WasteNot Consulting

Analysis of the Composition of Solid Waste in Queenstown Lakes District

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Queenstown Lakes District Council

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1 Introduction

Waste Management NZ Ltd (WMNZL) is contracted to Queenstown Lakes District Council (Council) to collect kerbside rubbish and recycling throughout Queenstown Lakes District, manage the Frankton and Wanaka transfer stations, and operate the materials recovery facility in Queenstown, which processes the kerbside recycling.

The contract requires WMNZL to undertake, on behalf of Council, three-yearly surveys of waste disposed of at the District's transfer stations and compositional audits of kerbside rubbish and recycling. The contract also stipulates that these audits and surveys be based on the methodologies recommended by the Ministry for the Environment's Solid Waste Analysis Protocol 2002 (SWAP).

In November 2019, Waste Not Consulting Ltd was engaged to conduct a six-day sort-and-weigh audit of kerbside rubbish and recycling in the District and two four-day visual surveys of the composition of waste disposed of at the refuse transfer stations (RTS) and landfill.

The kerbside rubbish and recycling audit took place from 4-11 December 2019. The results of the audit are presented in section 3.

The first of the two visual surveys at Wanaka and Frankton refuse transfer stations took place from 2-5 February 2020. The second visual survey took place from 23-26 September 2020. The results of the surveys are presented in sections 4.1 and 4.2.

The results of the audit and surveys are combined with weighbridge data from Victoria Flats landfill in sections 5 and 6 to provide an overview of the composition of all waste disposed of to landfill from Queenstown Lakes District.

Waste Not Consulting has previously undertaken visual surveys of waste at Wanaka and Frankton transfer stations in 2004, 2006, 2008, 2012, and 2016. The results of the 2020 surveys are compared to those of earlier survey in section 7.3.

1.1 Effects of Covid-19 on RTS surveys

The first visual survey of waste disposed of at Wanaka and Frankton took place in February 2020, a month before New Zealand entered Covid-19 Alert Level 4. The country moved to Alert Level 1 on 8 June. On 12 August, Auckland returned to Alert Level 3 and the rest of the country to Alert Level 2. On 21 September, all of the country, other than Auckland, returned to Alert Level 1, as did Auckland on 7 October. The second visual survey took place in September 2020, when all of the country, other than Auckland was at Alert Level 1.

While many types of economic activity were severely disrupted by the move into Alert Level 4, there was a relatively rapid recovery in many sectors when the lockdown ended. The disruption was particularly acute in Queenstown Lakes District, reliant as the District's economy is on tourism. While domestic tourism increased when the country moved from Alert Level 3 to Alert Level 2, international tourism remained severely restricted.

The generation and disposal of waste is directly correlated with the type and level of economic activity occurring in an area. One of the two visual surveys in Queenstown Lakes District took place before the lockdowns, when economic activity was potentially at its peak for the year, and the other survey was conducted in a period when the economy was in a

recovery mode. The surveys, as a result, showed significant differences in the quantity of waste generated by some types of activity, such as construction, but smaller differences for others, such as domestic activity.

The figure below presents the monthly tonnes of levied waste to Class 1 landfills in New Zealand from October 2019 to September 2020.

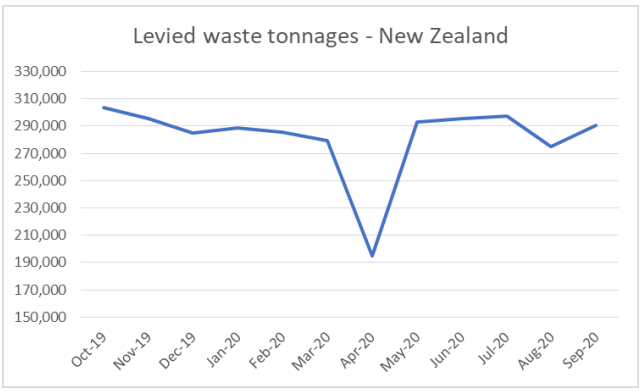

Figure 1.1 - Monthly tonnages of waste to Class 1 landfills - NZ

The graph of levied waste tonnages shows a sharp decrease in waste to landfill during the March lockdown, followed by sharp increase when the lockdown was lifted to slightly higher than before the lockdown, with a small decrease during the Auckland-only lockdown.

As the pre- and post-lockdown tonnages are roughly similar, the data from the two RTS visual surveys will be combined in this report to represent an 'average' weekly tonnage. Where appropriate, the results of the two surveys will be compared in the body of the report. For other data, the results of the two surveys will be presented separately in the appendices.

As the tonnages of waste to landfill during the first lockdown are clearly anomalous, no attempt has been made in this report to annualise any of the data.

1.2 Waste disposal services in Queenstown Lakes District

From 1 July 2019, Council introduced new residential kerbside rubbish and recycling collection services, based on a rates funded model. WMNZL has been contracted by Council to provide the service. The collections are available in Glenorchy, Kingston, Queenstown, Wakatipu, and Wanaka areas. Only properties that include a residential dwelling are eligible for the services.

Every residential property is supplied with:

- A 240-litre mixed recycling bin, collected fortnightly, for cardboard, paper, cans, plastic bottles, and plastic containers #1-7
- A 140-litre glass recycling bin, collected fortnightly, which is to be used for glass bottles and jars only
- A 140-litre rubbish bin, collected weekly, which is to be used for anything that can't be recycled.

Properties rated as 'commercial' or 'accommodation' are required to engage a commercial waste collector. Commercial waste collections are offered by All Waste, SJ Allen Holdings, Smart Environmental, and WMNZL. These companies offer services based on wheelie bins, front-loader bins, or gantry bins.

Council owns and provides for the operation of the Frankton and Wanaka refuse transfer stations, which are operated, under contract, by WMNZL. All waste disposed of at the transfer stations is transported to the landfill at Victoria Flats.

Victoria Flats landfill is operated by Scope Resources Ltd. Waste from the Cromwell and Alexandra refuse transfer stations (in Central Otago District) is also disposed of at Victoria Flats landfill.

The Frankton transfer station is located on Glenda Drive, in Frankton Industrial Estate. The Frankton transfer station is open seven days a week during the hours of 8:00 am to 5:00 pm. The facility has a separate drop-off point for greenwaste and bins are available for metal and cleanfill. The transfer station has no drop-off facilities for the recycling of cardboard or containers, but these materials can be disposed of at the adjoining Wakatipu Recycling Centre.

The Wanaka transfer station is located on Ballantyne Road, Wanaka, and operates seven days a week, between the hours of 8:00 am to 5:00 pm. The facility has a separate greenwaste drop-off and drop-off areas for metal, whiteware, and tyres. The adjoining Wanaka Wastebusters resource recovery centre accepts recyclable and reusable materials for recycling and reselling, and the adjacent Wanaka Green Waste Depot accepts greenwaste for composting.

Vehicles with loads over 200 kg entering both the Frankton and Wanaka transfer stations are required to be weighed when entering and again when leaving and are charged by the tonne for disposal. Traffic movements through the weighbridges are recorded by either licence plate numbers or vehicle identity numbers. Small loads of less than 200 kg may not be weighed, but charged at a flat rate based on volume. Disposal charges at both of the transfer stations are shown in the photo.

1.3 Note on presentation of data in tables and figures

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

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

2 Methodologies

2.1 Visual surveys of vehicle loads of waste at RTS

The methodology for the visual survey was designed to be consistent with the guidelines set out in section 5.4 of Procedure Two: Classification at Disposal Facility of the Ministry for the Environment's Solid Waste Analysis Protocol 2002 (SWAP).

Visual surveying provides information on vehicle loads of waste entering a disposal facility in terms of composition of the waste load and the activity source (including landscaping, residential, and construction and demolition).

The composition of waste is based on the 12 primary categories (such as paper, plastics, timber.) recommended by the SWAP. Further secondary categories were chosen after consultation with Council. A description of the categories is provided in Appendix 3.

The activity sources of waste used for the visual surveys were those recommended by the National Waste Data Framework.

2.1.1 Survey schedule

The visual surveys were undertaken over two four-day periods as per the following schedule. On two of the days, the survey started at the Wanaka RTS in the morning then moved to the Frankton RTS in the afternoon.

Table 2-1 – SWAP survey schedule 2020

Sunday 2 February	Wanaka refuse transfer station Frankton refuse transfer station
Monday 3 February	Frankton refuse transfer station
Tuesday 4 February	Wanaka refuse transfer station
Wednesday 5 February	Frankton refuse transfer station
Wednesday 23 September	Frankton refuse transfer station
Thursday 24 September	Wanaka refuse transfer station
Friday 25 September	Frankton refuse transfer station
Saturday 26 September	Wanaka refuse transfer station Frankton refuse transfer station

2.1.2 Analysing waste streams

For the purpose of analysing waste streams, Waste Not differentiates between kerbside rubbish collections, special waste, transfer station wastes, and general waste. Different methods are used for determining the composition of each waste stream.

Kerbside rubbish collections, in this context, are taken to include both Council and private collections of rubbish bags and wheelie bins from both residential and commercial/industrial properties. The composition of kerbside collections is most accurately determined by sort-and-weigh auditing, rather than by visual surveying techniques. A sort-and-weigh audit of

Queenstown Lakes District kerbside rubbish from residential properties was conducted in December 2019. Data from this audit has been assumed to be representative of the composition of all kerbside rubbish at the time of the two RTS surveys.

There is no precise definition for 'special waste', as these wastes vary between disposal facilities. Special wastes generated in Queenstown Lakes District are likely to include asbestos, biosolids, and wastewater treatment plant screenings. Special wastes from Queenstown Lakes District are taken directly to landfill and are not disposed of at the transfer stations. Biosolids from the wastewater treatment plants are disposed of at AB Lime landfill in Southland.

General waste is considered to be all wastes other than kerbside rubbish collections and special wastes. Visual surveying is used primarily for determining the composition of the general waste stream.

2.1.3 Activity sources

The activity sources that were used for classifying waste loads at Wanaka or Frankton RTS were those recommended by the National Waste Data Framework:

1. **Construction and demolition (C&D)** – waste materials from the construction or demolition of a building
2. **Industrial/commercial/institutional (ICI)** – waste from industrial, commercial, and institutional sources
3. **Kerbside rubbish collection** – waste collected from residential and commercial premises by private and council kerbside rubbish collections
4. **Landscaping and earthworks** – waste from landscaping activity, garden maintenance, and site works, both domestic and commercial
5. **Residential** – all waste originating from residential premises other than that covered by one of the other, more specific classifications (includes drop-offs of bagged domestic waste)
6. **Special wastes** – (usually applies only to waste disposed of directly to landfill) a subjective classification that includes any substantial waste stream (such as biosolids, infrastructural cleanfill, or industrial wastes), that either requires special handling or significantly affects the overall composition of the waste stream and is markedly different from waste streams at other disposal facilities.
7. **Transfer station** – waste entering a facility from another transfer station.

The activity source of each load was assessed and recorded by the surveyor at the same time as the composition was being assessed and recorded. If a load contained materials from more than one activity source, a judgement was made as to which activity source predominated in the load.

2.1.4 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 2.2. Photos and more detailed explanations of the truck types are provided in Appendix 4.

Table 2.2 - Vehicle classification system

Vehicle type	Uses
Car-sized loads	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.
Trailer-sized loads – including vans, small trucks, and utes	Small-medium sized loads, usually from a single source, either commercial or residential, some may be from multiple sources (i.e. a garden contractor)
Kerbside collection compactors	Large load usually from multiple regular sources, either residential or commercial or both combined
Front-loader trucks	Large loads, usually from numerous commercial sources that are regular users
Gantry trucks	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
Hook truck	Large loads, usually from a single source, may be one-off loads or regularly used by a large-scale waste generator.
Other trucks – including tip, box, and flat-deck	Medium to large loads, usually commercial, may be one off - loads or regular waste generators

2.1.5 Survey execution

The visual classification was conducted by a single Waste Not employee over two four-day periods in February and September 2020. As each vehicle to be surveyed entered the tipping area, the surveyor would record the time, the vehicle registration number, and the type of vehicle. Data was not recorded on vehicles disposing of cleanfill, metal, or greenwaste into the separate areas at either RTS designated for their disposal.

With the technique developed by Waste Not for visual waste classification, while each vehicle was being unloaded the surveyor assessed the relative weight of each constituent present in the load (in terms of the secondary classifications given in Appendix 3) on the basis of volume and density. Absolute weights of each material were not estimated; rather, the proportion of weight represented by each material was estimated. These data were 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 sort and weigh surveys of that type of vehicle load, was used as a template for the composition, and was adjusted according to the materials that were visible. For example, a front-loader carrying large amounts of supermarket or restaurant waste was assessed as having a higher-than-average proportion of food waste.

When the visual survey was completed, the data on proportion of weights was combined with weighbridge records of the weight for each load, and a weight for each of the individual materials in the load was calculated. As not all small loads were weighed at the weighbridge, the surveyor made an estimate of the weight for all small loads. These estimated weights

were based on known averages for the specific vehicle and load type from information made available by disposal facilities that weigh every vehicle load entering the facility.

As transfer station staff occasionally remove scrap metal from waste loads at both transfer stations, it was necessary to estimate the proportion of the waste load that was recovered and deduct that amount from the weighbridge weight.

2.1.6 Data for general waste at Victoria Flats landfill

A high proportion of vehicles disposing of waste at Victoria Flats landfill are transporting either transfer station waste or special waste. Fewer than five vehicles per day transport 'general, unclassified' waste. As such, it was not considered cost-effective to have a surveyor gather data at the facility.

General waste is classified at the weighbridge as being either 'commercial' or 'demolition'. As general waste represented only about 15% of all waste disposed of directly to the landfill in July and August 2016, the composition of the two types of waste were assumed to be the same as the corresponding classifications at Frankton transfer station.

For the February 2020 survey, tip face staff of Scope Resources Ltd at Victoria Flats landfill were requested to photograph loads of general waste over a two-week period. These photos were reviewed by Waste Not Consulting to ensure that the assumption regarding the composition of these loads being the same as at Frankton transfer station was appropriate.

As only a small number of photos were taken by staff in the February 2020 survey, the process was not repeated for the September 2020 survey

2.1.7 Data analysis

The raw data collected by the surveyor for each vehicle was cross-referenced with the weighbridge records of the load weight for that vehicle to produce information on the weight of each secondary constituent in each load.

Many loads of mixed waste included a small number of bags of domestic waste. As part of the data-gathering process, the surveyor recorded the number of bags of domestic waste accompanying each load. During the calculation of the waste composition, each bag was assigned a weight of 7 kg and the composition of each bag was assumed to be that determined by the December 2019 sort-and-weigh audit of kerbside rubbish.

For landfill data analysis, vehicles transporting waste from the transfer stations were analysed as a separate vehicle type. For determining the composition of waste entering the landfill, the composition of waste from the Wanaka and Frankton transfer stations was assumed to be that determined by the surveying undertaken at those facilities. The composition of waste from the Alexandra and Cromwell transfer stations has been based on the composition given in the Central Otago District Council's draft Waste Assessment 2011.

As the domestic waste and unclassified mixed waste streams require different management strategies, the analyses of these waste streams are presented separately. In this report, the unclassified mixed waste is referred to as 'general' waste. When combined with the kerbside rubbish collections (and, in the case of the landfill, any transfer station waste and special wastes), the waste stream is referred to as the 'overall' waste stream. A generic waste flow diagram illustrating this method of data analysis is presented in Figure 2-1.

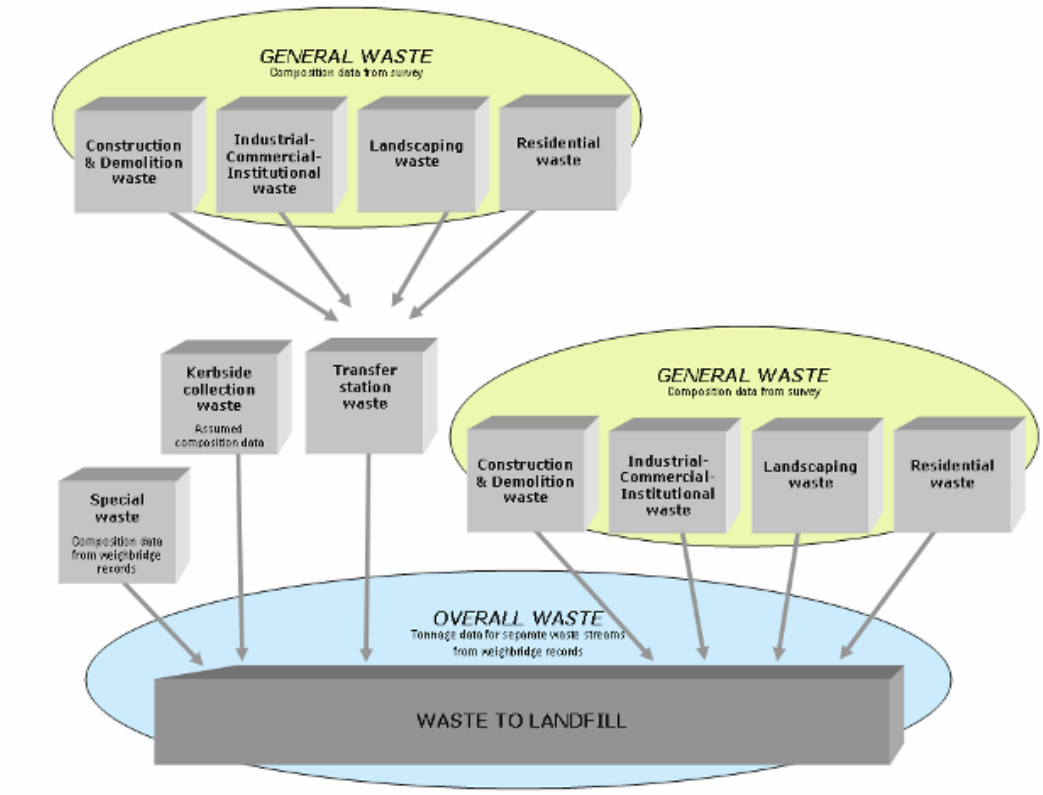

Figure 2-1 - Generic waste flow diagram

2.2 Sort-and-weigh audit of kerbside rubbish and recycling

The kerbside rubbish and recycling audit involved the collection and sorting of materials over a six-day period, from 4-11 December 2019. Each weekday, a sample of kerbside rubbish and either mixed recycling or glass recycling was collected. The samples were collected in Queenstown, Arrowtown, and Wanaka. Samples of both mixed recycling and glass recycling were collected in Queenstown and Wanaka.

All materials were taken to Frankton transfer station in Queenstown for sorting. The kerbside rubbish, mixed recycling, and glass recycling, were sorted separately into classifications determined in consultation with WMNZL and Council. A total of 4,065 kg of materials were sorted during the course of the audit, an average of 678 kg per day.

2.2.1 Sample size

A 'standard' kerbside rubbish SWAP audit is usually three to five days in length, with the equivalent of 60 x 140-litre wheelie bins (about 700kg) of waste being sorted and weighed each day. Such an audit usually gives results of a reasonable level of precision for three to five of the twelve primary categories recommended by the SWAP.

However, as the Queenstown Lakes District audit was designed to include three different materials (rubbish, mixed recycling, and glass recycling), a longer, six-day audit was undertaken. Both kerbside rubbish and either glass or mixed recycling were collected each day.

While the productivity of a team of four at sorting kerbside rubbish is known, prior to the audit it was uncertain how long it would take to sort and weigh mixed recycling or glass recycling. As an initial guideline, it was proposed that each day of auditing would include:

- the contents of 40 x 140-litre rubbish wheelie bins
- the contents of 30 mixed recycling or glass recycling wheelie bins

Based on these initial estimates, over the course of the six-day audit the following would have been sorted and weighed:

- the contents of 240 waste wheelie bins (229 were actually sorted)
- the contents of 90 mixed recycling wheelie bins (76 were actually sorted)
- the contents of 90 glass recycling wheelie bins (72 were actually sorted).

2.2.2 Sampling strategy and execution

The composition of residential kerbside rubbish and recycling, and the quantity generated per household, can vary according to a number of factors, including the socio-economic status of the householders, the occupancy rate per household, the nature of the housing stock, the size of the property, and the range of disposal and recycling services available.

Accordingly, to obtain a representative sample of residential kerbside rubbish and recycling from Queenstown Lakes District, the sample was collected from a range of communities in Queenstown, Arrowtown, and Wanaka. The sample was collected only from residential properties. Commercial properties were not included in the sample.

Each day's sample was collected from a range of streets in that day's Council collection area. The sample is usually collected from 8-10 streets each day, selected at random while driving through the area. However, due to the size of the vehicle used for the collection, it was difficult to locate safe sites to load the sample, and the sample was taken from a smaller number of streets.

The sample was collected on six weekdays, from Wednesday 4 December through Wednesday 11 December. The Wanaka sample was collected on Friday 6 December and Tuesday 10 December. This allowed for mixed recycling to be collected in Wanaka in the first week and glass recycling to be collected in the second week.

The sample collection started at 7:00 each morning and took approximately 2-2.5 hours.

The sampling was undertaken by a team of two in a box truck provided by WMNZL. The truck driver, also provided by WMNZL, assisted a Waste Not supervisor with the collection. The contents of all wheelie bins sampled were emptied individually into large plastic bags and labelled to identify whether the material was waste or recycling. The empty wheelie bins were left on the kerbside with the lid open.

2.2.3 Audit execution

The collected sample was transported to Frankton transfer station each morning for sorting. A team of four, comprising one supervisor from Waste Not and three casual staff (supplemented by Council staff), was used for the sorting process.

The contents of rubbish and mixed recycling wheelie bins were sorted in sampling units of four bins. Each bag of material in each sampling unit of four was weighed individually, opened, the contents spread on a sorting table, and the 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 glass recycling bins were sorted as a single unit. All bags were weighed in and then all glass beverage bottles were separated from other materials. The other materials were then sorted into the remaining categories and weighed out. The weight of glass beverage bottles was calculated by subtracting the weight of the other categories from the incoming weights.

2.2.4 Classification of kerbside rubbish and recycling

Council had requested that the classifications used for sorting rubbish and recycling would assist with assessing the impact that a container return scheme could have on Council's kerbside collections. Appropriate classifications were included in both sets of classifications (one set for rubbish, the other for recycling). The definition that was used for containers that might be included in a container return scheme was 'All 'ready-to-drink' beverage containers (including milk) over 300ml and under 3 litres'.[1]

The kerbside rubbish sample was sorted into the 12 primary categories identified in the SWAP and 26 secondary categories. The secondary categories used for the rubbish sorting are presented in Appendix 1. The classifications were chosen to identify the different types of recyclable and compostable materials present in the rubbish. The definitions for each classification were based on what materials were described in Council's educational material and/or were acceptable to WMNZL's materials recovery facility. These definitions were finalised in consultation with WMNZL and Council.

The classifications for sorting mixed recycling and glass recycling are provided in Appendix 2.

As all data was collected by weight, to assess the potential effects of a container return scheme it was necessary to determine average weights per item for each of the relevant classifications. Data for these conversion factors was gathered by counting and weighing an appropriate number of containers. This data was augmented with data from other, unreleased research previously undertaken by Waste Not Consulting.

[1] Envision New Zealand (2015) The InCENTive to Recycle - The Case for a Container Deposit System in New Zealand

Photo 2.1 - One day's sample from Council kerbside rubbish wheelie bins

Photo 2.2 - Audit equipment set up in marquee

Photo 2.3 - Sorting rubbish from Council kerbside rubbish wheelie bins

3 Kerbside rubbish and recycling audit

3.1 Kerbside rubbish audit

A total of 229 kerbside rubbish wheelie bins were sorted for the audit. The sorted rubbish weighed 2,607 kg.

3.1.1 Kerbside rubbish - Primary composition

The primary composition of kerbside rubbish wheelie bins is presented in Table 3.1 below and Figure 3.1 on the following page. The secondary composition, which includes all 26 categories and a statistical analysis of the results, is given in section 3.1.4.

Table 3.1 - Primary composition of kerbside rubbish wheelie bins - 4-11 December 2019

Queenstown Lakes District - Kerbside rubbish - December 2019 (margins of error for 95% confidence level)	Proportion of total		Mean wt. per wheelie bin	
Paper	7.8%	(±2.1%)	0.89 kg	(±0.23 kg)
Plastics	10.6%	(±0.8%)	1.20 kg	(±0.10 kg)
Organics	54.3%	(±5.6%)	6.18 kg	(±0.63 kg)
Ferrous metals	1.9%	(±0.6%)	0.21 kg	(±0.07 kg)
Non-ferrous metals	1.2%	(±0.4%)	0.14 kg	(±0.04 kg)
Glass	2.4%	(±0.6%)	0.27 kg	(±0.07 kg)
Textiles	4.8%	(±1.2%)	0.54 kg	(±0.14 kg)
Sanitary paper	7.5%	(±2.2%)	0.86 kg	(±0.25 kg)
Rubble	5.0%	(±2.9%)	0.57 kg	(±0.33 kg)
Timber	3.2%	(±1.9%)	0.37 kg	(±0.22 kg)
Rubber	0.3%	(±0.2%)	0.03 kg	(±0.02 kg)
Potentially hazardous	1.0%	(±0.3%)	0.12 kg	(±0.03 kg)
TOTAL	**100.0%**		**11.38 kg**	**(±0.71 kg)**

Organic material, primarily kitchen waste, was the largest single component of kerbside rubbish wheelie bins, comprising 54.3% of the total of 11.38 kg in the average wheelie bins. The average wheelie bin contained 6.18 kg of organic materials.

Plastics, representing 10.6% of the total, was the second largest component. Paper was the third largest component, at 7.8%, and Sanitary paper the fourth largest, at 7.5%.

The two largest components of kerbside rubbish are discussed in greater detail in the following sections.

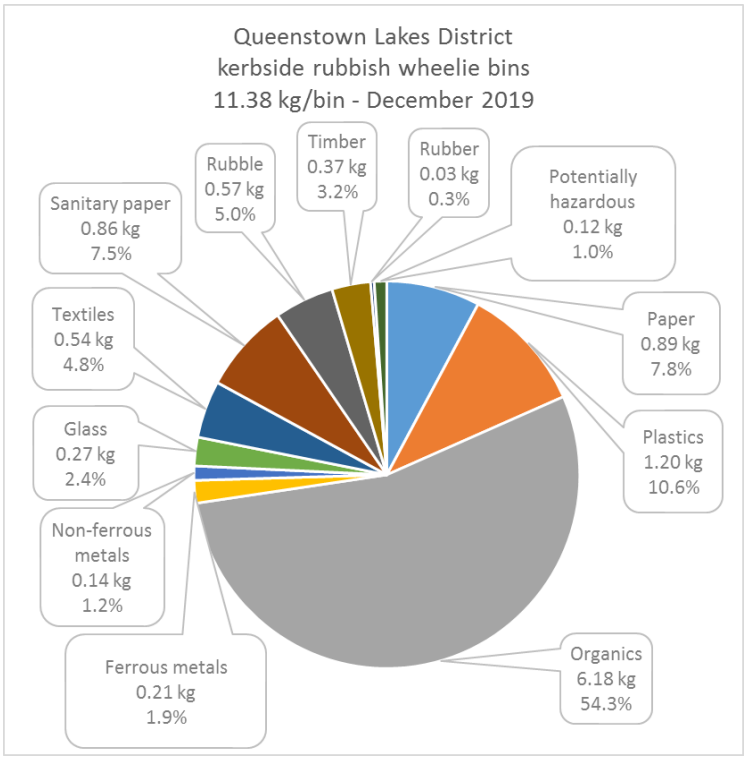

Figure 3.1 - Primary composition of kerbside rubbish - 4-11 December 2019

3.1.2 Organic matter in kerbside rubbish wheelie bins

Organic matter comprised 54.3% of the weight of all kerbside rubbish. The composition of the organic constituent of the rubbish is shown in Figure 3.2 below. 'Kitchen waste' compromised 62% of the organic material, an average of 3.85 kg per wheelie bin. Kitchen waste included food preparation waste, left-over food waste, and substantial quantities of perished goods. Greenwaste comprised 34% of organic material, or 2.07 kg per wheelie bin.

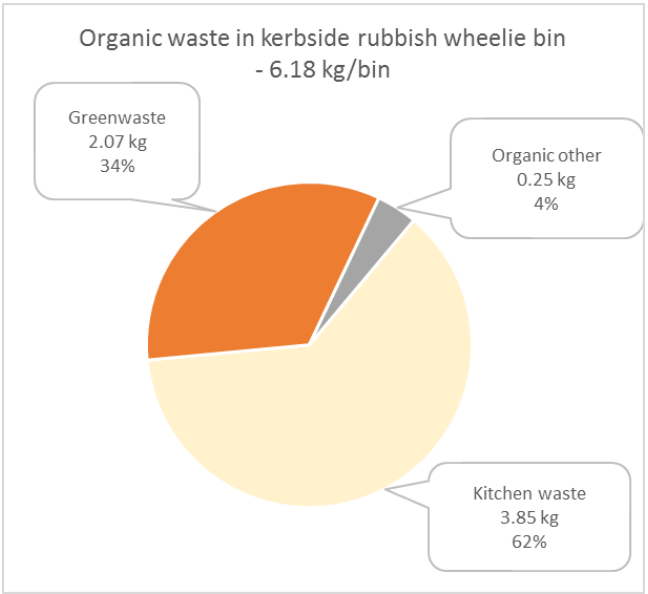

Figure 3.2 - Organic component of kerbside rubbish wheelie bins

The 'Other organic' material (4%) included vacuum cleaner dust, animal faeces, candles, fireplace ash, and human hair. Much of this material would be suitable for composting.

Photo 3.1 - Kitchen waste from four wheelie bins

Photo 3.2 - Greenwaste from a single wheelie bin

3.1.3 Plastics in kerbside rubbish wheelie bins

Plastics comprised 10.6% of material in the kerbside rubbish wheelie bins. Each bin contained an average of 1.20 kg of plastics. The composition of the plastics constituent of the rubbish is shown in Figure 3.3.

Plastic bags & film (soft plastics), shown in Photo 3.3 on the next page, were the major component of plastics in kerbside rubbish, comprising 51% of all plastics. Other types of non-recyclable plastic were the second largest component, comprising 33% of all plastics.

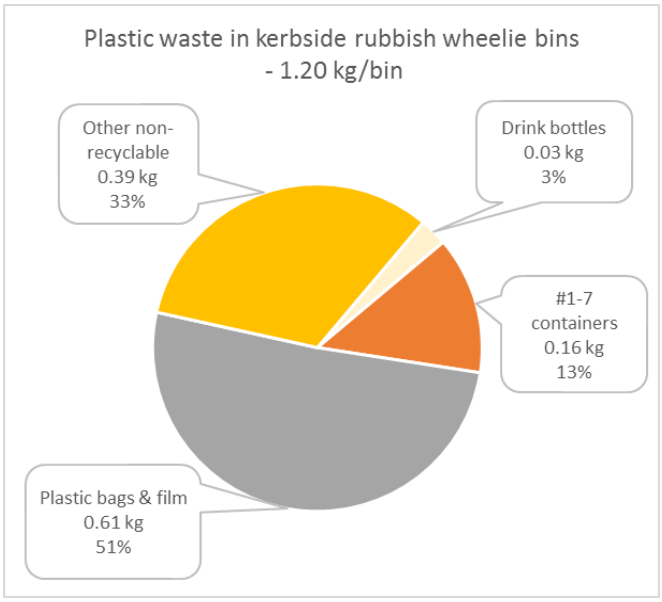

Figure 3.3 - Plastics component of kerbside rubbish wheelie bins

Photo 3.3 - Plastic bags & film from four rubbish wheelie bins

3.1.4 Kerbside rubbish - Secondary composition

Queenstown Lakes District - Kerbside rubbish - December 2019 (margins of error for 95% confidence level)		**% of total weight**	**Kg per rubbish wheelie bin**
Paper	Drink containers	0.2% (±0.1%)	0.02 kg (±0.01 kg)
	Recyclable	5.9% (±2.1%)	0.68 kg (±0.23 kg)
	Non-recyclable	1.7% (±0.2%)	0.20 kg (±0.02 kg)
	Subtotal	**7.8% (±2.1%)**	**0.89 kg (±0.23 kg)**
Plastics	Drink bottles	0.3% (±0.1%)	0.03 kg (±0.01 kg)
	# 1-7 containers	1.4% (±0.2%)	0.16 kg (±0.02 kg)
	Plastic bags & film	5.4% (±0.5%)	0.61 kg (±0.05 kg)
	Other non-recyclable	3.4% (±0.6%)	0.39 kg (±0.07 kg)
	Subtotal	**10.6% (±0.8%)**	**1.20 kg (±0.10 kg)**
Organics	Kitchen waste	33.9% (±3.3%)	3.85 kg (±0.37 kg)
	Greenwaste	18.2% (±5.5%)	2.07 kg (±0.63 kg)
	Other organic	2.2% (±1.3%)	0.25 kg (±0.15 kg)
	Subtotal	**54.3% (±5.6%)**	**6.18 kg (±0.63 kg)**
Ferrous metals	Steel cans	0.5% (±0.1%)	0.05 kg (±0.01 kg)
	Other steel	1.4% (±0.6%)	0.16 kg (±0.07 kg)
	Subtotal	**1.9% (±0.6%)**	**0.21 kg (±0.07 kg)**
Non ferrous metals	Drink cans	0.2% (±0.0%)	0.02 kg (±0.00 kg)
	Other aluminium cans	0.0% (±0.0%)	0.00 kg (±0.00 kg)
	Other non-ferrous	1.0% (±0.4%)	0.11 kg (±0.04 kg)
	Subtotal	**1.2% (±0.4%)**	**0.14 kg (±0.04 kg)**
Glass	Beverage bottles	1.1% (±0.5%)	0.12 kg (±0.05 kg)
	Other bottles/jars	0.8% (±0.4%)	0.09 kg (±0.04 kg)
	Non-recyclable glass	0.5% (±0.2%)	0.06 kg (±0.02 kg)
	Subtotal	**2.4% (±0.6%)**	**0.27 kg (±0.07 kg)**
Textiles	Clothing/textiles	2.7% (±0.8%)	0.30 kg (±0.09 kg)
	Other textiles	2.1% (±0.7%)	0.24 kg (±0.08 kg)
	Subtotal	**4.8% (±1.2%)**	**0.54 kg (±0.14 kg)**
Sanitary paper		**7.5% (±2.2%)**	**0.86 kg (±0.25 kg)**
Rubble		**5.0% (±2.9%)**	**0.57 kg (±0.33 kg)**
Timber		**3.2% (±1.9%)**	**0.37 kg (±0.22 kg)**
Rubber		**0.3% (±0.2%)**	**0.03 kg (±0.02 kg)**
Potentially hazardous	Household	0.8% (±0.2%)	0.09 kg (±0.03 kg)
	Other	0.2% (±0.2%)	0.03 kg (±0.02 kg)
	Subtotal	**1.0% (±0.3%)**	**0.12 kg (±0.03 kg)**
TOTAL		**100.0%**	**11.38 kg (±0.71 kg)**

3.1.5 Distribution of kerbside rubbish bin weights

A total of 229 kerbside rubbish wheelie bins were sorted for the audit. The sorted rubbish weighed 2,607 kg. The average weight of rubbish in Council's 140-litre rubbish wheelie bins was 11.38 kg.

The median rubbish wheelie bin weight was 9.64 kg. The lightest bin was 0.34 kg and the heaviest, 42.04 kg. The distribution of wheelie bin weights is shown in Figure 3.4.

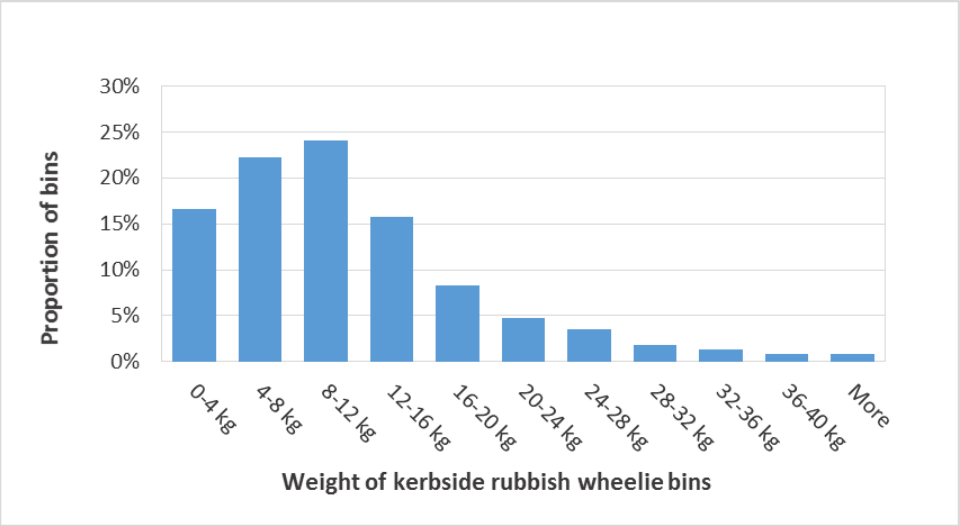

Figure 3.4 - Distribution of kerbside rubbish wheelie bin weights - December 2019

Nearly 17% of wheelie bins contained less than four kilograms of rubbish. Nearly two-thirds (62%) weighed between four and 16 kg. Thirteen percent weighed over 20 kilograms.

3.1.6 Diversion potential of kerbside rubbish

To minimise waste to landfill, Queenstown Lakes District Council provides households in the District with kerbside collections of mixed recycling and glass, alternating fortnightly, using 240-litre wheelie bins for mixed recycling and 140-litre bins for glass recycling. Recycling facilities are also available to the public at Wakatipu Recycling Centre in Frankton and Wastebusters Recycling Centre in Wanaka.

To further reduce waste to landfill, residents are able to dispose of greenwaste separately at Frankton and Wanaka transfer stations, the privately-owned Wanaka Greenwaste and Landscaping Supplies, and community-run facilities at Glenorchy, Kingston, Lake Hawea, Luggate, and Makarora. A greenwaste kerbside collection service is available in Wanaka only. Greenwaste can also be home-composted.

Although food waste collection services are not available in the District, residents are able to home compost their food waste. Council encourages home composting with an educational programme and subsidies for Bokashi bins and worms.

Table 3.2 on the next page shows the proportion of rubbish in Queenstown Lakes District Council's kerbside 140-litre rubbish wheelie bins that could have been diverted from landfill disposal using these methods. The average quantity per wheelie bin is also shown.

Table 3.2 - Diversion potential of kerbside rubbish wheelie bins - December 2019

Divertible materials in Council kerbside rubbish - December 2019	Proportion of total	Kg per rubbish wheelie bin
RECYCLABLE MATERIALS		
Paper - Recyclable	5.9%	0.68 kg
Plastic - Drink bottles	0.3%	0.03 kg
Plastic - #1-7 containers	1.4%	0.16 kg
Steel cans	0.5%	0.05 kg
Aluminium drink cans	0.2%	0.02 kg
Other aluminium cans	0.0%	0.00 kg
Glass - Beverage bottles	1.1%	0.12 kg
Glass - Other bottles/jars	0.8%	0.09 kg
Subtotal	**10.2%**	**1.16 kg**
COMPOSTABLE MATERIALS		
Kitchen waste	33.9%	3.85 kg
Greenwaste	18.2%	2.07 kg
Subtotal	**52.0%**	**5.92 kg**
TOTAL DIVERTIBLE	**62.2%**	**7.08 kg**

Approximately 10.2% of the materials in Council's 140-litre rubbish wheelie bins could have been recycled through Council's kerbside recycling collections or at the other recycling facilities. This equates to 1.16 kg in the average rubbish wheelie bin.

A further 52% of materials could have been composted, either at home or, in the case of the greenwaste, by being disposed of at the greenwaste drop-off points at transfer stations and community facilities.

Overall, 62.2%, by weight, of materials in Council's 140-litre rubbish wheelie bins could have been recycled or composted. Other materials, such as clothing and other metals, are also recyclable but have not been included in these calculations.

3.2 Mixed recycling audit

A total of 76 kerbside mixed recycling wheelie bins were sorted for the audit. The mixed recycling that was sorted weighed 606 kg. The results of the audit of Council's mixed recycling wheelie bins are shown, in Table 3.3 below, in terms of percentage composition and average weight per wheelie bin.

Table 3.3 - Composition of mixed recycling wheelie bins - December 2019

Queenstown Lakes District - Mixed recycling - December 2019 (margins of error for 95% confidence level)		**% of total weight**	**Kg per mixed recycling wheelie bin**
Paper	Drink containers	0.4% (±0.2%)	0.03 kg (±0.02 kg)
	Recyclable paper	67.4% (±19.2%)	5.38 kg (±1.54 kg)
	Non-recyclable paper	1.7% (±0.7%)	0.14 kg (±0.05 kg)
	Subtotal	**69.5% (±19.4%)**	**5.54 kg (±1.54 kg)**
Plastics	Drink bottles	5.4% (±1.2%)	0.43 kg (±0.10 kg)
	# 1-7 containers	3.7% (±0.6%)	0.30 kg (±0.05 kg)
	Unrinsed containers	1.6% (±0.7%)	0.13 kg (±0.06 kg)
	Other non-recyclable	3.2% (±0.9%)	0.25 kg (±0.07 kg)
	Subtotal	**13.9% (±2.5%)**	**1.11 kg (±0.20 kg)**
Organics		**1.9% (±1.4%)**	**0.15 kg (±0.11 kg)**
Ferrous metals	Steel cans	3.6% (±0.9%)	0.29 kg (±0.07 kg)
	Other steel	0.9% (±0.5%)	0.07 kg (±0.04 kg)
	Subtotal	**4.5% (±1.3%)**	**0.36 kg (±0.10 kg)**
Non ferrous metals	Aluminium drink cans	1.5% (±0.4%)	0.12 kg (±0.04 kg)
	Other aluminium cans	0.0% (±0.0%)	0.00 kg (±0.00 kg)
	Other non-ferrous	0.1% (±0.1%)	0.01 kg (±0.01 kg)
	Subtotal	**1.6% (±0.5%)**	**0.13 kg (±0.04 kg)**
Glass	Beverage bottles	3.5% (±2.4%)	0.28 kg (±0.19 kg)
	Other recyclable glass	1.2% (±0.6%)	0.10 kg (±0.04 kg)
	Broken glass/fines	0.0% -	0.00 kg -
	Non-recyclable glass	0.1% (±0.1%)	0.01 kg (±0.01 kg)
	Subtotal	**4.8% (±2.6%)**	**0.38 kg** (±0.21 kg)
Textiles		**0.4% (±0.5%)**	**0.03 kg** (±0.04 kg)
Sanitary paper		**0.0% -**	**0.00 kg -**
Other contamination		**3.5% (±2.4%)**	**0.28 kg (±0.19 kg)**
TOTAL		**100.0%**	**7.98 kg (±1.55 kg)**

The average contents of a 240-litre mixed recycling wheelie bin weighed 7.98 kg. Recyclable paper comprised the largest secondary component of mixed recycling, representing 67.4% of the total weight, or an average of 5.38 kg per wheelie bin. Plastic drink bottles, 5.4% of the total weight, or 0.43 kg per bin, was the second largest secondary category.

3.2.1 Approved materials in mixed recycling wheelie bins

Council publishes an online guide to materials that are approved for the kerbside recycling collections. Table 3.4 below shows the proportion of materials in mixed recycling wheelie

bins that met Council's guidelines [2] for mixed recycling, materials that met the guidelines for glass recycling, and materials that should not have been disposed of in either recycling bin (contamination).

The broken glass/fines classification has been categorised as suitable for glass recycling as it was not possible to determine whether the glass was broken before disposal or during the sample collection and sorting process.

Table 3.4 - Approved materials in mixed recycling wheelie bins - December 2019

Queenstown Lakes District - Mixed recycling - Approved materials - December 2019	% of total weight	Kg per mixed recycling wheelie bin
MIXED RECYCLING - Approved by guidelines		
Paper - Recyclable paper	67.4%	5.38 kg
Plastic - Drink bottles	5.4%	0.43 kg
Plastic - #1-7 containers	3.7%	0.30 kg
Steel cans	3.6%	0.29 kg
Aluminium drink cans	1.5%	0.12 kg
Other aluminium cans	0.0%	0.00 kg
Subtotal	**81.6%**	**6.51 kg**
GLASS RECYCLING - Not approved by guidelines for mixed recycling		
Glass - Beverage bottles	3.5%	0.28 kg
Glass - Other recyclable	1.2%	0.10 kg
Broken glass/fines	0.0%	0.00 kg
Subtotal	**4.7%**	**0.38 kg**
CONTAMINATION- Not approved by guidelines for mixed recycling		
Paper - Drink containers	0.4%	0.03 kg
Paper - Non-recyclable paper	1.7%	0.14 kg
Plastic - Unrinsed containers	1.6%	0.13 kg
Plastic - Other non-recyclable	3.2%	0.25 kg
All organic	1.9%	0.15 kg
Steel - Other steel	0.9%	0.07 kg
Other non-ferrous	0.1%	0.01 kg
Non-recyclable glass	0.1%	0.01 kg
Textiles	0.4%	0.03 kg
Sanitary paper	0.0%	0.00 kg
Other contamination	3.5%	0.28 kg
Subtotal	**13.7%**	**1.09 kg**
TOTAL	**100.0%**	**7.98 kg**

Of the 7.98 kg of material in the average 240-litre mixed recycling wheelie bin, 6.51 kg, or 81.6%, met Council's guidelines for mixed recycling. Materials that met the guidelines for glass recycling comprised 4.7% of the total weight, or an average of 0.38 kg per bin. Contamination (materials that do not meet the guidelines for either mixed recycling or glass recycling) comprised 13.7% of the total weight, or 1.09 kg per bin.

[2] https://www.qldc.govt.nz/services/rubbish-recycling/rubbish-recycling-collection

This breakdown of materials is shown in Figure 3.5 below. Materials that met the Council's guidelines for mixed recycling are broken out and itemised in the figure.

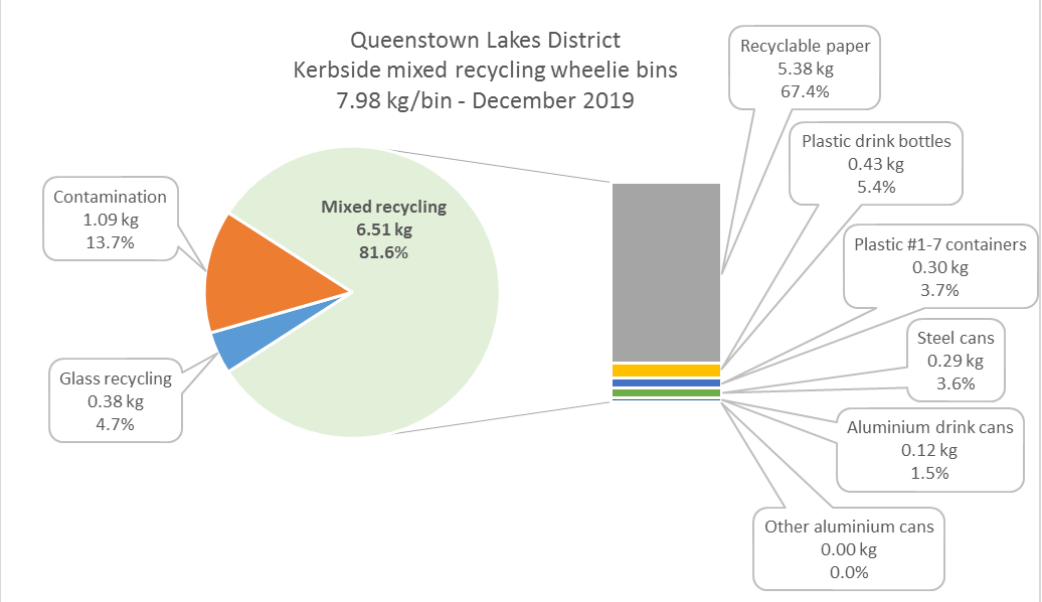

Figure 3.5 - Materials in mixed recycling wheelie bins - December 2019

The proportion of recyclable paper in the audit results is, possibly, anomalously high. A single wheelie bin contained 68 kg of undistributed junk mail, 17% of all recyclable paper recorded in the audit.

Photo 3.4 - Undistributed junk mail from a single mixed recycling wheelie bin

3.2.2 Distribution of kerbside mixed recycling bin weights

A total of 76 kerbside mixed recycling wheelie bins, containing 606 kg of material, were sorted for the audit. The average weight per bin was 7.98 kg. The median weight was 6.47 kg. The materials in the lightest bin weighed 0.66 kg and, in the heaviest, 68.30 kg. The distribution of wheelie bin weights is shown in Figure 3.6.

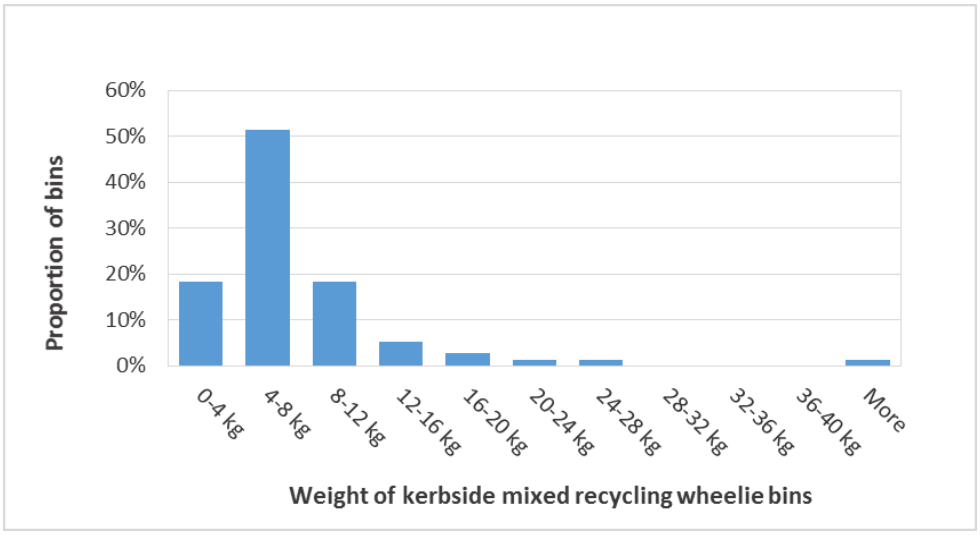

Figure 3.6 - Distribution of kerbside mixed recycling wheelie bin weights - December 2019

Over 50% of mixed recycling wheelie bins contained between four and eight kg of material. Twelve percent weighed more than 12 kg.

3.3 Glass recycling audit

A total of 72 kerbside glass recycling wheelie bins, weighing 852 kg, were sorted for the audit. The results of the audit of Council's glass recycling wheelie bins are shown, in Table 3.5 below, in terms of percentage composition and weight per wheelie bin. As all bins collected each day were sorted as a single sample, a statistical analysis cannot be done.

Table 3.5 - Composition of glass recycling wheelie bins - December 2019

Queenstown Lakes District - Glass recycling - December 2019		% of total weight	Kg per glass recycling wheelie bin
Paper	Drink containers	0.0%	0.00 kg
	Recyclable paper	0.1%	0.01 kg
	Non-recyclable paper	0.0%	0.00 kg
	Subtotal	**0.1%**	**0.01 kg**
Plastics	Drink bottles	0.0%	0.01 kg
	# 1-7 containers	0.0%	0.00 kg
	Unrinsed containers	0.0%	0.00 kg
	Other non-recyclable	0.0%	0.00 kg
	Subtotal	**0.1%**	**0.01 kg**
Organics		**0.0%**	**0.00 kg**
Ferrous metals	Steel cans	0.1%	0.01 kg
	Other steel	0.0%	0.00 kg
	Subtotal	**0.1%**	**0.01 kg**
Non ferrous metals	Aluminium drink cans	0.0%	0.01 kg
	Other aluminium cans	0.0%	0.00 kg
	Other non-ferrous	0.0%	0.00 kg
	Subtotal	**0.0%**	**0.01 kg**
Glass	Beverage bottles	89.6%	11.47 kg
	Other recyclable glass	7.3%	0.93 kg
	Broken glass/fines	1.9%	0.24 kg
	Non-recyclable glass	1.0%	0.12 kg
	Subtotal	**99.7%**	**12.76 kg**
Textiles		**0.0%**	**0.00 kg**
Sanitary paper		**0.0%**	**0.00 kg**
Other contamination		**0.0%**	**0.00 kg**
TOTAL		**100.0%**	**12.81 kg**

The contents of an average 140-litre glass recycling wheelie bin weighed 12.81 kg. Beverage bottles comprised the largest secondary component of glass recycling, representing 89.6% of the total weight, or an average of 11.47 kg per wheelie bin.

3.3.1 Approved materials in glass recycling wheelie bins

Table 3.6 below shows the proportion of materials in glass recycling wheelie bins that met Council's guidelines [3] for glass recycling, materials that met the guidelines for mixed recycling, and materials that should not have been disposed of in either recycling bin (contamination).

Table 3.6 - Approved materials in glass recycling wheelie bins - December 2019

Queenstown Lakes District - Glass recycling - Approved materials - December 2019	% of total weight	Kg per glass recycling wheelie bin
GLASS RECYCLING - Approved by guidelines		
Glass - Beverage bottles	89.6%	11.47 kg
Glass - Other recyclable	7.3%	0.93 kg
Broken glass/fines	1.9%	0.24 kg
Subtotal	**98.7%**	**12.64 kg**
MIXED RECYCLING - Not approved by guidelines for glass recycling		
Paper - Recyclable paper	0.1%	0.01 kg
Plastic - Drink bottles	0.0%	0.01 kg
Plastic - #1-7 containers	0.0%	0.00 kg
Steel cans	0.1%	0.01 kg
Aluminium drink cans	0.0%	0.01 kg
Other aluminium cans	0.0%	0.00 kg
Subtotal	**0.2%**	**0.03 kg**
CONTAMINATION - Not approved by guidelines for glass recycling		
Paper - Drink containers	0.0%	0.00 kg
Paper - Non-recyclable paper	0.0%	0.00 kg
Plastic - Unrinsed containers	0.0%	0.00 kg
Plastic - Other non-recyclable	0.0%	0.00 kg
All organic	0.0%	0.00 kg
Steel - Other steel	0.0%	0.00 kg
Other non-ferrous	0.0%	0.00 kg
Non-recyclable glass	1.0%	0.12 kg
Textiles	0.0%	0.00 kg
Sanitary paper	0.0%	0.00 kg
Contamination	0.0%	0.00 kg
Subtotal	**1.0%**	**0.13 kg**
TOTAL	**100.0%**	**12.81 kg**

Materials that met Council's guidelines for glass recycling comprised 98.7% of all materials, by weight, in the glass recycling bins included in the audit. The broken glass/fines classification has been categorised as suitable for glass recycling as it was not possible to determine whether the glass was broken before disposal or during the sample collection and sorting process.

[3] https://www.qldc.govt.nz/services/rubbish-recycling/rubbish-recycling-collection

This breakdown of materials is shown in Figure 3.7 below. Materials that met Council's guidelines for glass recycling are broken out and itemised in the figure.

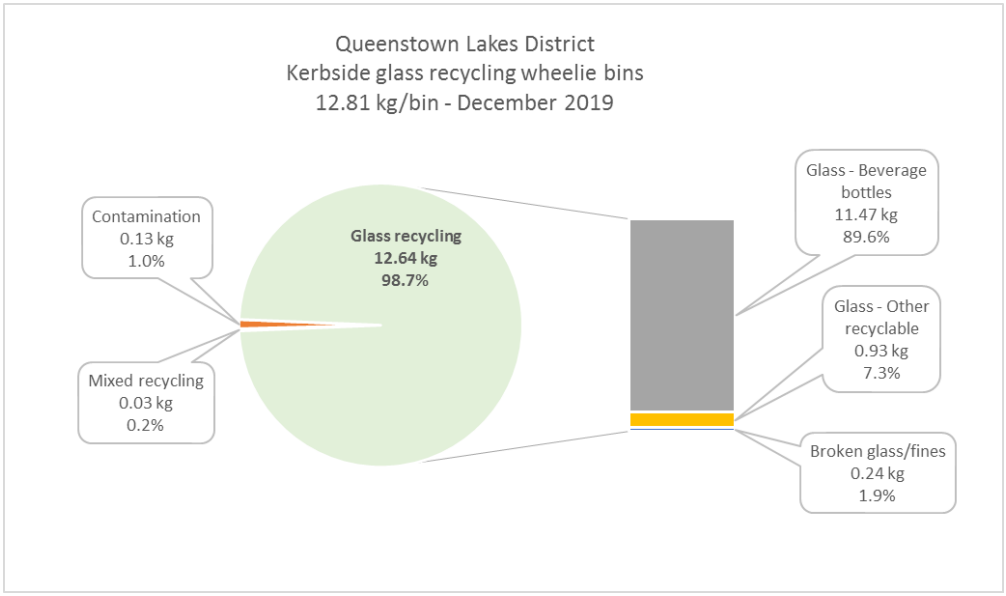

Figure 3.7 - Materials in glass recycling wheelie bins - December 2019

3.3.2 Distribution of kerbside glass recycling bin weights

A total of 72 kerbside glass recycling wheelie bins were sorted for the audit. The glass recycling that was sorted weighed 852 kg. [4] The average weight per bin was 12.81 kg. The median weight was 10.84 kg. The materials in the lightest bin weighed 1.52 kg and the heaviest, 36.90 kg. The distribution of wheelie bin weights is shown in Figure 3.8.

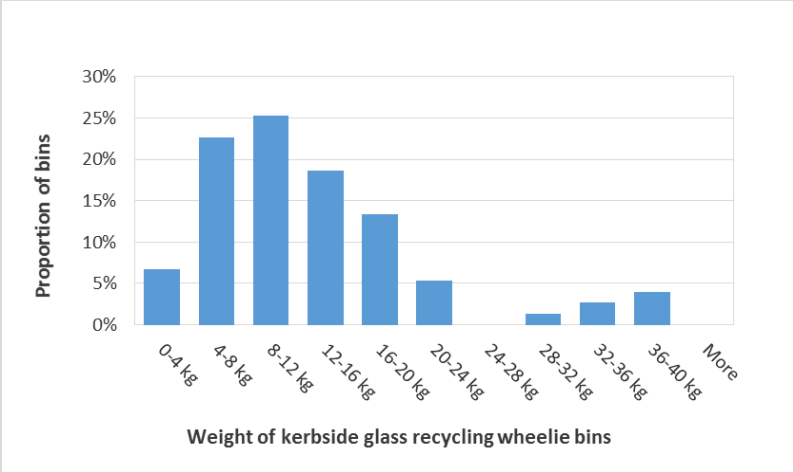

Figure 3.8 - Distribution of glass recycling wheelie bin weights - December 2019

Seven percent of wheelie bins weighed under four kg and thirteen percent weighed more than 20 kg.

[4] During the sample collection, three wheelie bins that were too heavy to be lifted safely were not collected. Estimated weights for these bins have been included in all calculations, including those in Table 3.5.

4 Refuse transfer station waste

4.1 Wanaka Refuse Transfer Station

For the first visual survey, Wanaka RTS was surveyed on 2 and 4 February 2020. On these two days, data was collected on a total of 77 vehicles. For the second visual survey, Wanaka RTS was surveyed on 24 and 26 September 2020. On these two days, data was collected on a total of 75 vehicles.

The data from the first visual survey were matched with the weighbridge records for 18 January - 28 February 2020, a six-week period that included the visual survey. Based on Victoria Flats landfill records for 18 January - 13 March 2020, an average of 198 T/week was disposed of to landfill from Wanaka RTS. The first survey results were applied to this tonnage.

The data from the second visual survey were matched with the RTS weighbridge records for the six-week period 20 August - 30 September 2020. The results were applied to the average of 188 T/week that was disposed of to landfill from Wanaka RTS, based on Victoria Flats landfill records for 20 August - 30 September 2020.

During both visual surveys, all compactor vehicles, primarily kerbside rubbish collections, were identified and registration details recorded. Using the Wanaka RTS weighbridge records, the average tonnage per week of kerbside rubbish collections was calculated. These totals were deducted from the total tonnage disposed of to landfill to determine the tonnage of 'general' waste disposed of at the transfer station.

4.1.1 Wanaka RTS - Overall waste stream - by activity source of waste loads

The proportion of loads, broken down by activity source, from both surveys combined is shown in Table 4.1.

Table 4.1 - Activity sources of Wanaka RTS waste loads - Both 2020 visual surveys combined

Activity sources of waste loads at Wanaka RTS - Both surveys combined	% of loads surveyed	% of total weight	Average tonnes/week
Construction & demolition	32%	41%	79 T/week
Industrial/commercial/institutional	22%	18%	34 T/week
Landscaping & earthworks	5%	1%	2 T/week
Residential	34%	5%	9 T/week
Subtotal - general waste	**93%**	**64%**	**124 T/week**
Council kerbside rubbish collections	7%	29%	55 T/week
Private kerbside rubbish collections		7%	14 T/week
TOTAL	**100%**	**100%**	**193 T/week**

C&D waste comprised 41% of waste disposed of at Wanaka RTS, by weight, or 79 tonnes per week. Industrial/commercial/institutional (ICI) waste comprised 18% of waste and landscaping and earthworks, 1%. Residential waste comprised 34% of all loads, but only

represented 5% of the total weight. Kerbside rubbish collections comprised 7% of vehicle loads, but Council and private collections combined represented 36% of all waste, by weight.

The results of the individual visual surveys are compared in Table 4.2, in terms of tonnes per week. The percentage change between the two surveys is also presented. It is noted that the February 2020 survey took place during the busy summer tourist season prior to the Covid-19 pandemic, which resulted in a substantial, nation-wide reduction in economic activity. The September 2020 survey took place after Covid-19 lockdown restrictions had been removed but during a period when international tourism was still severely restricted.

Table 4.2 - Activity sources of Wanaka RTS waste loads - 2020 visual surveys compared

Activity sources of waste loads at Wanaka RTS - Two surveys compared	Feb-20 survey	Sep-20 survey	% change
Construction & demolition	72 T/week	86 T/week	19%
Industrial/commercial/institutional	38 T/week	29 T/week	-24%
Landscaping & earthworks	3 T/week	2 T/week	-39%
Residential	12 T/week	7 T/week	-42%
Subtotal - general waste	**125 T/week**	**123 T/week**	**-1%**
Council kerbside rubbish collections	57 T/week	53 T/week	-7%
Private kerbside rubbish collections	16 T/week	12 T/week	-26%
TOTAL	**198 T/week**	**188 T/week**	**-5%**

The overall tonnage of waste disposed of to landfill from Wanaka RTS decreased 5% between the February and September 2020 surveys. General waste tonnages decreased 1% but there were significant differences in the individual activity sources of waste. C&D waste tonnages increased 19% between the two surveys while ICI waste decreased 24%. Landscaping and residential waste decreased by roughly equal percentages, but the sample sizes for these activity sources were small.

Council kerbside rubbish collections decreased by 7%, which could be the result of seasonal variations in the resident population. Private kerbside rubbish collections, however, decreased 26%. As most of the private kerbside rubbish collections are from commercial premises, this is in line with the 24% decrease in ICI waste.

4.1.2 Wanaka RTS - Primary composition of general and overall waste streams

The data from the visual surveys was used to determine the composition of the general waste (i.e. excluding kerbside rubbish collections) disposed of at the facility. The assumed composition of the kerbside rubbish collections (presented in section 3.1.4) was determined with sort-and-weigh audits in December 2019. For the purposes of calculating the composition of the overall waste stream, it has been assumed that the composition of private kerbside rubbish collections is the same as the composition of Council kerbside collections.

The primary compositions of the general waste stream, which excludes kerbside rubbish (both Council and private), and the overall waste stream, which includes kerbside rubbish, disposed of at Wanaka RTS are presented in Table 4.3 and Figure 4.1 and Figure 4.2. The compositions are the weighted average of the results of the two visual surveys conducted in 2020.

Table 4.3 - Primary composition of Wanaka RTS waste - Both 2020 visual surveys combined

Primary composition of Wanaka RTS waste - Both 2020 visual surveys combined	General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
	% of total	Tonnes per week	% of total	Tonnes per week
Paper	8.2%	10 T/week	8.1%	16 T/week
Plastics	8.5%	11 T/week	9.2%	18 T/week
Organics	7.5%	9 T/week	24.2%	47 T/week
Ferrous metals	3.3%	4 T/week	2.8%	5 T/week
Non-ferrous metals	0.6%	1 T/week	0.8%	2 T/week
Glass	1.0%	1 T/week	1.5%	3 T/week
Textiles	5.5%	7 T/week	5.2%	10 T/week
Sanitary paper	1.5%	2 T/week	3.6%	7 T/week
Rubble	19.9%	25 T/week	14.6%	28 T/week
Timber	42.2%	52 T/week	28.3%	55 T/week
Rubber	1.1%	1 T/week	0.8%	2 T/week
Potentially hazardous	0.6%	1 T/week	0.7%	1 T/week
TOTAL	**100.0%**	**124 T/week**	**100.0%**	**193 T/week**

From the results of both visual surveys combined, timber was the largest component of the general waste stream, comprising 42.2% of the total weight. Rubble was the second largest component of general waste, comprising 19.9% of the total weight. The high proportions of rubble and timber are associated with the high proportion of C&D waste.

Timber was the largest component of the overall waste stream, comprising 28.3% of the total weight. Organics, 24.2%, was the second largest component of the overall waste stream, by weight. Organic material is more prevalent in the overall waste stream due to the high proportion of kitchen waste in kerbside rubbish.

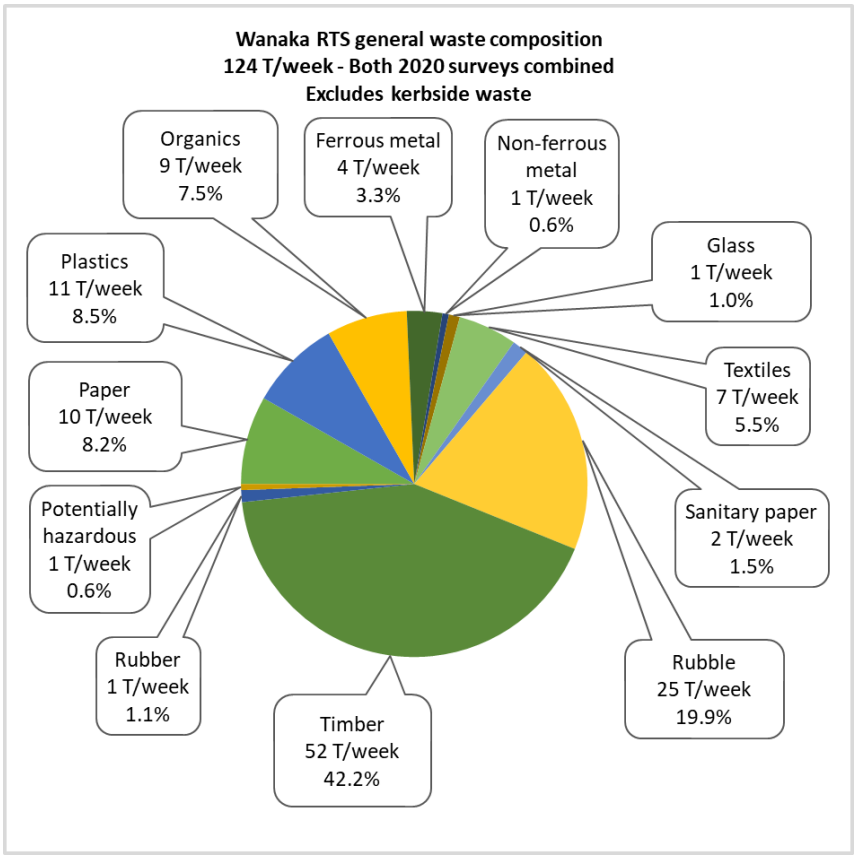

Figure 4.1 - Primary composition of Wanaka RTS general waste - Both 2020 surveys combined

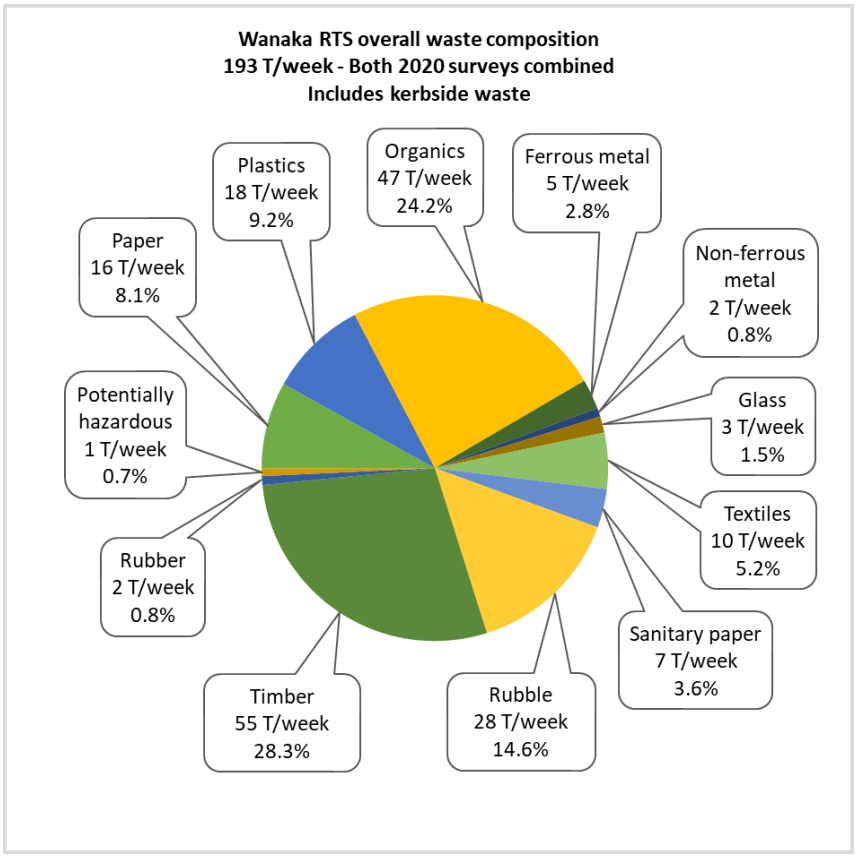

Figure 4.2 - Primary composition of Wanaka RTS overall waste - Both 2020 surveys combined

4.1.3 Wanaka RTS - Secondary composition of general and overall waste streams

The secondary compositions of the general waste stream and the overall waste stream disposed of at Wanaka RTS are presented in Table 4.4. The compositions are the weighted average of the results of the two visual surveys conducted in 2020. The results of the individual surveys are presented in Appendix 5 and Appendix 6.

Table 4.4 - Secondary composition of Wanaka RTS waste - Both 2020 surveys combined

Wanaka RTS General and overall waste streams - Both 2020 visual surveys combined		General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
		% of total	Tonnes per week	% of total	Tonnes per week
Paper	Recyclable	2.1%	3 T/week	3.3%	6 T/week
	Cardboard	5.6%	7 T/week	3.8%	7 T/week
	Non-recyclable	0.5%	1 T/week	1.0%	2 T/week
	Subtotal	**8.2%**	**10 T/week**	**8.1%**	**16 T/week**
Plastics	Recyclable	0.6%	1 T/week	1.0%	2 T/week
	Non-recyclable	8.0%	10 T/week	8.3%	16 T/week
	Subtotal	**8.5%**	**11 T/week**	**9.2%**	**18 T/week**
Organics	Kitchen waste	3.8%	5 T/week	14.5%	28 T/week
	Compostable greenwaste	1.4%	2 T/week	6.8%	13 T/week
	Non-compostable greenwaste	1.6%	2 T/week	1.7%	3 T/week
	Organics other	0.7%	1 T/week	1.3%	2 T/week
	Subtotal	**7.5%**	**9 T/week**	**24.2%**	**47 T/week**
Ferrous metals	Primarily ferrous	1.9%	2 T/week	1.4%	3 T/week
	Steel other	1.4%	2 T/week	1.4%	3 T/week
	Subtotal	**3.3%**	**4 T/week**	**2.8%**	**5 T/week**
Non-ferrous metals		**0.6%**	**1 T/week**	**0.8%**	**2 T/week**
Glass	Recyclable	0.5%	1 T/week	1.0%	2 T/week
	Non-recyclable	0.6%	1 T/week	0.6%	1 T/week
	Subtotal	**1.0%**	**1 T/week**	**1.5%**	**3 T/week**
Textiles	Clothing/textiles	1.9%	2 T/week	2.2%	4 T/week
	Multimaterial/other	3.6%	4 T/week	3.0%	6 T/week
	Subtotal	**5.5%**	**7 T/week**	**5.2%**	**10 T/week**
Sanitary paper		**1.5%**	**2 T/week**	**3.6%**	**7 T/week**
Rubble	Cleanfill	3.7%	5 T/week	2.4%	5 T/week
	New plasterboard	6.4%	8 T/week	4.1%	8 T/week
	Other	9.8%	12 T/week	8.1%	16 T/week
	Subtotal	**19.9%**	**25 T/week**	**14.6%**	**28 T/week**
Timber	Reusable	7.6%	9 T/week	4.9%	9 T/week
	Unpainted & untreated	3.8%	5 T/week	2.5%	5 T/week
	Non-recoverable	30.8%	38 T/week	21.0%	40 T/week
	Subtotal	**42.2%**	**52 T/week**	**28.3%**	**55 T/week**
Rubber		**1.1%**	**1 T/week**	**0.8%**	**2 T/week**
Potentially hazardous		**0.6%**	**1 T/week**	**0.7%**	**1 T/week**
TOTAL		**100.0%**	**124 T/week**	**100.0%**	**193 T/week**

4.1.4 Wanaka RTS - Primary composition of general waste - by activity source of waste loads

The primary compositions of the four activity sources that made up the general waste stream at Wanaka RTS are shown in Table 4.5 and Table 4.6. The compositions are the weighted average of the results of the two 2020 visual surveys. Secondary compositions are in Appendix 7. The results of the individual surveys are shown in Appendix 8 and Appendix 9.

Table 4.5 -Wanaka RTS general waste - By activity source - By % of weight

Wanaka RTS general waste By activity source Both surveys combined By % of total weight	C&D	ICI	Landscaping	Residential
Paper	3.8%	17.2%	0.0%	15.5%
Plastics	4.2%	18.0%	2.6%	12.6%
Organics	0.2%	17.2%	95.3%	14.1%
Ferrous metals	2.8%	3.5%	0.0%	7.9%
Non-ferrous metals	0.4%	1.0%	0.0%	1.0%
Glass	0.0%	3.3%	0.0%	1.8%
Textiles	1.1%	13.4%	2.1%	15.1%
Sanitary paper	0.0%	4.8%	0.0%	2.1%
Rubble	27.9%	7.5%	0.0%	1.4%
Timber	59.4%	8.6%	0.0%	27.4%
Rubber	0.1%	3.7%	0.0%	0.5%
Potentially hazardous	0.1%	1.7%	0.0%	0.7%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 4.6 -Wanaka RTS general waste - by activity source - By tonnes/week

Wanaka RTS general waste By activity source Both surveys combined By tonnes per week	C&D	ICI	Landscaping	Residential
Paper	3.0 T/week	5.8 T/week	0.0 T/week	1.4 T/week
Plastics	3.3 T/week	6.1 T/week	0.1 T/week	1.1 T/week
Organics	0.2 T/week	5.8 T/week	2.1 T/week	1.3 T/week
Ferrous metals	2.2 T/week	1.2 T/week	0.0 T/week	0.7 T/week
Non-ferrous metals	0.3 T/week	0.3 T/week	0.0 T/week	0.1 T/week
Glass	0.0 T/week	1.1 T/week	0.0 T/week	0.2 T/week
Textiles	0.9 T/week	4.5 T/week	0.0 T/week	1.4 T/week
Sanitary paper	0.0 T/week	1.6 T/week	0.0 T/week	0.2 T/week
Rubble	22.0 T/week	2.5 T/week	0.0 T/week	0.1 T/week
Timber	46.9 T/week	2.9 T/week	0.0 T/week	2.5 T/week
Rubber	0.1 T/week	1.3 T/week	0.0 T/week	0.0 T/week
Potentially hazardous	0.1 T/week	0.6 T/week	0.0 T/week	0.1 T/week
TOTAL	**78.9 T/week**	**33.9 T/week**	**2.2 T/week**	**9.1 T/week**

C&D waste was composed primarily of timber (59.4%) and rubble (27.9%), which, combined, represented 87.3%, by weight, of C&D waste. ICI waste was more heterogeneous, with plastics (18.0%) being the largest component. Landscaping waste was 95.3% organic material. Residential waste was also heterogeneous, with timber (27.4%) being the largest component. Timber was present primarily as furniture and C&D waste, which is frequently present in residential waste.

4.1.5 Wanaka RTS - Overall waste stream - by vehicle type

Table 4.7 shows the percentage of waste loads disposed of at Wanaka RTS by each of the six vehicle types recorded during the surveys, the percentage of total weight carried by each vehicle type, and the tonnes per week. The results are the weighted average of the results of the two 2020 visual surveys. Note that no hook trucks were recorded in either survey and that no other trucks were recorded in the September 2020 visual survey.

Table 4.7 - Wanaka RTS - By vehicle type - Both 2020 surveys combined

Wanaka RTS overall waste By vehicle type Both surveys combined	% of loads surveyed	% of weight	Tonnes/week
Car-sized loads	27%	2%	5 T/week
Compactors	7%	36%	69 T/week
Front-end loader	3%	10%	19 T/week
Gantry trucks	15%	31%	60 T/week
Other trucks	2%	0%	1 T/week
Trailer-sized loads	47%	21%	40 T/week
TOTAL	**100%**	**100%**	**193 T/week**

Compactors transported 36% of the total weight, but represented only 7% of the loads surveyed. Gantry trucks transported 31% of the total weight, and represented 15% of the loads surveyed. Forty-seven percent of the loads surveyed were trailer-sized loads, and these loads represented 21% of the total weight. While 27% of all loads were car-sized, these loads represented only 2% of the total weight of waste.

4.1.6 Wanaka RTS - Primary composition of general waste - by vehicle type

The primary compositions of the five vehicle types transporting general waste (compactors are excluded) are shown in Table 4.8. The results are the weighted average of the results of the two 2020 visual surveys. Secondary compositions are presented in Appendix 10. The results of the individual surveys are shown in Appendix 11 and Appendix 12.

Table 4.8 - Wanaka RTS general waste - By vehicle type - By % of weight

Wanaka RTS general waste - By vehicle type Both surveys combined By % of total weight	Cars	Front-end loaders	Gantry trucks	Other trucks	Trailers
Paper	18.4%	17.9%	4.5%	14.4%	6.8%
Plastics	13.4%	19.9%	5.4%	55.1%	4.4%
Organics	28.4%	19.6%	0.1%	12.5%	7.2%
Ferrous metals	2.3%	3.9%	3.6%	0.8%	2.2%
Non-ferrous metals	0.5%	1.2%	0.5%	2.0%	0.3%
Glass	1.1%	3.9%	0.0%	6.7%	0.5%
Textiles	9.6%	10.5%	4.5%	1.7%	5.8%
Sanitary paper	4.4%	5.6%	0.0%	6.7%	0.7%
Rubble	8.0%	7.1%	17.7%	0.0%	31.8%
Timber	12.5%	4.2%	63.4%	0.0%	39.5%
Rubber	0.6%	4.2%	0.1%	0.0%	0.7%
Potentially hazardous	1.0%	2.0%	0.1%	0.1%	0.2%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 4.9 - Wanaka RTS general waste - By vehicle type - By tonnes/week

Wanaka RTS general waste By vehicle type Both surveys combined By tonnes per week	Cars	Front-end loaders	Gantry trucks	Other trucks	Trailers
Paper	0.9 T/week	3.4 T/week	2.7 T/week	0.1 T/week	2.7 T/week
Plastics	0.6 T/week	3.8 T/week	3.2 T/week	0.5 T/week	1.8 T/week
Organics	1.3 T/week	3.7 T/week	0.1 T/week	0.1 T/week	2.9 T/week
Ferrous metals	0.1 T/week	0.7 T/week	2.2 T/week	0.0 T/week	0.9 T/week
Non-ferrous metals	0.0 T/week	0.2 T/week	0.3 T/week	0.0 T/week	0.1 T/week
Glass	0.0 T/week	0.7 T/week	0.0 T/week	0.1 T/week	0.2 T/week
Textiles	0.4 T/week	2.0 T/week	2.7 T/week	0.0 T/week	2.3 T/week
Sanitary paper	0.2 T/week	1.1 T/week	0.0 T/week	0.1 T/week	0.3 T/week
Rubble	0.4 T/week	1.3 T/week	10.6 T/week	0.0 T/week	12.7 T/week
Timber	0.6 T/week	0.8 T/week	37.8 T/week	0.0 T/week	15.7 T/week
Rubber	0.0 T/week	0.8 T/week	0.1 T/week	0.0 T/week	0.3 T/week
Potentially hazardous	0.0 T/week	0.4 T/week	0.1 T/week	0.0 T/week	0.1 T/week
TOTAL	**4.7 T/week**	**19.0 T/week**	**59.6 T/week**	**0.9 T/week**	**39.9 T/week**

4.1.7 Wanaka RTS - Diversion potential

Of the 25 material classifications used in the visual survey, nine are commonly recycled or recovered in New Zealand. A further four materials are compostable. There are currently diversion options available in Queenstown Lakes District for most of these 13 materials.

Based on these 13 materials, Table 4.10 shows the proportion of the general and overall waste streams disposed of at Wanaka RTS that could potentially be diverted from landfill disposal. The percentages and tonnages have been taken from Table 4.4, and represent the weighted average of both 2020 surveys.

Table 4.10 - Diversion potential of Wanaka RTS general and overall waste streams- Both 2020 surveys combined

Wanaka RTS waste Diversion potential Both 2020 surveys combined	General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
	% of total	T/week	% of total	T/week
Recyclable and recoverable materials				
Paper - Recyclable	2.1%	3 T/week	3.3%	6 T/week
Paper - Cardboard	5.6%	7 T/week	3.8%	7 T/week
Plastic - Recyclable	0.6%	1 T/week	1.0%	2 T/week
Ferrous metals	3.3%	4 T/week	2.8%	5 T/week
Non-ferrous metals	0.6%	1 T/week	0.8%	2 T/week
Glass - Recyclable	0.5%	1 T/week	1.0%	2 T/week
Textiles - Clothing	1.9%	2 T/week	2.2%	4 T/week
Rubble - Cleanfill	3.7%	5 T/week	2.4%	5 T/week
Timber - Reusable	7.6%	9 T/week	4.9%	9 T/week
Subtotal	**25.9%**	**32 T/week**	**22.1%**	**43 T/week**
Compostable materials				
Organics - Kitchen waste	3.8%	5 T/week	14.5%	28 T/week
Organics - Compostable greenwaste	1.4%	2 T/week	6.8%	13 T/week
Rubble - New plasterboard	6.4%	8 T/week	4.1%	8 T/week
Timber - Untreated/unpainted	3.8%	5 T/week	2.5%	5 T/week
Subtotal	**15.5%**	**19 T/week**	**27.9%**	**54 T/week**
TOTAL - Potentially divertable	**41.4%**	**51 T/week**	**50.0%**	**96 T/week**

Recyclable and recoverable materials comprised 25.9% of the general waste stream at Wanaka RTS and 22.1% of the overall waste stream. Compostable materials comprised 15.5% of the general waste stream at Wanaka RTS and 27.9% of the overall waste stream. Overall, approximately 41.4% of the general waste stream at Wanaka RTS and 50.0% of the overall waste stream could have been diverted from landfill disposal.

The largest single divertable component was kitchen waste, which comprised 14.5% of the overall waste stream, or 28 tonnes per week. Approximately 88% of the kitchen waste was in kerbside rubbish collections.

4.2 Frankton Refuse Transfer Station

For the first visual survey, Frankton RTS was surveyed on 2,3, and 5 February 2020. Over these three days, data was collected on a total of 270 vehicles. For the second visual survey, Frankton RTS was surveyed on 23, 25, and 26 September 2020. On these two days, data was collected on a total of 254 vehicles.

The data from the first visual survey were matched with the RTS weighbridge records for 18 January - 28 February 2020, a six-week period that included the visual survey. The results were applied to the average of 535 T/week that was disposed of to landfill from Frankton RTS, based on Victoria Flats landfill records for 18 January - 13 March 2020.

The data from the second visual survey were matched with the Frankton RTS weighbridge records for the six-week period 20 August - 30 September 2020. The results were applied to the average of 439 T/week that was disposed of to landfill from Frankton RTS, based on Victoria Flats landfill records for 20 August - 30 September 2020.

During both visual surveys, all compactor vehicles, primarily kerbside rubbish collections, were identified and registration details recorded. Using the Frankton RTS weighbridge records, the average tonnage per week of kerbside rubbish collections was calculated. These totals were deducted from the total tonnage disposed of to landfill to determine the tonnage of 'general' waste disposed of at the transfer station.

4.2.1 Frankton RTS - Overall waste stream - by activity source of waste loads

The proportion of loads, broken down by activity source, from both surveys combined is shown in Table 4.11.

Table 4.11 - Activity sources of Frankton RTS waste loads - Both 2020 visual surveys combined

Activity sources of waste loads at Frankton RTS - Both surveys combined	% of loads surveyed	% of total weight	Average tonnes/week
Construction & demolition	27%	31%	149 T/week
Industrial/commercial/institutional	30%	20%	97 T/week
Landscaping & earthworks	13%	3%	17 T/week
Residential	19%	4%	18 T/week
Subtotal - general waste	**89%**	**58%**	**280 T/week**
Council kerbside rubbish collections	11%	25%	123 T/week
Private kerbside rubbish collections		17%	84 T/week
TOTAL	**100%**	**100%**	**487 T/week**

C&D waste comprised 31% of waste disposed of at Frankton RTS, by weight, or 149 tonnes per week. Industrial/commercial/institutional (ICI) waste comprised 20% of waste and landscaping and earthworks, 3%. Residential loads comprised 19% of all loads, but only represented 4% of the total weight. Kerbside rubbish collections comprised 11% of vehicle loads, but represented 42% of all waste, by weight.

The results of the individual visual surveys are compared in Table 4.12, in terms of tonnes per week. The percentage change between the two surveys is also presented. It is noted that

the February 2020 survey took place during the busy summer tourist season and prior to the Covid-19 pandemic, which resulted in a substantial, nation-wide reduction in economic activity. The September 2020 survey took place after Covid-19 lockdown restrictions had been removed but during a period when international tourism was still severely restricted.

Table 4.12 - Activity sources of Frankton RTS waste loads - 2020 visual surveys compared

Activity sources of waste loads at Frankton RTS - Two surveys compared	Feb-20 survey	Sep-20 survey	% change
Construction & demolition	154 T/week	143 T/week	-7%
Industrial/commercial/institutional	125 T/week	69 T/week	-45%
Landscaping & earthworks	16 T/week	18 T/week	12%
Residential	15 T/week	21 T/week	41%
Subtotal - general waste	**310 T/week**	**251 T/week**	**-19%**
Council kerbside rubbish collections	126 T/week	120 T/week	-5%
Private kerbside rubbish collections	99 T/week	68 T/week	-32%
TOTAL	**535 T/week**	**439 T/week**	**-18%**

The overall tonnage of waste disposed of to landfill from Frankton RTS decreased 18% between the February and September 2020 surveys. General waste tonnages decreased 19% and there were significant differences in the individual activity sources of waste. C&D waste tonnages decreased 7% between the two surveys while ICI waste decreased 45%. Landscaping and residential waste both increased, but the sample sizes for these activity sources were small.

Council kerbside rubbish collections decreased by 5%, which could be the result of standard seasonal variations in the resident population. Private kerbside rubbish collections, however, decreased 32%. As most of the private kerbside rubbish collections are from commercial premises, this is in line with the 45% decrease in ICI waste.

4.2.2 Frankton RTS - Primary composition of general and overall waste streams

The data from the visual surveys was used to determine the composition of the general waste (i.e. excluding kerbside rubbish collections) disposed of at the facility. The composition of kerbside rubbish collections (presented in section 3.1.4) was determined with sort-and-weigh audits in December 2019. For the purposes of calculating the composition of the overall waste stream, it has been assumed that the composition of private kerbside rubbish collections is the same as the composition of Council kerbside collections.

The primary compositions of the general waste stream, which excludes kerbside rubbish (both Council and private), and the overall waste stream, which includes kerbside rubbish, disposed of at Frankton RTS are presented in Table 4.13 and Figure 4.3 and Figure 4.4. The compositions are the weighted average of the results of the two visual surveys conducted in 2020.

Table 4.13 - Primary composition of Frankton RTS waste - Both 2020 visual surveys combined

Primary composition of Frankton RTS waste - Both 2020 visual surveys combined	General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
	% of total	Tonnes per week	% of total	Tonnes per week
Paper	11.8%	33 T/week	10.1%	49 T/week
Plastics	10.1%	28 T/week	10.3%	50 T/week
Organics	10.0%	28 T/week	28.8%	140 T/week
Ferrous metals	2.6%	7 T/week	2.3%	11 T/week
Non-ferrous metals	0.3%	1 T/week	0.7%	3 T/week
Glass	1.0%	3 T/week	1.6%	8 T/week
Textiles	5.0%	14 T/week	4.9%	24 T/week
Sanitary paper	1.2%	3 T/week	3.9%	19 T/week
Rubble	19.1%	54 T/week	13.1%	64 T/week
Timber	37.3%	105 T/week	22.8%	111 T/week
Rubber	1.2%	3 T/week	0.8%	4 T/week
Potentially hazardous	0.4%	1 T/week	0.7%	3 T/week
TOTAL	**100.0%**	**280 T/week**	**100.0%**	**487 T/week**

From the results of both visual surveys combined, timber was the largest component of the general waste stream, comprising 37.3% of the total weight. Rubble was the second largest component of general waste, comprising 19.1% of the total weight.

Organics was the largest component of the overall waste stream, comprising 28.8% of the total weight. The high proportion of organic waste in the overall waste stream is associated with the high proportion of kitchen waste in kerbside rubbish. Timber, 22.8%, was the second largest component of the overall waste stream, by weight.

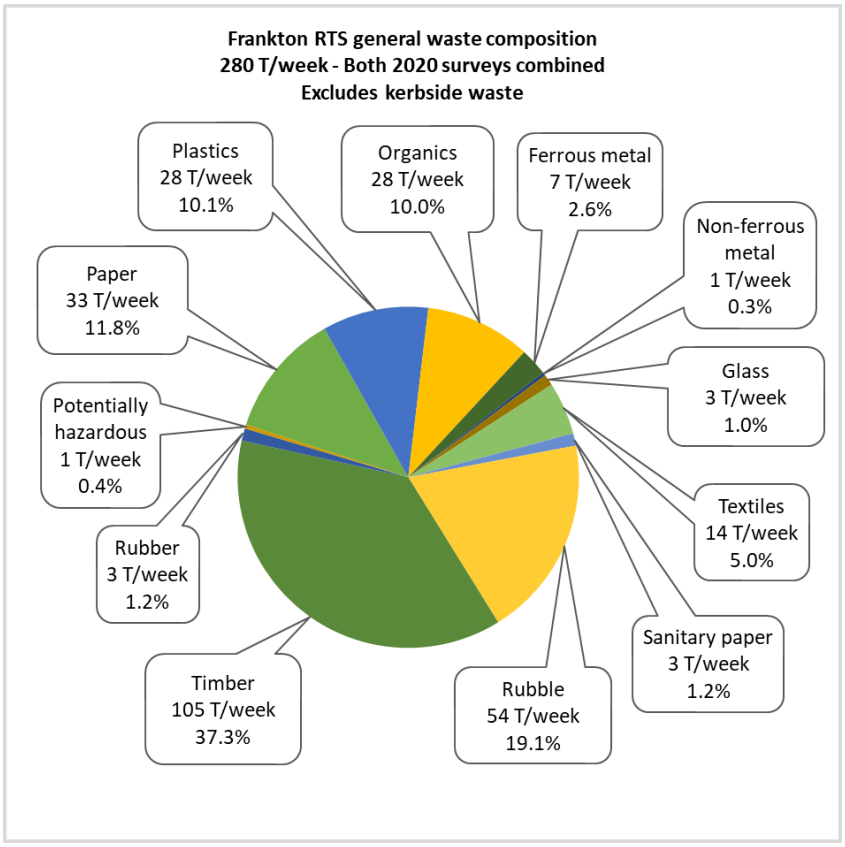

Figure 4.3 - Primary composition of Frankton RTS general waste - Both 2020 surveys combined

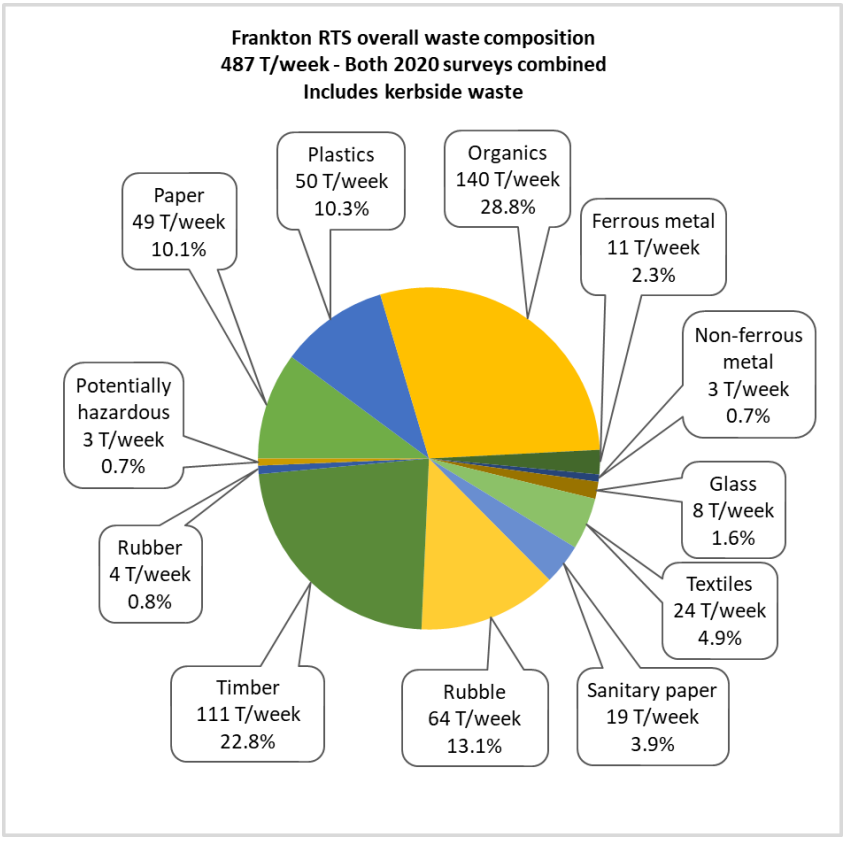

Figure 4.4 - Primary composition of Frankton RTS overall waste - Both 2020 surveys combined

4.2.3 Frankton RTS - Secondary composition of general and overall waste streams

The secondary compositions of the general waste stream and the overall waste stream disposed of at Frankton RTS are presented in Table 4.14. The compositions are the weighted average of the results of the two visual surveys conducted in 2020. The results of the individual surveys are presented in Appendix 13 and Appendix 14.

Table 4.14 - Secondary composition of Frankton RTS waste - Both 2020 surveys combined

Frankton RTS General and overall waste streams - Both 2020 visual surveys combined		General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
		% of total	Tonnes per week	% of total	Tonnes per week
Paper	Recyclable	4.6%	13 T/week	4.9%	24 T/week
	Cardboard	6.5%	18 T/week	4.0%	19 T/week
	Non-recyclable	0.8%	2 T/week	1.2%	6 T/week
	Subtotal	**11.8%**	**33 T/week**	**10.1%**	**49 T/week**
Plastics	Recyclable	1.0%	3 T/week	1.3%	6 T/week
	Non-recyclable	9.1%	25 T/week	9.0%	44 T/week
	Subtotal	**10.1%**	**28 T/week**	**10.3%**	**50 T/week**
Organics	Kitchen waste	1.9%	5 T/week	15.5%	75 T/week
	Compostable greenwaste	2.8%	8 T/week	8.6%	42 T/week
	Non-compostable greenwaste	4.9%	14 T/week	3.6%	17 T/week
	Organics other	0.4%	1 T/week	1.2%	6 T/week
	Subtotal	**10.0%**	**28 T/week**	**28.8%**	**140 T/week**
Ferrous metals	Primarily ferrous	1.5%	4 T/week	1.1%	5 T/week
	Steel other	1.1%	3 T/week	1.3%	6 T/week
	Subtotal	**2.6%**	**7 T/week**	**2.3%**	**11 T/week**
Non-ferrous metals		**0.3%**	**1 T/week**	**0.7%**	**3 T/week**
Glass	Recyclable	0.4%	1 T/week	1.0%	5 T/week
	Non-recyclable	0.7%	2 T/week	0.6%	3 T/week
	Subtotal	**1.0%**	**3 T/week**	**1.6%**	**8 T/week**
Textiles	Clothing/textiles	1.1%	3 T/week	1.7%	8 T/week
	Multimaterial/other	3.9%	11 T/week	3.2%	15 T/week
	Subtotal	**5.0%**	**14 T/week**	**4.9%**	**24 T/week**
Sanitary paper		**1.2%**	**3 T/week**	**3.9%**	**19 T/week**
Rubble	Cleanfill	2.9%	8 T/week	1.7%	8 T/week
	New plasterboard	8.2%	23 T/week	4.7%	23 T/week
	Other	8.0%	22 T/week	6.7%	33 T/week
	Subtotal	**19.1%**	**54 T/week**	**13.1%**	**64 T/week**
Timber	Reusable	2.1%	6 T/week	1.2%	6 T/week
	Unpainted & untreated	7.1%	20 T/week	4.1%	20 T/week
	Non-recoverable	28.1%	79 T/week	17.6%	86 T/week
	Subtotal	**37.3%**	**105 T/week**	**22.8%**	**111 T/week**
Rubber		**1.2%**	**3 T/week**	**0.8%**	**4 T/week**
Potentially hazardous		**0.4%**	**1 T/week**	**0.7%**	**3 T/week**
TOTAL		**100.0%**	**280 T/week**	**100.0%**	**487 T/week**

4.2.4 Frankton RTS - Primary composition of general waste - by activity source of waste loads

The primary compositions of the activity sources that made up the general waste stream at Frankton RTS are shown in Table 4.15 and Table 4.16. The compositions are the weighted average of the results of the two 2020 visual surveys. Secondary compositions are in Appendix 15. Results of the individual surveys are shown in Appendix 16 and Appendix 17.

Table 4.15 -Frankton RTS general waste - By activity source - By % of weight

Frankton RTS general waste By activity source Both surveys combined By % of total weight	C&D	ICI	Landscaping	Residential
Paper	3.4%	27.2%	0.7%	9.0%
Plastics	3.5%	21.6%	1.5%	9.3%
Organics	0.7%	11.7%	85.6%	7.8%
Ferrous metals	2.1%	2.9%	0.0%	7.3%
Non-ferrous metals	0.1%	0.6%	0.0%	0.8%
Glass	0.7%	1.6%	0.0%	1.7%
Textiles	1.9%	7.4%	0.1%	22.2%
Sanitary paper	0.0%	3.2%	0.0%	0.8%
Rubble	32.5%	3.2%	10.0%	3.6%
Timber	53.8%	18.3%	2.1%	36.2%
Rubber	1.3%	1.2%	0.0%	1.0%
Potentially hazardous	0.0%	1.0%	0.0%	0.4%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 4.16 -Frankton RTS general waste - by activity source - By tonnes/week

Frankton RTS general waste By activity source Both surveys combined By tonnes per week	C&D	ICI	Landscaping	Residential
Paper	5.0 T/week	26.4 T/week	0.1 T/week	1.6 T/week
Plastics	5.2 T/week	21.1 T/week	0.3 T/week	1.6 T/week
Organics	1.0 T/week	11.4 T/week	14.3 T/week	1.4 T/week
Ferrous metals	3.2 T/week	2.8 T/week	0.0 T/week	1.3 T/week
Non-ferrous metals	0.2 T/week	0.6 T/week	0.0 T/week	0.1 T/week
Glass	1.1 T/week	1.6 T/week	0.0 T/week	0.3 T/week
Textiles	2.9 T/week	7.2 T/week	0.0 T/week	3.9 T/week
Sanitary paper	0.0 T/week	3.1 T/week	0.0 T/week	0.1 T/week
Rubble	48.3 T/week	3.1 T/week	1.7 T/week	0.6 T/week
Timber	80.0 T/week	17.8 T/week	0.4 T/week	6.4 T/week
Rubber	1.9 T/week	1.2 T/week	0.0 T/week	0.2 T/week
Potentially hazardous	0.0 T/week	1.0 T/week	0.0 T/week	0.1 T/week
TOTAL	**149 T/week**	**97 T/week**	**17 T/week**	**18 T/week**

C&D waste was composed primarily of timber (53.8%) and rubble (32.5%), which, combined, represented 86.3%, by weight, of C&D waste. ICI waste was more heterogeneous, with paper (27.2%) being the largest component. A high proportion of paper was generated by the processing of Council's kerbside recycling collection.

Landscaping waste was 85.6% organic material. Residential waste was also heterogeneous, with timber (36.2%) being the largest component. Timber was present primarily as furniture and C&D waste, which is frequently present in residential waste.

4.2.5 Frankton RTS - Overall waste stream - by vehicle type

Table 4.17 shows the percentage of waste loads disposed of at Frankton RTS by each of the six vehicle types recorded during the surveys, the percentage of total weight carried by each vehicle type, and the tonnes per week. The results are the weighted average of the results of the two 2020 visual surveys. Note that no hook trucks were recorded in either survey but Frankton RTS weighbridge records showed one hook truck disposing of waste during the February survey.

Table 4.17 - Frankton RTS - By vehicle type - Both 2020 surveys combined

Frankton RTS overall waste By vehicle type Both surveys combined	% of loads surveyed	% of weight	Tonnes/week
Car-sized loads	17%	4%	17 T/week
Compactors	11%	42%	207 T/week
Front-end loader	1%	2%	11 T/week
Gantry trucks	19%	33%	159 T/week
Hook trucks	0%	0%	1 T/week
Other trucks	7%	7%	36 T/week
Trailer-sized loads	45%	11%	56 T/week
TOTAL	**100%**	**100%**	**487 T/week**

Compactors transported 42% of the total weight of waste disposed of at Frankton RTS, but represented only 11% of the loads surveyed. Gantry trucks transported 33% of the total weight, and represented 19% of the loads surveyed. Forty-five percent of the loads surveyed were trailer-sized loads, and these loads represented 11% of the total weight.

4.2.6 Frankton RTS - Primary composition of general waste - by vehicle type

The primary compositions of the five vehicle types transporting general waste (compactors and hook trucks are excluded) are shown in Table 4.18. The 'Other trucks' category included the fork-truck from the recycling processing plant. The results are the weighted average of the results of the two 2020 visual surveys. Secondary compositions are presented in Appendix 18. Results of the individual surveys are shown in Appendix 19 and Appendix 20.

Table 4.18 - Frankton RTS general waste - By vehicle type - By % of weight

Frankton RTS general waste - By vehicle type Both surveys combined By % of total weight	Cars	Front-end loaders	Gantry trucks	Other trucks	Trailers
Paper	16.7%	13.6%	5.3%	60.7%	9.2%
Plastics	14.2%	28.7%	6.3%	19.8%	9.4%
Organics	25.3%	17.6%	3.0%	2.0%	28.5%
Ferrous metals	3.3%	3.2%	3.1%	1.6%	1.9%
Non-ferrous metals	0.7%	1.1%	0.2%	0.3%	0.4%
Glass	2.2%	3.7%	0.5%	0.9%	1.6%
Textiles	11.5%	7.6%	3.1%	4.6%	9.0%
Sanitary paper	3.7%	6.8%	0.5%	0.5%	1.2%
Rubble	8.2%	3.8%	26.2%	1.4%	8.9%
Timber	10.4%	7.2%	50.6%	8.2%	28.9%
Rubber	2.6%	4.7%	1.0%	0.1%	0.2%
Potentially hazardous	1.4%	2.2%	0.1%	0.1%	0.8%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 4.19 - Frankton RTS general waste - By vehicle type - By tonnes/week

Frankton RTS general waste By vehicle type Both surveys combined By tonnes per week	Cars	Front-end loaders	Gantry trucks	Other trucks	Trailers
Paper	2.9 T/week	1.5 T/week	8.5 T/week	21.9 T/week	5.1 T/week
Plastics	2.5 T/week	3.1 T/week	9.9 T/week	7.2 T/week	5.2 T/week
Organics	4.4 T/week	1.9 T/week	4.8 T/week	0.7 T/week	15.9 T/week
Ferrous metals	0.6 T/week	0.3 T/week	4.9 T/week	0.6 T/week	1.0 T/week
Non-ferrous metals	0.1 T/week	0.1 T/week	0.4 T/week	0.1 T/week	0.2 T/week
Glass	0.4 T/week	0.4 T/week	0.8 T/week	0.3 T/week	0.9 T/week
Textiles	2.0 T/week	0.8 T/week	5.0 T/week	1.7 T/week	5.0 T/week
Sanitary paper	0.7 T/week	0.7 T/week	0.8 T/week	0.2 T/week	0.7 T/week
Rubble	1.4 T/week	0.4 T/week	41.6 T/week	0.5 T/week	5.0 T/week
Timber	1.8 T/week	0.8 T/week	80.4 T/week	2.9 T/week	16.1 T/week
Rubber	0.5 T/week	0.5 T/week	1.6 T/week	0.0 T/week	0.1 T/week
Potentially hazardous	0.2 T/week	0.2 T/week	0.1 T/week	0.0 T/week	0.4 T/week
TOTAL	**17.4 T/week**	**10.8 T/week**	**158.9 T/week**	**36.1 T/week**	**55.7 T/week**

4.2.7 Frankton RTS - Diversion potential

Of the 25 material classifications used in the visual survey, nine are commonly recycled or recovered in New Zealand. A further four materials are compostable. There are currently diversion options available in Queenstown Lakes District for most of these 13 materials.

Based on these 13 materials, Table 4.20 shows the proportion of the general and overall waste streams disposed of at Frankton RTS that could potentially be diverted from landfill disposal. The percentages and tonnages have been taken from Table 4.14, and represent the weighted average of both 2020 surveys.

Table 4.20 - Diversion potential of Frankton RTS general and overall waste streams- Both 2020 surveys combined

Frankton RTS waste Diversion potential Both 2020 surveys combined	General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
	% of total	T/week	% of total	T/week
Recyclable and recoverable materials				
Paper - Recyclable	4.6%	13 T/week	4.9%	24 T/week
Paper - Cardboard	6.5%	18 T/week	4.0%	19 T/week
Plastic - Recyclable	1.0%	3 T/week	1.3%	6 T/week
Ferrous metals	2.6%	7 T/week	2.3%	11 T/week
Non-ferrous metals	0.3%	1 T/week	0.7%	3 T/week
Glass - Recyclable	0.4%	1 T/week	1.0%	5 T/week
Textiles - Clothing	1.1%	3 T/week	1.7%	8 T/week
Rubble - Cleanfill	2.9%	8 T/week	1.7%	8 T/week
Timber - Reusable	2.1%	6 T/week	1.2%	6 T/week
Subtotal	**21.4%**	**60 T/week**	**18.8%**	**92 T/week**
Compostable materials				
Organics - Kitchen waste	1.9%	5 T/week	15.5%	75 T/week
Organics - Compostable greenwaste	2.8%	8 T/week	8.6%	42 T/week
Rubble - New plasterboard	8.2%	23 T/week	4.7%	23 T/week
Timber - Untreated/unpainted	7.1%	20 T/week	4.1%	20 T/week
Subtotal	**20.1%**	**56 T/week**	**32.9%**	**160 T/week**
TOTAL - Potentially divertable	**41.5%**	**116 T/week**	**51.7%**	**252 T/week**

Recyclable and recoverable materials comprised 21.4% of the general waste stream at Frankton RTS and 18.8% of the overall waste stream. Compostable materials comprised 20.1% of the general waste stream at Frankton RTS and 32.9% of the overall waste stream. Overall, approximately 41.5% of the general waste stream at Frankton RTS and 51.7% of the overall waste stream could have been diverted from landfill disposal.

The largest single divertable component was kitchen waste, which comprised 15.5% of the overall waste stream, or 75 tonnes per week. Approximately 91% of the kitchen waste was in kerbside rubbish collections.

5 Victoria Flats landfill

5.1 Victoria Flats landfill - types of waste

Waste entering the Victoria Flats landfill consists of consolidated waste loads from the four refuse transfer stations in the region (Wanaka, Queenstown, Alexandra, and Cromwell) and waste loads delivered directly to the landfill, including small amounts from Mackenzie District. Waste loads delivered directly to landfill include commercial and demolition waste, special wastes, and minor quantities of kerbside rubbish and recycling collections.

Table 5.1 shows the tonnages entering the landfill from each of these sources from 18 January - 13 March, from 20 August - 30 September 2020, and an average of the two periods. The waste types, geographic origins, and tonnages in this table are based on information recorded for each load by Victoria Flats landfill staff at the weighbridge. The 'Commercial' and 'Demolition' categories are those used on the weighbridge records. These categories correspond roughly to the ICI and C&D activity sources.

Table 5.1 - Types of waste entering Victoria Flats landfill

Victoria Flats landfill Types of waste - 2020		18/01 - 13/03 2020	20/08 - 30/09 2020	% change	% of total weight	Mean tonnes per week
Transfer station waste	**Alexandra**	88 T/week	75 T/week	-15%	8%	82 T/week
	Cromwell	73 T/week	64 T/week	-12%	7%	68 T/week
	Frankton	536 T/week	439 T/week	-18%	49%	488 T/week
	Wanaka	197 T/week	188 T/week	-4%	19%	193 T/week
	Subtotal	**894 T/week**	**766 T/week**	**-14%**	**83%**	**830 T/week**
General waste	***Commercial** **	108 T/week	67 T/week	-38%	9%	87 T/week
	***Demolition** **	43 T/week	45 T/week	5%	4%	44 T/week
Other wastes		38 T/week	14 T/week	-64%	3%	26 T/week
Subtotal		**188 T/week**	**126 T/week**	**-33%**	**16%**	**157 T/week**
Special wastes		**7 T/week**	**11 T/week**	**49%**	**1%**	**9 T/week**
TOTAL		**1,090 T/week**	**903 T/week**	**-17%**	**100%**	**996 T/week**

** Weighbridge classifications*

Between the January-March and August-September period, the average weekly tonnage of waste disposed of at Victoria Flats landfill decreased by 17%. This decrease is associated with both seasonal variations in waste generation and the economic effects of the Covid-19 pandemic.

From the average of the two periods, waste from the four transfer stations in the region accounted for 83% of all waste entering Victoria Flats landfill. Waste from Frankton transfer station represented 49% of all waste disposed of at the facility.

6 Waste from Queenstown Lakes District to landfill

The overall waste stream analysed in section 5.1 includes waste from Queenstown Lakes District, Central Otago District, and minor quantities from Mackenzie District. In this section, waste originating from Queenstown Lake District is analysed separately. Waste from the District is identified from the 'Ex' field in the weighbridge records.

Waste from Queenstown Lakes District includes consolidated waste loads from the two refuse transfer stations (Wanaka and Queenstown) and waste loads delivered directly to the landfill. Waste loads delivered directly to landfill include commercial and demolition waste and special wastes.

Table 6.1 shows the tonnages entering the landfill from these sources from 18 January - 13 March, from 20 August - 30 September 2020, and an average of the two periods. The waste types, geographic origins, and tonnages in this table are based on information recorded for each load by Victoria Flats landfill weighbridge. The 'Commercial' and 'Demolition' categories are those used on the weighbridge records. These categories correspond roughly to the ICI and C&D activity sources.

Table 6.1 - Waste entering Victoria Flats landfill from Queenstown Lakes District

Victoria Flats landfill - Waste from Queenstown Lakes District - 2020		18/01 - 13/03 2020	20/08 - 30/09 2020	% change	% of total weight	Mean tonnes per week
Transfer station waste	**Frankton**	535 T/week	439 T/week	-18%	64%	487 T/week
	Wanaka	198 T/week	188 T/week	-4%	25%	193 T/week
	Subtotal	**733 T/week**	**627 T/week**	**-14%**	**90%**	**680 T/week**
General waste	***Commercial** **	73 T/week	40 T/week	-44%	7%	56 T/week
	***Demolition** **	14 T/week	14 T/week	-3%	2%	14 T/week
Other wastes		1 T/week	1 T/week	81%	0%	1 T/week
	Subtotal	**88 T/week**	**56 T/week**	**-36%**	**9%**	**72 T/week**
Special wastes		**5 T/week**	**6 T/week**	**13%**	**1%**	**6 T/week**
TOTAL		**826 T/week**	**689 T/week**	**-17%**	**100%**	**757 T/week**

** Weighbridge classifications*

Using data from two eight-week periods, it has been calculated that an average of 757 tonnes per week of waste from Queenstown Lakes District was disposed of at Victoria Flats landfill. The two transfer stations, in Frankton and Wanaka, accounted for 90% of this total.

Between the January-March and August-September period, the total tonnage of waste disposed of from Queenstown Lakes District decreased by 17%. This decrease is associated with both seasonal variations in waste generation and the economic effects of the Covid-19 pandemic, particularly on the hospitality and other tourism-related sectors.

6.1 Activity sources of waste from Queenstown Lakes District to landfill

The activity sources of waste disposed of at Victoria Flats landfill solely from Queenstown Lakes District can be calculated using the tonnage data in Table 6.1 and applying the transfer station activity source data from Table 4.1 and Table 4.11. The results of the calculations are presented in Table 6.2. All data used for the calculations is from the average of the two surveys.

The analysis excludes biosolids from the District that are transported to AB Lime landfill in Southland for disposal.

Table 6.2 - Activity sources of all waste from Queenstown Lakes District to landfill

Activity sources of all waste from Queenstown Lakes District to landfill Both 2020 surveys combined	Frankton RTS	Wanaka RTS	Direct to landfill	% of total	Total from QLDC
Construction & demolition	149 T/week	79 T/week	14 T/week	32%	242 T/week
Industrial/commercial/institutional	97 T/week	34 T/week	58 T/week	25%	189 T/week
Landscaping & earthworks	17 T/week	2 T/week	0 T/week	2%	19 T/week
Residential	18 T/week	9 T/week	0 T/week	4%	27 T/week
Subtotal - general waste	**280 T/week**	**124 T/week**	**72 T/week**	**63%**	**476 T/week**
Council kerbside rubbish collections	123 T/week	55 T/week	0 T/week	24%	178 T/week
Private kerbside rubbish collections	84 T/week	14 T/week	0 T/week	13%	97 T/week
Special wastes	**0 T/week**	**0 T/week**	**6 T/week**	1%	**6 T/week**
TOTAL	**487 T/week**	**193 T/week**	**78 T/week**	**100%**	**757 T/week**

Kerbside rubbish collections (Council and private collections combined) represented the largest activity source of waste, comprising 37% of the total weight of waste. Council kerbside rubbish collections comprised 65% of kerbside rubbish. C&D waste represented 32% and ICI waste 25%.

6.2 Composition of waste from Queenstown Lakes District to landfill

To calculate the composition of all waste from Queenstown Lake District discharged at Victoria Flats landfill, the compositions used for individual waste streams are as follows:

- Wanaka transfer station - the composition for the overall waste given in section 4.1.3
- Frankton transfer station - the composition for the overall waste given in section 4.2.3
- General waste disposed of directly to Victoria Flats landfill - the composition of the 'Commercial' and 'Demolition' waste streams have been assumed to be the same as the ICI and C&D activity sources respectively at Frankton RTS, as given in Appendix 15
- Special waste - assumed to be 100% potentially hazardous

The primary composition of the overall waste stream from Queenstown Lakes District disposed of at Victoria Flats landfill is shown in Table 6.3 and Figure 6.1 on the following page. The secondary composition is given in section 6.2.1.

Table 6.3 - Primary composition of all waste from Queenstown Lakes District to Victoria Flats landfill - Both 2020 surveys combined

Primary composition of all waste from Queenstown Lakes District to landfill - Both 2020 surveys combined	% of total	Tonnes/week
Paper	10.7%	81 T/week
Plastics	10.7%	81 T/week
Organic	25.6%	194 T/week
Ferrous metals	2.5%	19 T/week
Nonferrous metals	0.7%	5 T/week
Glass	1.6%	12 T/week
Textiles	5.1%	39 T/week
Sanitary paper	3.7%	28 T/week
Rubble	13.0%	99 T/week
Timber	24.3%	184 T/week
Rubber	0.8%	6 T/week
Potentially hazardous	1.5%	11 T/week
TOTAL	**100.0%**	**757 T/week**

Figure 6.1 - Primary composition of all waste from Queenstown Lakes District to Victoria Flats landfill - Both 2020 surveys combined

Organic material was the largest component of the overall waste to landfill from Queenstown Lakes District, comprising 25.6% of the total, by weight. Timber was the second largest component, comprising 24.3% of the total weight. Rubble was the third largest component, comprising 13.0%. Paper and plastic both comprised 10.7% of the total weight.

6.2.1 Secondary composition of waste from Queenstown Lakes District to landfill

Table 6.4 - Secondary composition of all waste from Queenstown Lakes District to Victoria Flats landfill - Both 2020 surveys combined

Secondary composition of all waste from Queenstown Lakes District to Victoria Flats landfill. - Both 2020 visual surveys combined		% of total	Tonnes per week
Paper	Recyclable	4.9%	37 T/week
	Cardboard	4.6%	35 T/week
	Non-recyclable	1.2%	9 T/week
	Subtotal	**10.7%**	**81 T/week**
Plastics	Recyclable	1.3%	10 T/week
	Non-recyclable	9.4%	71 T/week
	Subtotal	**10.7%**	**81 T/week**
Organics	Kitchen waste	14.0%	106 T/week
	Compostable greenwaste	7.5%	57 T/week
	Non-compostable greenwaste	2.9%	22 T/week
	Organics other	1.1%	9 T/week
	Subtotal	**25.6%**	**194 T/week**
Ferrous metals	Primarily ferrous	1.2%	9 T/week
	Steel other	1.3%	10 T/week
	Subtotal	**2.5%**	**19 T/week**
Non-ferrous metals		**0.7%**	**5 T/week**
Glass	Recyclable	1.0%	7 T/week
	Non-recyclable	0.6%	4 T/week
	Subtotal	**1.6%**	**12 T/week**
Textiles	Clothing/textiles	1.8%	14 T/week
	Multimaterial/other	3.3%	25 T/week
	Subtotal	**5.1%**	**39 T/week**
Sanitary paper		**3.7%**	**28 T/week**
Rubble	Cleanfill	1.8%	14 T/week
	New plasterboard	4.4%	33 T/week
	Other	6.8%	52 T/week
	Subtotal	**13.0%**	**99 T/week**
Timber	Reusable	2.1%	16 T/week
	Unpainted & untreated	3.8%	29 T/week
	Non-recoverable	18.4%	139 T/week
	Subtotal	**24.3%**	**184 T/week**
Rubber		**0.8%**	**6 T/week**
Potentially hazardous		**1.5%**	**11 T/week**
TOTAL		**100.0%**	**757 T/week**

6.3 Diversion potential of waste from Queenstown Lakes District to landfill

Of the 25 material classifications used in the visual survey, nine are commonly recycled or recovered in New Zealand. A further four materials are compostable. There are currently diversion options available in Queenstown Lakes District for most of these 13 materials.

Based on these 13 materials, Table 6.5 shows the proportion of the general and overall waste streams disposed to landfill from Queenstown Lakes District that could potentially be diverted from disposal. The percentages and tonnages have been taken from Table 6.4 and represent the weighted average of both 2020 surveys.

Table 6.5 - Diversion potential of all waste from Queenstown Lakes District to Victoria Flats landfills - Both 2020 surveys combined

Diversion potential of all waste from Queenstown Lakes District to Victoria Flats landfill. - Both 2020 visual surveys combined	% of total	Tonnes per week
Recyclable materials		
Paper - Recyclable	4.9%	37 T/week
Paper - Cardboard	4.6%	35 T/week
Plastic - Recyclable	1.3%	10 T/week
Ferrous metals	2.5%	19 T/week
Non-ferrous metals	0.7%	5 T/week
Glass - Recyclable	1.0%	7 T/week
Textiles - Clothing	1.8%	14 T/week
Rubble - Cleanfill	1.8%	14 T/week
Timber - Reusable	2.1%	16 T/week
Subtotal	**20.7%**	**157 T/week**
Compostable materials		
Organics - Kitchen waste	14.0%	106 T/week
Organics - Compostable greenwaste	7.5%	57 T/week
Rubble - New plasterboard	4.4%	33 T/week
Timber - Untreated/unpainted	3.8%	29 T/week
Subtotal	**29.7%**	**225 T/week**
TOTAL - Potentially divertable	**50.4%**	**382 T/week**

Recyclable and recoverable materials comprised 20.7% of waste from Queenstown Lakes District disposed of at Victoria Flats landfill. Compostable materials comprised 29.7% of waste. Overall, approximately 50.4% of waste from Queenstown Lakes District disposed of at Victoria Flats landfill could have been diverted from landfill disposal.

The largest single divertable component was kitchen waste, which comprised 14.0% of the waste, or 106 tonnes per week. Approximately 86% of the kitchen waste was in kerbside rubbish collections.

7 Discussion

7.1 Precision of kerbside rubbish audit results

The SWAP defines a precision level of ±20% as being a 'reasonable level of accuracy'. For paper, which comprises in the region of 10% of kerbside rubbish, a precision level of ±20% at the 95% confidence interval means that the sample average for 95% of samples would lie within about 2% (the margin of error) of the 'actual' proportion of paper. The precision levels for the primary categories for the rubbish and mixed recycling audits are shown in Table 7.1 below.

Those levels that are ±20% or less at the 95% confidence interval are shown in bold. The results of the glass recycling audit have not been analysed as the collected material was sorted in bulk, and not in individual samples. This did not provide data suitable for statistical analysis.

As different classifications were used for sorting the rubbish and recycling, there is no data for several of the primary categories for mixed recycling.

Table 7.1 - Precision level of kerbside rubbish and recycling audit results

Precision level of kerbside rubbish and recycling audit results	Rubbish wheelie bins	Mixed recycling wheelie bins
Paper	26%	28%
Plastics	**8%**	**18%**
Organics	**10%**	74%
Ferrous metals	34%	28%
Non-ferrous metals	33%	33%
Glass	26%	54%
Textiles	25%	136%
Sanitary paper	29%	-
Rubble	57%	N/A
Timber	59%	N/A
Rubber	63%	N/A
Potentially hazardous	29%	N/A
Other contamination	N/A	71%

Two of the primary categories (plastics and organics) in the kerbside rubbish audit achieved precision levels of less than ±20%. The paper primary category would also have achieved this precision level except for one large sample (>25kg) that skewed the results. Five secondary categories also had precision levels of less than ±20%.

Plastics was the only primary category in the mixed recycling audit that has a precision level of less than ±20%. As with the kerbside rubbish audit, the paper primary category would also have achieved this precision level except for one large sample that skewed the results. One secondary category also had a precision level of less than ±20%.

7.2 Effects of container return scheme

Four of the classification used for the sorting of rubbish and recycling were defined so as to permit an analysis of the effect a container return scheme might have on Council's kerbside collections. The definition that was used for containers that might be included in a container return scheme was 'All 'ready-to-drink' beverage containers (including milk) over 300ml and under 3 litres'.[5] This definition was used for secondary classifications in the primary paper, plastic, aluminium, and glass primary categories.

Using weight per item data collected during the audit and volume per item data from previous research, the number and volume of beverage containers in kerbside mixed recycling, glass recycling, and rubbish wheelie bins have been estimated.

1.1.1 Beverage containers in kerbside recycling wheelie bins

Table 7.2 shows the number of beverage containers per recycling wheelie bin and the volume of those items. These figures are shown separately for mixed recycling wheelie bins and glass recycling wheelie bins.

Table 7.2 - Beverage containers in kerbside recycling

Beverage containers in kerbside recycling - December 2019	Mixed recycling wheelie bins			Glass recycling wheelie bins		
	Weight per wheelie bin	# items per wheelie bin	Volume per wheelie bin	Weight per wheelie bin	# items per wheelie bin	Volume per wheelie bin
Paper - Drink containers	0.03 kg	1.4	0.90 litre	0.00 kg	0.0	0.00 litre
Plastic - Drink bottles	0.43 kg	8.7	14.68 litre	0.01 kg	0.1	0.17 litre
Aluminium drink cans	0.12 kg	7.2	3.26 litre	0.01 kg	0.3	0.14 litre
Glass - Beverage bottles	0.28 kg	0.9	0.56 litre	11.47 kg	38.2	22.94 litre
TOTAL	**0.86 kg**	**18.3**	**19.39 litre**	**11.48 kg**	**38.6**	**23.25 litre**

Beverage containers in mixed recycling wheelie bins weighed an average of 0.86 kg per bin, 11% of the total weight of materials in the bins. On average, there were 18.3 beverage containers with a volume of 19.39 litres in each mixed recycling wheelie bin.

In glass recycling wheelie bins, beverage containers weighed an average of 11.48 kg per bin, 90% of the total weight of materials. On average, there were 38.6 beverage containers with a volume of 23.25 litres in each glass recycling wheelie bin.

[5] Envision New Zealand (2015) The InCENTive to Recycle - The Case for a Container Deposit System in New Zealand

1.1.2 Beverage containers in kerbside rubbish wheelie bins

The data in Table 7.3 shows the average number of beverage containers in kerbside rubbish wheelie bins and the volume of those items.

Table 7.3 - Beverage containers in kerbside rubbish

Beverage containers in kerbside rubbish - December 2019	Kerbside rubbish wheelie bins		
	Weight per wheelie bin	# items per wheelie bin	Volume per wheelie bin
Paper - Drink containers	0.02 kg	1.0	0.61 litre
Plastic - Drink bottles	0.03 kg	0.7	1.11 litre
Aluminium drink cans	0.02 kg	1.1	0.51 litre
Glass - Beverage bottles	0.12 kg	0.4	0.24 litre
TOTAL	**0.19 kg**	**3.2**	**2.47 litre**

Beverage containers in kerbside rubbish wheelie bins weighed an average of 0.19 kg per bin, 2% of the total weight of materials in the bins. On average, there were 3.2 beverage containers with a volume of 2.47 litres in each kerbside rubbish wheelie bin.

1.1.3 Beverage containers in kerbside collections - weekly

New Council kerbside collection services were introduced in Queenstown Lakes District on 1 July 2019. For this report, WMNZL has provided tonnage data for the three kerbside collections for the period July 2019-January 2020. As July was the first month of the new services, the tonnage data for that month could be anomalous and has not been used for this analysis. In Table 7.4 below, tonnage data for the period August 2019 - January 2020 has been used to calculate an average weekly tonnage for each collection during that period.

Table 7.4 - Weekly tonnages of kerbside collections

Weekly tonnages of kerbside collections	Tonnes - August 2019 - January 2020	Average tonnes/week
Rubbish	1,657 tonnes	63 T/week
Mixed recycling	524 tonnes	20 T/week
Glass recycling	486 tonnes	18 T/week

1.1.4 Beverage containers in kerbside collections - per week

Beverage containers as a percentage of kerbside rubbish, mixed recycling, and glass recycling are provided in sections 3.2, 4, and 5, respectively. These percentages have been applied to the weekly tonnages of each of the three collections in Table 7.5 to calculate the average weekly tonnage of each type of beverage container in each of the kerbside collections.

The average weight for each type of container has then been applied to the average weekly tonnage to calculate the average number of beverage containers in each collection per week.

Table 7.5 - Beverage containers in kerbside collections - per week

Beverage containers in kerbside collections- Aug 2019 - Jan 2020	Weekly weight of beverage containers			Weekly number of beverage containers		
	Rubbish	Mixed recycling	Glass recycling	Rubbish	Mixed recycling	Glass recycling
Paper - Drink containers	0.12 T/week	0.08 T/week	0.00 T/week	5,365	3,557	0
Plastic - Drink bottles	0.18 T/week	1.08 T/week	0.01 T/week	3,628	21,646	148
Aluminium drink cans	0.10 T/week	0.29 T/week	0.01 T/week	6,288	18,082	461
Glass - Beverage bottles	0.67 T/week	0.70 T/week	16.56 T/week	2,236	2,319	55,201
TOTAL	**1.07 T/week**	**2.15 T/week**	**16.58 T/week**	**17,516**	**45,603**	**55,810**

1.1.1 Recovery rate of beverage containers in kerbside collections

The effectiveness of the new kerbside collection system can be assessed by expressing the number of beverage containers in the two recycling collections as a percentage of beverage containers in all three collections. The 'recovery rates' for the four types of beverage containers are calculated in Table 7.6.

Table 7.6 - Recovery rate of beverage containers in kerbside collections

Recovery rate of beverage containers in kerbside collections - Aug 2019 - Jan 2020	Rubbish	Mixed recycling	Glass recycling	Total weekly number of containers	Percentage recycled
Paper - Drink containers	5,365	3,557	0	8,921	40%
Plastic - Drink bottles	3,628	21,646	148	25,421	86%
Aluminium drink cans	6,288	18,082	461	24,831	75%
Glass - Beverage bottles	2,236	2,319	55,201	59,756	96%
TOTAL	**17,516**	**45,603**	**55,810**	**118,930**	**85%**

Forty percent of paper drink containers (such as Tetra Paks) were disposed of through the mixed recycling system. These containers, however, are not approved for recycling. The recovery rate for plastic drink bottles was 86%, for aluminium drink cans, 75%, and for glass beverage bottles, 96%. Overall, the recovery rate for beverage containers was 85%.

7.3 Comparisons with previous transfer station surveys

7.3.1 Activity sources of waste at Frankton RTS - 2008 - 2020

Previous surveys of waste disposed of at Frankton RTS were undertaken by Waste Not Consulting in 2004, 2006, 2008, 2012, and 2016. In Table 7.7, the 2008, 2012, and 2016 weekly tonnages of the activity sources of waste being disposed of at Frankton RTS are compared to those from the 2020 survey. Different categories for activity sources were used in the 2004 and 2006 surveys so these have not been included. Seasonal differences in waste disposal should be taken into account when comparing the results.

Table 7.7 – Activity sources of waste at Frankton transfer station - 2008 - 2020

Frankton transfer station - activity sources - 2008 - 2020	August 2008	February/ March 2012	August 2016	Both surveys 2020
Construction & demolition	55 T/week	46 T/week	139 T/week	149 T/week
Industrial/commercial/institutional	37 T/week	29 T/week	47 T/week	97 T/week
Landscaping & earthworks	12 T/week	9 T/week	4 T/week	17 T/week
Residential	10 T/week	9 T/week	14 T/week	18 T/week
Council kerbside rubbish	13 T/week	21 T/week	29 T/week	123 T/week
Private kerbside rubbish	51 T/week	44 T/week	65 T/week	84 T/week
TOTAL	**179 T/week**	**157 T/week**	**297 T/week**	**487 T/week**

The weekly tonnage of waste disposed to landfill from Frankton transfer station was 12% lower in the 2012 survey period than in the 2008 survey period but increased 30% from 2012 to 2016 and then 64% from 2016 to 2020. All waste activity sources other than landscaping waste were higher in 2015 than in 2012.

However, the changes between 2016 and 2020 are associated with a reduction in the tonnages of waste being disposed of directly to Victoria Flats landfill, particularly for kerbside rubbish collections and ICI waste transported by front-end loaders. As such, the changes in tonnages disposed of at Frankton transfer station cannot be considered to be directly attributable to changes in waste generation, particularly for kerbside rubbish and ICI waste.

7.3.2 Activity sources of waste disposed of at Wanaka RTS - 2008 - 2020

Surveys of waste disposed of at Wanaka RTS have previously been undertaken by Waste Not Consulting in 2004, 2006, 2008, 2012, and 2016. In Table 7.8, the 2008, 2012, and 2016 weekly tonnages of the activity sources of waste being disposed of at Wanaka RTS are compared with those from the 2020 survey. Different categories for waste activity sources were used in the 2004 and 2006 surveys so these have not been included. Seasonal differences in waste disposal should be taken into account when comparing the results.

Table 7.8 – Activity sources of waste at Wanaka transfer station - 2008 - 2020

Wanaka transfer station - activity sources - 2008 - 2020	August 2008	February/ March 2012	August 2016[6]	Both surveys 2020
Construction & demolition	42 T/week	37 T/week	52 T/week	79 T/week
Industrial/commercial/institutional	25 T/week	20 T/week	28 T/week	34 T/week
Landscaping & earthworks	2 T/week	1 T/week	1 T/week	2 T/week
Residential	8 T/week	3 T/week	9 T/week	9 T/week
Council kerbside rubbish	25 T/week	26 T/week	33 T/week	55 T/week
Private kerbside rubbish	8 T/week	9 T/week	12 T/week	14 T/week
TOTAL	**110 T/week**	**96 T/week**	**134 T/week**	**193 T/week**

The weekly tonnage of waste disposed of at Wanaka RTS increased 44% between 2016 and 2020. All waste activity sources were higher in 2020 than in 2016. The greatest increase was in construction and demolition waste, which increased 41% between 2012 and 2016 and then 52% between 2016 and 2020.

7.3.3 Types of waste at Victoria Flats landfill – 2006, 2008, 2012, and 2016

Previous surveys of waste disposed of at Victoria Flats landfill were undertaken by Waste Not Consulting in August 2004, January 2006, August 2008, and February/March 2012. In Table 7.9, the weekly tonnages of the types of waste at Victoria Flats landfill from the previous surveys are compared with the 2020 results. Seasonal differences in waste disposal should be taken into account when comparing the results.

Table 7.9 – Types of waste disposed of at Victoria Flats landfill – 2006 - 2020

Victoria Flats landfill – Types of waste - 2006 - 2020		January 2006	August 2008	February/ March 2012	July/ August 2016	Both surveys 2020
Transfer station waste	Alexandra	152 T/week	101 T/week	123 T/week	59 T/week	82 T/week
	Cromwell	78 T/week	56 T/week	66 T/week	66 T/week	68 T/week
	Frankton	290 T/week	179 T/week	157 T/week	297 T/week	488 T/week
	Wanaka	133 T/week	110 T/week	96 T/week	134 T/week	193 T/week
	Subtotal	**654 T/week**	**445 T/week**	**442 T/week**	**555 T/week**	**830 T/week**
General waste	*Commercial* *	82 T/week	62 T/week	61 T/week	104 T/week	87 T/week
	Other wastes	42 T/week	2 T/week	0 T/week	0 T/week	26 T/week
	Demolition *	13 T/week	82 T/week	17 T/week	17 T/week	44 T/week
	Subtotal	**137 T/week**	**147 T/week**	**78 T/week**	**121 T/week**	**157 T/week**
Special waste		8 T/week	9 T/week	27 T/week	38 T/week	**9 T/week**
Glass from Wakatipu Recycling		-	-	-	51 T/week	-
QLDC kerbside collection		12 T/week	42 T/week	39 T/week	41 T/week	-
TOTAL		**811 T/week**	**642 T/week**	**585 T/week**	**805 T/week**	**996 T/week**

* *Weighbridge classifications*

[6] The figures for activity sources of waste at Wanaka transfer station differ from those in the 2016 report. A more accurate method of calculating activity source was used for the 2020 report and has been applied to the 2016 data.

The global financial crisis of 2008 resulted in a reduced level of economic activity and a reduction in waste to landfill in most areas, with the tonnages at Victoria Flats landfill reflecting this pattern. Between 2012 and 2016, the total tonnage to Victoria Flats landfill increased 38%. Between 2016 and 2020, the total tonnage increased 24%.

7.4 Per capita waste to Class 1 landfills

The total quantity of waste disposed of at Class 1 landfills from a specific area is related to a number of factors, including:

- the size and levels of affluence of the population
- the extent and nature of waste collection and disposal activities and services
- the extent and nature of resource recovery activities and services
- the level and types of economic activity, particularly industrial activity and construction and demolition activity
- the relationship between the costs of landfill disposal and the value of recovered materials
- the availability and cost of disposal alternatives, such as Class 2-4 landfills
- seasonal fluctuations in population (including those related to tourism).

By combining Stats NZ 2020 usually resident population estimate and the weekly disposal data for the District in Table 6.2, the per capita per annum waste to Class 1 landfill in 2020 from Queenstown Lakes District can be calculated, as shown in Table 7.10. The estimate includes special wastes disposed of at Victoria Flats landfill, but not biosolids disposed of at AB Lime landfill.

It should be noted that the Stats NZ usually resident population estimate of an area is based on a count of all people who usually live in that area and were present in New Zealand on census night. ***Excluded*** from the usually resident population count are visitors from overseas, visitors from elsewhere in New Zealand, and residents temporarily overseas on census night.

Table 7.10 – Waste disposal per capita - Queenstown Lakes District

Calculation of per capita waste to Victoria Flats landfill from Queenstown Lakes District	
Estimated usually resident population 2020	47,400[7]
Weekly tonnage of waste to Victoria Flats landfill from Queenstown Lakes District (both surveys combined)	757 T/week
Annualised tonnage of waste to Victoria Flats landfill from Queenstown Lakes District	39,498 T/annum
Tonnes/capita/annum of waste to Class 1 landfills	**0.833 T/capita/annum**

It is estimated that 0.833 tonnes of levied waste was disposed of annually at Victoria Flats landfill for each usually resident person in Queenstown Lakes District. Visitors from neither New Zealand nor overseas are counted as being 'usually resident persons'.

The per capita estimate for waste disposal for Queenstown Lakes District is compared to estimates for other districts in Table 7.11. The data for other districts has been taken from

[7] https://www.stats.govt.nz/information-releases/subnational-population-estimates-at-30-june-2020

the results of SWAP surveys by Waste Not Consulting Ltd. The table also includes the per capita waste disposal rate from the 2012 and 2016 surveys in Queenstown Lakes District.

The national average in Table 7.11 has been calculated using data from MfE's waste levy data [8] and Stats NZ usually resident population estimates[9].

Table 7.11 – Per capita waste to Class 1 landfills compared to other districts

Overall waste to landfill including special wastes (excluding cover materials)	Tonnes per capita per annum
Gisborne District 2017	0.296
Waimakariri District 2017	0.325
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
Dunedin City 2018	0.554
Wellington region 2016	0.608
Napier/Hastings 2019	0.630
New Zealand (to September 2020) [10]	0.663
Taupō District 2017	0.673
Hamilton City 2017	0.718
Queenstown Lakes District 2012	***0.735***
Queenstown Lakes District 2020	***0.833***
Auckland region 2016	**1.053**
Queenstown Lakes District 2016	***1.103***

The districts with the lowest per capita waste disposal rates tend to be rural areas or urban areas with relatively low levels of manufacturing activity. The areas with the higher per capita waste generation rates are those with significant primary manufacturing activity or with large numbers of tourists, such as Taupō and Queenstown Lakes Districts.

The 2016 per capita disposal rate for Queenstown Lakes District was the highest of any district measured by Waste Not Consulting Ltd. The disposal rate for 2020 is 25% lower than the comparable result for 2016.

[8] https://www.mfe.govt.nz/waste/waste-guidance-and-technical-information/waste-disposal-levy/monthly-levy-graph
[9] https://www.stats.govt.nz/indicators/population-of-nz
[10] Ministry for the Environment. 2017. Review of the Effectiveness of the Waste Disposal Levy 2017. Wellington: Ministry for the Environment.

7.4.1 Construction and demolition waste - 2008 - 2020

Table 7.12 compares the weekly tonnage of construction and demolition waste disposed of at the three disposal sites in August 2008, February/March 2012, August 2016, and both 2020 surveys combined. The comparison is presented in terms of tonnes per week. Seasonal differences in construction activity should be taken into account when comparing the results.

Table 7.12 - C&D waste - 2008 - 2020

Construction and demolition waste - 2008-2020	August 2008	February/March 2012	August 2016 [11]	Both surveys 2020
Wanaka transfer station	42 T/week	37 T/week	52 T/week	79 T/week
Frankton transfer station	55 T/week	46 T/week	139 T/week	149 T/week
Direct to Victoria Flats landfill	82 T/week	17 T/week	17 T/week	14 T/week
TOTAL	**179 T/week**	**100 T/week**	**213 T/week**	**242 T/week**

Overall, the quantity of construction and demolition waste disposed of to landfill decreased 44% between the 2008 and 2012 surveys but then increased 113% between 2012 and 2016 and 28% between 2016 and 2020. The percentage increase from 2016 to 2020 was lower at Frankton transfer station than at Wanaka transfer station.

[11] The figure for C&D waste at Wanaka transfer stations differ from that in the 2016 report. A more accurate method of calculating activity source was used for the 2020 report and has been applied to the 2016 data.

Appendix 1 - Kerbside rubbish classifications

Primary category	Secondary category	Definitions
Paper	Drink containers	'Ready-to-drink' paper-based beverage containers (including milk) over 300 ml and under 3 litres
	Recyclable paper	Clean cardboard incl. pizza boxes, newspapers, brochures, office paper, magazines, books, printer paper, other paper packaging
	Non-recyclable paper	Non-recyclable paper packaging (wet-strength, food contaminated), coffee cups, photographic paper, playing cards, laminated paper
Plastics	Drink bottles	'Ready-to-drink' plastic beverage containers (including milk) over 300 ml and under 3 litres
	#1-7 containers	Other bottles & containers with recycling logo # 1 to 7
	Plastic bags/film	All plastic bags, film, and other soft plastics
	Other non-recyclable	Non-recyclable plastic packaging, including polystyrene meat trays, paint, engine oil and chemical containers. All non-packaging materials made primarily of plastic.
Organics	Kitchen waste	All kitchen food waste
	Greenwaste	All organic garden waste, excludes soil
	Other organic	All other primarily organic items – includes cat tray litter, hair, vacuum cleaner bags
Steel	Steel cans	All steel cans, except aerosol cans
	Other steel	Other items made primarily of steel, incl. aerosol cans
Non-ferrous metals	Aluminium drink cans	'Ready-to-drink' beverage cans over 300ml
	Other aluminium cans	Food and other aluminium cans, except aerosol cans
	Other non-ferrous	All other items made primarily of non-ferrous metal, incl. aerosol cans
Glass	Beverage bottles	All 'ready-to-drink' glass beverage containers (including milk) over 300ml and under 3 litres
	Other recyclable glass	Jars and other recyclable containers
	Non-recyclable glass	All other items made primarily of glass, includes light bulbs, drinking glasses, and window glass
Textiles	Clothing & rags	All woven items primarily made of a fabric, such as clothes, curtains, suitable for rags
	Other textiles	Includes shoes, backpacks, handbags, rugs, not suitable for rags
Sanitary paper		Includes disposable nappies, paper towels, tissues, menstruation products, wet wipes
Rubble, concrete		All concrete, rubble, ceramics, and soil
Timber		All items made primarily of timber
Rubber		All items made primarily of rubber (e.g. kitchen gloves)
Potentially hazardous	Household	Batteries, aerosol cans, medicines and cosmetics, cleaning agents
	Other hazardous	Potentially hazardous items not associated with domestic activity, such as used oil and garden chemicals.

Appendix 2 - Recycling classifications

Primary category	Secondary category	Definitions
Paper	Drink containers	'Ready-to-drink' paper beverage containers (including milk) over 300 ml and under 3 litres
	Recyclable paper	Clean cardboard incl. pizza boxes, newspapers, brochures, office paper, magazines, books, printer paper, junk mail, other paper packaging
	Non-recyclable paper	Non-recyclable paper packaging (wet-strength, food contaminated), coffee cups, photographic paper, playing cards, laminated paper.
Plastics	Drink bottles	'Ready-to-drink' plastic beverage containers (including milk) over 300ml and under 3 litres
	#1-7 container	Other bottles & containers with recycling # 1 to 7
	Unrinsed containers	Unrinsed bottles & containers with recycling # 1 to 7
	Other non-recyclable	Plastic bags & film, non-recyclable plastic packaging, including polystyrene meat trays, paint, engine oil and chemical containers. All other non-packaging materials made primarily of plastic
Organics	Organic waste	All kitchen food waste, greenwaste, other organic items
Steel	Steel cans	All steel cans, except aerosol cans
	Other steel	Items made primarily of steel, incl. aerosol cans
Non-ferrous metals	Aluminium drink cans	'Ready-to-drink' beverage cans over 300ml
	Other aluminium cans	Food and other aluminium cans, except aerosol cans
	Other non-ferrous	All other items made primarily of non-ferrous metal
Glass	Beverage bottles	Clear 'ready-to-drink' glass beverage containers (including milk) over 300ml and under 3 litres
	Other recyclable glass	Clear jars and other containers, including small bottles
	Broken glass and fines	Broken pieces of glass unsuitable for hand sorting
	Non-recyclable glass	All other items made primarily of glass, includes light bulbs, drinking glasses, and window glass
Textiles		All items made of textiles (woven materials)
Sanitary paper		Includes disposable nappies, paper towels, tissues, menstruation products, wet wipes
Other contamination		All other non-recyclable items

Appendix 3 - Visual survey classifications

Primary category	Secondary category	Description
Paper	Recyclable	Newspapers, magazines, office paper, etc.
	Cardboard	Kraft cartons
	Multimaterial/other	Multimaterials, building paper, contaminated paper
Plastics	Recyclable	Containers with recycling logo 1-7
	Multimaterial/other	Other types of plastic and primarily plastic multimaterials
Organic	Kitchen/food	Food and food preparation waste
	Compostable greenwaste	Tree branches up to 400 mm, small tree stumps
	Non-compostable greenwaste	Leaves, lawn clippings, broom, flax, gorse, cabbage tree, weeds
	Multimaterial/other	Organic matter such as meat processing waste
Ferrous metals	Primarily ferrous	Items made primarily of steel
	Multimaterial/other	Ferrous items containing a sizable proportion of other materials
Nonferrous metals	Primarily Nonferrous	Items made primarily of nonferrous metal
Glass	Recyclable	Bottles and jars
	Multimaterial/other	Other items made primarily of glass, includes pane, TVs, and computer monitors
Textiles	Clothing/textile	Items made primarily of cloth or textiles
	Multimaterial/other	Items containing some textile and other materials, such as carpets, shoes, backpacks, suitcases
Sanitary paper	None	Sanitary materials such as nappies, paper towels, feminine hygiene products
Rubble	Cleanfill	All materials suitable for cleanfill disposal
	New plasterboard	Off-cuts of new plasterboard
	Other	Other materials such as soil, fibreglass, ceramics, plasterboard
Timber	Reusable	Lengths of timber and pieces of sheet suitable for reuse
	Unpainted & untreated	Unpainted and untreated lengths of timber
	Multimaterial/other	Sawdust, construction and demolition debris, CCA treated wood
Rubber	None	All items made primarily of rubber such as tyres, latex foam mattresses
Potentially hazardous	None	Material with potentially toxic or ecotoxic properties or having properties requiring special disposal techniques.

Appendix 4 - Types of waste vehicles

FRONT-END LOADER TRUCKS

Front-end 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-end loaders work primarily in urban areas, regularly servicing medium to large-scale industrial, commercial, and institutional customers. In general, a business using front-end loader bins would be serviced at least weekly, but can be serviced several times a day for a business like a large supermarket. Front-end 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-end 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-end 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 bagged refuse 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.

Appendix 5 - Wanaka RTS - Composition - Feb-20

Wanaka RTS General and overall waste streams February 2020 visual survey		General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
		% of total	Tonnes per week	% of total	Tonnes per week
Paper	Recyclable	2.3%	3 T/week	3.4%	7 T/week
	Cardboard	5.1%	6 T/week	3.4%	7 T/week
	Non-recyclable	0.4%	0 T/week	0.9%	2 T/week
	Subtotal	**7.8%**	**10 T/week**	**7.8%**	**15 T/week**
Plastics	Recyclable	0.4%	1 T/week	0.9%	2 T/week
	Non-recyclable	7.7%	10 T/week	8.1%	16 T/week
	Subtotal	**8.1%**	**10 T/week**	**9.0%**	**18 T/week**
Organics	Kitchen waste	5.2%	6 T/week	15.7%	31 T/week
	Compostable greenwaste	1.9%	2 T/week	7.3%	14 T/week
	Non-compostable greenwaste	2.2%	3 T/week	2.1%	4 T/week
	Organics other	1.1%	1 T/week	1.5%	3 T/week
	Subtotal	**10.5%**	**13 T/week**	**26.6%**	**53 T/week**
Ferrous metals	Primarily ferrous	0.8%	1 T/week	0.7%	1 T/week
	Steel other	1.9%	2 T/week	1.7%	3 T/week
	Subtotal	**2.7%**	**3 T/week**	**2.4%**	**5 T/week**
Non-ferrous metals		**0.8%**	**1 T/week**	**1.0%**	**2 T/week**
Glass	Recyclable	0.6%	1 T/week	1.1%	2 T/week
	Non-recyclable	0.6%	1 T/week	0.6%	1 T/week
	Subtotal	**1.3%**	**2 T/week**	**1.7%**	**3 T/week**
Textiles	Clothing/textiles	1.6%	2 T/week	2.0%	4 T/week
	Multimaterial/other	3.9%	5 T/week	3.2%	6 T/week
	Subtotal	**5.5%**	**7 T/week**	**5.2%**	**10 T/week**
Sanitary paper		**1.5%**	**2 T/week**	**3.7%**	**7 T/week**
Rubble	Cleanfill	1.0%	1 T/week	0.6%	1 T/week
	New plasterboard	5.4%	7 T/week	3.4%	7 T/week
	Other	11.7%	15 T/week	9.2%	18 T/week
	Subtotal	**18.0%**	**23 T/week**	**13.2%**	**26 T/week**
Timber	Reusable	9.0%	11 T/week	5.7%	11 T/week
	Unpainted & untreated	3.6%	5 T/week	2.3%	5 T/week
	Non-recoverable	29.4%	37 T/week	19.7%	39 T/week
	Subtotal	**42.0%**	**52 T/week**	**27.7%**	**55 T/week**
Rubber		**1.2%**	**2 T/week**	**0.9%**	**2 T/week**
Potentially hazardous		**0.7%**	**1 T/week**	**0.8%**	**2 T/week**
TOTAL		**100.0%**	**125 T/week**	**100.0%**	**198 T/week**

Appendix 6 - Wanaka RTS - Composition - Sept-20

Wanaka RTS General and overall waste streams September 2020 visual survey		General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
		% of total	Tonnes per week	% of total	Tonnes per week
Paper	Recyclable	1.9%	2 T/week	3.1%	6 T/week
	Cardboard	6.2%	8 T/week	4.3%	8 T/week
	Non-recyclable	0.6%	1 T/week	1.1%	2 T/week
	Subtotal	**8.7%**	**11 T/week**	**8.4%**	**16 T/week**
Plastics	Recyclable	0.7%	1 T/week	1.1%	2 T/week
	Non-recyclable	8.3%	10 T/week	8.5%	16 T/week
	Subtotal	**9.0%**	**11 T/week**	**9.5%**	**18 T/week**
Organics	Kitchen waste	2.5%	3 T/week	13.3%	25 T/week
	Compostable greenwaste	0.9%	1 T/week	6.2%	12 T/week
	Non-compostable greenwaste	0.9%	1 T/week	1.2%	2 T/week
	Organics other	0.3%	0 T/week	1.0%	2 T/week
	Subtotal	**4.6%**	**6 T/week**	**21.7%**	**41 T/week**
Ferrous metals	Primarily ferrous	3.1%	4 T/week	2.2%	4 T/week
	Steel other	0.8%	1 T/week	1.0%	2 T/week
	Subtotal	**3.9%**	**5 T/week**	**3.2%**	**6 T/week**
Non-ferrous metals		**0.4%**	**0 T/week**	**0.7%**	**1 T/week**
Glass	Recyclable	0.3%	0 T/week	0.8%	2 T/week
	Non-recyclable	0.5%	1 T/week	0.5%	1 T/week
	Subtotal	**0.8%**	**1 T/week**	**1.3%**	**3 T/week**
Textiles	Clothing/textiles	2.3%	3 T/week	2.4%	5 T/week
	Multimaterial/other	3.2%	4 T/week	2.8%	5 T/week
	Subtotal	**5.5%**	**7 T/week**	**5.3%**	**10 T/week**
Sanitary paper		**1.5%**	**2 T/week**	**3.6%**	**7 T/week**
Rubble	Cleanfill	6.4%	8 T/week	4.2%	8 T/week
	New plasterboard	7.5%	9 T/week	4.9%	9 T/week
	Other	7.9%	10 T/week	6.9%	13 T/week
	Subtotal	**21.8%**	**27 T/week**	**16.0%**	**30 T/week**
Timber	Reusable	6.2%	8 T/week	4.0%	8 T/week
	Unpainted & untreated	4.0%	5 T/week	2.6%	5 T/week
	Non-recoverable	32.2%	40 T/week	22.2%	42 T/week
	Subtotal	**42.4%**	**52 T/week**	**28.9%**	**54 T/week**
Rubber		**1.0%**	**1 T/week**	**0.8%**	**1 T/week**
Potentially hazardous		**0.4%**	**1 T/week**	**0.6%**	**1 T/week**
TOTAL		**100.0%**	**123 T/week**	**100.0%**	**188 T/week**

Appendix 7 - Wanaka RTS - Composition by activity source - Both visual surveys combined

Wanaka RTS - General waste stream - By activity source of waste load - Both 2020 visual surveys combined		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.3%	6.3%	0.0%	2.6%
	Cardboard	3.3%	9.7%	0.0%	12.5%
	Non-recyclable	0.2%	1.2%	0.0%	0.4%
	Subtotal	**3.8%**	**17.2%**	**0.0%**	**15.5%**
Plastics	Recyclable	0.4%	1.2%	0.0%	0.4%
	Non-recyclable	3.8%	16.8%	2.6%	12.2%
	Subtotal	**4.2%**	**18.0%**	**2.6%**	**12.6%**
Organics	Kitchen waste	0.0%	12.0%	0.0%	7.2%
	Compostable greenwaste	0.2%	2.0%	20.5%	5.1%
	Non-compostable greenwaste	0.0%	0.5%	74.8%	1.5%
	Organics other	0.0%	2.7%	0.0%	0.2%
	Subtotal	**0.2%**	**17.2%**	**95.3%**	**14.1%**
Ferrous metals	Primarily ferrous	2.3%	1.4%	0.0%	0.9%
	Steel other	0.4%	2.1%	0.0%	7.0%
	Subtotal	**2.8%**	**3.5%**	**0.0%**	**7.9%**
Non-ferrous metals		**0.4%**	**1.0%**	**0.0%**	**1.0%**
Glass	Recyclable	0.0%	1.4%	0.0%	1.1%
	Glass other	0.0%	1.9%	0.0%	0.7%
	Subtotal	0.0%	3.3%	0.0%	1.8%
Textiles	Clothing/textiles	0.0%	6.2%	0.0%	3.6%
	Multimaterial/other	1.1%	7.2%	2.1%	11.5%
	Subtotal	**1.1%**	**13.4%**	**2.1%**	**15.1%**
Sanitary paper		**0.0%**	**4.8%**	**0.0%**	**2.1%**
Rubble	Cleanfill	5.5%	0.6%	0.0%	0.1%
	New plasterboard	10.1%	0.0%	0.0%	0.2%
	Other	12.3%	6.8%	0.0%	1.1%
	Subtotal	27.9%	7.5%	0.0%	1.4%
Timber	Reusable	11.4%	0.3%	0.0%	3.3%
	Unpainted & untreated	4.5%	2.8%	0.0%	2.9%
	Non-recoverable	43.6%	5.5%	0.0%	21.2%
	Subtotal	**59.4%**	**8.6%**	**0.0%**	**27.4%**
Rubber		**0.1%**	**3.7%**	**0.0%**	**0.5%**
Potentially hazardous		**0.1%**	**1.7%**	**0.0%**	**0.7%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	2.6%
Tonnes per week		**78.9 T/week**	**33.9 T/week**	**2.2 T/week**	**9.1 T/week**

Appendix 8 - Wanaka RTS - Composition by activity source - Feb-20 visual survey

Wanaka RTS - General waste stream - By activity source of waste load - February 2020 visual survey		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.3%	6.1%	0.0%	2.4%
	Cardboard	1.5%	9.1%	0.0%	15.9%
	Non-recyclable	0.0%	1.1%	0.0%	0.3%
	Subtotal	**1.8%**	**16.3%**	**0.0%**	**18.6%**
Plastics	Recyclable	0.0%	1.3%	0.0%	0.3%
	Non-recyclable	2.3%	15.9%	2.7%	14.5%
	Subtotal	**2.3%**	**17.2%**	**2.7%**	**14.9%**
Organics	Kitchen waste	0.0%	14.7%	0.0%	6.8%
	Compostable greenwaste	0.3%	3.5%	5.4%	6.1%
	Non-compostable greenwaste	0.0%	0.9%	89.9%	0.2%
	Organics other	0.0%	3.7%	0.0%	0.2%
	Subtotal	**0.3%**	**22.8%**	**95.3%**	**13.3%**
Ferrous metals	Primarily ferrous	0.7%	1.0%	0.0%	0.6%
	Steel other	1.0%	1.9%	0.0%	8.3%
	Subtotal	**1.7%**	**2.9%**	**0.0%**	**8.9%**
Non-ferrous metals		**0.7%**	**1.0%**	**0.0%**	**1.2%**
Glass	Recyclable	0.0%	1.7%	0.0%	1.4%
	Glass other	0.0%	1.8%	0.0%	0.7%
	Subtotal	**0.0%**	**3.5%**	**0.0%**	**2.1%**
Textiles	Clothing/textiles	0.0%	3.8%	0.0%	4.9%
	Multimaterial/other	1.8%	6.7%	2.0%	7.8%
	Subtotal	**1.8%**	**10.4%**	**2.0%**	**12.8%**
Sanitary paper		**0.0%**	**4.1%**	**0.0%**	**2.1%**
Rubble	Cleanfill	1.2%	0.9%	0.0%	0.1%
	New plasterboard	9.3%	0.0%	0.0%	0.2%
	Other	16.6%	6.5%	0.0%	0.6%
	Subtotal	**27.1%**	**7.4%**	**0.0%**	**0.9%**
Timber	Reusable	14.7%	0.0%	0.0%	5.2%
	Unpainted & untreated	3.9%	3.2%	0.0%	4.2%
	Non-recoverable	45.5%	5.4%	0.0%	14.6%
	Subtotal	**64.1%**	**8.6%**	**0.0%**	**23.9%**
Rubber		**0.0%**	**3.8%**	**0.0%**	**0.6%**
Potentially hazardous		**0.2%**	**1.8%**	**0.0%**	**0.8%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**72.1 T/week**	**38.4 T/week**	**2.7 T/week**	**11.5 T/week**

Appendix 9 - Wanaka RTS - Composition by activity source - Sept-20 visual survey

Wanaka RTS - General waste stream - By activity source of waste load - September 2020 visual survey		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.3%	6.6%	0.0%	3.1%
	Cardboard	4.8%	10.5%	0.0%	6.5%
	Non-recyclable	0.4%	1.2%	0.0%	0.4%
	Subtotal	**5.5%**	**18.3%**	**0.0%**	**10.1%**
Plastics	Recyclable	0.6%	1.0%	0.0%	0.4%
	Non-recyclable	5.1%	18.0%	2.4%	8.2%
	Subtotal	**5.7%**	**19.0%**	**2.4%**	**8.6%**
Organics	Kitchen waste	0.0%	8.5%	0.0%	8.0%
	Compostable greenwaste	0.1%	0.0%	45.2%	3.3%
	Non-compostable greenwaste	0.0%	0.0%	50.0%	3.9%
	Organics other	0.0%	1.3%	0.0%	0.2%
	Subtotal	**0.2%**	**9.9%**	**95.2%**	**15.4%**
Ferrous metals	Primarily ferrous	3.7%	2.0%	0.0%	1.5%
	Steel other	0.0%	2.3%	0.0%	4.8%
	Subtotal	**3.7%**	**4.3%**	**0.0%**	**6.3%**
Non-ferrous metals		**0.2%**	**1.0%**	**0.0%**	**0.6%**
Glass	Recyclable	0.0%	1.1%	0.0%	0.5%
	Glass other	0.0%	1.9%	0.0%	0.7%
	Subtotal	**0.0%**	**3.1%**	**0.0%**	**1.2%**
Textiles	Clothing/textiles	0.0%	9.3%	0.0%	1.3%
	Multimaterial/other	0.5%	8.0%	2.4%	17.9%
	Subtotal	**0.5%**	**17.3%**	**2.4%**	**19.2%**
Sanitary paper		**0.0%**	**5.8%**	**0.0%**	**2.1%**
Rubble	Cleanfill	9.1%	0.3%	0.0%	0.0%
	New plasterboard	10.7%	0.0%	0.0%	0.1%
	Other	8.7%	7.3%	0.0%	2.1%
	Subtotal	**28.6%**	**7.6%**	**0.0%**	**2.2%**
Timber	Reusable	8.6%	0.6%	0.0%	0.1%
	Unpainted & untreated	4.9%	2.4%	0.0%	0.8%
	Non-recoverable	41.9%	5.6%	0.0%	32.6%
	Subtotal	**55.5%**	**8.7%**	**0.0%**	**33.5%**
Rubber		**0.2%**	**3.6%**	**0.0%**	**0.3%**
Potentially hazardous		**0.0%**	**1.5%**	**0.0%**	**0.6%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**85.7 T/week**	**29.4 T/week**	**1.6 T/week**	**6.7 T/week**

Appendix 10 - Wanaka RTS - Composition by vehicle type - Both visual surveys combined

Wanaka RTS - General waste stream - By vehicle type - Both 2020 visual surveys combined		Cars	Front loaders	Gantry trucks	Other trucks	Trailer
Paper	Recyclable	4.4%	7.0%	0.8%	7.7%	0.6%
	Cardboard	13.5%	9.7%	3.5%	2.0%	5.8%
	Non-recyclable	0.5%	1.2%	0.3%	4.7%	0.4%
	Subtotal	**18.4%**	**17.9%**	**4.5%**	**14.4%**	**6.8%**
Plastics	Recyclable	1.0%	1.2%	0.4%	11.4%	0.1%
	Non-recyclable	12.4%	18.7%	4.9%	43.7%	4.3%
	Subtotal	**13.4%**	**19.9%**	**5.4%**	**55.1%**	**4.4%**
Organics	Kitchen waste	13.9%	14.0%	0.0%	12.5%	1.0%
	Compostable greenwaste	9.1%	1.8%	0.1%	0.0%	2.4%
	Non-compostable greenwaste	4.9%	0.6%	0.0%	0.0%	3.7%
	Organics other	0.4%	3.2%	0.0%	0.0%	0.1%
	Subtotal	**28.4%**	**19.6%**	**0.1%**	**12.5%**	**7.2%**
Ferrous metals	Primarily ferrous	0.5%	1.6%	2.9%	0.8%	0.6%
	Steel other	1.7%	2.3%	0.7%	0.0%	1.6%
	Subtotal	2.3%	3.9%	3.6%	0.8%	2.2%
Non-ferrous metals		**0.5%**	**1.2%**	**0.5%**	**2.0%**	**0.3%**
Glass	Recyclable	0.5%	1.6%	0.0%	6.7%	0.3%
	Glass other	0.6%	2.3%	0.0%	0.0%	0.1%
	Subtotal	**1.1%**	**3.9%**	**0.0%**	**6.7%**	**0.5%**
Textiles	Clothing/textiles	1.9%	4.7%	2.2%	0.8%	0.7%
	Multimaterial/other	7.7%	5.8%	2.3%	0.8%	5.1%
	Subtotal	**9.6%**	**10.5%**	**4.5%**	**1.7%**	**5.8%**
Sanitary paper		**4.4%**	**5.6%**	**0.0%**	**6.7%**	**0.7%**
Rubble	Cleanfill	0.0%	0.8%	1.3%	0.0%	9.7%
	New plasterboard	7.4%	0.0%	6.4%	0.0%	8.1%
	Other	0.6%	6.3%	10.0%	0.0%	14.0%
	Subtotal	**8.0%**	**7.1%**	**17.7%**	**0.0%**	**31.8%**
Timber	Reusable	0.1%	0.4%	7.4%	0.0%	12.3%
	Unpainted & untreated	3.7%	1.4%	5.8%	0.0%	3.8%
	Non-recoverable	8.7%	2.5%	50.1%	0.0%	23.3%
	Subtotal	**12.5%**	**4.2%**	**63.4%**	**0.0%**	**39.5%**
Rubber		**0.6%**	**4.2%**	**0.1%**	**0.0%**	**0.7%**
Potentially hazardous		**1.0%**	**2.0%**	**0.1%**	**0.1%**	**0.2%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**5 T/week**	**19 T/week**	**60 T/week**	**1 T/week**	**40 T/week**

Appendix 11 - Wanaka RTS - Composition by vehicle type - Feb-20

Wanaka RTS - General waste stream - By vehicle type - February 2020 visual survey		Cars	Front loaders	Gantry trucks	Other trucks	Trailer
Paper	Recyclable	4.6%	6.9%	0.5%	7.7%	0.9%
	Cardboard	13.1%	9.1%	1.6%	2.0%	6.5%
	Non-recyclable	0.5%	1.1%	0.0%	4.7%	0.2%
	Subtotal	**18.2%**	**17.1%**	**2.2%**	**14.4%**	**7.6%**
Plastics	Recyclable	1.4%	1.1%	0.0%	11.4%	0.2%
	Non-recyclable	5.5%	17.1%	3.4%	43.7%	5.8%
	Subtotal	**6.9%**	**18.3%**	**3.4%**	**55.1%**	**6.0%**
Organics	Kitchen waste	12.7%	17.1%	0.0%	12.5%	1.8%
	Compostable greenwaste	11.4%	3.4%	0.1%	0.0%	2.2%
	Non-compostable greenwaste	0.4%	1.1%	0.0%	0.0%	5.6%
	Organics other	0.4%	4.6%	0.0%	0.0%	0.1%
	Subtotal	**24.8%**	**26.3%**	**0.1%**	**12.5%**	**9.7%**
Ferrous metals	Primarily ferrous	0.5%	1.1%	0.9%	0.8%	0.3%
	Steel other	2.2%	2.3%	1.5%	0.0%	2.0%
	Subtotal	2.6%	3.4%	2.4%	0.8%	2.3%
Non-ferrous metals		**0.5%**	**1.1%**	**0.9%**	**2.0%**	**0.4%**
Glass	Recyclable	0.5%	1.7%	0.0%	6.7%	0.6%
	Glass other	0.5%	2.3%	0.0%	0.0%	0.2%
	Subtotal	**0.9%**	**4.0%**	**0.0%**	**6.7%**	**0.8%**
Textiles	Clothing/textiles	2.4%	4.6%	0.0%	0.8%	1.2%
	Multimaterial/other	5.7%	5.7%	2.8%	0.8%	5.3%
	Subtotal	**8.1%**	**10.3%**	**2.8%**	**1.7%**	**6.5%**
Sanitary paper		**4.6%**	**4.4%**	**0.0%**	**6.7%**	**0.8%**
Rubble	Cleanfill	0.0%	1.1%	0.0%	0.0%	2.0%
	New plasterboard	12.7%	0.0%	0.4%	0.0%	13.3%
	Other	0.5%	7.6%	17.0%	0.0%	7.8%
	Subtotal	**13.2%**	**8.8%**	**17.3%**	**0.0%**	**23.1%**
Timber	Reusable	0.0%	0.0%	9.3%	0.0%	14.4%
	Unpainted & untreated	6.0%	0.0%	6.2%	0.0%	5.7%
	Non-recoverable	12.6%	0.0%	55.2%	0.0%	21.2%
	Subtotal	**18.6%**	**0.0%**	**70.7%**	**0.0%**	**41.4%**
Rubber		**0.5%**	**4.0%**	**0.0%**	**0.0%**	**1.3%**
Potentially hazardous		**1.3%**	**2.2%**	**0.1%**	**0.1%**	**0.2%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**5 T/week**	**20 T/week**	**59 T/week**	**2 T/week**	**39 T/week**

Appendix 12 - Wanaka RTS - Composition by vehicle type - Sept-20

Wanaka RTS - General waste stream - By vehicle type - September 2020 visual survey		Cars	Front loaders	Gantry trucks	Other trucks	Trailer
Paper	Recyclable	4.1%	7.2%	1.1%	-	0.3%
	Cardboard	14.1%	10.4%	5.2%	-	5.1%
	Non-recyclable	0.5%	1.2%	0.5%	-	0.5%
	Subtotal	**18.7%**	**18.8%**	**6.8%**	**-**	**5.9%**
Plastics	Recyclable	0.5%	1.2%	0.9%	-	0.1%
	Non-recyclable	21.8%	20.4%	6.4%	-	2.9%
	Subtotal	**22.3%**	**21.6%**	**7.2%**	**-**	**2.9%**
Organics	Kitchen waste	15.6%	10.6%	0.0%	-	0.3%
	Compostable greenwaste	6.0%	0.0%	0.0%	-	2.5%
	Non-compostable greenwaste	11.0%	0.0%	0.0%	-	1.9%
	Organics other	0.5%	1.6%	0.0%	-	0.1%
	Subtotal	**33.1%**	**12.2%**	**0.0%**	**-**	**4.8%**
Ferrous metals	Primarily ferrous	0.6%	2.0%	4.8%	-	0.9%
	Steel other	1.1%	2.4%	0.0%	-	1.3%
	Subtotal	1.8%	4.4%	4.8%	-	2.2%
Non-ferrous metals		**0.5%**	**1.2%**	**0.2%**	**-**	**0.2%**
Glass	Recyclable	0.5%	1.4%	0.0%	-	0.1%
	Glass other	0.7%	2.4%	0.0%	-	0.1%
	Subtotal	**1.2%**	**3.8%**	**0.1%**	**-**	**0.2%**
Textiles	Clothing/textiles	1.2%	4.8%	4.3%	-	0.2%
	Multimaterial/other	10.4%	6.0%	1.8%	-	4.9%
	Subtotal	**11.6%**	**10.8%**	**6.2%**	**-**	**5.1%**
Sanitary paper		**4.1%**	**6.8%**	**0.0%**	**-**	**0.7%**
Rubble	Cleanfill	0.1%	0.4%	2.6%	-	16.9%
	New plasterboard	0.1%	0.0%	12.2%	-	3.3%
	Other	0.7%	4.8%	3.3%	-	19.8%
	Subtotal	**1.0%**	**5.2%**	**18.1%**	**-**	**39.9%**
Timber	Reusable	0.3%	0.8%	5.6%	-	10.3%
	Unpainted & untreated	0.6%	2.9%	5.5%	-	2.0%
	Non-recoverable	3.5%	5.3%	45.2%	-	25.3%
	Subtotal	**4.4%**	**8.9%**	**56.3%**	**-**	**37.6%**
Rubber		**0.8%**	**4.5%**	**0.3%**	**-**	**0.1%**
Potentially hazardous		**0.5%**	**1.8%**	**0.1%**	**-**	**0.2%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**-**	**100.0%**
Tonnes per week		**4 T/week**	**18 T/week**	**61 T/week**	**0 T/week**	**41 T/week**

Appendix 13 - Frankton RTS - Composition - Feb-20

Frankton RTS General and overall waste streams February 2020 visual survey		General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
		% of total	Tonnes per week	% of total	Tonnes per week
Paper	Recyclable	3.8%	12 T/week	4.4%	24 T/week
	Cardboard	7.6%	24 T/week	4.7%	25 T/week
	Non-recyclable	1.0%	3 T/week	1.4%	7 T/week
	Subtotal	**12.4%**	**38 T/week**	**10.5%**	**56 T/week**
Plastics	Recyclable	1.7%	5 T/week	1.7%	9 T/week
	Non-recyclable	10.5%	33 T/week	9.8%	53 T/week
	Subtotal	**12.2%**	**38 T/week**	**11.5%**	**62 T/week**
Organics	Kitchen waste	2.4%	7 T/week	15.6%	84 T/week
	Compostable greenwaste	3.9%	12 T/week	9.2%	49 T/week
	Non-compostable greenwaste	3.6%	11 T/week	2.9%	15 T/week
	Organics other	0.5%	2 T/week	1.2%	7 T/week
	Subtotal	**10.5%**	**32 T/week**	**28.9%**	**155 T/week**
Ferrous metals	Primarily ferrous	1.7%	5 T/week	1.2%	6 T/week
	Steel other	1.3%	4 T/week	1.4%	7 T/week
	Subtotal	**3.0%**	**9 T/week**	**2.5%**	**13 T/week**
Non-ferrous metals		**0.4%**	**1 T/week**	**0.7%**	**4 T/week**
Glass	Recyclable	0.5%	2 T/week	1.1%	6 T/week
	Non-recyclable	0.9%	3 T/week	0.8%	4 T/week
	Subtotal	**1.4%**	**4 T/week**	**1.8%**	**10 T/week**
Textiles	Clothing/textiles	0.9%	3 T/week	1.7%	9 T/week
	Multimaterial/other	3.7%	12 T/week	3.1%	16 T/week
	Subtotal	**4.7%**	**14 T/week**	**4.7%**	**25 T/week**
Sanitary paper		**1.5%**	**5 T/week**	**4.0%**	**22 T/week**
Rubble	Cleanfill	4.0%	12 T/week	2.3%	12 T/week
	New plasterboard	7.1%	22 T/week	4.1%	22 T/week
	Other	6.6%	21 T/week	5.9%	32 T/week
	Subtotal	**17.7%**	**55 T/week**	**12.4%**	**66 T/week**
Timber	Reusable	2.4%	8 T/week	1.4%	8 T/week
	Unpainted & untreated	6.6%	21 T/week	3.8%	21 T/week
	Non-recoverable	25.7%	80 T/week	16.3%	87 T/week
	Subtotal	**34.8%**	**108 T/week**	**21.5%**	**115 T/week**
Rubber		**0.9%**	**3 T/week**	**0.7%**	**4 T/week**
Potentially hazardous		**0.6%**	**2 T/week**	**0.8%**	**4 T/week**
TOTAL		**100.0%**	**310 T/week**	**100.0%**	**535 T/week**

Appendix 14 - Frankton RTS - Composition - Sept-20

Frankton RTS General and overall waste streams September 2020 visual survey		General waste (excludes kerbside rubbish)		Overall waste (includes kerbside rubbish)	
		% of total	Tonnes per week	% of total	Tonnes per week
Paper	Recyclable	5.5%	14 T/week	5.4%	24 T/week
	Cardboard	5.1%	13 T/week	3.2%	14 T/week
	Non-recyclable	0.5%	1 T/week	1.1%	5 T/week
	Subtotal	**11.1%**	**28 T/week**	**9.7%**	**43 T/week**
Plastics	Recyclable	0.2%	0 T/week	0.8%	4 T/week
	Non-recyclable	7.3%	18 T/week	7.9%	35 T/week
	Subtotal	**7.4%**	**19 T/week**	**8.8%**	**38 T/week**
Organics	Kitchen waste	1.3%	3 T/week	15.3%	67 T/week
	Compostable greenwaste	1.5%	4 T/week	7.9%	35 T/week
	Non-compostable greenwaste	6.4%	16 T/week	4.5%	20 T/week
	Organics other	0.2%	1 T/week	1.1%	5 T/week
	Subtotal	**9.4%**	**24 T/week**	**28.6%**	**126 T/week**
Ferrous metals	Primarily ferrous	1.2%	3 T/week	0.9%	4 T/week
	Steel other	0.9%	2 T/week	1.1%	5 T/week
	Subtotal	**2.2%**	**5 T/week**	**2.0%**	**9 T/week**
Non-ferrous metals		**0.2%**	**1 T/week**	**0.7%**	**3 T/week**
Glass	Recyclable	0.2%	1 T/week	0.9%	4 T/week
	Non-recyclable	0.3%	1 T/week	0.4%	2 T/week
	Subtotal	**0.6%**	**1 T/week**	**1.4%**	**6 T/week**
Textiles	Clothing/textiles	1.2%	3 T/week	1.8%	8 T/week
	Multimaterial/other	4.2%	10 T/week	3.3%	14 T/week
	Subtotal	**5.4%**	**14 T/week**	**5.1%**	**23 T/week**
Sanitary paper		**0.8%**	**2 T/week**	**3.7%**	**16 T/week**
Rubble	Cleanfill	1.6%	4 T/week	0.9%	4 T/week
	New plasterboard	9.6%	24 T/week	5.5%	24 T/week
	Other	9.6%	24 T/week	7.7%	34 T/week
	Subtotal	**20.9%**	**52 T/week**	**14.1%**	**62 T/week**
Timber	Reusable	1.6%	4 T/week	0.9%	4 T/week
	Unpainted & untreated	7.6%	19 T/week	4.4%	19 T/week
	Non-recoverable	31.1%	78 T/week	19.1%	84 T/week
	Subtotal	**40.3%**	**101 T/week**	**24.4%**	**107 T/week**
Rubber		**1.5%**	**4 T/week**	**1.0%**	**4 T/week**
Potentially hazardous		**0.2%**	**0 T/week**	**0.5%**	**2 T/week**
TOTAL		**100.0%**	**251 T/week**	**100.0%**	**439 T/week**

Appendix 15 - Frankton RTS - Composition by activity source - Both visual surveys combined

Frankton RTS - General waste stream - By activity source of waste load - Both 2020 visual surveys combined		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.1%	12.6%	0.0%	1.6%
	Cardboard	2.9%	13.0%	0.6%	7.0%
	Non-recyclable	0.4%	1.6%	0.1%	0.3%
	Subtotal	**3.4%**	**27.2%**	**0.7%**	**9.0%**
Plastics	Recyclable	0.1%	2.7%	0.0%	0.3%
	Non-recyclable	3.5%	19.0%	1.5%	8.9%
	Subtotal	**3.5%**	**21.6%**	**1.5%**	**9.3%**
Organics	Kitchen waste	0.0%	5.1%	0.0%	2.5%
	Compostable greenwaste	0.2%	3.9%	19.5%	3.2%
	Non-compostable greenwaste	0.3%	2.0%	66.1%	1.9%
	Organics other	0.2%	0.8%	0.0%	0.2%
	Subtotal	**0.7%**	**11.7%**	**85.6%**	**7.8%**
Ferrous metals	Primarily ferrous	1.6%	1.5%	0.0%	1.6%
	Steel other	0.5%	1.4%	0.0%	5.7%
	Subtotal	**2.1%**	**2.9%**	**0.0%**	**7.3%**
Non-ferrous metals		**0.1%**	**0.6%**	**0.0%**	**0.8%**
Glass	Recyclable	0.0%	1.0%	0.0%	0.4%
	Glass other	0.7%	0.6%	0.0%	1.3%
	Subtotal	0.7%	1.6%	0.0%	1.7%
Textiles	Clothing/textiles	0.2%	1.7%	0.0%	5.1%
	Multimaterial/other	1.7%	5.7%	0.1%	17.1%
	Subtotal	**1.9%**	**7.4%**	**0.1%**	**22.2%**
Sanitary paper		**0.0%**	**3.2%**	**0.0%**	**0.8%**
Rubble	Cleanfill	4.0%	0.5%	9.8%	0.7%
	New plasterboard	15.5%	0.0%	0.0%	0.5%
	Other	13.0%	2.6%	0.2%	2.3%
	Subtotal	32.5%	3.2%	10.0%	3.6%
Timber	Reusable	3.3%	0.8%	0.3%	0.4%
	Unpainted & untreated	9.6%	4.8%	0.4%	4.6%
	Non-recoverable	40.8%	12.8%	1.3%	31.1%
	Subtotal	**53.8%**	**18.3%**	**2.1%**	**36.2%**
Rubber		**1.3%**	**1.2%**	**0.0%**	**1.0%**
Potentially hazardous		**0.0%**	**1.0%**	**0.0%**	**0.4%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**149 T/week**	**97 T/week**	**17 T/week**	**18 T/week**

Appendix 16 - Frankton RTS - Composition by activity source - Feb-20 visual survey

Frankton RTS - General waste stream - By activity source of waste load - February 2020 visual survey		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.1%	8.9%	0.1%	1.9%
	Cardboard	2.9%	14.0%	0.7%	10.3%
	Non-recyclable	0.5%	1.8%	0.2%	0.4%
	Subtotal	**3.5%**	**24.8%**	**0.9%**	**12.5%**
Plastics	Recyclable	0.1%	3.9%	0.1%	0.5%
	Non-recyclable	2.9%	20.7%	2.8%	12.4%
	Subtotal	**3.0%**	**24.6%**	**2.8%**	**12.8%**
Organics	Kitchen waste	0.0%	5.6%	0.0%	3.1%
	Compostable greenwaste	0.5%	5.4%	27.8%	2.4%
	Non-compostable greenwaste	0.3%	1.2%	58.8%	0.2%
	Organics other	0.3%	0.9%	0.0%	0.4%
	Subtotal	**1.0%**	**13.0%**	**86.7%**	**6.2%**
Ferrous metals	Primarily ferrous	2.1%	1.4%	0.0%	1.5%
	Steel other	1.0%	1.3%	0.0%	6.4%
	Subtotal	**3.1%**	**2.7%**	**0.0%**	**7.9%**
Non-ferrous metals		**0.2%**	**0.7%**	**0.0%**	**0.4%**
Glass	Recyclable	0.0%	1.2%	0.0%	0.6%
	Glass other	1.3%	0.6%	0.0%	1.4%
	Subtotal	**1.3%**	**1.7%**	**0.0%**	**2.0%**
Textiles	Clothing/textiles	0.0%	1.8%	0.0%	3.6%
	Multimaterial/other	2.0%	5.1%	0.0%	14.5%
	Subtotal	**2.0%**	**6.9%**	**0.0%**	**18.2%**
Sanitary paper		**0.0%**	**3.6%**	**0.0%**	**1.2%**
Rubble	Cleanfill	6.6%	0.8%	6.4%	1.7%
	New plasterboard	14.3%	0.0%	0.0%	0.2%
	Other	11.3%	2.1%	0.4%	2.7%
	Subtotal	**32.2%**	**2.9%**	**6.8%**	**4.5%**
Timber	Reusable	3.9%	1.1%	0.7%	0.3%
	Unpainted & untreated	11.4%	2.1%	0.7%	1.3%
	Non-recoverable	37.8%	13.4%	1.4%	31.2%
	Subtotal	**53.2%**	**16.5%**	**2.8%**	**32.8%**
Rubber		**0.6%**	**1.4%**	**0.0%**	**1.0%**
Potentially hazardous		**0.0%**	**1.3%**	**0.0%**	**0.5%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**154 T/week**	**125 T/week**	**16 T/week**	**15 T/week**

Appendix 17 - Frankton RTS - Composition by activity source - Sept-20 visual survey

Frankton RTS - General waste stream - By activity source of waste load - September 2020 visual survey		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.2%	19.2%	0.0%	1.4%
	Cardboard	2.9%	11.1%	0.5%	4.7%
	Non-recyclable	0.2%	1.2%	0.0%	0.3%
	Subtotal	**3.2%**	**31.5%**	**0.5%**	**6.4%**
Plastics	Recyclable	0.0%	0.5%	0.0%	0.3%
	Non-recyclable	4.1%	15.8%	0.4%	6.5%
	Subtotal	**4.1%**	**16.3%**	**0.4%**	**6.8%**
Organics	Kitchen waste	0.0%	4.2%	0.0%	2.1%
	Compostable greenwaste	0.0%	1.2%	12.0%	3.8%
	Non-compostable greenwaste	0.3%	3.4%	72.6%	3.1%
	Organics other	0.0%	0.7%	0.0%	0.1%
	Subtotal	**0.3%**	**9.4%**	**84.6%**	**9.0%**
Ferrous metals	Primarily ferrous	1.1%	1.7%	0.0%	1.6%
	Steel other	0.0%	1.7%	0.0%	5.3%
	Subtotal	**1.1%**	**3.4%**	**0.0%**	**6.9%**
Non-ferrous metals		**0.1%**	**0.5%**	**0.0%**	**1.0%**
Glass	Recyclable	0.0%	0.7%	0.0%	0.3%
	Glass other	0.1%	0.7%	0.0%	1.2%
	Subtotal	**0.1%**	**1.4%**	**0.0%**	**1.5%**
Textiles	Clothing/textiles	0.5%	1.6%	0.0%	6.2%
	Multimaterial/other	1.3%	6.7%	0.1%	18.9%
	Subtotal	**1.8%**	**8.3%**	**0.1%**	**25.0%**
Sanitary paper		**0.0%**	**2.6%**	**0.0%**	**0.5%**
Rubble	Cleanfill	1.2%	0.1%	12.9%	0.1%
	New plasterboard	16.7%	0.0%	0.0%	0.7%
	Other	14.9%	3.5%	0.0%	2.0%
	Subtotal	**32.8%**	**3.6%**	**12.9%**	**2.9%**
Timber	Reusable	2.7%	0.2%	0.0%	0.5%
	Unpainted & untreated	7.7%	9.6%	0.2%	6.9%
	Non-recoverable	44.1%	11.8%	1.3%	31.1%
	Subtotal	**54.5%**	**21.6%**	**1.5%**	**38.6%**
Rubber		**2.0%**	**1.0%**	**0.0%**	**1.0%**
Potentially hazardous		**0.0%**	**0.5%**	**0.0%**	**0.4%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**143 T/week**	**69 T/week**	**18 T/week**	**21 T/week**

Appendix 18 - Frankton RTS - Composition by vehicle type - Both visual surveys combined

Frankton RTS - General waste stream - By vehicle type - Both 2020 visual surveys combined		Cars	Front loaders	Gantry trucks	Other trucks	Trailer
Paper	Recyclable	7.6%	4.8%	0.5%	41.2%	1.7%
	Cardboard	8.5%	7.8%	4.4%	16.8%	6.4%
	Non-recyclable	0.7%	1.1%	0.4%	2.6%	1.1%
	Subtotal	**16.7%**	**13.6%**	**5.3%**	**60.7%**	**9.2%**
Plastics	Recyclable	0.6%	1.1%	0.5%	5.1%	0.2%
	Non-recyclable	13.5%	27.7%	5.7%	14.7%	9.1%
	Subtotal	**14.2%**	**28.7%**	**6.3%**	**19.8%**	**9.4%**
Organics	Kitchen waste	11.4%	12.4%	0.3%	0.2%	2.4%
	Compostable greenwaste	3.3%	1.7%	1.9%	0.1%	6.8%
	Non-compostable greenwaste	8.5%	0.6%	0.7%	1.7%	19.2%
	Organics other	2.1%	3.0%	0.2%	0.0%	0.1%
	Subtotal	**25.3%**	**17.6%**	**3.0%**	**2.0%**	**28.5%**
Ferrous metals	Primarily ferrous	1.1%	1.1%	2.1%	0.7%	0.5%
	Steel other	2.1%	2.1%	1.0%	0.9%	1.4%
	Subtotal	3.3%	3.2%	3.1%	1.6%	1.9%
Non-ferrous metals		**0.7%**	**1.1%**	**0.2%**	**0.3%**	**0.4%**
Glass	Recyclable	0.9%	1.6%	0.2%	0.5%	0.3%
	Glass other	1.2%	2.1%	0.3%	0.3%	1.3%
	Subtotal	**2.2%**	**3.7%**	**0.5%**	**0.9%**	**1.6%**
Textiles	Clothing/textiles	3.8%	3.0%	0.8%	1.1%	0.8%
	Multimaterial/other	7.7%	4.7%	2.4%	3.5%	8.2%
	Subtotal	**11.5%**	**7.6%**	**3.1%**	**4.6%**	**9.0%**
Sanitary paper		**3.7%**	**6.8%**	**0.5%**	**0.5%**	**1.2%**
Rubble	Cleanfill	4.2%	0.6%	3.2%	0.0%	2.1%
	New plasterboard	0.0%	0.0%	13.5%	0.3%	2.3%
	Other	4.0%	3.2%	9.5%	1.0%	4.6%
	Subtotal	**8.2%**	**3.8%**	**26.2%**	**1.4%**	**8.9%**
Timber	Reusable	0.1%	1.1%	2.6%	0.0%	2.4%
	Unpainted & untreated	0.1%	1.9%	9.7%	3.8%	5.3%
	Non-recoverable	10.1%	4.1%	38.3%	4.4%	21.2%
	Subtotal	**10.4%**	**7.2%**	**50.6%**	**8.2%**	**28.9%**
Rubber		**2.6%**	**4.7%**	**1.0%**	**0.1%**	**0.2%**
Potentially hazardous		**1.4%**	**2.2%**	**0.1%**	**0.1%**	**0.8%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**17 T/week**	**11 T/week**	**159 T/week**	**36 T/week**	**56 T/week**

Appendix 19 - Frankton RTS - Composition by vehicle type - Feb-20

Frankton RTS - General waste stream - By vehicle type - February 2020 visual survey		Cars	Front loaders	Gantry trucks	Other trucks	Trailer
Paper	Recyclable	6.8%	5.5%	0.7%	27.4%	2.0%
	Cardboard	10.0%	6.8%	5.9%	19.5%	7.5%
	Non-recyclable	0.9%	1.0%	0.5%	3.1%	1.4%
	Subtotal	**17.7%**	**13.3%**	**7.2%**	**50.0%**	**10.9%**
Plastics	Recyclable	0.8%	1.0%	1.0%	11.9%	0.3%
	Non-recyclable	15.8%	31.3%	5.5%	23.8%	11.4%
	Subtotal	**16.7%**	**32.3%**	**6.5%**	**35.8%**	**11.7%**
Organics	Kitchen waste	13.4%	10.0%	0.3%	0.3%	3.2%
	Compostable greenwaste	3.0%	1.9%	3.2%	0.3%	7.7%
	Non-compostable greenwaste	6.8%	0.6%	0.1%	0.0%	13.6%
	Organics other	3.0%	2.8%	0.3%	0.0%	0.2%
	Subtotal	**26.2%**	**15.3%**	**3.9%**	**0.6%**	**24.7%**
Ferrous metals	Primarily ferrous	1.5%	1.0%	2.3%	1.0%	0.6%
	Steel other	2.5%	2.0%	1.1%	0.8%	1.5%
	Subtotal	**4.0%**	**3.0%**	**3.4%**	**1.8%**	**2.1%**
Non-ferrous metals		**0.8%**	**1.0%**	**0.2%**	**0.2%**	**0.5%**
Glass	Recyclable	1.3%	1.5%	0.3%	0.9%	0.4%
	Glass other	1.7%	2.0%	0.5%	0.3%	1.7%
	Subtotal	**3.0%**	**3.4%**	**0.8%**	**1.2%**	**2.1%**
Textiles	Clothing/textiles	4.1%	3.2%	0.4%	1.9%	0.4%
	Multimaterial/other	8.2%	4.9%	2.5%	1.2%	6.1%
	Subtotal	**12.3%**	**8.1%**	**2.9%**	**3.1%**	**6.5%**
Sanitary paper		**4.6%**	**4.9%**	**0.9%**	**0.3%**	**1.7%**
Rubble	Cleanfill	1.6%	0.6%	5.7%	0.0%	2.8%
	New plasterboard	0.0%	0.0%	11.2%	0.0%	3.0%
	Other	2.2%	3.2%	8.8%	1.1%	5.3%
	Subtotal	**3.9%**	**3.8%**	**25.7%**	**1.1%**	**11.1%**
Timber	Reusable	0.0%	1.2%	2.9%	0.0%	3.0%
	Unpainted & untreated	0.1%	2.2%	9.5%	0.9%	4.3%
	Non-recoverable	5.2%	4.1%	35.4%	4.9%	20.2%
	Subtotal	**5.3%**	**7.5%**	**47.8%**	**5.8%**	**27.5%**
Rubber		**3.7%**	**4.9%**	**0.5%**	**0.1%**	**0.2%**
Potentially hazardous		**1.9%**	**2.5%**	**0.1%**	**0.1%**	**1.0%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**22 T/week**	**12 T/week**	**161 T/week**	**28 T/week**	**83 T/week**

Appendix 20 - Frankton RTS - Composition by vehicle type - Sept-20

Frankton RTS - General waste stream - By vehicle type - September 2020 visual survey		Cars	Front loaders	Gantry trucks	Other trucks	Trailer
Paper	Recyclable	8.8%	3.9%	0.3%	50.0%	0.7%
	Cardboard	5.8%	9.0%	2.8%	15.1%	3.4%
	Non-recyclable	0.3%	1.1%	0.3%	2.3%	0.0%
	Subtotal	**14.9%**	**14.0%**	**3.4%**	**67.4%**	**4.1%**
Plastics	Recyclable	0.3%	1.1%	0.1%	0.7%	0.0%
	Non-recyclable	9.5%	23.4%	5.9%	8.9%	2.4%
	Subtotal	**9.7%**	**24.5%**	**6.0%**	**9.7%**	**2.4%**
Organics	Kitchen waste	7.9%	15.1%	0.2%	0.1%	0.0%
	Compostable greenwaste	3.9%	1.4%	0.5%	0.0%	4.0%
	Non-compostable greenwaste	11.5%	0.5%	1.3%	2.7%	35.9%
	Organics other	0.5%	3.2%	0.1%	0.0%	0.0%
	Subtotal	**23.8%**	**20.2%**	**2.1%**	**2.8%**	**39.9%**
Ferrous metals	Primarily ferrous	0.4%	1.1%	1.9%	0.6%	0.0%
	Steel other	1.6%	2.3%	0.9%	0.9%	1.2%
	Subtotal	**2.0%**	**3.4%**	**2.8%**	**1.4%**	**1.2%**
Non-ferrous metals		**0.4%**	**1.1%**	**0.2%**	**0.4%**	**0.0%**
Glass	Recyclable	0.3%	1.7%	0.1%	0.3%	0.0%
	Glass other	0.4%	2.3%	0.2%	0.3%	0.3%
	Subtotal	**0.7%**	**3.9%**	**0.3%**	**0.6%**	**0.3%**
Textiles	Clothing/textiles	3.3%	2.7%	1.2%	0.7%	2.1%
	Multimaterial/other	6.6%	4.3%	2.2%	5.0%	14.4%
	Subtotal	**9.9%**	**7.1%**	**3.3%**	**5.6%**	**16.5%**
Sanitary paper		**2.2%**	**9.0%**	**0.2%**	**0.6%**	**0.0%**
Rubble	Cleanfill	8.7%	0.5%	0.8%	0.0%	0.0%
	New plasterboard	0.0%	0.0%	15.8%	0.5%	0.0%
	Other	7.1%	3.2%	10.2%	1.0%	2.3%
	Subtotal	**15.9%**	**3.7%**	**26.7%**	**1.5%**	**2.3%**
Timber	Reusable	0.2%	1.0%	2.3%	0.0%	0.5%
	Unpainted & untreated	0.3%	1.7%	9.9%	5.6%	8.4%
	Non-recoverable	19.0%	4.2%	41.2%	4.0%	24.2%
	Subtotal	**19.5%**	**6.8%**	**53.4%**	**9.7%**	**33.1%**
Rubber		**0.6%**	**4.3%**	**1.5%**	**0.1%**	**0.2%**
Potentially hazardous		**0.4%**	**1.8%**	**0.1%**	**0.1%**	**0.0%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Tonnes per week		**12 T/week**	**10 T/week**	**156 T/week**	**44 T/week**	**28 T/week**