&D waste and landscaping waste.

The disposal facility audits were undertaken for three days at each of the three main facilities in the region. The two transfer stations were both surveyed for two weekdays and one day on the weekend; the landfill was surveyed for three weekdays. It has been assumed that the results of these three days of surveying are representative of the waste entering the facility over an entire week.



## 3 Hastings District waste streams

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### 3.1 Hastings domestic kerbside orange rubbish bag collection

#### 3.1.1 Sampling schedule

The sample of Hastings domestic kerbside rubbish bag comprised 150 bags collected from 121 households. When the sample was being collected, the number of bags set out by each household was recorded. The sample was collected from Wednesday 10 April to Tuesday 16 April 2019 from the streets shown in Appendix 1.

Only dwellings to which a distinct quantity of rubbish bags could be attributed were chosen for the sample collection. Waste was not taken, for example, from beside shared driveways or from multi-unit dwellings as it may have represented the kerbside waste output of several households.

#### 3.1.2 Primary composition of Hastings domestic kerbside rubbish bags

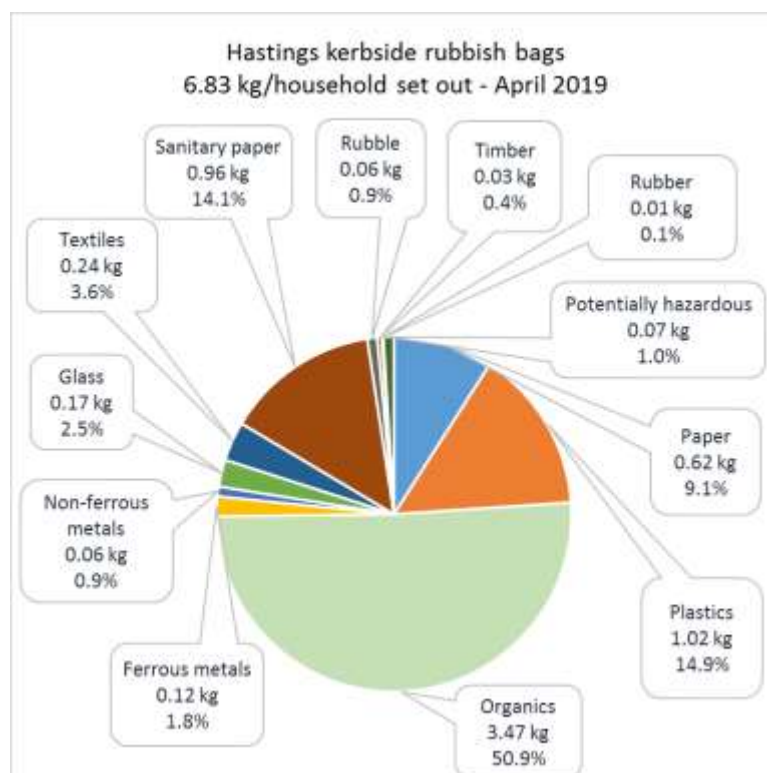
The primary composition of Hastings domestic kerbside rubbish bags is presented in Table 3.1 and Figure 3.1 on the following page. The secondary composition, which includes all 25 categories, is given in Appendix 2.

The mean weight per household set out of 6.83 kg in the table has been calculated by combining the average bag weight (4.98 kg) with the average number of bags set out per household (1.37). The average set out weight of kerbside waste is related to the frequency with which households put waste out for collection. As not all households put waste out every week, the average household set out weight can not be regarded as equivalent to an average weekly waste generation.

**Table 3.1 - Primary composition of Hastings domestic kerbside rubbish bags - April 2019**

Hastings kerbside rubbish bags - April 2019 (margins of error for 95% confidence level)	Proportion of total	Mean wt. per bag	Mean wt. per household set out
<b>Paper</b>	9.1% (±1.7%)	0.45 kg (±0.09 kg)	0.62 kg (±0.12 kg)
<b>Plastics</b>	14.9% (±1.9%)	0.74 kg (±0.09 kg)	1.02 kg (±0.13 kg)
<b>Organics</b>	50.9% (±4.9%)	2.53 kg (±0.24 kg)	3.47 kg (±0.33 kg)
<b>Ferrous metals</b>	1.8% (±0.7%)	0.09 kg (±0.03 kg)	0.12 kg (±0.04 kg)
<b>Non-ferrous metals</b>	0.9% (±0.3%)	0.04 kg (±0.01 kg)	0.06 kg (±0.02 kg)
<b>Glass</b>	2.5% (±1.0%)	0.12 kg (±0.05 kg)	0.17 kg (±0.07 kg)
<b>Textiles</b>	3.6% (±1.3%)	0.18 kg (±0.06 kg)	0.24 kg (±0.09 kg)
<b>Sanitary paper</b>	14.1% (±3.9%)	0.70 kg (±0.20 kg)	0.96 kg (±0.27 kg)
<b>Rubble</b>	0.9% (±0.7%)	0.04 kg (±0.03 kg)	0.06 kg (±0.05 kg)
<b>Timber</b>	0.4% (±0.4%)	0.02 kg (±0.02 kg)	0.03 kg (±0.03 kg)
<b>Rubber</b>	0.1% (±0.1%)	0.01 kg (±0.00 kg)	0.01 kg (±0.01 kg)
<b>Potentially hazardous</b>	1.0% (±0.4%)	0.05 kg (±0.02 kg)	0.07 kg (±0.03 kg)
<b>TOTAL</b>	<b>100.0%</b>	<b>4.98 kg (±0.38 kg)</b>	<b>6.83 kg (±0.52 kg)</b>

Organic material, primarily kitchen waste, was the largest single component of Hastings domestic kerbside rubbish bags, comprising 50.9% of the total weight. Plastics, 14.9%, was the second largest component and Sanitary paper, 14.1%, the third.


**Figure 3.1 - Primary composition of Hastings kerbside rubbish bags - April 2019**

### 3.1.3 Distribution of kerbside rubbish bag weights

The average Hastings domestic rubbish bag weight was 4.98 kg ( $\pm 0.38$  kg at the 95% confidence level). The distribution of rubbish bag weights is shown in Figure 3.2 below.

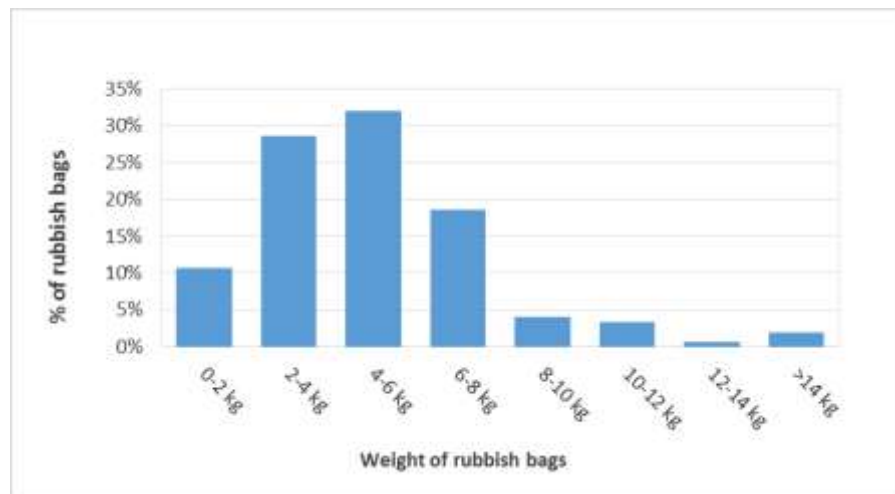


Figure 3.2 - Distribution of weights of Hastings kerbside rubbish bags - April 2019

Seventy-nine percent of all bags weighed between 2 and 8 kg. Six percent of bags weighed more than the official limit of 10 kg.

### 3.1.4 Distribution of kerbside rubbish bag set outs

The Hastings sample of domestic rubbish bags was collected from 121 households, and the total number of bags set out by each household was recorded. The average household bag set out was 1.37 rubbish bags. Figure 3.3 below shows the distribution of the bag set outs.

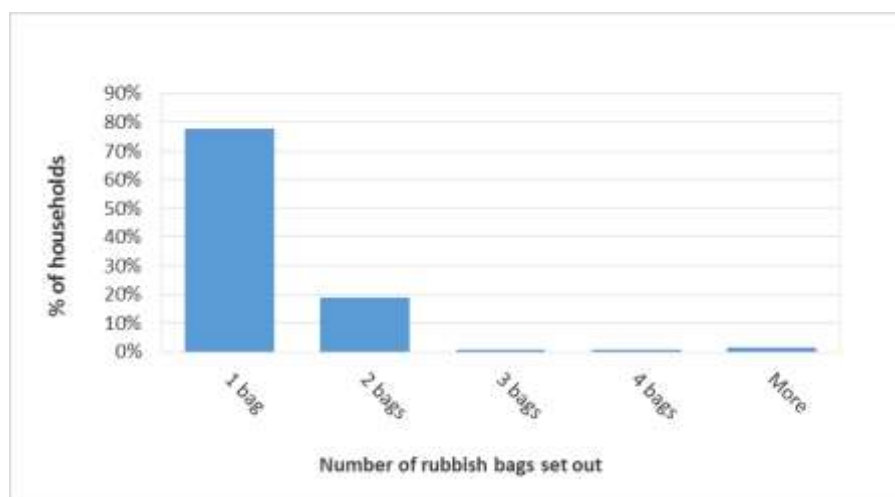


Figure 3.3 - Distribution of set out of Hastings kerbside rubbish bags - April 2019

Seventy-eight percent of households that set out bags set out a single rubbish bag. Three percent of households set out more than two bags.

### 3.1.5 Diversion potential of Hastings domestic kerbside rubbish bags

A common means for local government to divert domestic kerbside waste from landfill disposal is by providing systems for the collection of recyclable and compostable materials. Hastings District Council provides a kerbside recycling service to households in the District. While there is no Council-provided kerbside organics collection, private greenwaste collections are available and kitchen waste and garden waste can be composted by residents. Home composting and worm farming is actively encouraged by Council through a contract with Hawke's Bay Environment Centre.

Table 3.2 shows the proportion of Hastings domestic kerbside rubbish bags that could have been diverted using these methods. The table also shows the weight of materials per average household set out that could have been diverted.

**Table 3.2 - Diversion potential of Hastings kerbside rubbish bags - April 2019**

Kerbside recyclable materials	% of total	Kg household set out
Paper - Recyclable	6.5%	0.44 kg
# 1-2 bottles	1.4%	0.10 kg
#1-2 trays & punnets	1.0%	0.07 kg
Ferrous metals - Steel cans	1.7%	0.11 kg
Non-ferrous metals - Aluminium cans	0.5%	0.04 kg
Glass - Bottles/jars	1.8%	0.12 kg
<b>Subtotal</b>	<b>12.8%</b>	<b>0.87 kg</b>
<b>Compostable materials</b>		
Organics - Kitchen waste	47.0%	3.21 kg
Organics - Green waste	1.7%	0.12 kg
<b>Subtotal</b>	<b>48.8%</b>	<b>3.33 kg</b>
<b>TOTAL - Potentially divertable</b>	<b>61.6%</b>	<b>4.20 kg</b>

Of the materials in Hastings domestic kerbside rubbish bags, 12.8% could have been recycled through the existing kerbside recycling collection. Paper comprised nearly half of the recyclable materials. A further 48.8% could have been composted. In total, 61.6% of Hastings domestic rubbish bags could have been diverted from landfill disposal by either recycling or composting. This equates to 4.20 kg of waste per average household set out.

Other materials, such as clothing and other metals, are also recyclable but have not been included in these calculations.

## 3.2 Henderson Rd Refuse Transfer Station

Henderson Rd Refuse Transfer Station was surveyed on Friday 29 March, Wednesday 8 May, and Thursday 9 May 2019. During this period, data was collected on 297 vehicle loads of waste. The data from vehicle loads (other than kerbside compactors) was used to determine the composition of the 'general' waste (i.e. excluding kerbside waste collections) disposed of at the facility.

The overall tonnage to landfill from Henderson Rd RTS was taken from Omarunui Landfill disposal records for the periods 18 March - 10 May 2019. These records, which covered eight weeks in total, showed an average of 217 tonnes per week of waste from the transfer station was disposed of at Omarunui Landfill.

During the survey at Henderson Rd RTS, all vehicles disposing of kerbside waste collections were identified and registration details recorded. Using the Henderson Rd RTS weighbridge records, the total tonnage of kerbside collections was calculated. This total was deducted from the tonnage disposed of at Omarunui Landfill to determine the tonnage of general waste disposed of at the transfer station.

### 3.2.1 Activity source of waste loads in overall waste stream

As every vehicle load of waste was unloaded, the surveyor made an assessment of the activity source of the waste load. The proportion of these is shown in Table 3.3. "Kerbside collections" includes Hastings District Council and private kerbside waste collections and Council orange bags dropped off at the resource recovery centre.

**Table 3.3 - Activity sources of waste load entering Henderson Rd RTS -  
18 March - 10 May 2019**

Activity source of waste load	% of loads surveyed	% of total weight	Tonnes/week
Construction & demolition	24%	33%	72 T/week
Industrial/commercial/institutional	19%	26%	57 T/week
Landscaping & earthworks	6%	5%	11 T/week
Residential	49%	20%	43 T/week
<b>Subtotal - General waste</b>	<b>98%</b>	<b>84%</b>	<b>183 T/week</b>
Kerbside collections	2%	16%	34 T/week
Special wastes	0%	0%	0 T/week
Transfer stations	0%	0%	0 T/week
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>217 T/week</b>

C&D waste comprised 33% of the total waste, by weight; ICI waste 26%, and landscaping and earthworks 5%. Residential loads comprised nearly half of all loads (48%), but only represented 20% of the total weight. Kerbside waste collections comprised only 2% of vehicle loads, but represented 16% of all waste, by weight.

### 3.2.2 Primary composition of general and overall waste streams

The primary compositions of the general waste stream at Henderson Rd RTS, which excludes kerbside collections (both Council and private), and the overall waste stream, which includes kerbside collections, are presented in Table 3.4 below and Figure 3.4 and Figure 3.5 on the following page. The secondary compositions, which include all 25 categories, are given in Appendix 4 in terms of both percentages and tonnes per week. The survey did not include material removed by transfer station staff from waste loads prior to disposal of the waste.

**Table 3.4 - Primary composition of Henderson Rd RTS waste - 18 March - 10 May 2019**

Primary category	General waste (excludes kerbside collections)		Overall waste (includes kerbside collections)	
	% of total	Tonnes per week	% of total	Tonnes per week
Paper	5.7%	10 T/week	6.2%	13 T/week
Plastics	9.8%	18 T/week	10.6%	23 T/week
Organics	10.0%	18 T/week	16.4%	36 T/week
Ferrous metals	4.7%	9 T/week	4.3%	9 T/week
Non-ferrous metals	0.4%	0.8 T/week	0.5%	1.1 T/week
Glass	2.0%	4 T/week	2.1%	4 T/week
Textiles	11.4%	21 T/week	10.2%	22 T/week
Sanitary paper	1.6%	3 T/week	3.6%	8 T/week
Rubble	12.9%	24 T/week	11.0%	24 T/week
Timber	39.9%	73 T/week	33.8%	73 T/week
Rubber	1.1%	2.1 T/week	1.0%	2.1 T/week
Potentially hazardous	0.3%	0.6 T/week	0.4%	0.9 T/week
<b>TOTAL</b>	<b>100.0%</b>	<b>183 T/week</b>	<b>100.0%</b>	<b>217 T/week</b>

Timber was the largest component of both the general waste stream and the overall waste stream, comprising 39.9% of the former and 33.8% of the latter. Rubble was the second largest component of general waste, comprising 12.9% of the general waste stream. Organic material was the second largest component of the overall waste stream, comprising 16.4% of the total weight.



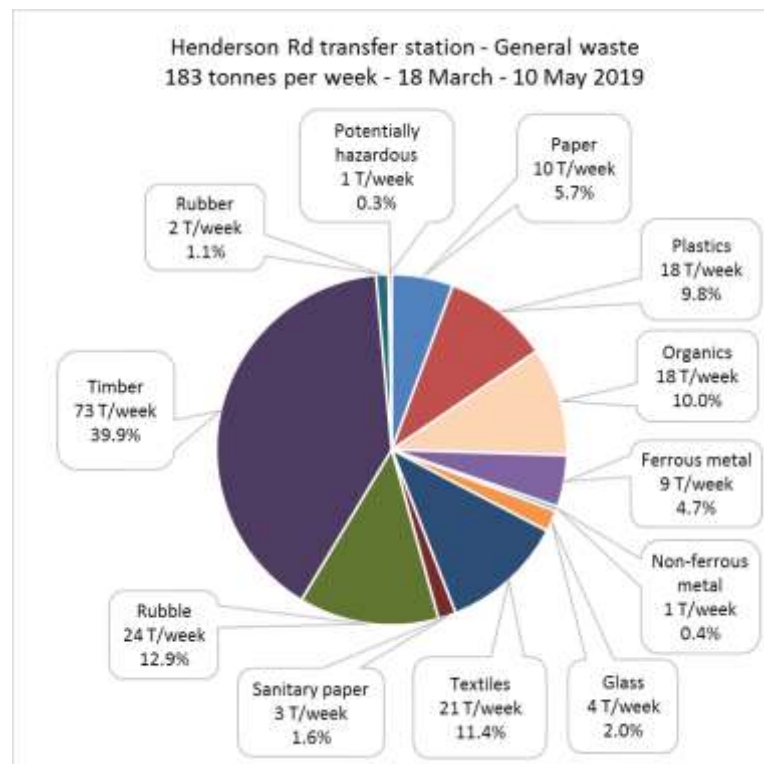


Figure 3.4 - Primary composition of Henderson Rd RTS general waste - 18 March - 10 May 2019

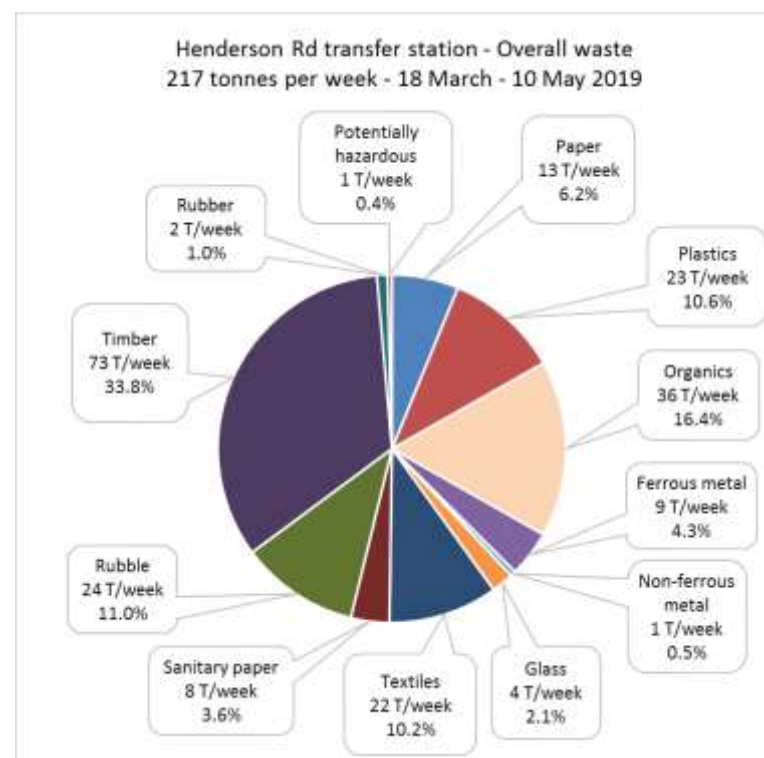


Figure 3.5 - Primary composition of Henderson Rd RTS overall waste - 18 March - 10 May 2019

### 3.2.3 Primary composition - by activity source of waste load

The compositions of the four activity sources of waste loads that make up the general waste stream are shown in Table 3.5. Secondary compositions, including tonnes per week, are given in Appendix 4.

**Table 3.5 - Composition of Henderson Rd RTS general waste -  
By activity source of waste load - 18 March - 10 May 2019**

Primary category	C&D	ICI	Landscaping	Residential
Paper	2.5%	9.3%	1.1%	7.4%
Plastics	1.9%	20.1%	12.0%	9.0%
Organics	0.8%	15.1%	37.7%	11.5%
Ferrous metals	1.7%	3.1%	0.7%	13.0%
Non-ferrous metals	0.1%	0.6%	0.0%	0.7%
Glass	0.7%	3.3%	0.0%	3.0%
Textiles	2.1%	19.2%	1.8%	19.0%
Sanitary paper	0.0%	4.2%	0.0%	1.4%
Rubble	21.4%	5.6%	35.5%	2.7%
Timber	66.7%	18.5%	11.1%	31.3%
Rubber	2.2%	0.4%	0.0%	0.7%
Potentially hazardous	0.0%	0.7%	0.0%	0.3%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

### 3.2.4 Overall waste stream - by vehicle type

Table 3.6 shows the percentage of loads transported by each of the seven vehicle types described in section 2.2.3, the percentage of total weight carried by each vehicle type, and the tonnes per week for each. The tonnes per week for compactors, front-loaders and gantry trucks have been taken directly from the weighbridge records. The tonnes per week for cars, other trucks, and trailers are based on the survey results.

**Table 3.6 - Henderson Rd RTS overall waste - by vehicle type - 18 March - 10 May 2019**

Vehicle type	% of loads surveyed	% of weight	Tonnes/week
Cars	29%	7%	15 T/week
Compactors	2%	15%	33 T/week
Front loader	1%	3%	7 T/week
Gantry	9%	20%	44 T/week
Hook truck	0%	0%	0 T/week
Other truck	4%	9%	19 T/week
Trailer	55%	45%	98 T/week
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>217 T/week</b>

While 29% of all loads were car-sized, these loads represented only 7% of the total weight of waste. Fifty-five percent of the loads surveyed were trailer-sized loads, and these loads represented 45% of the total weight. Kerbside compactors transported 15% of the total weight, but represented only 2% of the loads surveyed.

### 3.2.5 Primary composition by vehicle type

The compositions of the four main vehicle types (front-loaders are excluded) transporting general waste are shown in Table 3.7. Secondary compositions are given in Appendix 4. The analysis does not include kerbside waste compactors.

**Table 3.7 - Primary composition of Henderson Rd RTS general waste -  
By vehicle type - 18 March - 10 May 2019**

Primary category	Cars	Gantry trucks	Other trucks	Trailers
Paper	10.4%	4.5%	3.0%	4.9%
Plastics	10.7%	11.2%	8.3%	6.6%
Organics	23.5%	9.0%	2.3%	8.3%
Ferrous metals	7.6%	3.7%	3.6%	5.5%
Non-ferrous metals	1.3%	0.1%	0.1%	0.4%
Glass	4.0%	0.5%	0.4%	2.5%
Textiles	13.2%	4.7%	46.1%	9.4%
Sanitary paper	3.8%	0.3%	2.9%	0.4%
Rubble	4.2%	11.7%	13.0%	16.8%
Timber	19.8%	51.2%	20.2%	44.9%
Rubber	0.8%	2.9%	0.1%	0.2%
Potentially hazardous	0.5%	0.1%	0.0%	0.1%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
<b>WT/WEEK</b>	<b>15 T/week</b>	<b>44 T/week</b>	<b>19 T/week</b>	<b>98 T/week</b>

### 3.2.6 Diversion potential

A range of materials are commonly separated and recovered at transfer stations. Systems have been established at Henderson Rd RTS for the separation and recovery of many of these recyclable and compostable materials. The facility has separate drop-off points for greenwaste, scrap metals, hardfill, and other recoverable materials. Staff also manually separate recoverable materials, mainly scrap metal, from the tipping floor.

Table 3.8 shows the proportion of the general waste entering Henderson Rd RTS that could potentially be diverted from landfill disposal using existing systems or systems that could potentially be established. Kerbside waste collections are not included in the general waste stream.

The listed materials include food waste (which is present in ICI and residential waste). BioRich Composting Ltd is able to process food waste and is actively looking to attract this material. New plasterboard is also able to be composted, although this is limited to commercial users at Bio Rich. Untreated/unpainted timber can be used for hog fuel at Pan Pac.

**Table 3.8 - Diversion potential of Henderson Rd RTS general waste - 18 March - 10 May 2019**

Recyclable and recoverable materials	% of total	Tonnes per week
Paper - Recyclable	1.5%	3 T/week
Paper - Cardboard	3.4%	6 T/week
Plastic - Recyclable	0.3%	1 T/week
Ferrous metals	4.7%	9 T/week
Non-ferrous metals	0.4%	1 T/week
Glass - Recyclable	0.5%	1 T/week
Textiles - Clothing	1.5%	3 T/week
Rubble - Cleanfill	2.4%	4 T/week
Timber - Reusable	1.7%	3 T/week
<b>Subtotal</b>	<b>16.6%</b>	<b>30 T/week</b>
<b>Compostable materials</b>		
Kitchen waste	4.5%	8 T/week
Compostable greenwaste	4.4%	8 T/week
New plasterboard	1.9%	3 T/week
Untreated/unpainted timber	9.4%	17 T/week
<b>Subtotal</b>	<b>20.2%</b>	<b>37 T/week</b>
<b>TOTAL - Potentially divertable</b>	<b>36.7%</b>	<b>67 T/week</b>

Overall, approximately 36.7% of the general waste stream entering Henderson Rd RTS could have been diverted from landfill disposal. The largest single divertable component was untreated/unpainted timber, which comprised 9.4% of the general waste stream.

## 4 Napier City waste streams

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### 4.1 Napier domestic kerbside rubbish bag collection

#### 4.1.1 Sampling schedule

The sample of Napier domestic kerbside rubbish bags comprised 150 bags collected from 150 households. When the sample was being collected, the number of bags set out by each household was recorded. The sample was collected from Wednesday 10 April to Tuesday 16 April 2019 from the streets shown in Appendix 1.

Only dwellings to which a distinct quantity of rubbish bags could be attributed were chosen for the sample collection. Rubbish bags were not taken, for example, from beside shared driveways or from multi-unit dwellings as it may have represented the waste output of several households.

#### 4.1.2 Primary composition of Napier domestic kerbside rubbish bags

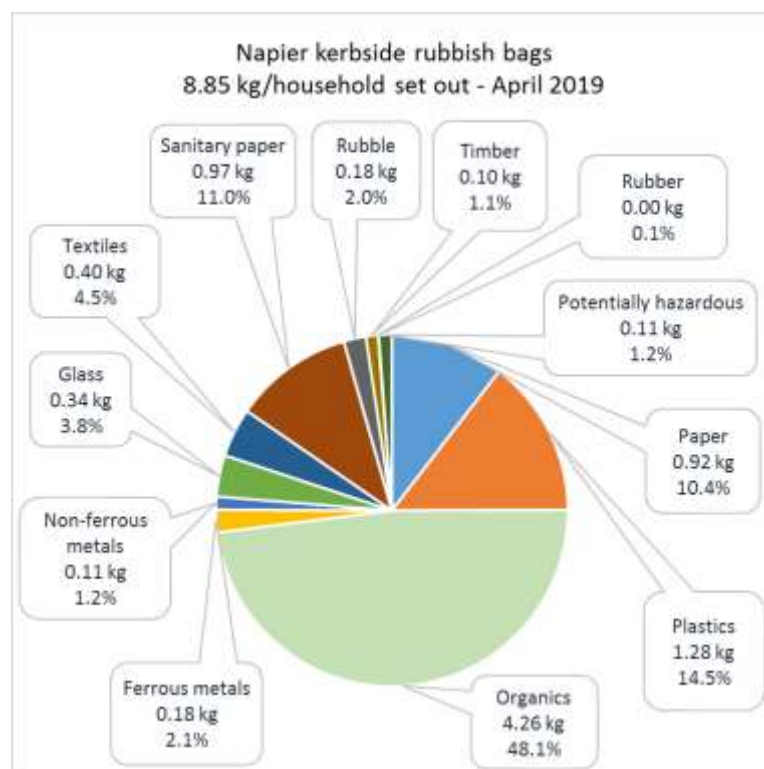
The primary composition of Napier domestic kerbside rubbish bags is presented in Table 4.1 and Figure 4.1 on the following page. The secondary composition, which includes all 25 categories, is given in Appendix 3.

The mean weight per household set out of 8.85 kg in the table has been calculated by combining the average rubbish bag weight (5.70 kg) with the average number of bags set out per household (1.55 bags). The average set out weight of domestic kerbside waste is related to the frequency with which households put waste out for collection. As not all households put kerbside waste out every week, the average household set out weight can not be regarded as equivalent to an average weekly waste generation.

**Table 4.1 - Primary composition of Napier domestic kerbside rubbish bags - April 2019**

<b>Napier kerbside rubbish bags - April 2019</b> (margins of error for 95% confidence level)	<b>Proportion of total</b>	<b>Mean wt. per bag</b>	<b>Mean wt. per household set out</b>
<b>Paper</b>	10.4% ( $\pm 2.2\%$ )	0.60 kg ( $\pm 0.12$ kg)	0.92 kg ( $\pm 0.19$ kg)
<b>Plastics</b>	14.5% ( $\pm 1.4\%$ )	0.83 kg ( $\pm 0.08$ kg)	1.28 kg ( $\pm 0.12$ kg)
<b>Organics</b>	48.1% ( $\pm 5.1\%$ )	2.74 kg ( $\pm 0.29$ kg)	4.26 kg ( $\pm 0.45$ kg)
<b>Ferrous metals</b>	2.1% ( $\pm 0.9\%$ )	0.12 kg ( $\pm 0.05$ kg)	0.18 kg ( $\pm 0.08$ kg)
<b>Non-ferrous metals</b>	1.2% ( $\pm 0.5\%$ )	0.07 kg ( $\pm 0.03$ kg)	0.11 kg ( $\pm 0.04$ kg)
<b>Glass</b>	3.8% ( $\pm 1.5\%$ )	0.22 kg ( $\pm 0.09$ kg)	0.34 kg ( $\pm 0.13$ kg)
<b>Textiles</b>	4.5% ( $\pm 1.5\%$ )	0.26 kg ( $\pm 0.08$ kg)	0.40 kg ( $\pm 0.13$ kg)
<b>Sanitary paper</b>	11.0% ( $\pm 3.3\%$ )	0.63 kg ( $\pm 0.19$ kg)	0.97 kg ( $\pm 0.29$ kg)
<b>Rubble</b>	2.0% ( $\pm 1.7\%$ )	0.12 kg ( $\pm 0.10$ kg)	0.18 kg ( $\pm 0.15$ kg)
<b>Timber</b>	1.1% ( $\pm 0.8\%$ )	0.06 kg ( $\pm 0.05$ kg)	0.10 kg ( $\pm 0.07$ kg)
<b>Rubber</b>	0.1% ( $\pm 0.0\%$ )	0.00 kg ( $\pm 0.00$ kg)	0.00 kg ( $\pm 0.00$ kg)
<b>Potentially hazardous</b>	1.2% ( $\pm 0.7\%$ )	0.07 kg ( $\pm 0.04$ kg)	0.11 kg ( $\pm 0.06$ kg)
<b>TOTAL</b>	<b>100.0%</b>	<b>5.70 kg (<math>\pm 0.35</math> kg)</b>	<b>8.85 kg (<math>\pm 0.55</math> kg)</b>

Organic material, primarily kitchen waste, was the largest single component of the domestic rubbish bag, comprising 48.1% of the total weight. Plastic was the second largest component, 14.5%, and Sanitary paper, 11.0%, was the third largest component.


**Figure 4.1 - Primary composition of Napier kerbside rubbish bags - April 2019**



#### 4.1.3 Distribution of kerbside rubbish bag weights

The average Napier domestic rubbish bag weight was 5.70 kg ( $\pm 0.35$  kg at the 95% confidence interval). The distribution of the bag weights is shown in Figure 4.2 below.

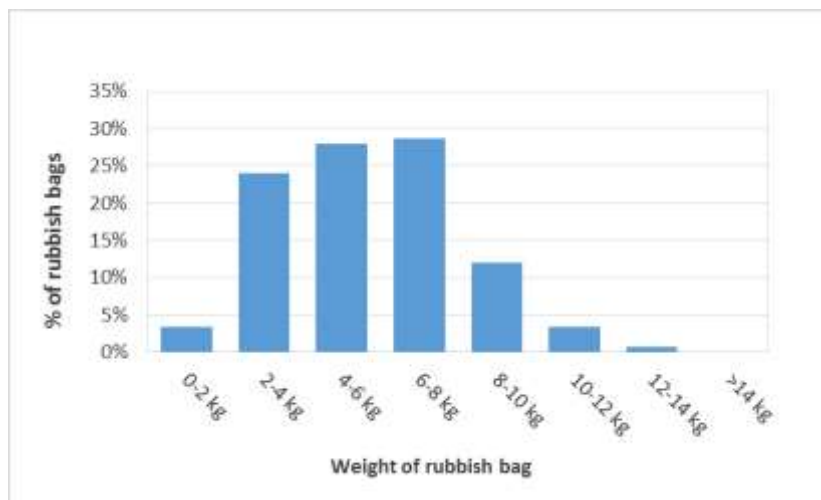


Figure 4.2 - Distribution of weights of Napier kerbside rubbish bags - April 2019

Over 80% of all bags weighed between 2 and 8 kg. Approximately 4% of bags weighed over the official limit of 10 kg.

#### 4.1.4 Distribution of kerbside rubbish bag set outs

The sample of domestic rubbish bags was collected from 150 households, and the total number of bags set out by each household was recorded. The average household bag set out was 1.55 bags. Figure 4.3 below shows the distribution of the bag set outs.

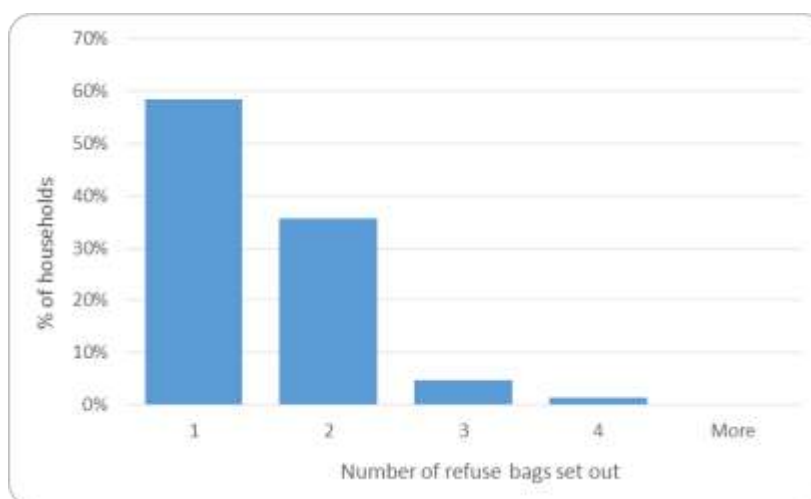


Figure 4.3 - Distribution of bag set out of Napier kerbside rubbish bags - April 2019

Nearly sixty percent of all households set out a single rubbish bag. Seven percent of households set out more than the official maximum of two bags.

#### 4.1.5 Diversion potential of Napier domestic rubbish bags

Common means used by local government to divert domestic kerbside waste from landfill disposal are by providing systems for the collection of recyclable and compostable materials. Napier City Council provides a kerbside recycling service to households in the district. While there is no Council-provided kerbside organics collection, private greenwaste collections are available and kitchen waste and garden waste can be composted by residents.

Table 4.2 shows the proportion of Napier domestic rubbish bags that could have been diverted using these methods. The table also shows the weight of materials per average household set out that could have been diverted.

**Table 4.2 - Diversion potential of Napier kerbside rubbish bags - April 2019**

Kerbside recyclable materials	% of total	Kg household set out
<b>Paper - Recyclable</b>	8.3%	0.73 kg
<b># 1-2 bottles</b>	1.5%	0.13 kg
<b>#1-2 trays &amp; punnets</b>	1.1%	0.10 kg
<b>Ferrous metals - Steel cans</b>	1.1%	0.10 kg
<b>Non-ferrous metals - Aluminium cans</b>	0.5%	0.04 kg
<b>Glass - Bottles/jars</b>	3.1%	0.27 kg
<b>Subtotal</b>	<b>15.6%</b>	<b>1.38 kg</b>
<b>Compostable materials</b>		
<b>Organics - Kitchen waste</b>	41.8%	3.70 kg
<b>Organics - Green waste</b>	3.5%	0.31 kg
<b>Subtotal</b>	<b>45.3%</b>	<b>4.01 kg</b>
<b>TOTAL - Potentially divertable</b>	<b>60.9%</b>	<b>5.39 kg</b>

Of the materials in Napier kerbside rubbish bags, 15.6% could have been recycled through the existing kerbside recycling collection. Paper comprised 53% of the recyclable materials. A further 45.3% of the rubbish bags could have been composted. In total, 60.9% of Napier kerbside rubbish bags, by weight, could have been diverted from landfill disposal by either recycling or composting. This equates to 5.39 kg per average household set out.

Other materials, such as clothing and other metals, are also recoverable, but have not been included in these calculations.

## 4.2 Redclyffe Refuse Transfer Station

Redclyffe Refuse Transfer Station was surveyed on Tuesday 26 March, Thursday 28 March, Saturday 30 March, and Monday 6 May 2019. During this period, data were collected on 269 vehicle loads of waste. The data from these vehicle loads were used to determine the composition of the overall waste disposed of at the facility. As no kerbside waste compactors disposed of waste at the facility during the survey and as the proportion of Napier City Council's rural kerbside collections disposed of at the facility is small (2% of the total weight), a separate breakdown of the 'general' waste stream (i.e. excluding kerbside collections) is not presented. A single kerbside compactor was also recorded during the survey.

Average tonnage of waste to landfill from Redclyffe RTS was determined to be 160 tonnes/week, based on Omarunui Landfill disposal records for the period 18 March - 10 May 2019.

### 4.2.1 Activity sources of waste loads in overall waste stream

As every vehicle load of waste was unloaded, the surveyor assessed and recorded the activity source of the waste load. The proportion of these is shown in Table 4.3.

**Table 4.3 - Activity sources of waste loads entering Redclyffe RTS - 18 March - 10 May 2019**

Activity source of waste load	% of loads surveyed	% of total weight	Tonnes/week
Construction & demolition	22%	34%	55 T/week
Industrial/commercial/institutional	14%	26%	42 T/week
Landscaping & earthworks	6%	6%	9 T/week
Residential	58%	30%	48 T/week
<b>Subtotal - General waste</b>	<b>100%</b>	<b>96%</b>	<b>154 T/week</b>
Kerbside collections	0%	4%	6 T/week
Special wastes	0%	0%	0 T/week
Transfer stations	0%	0%	0 T/week
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>160 T/week</b>

C&D waste comprised 34% of the total weight of waste. Residential waste represented 30% of the total weight of waste and industrial/commercial/institutional loads comprised 26%. Landscaping represented 6% of the total weight of waste.

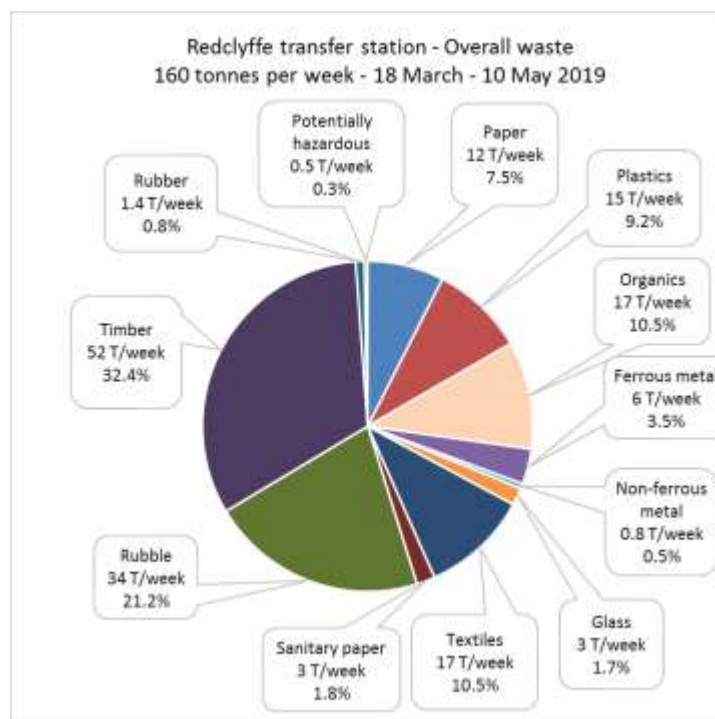
Kerbside collections, which includes rural refuse collected by Council, comprised 4% of the total weight of waste.

#### 4.2.2 Primary composition of overall waste stream

The primary composition of the 160 tonnes/week overall waste stream entering Redclyffe RTS, by proportion of total and tonnes per week, is presented in Table 4.4 and Figure 4.4 below. The secondary composition, which includes all 25 categories, is given in Appendix 5. The survey does not include material removed from the tipping floor by transfer station staff.

**Table 4.4 - Primary composition of overall Redclyffe RTS waste - 18 March - 10 May 2019**

Primary category	% of total	Tonnes per week
Paper	7.5%	12 T/week
Plastics	9.2%	15 T/week
Organics	10.5%	17 T/week
Ferrous metals	3.5%	6 T/week
Non-ferrous metals	0.5%	0.8 T/week
Glass	1.7%	3 T/week
Textiles	10.5%	17 T/week
Sanitary paper	1.8%	3 T/week
Rubble	21.2%	34 T/week
Timber	32.4%	52 T/week
Rubber	0.8%	1.4 T/week
Potentially hazardous	0.3%	0.5 T/week
<b>TOTAL</b>	<b>100.0%</b>	<b>160 T/week</b>



**Figure 4.4 - Primary composition of overall Redclyffe RTS waste - 18 March - 10 May 2019**

Timber was the largest primary component of waste entering the Redclyffe RTS, comprising 32.4% of the total weight. Rubble was the second largest component, comprising 21.2%.

#### 4.2.3 Primary composition by activity source of waste load

The primary compositions of the four different activity sources of general waste loads are shown in Table 4.5. Secondary compositions are given in Appendix 5. Kerbside collections are excluded from this analysis.

**Table 4.5 - Primary composition of overall Redclyffe RTS waste -  
By activity source of waste load - 18 March - 10 May 2019**

Primary category	C&D	ICI	Landscaping	Residential
Paper	2.6%	12.9%	2.5%	9.1%
Plastics	3.8%	19.0%	2.0%	7.5%
Organics	2.2%	11.4%	33.5%	10.4%
Ferrous metals	0.8%	5.3%	0.4%	5.7%
Non-ferrous metals	0.2%	0.8%	0.0%	0.5%
Glass	0.3%	2.1%	0.2%	2.9%
Textiles	2.9%	8.5%	1.6%	23.4%
Sanitary paper	0.1%	3.7%	0.3%	1.3%
Rubble	39.6%	13.8%	28.1%	7.7%
Timber	46.9%	20.5%	31.2%	30.3%
Rubber	0.5%	1.3%	0.1%	1.0%
Potentially hazardous	0.1%	0.6%	0.1%	0.3%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

#### 4.2.4 Overall waste stream - by vehicle type

Table 4.6 shows the percentage of loads transported by each of the seven vehicle types described in section 2.2.3, the percentage of total weight carried by each vehicle type, and the tonnes per week. The tonnes per week for compactors, front loaders, and gantries are taken directly from weighbridge records. The weights for the other vehicle types are calculated from the survey results.

**Table 4.6 - Redclyffe RTS overall waste - by vehicle type - 18 March - 10 May 2019**

Vehicle type	% of loads surveyed	% of weight	Tonnes/week
Cars	41%	12%	19 T/week
Compactors	0%	1%	2 T/week
Front loaders	0%	2%	3 T/week
Gantry trucks	5%	21%	33 T/week
Hook trucks	0%	0%	0 T/week
Other trucks	3%	9%	14 T/week
Trailer	51%	55%	88 T/week
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>160 T/week</b>

While 41% of all loads were car-sized, these loads represented only 12% of the total weight of waste. Fifty-one percent of the loads surveyed were trailer-sized loads, and these loads represented 55% of the total weight. Gantry trucks transported 21% of the total weight.

#### 4.2.5 Primary composition by vehicle type

The primary compositions of the four vehicle types surveyed are shown in Table 4.7. Secondary composition is given in Appendix 5. Compactors transporting kerbside collections and litter and front-loaders are excluded from this analysis.

**Table 4.7 - Primary composition of overall Redclyffe RTS waste -  
By vehicle type - 18 March - 10 May 2019**

Primary category	Cars	Gantry trucks	Other trucks	Trailers
Paper	14.8%	3.9%	5.9%	5.8%
Plastics	10.9%	5.1%	3.9%	9.0%
Organics	18.7%	11.1%	3.4%	6.1%
Ferrous metals	7.4%	3.6%	2.0%	2.8%
Non-ferrous metals	0.8%	0.2%	0.0%	0.5%
Glass	3.4%	0.6%	0.0%	1.7%
Textiles	11.5%	12.0%	9.9%	10.8%
Sanitary paper	3.1%	0.6%	0.0%	0.7%
Rubble	7.0%	38.2%	30.9%	18.5%
Timber	19.9%	23.9%	41.7%	43.7%
Rubber	2.2%	0.5%	2.4%	0.3%
Potentially hazardous	0.5%	0.3%	0.0%	0.1%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
<b>WT/WEEK</b>	<b>19 T/week</b>	<b>33 T/week</b>	<b>14 T/week</b>	<b>88 T/week</b>

#### 4.2.6 Diversion potential

A range of materials are commonly separated and recovered at disposal facilities. Systems have been established at Redclyffe RTS for the separation and recovery of many of these recyclable and compostable materials. The facility has separate drop-off points for greenwaste, scrap metals, hardfill, and other recoverable materials. Staff also manually separate recoverable materials, mainly scrap metal, from the tipping floor.

Table 4.8 shows the proportion of waste disposed of at Redclyffe RTS that could potentially be diverted from landfill disposal using existing systems or systems that could potentially be established.

The listed materials include food waste (which is present in ICI and residential waste). BioRich Composting Ltd is able to process food waste and is actively looking to attract this material. New plasterboard is also able to be composted, although this may not currently be done in the region. Untreated/unpainted timber can be used for hog fuel at Pan Pac.



**Table 4.8 - Diversion potential of Redclyffe RTS general waste - 18 March - 10 May 2019**

Recyclable and recoverable materials	% of total	Tonnes per week
Paper - Recyclable	2.2%	4 T/week
Paper - Cardboard	4.4%	7 T/week
Plastic - Recyclable	0.3%	0 T/week
Ferrous metals	3.5%	6 T/week
Non-ferrous metals	0.5%	1 T/week
Glass - Recyclable	0.5%	1 T/week
Textiles - Clothing	2.1%	3 T/week
Rubble - Cleanfill	5.3%	9 T/week
Timber - Reusable	1.3%	2 T/week
<b>Subtotal</b>	<b>20.1%</b>	<b>32 T/week</b>
<b>Compostable materials</b>		
Kitchen waste	4.6%	7 T/week
Compostable greenwaste	4.4%	7 T/week
New plasterboard	1.4%	2 T/week
Untreated/unpainted timber	6.5%	10 T/week
<b>Subtotal</b>	<b>16.9%</b>	<b>27 T/week</b>
<b>TOTAL - Potentially divertable</b>	<b>37.0%</b>	<b>59 T/week</b>

Approximately 37.0% the overall waste stream disposed of at Redclyffe RTS could have been diverted from landfill disposal. The largest single divertable component was untreated/unpainted timber, which comprised 6.5% of the overall waste stream.

## 5 240-litre MGB domestic kerbside waste

### 5.1 Sampling schedule

The sample of MGB domestic kerbside waste comprised the contents of 54 Waste Management NZ Ltd and Bay Environmental 240-litre MGBs. As the uptake of subscription MGB services is higher in Hastings than Napier, on four of the five days the sample was collected primarily from the same streets in Hastings from which the kerbside rubbish bag samples were taken. Approximately 25% of the MGB sample was collected from Napier.

Permission to sample the MGBs was obtained from Waste Management and Bay Environmental before the sampling. An explanatory note was left in the letterbox of every property from which an MGB was sampled. The contents of the MGBs were tipped into large plastic bags for transport to Omarunui Landfill for sorting.

### 5.2 Primary composition

The primary composition of domestic kerbside waste from 240-litre MGBs is presented in Table 5.1 and Figure 5.1 on the following page. The secondary composition, which includes all 25 categories, is given in Appendix 6.

**Table 5.1 - Primary composition of 240-litre MGB domestic kerbside waste**

<b>Primary category</b> (margins of error for 95% confidence level)	<b>Proportion of total</b>	<b>Mean wt. per MGB</b>
<b>Paper</b>	7.1% (±1.9%)	1.78 kg (±0.47 kg)
<b>Plastics</b>	8.0% (±1.6%)	2.01 kg (±0.40 kg)
<b>Organics</b>	56.9% (±11.2%)	14.29 kg (±2.82 kg)
<b>Ferrous metals</b>	1.9% (±1.5%)	0.48 kg (±0.37 kg)
<b>Non-ferrous metals</b>	0.7% (±0.3%)	0.17 kg (±0.07 kg)
<b>Glass</b>	7.9% (±6.1%)	1.98 kg (±1.54 kg)
<b>Textiles</b>	1.5% (±0.6%)	0.38 kg (±0.16 kg)
<b>Sanitary paper</b>	4.0% (±3.0%)	1.01 kg (±0.75 kg)
<b>Rubble</b>	3.7% (±2.9%)	0.93 kg (±0.73 kg)
<b>Timber</b>	6.1% (±7.9%)	1.52 kg (±1.97 kg)
<b>Rubber</b>	0.1% (±0.0%)	0.01 kg (±0.01 kg)
<b>Potentially hazardous</b>	2.2% (±2.5%)	0.55 kg (±0.62 kg)
<b>TOTAL</b>	<b>100.0%</b>	<b>25.11 kg (±2.89 kg)</b>

Organic material was the largest single component of domestic kerbside waste from 240-litre MGBs, comprising 56.9% of the total weight. Nearly 60% of the organic waste was greenwaste. Plastics was the second largest component, 8.0%, and Glass, 7.9%, was the third largest component. A high proportion of the glass was present in a small number of MGBs.

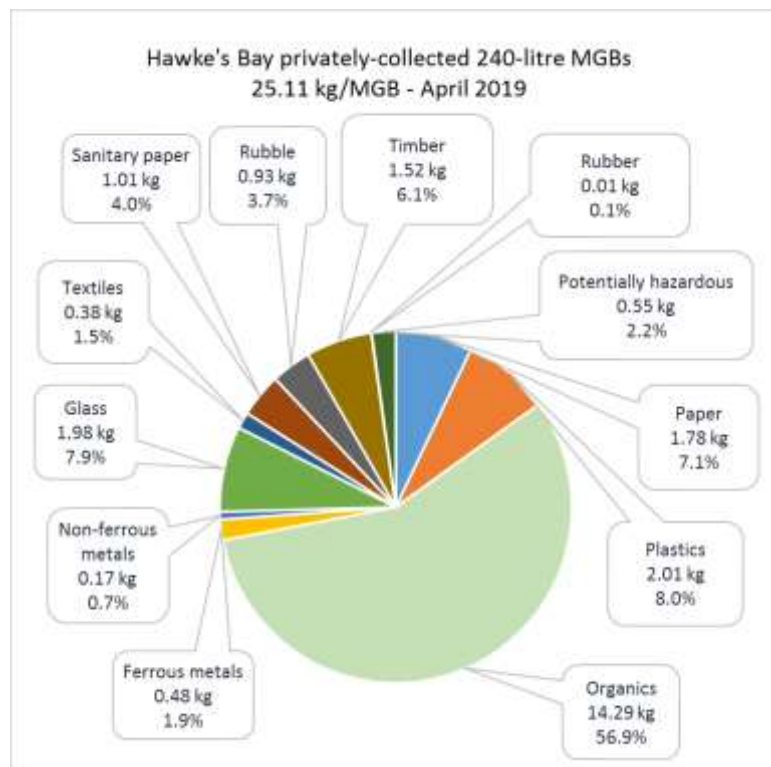


Figure 5.1 - Primary composition of 240-litre MGB domestic kerbside waste

### 5.3 Distribution of 240-litre MGB weights

The average weight of a 240-litre MGB of domestic kerbside waste was 25.11 kg ( $\pm 2.89$  kg at the 95% confidence interval). The lightest bin weighed 4.9 kg and the heaviest 66.00 kg. The distribution of the MGB weights is shown in Figure 5.2 below.

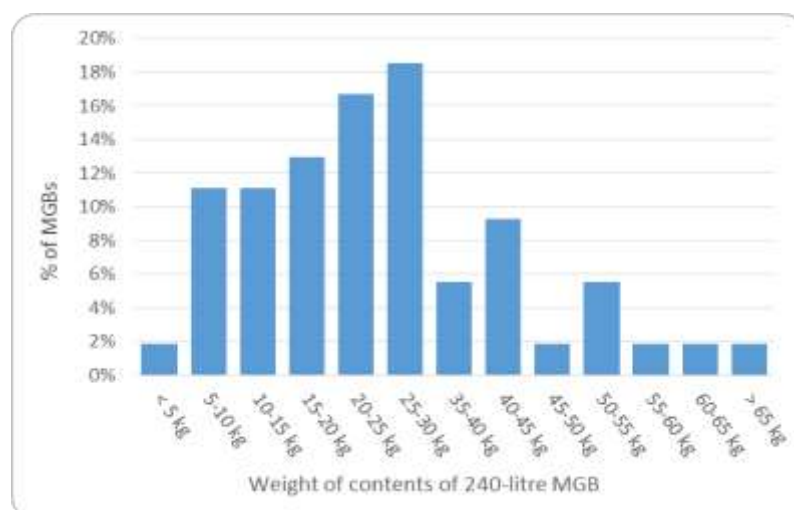


Figure 5.2 - Distribution of weight of 240-litre MGB domestic kerbside waste

Nearly two-thirds of 240-litre MGBs (63.0%) contained more than 20 kg of domestic kerbside waste. Twenty-two percent contained more than 40 kg of waste.

## 5.4 Diversion potential of 240-litre MGB domestic kerbside waste

Common means for local government to divert domestic kerbside waste materials from landfill disposal are by providing systems for the collection of recyclable and compostable materials. Both Napier City and Hastings District Councils provide kerbside recycling services to households. While there is no Council-provided kerbside organics collection, private greenwaste collections are available and kitchen waste and garden waste can be composted by residents. Table 5.2 shows the proportion of the 240-litre MGB domestic kerbside waste that could have been diverted using these methods.

**Table 5.2 - Diversion potential of 240-litre MGB domestic kerbside waste**

Kerbside recyclable materials	% of total	Kg household set out
Paper - Recyclable	5.6%	1.42 kg
# 1-2 bottles	1.2%	0.29 kg
#1-2 trays & punnets	0.5%	0.12 kg
Ferrous metals - Steel cans	0.7%	0.17 kg
Non-ferrous metals - Aluminium cans	0.4%	0.10 kg
Glass - Bottles/jars	4.8%	1.21 kg
<b>Subtotal</b>	<b>13.1%</b>	<b>3.30 kg</b>
<b>Compostable materials</b>	<b>x</b>	<b>x</b>
Organics - Kitchen waste	21.1%	5.31 kg
Organics - Green waste	32.8%	8.23 kg
<b>Subtotal</b>	<b>53.9%</b>	<b>13.54 kg</b>
<b>TOTAL - Potentially divertable</b>	<b>67.0%</b>	<b>16.84 kg</b>

Approximately 13.1% of materials in the 240-litre MGB domestic kerbside waste could have been recycled through an existing kerbside recycling collection. A further 53.9% of the 240-litre MGB domestic kerbside waste could have been composted. In total, 67.0%, of the 240-litre MGB domestic kerbside waste could have been diverted from landfill disposal by either recycling or composting. This equates to 16.84 kg per MGB.

### 5.4.1 Reduction of waste volume in 240-litre MGBs

In the councils' *Joint Waste Management and Minimisation Plan 2018-2024*, there is an action to "Enhance existing Council-provided kerbside rubbish service by: Providing urban households with a weekly-collected 80L wheelie bin for rubbish..". To address concerns that a small MGB would not be adequate for many households' requirements, the contents of a number of 240-litre wheelie bins were tested.

Each day of the audit, one of the largest 240-litre MGBs was chosen for testing. Three of the MGBs weighed over 40 kg. First, the contents were sorted in the usual manner. Then the sorted materials were separated into recyclable, greenwaste, and 'other materials'. Finally, the 'other material's were tested in a 120-litre MGB. In all cases, the 'other materials', i.e. those that could not have been easily diverted by the householder, fit into a 120-litre MGB.

In one instance, force was required to fit the 'other materials' into a 120-litre MGB. In that case the 'other materials' included 20 kg of nappies.

The process is shown in the top two rows of photos below. The MGB was chosen for the photos as it was bulky but contained no greenwaste. The photos in the bottom row illustrate the quantities of greenwaste that can be present in 240-litre MGBs.



Contents of 240-litre MGB



Non-recyclable components of 240-litre MGB



Recyclable components of 240-litre MGB



Non-recyclable components in 120-litre MGB



23 kg of greenwaste in 240-litre MGB



22 kg of greenwaste in 240-litre MGB



## 6 Omarunui Landfill

### 6.1 Sources of levied waste to landfill

Waste entering Omarunui Landfill is composed of waste from three transfer stations (Blackbridge, Henderson Rd, and Redclyffe), Napier City Council kerbside collections, private kerbside collections, a small quantity of Hastings District Council kerbside collections (from coastal communities), and waste transported to landfill by commercial operators. The landfill was surveyed on Wednesday 27 March, Thursday 28 March, and Tuesday 7 May. Data was gathered on 173 loads of waste levy-paid residual waste, 81 of which were general or special waste. The other 92 loads were kerbside waste collections or from transfer stations.

Cover material, which is used to regularly cover the exposed waste face to reduce stormwater infiltration and reduce bird and rodent vectors, is sourced from within the landfill complex. Internally-sourced cover material, upon which the waste levy is not paid, has *not* been included in this analysis.

As the composition of the kerbside waste collections and waste from the two major transfer stations has been determined directly by survey, the following sections initially analyse other waste that is transported directly to landfill. In the final sections, the overall levied waste stream, which includes the kerbside collections and transfer station waste, is analysed. Table 6.1 below and Figure 6.1 on the next page show the proportions of the different waste streams that were disposed of at Omarunui Landfill during the eight-week period 18 March - 10 May for which weighbridge data was analysed.

**Table 6.1 - Source of levied waste to Omarunui Landfill - 18 March - 10 May 2019**

Source	% of total	Tonnes/week
Napier CC kerbside collections	7.3%	128 T/week
Hastings DC kerbside collections (Waimarama only)	0.2%	4 T/week
Private kerbside collections	24.6%	429 T/week
Redclyffe RTS	9.2%	160 T/week
Blackbridge RTS	1.0%	17 T/week
Henderson Rd RTS	12.4%	217 T/week
General direct to landfill	28.8%	503 T/week
Special direct to landfill	16.6%	290 T/week
<b>TOTAL</b>	<b>100.0%</b>	<b>1,748 T/week</b>

During the 2019 survey period (eight weeks of weighbridge records were analysed), an average of 1,748 tonnes of residual waste were disposed of per week at Omarunui Landfill. General waste disposed of directly to landfill was the single largest source of levied waste (503 T/week), comprising 28.8% of the total. Private kerbside collections were the second largest source of waste, representing 24.6% of the total weight. Henderson Road RTS represented 12.4% of the total and Redclyffe RTS represented 9.2% of the total. Special wastes comprised 16.6% of the total waste disposed of directly to landfill.

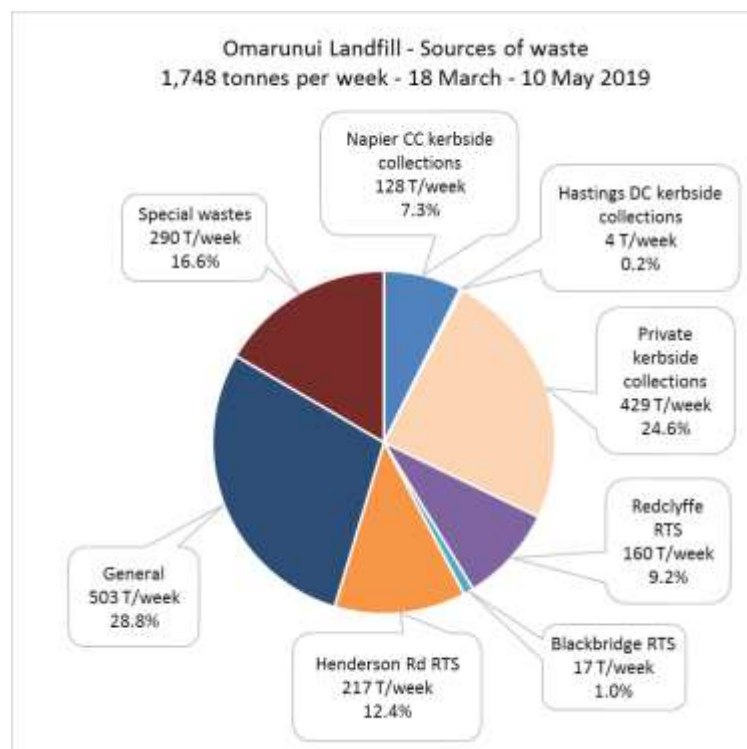


Figure 6.1 - Sources of waste to Omarunui Landfill - 18 March - 10 May 2019

## 6.2 General waste direct to landfill

### 6.2.1 Activity source of general waste

The general waste stream entering Omarunui Landfill excludes kerbside collections (both Councils' and private), special wastes, and transfer station waste. Each load of general waste transported directly to Omarunui Landfill was categorised as one of four different activity sources. The proportions of the four activity sources that comprise the general waste stream are shown in Table 6.2 below.

**Table 6.2 - General waste direct to landfill -  
By activity source of waste load - 18 March - 10 May 2019**

Activity source of general waste	% of loads	% of weight	Tonnes/week
Construction and demolition	19%	12%	62 T/week
Industrial/commercial/institutional	81%	88%	441 T/week
Landscaping	0%	0%	0 T/week
Residential	0%	0%	0 T/week
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>503 T/week</b>

Industrial/commercial/institutional waste comprised 88% by weight of general waste taken directly to landfill. The only other activity source of waste during the survey period was C&D waste, which comprised 12%, by weight, of general waste. There were no landscaping waste loads or loads of residential waste recorded during the survey. The compositions of C&D waste and ICI waste are provided in Appendix 7.

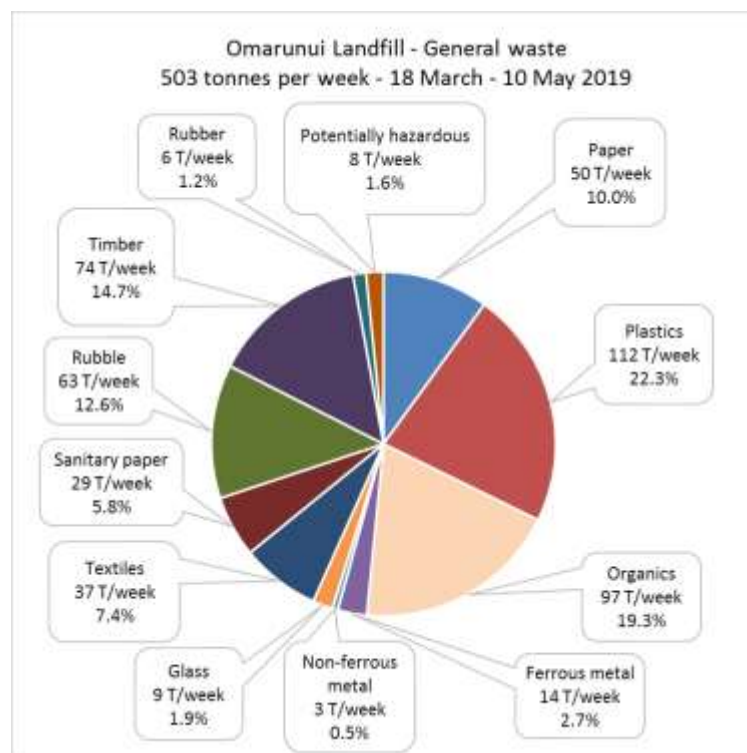


## 6.2.2 Primary composition of general waste direct to landfill

The primary composition of general waste taken directly to Omarunui Landfill is shown in Table 6.3 and Figure 6.2 below. The secondary composition of the general waste is given in Appendix 7.

**Table 6.3 - Primary composition of general waste direct to landfill - 18 March - 10 May 2019**

General waste Direct to landfill	% of total	Tonnes per week
Paper	10.0%	50 T/week
Plastics	22.3%	112 T/week
Organics	19.3%	97 T/week
Ferrous metals	2.7%	14 T/week
Non-ferrous metals	0.5%	3 T/week
Glass	1.9%	9 T/week
Textiles	7.4%	37 T/week
Sanitary paper	5.8%	29 T/week
Rubble	12.6%	63 T/week
Timber	14.7%	74 T/week
Rubber	1.2%	6 T/week
Potentially hazardous	1.6%	8 T/week
<b>TOTAL</b>	<b>100.0%</b>	<b>503 T/week</b>



**Figure 6.2 - Composition of general waste direct to landfill - 18 March - 10 May 2019**

Plastics was the largest component of the general waste stream to landfill, comprising 22.3% of the total. Organic material was the second largest component, comprising 19.3% of the total weight.

### 6.3 Special wastes

Special wastes comprised those in the following weighbridge material classifications:

- Asbestos
- Chemicals & Baits
- Chrome Waste (tannery waste)
- Food Waste (mainly canned food from a cannery)
- HDC Animal Disposal
- HDC Milliscreen
- HDC Road Sweepings
- NCC Animal Disposal
- NCC Milliscreen
- Road Sweepings
- Special Waste
- Spoil - Contaminated Soil

Based on an assumed, homogeneous composition for each of these materials classifications, the primary composition has been calculated as shown in Table 6.4.

**Table 6.4 - Primary composition of special waste direct to landfill - 18 March - 10 May 2019**

Special waste to landfill	% of total	Tonnes per week
Paper	0%	0 T/week
Plastics	0%	0 T/week
Organics	17%	50 T/week
Ferrous metals	0%	0 T/week
Non-ferrous metals	0%	0 T/week
Glass	0%	0 T/week
Textiles	0%	0 T/week
Sanitary paper	0%	0 T/week
Rubble	0%	0 T/week
Timber	0%	0 T/week
Rubber	0%	0 T/week
Potentially hazardous	83%	240 T/week
<b>TOTAL</b>	<b>100%</b>	<b>290 T/week</b>

Special wastes comprised 16.6% (290 tonnes/week) of the overall waste stream disposed of at Omarunui Landfill during the eight-week period analysed. Potentially hazardous materials comprised 83% of the special wastes and organic material, primarily from food processing, the other 17%. These proportions may change on a seasonal basis and other factors, such as the clearing of contaminated sites, also affect the composition.

## 6.4 Overall waste stream to landfill

The composition of the overall waste stream is based on the proportions of the different waste streams given in Table 6.1. The composition for each waste source is combined in the proportions shown in that table. The following assumptions were made for the calculations:

- The annual tonnage to 31 May 2019 of all levied waste disposed of at Omarunui Landfill was 88,273 tonnes, based on weighbridge data provided by Hastings District Council.
- Domestic kerbside waste in 240-litre MGBs has the composition given in Appendix 6
- Domestic kerbside waste from other sizes of MGBs has the same composition as Napier Council domestic kerbside rubbish bags.
- Blackbridge RTS waste composition is the same as general waste from Henderson Rd RTS.

Based on these assumptions, the primary composition of the overall waste stream to Omarunui Landfill is presented in Table 6.5 below. The secondary composition is given in Appendix 7.

Based on information provided by the councils, Omarunui Landfill accepted 89,455 tonnes of levied waste for the one-year period 1 July 2018 to 30 June 2019. In Table 6.5, the composition from the SWAP survey has been applied to this tonnage. The reliability of this extrapolation is uncertain, however, as it does not take seasonal variations in waste composition into account. The extrapolated results should be considered to be of an indicative nature only.

**Table 6.5 - Primary composition of overall waste to Omarunui Landfill -18 March - 10 May 2019**

Overall levied waste to Omarunui Landfill	% of total	Tonnes per week	Tonnes per annum (Indicative only)
Paper	7.0%	123 T/week	6,306 T/annum
Plastics	12.0%	210 T/week	10,745 T/annum
Organics	28.8%	504 T/week	25,771 T/annum
Ferrous metals	2.3%	40 T/week	2,061 T/annum
Non-ferrous metals	0.5%	10 T/week	488 T/annum
Glass	3.0%	53 T/week	2,706 T/annum
Textiles	5.3%	92 T/week	4,732 T/annum
Sanitary paper	4.4%	77 T/week	3,961 T/annum
Rubble	8.0%	140 T/week	7,183 T/annum
Timber	13.1%	228 T/week	11,684 T/annum
Rubber	0.6%	10 T/week	519 T/annum
Potentially hazardous	14.9%	260 T/week	13,299 T/annum
<b>TOTAL</b>	<b>100.0%</b>	<b>1,748 T/week</b>	<b>89,455 T/annum</b>

Organic material was the largest single component of the overall waste stream being disposed of at Omarunui Landfill, comprising 28.8% of the total. Potentially hazardous

material (primarily special wastes) was the second largest component, comprising 14.9% of the total weight. The primary composition is shown in Figure 6.3 below.

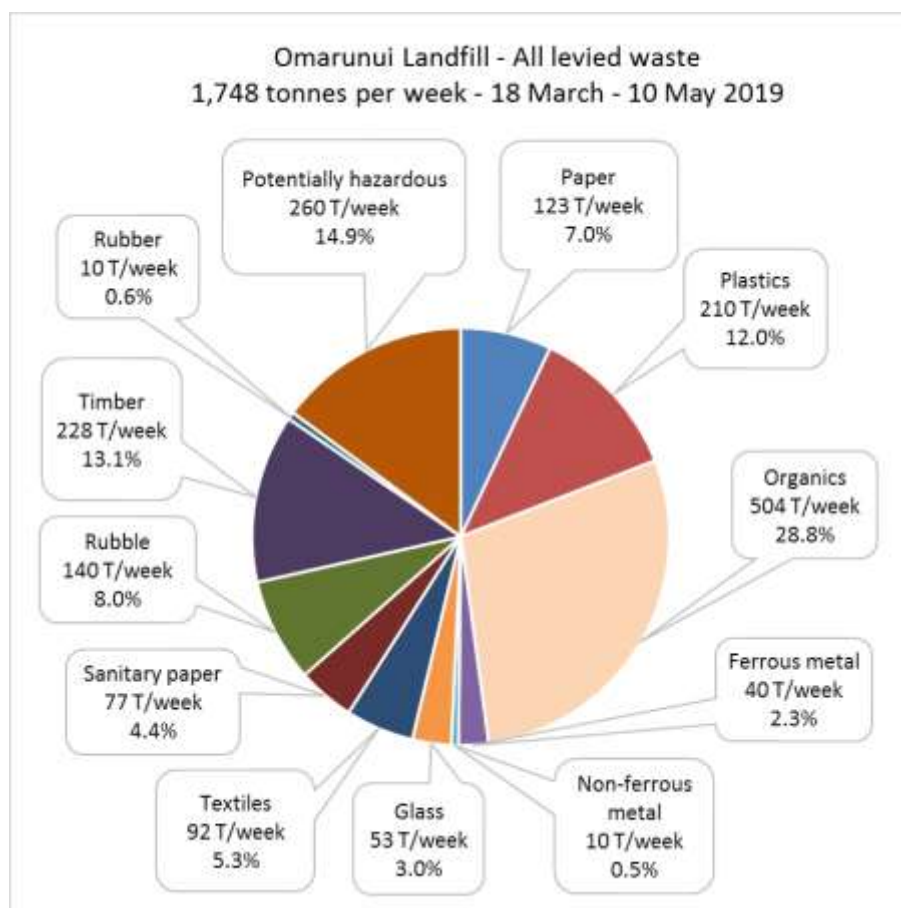


Figure 6.3 - Primary composition of overall waste to Omarunui Landfill - 18 March - 10 May 2019

#### 6.4.1 Diversion potential

There are no facilities for the recovery of materials at Omarunui Landfill. Table 6.6 below shows the theoretical diversion potential of the overall waste stream, based on recovery of the same materials as was assumed for the refuse transfer stations.

**Table 6.6 - Diversion potential of Omarunui overall waste stream - 18 March - 10 May 2019**

Recyclable and recoverable materials	% of total	Tonnes per week
Paper - Recyclable	3.3%	57 T/week
Paper - Cardboard	2.0%	34 T/week
Plastic - Recyclable	1.1%	20 T/week
Ferrous metals	2.3%	40 T/week
Non-ferrous metals	0.5%	10 T/week
Glass - Recyclable	1.7%	29 T/week
Textiles - Clothing	1.3%	22 T/week
Rubble - Cleanfill	1.0%	18 T/week
Timber - Reusable	0.3%	6 T/week
<b>Subtotal</b>	<b>13.5%</b>	<b>236 T/week</b>
<b>Compostable materials</b>		
Kitchen waste	14.7%	256 T/week
Compostable greenwaste	8.0%	139 T/week
New plasterboard	0.4%	6 T/week
Untreated/unpainted timber	3.9%	69 T/week
<b>Subtotal</b>	<b>26.9%</b>	<b>470 T/week</b>
<b>TOTAL - Potentially divertable</b>	<b>40.4%</b>	<b>706 T/week</b>

Approximately 13.5% of levied waste being disposed of at Omarunui Landfill was recyclable and 26.9% was compostable. In total, 40.4% of levied waste could theoretically have been diverted from landfill disposal.

Kitchen waste was the largest divertable component, comprising 14.7% of all levied waste. Over half of the 256 tonnes per week of kitchen waste was in kerbside waste.

Compostable greenwaste was the second largest divertable component, comprising 8.0% of all levied waste. Nearly 80% of compostable greenwaste was in kerbside waste.

## 7 Discussion and analysis

### 7.1 Regional waste flows

Using data from the analyses presented in the previous sections, Figure 7.1 shows the major waste flows in Hawke's Bay. The tonnages are based on the survey results and weighbridge records from Omarunui Landfill, Henderson Rd RTS, and Redclyffe RTS for the eight-week period in 18 March - 10 May 2019.

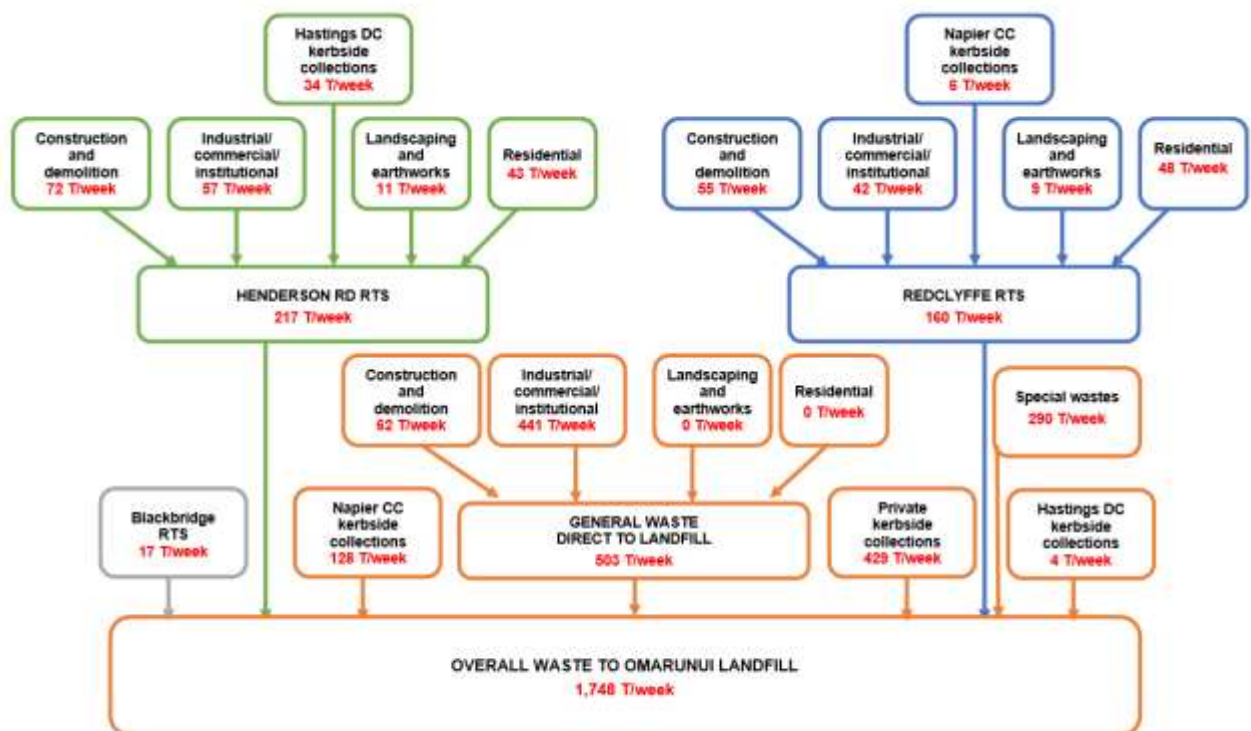


Figure 7.1 - Overall waste flows in Hawke's Bay - 18 March - 10 May 2019

## 7.2 Per capita disposal of kerbside waste

The per capita disposal of kerbside waste (i.e. both MGBs and rubbish bags) for residents of Hastings District and Napier City combined is calculated in Table 7.1 below, using data provided previously in this report. The totals for kerbside waste include both private and Council collections of both domestic and commercial refuse. To provide data that is compatible with the National Waste Data Framework, an estimate is also made of the quantity of kerbside waste that is from domestic, rather than commercial sources. Based on information provided by waste collectors in 2016, it is estimated that 10% of kerbside waste is from commercial properties.

**Table 7.1 - Per capita disposal of kerbside waste**

<b>Combined population Hastings District and Napier City (Stats NZ 2018 estimate)</b>	<b>142,100</b>
Kerbside waste direct to Omarunui Landfill	562 T/week
Kerbside waste direct to Henderson Rd RTS	34 T/week
Rural kerbside waste direct to Redclyffe RTS	6 T/week
<b>Total kerbside waste per week</b>	<b>602 T/week</b>
<b>Total kerbside waste per annum</b>	<b>31,372 tonnes</b>
<b>Per capita disposal of kerbside waste</b>	<b>221 kg/capita/annum</b>
Proportion of kerbside waste from commercial properties	10%
<b>Total <u>domestic</u> kerbside waste per annum</b>	<b>28,234 tonnes</b>
<b>Per capita disposal of <u>domestic</u> kerbside waste</b>	<b>199 kg/capita/annum</b>

By extrapolating the tonnage figures from the survey weighbridge analysis to an annual total, it is calculated that approximately 31,372 tonnes per annum of kerbside waste are disposed of to landfill from Hastings District and Napier City. This equates to 221 kg per person per annum for all kerbside waste, or 199 kg per person per annum for domestic kerbside waste. The figure for all kerbside waste is compared to the disposal rates from other areas previously surveyed by Waste Not Consulting in Table 7.2 below.

**Table 7.2 - Comparison of per capita disposal of kerbside waste**

<b>Domestic and commercial kerbside collections combined</b>	<b>Kg/capita/annum</b>
<b>Christchurch City 2011</b>	110
<b>Auckland Council 2016</b>	156
<b>Tauranga City and Western Bay of Plenty District 2017</b>	178
<b>Dunedin City 2018</b>	187
<b>Hamilton City 2017</b>	197
<b>Wellington region 2014/15</b>	206
<b><i>Hastings District/Napier City 2012</i></b>	<b>214</b>
<b><i>Hastings District/Napier City 2019</i></b>	<b>221</b>
<b><i>Hastings District/Napier City 2016</i></b>	<b>225</b>
<b><i>Hastings District/Napier City 2009</i></b>	<b>227</b>
<b>Taupo District 2017</b>	243



### 7.3 Per capita disposal of levied waste to landfill

The per capita disposal of levied waste to the Omarunui Class 1 landfill by residents of Napier City and Hastings District is calculated as shown in Table 7.3 below. This figure is compared to disposal figures from previous surveys in Hawke's Bay and from other local authorities previously surveyed by Waste Not Consulting in Table 7.4. For practical purposes, the waste levy is paid on all waste included in the annual tonnage.

**Table 7.3 - Per capita disposal of levied waste to landfill**

<b>Combined population Hastings and Napier (Stats NZ 2018 estimate)</b>	<b>142,100</b>
Levied waste to landfill per annum <u>including</u> special waste	89,455 T/annum
<b>Per capita disposal of waste to landfill <u>including</u> special waste</b>	<b>0.630 T/capita/annum</b>
Waste to landfill per annum <u>excluding</u> special waste	76,527 T/annum
<b>Per capita disposal of waste to landfill <u>excluding</u> special waste</b>	<b>0.539 T/capita/annum</b>

**Table 7.4 - Disposal rates compared to other local authorities**

<b>Overall waste to landfill <u>including</u> special wastes (excluding unlevied cover materials)</b>	<b>Tonnes per capita per annum</b>
Gisborne District 2017	0.296
Waimakariri District 2017	0.325
Christchurch City 2012	0.524
Invercargill City 2018	0.528
Tauranga and WBOP District 2016/17	0.543
Palmerston North 2017 (seasonally-adjusted)	0.545
Kāpiti Coast District 2017	0.546
<b>Napier/Hastings 2016</b>	<b>0.548</b>
Dunedin City 2018	0.554
<b>Napier/Hastings 2012</b>	<b>0.590</b>
Wellington region 2016	0.608
<b>Napier/Hastings 2019</b>	<b>0.630</b>
Whangarei District 2017	0.640
<b>Napier/Hastings 2009</b>	<b>0.652</b>
Taupō District 2017	0.673
Hamilton City 2017	0.718
New Zealand (to June 2016) <sup>1</sup>	0.734
<b>Napier/Hastings 2007</b>	<b>0.870</b>
Auckland region 2016	1.053
Queenstown Lakes District 2016	1.103

<sup>1</sup> Ministry for the Environment. 2017. *Review of the Effectiveness of the Waste Disposal Levy 2017*. Wellington: Ministry for the Environment.

The per capita disposal rate for Napier/Hastings decreased between the 2007 and 2016 surveys, then increased to 2019. The earlier decrease was associated with the global financial crisis. Other factors, such as improved resource efficiency, changes in economic activity, and increased resource recovery activity may also have contributed to the decrease in waste to landfill. The increase between 2016 and 2019 is associated specifically with an increase in C&D and special wastes (see Table 7.10) and, overall, with an increase in economic activity.

## 7.4 Precision of rubbish bag audit results

The SWAP defines a precision level of  $\pm 20\%$  as being a “reasonable level of accuracy”. For paper, which comprises in the region of 15% of domestic waste, a precision level of  $\pm 20\%$  at the 95% confidence interval means that the sample average for 95% of samples would lie within about 3% (the margin of error) of the “actual” proportion of paper.

For the audit of Napier and Hastings domestic kerbside rubbish bag, sample sizes smaller than that recommended by the SWAP were used. For the audits, 150 rubbish bags were collected from both Hastings and Napier. For the 240-litre MGB audit, the contents of 54 MGBs were collected.

The precision levels for the primary categories for the three audits are shown in Table 7.5 below. Those levels that are  $\pm 20\%$  or less at the 95% confidence interval are in bold.

**Table 7.5 - Precision level of kerbside waste audit results**

Precision level of kerbside waste audit results	Hastings domestic bags	Napier domestic bags	240-litre MGBs
<b>Paper</b>	<b>19%</b>	<b>20%</b>	27%
<b>Plastics</b>	<b>13%</b>	<b>9%</b>	<b>20%</b>
<b>Organics</b>	<b>10%</b>	<b>11%</b>	<b>20%</b>
<b>Ferrous metals</b>	36%	41%	78%
<b>Non-ferrous metals</b>	30%	41%	41%
<b>Glass</b>	42%	40%	78%
<b>Textiles</b>	36%	32%	42%
<b>Sanitary paper</b>	28%	30%	74%
<b>Rubble</b>	77%	83%	78%
<b>Timber</b>	95%	73%	130%
<b>Rubber</b>	58%	54%	85%
<b>Potentially hazardous</b>	42%	58%	113%

Both the Napier and Hastings domestic rubbish bag audits achieved precision levels of less than  $\pm 20\%$  for the three major primary categories (paper, plastic, and organic waste). Plastics and organics achieved a precision level of less than  $\pm 20\%$  for the 240-litre MGB audit. The reduced precision for the 240-litre MGB audit is associated with the smaller sample.

Given the sample sizes, the precision level of the results are satisfactory. In Waste Not's experience, in an audit of 500 rubbish bags, it is uncommon to obtain “reasonable levels of accuracy” for more than four of the primary categories.

## 7.5 Comparison to previous audit results

In July 2007, November 2009, March 2012, and April 2016, audits of Hastings and Napier waste streams were undertaken by Waste Not Consulting, using methodologies very similar to those used for the 2019 project. Comparisons between the results of the five survey programmes are presented in the following sections.

### 7.5.1 Rubbish bag comparison

In this section, the results of the five rubbish bag audit are compared. In all five surveys, Hastings' kerbside waste collection was based on a user-pays bag system, while the Napier kerbside collection was rates-funded, with households being limited to two bags per week. In Table 7.6, the primary composition of domestic rubbish bags from the five surveys is compared. The mean bag weight from each audit is also shown.

**Table 7.6 - Comparison of domestic kerbside rubbish bag audits**

Comparison of domestic kerbside rubbish bag audits	Hastings					Napier				
	2007	2009	2012	2016	2019	2007	2009	2012	2016	2019
Paper	10.6%	10.8%	10.5%	7.5%	9.1%	14.4%	13.2%	13.3%	12.8%	10.4%
Plastics	12.5%	11.6%	13.5%	12.8%	14.9%	14.4%	12.3%	14.4%	13.2%	14.5%
Organics	51.7%	51.2%	51.3%	52.6%	50.9%	47.7%	44.9%	47.6%	49.3%	48.1%
Ferrous metals	2.2%	1.7%	2.5%	1.4%	1.8%	2.7%	2.4%	2.9%	2.0%	2.1%
Non-ferrous metals	0.5%	0.6%	1.4%	1.8%	0.9%	0.6%	0.6%	1.4%	1.2%	1.2%
Glass	3.4%	3.0%	2.2%	1.3%	2.5%	6.2%	5.7%	5.4%	3.2%	3.8%
Textiles	3.6%	3.4%	3.0%	3.3%	3.6%	2.1%	5.2%	3.2%	5.3%	4.5%
Sanitary paper	14.2%	15.3%	13.2%	16.1%	14.1%	8.8%	11.6%	7.6%	9.5%	11.0%
Rubble	0.5%	0.3%	1.0%	1.8%	0.9%	1.9%	1.3%	1.9%	1.7%	2.0%
Timber	0.0%	0.2%	0.2%	0.5%	0.4%	0.5%	0.5%	0.5%	0.3%	1.1%
Rubber	0.3%	0.1%	0.2%	0.0%	0.1%	0.1%	0.3%	0.2%	0.6%	0.1%
Potentially hazardous	0.6%	1.8%	1.0%	0.9%	1.0%	0.8%	2.1%	1.6%	1.0%	1.2%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Mean bag weight</b>	5.73 kg	5.37 kg	6.04 kg	5.40 kg	4.98 kg	5.85 kg	5.85 kg	5.37 kg	5.81 kg	5.70 kg

The compositions of the two kerbside waste streams have remained relatively constant through the 12-year period during which the audits have been conducted. The relative differences between the Hastings domestic rubbish bag and the Napier domestic rubbish bag have also remained relatively consistent:

- Napier rubbish bags contain a higher proportion of paper, plastics, ferrous metals, glass, rubble, and potentially hazardous materials than Hastings
- Hastings rubbish bags contain a higher proportion of organics and sanitary paper than Napier.

The differences relate to the proportion of materials that are recycled in each area and the demographics of the population (e.g. more sanitary paper is associated with a higher proportion of young children).

### 7.5.2 Activity source of waste loads at Henderson Rd RTS

Table 7.7 compares the activity sources of all waste loads, by tonnes per week, disposed of at Henderson Rd RTS during the five solid waste surveys.

**Table 7.7 - Activity sources of waste loads - Henderson Rd RTS - 2007 - 2019**

Comparison of activity sources of waste loads - Henderson Rd RTS	2007	2009	2012	2016	2019
Construction & demolition	58 T/week	52 T/week	16 T/week	41 T/week	72 T/week
Industrial/commercial/institutional	101 T/week	40 T/week	68 T/week	62 T/week	57 T/week
Kerbside collections	178 T/week	181 T/week	169 T/week	39 T/week	34 T/week
Landscaping & earthworks	37 T/week	29 T/week	9 T/week	9 T/week	11 T/week
Residential	98 T/week	52 T/week	37 T/week	45 T/week	43 T/week
<b>TOTAL</b>	<b>473 T/week</b>	<b>355 T/week</b>	<b>299 T/week</b>	<b>197 T/week</b>	<b>217 T/week</b>

Between 2007 and 2019, the weekly tonnage at Henderson Rd RTS declined from 473 tonnes to 217 tonnes, a decrease of 54%. Most of the decrease is likely to be associated with pricing differentials between the transfer station and Omarunui Landfill, with many commercial waste collectors now transporting waste directly to the landfill. C&D waste increased substantially in 2019 compared to 2016 while ICI waste decreased slightly.

### 7.5.3 Activity source of waste loads at Redclyffe RTS

Table 7.8 compares the activity sources of waste loads, by tonnes per week, disposed of at Redclyffe RTS during the five solid waste surveys.

**Table 7.8 - Activity sources of waste loads - Redclyffe RTS - 2007 - 2019**

Comparison of activity sources of waste loads - Redclyffe RTS	2007	2009	2012	2016	2019
Construction & demolition	112 T/week	67 T/week	48 T/week	43 T/week	55 T/week
Industrial/commercial/institutional	82 T/week	50 T/week	27 T/week	57 T/week	42 T/week
Kerbside collections	0 T/week	16 T/week	3 T/week	3 T/week	6 T/week
Landscaping & earthworks	42 T/week	73 T/week	15 T/week	23 T/week	9 T/week
Residential	54 T/week	63 T/week	44 T/week	39 T/week	48 T/week
<b>TOTAL</b>	<b>291 T/week</b>	<b>269 T/week</b>	<b>136 T/week</b>	<b>164 T/week</b>	<b>160 T/week</b>

Between 2007 and 2019, the weekly tonnage of waste disposed of to landfill from Redclyffe RTS declined from 291 tonnes to 160 tonnes, a decrease of 45%.

As with Henderson Rd RTS, much of the change in tonnages may be associated with pricing differentials between the disposal facilities in the region. Changes in economic activity, particularly construction, will have had some effect on the variation, but the effect of this can not be estimated when looking at each facility individually. As with Henderson Rd RTS, C&D waste increased substantially in 2019 compared to 2016 while ICI waste decreased.

#### 7.5.4 Sources of waste loads at Omarunui Landfill

Table 7.9 compares the sources of waste loads, by tonnes per week, disposed of at Omarunui Landfill during the five surveys.

**Table 7.9 - Sources of waste loads - Omarunui Landfill - 2007 - 2019**

Comparison of sources of waste loads - Omarunui Landfill	2007	2009	2012	2016	2019
Hastings kerbside collections	0 T/week	0 T/week	4 T/week	4 T/week	4 T/week
Napier kerbside collections	175 T/week	134 T/week	131 T/week	135 T/week	128 T/week
Private kerbside collections	163 T/week <sup>(1)</sup>	242 T/week	239 T/week	409 T/week	429 T/week
Subtotal kerbside collections	<b>338 T/week <sup>(1)</sup></b>	<b>376 T/week</b>	<b>374 T/week</b>	<b>549 T/week</b>	<b>562 T/week</b>
Redclyffe RTS	292 T/week	269 T/week	136 T/week	164 T/week	160 T/week
Blackbridge RTS	55 T/week	30 T/week	19 T/week	19 T/week	17 T/week
Henderson Rd RTS	473 T/week	355 T/week	299 T/week	197 T/week	217 T/week
General direct to landfill	646 T/week <sup>(1)</sup>	441 T/week	408 T/week	446 T/week	503 T/week
Special direct to landfill	162 T/week	180 T/week	272 T/week	138 T/week	290 T/week
<b>TOTAL</b>	<b>1,966 T/week</b>	<b>1,651 T/week</b>	<b>1,508 T/week</b>	<b>1,513 T/week</b>	<b>1,748 T/week</b>

(1) Differs from figures in 2007 report

During the 2019 survey period, an average of 1,748 tonnes of waste were disposed of per week at Omarunui Landfill. This was a 16% increase from 2016. Two-thirds of the increase was from special wastes. General waste, the largest single source of waste to landfill, increased by 13% over the 2016. This increase is associated with a period of economic growth in Hawke's Bay.

Kerbside collections taken directly to landfill, which were relatively constant between 2007 and 2012, increased 47% between 2012 and 2016 and then 2% to 2019. The increase between 2012 and 2016 was associated both with a decrease in kerbside collections taken to the Henderson Rd RTS and an increase in the overall quantity of kerbside waste (see Table 7.10).

### 7.5.5 Activity source of waste generated in Hawke's Bay

Table 7.10 compares the activity sources of waste loads, by tonnes per week, disposed of at all three transfer stations and Omarunui Landfill during the five solid waste surveys. As no direct data was available on the small amount disposed of at Blackbridge transfer station, the activity source of waste disposed there has been assumed to be the same as general waste at Henderson Rd RTS..

It should be noted that "Kerbside collections" includes both the Council and private kerbside collections from both residential and commercial properties.

**Table 7.10 - Activity sources of waste loads - all facilities combined**

<b>Comparison of activity sources of waste loads - all facilities combined</b>	<b>2007</b>	<b>2009</b>	<b>2012</b>	<b>2016</b>	<b>2019</b>
<b>Construction &amp; demolition</b>	208 T/week	164 T/week	66 T/week	100 T/week	195 T/week
<b>Industrial/commercial/institutional</b>	808 T/week	506 T/week	496 T/week	565 T/week	545 T/week
<b>Kerbside collections</b>	516 T/week	573 T/week	546 T/week	591 T/week	602 T/week
<b>Landscaping &amp; earthworks</b>	94 T/week	106 T/week	25 T/week	33 T/week	22 T/week
<b>Residential</b>	179 T/week	122 T/week	103 T/week	86 T/week	95 T/week
<b>Special waste</b>	162 T/week	180 T/week	272 T/week	138 T/week	290 T/week
<b>TOTAL</b>	<b>1,966 T/week</b>	<b>1,651 T/week</b>	<b>1,508 T/week</b>	<b>1,513 T/week</b>	<b>1,748 T/week</b>

Between 2007 and 2012, the weekly tonnage of C&D waste decreased but then increased in 2016 and again in 2019. The marked decrease in 2012 could be associated with a slowdown in construction activity following the global financial crisis of 2008. C&D waste increased 95% between 2016 and 2019.

ICI waste followed a similar pattern, with the 2016 tonnage being the highest since 2007, but then decreased marginally between 2016 and 2019.

The sharp reduction in landscaping waste over the nine-year period is likely to be associated with improved greenwaste recovery efforts at the transfer stations and the increase in waste disposal charges. The quantity of landscaping waste can also be influenced by weather conditions during the survey period.

## Appendix 1 - Kerbside waste sampling schedule

### Streets sampled for Hastings District kerbside waste audit - 2019

Date	Street	Suburb	Date	Street	Suburb
10/4/19	Read Cres	Clive	12/04/19	Lipscombe Cres	Havelock Nth
10/4/19	Mill Road	Clive	15/04/19	Henderson Road	Flaxmere
10/4/19	Main Rd	Clive	15/04/19	Dover Road	Flaxmere
10/4/19	Tucker Lane	Clive	15/04/19	Chatham Mews	Flaxmere
10/4/19	Valerie St	Clive	15/04/19	Stanley Street	Flaxmere
10/4/19	Sutton Ave	Clive	15/04/19	Burton Place	Flaxmere
10/4/19	Beach Road	Haumoana	15/04/19	Livingstone Road	Flaxmere
10/4/19	Shrimpton Road	Haumoana	15/04/19	Walton Way	Flaxmere
10/4/19	East Road	Haumoana	15/04/19	Caernarvon Drive	Flaxmere
11/4/19	Buller Street	Akina	15/04/19	Berwick Street	Flaxmere
11/4/19	Miller Street	Mayfair	16/04/19	Francis Hicks Pl	Raureka
11/4/19	Queen St East	Parkvale	16/04/19	Kennedy Road	Onekawa
11/4/19	Willowpark Road	Mayfair	16/04/19	Puriri Street	Raureka
11/4/19	Maddison Street	Akina	16/04/19	Gordon Road	Raureka
11/4/19	Riverslea Road	Mayfair	16/04/19	Pepper Street	St Leonards
12/04/19	Mangarau Cres	Havelock Nth	16/04/19	Cook Place	Raureka

### Streets sampled for Napier City kerbside waste audit - 2019

Date	Street	Suburb	Date	Street	Suburb
10/04/19	Wycliffe Street	Onekawa	12/04/19	Auckland Road	Greenmeadows
10/04/19	Oldham Avenue	Onekawa	12/04/19	Laurent Place	Greenmeadows
10/04/19	Marshall Street	Onekawa	12/04/19	Avondale Road	Greenmeadows
10/04/19	Harold Holt Ave	Meeanee	15/04/19	Vigor Brown St	Napier South
10/04/19	Butler Street	Onekawa	15/04/19	Carnell Street	Napier South
10/04/19	Coverdale Street	Onekawa	15/04/19	Georges Drive	Napier South
10/04/19	Morris Spence Ave	Onekawa	15/04/19	Logan Avenue	Napier South
10/04/19	Scully Crescent	Onekawa	15/04/19	Herrick Street	Marewa
11/04/19	Lamason Street	Greenmeadows	15/04/19	Alpers Terrace	Marewa
11/04/19	Tait Drive	Greenmeadows	15/04/19	Morse Street	Marewa
11/04/19	Spriggs Crescent	Greenmeadows	16/04/19	Latham Street	Napier South
11/04/19	Harris Street	Greenmeadows	16/04/19	Nelson Crescent	Napier South
11/04/19	Clement Place	Greenmeadows	16/04/19	Todd Street	Napier South
12/04/19	Coote Road	Bluff Hill	16/04/19	McVay Street	Napier South
12/04/19	Shakespeare Tce	Bluff Hill	16/04/19	Ashridge Road	Napier South



## Appendix 2 - Hastings rubbish bags

Hastings District Council Domestic kerbside rubbish bags April 2019 (margins of error for 95% confidence interval)		% of total	Weight per household set out
Paper	Recyclable	6.5% (±1.4%)	0.44 kg (±0.09 kg)
	Non-recyclable	2.6% (±0.6%)	0.18 kg (±0.04 kg)
	<b>Subtotal</b>	<b>9.1% (±1.7%)</b>	<b>0.62 kg (±0.12 kg)</b>
Plastics	# 1-2 bottles	1.4% (±0.4%)	0.10 kg (±0.03 kg)
	#1-2 trays punnets	1.0% (±0.2%)	0.07 kg (±0.01 kg)
	#3-7 containers	1.2% (±0.2%)	0.08 kg (±0.02 kg)
	Non-recyclable containers	1.8% (±0.7%)	0.12 kg (±0.05 kg)
	Plastic bags/film	8.6% (±1.1%)	0.58 kg (±0.08 kg)
	Other non-recyclable	0.9% (±0.4%)	0.06 kg (±0.03 kg)
	<b>Subtotal</b>	<b>14.9% (±1.9%)</b>	<b>1.02 kg (±0.13 kg)</b>
Organics	Kitchen waste	47.0% (±5.0%)	3.21 kg (±0.34 kg)
	Greenwaste	1.7% (±1.3%)	0.12 kg (±0.09 kg)
	Multimaterial/other	2.1% (±1.5%)	0.14 kg (±0.10 kg)
	<b>Subtotal</b>	<b>50.9% (±4.9%)</b>	<b>3.47 kg (±0.33 kg)</b>
Ferrous metals	Steel cans	1.7% (±0.6%)	0.11 kg (±0.04 kg)
	Steel other	0.1% (±0.1%)	0.01 kg (±0.01 kg)
	<b>Subtotal</b>	<b>1.8% (±0.7%)</b>	<b>0.12 kg (±0.04 kg)</b>
Non ferrous metals	Aluminium cans	0.5% (±0.2%)	0.04 kg (±0.01 kg)
	Other non-ferrous	0.4% (±0.1%)	0.02 kg (±0.01 kg)
	<b>Subtotal</b>	<b>0.9% (±0.3%)</b>	<b>0.06 kg (±0.02 kg)</b>
Glass	Bottles/jars	1.8% (±1.0%)	0.12 kg (±0.07 kg)
	Non-recyclable	0.7% (±0.4%)	0.05 kg (±0.03 kg)
	<b>Subtotal</b>	<b>2.5% (±1.0%)</b>	<b>0.17 kg (±0.07 kg)</b>
Textiles	Clothing/textiles	1.8% (±0.8%)	0.12 kg (±0.05 kg)
	Multimaterial/other	1.8% (±0.9%)	0.12 kg (±0.06 kg)
	<b>Subtotal</b>	<b>3.6% (±1.3%)</b>	<b>0.24 kg (±0.09 kg)</b>
Sanitary paper		<b>14.1% (±3.9%)</b>	<b>0.96 kg (±0.27 kg)</b>
Rubble		<b>0.9% (±0.7%)</b>	<b>0.06 kg (±0.05 kg)</b>
Timber		<b>0.4% (±0.4%)</b>	<b>0.03 kg (±0.03 kg)</b>
Rubber		<b>0.1% (±0.1%)</b>	<b>0.01 kg (±0.01 kg)</b>
Potentially hazardous	Household	0.9% (±0.4%)	0.06 kg (±0.03 kg)
	Other	0.0% (±0.0%)	0.00 kg (±0.00 kg)
	<b>Subtotal</b>	<b>1.0% (±0.4%)</b>	<b>0.07 kg (±0.03 kg)</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>6.83 kg (±0.52 kg)</b>

<b>Hastings District Council</b> <b>Domestic kerbside rubbish bags</b> <b>April 2019</b> (margins of error for 95% confidence level)		<b>Weight per bag</b>	
<b>Paper</b>	Recyclable	0.32 kg	(±0.07 kg)
	Non-recyclable	0.13 kg	(±0.03 kg)
	<b>Subtotal</b>	<b>0.45 kg</b>	<b>(±0.09 kg)</b>
<b>Plastics</b>	# 1-2 bottles	0.07 kg	(±0.02 kg)
	#1-2 trays punnets	0.05 kg	(±0.01 kg)
	#3-7 containers	0.06 kg	(±0.01 kg)
	Non-recyclable containers	0.09 kg	(±0.04 kg)
	Plastic bags/film	0.43 kg	(±0.06 kg)
	Other non-recyclable	0.05 kg	(±0.02 kg)
	<b>Subtotal</b>	<b>0.74 kg</b>	<b>(±0.09 kg)</b>
<b>Organics</b>	Kitchen waste	2.34 kg	(±0.25 kg)
	Greenwaste	0.09 kg	(±0.06 kg)
	Multimaterial/other	0.10 kg	(±0.08 kg)
	<b>Subtotal</b>	<b>2.53 kg</b>	<b>(±0.24 kg)</b>
<b>Ferrous metals</b>	Steel cans	0.08 kg	(±0.03 kg)
	Steel other	0.01 kg	(±0.01 kg)
	<b>Subtotal</b>	<b>0.09 kg</b>	<b>(±0.03 kg)</b>
<b>Non ferrous metals</b>	Aluminium cans	0.03 kg	(±0.01 kg)
	Other non-ferrous	0.02 kg	(±0.00 kg)
	<b>Subtotal</b>	<b>0.04 kg</b>	<b>(±0.01 kg)</b>
<b>Glass</b>	Bottles/jars	0.09 kg	(±0.05 kg)
	Non-recyclable	0.03 kg	(±0.02 kg)
	<b>Subtotal</b>	<b>0.12 kg</b>	<b>(±0.05 kg)</b>
<b>Textiles</b>	Clothing/textiles	0.09 kg	(±0.04 kg)
	Multimaterial/other	0.09 kg	(±0.05 kg)
	<b>Subtotal</b>	<b>0.18 kg</b>	<b>(±0.06 kg)</b>
<b>Sanitary paper</b>		<b>0.70 kg</b>	<b>(±0.20 kg)</b>
<b>Rubble</b>		<b>0.04 kg</b>	<b>(±0.03 kg)</b>
<b>Timber</b>		<b>0.02 kg</b>	<b>(±0.02 kg)</b>
<b>Rubber</b>		<b>0.01 kg</b>	<b>(±0.00 kg)</b>
<b>Potentially hazardous</b>	Household	0.05 kg	(±0.02 kg)
	Other	0.00 kg	(±0.00 kg)
	<b>Subtotal</b>	<b>0.05 kg</b>	<b>(±0.02 kg)</b>
<b>TOTAL</b>		<b>4.98 kg</b>	<b>(±0.38 kg)</b>

## Appendix 3 - Napier rubbish bags

Napier City Council Domestic kerbside rubbish bags April 2019 (margins of error for 95% confidence interval)		% of total	Weight per household set out
Paper	Recyclable	8.3% (±1.8%)	0.73 kg (±0.16 kg)
	Non-recyclable	2.1% (±0.5%)	0.19 kg (±0.05 kg)
	<b>Subtotal</b>	<b>10.4% (±2.2%)</b>	<b>0.92 kg (±0.19 kg)</b>
Plastics	# 1-2 bottles	1.5% (±0.4%)	0.13 kg (±0.04 kg)
	#1-2 trays punnets	1.1% (±0.2%)	0.10 kg (±0.02 kg)
	#3-7 containers	1.3% (±0.3%)	0.11 kg (±0.03 kg)
	Non-recyclable containers	1.5% (±0.3%)	0.13 kg (±0.03 kg)
	Plastic bags/film	6.8% (±0.4%)	0.60 kg (±0.03 kg)
	Other non-recyclable	2.3% (±1.1%)	0.20 kg (±0.09 kg)
	<b>Subtotal</b>	<b>14.5% (±1.4%)</b>	<b>1.28 kg (±0.12 kg)</b>
Organics	Kitchen waste	41.8% (±4.6%)	3.70 kg (±0.41 kg)
	Greenwaste	3.5% (±1.8%)	0.31 kg (±0.16 kg)
	Multimaterial/other	2.7% (±1.8%)	0.24 kg (±0.16 kg)
	<b>Subtotal</b>	<b>48.1% (±5.1%)</b>	<b>4.26 kg (±0.45 kg)</b>
Ferrous metals	Steel cans	1.1% (±0.4%)	0.10 kg (±0.03 kg)
	Steel other	0.9% (±0.6%)	0.08 kg (±0.06 kg)
	<b>Subtotal</b>	<b>2.1% (±0.9%)</b>	<b>0.18 kg (±0.08 kg)</b>
Non-ferrous metals	Aluminium cans	0.5% (±0.2%)	0.04 kg (±0.02 kg)
	Other non-ferrous	0.7% (±0.4%)	0.06 kg (±0.04 kg)
	<b>Subtotal</b>	<b>1.2% (±0.5%)</b>	<b>0.11 kg (±0.04 kg)</b>
Glass	Bottles/jars	3.1% (±1.4%)	0.27 kg (±0.12 kg)
	Non-recyclable	0.7% (±0.4%)	0.07 kg (±0.04 kg)
	<b>Subtotal</b>	<b>3.8% (±1.5%)</b>	<b>0.34 kg (±0.13 kg)</b>
Textiles	Clothing/textiles	2.6% (±1.0%)	0.23 kg (±0.09 kg)
	Multimaterial/other	1.9% (±0.7%)	0.16 kg (±0.06 kg)
	<b>Subtotal</b>	<b>4.5% (±1.5%)</b>	<b>0.40 kg (±0.13 kg)</b>
Sanitary paper		<b>11.0% (±3.3%)</b>	<b>0.97 kg (±0.29 kg)</b>
Rubble		<b>2.0% (±1.7%)</b>	<b>0.18 kg (±0.15 kg)</b>
Timber		<b>1.1% (±0.8%)</b>	<b>0.10 kg (±0.07 kg)</b>
Rubber		<b>0.1% (±0.0%)</b>	<b>0.00 kg (±0.00 kg)</b>
Potentially hazardous	Household	0.6% (±0.3%)	0.05 kg (±0.02 kg)-
	Other	0.6% (±0.6%)	0.06 kg (±0.05 kg)
	<b>Subtotal</b>	<b>1.2% (±0.7%)</b>	<b>0.11 kg (±0.06 kg)</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>8.85 kg (±0.55 kg)</b>

<b>Napier City Council</b> <b>Domestic kerbside rubbish bags</b> <b>April 2019</b> (margins of error for 95% confidence level)		<b>Weight per bag</b>	
<b>Paper</b>	Recyclable	0.47 kg	(±0.10 kg)
	Non-recyclable	0.12 kg	(±0.03 kg)
	<b>Subtotal</b>	<b>0.60 kg</b>	<b>(±0.12 kg)</b>
<b>Plastics</b>	# 1-2 bottles	0.08 kg	(±0.02 kg)
	#1-2 trays punnets	0.07 kg	(±0.01 kg)
	#3-7 containers	0.07 kg	(±0.02 kg)
	Non-recyclable containers	0.09 kg	(±0.02 kg)
	Plastic bags/film	0.39 kg	(±0.02 kg)
	Other non-recyclable	0.13 kg	(±0.06 kg)
	<b>Subtotal</b>	<b>0.83 kg</b>	<b>(±0.08 kg)</b>
<b>Organics</b>	Kitchen waste	2.38 kg	(±0.26 kg)
	Greenwaste	0.20 kg	(±0.10 kg)
	Multimaterial/other	0.16 kg	(±0.10 kg)
	<b>Subtotal</b>	<b>2.74 kg</b>	<b>(±0.29 kg)</b>
<b>Ferrous metals</b>	Steel cans	0.06 kg	(±0.02 kg)
	Steel other	0.05 kg	(±0.04 kg)
	<b>Subtotal</b>	<b>0.12 kg</b>	<b>(±0.05 kg)</b>
<b>Non ferrous metals</b>	Aluminium cans	0.03 kg	(±0.01 kg)
	Other non-ferrous	0.04 kg	(±0.02 kg)
	<b>Subtotal</b>	<b>0.07 kg</b>	<b>(±0.03 kg)</b>
<b>Glass</b>	Bottles/jars	0.17 kg	(±0.08 kg)
	Non-recyclable	0.04 kg	(±0.02 kg)
	<b>Subtotal</b>	<b>0.22 kg</b>	<b>(±0.09 kg)</b>
<b>Textiles</b>	Clothing/textiles	0.15 kg	(±0.06 kg)
	Multimaterial/other	0.11 kg	(±0.04 kg)
	<b>Subtotal</b>	<b>0.26 kg</b>	<b>(±0.08 kg)</b>
<b>Sanitary paper</b>		<b>0.63 kg</b>	<b>(±0.19 kg)</b>
<b>Rubble</b>		<b>0.12 kg</b>	<b>(±0.10 kg)</b>
<b>Timber</b>		<b>0.06 kg</b>	<b>(±0.05 kg)</b>
<b>Rubber</b>		<b>0.00 kg</b>	<b>(±0.00 kg)</b>
<b>Potentially hazardous</b>	Household	0.03 kg	(±0.01 kg)
	Other	0.04 kg	(±0.03 kg)
	<b>Subtotal</b>	<b>0.07 kg</b>	<b>(±0.04 kg)</b>
<b>TOTAL</b>		<b>5.70 kg</b>	<b>(±0.35 kg)</b>

## Appendix 4 - Henderson Rd RTS

Henderson Rd RTS General and overall waste streams - 18 March - 10 May 2019		General waste (excludes kerbside collections)		Overall waste (includes kerbside collections)	
		% of total	Tonnes per week	% of total	Tonnes per week
<b>Paper</b>	Recyclable	1.5%	3 T/week	2.2%	5 T/week
	Cardboard	3.4%	6 T/week	3.0%	6 T/week
	Non-recyclable	0.7%	1 T/week	1.0%	2 T/week
	<b>Subtotal</b>	<b>5.7%</b>	<b>10 T/week</b>	<b>6.2%</b>	<b>13 T/week</b>
<b>Plastics</b>	Recyclable	0.3%	1 T/week	0.6%	1 T/week
	Non-recyclable	9.5%	17 T/week	10.0%	22 T/week
	<b>Subtotal</b>	<b>9.8%</b>	<b>18 T/week</b>	<b>10.6%</b>	<b>23 T/week</b>
<b>Organics</b>	Kitchen waste	4.5%	8 T/week	11.2%	24 T/week
	Compostable greenwaste	4.4%	8 T/week	3.9%	9 T/week
	Non-compostable greenwaste	0.9%	2 T/week	0.8%	2 T/week
	Multimaterial/other	0.2%	0 T/week	0.5%	1 T/week
	<b>Subtotal</b>	<b>10.0%</b>	<b>18 T/week</b>	<b>16.4%</b>	<b>36 T/week</b>
<b>Ferrous metals</b>	Primarily ferrous	1.6%	3 T/week	1.6%	3 T/week
	Multimaterial/other	3.2%	6 T/week	2.7%	6 T/week
	<b>Subtotal</b>	<b>4.7%</b>	<b>9 T/week</b>	<b>4.3%</b>	<b>9 T/week</b>
<b>Non-ferrous metals</b>		<b>0.4%</b>	<b>1 T/week</b>	<b>0.5%</b>	<b>1 T/week</b>
<b>Glass</b>	Recyclable	0.5%	1 T/week	0.7%	2 T/week
	Multimaterial/other	1.5%	3 T/week	1.3%	3 T/week
	<b>Subtotal</b>	<b>2.0%</b>	<b>4 T/week</b>	<b>2.1%</b>	<b>4 T/week</b>
<b>Textiles</b>	Clothing/textiles	1.5%	3 T/week	1.6%	3 T/week
	Multimaterial/other	9.9%	18 T/week	8.6%	19 T/week
	<b>Subtotal</b>	<b>11.4%</b>	<b>21 T/week</b>	<b>10.2%</b>	<b>22 T/week</b>
<b>Sanitary paper</b>		<b>1.6%</b>	<b>3 T/week</b>	<b>3.6%</b>	<b>8 T/week</b>
<b>Rubble</b>	Cleanfill	2.4%	4 T/week	2.0%	4 T/week
	New plasterboard	1.9%	3 T/week	1.6%	3 T/week
	Other	8.6%	16 T/week	7.4%	16 T/week
	<b>Subtotal</b>	<b>12.9%</b>	<b>24 T/week</b>	<b>11.0%</b>	<b>24 T/week</b>
<b>Timber</b>	Reusable	1.7%	3 T/week	1.4%	3 T/week
	Unpainted & untreated	9.4%	17 T/week	7.9%	17 T/week
	Non-recoverable	28.9%	53 T/week	24.4%	53 T/week
	<b>Subtotal</b>	<b>39.9%</b>	<b>73 T/week</b>	<b>33.8%</b>	<b>73 T/week</b>
<b>Rubber</b>		<b>1.1%</b>	<b>2 T/week</b>	<b>1.0%</b>	<b>2 T/week</b>
<b>Potentially hazardous</b>		<b>0.3%</b>	<b>1 T/week</b>	<b>0.4%</b>	<b>1 T/week</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>183 T/week</b>	<b>100.0%</b>	<b>217 T/week</b>

Henderson Rd RTS - General waste stream - By activity source of waste load - 18 March - 10 May 2019		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.0%	3.1%	0.0%	2.4%
	Cardboard	1.7%	5.1%	1.1%	4.6%
	Non-recyclable	0.8%	1.0%	0.0%	0.4%
	<b>Subtotal</b>	<b>2.5%</b>	<b>9.3%</b>	<b>1.1%</b>	<b>7.4%</b>
Plastics	Recyclable	0.0%	0.7%	0.0%	0.3%
	Non-recyclable	1.9%	19.3%	12.0%	8.7%
	<b>Subtotal</b>	<b>1.9%</b>	<b>20.1%</b>	<b>12.0%</b>	<b>9.0%</b>
Organics	Kitchen waste	0.0%	10.5%	0.0%	5.3%
	Compostable greenwaste	0.6%	3.9%	25.3%	5.7%
	Non-compostable greenwaste	0.2%	0.0%	12.4%	0.2%
	Organic other	0.0%	0.6%	0.0%	0.2%
	<b>Subtotal</b>	<b>0.8%</b>	<b>15.1%</b>	<b>37.7%</b>	<b>11.5%</b>
Ferrous metals	Primarily ferrous	1.2%	0.7%	0.6%	3.7%
	Multimaterial/other	0.5%	2.5%	0.1%	9.3%
	<b>Subtotal</b>	<b>1.7%</b>	<b>3.1%</b>	<b>0.7%</b>	<b>13.0%</b>
Non-ferrous metals		0.1%	0.6%	0.0%	0.7%
Glass	Recyclable	0.0%	1.3%	0.0%	0.4%
	Non-recyclable	0.6%	2.0%	0.0%	2.6%
	<b>Subtotal</b>	<b>0.7%</b>	<b>3.3%</b>	<b>0.0%</b>	<b>3.0%</b>
Textiles	Clothing/textiles	0.0%	2.4%	0.0%	3.4%
	Multimaterial/other	2.1%	16.9%	1.8%	15.6%
	<b>Subtotal</b>	<b>2.1%</b>	<b>19.2%</b>	<b>1.8%</b>	<b>19.0%</b>
Sanitary paper		<b>0.0%</b>	<b>4.2%</b>	<b>0.0%</b>	<b>1.4%</b>
Rubble	Cleanfill	1.4%	0.8%	24.9%	0.3%
	New plasterboard	4.7%	0.0%	0.0%	0.3%
	Other	15.3%	4.8%	10.5%	2.0%
	<b>Subtotal</b>	<b>21.4%</b>	<b>5.6%</b>	<b>35.5%</b>	<b>2.7%</b>
Timber	Reusable	3.9%	0.0%	0.8%	0.5%
	Unpainted & untreated	14.8%	6.6%	6.7%	4.7%
	Non-recoverable	48.0%	11.9%	3.6%	26.2%
	<b>Subtotal</b>	<b>66.7%</b>	<b>18.5%</b>	<b>11.1%</b>	<b>31.3%</b>
Rubber		<b>2.2%</b>	<b>0.4%</b>	<b>0.0%</b>	<b>0.7%</b>
Potentially hazardous		<b>0.0%</b>	<b>0.7%</b>	<b>0.0%</b>	<b>0.3%</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Henderson Rd RTS - General waste stream - By activity source of waste load - 18 March - 10 May 2019		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.0 T/week	1.8 T/week	0.0 T/week	1.0 T/week
	Cardboard	1.2 T/week	2.9 T/week	0.1 T/week	2.0 T/week
	Non-recyclable	0.5 T/week	0.6 T/week	0.0 T/week	0.2 T/week
	<b>Subtotal</b>	<b>1.8 T/week</b>	<b>5.3 T/week</b>	<b>0.1 T/week</b>	<b>3.2 T/week</b>
Plastics	Recyclable	0.0 T/week	0.4 T/week	0.0 T/week	0.1 T/week
	Non-recyclable	1.3 T/week	11.0 T/week	1.4 T/week	3.7 T/week
	<b>Subtotal</b>	<b>1.3 T/week</b>	<b>11.4 T/week</b>	<b>1.4 T/week</b>	<b>3.9 T/week</b>
Organics	Kitchen waste	0.0 T/week	5.9 T/week	0.0 T/week	2.3 T/week
	Compostable greenwaste	0.4 T/week	2.2 T/week	2.9 T/week	2.5 T/week
	Non-compostable greenwaste	0.1 T/week	0.0 T/week	1.4 T/week	0.1 T/week
	Organic other	0.0 T/week	0.4 T/week	0.0 T/week	0.1 T/week
	<b>Subtotal</b>	<b>0.6 T/week</b>	<b>8.6 T/week</b>	<b>4.3 T/week</b>	<b>5.0 T/week</b>
Ferrous metals	Primarily ferrous	0.9 T/week	0.4 T/week	0.1 T/week	1.6 T/week
	Multimaterial/other	0.3 T/week	1.4 T/week	0.0 T/week	4.0 T/week
	<b>Subtotal</b>	<b>1.2 T/week</b>	<b>1.8 T/week</b>	<b>0.1 T/week</b>	<b>5.6 T/week</b>
Non-ferrous metals		<b>0.1 T/week</b>	<b>0.3 T/week</b>	<b>0.0 T/week</b>	<b>0.3 T/week</b>
Glass	Recyclable	0.0 T/week	0.7 T/week	0.0 T/week	0.2 T/week
	Non-recyclable	0.4 T/week	1.1 T/week	0.0 T/week	1.1 T/week
	<b>Subtotal</b>	<b>0.5 T/week</b>	<b>1.8 T/week</b>	<b>0.0 T/week</b>	<b>1.3 T/week</b>
Textiles	Clothing/textiles	0.0 T/week	1.3 T/week	0.0 T/week	1.5 T/week
	Multimaterial/other	1.5 T/week	9.6 T/week	0.2 T/week	6.7 T/week
	<b>Subtotal</b>	<b>1.5 T/week</b>	<b>10.9 T/week</b>	<b>0.2 T/week</b>	<b>8.2 T/week</b>
Sanitary paper		<b>0.0 T/week</b>	<b>2.4 T/week</b>	<b>0.0 T/week</b>	<b>0.6 T/week</b>
Rubble	Cleanfill	1.0 T/week	0.5 T/week	2.8 T/week	0.1 T/week
	New plasterboard	3.3 T/week	0.0 T/week	0.0 T/week	0.1 T/week
	Other	11.0 T/week	2.7 T/week	1.2 T/week	0.9 T/week
	<b>Subtotal</b>	<b>15.3 T/week</b>	<b>3.1 T/week</b>	<b>4.0 T/week</b>	<b>1.2 T/week</b>
Timber	Reusable	2.8 T/week	0.0 T/week	0.1 T/week	0.2 T/week
	Unpainted & untreated	10.6 T/week	3.8 T/week	0.8 T/week	2.0 T/week
	Non-recoverable	34.4 T/week	6.7 T/week	0.4 T/week	11.3 T/week
	<b>Subtotal</b>	<b>47.7 T/week</b>	<b>10.5 T/week</b>	<b>1.3 T/week</b>	<b>13.5 T/week</b>
Rubber		<b>1.6 T/week</b>	<b>0.2 T/week</b>	<b>0.0 T/week</b>	<b>0.3 T/week</b>
Potentially hazardous		<b>0.0 T/week</b>	<b>0.4 T/week</b>	<b>0.0 T/week</b>	<b>0.1 T/week</b>
<b>TOTAL</b>		<b>71.6 T/week</b>	<b>56.7 T/week</b>	<b>11.3 T/week</b>	<b>43.2 T/week</b>

Henderson Rd RTS - Overall waste stream - by vehicle type - 18 March - 10 May 2019		Cars	Front-loaders	Gantry trucks	Other trucks	Trailers
Paper	Recyclable	9.9%	3.7%	0.9%	1.8%	0.9%
	Cardboard	4.3%	8.9%	3.0%	1.0%	3.3%
	Non-recyclable	1.0%	1.2%	0.6%	0.2%	0.7%
	<b>Subtotal</b>	<b>10.4%</b>	<b>13.9%</b>	<b>4.5%</b>	<b>3.0%</b>	<b>4.9%</b>
Plastics	Recyclable	0.5%	1.2%	0.3%	0.1%	0.1%
	Non-recyclable	10.3%	24.8%	10.9%	8.2%	6.5%
	<b>Subtotal</b>	<b>10.7%</b>	<b>26.0%</b>	<b>11.2%</b>	<b>8.3%</b>	<b>6.6%</b>
Organics	Kitchen waste	14.4%	7.2%	7.1%	0.7%	1.4%
	Compostable greenwaste	8.0%	1.0%	1.7%	1.0%	5.2%
	Non-compostable greenwaste	0.6%	0.0%	0.2%	0.5%	1.6%
	Multimaterial/other	0.6%	2.1%	0.0%	0.0%	0.1%
	<b>Subtotal</b>	<b>23.5%</b>	<b>10.3%</b>	<b>9.0%</b>	<b>2.3%</b>	<b>8.3%</b>
Ferrous metals	Primarily ferrous	1.1%	1.2%	1.2%	3.2%	1.7%
	Multimaterial/other	6.5%	2.5%	2.5%	0.4%	3.8%
	<b>Subtotal</b>	<b>7.6%</b>	<b>3.7%</b>	<b>3.7%</b>	<b>3.6%</b>	<b>5.5%</b>
Non-ferrous metals		<b>1.3%</b>	<b>1.2%</b>	<b>0.1%</b>	<b>0.1%</b>	<b>0.4%</b>
Glass	Recyclable	2.1%	1.7%	0.1%	0.4%	0.2%
	Non-recyclable	1.9%	2.5%	0.4%	0.0%	2.3%
	<b>Subtotal</b>	<b>4.0%</b>	<b>4.2%</b>	<b>0.5%</b>	<b>0.4%</b>	<b>2.5%</b>
Textiles	Clothing/textiles	2.8%	3.4%	0.4%	4.2%	1.3%
	Multimaterial/other	10.4%	5.5%	4.3%	42.0%	8.2%
	<b>Subtotal</b>	<b>13.2%</b>	<b>8.9%</b>	<b>4.7%</b>	<b>46.1%</b>	<b>9.4%</b>
Sanitary paper		<b>3.8%</b>	<b>10.5%</b>	<b>0.3%</b>	<b>2.9%</b>	<b>0.4%</b>
Rubble	Cleanfill	0.7%	0.0%	1.2%	4.9%	3.5%
	New plasterboard	0.0%	0.0%	3.8%	3.6%	0.9%
	Other	3.5%	5.0%	6.6%	4.6%	12.4%
	<b>Subtotal</b>	<b>4.2%</b>	<b>5.0%</b>	<b>11.7%</b>	<b>13.0%</b>	<b>16.8%</b>
Timber	Reusable	0.1%	0.0%	2.6%	0.0%	2.0%
	Unpainted & untreated	0.3%	4.5%	15.4%	2.1%	9.1%
	Non-recoverable	19.4%	7.9%	33.2%	18.1%	33.7%
	<b>Subtotal</b>	<b>19.8%</b>	<b>12.5%</b>	<b>51.2%</b>	<b>20.2%</b>	<b>44.9%</b>
Rubber		<b>0.8%</b>	<b>1.2%</b>	<b>2.9%</b>	<b>0.1%</b>	<b>0.2%</b>
Potentially hazardous		<b>0.5%</b>	<b>2.6%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.1%</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>



Henderson Rd RTS - Overall waste stream - by vehicle type - 18 March - 10 May 2019		Cars	Front-loaders	Gantry trucks	Other trucks	Trailers
Paper	Recyclable	2 T/week	0 T/week	0 T/week	0 T/week	1 T/week
	Cardboard	1 T/week	1 T/week	1 T/week	0 T/week	3 T/week
	Non-recyclable	0 T/week	0 T/week	0 T/week	0 T/week	1 T/week
	<b>Subtotal</b>	<b>2 T/week</b>	<b>1 T/week</b>	<b>2 T/week</b>	<b>1 T/week</b>	<b>5 T/week</b>
Plastics	Recyclable	0 T/week	0 T/week	0 T/week	0 T/week	0 T/week
	Non-recyclable	2 T/week	2 T/week	5 T/week	2 T/week	6 T/week
	<b>Subtotal</b>	<b>2 T/week</b>	<b>2 T/week</b>	<b>5 T/week</b>	<b>2 T/week</b>	<b>6 T/week</b>
Organics	Kitchen waste	2 T/week	1 T/week	3 T/week	0 T/week	1 T/week
	Compostable greenwaste	1 T/week	0 T/week	1 T/week	0 T/week	5 T/week
	Non-compostable greenwaste	0 T/week	0 T/week	0 T/week	0 T/week	2 T/week
	Multimaterial/other	0 T/week	0 T/week	0 T/week	0 T/week	0 T/week
	<b>Subtotal</b>	<b>4 T/week</b>	<b>1 T/week</b>	<b>4 T/week</b>	<b>0 T/week</b>	<b>8 T/week</b>
Ferrous metals	Primarily ferrous	0 T/week	0 T/week	1 T/week	1 T/week	2 T/week
	Multimaterial/other	1 T/week	0 T/week	1 T/week	0 T/week	4 T/week
	<b>Subtotal</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>2 T/week</b>	<b>1 T/week</b>	<b>5 T/week</b>
Non-ferrous metals		<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>
Glass	Recyclable	0 T/week	0 T/week	0 T/week	0 T/week	0 T/week
	Non-recyclable	0 T/week	0 T/week	0 T/week	0 T/week	2 T/week
	<b>Subtotal</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>2 T/week</b>
Textiles	Clothing/textiles	0 T/week	0 T/week	0 T/week	1 T/week	1 T/week
	Multimaterial/other	2 T/week	0 T/week	2 T/week	8 T/week	8 T/week
	<b>Subtotal</b>	<b>2 T/week</b>	<b>1 T/week</b>	<b>2 T/week</b>	<b>9 T/week</b>	<b>9 T/week</b>
Sanitary paper		<b>1 T/week</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>1 T/week</b>	<b>0 T/week</b>
Rubble	Cleanfill	0 T/week	0 T/week	1 T/week	1 T/week	3 T/week
	New plasterboard	0 T/week	0 T/week	2 T/week	1 T/week	1 T/week
	Other	1 T/week	0 T/week	3 T/week	1 T/week	12 T/week
	<b>Subtotal</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>5 T/week</b>	<b>3 T/week</b>	<b>16 T/week</b>
Timber	Reusable	0 T/week	0 T/week	1 T/week	0 T/week	2 T/week
	Unpainted & untreated	0 T/week	0 T/week	7 T/week	0 T/week	9 T/week
	Non-recoverable	3 T/week	1 T/week	15 T/week	4 T/week	33 T/week
	<b>Subtotal</b>	<b>3 T/week</b>	<b>1 T/week</b>	<b>22 T/week</b>	<b>4 T/week</b>	<b>44 T/week</b>
Rubber		<b>0 T/week</b>	<b>0 T/week</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>
Potentially hazardous		<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>
<b>TOTAL</b>		<b>15 T/week</b>	<b>7 T/week</b>	<b>44 T/week</b>	<b>19 T/week</b>	<b>98 T/week</b>

## Appendix 5 - Redclyffe RTS

Redclyffe RTS - Overall waste stream - 18 March - 10 May 2019		% of total	Tonnes per week
<b>Paper</b>	Recyclable	2.2%	4 T/week
	Cardboard	4.4%	7 T/week
	Non-recyclable	0.8%	1 T/week
	<b>Subtotal</b>	<b>7.5%</b>	<b>12 T/week</b>
<b>Plastics</b>	Recyclable	0.3%	0 T/week
	Non-recyclable	8.9%	14 T/week
	<b>Subtotal</b>	<b>9.2%</b>	<b>15 T/week</b>
<b>Organics</b>	Kitchen waste	4.6%	7 T/week
	Compostable greenwaste	4.4%	7 T/week
	Non-compostable greenwaste	1.2%	2 T/week
	Other organic	0.4%	1 T/week
	<b>Subtotal</b>	<b>10.5%</b>	<b>17 T/week</b>
<b>Ferrous metals</b>	Primarily ferrous	1.4%	2 T/week
	Multimaterial/other	2.1%	3 T/week
	<b>Subtotal</b>	<b>3.5%</b>	<b>6 T/week</b>
<b>Non-ferrous metals</b>		<b>0.5%</b>	<b>1 T/week</b>
<b>Glass</b>	Recyclable	0.5%	1 T/week
	Non-recyclable	1.2%	2 T/week
	<b>Subtotal</b>	<b>1.7%</b>	<b>3 T/week</b>
<b>Textiles</b>	Clothing/textiles	2.1%	3 T/week
	Multimaterial/other	8.4%	13 T/week
	<b>Subtotal</b>	<b>10.5%</b>	<b>17 T/week</b>
<b>Sanitary paper</b>		<b>1.8%</b>	<b>3 T/week</b>
<b>Rubble</b>	Cleanfill	5.3%	9 T/week
	New plasterboard	1.4%	2 T/week
	Other	14.6%	23 T/week
	<b>Subtotal</b>	<b>21.2%</b>	<b>34 T/week</b>
<b>Timber</b>	Reusable	1.3%	2 T/week
	Unpainted & untreated	6.5%	10 T/week
	Non-recoverable	24.6%	39 T/week
	<b>Subtotal</b>	<b>32.4%</b>	<b>52 T/week</b>
<b>Rubber</b>		<b>0.8%</b>	<b>1 T/week</b>
<b>Potentially hazardous</b>		<b>0.3%</b>	<b>0 T/week</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>160 T/week</b>

Redclyffe RTS - General waste stream - By activity source of waste load - 18 March - 10 May 2019		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.1%	3.9%	0.3%	3.1%
	Cardboard	2.1%	7.0%	2.0%	5.8%
	Non-recyclable	0.4%	2.0%	0.2%	0.2%
	<b>Subtotal</b>	<b>2.6%</b>	<b>12.9%</b>	<b>2.5%</b>	<b>9.1%</b>
Plastics	Recyclable	0.0%	0.4%	0.1%	0.2%
	Non-recyclable	3.8%	18.5%	2.0%	7.3%
	<b>Subtotal</b>	<b>3.8%</b>	<b>19.0%</b>	<b>2.0%</b>	<b>7.5%</b>
Organics	Kitchen waste	0.3%	5.7%	1.2%	4.6%
	Compostable greenwaste	1.7%	4.5%	21.9%	4.2%
	Non-compostable greenwaste	0.1%	0.4%	10.3%	1.4%
	Multimaterial/other	0.0%	0.8%	0.1%	0.3%
	<b>Subtotal</b>	<b>2.2%</b>	<b>11.4%</b>	<b>33.5%</b>	<b>10.4%</b>
Ferrous metals	Primarily ferrous	0.5%	2.4%	0.1%	1.7%
	Multimaterial/other	0.3%	2.9%	0.3%	3.9%
	<b>Subtotal</b>	<b>0.8%</b>	<b>5.3%</b>	<b>0.4%</b>	<b>5.7%</b>
Non-ferrous metals		<b>0.2%</b>	<b>0.8%</b>	<b>0.0%</b>	<b>0.5%</b>
Glass	Recyclable	0.0%	0.6%	0.1%	0.7%
	Non-recyclable	0.3%	1.5%	0.1%	2.3%
	<b>Subtotal</b>	<b>0.3%</b>	<b>2.1%</b>	<b>0.2%</b>	<b>2.9%</b>
Textiles	Clothing/textiles	0.0%	4.7%	0.2%	2.6%
	Multimaterial/other	2.9%	3.8%	1.4%	20.8%
	<b>Subtotal</b>	<b>2.9%</b>	<b>8.5%</b>	<b>1.6%</b>	<b>23.4%</b>
Sanitary paper		<b>0.1%</b>	<b>3.7%</b>	<b>0.3%</b>	<b>1.3%</b>
Rubble	Cleanfill	12.1%	0.1%	5.6%	2.7%
	New plasterboard	3.7%	0.0%	0.0%	0.2%
	Other	23.7%	13.7%	22.5%	4.8%
	<b>Subtotal</b>	<b>39.6%</b>	<b>13.8%</b>	<b>28.1%</b>	<b>7.7%</b>
Timber	Reusable	2.6%	0.0%	5.7%	0.2%
	Unpainted & untreated	11.0%	8.8%	0.2%	1.5%
	Non-recoverable	33.3%	11.7%	25.3%	28.5%
	<b>Subtotal</b>	<b>46.9%</b>	<b>20.5%</b>	<b>31.2%</b>	<b>30.3%</b>
Rubber		<b>0.5%</b>	<b>1.3%</b>	<b>0.1%</b>	<b>1.0%</b>
Potentially hazardous		<b>0.1%</b>	<b>0.6%</b>	<b>0.1%</b>	<b>0.3%</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Redclyffe RTS - General waste stream - By activity source of waste load - 18 March - 10 May 2019		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.1 T/week	1.6 T/week	0.0 T/week	1.5 T/week
	Cardboard	1.1 T/week	2.9 T/week	0.2 T/week	2.8 T/week
	Non-recyclable	0.2 T/week	0.8 T/week	0.0 T/week	0.1 T/week
	<b>Subtotal</b>	<b>1.4 T/week</b>	<b>5.3 T/week</b>	<b>0.2 T/week</b>	<b>4.4 T/week</b>
Plastics	Recyclable	0.0 T/week	0.2 T/week	0.0 T/week	0.1 T/week
	Non-recyclable	2.1 T/week	7.7 T/week	0.2 T/week	3.5 T/week
	<b>Subtotal</b>	<b>2.1 T/week</b>	<b>7.9 T/week</b>	<b>0.2 T/week</b>	<b>3.6 T/week</b>
Organics	Kitchen waste	0.1 T/week	2.4 T/week	0.1 T/week	2.2 T/week
	Compostable greenwaste	1.0 T/week	1.9 T/week	2.0 T/week	2.0 T/week
	Non-compostable greenwaste	0.1 T/week	0.2 T/week	1.0 T/week	0.7 T/week
	Organic other	0.0 T/week	0.3 T/week	0.0 T/week	0.1 T/week
	<b>Subtotal</b>	<b>1.2 T/week</b>	<b>4.8 T/week</b>	<b>3.1 T/week</b>	<b>5.0 T/week</b>
Ferrous metals	Primarily ferrous	0.3 T/week	1.0 T/week	0.0 T/week	0.8 T/week
	Multimaterial/other	0.2 T/week	1.2 T/week	0.0 T/week	1.9 T/week
	<b>Subtotal</b>	<b>0.5 T/week</b>	<b>2.2 T/week</b>	<b>0.0 T/week</b>	<b>2.7 T/week</b>
Non-ferrous metals		<b>0.1 T/week</b>	<b>0.3 T/week</b>	<b>0.0 T/week</b>	<b>0.3 T/week</b>
Glass	Recyclable	0.0 T/week	0.3 T/week	0.0 T/week	0.3 T/week
	Non-recyclable	0.2 T/week	0.6 T/week	0.0 T/week	1.1 T/week
	<b>Subtotal</b>	<b>0.2 T/week</b>	<b>0.9 T/week</b>	<b>0.0 T/week</b>	<b>1.4 T/week</b>
Textiles	Clothing/textiles	0.0 T/week	2.0 T/week	0.0 T/week	1.3 T/week
	Multimaterial/other	1.6 T/week	1.6 T/week	0.1 T/week	10.0 T/week
	<b>Subtotal</b>	<b>1.6 T/week</b>	<b>3.5 T/week</b>	<b>0.1 T/week</b>	<b>11.3 T/week</b>
Sanitary paper		<b>0.0 T/week</b>	<b>1.6 T/week</b>	<b>0.0 T/week</b>	<b>0.6 T/week</b>
Rubble	Cleanfill	6.7 T/week	0.0 T/week	0.5 T/week	1.3 T/week
	New plasterboard	2.1 T/week	0.0 T/week	0.0 T/week	0.1 T/week
	Other	13.0 T/week	5.7 T/week	2.1 T/week	2.3 T/week
	<b>Subtotal</b>	<b>21.8 T/week</b>	<b>5.8 T/week</b>	<b>2.6 T/week</b>	<b>3.7 T/week</b>
Timber	Reusable	1.5 T/week	0.0 T/week	0.5 T/week	0.1 T/week
	Unpainted & untreated	6.1 T/week	3.7 T/week	0.0 T/week	0.7 T/week
	Non-recoverable	18.3 T/week	4.9 T/week	2.4 T/week	13.8 T/week
	<b>Subtotal</b>	<b>25.8 T/week</b>	<b>8.5 T/week</b>	<b>2.9 T/week</b>	<b>14.6 T/week</b>
Rubber		<b>0.3 T/week</b>	<b>0.6 T/week</b>	<b>0.0 T/week</b>	<b>0.5 T/week</b>
Potentially hazardous		<b>0.0 T/week</b>	<b>0.3 T/week</b>	<b>0.0 T/week</b>	<b>0.1 T/week</b>
<b>TOTAL</b>		<b>55.0 T/week</b>	<b>41.6 T/week</b>	<b>9.3 T/week</b>	<b>48.2 T/week</b>

Redclyffe RTS - Overall waste stream - by vehicle type - 18 March - 10 May 2019		Cars	Front-loaders	Gantry trucks	Other trucks	Trailers
Paper	Recyclable	4.2%	6.7%	1.3%	0.9%	1.5%
	Cardboard	10.1%	13.3%	1.3%	4.9%	3.6%
	Non-recyclable	0.5%	1.3%	1.3%	0.1%	0.6%
	<b>Subtotal</b>	<b>14.8%</b>	<b>21.3%</b>	<b>3.9%</b>	<b>5.9%</b>	<b>5.8%</b>
Plastics	Recyclable	0.4%	1.3%	0.1%	0.0%	0.1%
	Non-recyclable	10.6%	24.0%	5.0%	3.9%	8.9%
	<b>Subtotal</b>	<b>10.9%</b>	<b>25.3%</b>	<b>5.1%</b>	<b>3.9%</b>	<b>9.0%</b>
Organics	Kitchen waste	11.2%	13.3%	0.9%	0.0%	1.6%
	Compostable greenwaste	6.0%	0.0%	7.7%	3.4%	3.3%
	Non-compostable greenwaste	0.8%	0.0%	2.6%	0.0%	1.0%
	Multimaterial/other	0.6%	2.7%	0.0%	0.0%	0.1%
	<b>Subtotal</b>	<b>18.7%</b>	<b>16.0%</b>	<b>11.1%</b>	<b>3.4%</b>	<b>6.1%</b>
Ferrous metals	Primarily ferrous	2.4%	1.3%	1.7%	0.3%	1.2%
	Multimaterial/other	5.0%	2.7%	1.9%	1.7%	1.6%
	<b>Subtotal</b>	<b>7.4%</b>	<b>4.0%</b>	<b>3.6%</b>	<b>2.0%</b>	<b>2.8%</b>
Non-ferrous metals		<b>0.8%</b>	<b>1.3%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.5%</b>
Glass	Recyclable	0.4%	1.3%	0.3%	0.0%	0.3%
	Non-recyclable	3.0%	2.7%	0.2%	0.0%	1.3%
	<b>Subtotal</b>	<b>3.4%</b>	<b>4.0%</b>	<b>0.6%</b>	<b>0.0%</b>	<b>1.7%</b>
Textiles	Clothing/textiles	2.3%	2.7%	5.2%	2.5%	0.5%
	Multimaterial/other	9.1%	2.7%	6.8%	7.4%	10.4%
	<b>Subtotal</b>	<b>11.5%</b>	<b>5.3%</b>	<b>12.0%</b>	<b>9.9%</b>	<b>10.8%</b>
Sanitary paper		<b>3.1%</b>	<b>9.3%</b>	<b>0.6%</b>	<b>0.0%</b>	<b>0.7%</b>
Rubble	Cleanfill	1.7%	0.0%	9.4%	21.5%	2.7%
	New plasterboard	0.1%	0.0%	0.9%	0.0%	2.3%
	Other	5.2%	5.3%	27.9%	9.4%	13.4%
	<b>Subtotal</b>	<b>7.0%</b>	<b>5.3%</b>	<b>38.2%</b>	<b>30.9%</b>	<b>18.5%</b>
Timber	Reusable	0.6%	0.0%	1.6%	0.0%	1.8%
	Unpainted & untreated	2.7%	0.0%	8.4%	2.1%	8.6%
	Non-recoverable	16.7%	4.0%	13.9%	39.6%	33.3%
	<b>Subtotal</b>	<b>19.9%</b>	<b>4.0%</b>	<b>23.9%</b>	<b>41.7%</b>	<b>43.7%</b>
Rubber		<b>2.2%</b>	<b>2.7%</b>	<b>0.5%</b>	<b>2.4%</b>	<b>0.3%</b>
Potentially hazardous		<b>0.5%</b>	<b>1.3%</b>	<b>0.3%</b>	<b>0.0%</b>	<b>0.1%</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Redclyffe RTS - Overall waste stream - by vehicle type - 18 March - 10 May 2019		Cars	Front-loaders	Gantry trucks	Other trucks	Trailers
Paper	Recyclable	1 T/week	0 T/week	0 T/week	0 T/week	1 T/week
	Cardboard	2 T/week	0 T/week	0 T/week	1 T/week	3 T/week
	Non-recyclable	0 T/week	0 T/week	0 T/week	0 T/week	1 T/week
	<b>Subtotal</b>	<b>3 T/week</b>	<b>1 T/week</b>	<b>1 T/week</b>	<b>1 T/week</b>	<b>5 T/week</b>
Plastics	Recyclable	0 T/week	0 T/week	0 T/week	0 T/week	0 T/week
	Non-recyclable	2 T/week	1 T/week	2 T/week	1 T/week	8 T/week
	<b>Subtotal</b>	<b>2 T/week</b>	<b>1 T/week</b>	<b>2 T/week</b>	<b>1 T/week</b>	<b>8 T/week</b>
Organics	Kitchen waste	2 T/week	0 T/week	0 T/week	0 T/week	1 T/week
	Compostable greenwaste	1 T/week	0 T/week	3 T/week	0 T/week	3 T/week
	Non-compostable greenwaste	0 T/week	0 T/week	1 T/week	0 T/week	1 T/week
	Multimaterial/other	0 T/week	0 T/week	0 T/week	0 T/week	0 T/week
	<b>Subtotal</b>	<b>4 T/week</b>	<b>1 T/week</b>	<b>4 T/week</b>	<b>0 T/week</b>	<b>5 T/week</b>
Ferrous metals	Primarily ferrous	0 T/week	0 T/week	1 T/week	0 T/week	1 T/week
	Multimaterial/other	1 T/week	0 T/week	1 T/week	0 T/week	1 T/week
	<b>Subtotal</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>2 T/week</b>
Non-ferrous metals		<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>
Glass	Recyclable	0 T/week	0 T/week	0 T/week	0 T/week	0 T/week
	Non-recyclable	1 T/week	0 T/week	0 T/week	0 T/week	1 T/week
	<b>Subtotal</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>1 T/week</b>
Textiles	Clothing/textiles	0 T/week	0 T/week	2 T/week	0 T/week	0 T/week
	Multimaterial/other	2 T/week	0 T/week	2 T/week	1 T/week	9 T/week
	<b>Subtotal</b>	<b>2 T/week</b>	<b>0 T/week</b>	<b>4 T/week</b>	<b>1 T/week</b>	<b>9 T/week</b>
Sanitary paper		<b>1 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>1 T/week</b>
Rubble	Cleanfill	0 T/week	0 T/week	3 T/week	3 T/week	2 T/week
	New plasterboard	0 T/week	0 T/week	0 T/week	0 T/week	2 T/week
	Other	1 T/week	0 T/week	9 T/week	1 T/week	12 T/week
	<b>Subtotal</b>	<b>1 T/week</b>	<b>0 T/week</b>	<b>13 T/week</b>	<b>4 T/week</b>	<b>16 T/week</b>
Timber	Reusable	0 T/week	0 T/week	1 T/week	0 T/week	2 T/week
	Unpainted & untreated	1 T/week	0 T/week	3 T/week	0 T/week	8 T/week
	Non-recoverable	3 T/week	0 T/week	5 T/week	6 T/week	29 T/week
	<b>Subtotal</b>	<b>4 T/week</b>	<b>0 T/week</b>	<b>8 T/week</b>	<b>6 T/week</b>	<b>38 T/week</b>
Rubber		<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>
Potentially hazardous		<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>	<b>0 T/week</b>
<b>TOTAL</b>		<b>19 T/week</b>	<b>3 T/week</b>	<b>33 T/week</b>	<b>14 T/week</b>	<b>88 T/week</b>

## Appendix 6 - 240-litre MGB kerbside waste

240-litre MGB Domestic kerbside waste April 2019 (margins of error for 95% confidence interval)		% of total	Weight per MGB
Paper	Recyclable	5.6% (±1.7%)	1.42 kg (±0.42 kg)
	Non-recyclable	1.4% (±0.7%)	0.36 kg (±0.18 kg)
	<b>Subtotal</b>	<b>7.1% (±1.9%)</b>	<b>1.78 kg (±0.47 kg)</b>
Plastics	# 1-2 bottles	1.2% (±0.5%)	0.29 kg (±0.13 kg)
	#1-2 trays punnets	0.5% (±0.1%)	0.12 kg (±0.04 kg)
	#3-7 containers	0.6% (±0.2%)	0.16 kg (±0.04 kg)
	Non-recyclable containers	0.6% (±0.2%)	0.14 kg (±0.04 kg)
	Plastic bags/film	3.1% (±0.5%)	0.77 kg (±0.14 kg)
	Other non-recyclable	2.1% (±1.4%)	0.52 kg (±0.35 kg)
	<b>Subtotal</b>	<b>8.0% (±1.6%)</b>	<b>2.01 kg (±0.40 kg)</b>
Organics	Kitchen waste	21.1% (±4.1%)	5.31 kg (±1.04 kg)
	Greenwaste	32.8% (±10.5%)	8.23 kg (±2.64 kg)
	Multimaterial/other	3.0% (±2.1%)	0.75 kg (±0.52 kg)
	<b>Subtotal</b>	<b>56.9% (±11.2%)</b>	<b>14.29 kg (±2.82 kg)</b>
Ferrous metals	Steel cans	0.7% (±0.3%)	0.17 kg (±0.07 kg)
	Steel other	1.2% (±1.5%)	0.31 kg (±0.38 kg)
	<b>Subtotal</b>	<b>1.9% (±1.5%)</b>	<b>0.48 kg (±0.37 kg)</b>
Non ferrous metals	Aluminium cans	0.4% (±0.2%)	0.10 kg (±0.05 kg)
	Other non-ferrous	0.3% (±0.2%)	0.08 kg (±0.05 kg)
	<b>Subtotal</b>	<b>0.7% (±0.3%)</b>	<b>0.17 kg (±0.07 kg)</b>
Glass	Bottles/jars	4.8% (±3.7%)	1.21 kg (±0.93 kg)
	Non-recyclable	3.1% (±5.1%)	0.78 kg (±1.28 kg)
	<b>Subtotal</b>	<b>7.9% (±6.1%)</b>	<b>1.98 kg (±1.54 kg)</b>
Textiles	Clothing/textiles	0.7% (±0.3%)	0.17 kg (±0.09 kg)
	Multimaterial/other	0.8% (±0.5%)	0.20 kg (±0.12 kg)
	<b>Subtotal</b>	<b>1.5% (±0.6%)</b>	<b>0.38 kg (±0.16 kg)</b>
Sanitary paper		<b>4.0% (±3.0%)</b>	<b>1.01 kg (±0.75 kg)</b>
Rubble		<b>3.7% (±2.9%)</b>	<b>0.93 kg (±0.73 kg)</b>
Timber		<b>6.1% (±7.9%)</b>	<b>1.52 kg (±1.97 kg)</b>
Rubber		<b>0.1% (±0.0%)</b>	<b>0.01 kg (±0.01 kg)</b>
Potentially hazardous	Household	0.7% (±0.7%)	0.18 kg (±0.19 kg)
	Other	1.5% (±2.4%)	0.37 kg (±0.61 kg)
	<b>Subtotal</b>	<b>2.2% (±2.5%)</b>	<b>0.55 kg (±0.62 kg)</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>25.11 kg (±2.89 kg)</b>



## Appendix 7 - Omarunui Landfill

Omarunui Landfill - General waste direct to landfill - Excludes transfer station waste, special waste, and kerbside collections - 18 March - 10 May 2019		% of total	Tonnes per week
<b>Paper</b>	Recyclable	2.9%	15 T/week
	Cardboard	3.3%	16 T/week
	Non-recyclable	3.8%	19 T/week
	<b>Subtotal</b>	<b>10.0%</b>	<b>50 T/week</b>
<b>Plastics</b>	Recyclable	1.3%	7 T/week
	Non-recyclable	21.0%	106 T/week
	<b>Subtotal</b>	<b>22.3%</b>	<b>112 T/week</b>
<b>Organics</b>	Kitchen waste	12.2%	62 T/week
	Compostable greenwaste	2.2%	11 T/week
	Non-compostable greenwaste	2.6%	13 T/week
	Organic other	2.2%	11 T/week
	<b>Subtotal</b>	<b>19.3%</b>	<b>97 T/week</b>
<b>Ferrous metals</b>	Primarily ferrous	1.5%	7 T/week
	Multimaterial/other	1.3%	6 T/week
	<b>Subtotal</b>	<b>2.7%</b>	<b>14 T/week</b>
<b>Non-ferrous metals</b>		<b>0.5%</b>	<b>3 T/week</b>
<b>Glass</b>	Recyclable	0.7%	4 T/week
	Non-recyclable	1.2%	6 T/week
	<b>Subtotal</b>	<b>1.9%</b>	<b>9 T/week</b>
<b>Textiles</b>	Clothing/textiles	1.4%	7 T/week
	Multimaterial/other	6.0%	30 T/week
	<b>Subtotal</b>	<b>7.4%</b>	<b>37 T/week</b>
<b>Sanitary paper</b>		<b>5.8%</b>	<b>29 T/week</b>
<b>Rubble</b>	Cleanfill	1.0%	5 T/week
	New plasterboard	0.1%	0 T/week
	Other	11.5%	58 T/week
	<b>Subtotal</b>	<b>12.6%</b>	<b>63 T/week</b>
<b>Timber</b>	Reusable	0.1%	0 T/week
	Unpainted & untreated	7.9%	40 T/week
	Non-recoverable	6.7%	34 T/week
	<b>Subtotal</b>	<b>14.7%</b>	<b>74 T/week</b>
<b>Rubber</b>		<b>1.2%</b>	<b>6 T/week</b>
<b>Potentially hazardous</b>		<b>1.6%</b>	<b>8 T/week</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>503 T/week</b>

Omarunui Landfill - General and special waste direct to landfill -- By activity source of waste load - 18 March - 10 May 2019		C&D	ICI	Special
Paper	Recyclable	0.0%	3.4%	0.0%
	Cardboard	0.5%	3.7%	0.0%
	Non-recyclable	0.1%	4.3%	0.0%
	<b>Subtotal</b>	<b>0.6%</b>	<b>11.3%</b>	<b>0.0%</b>
Plastics	Recyclable	0.0%	1.5%	0.0%
	Non-recyclable	0.8%	23.8%	0.0%
	<b>Subtotal</b>	<b>0.8%</b>	<b>25.3%</b>	<b>0.0%</b>
Organics	Kitchen waste	0.0%	14.0%	0.0%
	Compostable greenwaste	0.0%	2.5%	0.0%
	Non-compostable greenwaste	0.0%	3.0%	0.0%
	Organic other	0.0%	2.5%	17.2%
	<b>Subtotal</b>	<b>0.0%</b>	<b>22.0%</b>	<b>17.2%</b>
Ferrous metals	Primarily ferrous	0.4%	1.6%	0.0%
	Multimaterial/other	0.1%	1.4%	0.0%
	<b>Subtotal</b>	<b>0.4%</b>	<b>3.0%</b>	<b>0.0%</b>
Non-ferrous metals		<b>0.0%</b>	<b>0.6%</b>	<b>0.0%</b>
Glass	Recyclable	0.0%	0.8%	0.0%
	Non-recyclable	0.0%	1.3%	0.0%
	<b>Subtotal</b>	<b>0.0%</b>	<b>2.2%</b>	<b>0.0%</b>
Textiles	Clothing/textiles	0.0%	1.6%	0.0%
	Multimaterial/other	0.1%	6.8%	0.0%
	<b>Subtotal</b>	<b>0.1%</b>	<b>8.4%</b>	<b>0.0%</b>
Sanitary paper		<b>0.0%</b>	<b>6.6%</b>	<b>0.0%</b>
Rubble	Cleanfill	6.4%	0.2%	0.0%
	New plasterboard	0.5%	0.0%	0.0%
	Other	48.5%	6.3%	0.0%
	<b>Subtotal</b>	<b>55.4%</b>	<b>6.6%</b>	<b>0.0%</b>
Timber	Reusable	0.2%	0.0%	0.0%
	Unpainted & untreated	16.7%	6.6%	0.0%
	Non-recoverable	25.5%	4.1%	0.0%
	<b>Subtotal</b>	<b>42.4%</b>	<b>10.8%</b>	<b>0.0%</b>
Rubber		<b>0.2%</b>	<b>1.4%</b>	<b>0.0%</b>
Potentially hazardous		<b>0.0%</b>	<b>1.9%</b>	<b>82.8%</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Omarunui Landfill - Overall waste to landfill - 18 March - 10 May 2019		% of total	Tonnes per week	Tonnes per annum (Indicative only)
Paper	Recyclable	3.3%	57 T/week	2,913 T/annum
	Cardboard	2.0%	34 T/week	1,747 T/annum
	Non-recyclable	1.8%	32 T/week	1,645 T/annum
	<b>Subtotal</b>	<b>7.0%</b>	<b>123 T/week</b>	<b>6,306 T/annum</b>
Plastics	Recyclable	1.1%	20 T/week	1,008 T/annum
	Non-recyclable	10.9%	190 T/week	9,737 T/annum
	<b>Subtotal</b>	<b>12.0%</b>	<b>210 T/week</b>	<b>10,745 T/annum</b>
Organics	Kitchen waste	14.7%	256 T/week	13,121 T/annum
	Compostable greenwaste	8.0%	139 T/week	7,112 T/annum
	Non-compostable greenwaste	1.7%	29 T/week	1,504 T/annum
	Organic other	4.5%	79 T/week	4,033 T/annum
	<b>Subtotal</b>	<b>28.8%</b>	<b>504 T/week</b>	<b>25,771 T/annum</b>
Ferrous metals	Primarily ferrous	1.0%	18 T/week	924 T/annum
	Multimaterial/other	1.3%	22 T/week	1,137 T/annum
	<b>Subtotal</b>	<b>2.3%</b>	<b>40 T/week</b>	<b>2,061 T/annum</b>
Non-ferrous metals		<b>0.5%</b>	<b>10 T/week</b>	<b>488 T/annum</b>
Glass	Recyclable	1.7%	29 T/week	1,507 T/annum
	Non-recyclable	1.3%	23 T/week	1,199 T/annum
	<b>Subtotal</b>	<b>3.0%</b>	<b>53 T/week</b>	<b>2,706 T/annum</b>
Textiles	Clothing/textiles	1.3%	22 T/week	1,129 T/annum
	Multimaterial/other	4.0%	70 T/week	3,603 T/annum
	<b>Subtotal</b>	<b>5.3%</b>	<b>92 T/week</b>	<b>4,732 T/annum</b>
Sanitary paper		<b>4.4%</b>	<b>77 T/week</b>	<b>3,961 T/annum</b>
Rubble	Cleanfill	1.0%	18 T/week	925 T/annum
	Plasterboard	0.4%	6 T/week	327 T/annum
	Other	6.6%	116 T/week	5,932 T/annum
	<b>Subtotal</b>	<b>8.0%</b>	<b>140 T/week</b>	<b>7,183 T/annum</b>
Timber	Unpainted & untreated	0.3%	6 T/week	294 T/annum
	Fabricated	3.9%	69 T/week	3,508 T/annum
	Non-recoverable	8.8%	154 T/week	7,882 T/annum
	<b>Subtotal</b>	<b>13.1%</b>	<b>228 T/week</b>	<b>11,684 T/annum</b>
Rubber		<b>0.6%</b>	<b>10 T/week</b>	<b>519 T/annum</b>
Potentially hazardous		<b>14.9%</b>	<b>260 T/week</b>	<b>13,299 T/annum</b>
<b>TOTAL</b>		<b>100.0%</b>	<b>1,748 T/week</b>	<b>89,455 T/annum</b>

## Appendix 8 - Kerbside waste classifications

Primary category	Secondary category	Definition
<b>Paper</b>	Recyclable paper	Paper bags, magazines, cardboard boxes, newspapers, junk mail
	Non-recyclable paper	Non-recyclable paper packaging (e.g. food contaminated), photographic paper, playing cards, laminated paper, etc.
<b>Plastics</b>	#1-2 bottles	All #1-2 containers other than trays and punnets
	#1-2 trays & punnets	#1-2 trays and punnets only
	#3-7 containers	Only containers with #3-7 recycling logos
	Non-recyclable containers	Containers with no logo, expanded polystyrene meat trays, multi-material plastic containers, paint, engine oil and chemical containers,
	Plastic bags/film	All soft plastics and film
	Multimaterial/ other	All other materials made of plastic
<b>Organics</b>	Kitchen waste	All kitchen waste
	Green waste	All organic garden waste
	Organic other	All other primarily organic items - includes cat tray litter, hair, vacuum cleaner bags
<b>Ferrous metals</b>	Steel cans	All steel cans, including aerosol cans
	Non-recyclable	All other items made primarily of ferrous metal
<b>Non-ferrous metals</b>	Aluminium cans	All aluminium cans, including aerosols
	Non-recyclable	All other items made primarily of non-ferrous metal
<b>Glass</b>	Glass bottles/jars	All bottles and jars, emptied with the lids and contents removed
	Non-recyclable	All other items made primarily of glass, includes light bulbs, drinking glasses, and window glass
<b>Textiles</b>	Clothing & textile	All items primarily made of a fabric, such as clothes, curtains
	Multimaterial/other	Includes shoes, backpacks, handbags, rugs
<b>Sanitary paper</b>		Includes disposable nappies, paper towels, tissues
<b>Rubble, concrete</b>		All concrete, rubble and soil
<b>Timber</b>		All items made primarily of timber
<b>Rubber</b>		All items made primarily of rubber (e.g. kitchen gloves)
<b>Potentially hazardous</b>	Household	Batteries, aerosol cans, medicines and cosmetics, cleaning agents
	Other	Potentially hazardous items not associated with domestic activity, such as used oil and garden chemicals.

## Appendix 9 - Visual survey waste classifications

Primary category	Secondary category	Description
<b>Paper</b>	Recyclable	Newspapers, magazines, office paper, etc.
	Cardboard	Kraft cartons
	Non-recyclable	Multimaterials, Tetra Paks, contaminated paper
<b>Plastics</b>	Recyclable	Containers with recycling logo 1-2
	Non-recyclable	Other types of plastic and primarily plastic multimaterials
<b>Organic</b>	Kitchen/food	Food and food preparation waste
	Compostable greenwaste	Tree branches up to 400 mm, small tree stumps
	Non-compostable greenwaste	Flax, cabbage tree, palm fronds
	Other organic	Organic matter such as meat processing waste
<b>Ferrous metals</b>	Primarily ferrous	Items made primarily of steel
	Multimaterial/other	Ferrous items containing a sizable proportion of other materials
<b>Nonferrous metals</b>	Primarily nonferrous	Items made primarily of nonferrous metal
<b>Glass</b>	Recyclable	Bottles and jars
	Non-recyclable	Includes glass pane, CRT TVs, and computer monitors
<b>Textiles</b>	Clothing/textile	Items made primarily of cloth or textiles
	Multimaterial/other	Items containing some textile and other materials, such as carpets, shoes, backpacks, suitcases
<b>Sanitary paper</b>	None	Sanitary materials such as nappies, paper towels, feminine hygiene products
<b>Rubble</b>	Cleanfill	All materials suitable for cleanfill disposal
	New plasterboard	Off-cuts of new plasterboard
	Other	Other materials such as soil, ceramics, old plasterboard
<b>Timber</b>	Reusable	Lengths of timber and pieces of sheet suitable for reuse
	Unpainted & untreated	Unpainted and untreated lengths of timber
	Non-recoverable	Sawdust, construction and demolition debris, CCA treated wood
<b>Rubber</b>	None	All items made primarily of rubber such as tyres, latex foam mattresses
<b>Potentially hazardous</b>	None	Material with potentially toxic or ecotoxic properties or having properties requiring special disposal techniques.

## Appendix 10 - Types of waste collection vehicles

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### FRONT-LOADER TRUCKS

“Front-loaders” are top-loading compactors that use forks mounted to the front of the vehicle to lift bins over the cab and tip the contents of the bin into the compactor unit at the rear. Front-loaders work primarily in urban areas, regularly servicing medium to large-scale industrial, commercial, and institutional customers. In general, a business using front-loader bins would be serviced at least weekly, but can be serviced several times a day for a business like a large supermarket. Front-loaders vary in size, and may carry loads from 4 to 10 tonnes. A single load may contain waste from ten to fifty customers.



The potential for the recovery of materials from waste transported by front-loaders is limited. The waste load is compacted by the truck, and the loads tend to be large and heterogeneous. This restricts significantly the potential for manually separating recoverable materials when the load is discharged on a tipping floor. There are usually not significant quantities of easily-separable materials other than cardboard packaging in front-loader refuse.

### GANTRY TRUCKS

“Gantry trucks” are used to transport gantry bins (skip bins) from customers’ premises to a disposal facility. Gantry truck services are used by industrial, commercial, institutional, and residential customers. Some large-scale commercial waste generators use gantry bins as their regular disposal system. Residential customers and business customers both use gantry bins for one-off large-scale refuse removal. Some commercial customers, such as hotels and supermarkets, use portable, stationary refuse compactors that are transported for disposal by gantry trucks. Gantry bins are often used for special wastes, such as sludges, asbestos, and animal by-products



Typical gantry truck loads weigh from 0.5-3 tonnes. As most refuse transported in gantry bins is not compacted, there is often opportunity for manually recovering materials from gantry bins when discharged onto a tipping floor. Gantry bins often contain significant quantities of recoverable materials, such as timber and packaging and reusable items can be recovered intact from residential loads.

#### **KERBSIDE COLLECTION COMPACTORS**

Side-loading and rear-loading compactors are commonly used for the kerbside collection of residential and small business refuse. They can be designed to service rubbish bag collections, wheelie bin refuse collections, or both. Side-loading compactors can be used for bag collections or fitted with hydraulic arms for emptying wheelie bins without the driver leaving the vehicle. Rear-loading compactors can also be used for bag collections or fitted with hydraulic arms for emptying bins.



As kerbside collection vehicles collect small quantities of refuse from a large number of customers and the refuse is heavily compacted, there is little opportunity for manually recovering materials from the refuse.

#### **OTHER TRUCKS**

Other truck types commonly used for the transport of waste include tip trucks, box trucks, and flat decks. Tip trucks are most commonly used for the transport of waste from landscaping, earthworks, and construction and demolition activity. Box trucks are rarely used as dedicated waste transport vehicles, but are often used for waste transport by businesses that also use them for goods pick-up and delivery. Flat decks are used for the transport of bulky waste items, or by general carriers for the disposal of stackable items, such as pallets.