WasteNot Consulting

Analysis of the Composition of Solid Waste in Queenstown Lakes District

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Contact details

Queenstown Lakes District Council

Contact: Melanie Heather
Environmental Consents Officer
Infrastructure
Phone: 03 441 0499

Waste Not Consulting Ltd

Contact: Bruce Middleton
Director
PO Box 78 372
Grey Lynn
Auckland 1245
Phone: 09 360 5188
E-mail: bruce@wastenot.co.nz

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Executive Summary

In accordance with policy contained in its 2011 Waste Management and Minimisation Plan, Queenstown Lakes District Council engaged Waste Not Consulting to analyse the composition of waste being disposed of to landfill from the District. The survey comprised six days of surveying by Waste Not Consulting at Wanaka and Frankton transfer stations and the analysis of weighbridge records for the transfer stations and Victoria Flats landfill.

The weekly tonnages and percentages of each waste activity source disposed of at Wanaka and Frankton transfer stations during the survey period are shown in the table below.

Activity source of waste disposed of at transfer stations - 8-13 August 2016	Wanaka transfer station		Frankton transfer station	
	% of total	Tonnes/week	% of total	Tonnes/week
Construction and demolition	43%	57 T/week	47%	139 T/week
Industrial/commercial/institutional	17%	22 T/week	16%	47 T/week
Landscaping	1%	1 T/week	1%	4 T/week
Residential	7%	9 T/week	5%	14 T/week
Council kerbside collections	24%	33 T/week	10%	29 T/week
Private kerbside collections	9%	12 T/week	22%	65 T/week
TOTAL	**100%**	**134 T/week**	**100%**	**297 T/week**

The weekly tonnages and percentages of each waste activity source disposed of at Victoria Flats landfill during July and August 2016 are shown in the table below.

Types of waste at Victoria Flats landfill – July and August 2016		% of total	Tonnes/week
Transfer station waste	*Alexandra*	*7%*	*59 T/week*
	Cromwell	*8%*	*66 T/week*
	Frankton	*37%*	*297 T/week*
	Wanaka	*17%*	*134 T/week*
	Subtotal	**69%**	**555 T/week**
General waste direct	*Commercial* *	*13%*	*104 T/week*
to landfill	*Demolition* *	*2%*	*17 T/week*
	Subtotal	**15%**	**121 T/week**
Special		5%	38 T/week
Glass from Wakatipu Recycling Centre		6%	51 T/week
QLDC kerbside waste collection		5%	41 T/week
TOTAL		**100%**	**805 T/week**

* Victoria Flats landfill weighbridge classifications

The 2016 survey was the fifth conducted by Waste Not Consulting since 2004. The primary composition of the waste streams from the most recent surveys at the three disposal facilities in Queenstown Lakes District are shown in the table below.

Overall waste streams – 8-13 August 2016	Wanaka transfer station overall waste stream			Frankton transfer station overall waste stream			Victoria Flats landfill overall waste stream from QLD only		
	2008	2012	2016	2008	2012	2016	2008	2012	2016
Paper	14%	12%	12%	10%	11%	11%	11%	12%	12%
Plastics	12%	11%	12%	11%	9%	9%	10%	11%	10%
Organic	25%	23%	19%	25%	28%	18%	24%	30%	16%
Ferrous metals	3%	2%	3%	3%	2%	2%	3%	3%	2%
Nonferrous metals	1%	1%	0%	1%	1%	1%	0%	1%	1%
Glass	5%	3%	3%	6%	5%	4%	5%	5%	12%
Textiles	5%	6%	5%	4%	7%	6%	4%	5%	6%
Sanitary paper	5%	4%	4%	3%	3%	2%	4%	5%	3%
Rubble	10%	10%	20%	11%	9%	21%	11%	7%	15%
Timber	19%	26%	20%	25%	24%	26%	23%	15%	19%
Rubber	1%	0.3%	1%	1%	0.3%	0%	1%	1%	1%
Potentially hazardous	2%	1%	1%	1%	1%	0%	3%	5%	5%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

The primary composition of the overall waste stream, in terms of tonnes per week, at each of the three facilities is given in the table below.

Overall waste streams – 8-13 August 2016	Wanaka transfer station	Frankton transfer station	Victoria Flats landfill
Paper	17 T/week	33 T/week	99 T/week
Plastics	16 T/week	26 T/week	82 T/week
Organic	26 T/week	53 T/week	152 T/week
Ferrous metals	4 T/week	6 T/week	16 T/week
Nonferrous metals	1 T/week	2 T/week	6 T/week
Glass	5 T/week	13 T/week	86 T/week
Textiles	6 T/week	17 T/week	45 T/week
Sanitary paper	5 T/week	7 T/week	28 T/week
Rubble	27 T/week	62 T/week	109 T/week
Timber	27 T/week	76 T/week	135 T/week
Rubber	1 T/week	1 T/week	7 T/week
Potentially hazardous	1 T/week	1 T/week	40 T/week
TOTAL	**134 T/week**	**297 T/week**	**805 T/week**

Organic material, timber, and rubble were the largest three components of the overall waste streams at all three facilities. The high proportions of timber and rubble are associated with the high level of construction and demolition activity in the District.

1 Introduction

Territorial authorities have statutory responsibility for promoting effective and efficient waste management and waste reduction practices within their district. This responsibility is specified in section 42 of the Waste Minimisation Act 2008. Section 43 of the Act requires territorial authorities to adopt a waste management and minimisation plan. The Act also requires that plans be reviewed not more than 6 years after the last review.

Queenstown Lakes District Council (Council) adopted its Waste Management and Minimisation Plan in December 2011. The plan must be reviewed by 2017. The Plan includes a policy to "gather information about diverted material and waste in the District so as to improve waste management and minimisation planning". One of the Plan's methods for fulfilling this policy is the "monitoring of quantities and compositions of waste streams, and origins and destinations of waste".

This report presents the results of a survey of waste composition undertaken by Waste Not Consulting in August 2016. Waste Not Consulting had previously undertaken surveys of the composition of solid waste in Queenstown Lakes District in 2004, 2006, 2008, and 2012. The methodology used for these surveys has remained consistent with that recommended in the Ministry for the Environment's Solid Waste Analysis Protocol 2002 (SWAP).

The 2016 surveying programme comprised the following:

- three full days (11:30-3:30) surveying at Wanaka transfer station
- three full days and three part days surveying at Frankton transfer station
- review of photos of general waste loads taken by Scope Resources Ltd staff over a two-week period
- analysis of weighbridge records from the transfer stations and Victoria Flats landfill.

1.1 Objectives of survey

The survey of waste disposed of at the Frankton and Wanaka refuse transfer stations and Victoria Flats landfill provided the following information:

- composition of overall waste being disposed of at Wanaka and Frankton transfer stations and Victoria Flats landfill in terms of 25 material types
- proportion of waste that is generated by seven activity sources, and the composition of waste from each source
- proportion of waste that is transported by different vehicle types, and the composition of waste transported by each
- an estimate of the composition of the overall waste stream generated in Queenstown Lakes District, calculated using weighbridge data supplied by the landfill operator
- an estimate of the composition of all waste disposed of at Victoria Flats landfill

1.2 Waste disposal services in Queenstown Lakes District

A range of waste disposal services is available to residents and businesses in Queenstown Lakes District. Council provides a weekly kerbside collection of waste in Glenorchy, Kingston, Queenstown, Wakatipu, and Wanaka areas. Under contract to Council, Trojan Holdings Ltd, trading as AllWaste, collects Council-approved blue rubbish bags (available from Council offices and all local supermarkets for $3.50 for the 60-litre size) on a weekly basis. The

Council domestic collection is disposed of either to the nearest transfer station or directly to landfill.

At the same time as collecting the Council bagged refuse, using the same vehicles, AllWaste also collects kerbside waste from its own subscriber service wheelie bins. These bins are paid for privately by the householders using the service and the Council receives a proportion of the charge to cover the collection and disposal cost. A rural domestic waste collection service from pre-determined collection points is also provided by Council.

A Council kerbside recycling service is available to residents in Wanaka and Queenstown. This service is provided by Smart Environmental and is based on 140-litre wheelie bins. The commingled recycling collection accepts:

- All plastic containers with recycling logo #1-7
- Steel cans, including aerosols
- Aluminium cans
- Clean aluminium foil
- Glass bottles and jars
- All clean paper and cardboard.

Drop-off recycling facilities are also available at the Wakatipu Recycling Centre in Frankton and at Wanaka Wastebusters in Wanaka.

Commercial waste pick up is by arrangement with AllWaste, Northern Southland Transport Holdings, or Skip Bins. The companies offer commercial wheelie bins, front-loader skips, and gantry skip rental services. The service is available only in Arrowtown, Wanaka, Hawea, and greater Queenstown. The general public is also able to rent gantry skips for the removal of large quantities of waste from their properties.

Commercial recycling collections are offered by Smart Environmental in Queenstown and Wanaka Wastebusters in Wanaka.

Council owns and provides for the operation of the Frankton and Wanaka refuse transfer stations. All waste disposed of at the transfer stations is transported to the landfill at Victoria Flats. The landfill is operated by Scope Resources Ltd. Refuse from the Cromwell and Alexandra refuse transfer stations (in Central Otago District) is also taken to the Victoria Flats landfill. A diagrammatic summary of the waste flows into the landfill is presented in section 7.

The Frankton transfer station (see photo page 6) 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. As the separated greenwaste is shredded and used as mulch on Council parks and reserves, only a limited range of greenwaste is accepted, as shown in the photo on the next page. 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 (see photo page 6) is located on Ballantyne Road, Wanaka, and operates seven days a week, between the hours of 11:30 am and 3:30 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 entering both the Frankton and Wanaka transfer stations with loads over 200 kg are required to pass over weighbridges. Weighed vehicles are weighed when entering and again when leaving and 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. Refuse charges at the transfer stations are shown in the photo.

FRANKTON TRANSFER STATION

WANAKA TRANSFER STATION

2 Methodology

The methodology for the visual survey by Waste Not Consulting 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).

2.1 Survey schedule

The Waste Not Consulting survey was undertaken for six days as per the following schedule. As Wanaka transfer station is only open for 4 hours per day, on three of the survey days the surveyor started at Frankton transfer station from 8.00 am until 10.30 am, and then drove to Wanaka to survey from 11.30 am until 3.30 pm.

Table 2-1 – SWAP survey schedule 2016

Monday	8 August - Frankton transfer station
Tuesday	9 August - Frankton and Wanaka transfer stations
Wednesday	10 August - Frankton transfer station
Thursday	11 August - Frankton and Wanaka transfer stations
Friday	12 August - Frankton transfer station
Saturday	13 August - Frankton and Wanaka transfer stations

2.2 Classification of waste

Waste was categorised into the 12 primary categories identified in the SWAP and 25 secondary categories selected in consultation with Council. The categories are detailed in Appendix 4.

2.3 Survey execution

The visual classification was conducted by a single Waste Not employee over six days from 8-13 August 2016. 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.

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 (in terms of the secondary classifications given in Appendix 4) present in the load 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 were 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.

The surveys included only vehicles disposing of waste to landfill, not vehicles carrying green waste, recyclables, or any other material that was not destined for landfill disposal.

As transfer station staff 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.

2.3.1 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.

Staff of Scope Resources Ltd at Victoria Flats landfill photographed 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.

2.4 Waste classifications

The SWAP recommends the use of twelve primary classifications of waste for all waste audits, with secondary classifications being selected to meet particular circumstances. In the body of this report, results are presented for the composition of waste based on the primary classifications. The results for the composition based on the 25 secondary classifications are presented in the appendices. A description of each classification of waste is given in Appendix 4.

2.5 Activity source of waste loads

For visual waste surveys, Waste Not has developed a set of categories for the activity sources of waste that is aimed at providing the information that is most useful for monitoring waste streams and effectively targeting waste minimisation initiatives and policies. These categories have been included in the National Waste Data Framework, with a minor variation. Information on the activity source of individual waste loads was gathered as the waste was unloaded, either by observation of the waste itself or by questioning the vehicle driver.

The categories used for the Queenstown Lakes District surveys were:

1. **Kerbside collection** – waste collected from both residential and commercial premises by both Council bagged waste and private wheelie bin kerbside collections
2. **Residential** – all waste originating from residential premises other than kerbside waste, construction and demolition waste, or landscaping waste (residential waste includes drop-offs of bagged domestic waste)
3. **Industrial/commercial/institutional** (ICI) – waste from industrial, commercial, and institutional sources.
4. **Construction and demolition** (C&D) – waste materials from the construction or demolition of a building or structure
5. **Landscaping** – waste from landscaping activity and garden maintenance, both domestic and commercial
6. **Transfer station** – (for waste entering landfills)
7. **Special wastes** – (for waste entering landfills) a subjective classification that includes any substantial waste stream (such as biosolids, landfill cover material, infrastructural cleanfill, or industrial wastes), that significantly affects the overall composition of the waste stream and may be markedly different from waste streams at other disposal facilities.

2.6 Identification of vehicle types

As loads carried by different vehicle types are not affected in similar ways by waste reduction initiatives, all vehicles carrying waste were identified by the surveyor as being one of the following types:

- cars
- trailers
- front-loader trucks
- gantry trucks
- compactor trucks
- hook trucks
- other trucks (such as tip trucks and box trucks).

A description of truck types is provided in Appendix 6.

2.7 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. As it is not possible to accurately visually survey domestic bagged refuse, an assumed composition of the domestic kerbside refuse collections was used. The assumed domestic kerbside refuse composition was based on the results of detailed domestic refuse surveys in areas with similar waste management services to those offered by Council. The assumed kerbside refuse composition is presented in Appendix 5.

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 used for the domestic kerbside bagged refuse collections.

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 waste 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.

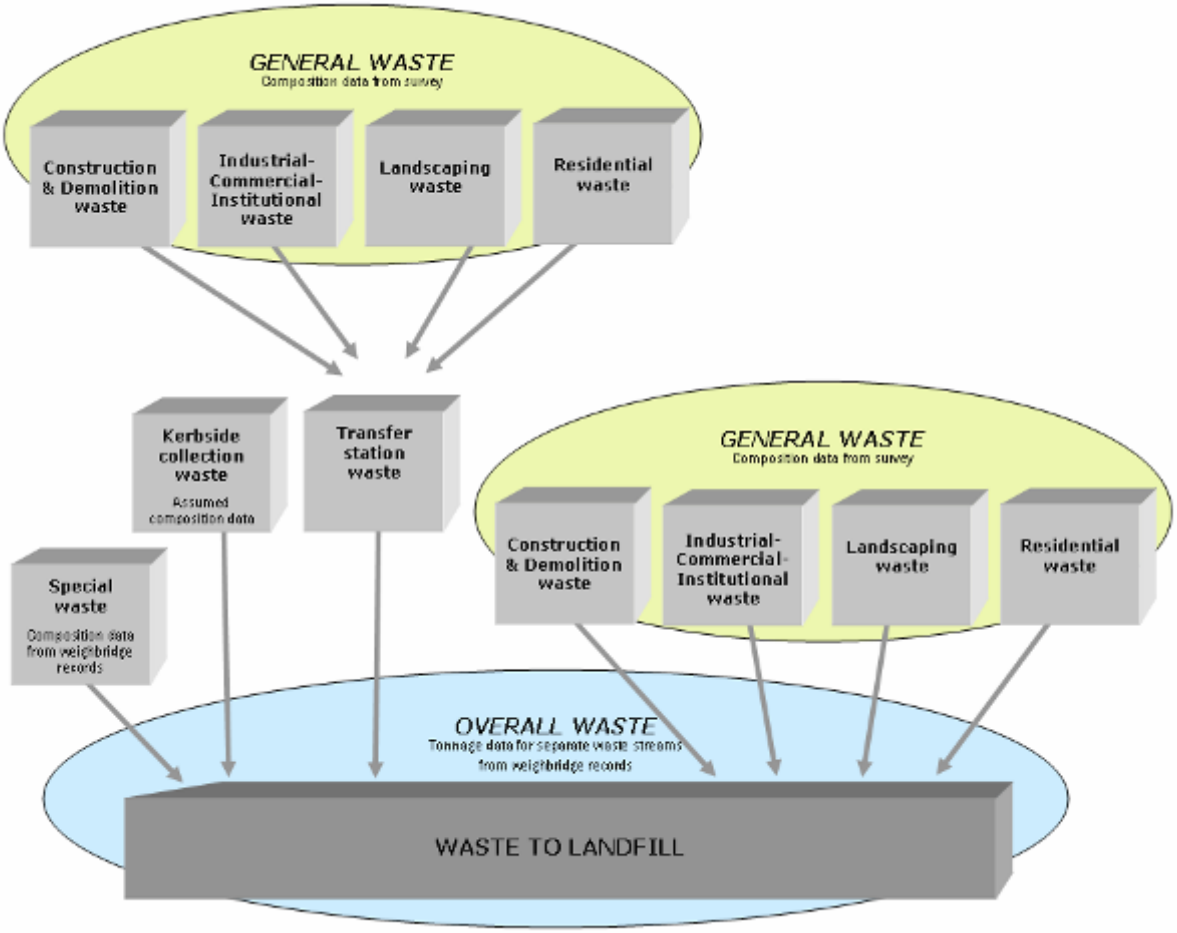

Figure 2-1 – Generic waste flow diagram

3 Wanaka transfer station

Wanaka transfer station was surveyed on 9, 11, and 13 August 2016. During the survey, the surveyor collected data for a four-hour period each day (being all hours during which the facility is open to the public) on all vehicles disposing of residual waste into the transfer pit. If a portion of a load was removed from the pit floor by staff for recycling, this material was not included in the survey data and the proportion of the load that had been recovered was recorded. Scrap metal was the only material recovered from the pit floor.

Outside of normal opening hours, AllWaste, the facility operator, disposes of residual waste from its gantry skip bin collection. While composition data for these vehicles is not available, vehicle type data could be determined from the weighbridge records.

3.1 Wanaka transfer station general waste

In section 2.5, the activity sources that comprise the overall waste stream are described. The following sections analyse what is referred to as the 'general waste' stream disposed of at Wanaka transfer station. The general waste stream comprises residential waste, ICI waste, C&D waste, and landscaping waste. General waste excludes kerbside collections, waste from transfer stations, and special wastes. There were no special wastes disposed of during the survey period and no waste from other transfer stations is disposed of at Wanaka transfer station.

Weighbridge records from Victoria Flats landfill indicate that, during July and August 2016, an average of 134 tonnes/week of waste was received from Wanaka transfer station. The Wanaka transfer station records for 17 July - 13 August 2016 show that a weekly average of 44 tonnes of kerbside collections (including Council and private kerbside collections and the after-hours bag drop-off bin at the transfer station) was received at the facility. ***For the purposes of these analyses, a general waste flow (overall waste less kerbside collections) of 90 tonnes/week is used for Wanaka transfer station.***

3.1.1 Wanaka transfer station general waste – primary composition

The primary composition of general waste disposed of at the Wanaka transfer station is presented in Table 3-1 and Figure 3-1 on the next page. The secondary composition, which includes all 25 categories, is given in Appendix 1.

Timber and rubble, largely from construction waste, comprised the two largest components of general waste, each representing 30% of the total, by weight. Paper and plastics both comprised approximately 11% of the total.

Table 3-1 – Wanaka transfer station general waste – 8 - 13 August 2016 (excludes kerbside collections)

Wanaka transfer station – general waste – 8 - 13 August 2016	Proportion of total	Tonnes/week
Paper	10.5%	9 T/week
Plastics	11.0%	10 T/week
Organic	5.7%	5 T/week
Ferrous metals	2.9%	3 T/week
Nonferrous metals	0.3%	0.2 T/week
Glass	2.1%	2 T/week
Textiles	4.9%	4 T/week
Sanitary paper	1.7%	2 T/week
Rubble	29.8%	27 T/week
Timber	29.7%	27 T/week
Rubber	0.8%	1 T/week
Potentially hazardous	0.6%	1 T/week
TOTAL	**100.0%**	**90 T/week**

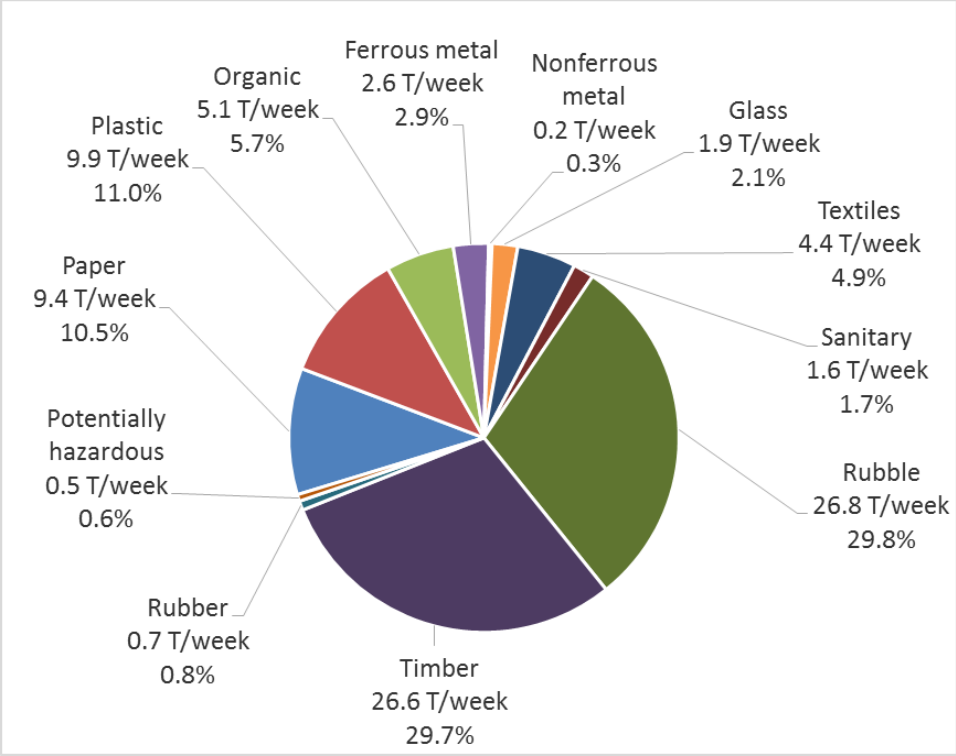

Figure 3-1 – Wanaka transfer station general waste – 8 - 13 August 2016 (excludes kerbside collections)

3.1.2 Wanaka transfer station general waste – by activity source

Each load of general waste discharged at the Wanaka transfer station was assessed as to the activity that had resulted in its generation. Table 3-2 below shows the percentage of loads of each activity source, the percentage of total weight, and the tonnes per week.

Table 3-2 – Activity source of Wanaka transfer station general waste – 8 - 13 August 2016 (excludes kerbside collections)

Wanaka transfer station - general waste by activity source – 8 – 13 August 2016	# of loads surveyed	% of loads	% of weight	Tonnes/week
Construction and demolition	35	36%	64%	57 T/week
Industrial/commercial/institutional	26	27%	25%	22 T/week
Landscaping	3	3%	1%	1 T/week
Residential	34	35%	10%	9 T/week
TOTAL	**98**	**100%**	**100%**	**90 T/week**

Construction and demolition was the largest activity source of waste, comprising 64% of the general waste stream. Industrial/commercial/institutional waste comprised 25%.

3.1.3 Wanaka transfer station general waste – composition by activity source

The primary compositions of the activity sources of general waste at the Wanaka transfer station are shown in Table 3-3 below. The secondary compositions are in Appendix 1.

Table 3-3 – Primary composition of Wanaka transfer station general waste – by activity source - 8 - 13 August 2016 (excludes kerbside collections)

Wanaka transfer station general waste – by activity source - 8 - 13 August 2016	C&D	ICI	Landscaping	Residential
Paper	5.7%	20.8%	0.0%	16.6%
Plastics	5.1%	24.2%	6.8%	16.2%
Organics	0.2%	17.8%	19.2%	8.6%
Ferrous metals	2.2%	3.3%	0.0%	6.5%
Nonferrous metals	0.0%	0.7%	0.0%	0.8%
Glass	0.3%	6.0%	0.0%	4.5%
Textiles	0.1%	8.0%	0.0%	27.0%
Sanitary paper	0.0%	6.4%	0.0%	1.2%
Rubble	44.1%	1.7%	74.0%	4.0%
Timber	42.0%	7.1%	0.0%	12.0%
Rubber	0.0%	2.4%	0.0%	1.8%
Potentially hazardous	0.1%	1.5%	0.0%	0.8%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Over 86% of C&D waste was composed of two primary materials, rubble and timber. ICI waste was more heterogeneous, with paper, plastic, and organics each comprising between 18%-24% of the total. Landscaping waste was almost entirely greenwaste and rubble. There were only three loads of landscaping waste in the survey, and one comprised a large quantity of soil. Textile waste was the largest single component of the residential waste, which represented 10% of the general waste. The textile waste was mainly large quantities of carpet and underlay in a small number of loads.

3.1.4 Wanaka transfer station overall waste – by vehicle type

For all vehicle loads of waste disposed of at the Wanaka transfer station, the vehicle type was recorded. Table 3-4 shows the percentage of loads transported by each of the vehicle types, the percentage of total weight carried by each vehicle type, and the tonnes per week. The tonnes per week for compactors, front-loader trucks, and gantry trucks are taken directly from the weighbridge records. The tonnes per week for cars, other trucks, and trailers are based on the survey results, using a total weight for those vehicle types combined taken from the weighbridge records.

Due to the small sample sizes of front-loader trucks and other trucks, the composition data can not be considered as necessarily reliable.

Table 3-4 – Wanaka transfer station overall waste – by vehicle type – 8 - 13 August 2016

Wanaka transfer station – overall waste – by vehicle type - 8-13 August 2016	# of loads surveyed	% of loads surveyed	% of weight	Tonnes/week
Cars	26	25%	1%	2 T/week
Compactors	3	3%	30%	40 T/week
Front-loader trucks	1	1%	11%	14 T/week
Gantry trucks	18	18%	33%	44 T/week
Other trucks	3	3%	2%	3 T/week
Trailers	51	50%	24%	32 T/week
TOTAL	**102**	**100%**	**100%**	**134 T/week**

While a quarter of all loads were car-sized, these loads represented only 1% of the total weight of waste. These loads often comprised a small quantity of bagged refuse. Half of the loads surveyed were trailer-sized loads, and these loads represented 24% of the total weight. Kerbside compactors transported 30% of the total weight, but represented only 3% of the loads surveyed. Gantry trucks transported one-third of the total weigh of waste during the period analysed.

3.1.5 Wanaka transfer station general waste – composition by vehicle type

The primary compositions of loads carried by the five types of vehicles that disposed of general waste at the Wanaka transfer station are shown in Table 3-5 below. The secondary compositions are shown in Appendix 1.

Table 3-5 – Primary composition of Wanaka transfer general station waste – by vehicle type – 8 - 13 August 2016 (excludes kerbside collections)

Wanaka transfer station – general waste – by vehicle type – 8-13 August 2016	Car	Front-loader	Gantry	Other truck	Trailer
Paper	17.5%	17.0%	7.4%	7.4%	13.6%
Plastics	16.7%	18.2%	7.2%	39.2%	12.5%
Organics	26.3%	26.1%	2.6%	3.8%	4.5%
Ferrous metals	2.0%	3.4%	3.4%	6.6%	1.9%
Nonferrous metals	0.7%	1.1%	0.2%	0.4%	0.1%
Glass	6.4%	4.0%	1.4%	5.9%	2.2%
Textiles	13.3%	10.2%	4.1%	11.1%	3.8%
Sanitary paper	3.8%	5.7%	0.9%	0.5%	2.1%
Rubble	8.1%	2.3%	30.1%	2.1%	39.2%
Timber	4.0%	3.4%	42.1%	21.0%	19.6%
Rubber	0.6%	5.7%	0.4%	1.0%	0.2%
Potentially hazardous	0.5%	2.8%	0.3%	0.8%	0.3%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

3.2 Wanaka transfer station overall waste

Data on three separate waste streams have been combined to produce information on the overall waste flow being discharged at the Wanaka transfer station. The three waste streams are general waste, Council kerbside collections, and private kerbside wheelie bin collections.

Weighbridge records from Victoria Flats landfill indicate that, during July and August 2016, an average of 134 tonnes/week of waste was received from Wanaka transfer station. The Wanaka transfer station records for 17 July - 13 August 2016 show that a weekly average of 44.4 tonnes of kerbside collections (including Council and private kerbside collections and the after-hours bag drop-off bin at the transfer station) was received at the facility.

Of this 44.4 tonnes, 32.6 tonnes were the Council kerbside collection primarily from domestic premises (plus the after-hours drop-off bin), and 11.8 tonnes were private waste operator collections from commercial premises. This data is shown in Table 3-6 on the next page. As waste quantities fluctuate on a seasonal basis, and as short-term disposal figures can be influenced by one-off events, extrapolating from these data to an annual basis is not necessarily reliable.

Table 3-6 – Types of overall waste to Wanaka transfer station – 8 - 13 August 2016

Wanaka transfer station – overall waste types – 8-13 August 2016	% of weight	Tonnes/week
Council kerbside collections	24%	33 T/week
Private kerbside collections	9%	12 T/week
General waste	67%	90 T/week
TOTAL	**100%**	**134 T/week**

It is calculated that 134 tonnes of waste were discharged at Wanaka transfer station during the week of 8-13 August 2016. About 67% of the waste was general waste and 33% of the total was kerbside collections, which includes both Council domestic and private kerbside collections and the after-hours drop-off bin at the transfer station.

3.2.1 Wanaka transfer station overall waste - primary composition

The three waste streams which comprise the overall waste stream at Wanaka transfer station are quantified in Table 3-6. By combining the composition of these waste streams in the proportions shown in the table, the composition of the overall waste stream can be calculated. For the calculations, the compositions are assumed to be as follows:

- general waste – as shown in Table 3-1
- Council kerbside collections of waste – as shown in Appendix 5
- private kerbside collections from commercial premises – as shown in Appendix 5.

The primary composition of the overall waste stream is presented in Table 3-7 below and Figure 3-2 on the following page. The secondary composition is presented in Appendix 1.

Table 3-7 – Composition of Wanaka transfer station overall waste – 8 - 13 August 2016

Wanaka transfer station – overall waste – 8-13 August 2016	Proportion of total	Tonnes/week
Paper	12.4%	17 T/week
Plastics	11.7%	16 T/week
Organics	19.1%	26 T/week
Ferrous metals	2.6%	4 T/week
Nonferrous metals	0.5%	1 T/week
Glass	3.4%	5 T/week
Textiles	4.6%	6 T/week
Sanitary paper	3.6%	5 T/week
Rubble	20.4%	27 T/week
Timber	20.2%	27 T/week
Rubber	0.6%	1 T/week
Potentially hazardous	0.7%	1 T/week
TOTAL	**100.0%**	**134 T/week**

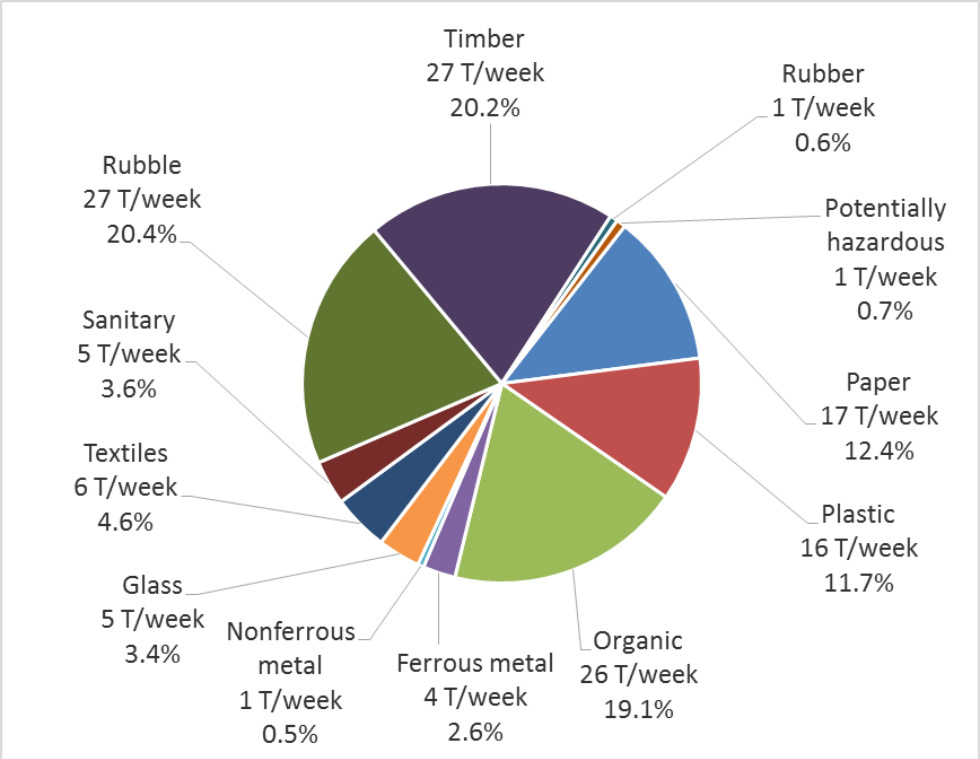

Figure 3-2 – Composition of Wanaka transfer station overall waste – 8 - 13 August 2016

Rubble and timber were the largest constituents of the overall waste stream to Wanaka transfer station, with both accounting for slightly over 20% of the total. Most of these materials were in construction and demolition waste. Organic material comprised the next largest primary classification of the overall waste stream, representing 19% of the total. About 72% of the organic material was kitchen waste. Paper and plastics each comprised approximately 12% of the overall waste stream.

4 Frankton transfer station

All vehicles disposing of residual waste into the transfer pit at the Frankton transfer station were surveyed for full days on 8, 10, and 12 August 2016 and for part days on 9, 11 and 13 August 2016. Data was not collected on vehicles disposing of greenwaste at the drop-off point. If a portion of a load was recovered from the pit floor by staff, this material was not included in the survey data and the proportion of the load that had been recovered was recorded. Scrap metal was the only material recovered from the pit floor.

4.1 Frankton transfer station general waste

The following sections analyse what is referred to as the 'general waste' stream disposed of at Frankton transfer station. The general waste stream comprises residential waste, ICI waste, C&D waste, and landscaping waste. General waste excludes kerbside collections.

Weighbridge records from Victoria Flats landfill indicate that, during July and August 2016, an average of 297 tonnes/week of waste was received from Frankton transfer station. The Frankton transfer station records for 17 July - 13 August 2016 show that a weekly average of 94 tonnes of kerbside collections (including Council and private kerbside collections) was received at the facility. ***For the purposes of these analyses, a general waste flow (overall waste less kerbside collections) of 203 tonnes/week is used for Frankton transfer station.***

4.1.1 Frankton transfer station general waste – primary composition

The primary composition of general waste disposed of at the Frankton transfer station is presented in Table 4-1 below and Figure 4-1 on the next page. The secondary composition, which includes all 25 categories, is given in Appendix 2.

Table 4-1 – Composition of Frankton transfer station general waste – 8 - 13 August 2016 (excludes kerbside collections)

Frankton transfer station – general waste – 8-13 August 2016	Proportion of total	Tonnes/week
Paper	8.8%	18 T/week
Plastics	7.0%	14 T/week
Organic	4.9%	10 T/week
Ferrous metals	2.0%	4 T/week
Nonferrous metals	0.5%	1 T/week
Glass	2.1%	4 T/week
Textiles	6.5%	13 T/week
Sanitary paper	0.9%	2 T/week
Rubble	29.8%	61 T/week
Timber	37.1%	75 T/week
Rubber	0.2%	0.5 T/week
Potentially hazardous	0.2%	0.4 T/week
TOTAL	**100.0%**	**203 T/week**

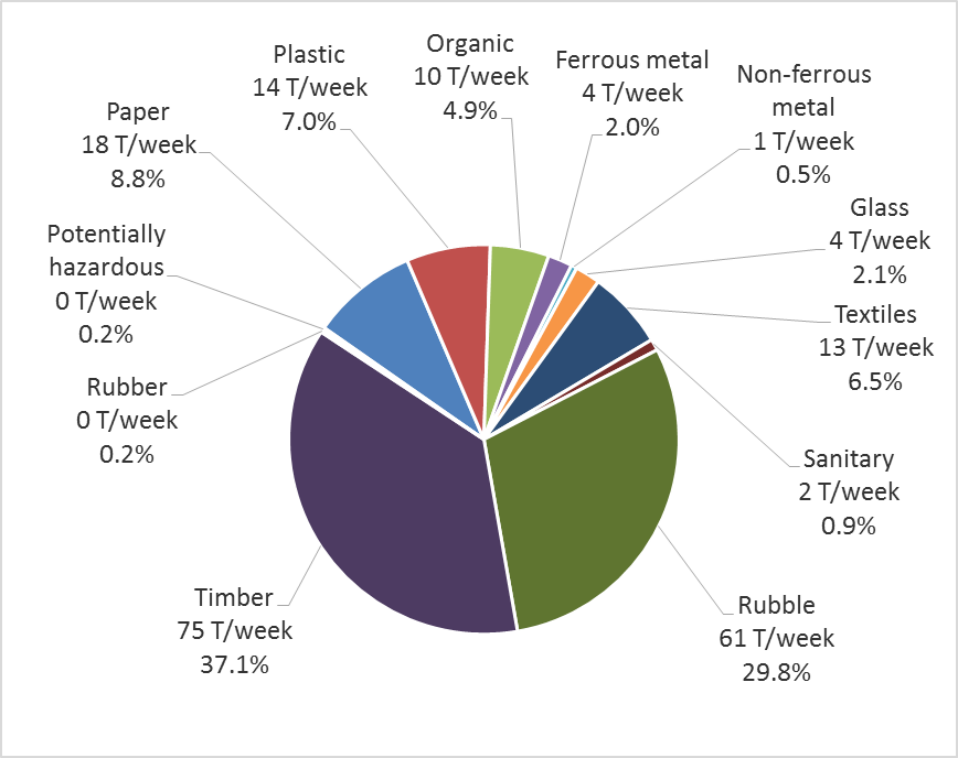

Figure 4-1 – Composition of Frankton transfer station general waste – 8 - 13 August 2016 (excludes kerbside collections)

Timber, largely from construction waste, comprised the largest single component of general waste at Frankton transfer station, representing 37% of the total. Rubble, which includes construction materials such as plasterboard, comprised 30% of the total. Paper, plastics, and textiles each represented 6-9% of the total.

4.1.2 Frankton transfer station general waste – by activity source

The activity source of each load of general waste discharged at the Frankton transfer station was assessed. Table 4-2 shows the percentage of loads of each waste type, the percentage of total weight, and the tonnes per week.

Table 4-2 –Frankton transfer station general waste activity sources – 8 - 13 August 2016 (excludes kerbside collections)

Frankton transfer station – general waste – by activity source – 8-13 August 2016	# of loads surveyed	% of loads	% of weight	Tonnes/week
Construction and demolition	108	33%	68%	139 T/week
Industrial/commercial/institutional	93	28%	23%	47 T/week
Landscaping	33	10%	2%	4 T/week
Residential	93	28%	7%	14 T/week
TOTAL	**327**	**100%**	**100%**	**203 T/week**

Construction and demolition activity was the largest source of general waste, with C&D waste comprising 68% of the weight of general waste. Industrial/commercial/institutional waste was the next largest waste activity source, comprising 23% of the total weight.

4.1.3 Frankton transfer station general waste – composition by activity source

The primary compositions of the activity sources comprising general waste at Frankton transfer station are shown in Table 4-3 below. The secondary compositions are shown in Appendix 2.

Table 4-3 – Primary composition of Frankton transfer station general waste – by waste activity source – 8 - 13 August 2016 (excludes kerbside collections)

Frankton transfer station – general waste – by activity source – 8-13 August 2016	C&D	ICI	Landscaping	Residential
Paper	3.4%	23.8%	3.7%	14.1%
Plastics	3.0%	18.2%	1.4%	9.8%
Organic	0.6%	7.8%	84.7%	16.6%
Ferrous metals	1.5%	2.2%	0.3%	7.2%
Nonferrous metals	0.2%	1.3%	0.0%	0.4%
Glass	0.2%	7.4%	0.0%	3.9%
Textiles	2.0%	15.4%	0.6%	23.1%
Sanitary paper	0.0%	3.5%	0.1%	1.5%
Rubble	41.8%	4.2%	6.8%	2.3%
Timber	47.0%	15.3%	2.3%	19.9%
Rubber	0.1%	0.5%	0.0%	0.8%
Potentially hazardous	0.1%	0.4%	0.0%	0.5%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Nearly 90% of C&D waste was comprised of two primary materials, rubble and timber, with timber comprising 47% of the total. ICI waste was more heterogeneous, with paper comprising 24% of the total and timber, textiles, and plastics comprising 15-18%. Landscaping waste was 84% greenwaste, with rubble (mainly soil) being the only other significant component. Residential waste was also relatively heterogeneous, with no single material comprising over 23% of the total.

4.1.4 Frankton transfer station overall waste – by vehicle type

The type of vehicle type was recorded for all loads of waste disposed of at the Frankton transfer station. Table 4-4 shows the percentage of loads transported by each of the vehicle types during the survey, the percentage of total weight carried by each vehicle type (based on weighbridge records for compactors and gantry trucks), and the tonnes per week. The overall tonnes per week is based on Victoria Flats landfill records.

Table 4-4 – Frankton transfer station overall waste – by vehicle type – 8 - 13 August 2016

Frankton transfer station – overall waste – by vehicle type – 8-13 August 2016	# of loads surveyed	% of loads	% of weight	Tonnes/week
Cars	95	27%	2%	5 T/week
Compactors	14	4%	30%	88 T/week
Front-loader trucks	0	0%	0%	0 T/week
Gantry trucks	68	19%	40%	117 T/week
Other trucks	27	8%	7%	21 T/week
Trailers	147	42%	22%	66 T/week
TOTAL	**351**	**100%**	**100%**	**297 T/week**

Trailers represented 42% of the vehicles at Frankton transfer station, and discharged 22% of the total weight. Gantry trucks were 19% of vehicles surveyed, but these discharged 40% of the total weight. Compactors, which included both residential and commercial wheelie bin collections, were only 4% of vehicles but transported 30% of the total weight.

4.1.5 Frankton transfer station general waste – composition by vehicle type

The primary compositions of loads carried by the four types of vehicles that disposed of general waste at the Frankton transfer station are shown in Table 4-5. The secondary compositions are shown in Appendix 2.

Table 4-5 – Primary composition of Frankton transfer station general waste – by vehicle type – 8 - 13 August 2016 (excludes kerbside collections)

Frankton transfer station – general waste – by vehicle type – 8-13 August 2016	Car	Gantry	Other truck	Trailer
Paper	15.3%	5.6%	26.9%	10.9%
Plastics	11.7%	4.1%	18.1%	10.5%
Organic	44.5%	1.9%	0.2%	11.2%
Ferrous metals	3.7%	2.2%	0.5%	1.9%
Nonferrous metals	0.5%	0.2%	0.0%	1.2%
Glass	3.5%	0.4%	6.0%	5.0%
Textiles	4.7%	3.1%	12.5%	13.3%
Sanitary paper	5.2%	0.3%	0.0%	2.5%
Rubble	1.7%	37.5%	10.9%	18.4%
Timber	7.9%	44.3%	24.9%	24.3%
Rubber	0.7%	0.2%	0.0%	0.4%
Potentially hazardous	0.6%	0.2%	0.0%	0.3%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**

4.2 Frankton transfer station overall waste

Data on three separate waste streams have been combined to produce information on the overall waste flow being disposed of to landfill from Frankton transfer station. The three waste streams are general waste, Council kerbside collections, and private kerbside wheelie bin collections.

Weighbridge records from Victoria Flats landfill indicate that, during July and August 2016, an average of 297 tonnes/week of waste was received from Frankton transfer station. The Frankton transfer station records for 17 July - 13 August 2016 show that an average of 94 tonnes/week of kerbside collections (including Council and private kerbside collections) was received at the facility. Of these 94 tonnes/week, 32 tonnes were from Council kerbside collections (another 41 tonnes/week of Council's kerbside waste from Queenstown went directly to landfill), and 62 tonnes were private kerbside collections, mainly from commercial premises. This data is shown in Table 4-6. As waste quantities fluctuate on a seasonal basis, and as short-term disposal figures can be influenced by one-off events, extrapolating from these data to an annual basis is not necessarily reliable.

Table 4-6 – Types of overall waste to Frankton transfer station – 8 - 13 August 2016

Frankton transfer station – overall waste types- 8-13 August 2016	% of weight	Tonnes/week
Council kerbside collections	10%	29 T/week
Private kerbside collections	22%	65 T/week
General waste	68%	203 T/week
TOTAL	**100%**	**297 T/week**

It is estimated that 297 tonnes of waste were discharged at Frankton transfer station during the week of 8-13 August 2016. General waste comprised 68% of the total weight and 32% of the total was kerbside collections, including both domestic and commercial collections.

4.2.1 Frankton transfer station overall waste - primary composition

The three waste streams which comprise the overall waste stream at Frankton transfer station are quantified in Table 4-6. By combining the composition of these waste streams in the proportions shown in the table, the composition of the overall waste stream can be calculated. For the calculations, the compositions of the three sources of waste are assumed to be as follows:

- general waste – as shown in Table 4-1
- Council domestic kerbside waste collections – assumed composition in Appendix 5
- private kerbside collections – assumed composition in Appendix 5.

The primary composition of the overall waste stream is presented in Table 4-7and Figure 4-2 on the following page. The secondary composition is presented in Appendix 2.

Table 4-7 – Composition of Frankton transfer station overall waste – 8 - 13 August 2016

Frankton transfer station – overall waste – 8-13 August 2016	Proportion of total	Tonnes/week
Paper	11.2%	33 T/week
Plastics	8.6%	26 T/week
Organic	17.7%	53 T/week
Ferrous metals	2.0%	6 T/week
Nonferrous metals	0.6%	2 T/week
Glass	4.4%	13 T/week
Textiles	5.6%	17 T/week
Sanitary paper	2.5%	7 T/week
Rubble	20.9%	62 T/week
Timber	25.7%	76 T/week
Rubber	0.3%	1 T/week
Potentially hazardous	0.4%	1 T/week
TOTAL	**100.0%**	**297 T/week**

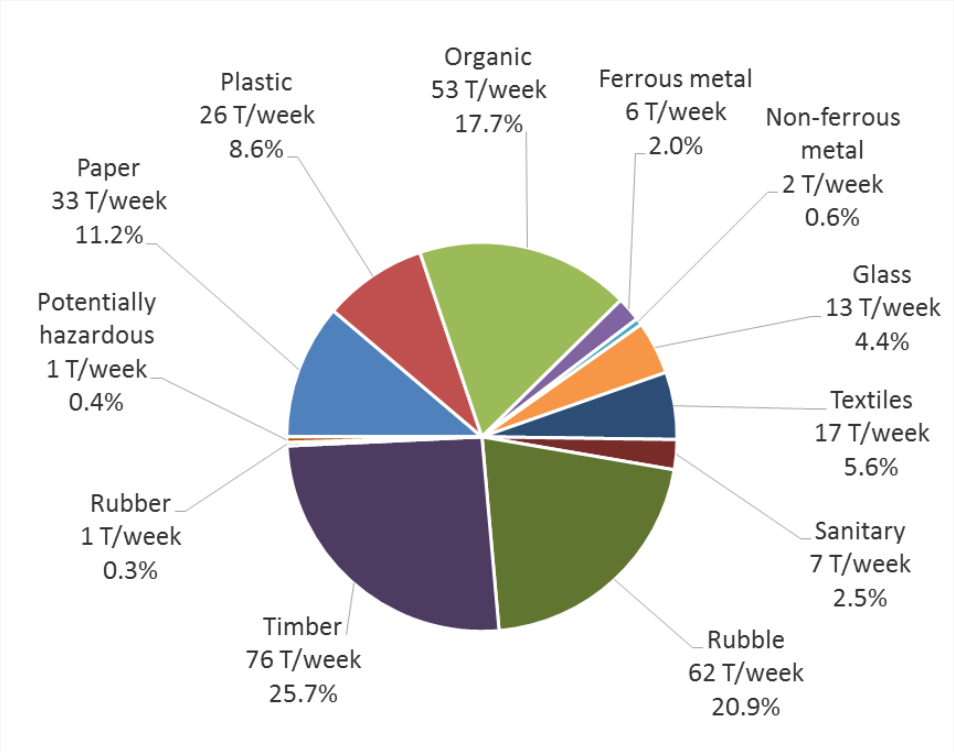

Figure 4-2 – Composition of Frankton transfer station overall waste – 8 - 13 August 2016

Timber and rubble were the largest primary classifications of the overall waste stream, with timber comprising 26% and rubble comprising 21% of the total, by weight. Organics comprised 18% of the total.

5 Results – 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. Waste loads delivered directly to landfill include general waste, special wastes, glass from the Wakatipu Recycling Centre, and a proportion of Council's kerbside waste collection. The remainder of Council's kerbside waste collection is transported to the Frankton transfer station. A higher proportion of the kerbside waste goes to the transfer station in busy periods, such as summer, to reduce travel time.

During July and August 2016, weighbridge records indicate that an average of 805 T/week of waste was disposed of at the landfill. Waste loads entering the landfill are classified by the staff at the landfill weighbridge as belonging to one of the following categories:

- refuse transfer station
- household collection
- commercial
- glass
- demolition
- special.

Table 5-1 below and Figure 5-1 on the following page show the tonnages entering the landfill from each of these sources during the average week in July and August 2016. The sources and tonnages in this table are based on information recorded for each load by Victoria Flats landfill staff at the weighbridge. The names for the categories classified as 'general waste' are those used on the weighbridge records. These categories correspond to the ICI and C&D activity sources.

Table 5-1 – Types of waste entering Victoria Flats landfill – July and August 2016

Victoria Flats landfill – types of waste – July and August 2016		% of total	Tonnes per week
Transfer station waste	*Alexandra*	*7%*	*59 T/week*
	Cromwell	*8%*	*66 T/week*
	Frankton	*37%*	*297 T/week*
	Wanaka	*17%*	*134 T/week*
	Subtotal	**69%**	**555 T/week**
General waste direct to landfill	*Commercial* *	*13%*	*104 T/week*
	Demolition *	*2%*	*17 T/week*
	Subtotal	**15%**	**121 T/week**
Special		5%	38 T/week
Glass from Wakatipu Recycling Centre		6%	51 T/week
QLDC kerbside waste collection		5%	41 T/week
TOTAL		**100%**	**805 T/week**

* Weighbridge classifications

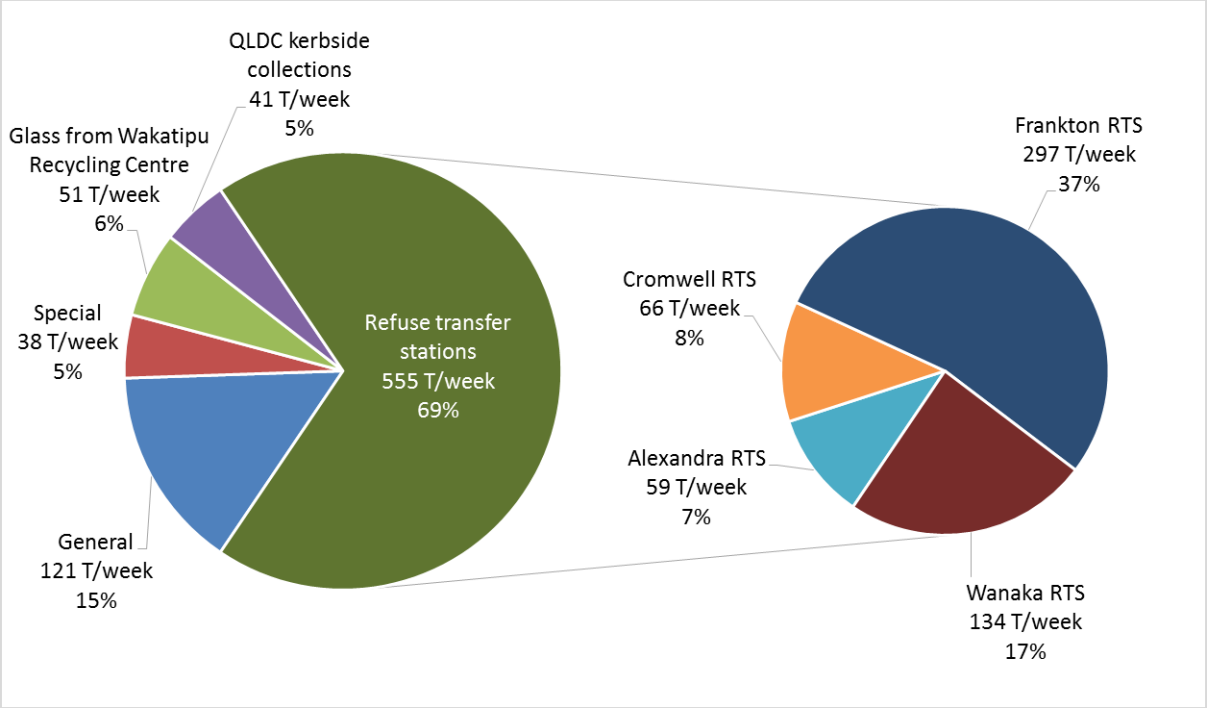

Figure 5-1 – Types of waste entering Victoria Flats landfill – July and August 2016

Waste from the four transfer stations in the region accounted for 69% of all waste entering Victoria Flats landfill. General waste comprised 15% of the total, kerbside collections 5%, and special waste (contaminated soil, asbestos, tyres, sewage sludge, and milliscreenings) comprised 5%. These data are also shown diagrammatically in section 7.

5.2 Victoria Flats landfill general waste - primary composition

On average, approximately three vehicles per day disposed of general waste (classified as either 'Com' or 'Dem' at the weighbridge) during July and August 2016. Rather than engage a surveyor to gather data on these vehicles, a surrogate composition has been calculated for general waste disposed of at Victoria Flats landfill. To calculate this surrogate composition, the compositions of the ICI and C&D activity sources at Frankton transfer station (see Table 4-5) have been combined in proportion to the 'Commercial' and 'Demolition' tonnages in Table 5-1.

Staff of Scope Resources Ltd at Victoria Flats landfill photographed 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.

The primary composition of general waste to Victoria Flat landfill (i.e. all loads exclusive of kerbside waste collections, special waste, glass, and transfer station waste) is given in Table 5-2and Figure 5-2on the following page. Secondary classifications for the waste types and general waste are given in Appendix 3.

Paper (half of which was cardboard) was the largest component of the general waste disposed of at Victoria Flats landfill, comprising 21% of the total. Timber was the second largest component, comprising 20% of the total.

Table 5-2 – Primary composition of Victoria Flats landfill general waste – 8 - 13 August 2016 (excludes kerbside collections, glass, transfer stations, and special wastes)

Victoria Flats landfill – general waste – 8 - 13 August 2016	% of total	Tonnes/week
Paper	20.9%	25 T/week
Plastics	16.1%	19 T/week
Organic	6.8%	8 T/week
Ferrous metals	2.1%	3 T/week
Nonferrous metals	1.1%	1 T/week
Glass	6.4%	8 T/week
Textiles	13.6%	16 T/week
Sanitary paper	3.0%	4 T/week
Rubble	9.5%	11 T/week
Timber	19.7%	24 T/week
Rubber	0.4%	1 T/week
Potentially hazardous	0.4%	0 T/week
TOTAL	**100.0%**	**121 T/week**

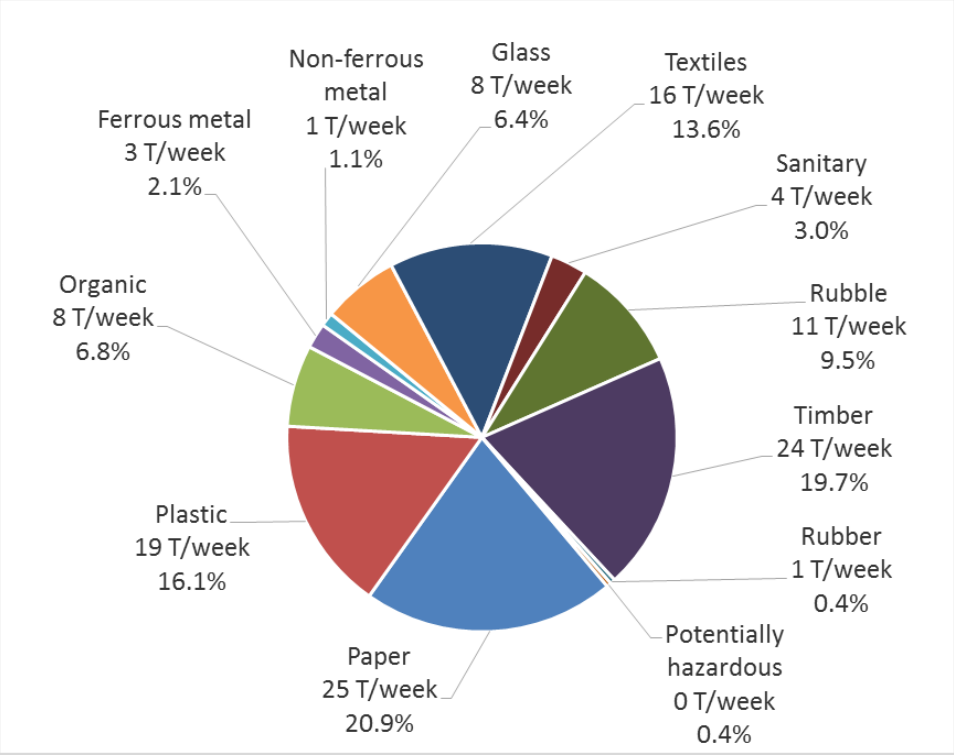

Figure 5-2 – Primary composition of Victoria Flats landfill general waste – 8 - 13 August 2016 (excludes kerbside collections, glass, transfer stations, and special wastes)

5.3 Victoria Flats landfill overall waste - primary composition

The composition of the overall waste stream discharged at Victoria Flats landfill has been calculated based on the tonnage of the different sources in Table 5-1. The compositions used for the various waste streams are as follows:

- Alexandra and Cromwell transfer stations – the 'Waste to Landfill Composition' from the *'Draft Central Otago District Council Waste Assessment 2012'*. Secondary classifications are given in Appendix 5.
- Wanaka transfer station – the composition for the overall waste stream given in section 3.2.1
- Frankton transfer station – the composition for the overall waste stream given in section 4.2.1
- general waste – the composition given in section 5.2
- special waste – assumed composition in Appendix 5, based on weighbridge records
- Council kerbside collection – the assumed composition given in Appendix 5.

The primary composition of the overall waste stream discharged at Victoria Flats landfill is shown in Table 5-3 below and Figure 5-3 on the following page. The secondary composition is given in Appendix 3.

Table 5-3 – Primary composition of Victoria Flats landfill overall waste – 8 - 13 August 2016

Victoria Flats landfill – overall waste – 8-13 August 2016	% of total	Tonnes/week
Paper	12.3%	99 T/week
Plastics	10.2%	82 T/week
Organic	18.9%	152 T/week
Ferrous metals	2.0%	16 T/week
Nonferrous metals	0.7%	6 T/week
Glass	10.6%	86 T/week
Textiles	5.6%	45 T/week
Sanitary paper	3.5%	28 T/week
Rubble	13.6%	109 T/week
Timber	16.7%	135 T/week
Rubber	0.9%	7 T/week
Potentially hazardous	5.0%	40 T/week
TOTAL	**100.0%**	**805 T/week**

Organic material was the largest component of the overall waste, comprising 19% of the total, by weight. Timber was the second largest component, comprising 17% of the total. Rubble, 14%, was the third largest component. Paper, plastics, and glass each comprised 10-12% of the total.

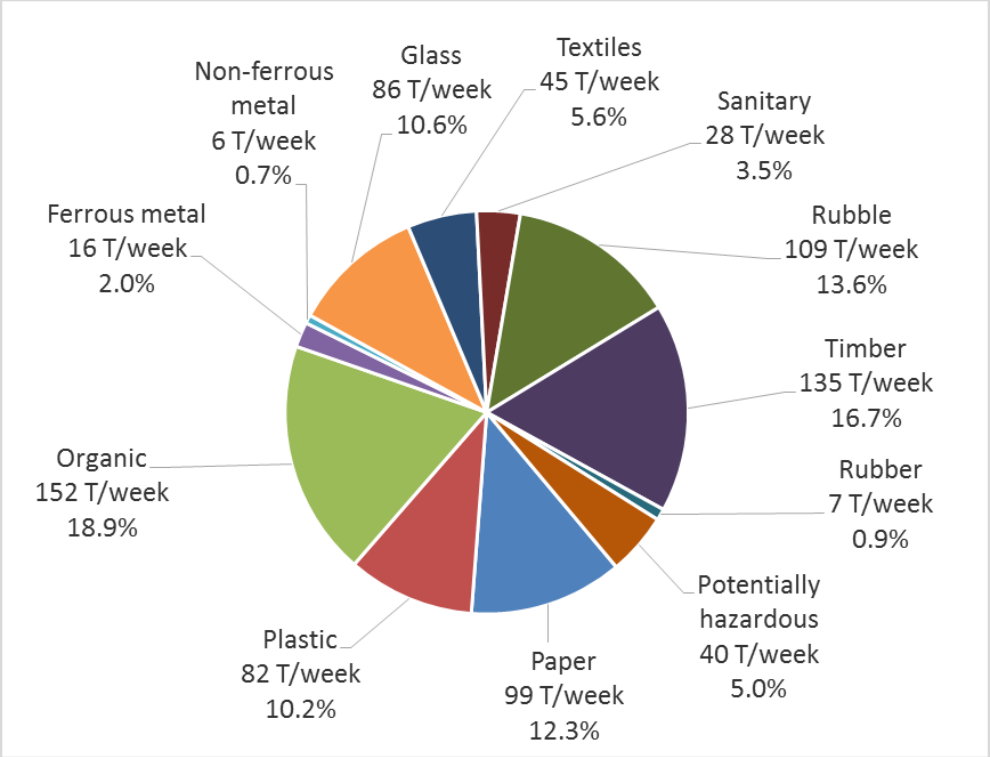

Figure 5-3 – Primary composition of Victoria Flats landfill overall waste – 8 - 13 August 2016

5.4 Overall waste from Queenstown Lakes District

The overall waste stream analysed in section 5.3 includes waste from both Queenstown Lakes District and Central Otago District. In this section, the waste from Queenstown Lake District is analysed separately. The compositions used for the various waste streams from Queenstown Lake District discharged at Victoria Flats landfill are as follows:

- Wanaka transfer station – the composition for the overall waste given in section 3.2.1
- Frankton transfer station – the composition for the overall waste given in section 4.2.1
- General waste – the composition given in section 5.2
- Glass – assumed to be all recyclable glass
- Special waste – assumed composition in Appendix 5, based on landfill weighbridge records
- Queenstown domestic kerbside collection – the assumed composition in Appendix 5

The tonnages of the separate waste streams from Queenstown Lakes District are given in Table 5-4 on the next page.

Table 5-4 – Types of waste entering Victoria Flats landfill from Queenstown Lakes District – July and August 2016

Victoria Flats landfill – types of waste – 8-13 August 2016		% of total	Tonnes/week
Transfer station waste	*Frankton*	*46%*	*297 T/week*
	Wanaka	*21%*	*134 T/week*
	Subtotal	**66%**	**431 T/week**
General waste	*Commercial* *	*13%*	*83 T/week*
	Demolition *	*2%*	*14 T/week*
	Subtotal	**15%**	**97 T/week**
Special		5%	30 T/week
Glass from Wakatipu Recycling Centre		8%	51 T/week
Queenstown domestic kerbside collection		6%	41 T/week
TOTAL		**100%**	**649 T/week**

* Weighbridge classifications

The primary composition of the overall waste stream from Queenstown Lakes District discharged at Victoria Flats landfill is shown in Table 5-5 and Figure 5-4 on the following page. The secondary composition is given in Appendix 3.

Table 5-5 – Primary composition of Victoria Flats landfill overall waste from Queenstown Lakes District - 8 - 13 August 2016

Victoria Flats landfill – overall waste from QLD – 8-13 August 2016	% of total	Tonnes/week
Paper	11.8%	77 T/week
Plastics	9.6%	62 T/week
Organic	16.0%	104 T/week
Ferrous metals	1.9%	12 T/week
Nonferrous metals	0.6%	4 T/week
Glass	11.8%	77 T/week
Textiles	5.8%	38 T/week
Sanitary paper	2.8%	18 T/week
Rubble	15.3%	99 T/week
Timber	18.9%	123 T/week
Rubber	0.6%	4 T/week
Potentially hazardous	4.8%	31 T/week
TOTAL	**100.0%**	**649 T/week**

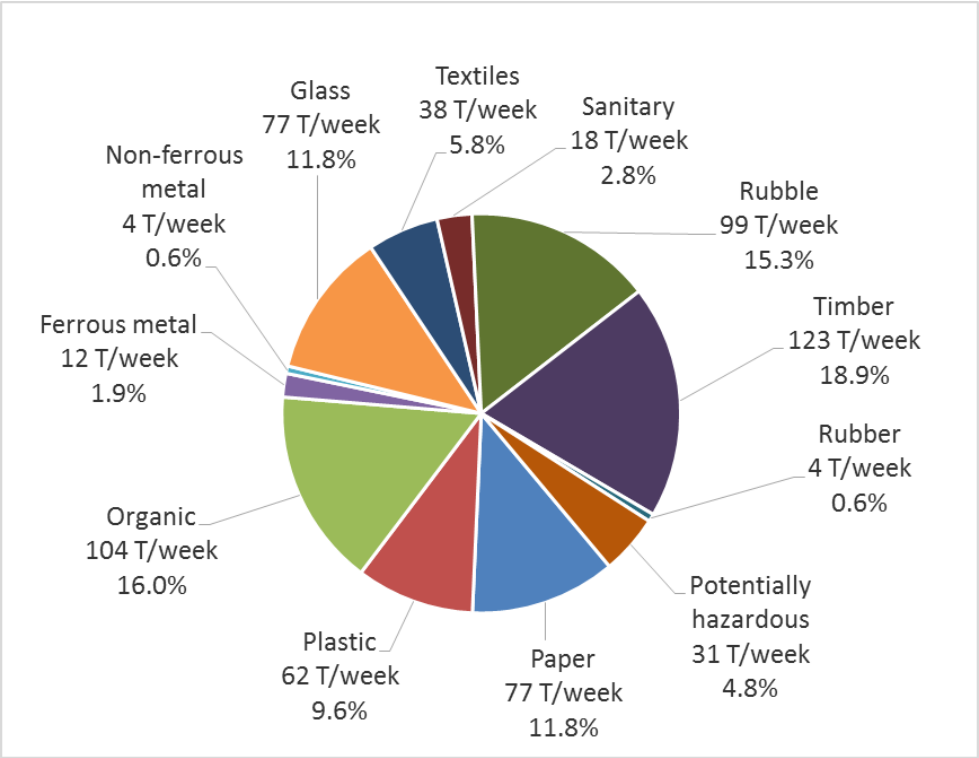

Figure 5-4 – Primary composition of Victoria Flats landfill waste from Queenstown Lakes District – 8 - 13 August 2016

Timber was the largest component of the overall waste to landfill from Queenstown Lakes District, comprising 19% of the total, by weight. Organic material was the second largest component, comprising 16% of the total. Rubble was the third largest component, comprising 15%. Paper, plastics, and glass each comprised about 10-12% of the total.

6 Discussion and analysis

6.1 Diversion potential of waste to Victoria Flats landfill

Three main systems have been established by Council for the separation and recovery of waste materials. Kerbside collections of recyclable materials are provided to most residents, greenwaste drop-offs are available at the transfer stations, and transfer station staff remove metals from the tipping floors. Private recycling and composting services are also available.

Table 6-1 shows the proportion of the three overall waste streams currently disposed of to landfill that could potentially have been diverted from landfill disposal. Currently recyclable and compostable materials (through Council systems only) are shown and materials that are recovered elsewhere in New Zealand are identified as 'Potentially recoverable'.

Table 6-1 – Potentially divertable materials in overall waste streams = 8-13 August 2016

Divertable materials in overall waste streams - 8-13 August 2016	Frankton transfer station	Wanaka transfer station	Victoria Flats landfill
CURRENTLY RECYCLABLE MATERIALS			
Paper - Recyclable	5.1%	6.0%	5.0%
Paper - Cardboard	4.5%	5.1%	4.9%
Plastic - Recyclable	1.4%	1.7%	1.6%
Ferrous metal - All	2.0%	2.6%	2.0%
Nonferrous metal - All	0.6%	0.5%	0.7%
Subtotal	**13.6%**	**15.8%**	**14.2%**
CURRENTLY COMPOSTABLE MATERIALS			
Organics - Compostable greenwaste	2.4%	1.3%	2.2%
Subtotal	**2.4%**	**1.3%**	**2.2%**
POTENTIALLY RECOVERABLE MATERIALS			
Organics - Kitchen waste	13.0%	13.8%	13.4%
Glass - Recyclable	3.2%	2.6%	9.1%
Rubble - Cleanfill	7.7%	1.1%	3.4%
Rubble - New plasterboard	4.3%	11.4%	4.0%
Timber - Reusable	2.9%	4.0%	2.1%
Timber - Untreated/unpainted	6.2%	3.6%	4.2%
Subtotal	**37.3%**	**36.4%**	**36.2%**
TOTAL - POTENTIALLY DIVERTABLE	**53.2%**	**53.5%**	**52.7%**

The diversion potential of the three waste streams is very similar, with currently recyclable materials comprising 14%-16%, currently compostable materials comprise 1%-2% of all waste, and potentially recoverable materials comprise approximately 36% of all materials at all three facilities. In total, 53% of the waste streams could potentially be diverted.

6.2 Comparisons with previous surveys

6.2.1 Activity sources of waste at Frankton transfer station – 2008, 2012, and 2016

Previous surveys of waste disposed of at Frankton transfer station were undertaken by Waste Not Consulting in 2004, 2006, 2008 and 2012. In Table 6-2 the 2008, 2012, and 2016 weekly tonnages of the different activity sources of waste being disposed of at Frankton transfer station are compared. 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 6-2 – Activity sources of waste at Frankton transfer station – 2008, 2012, and 2016

Frankton transfer station - activity sources – 2008 – 2016	August 2008	February/ March 2012	August 2016
Construction and demolition	55 T/week	46 T/week	139 T/week
Industrial/commercial/institutional	37 T/week	29 T/week	47 T/week
Landscaping	12 T/week	9 T/week	4 T/week
Residential	10 T/week	9 T/week	14 T/week
Council kerbside collections	13 T/week	21 T/week	29 T/week
Private kerbside collections	51 T/week	44 T/week	65 T/week
TOTAL	**179 T/week**	**157 T/week**	**203 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 has increased 30% from 2012 to 2016. All waste activity sources other than landscaping waste were higher in 2015 than in 2012.

The greatest increase has been in construction and demolition waste, which increased 202% between 2012 and 2016.

6.2.2 Activity sources of waste disposed of at Wanaka transfer station – 2008, 2012, and 2016

Surveys of waste disposed of at Wanaka transfer station were undertaken by Waste Not Consulting in 2004, 2006, 2008, and 2012. In Table 6-3 on the next page, the 2008, 2012, and 2016 weekly tonnages of the different activity sources of waste being disposed of at Wanaka transfer station are compared. 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 6-3 – Activity sources of waste at Wanaka transfer station – 2008, 2012, and 2016

Wanaka transfer station - activity sources – 2008 – 2016	August 2008	February/ March 2012	August 2016
Construction and demolition	42 T/week	37 T/week	57 T/week
Industrial/commercial/institutional	25 T/week	20 T/week	22 T/week
Landscaping	2 T/week	1 T/week	1 T/week
Residential	8 T/week	3 T/week	9 T/week
Council kerbside collections	25 T/week	26 T/week	33 T/week
Private kerbside collections	8 T/week	9 T/week	12 T/week
TOTAL	**110 T/week**	**96 T/week**	**134 T/week**

Overall, the weekly tonnage of waste was 13% lower in the 2012 survey period than in the 2008 survey period but is 40% higher in 2016 than in 2012. All waste activity sources other than landscaping waste are higher in 2016 than in 2012. Due to the small sample size, the changes in landscaping and residential waste should be considered to be of an indicative nature only. The greatest increase has been in construction and demolition waste, which increased 54% between 2012 and 2016.

6.2.3 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 6-4, the weekly tonnages of the different types of waste at Victoria Flats landfill from the previous surveys are compared with the 2016 results. Seasonal differences in waste disposal should be taken into account when comparing the results.

Table 6-4 – Types of waste disposed of at Victoria Flats landfill – 2006, 2008, 2012, and 2016

Victoria Flats landfill – types of waste		January 2006	August 2008	February/ March 2012	July & August 2016
Transfer station waste	*Alexandra*	*152 T/week*	*101 T/week*	*123 T/week*	*59 T/week*
	Cromwell	*78 T/week*	*56 T/week*	*66 T/week*	*66 T/week*
	Frankton	*290 T/week*	*179 T/week*	*157 T/week*	*297 T/week*
	Wanaka	*133 T/week*	*110 T/week*	*96 T/week*	*134 T/week*
	Subtotal	**654 T/week**	**445 T/week**	**442 T/week**	**555 T/week**
General waste	*Commercial* *	*82 T/week*	*62 T/week*	*61 T/week*	*104 T/week*
	Vegetation *	*42 T/week*	*2 T/week*	*0 T/week*	*0 T/week*
	Demolition *	*13 T/week*	*82 T/week*	*17 T/week*	*17 T/week*
	Subtotal	**137 T/week**	**147 T/week**	**78 T/week**	**121 T/week**
Special waste		8 T/week	9 T/week	27 T/week	38 T/week
Glass from Wakatipu Recycling Centre		-	-	-	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**

* Weighbridge classifications

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%.

Tonnages from Frankton and Wanaka transfer stations increased 89% and 40%, respectively, between 2012 and 2016. The tonnage from Alexandra transfer station decreased substantially during this period. The reason for this is not known, but it is possible it is being disposed of at a different landfill.

General waste increased 55% between 2012 and 2016 while special wastes and QLDC kerbside collections increased marginally.

6.2.4 Overall waste composition – 2008, 2012, and 2016 – Wanaka, Frankton, and Victoria Flats

Table 6-5 compares the primary compositions of the overall waste from the three disposal sites in August 2008, February/March 2012, and August 2016. Seasonal differences in waste disposal should be taken into account when comparing the results.

Table 6-5 – Comparison of 2008, 2012, and 2016 surveys – overall waste composition

Comparison of composition – 2008 - 2016	Wanaka transfer station overall waste stream			Frankton transfer station overall waste stream			Victoria Flats landfill overall waste stream		
	2008	2012	2016	2008	2012	2016	2008	2012	2016
Paper	14%	12%	12%	10%	11%	11%	11%	12%	12%
Plastics	12%	11%	12%	11%	9%	9%	10%	11%	10%
Organic	25%	23%	19%	25%	28%	18%	24%	30%	19%
Ferrous metals	3%	2%	3%	3%	2%	2%	3%	3%	2%
Nonferrous metals	1%	1%	0%	1%	1%	1%	0%	1%	1%
Glass	5%	3%	3%	6%	5%	4%	5%	5%	11%
Textiles	5%	6%	5%	4%	7%	6%	4%	5%	6%
Sanitary paper	5%	4%	4%	3%	3%	2%	4%	5%	3%
Rubble	10%	10%	20%	11%	9%	21%	11%	7%	14%
Timber	19%	26%	20%	25%	24%	26%	23%	15%	17%
Rubber	1%	0.3%	1%	1%	0.3%	0%	1%	1%	1%
Potentially hazardous	2%	1%	1%	1%	1%	0%	3%	5%	5%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

In relative terms, the compositions of the overall waste streams has remained relatively consistent through the three surveys. The notable changes have been in the decrease in the proportion of organic waste and the increase in the proportion of rubble, which is largely associated with construction and demolition activity.

6.2.5 Victoria Flats general and overall waste composition – 2008, 2012, and 2016

Table 6-6 compares the results of the 2008, 2012, and 2016 surveys for three waste streams being disposed of at Victoria Flats landfill – general waste, waste from Queenstown Lakes District, and the overall waste stream. Seasonal differences in waste disposal should be taken into account when comparing the results.

Table 6-6 – Comparison of 2008, 2012, and 2016 surveys – Victoria Flats landfill

Victoria Flats landfill - comparison of composition – 2008 - 2016	Victoria Flats landfill general waste stream			Victoria Flats landfill waste from Queenstown Lakes			Victoria Flats landfill overall waste stream		
	2008	2012	2016	2008	2012	2016	2008	2012	2016
Paper	9%	13%	21%	11%	12%	12%	11%	12%	12%
Plastics	7%	13%	16%	10%	10%	10%	10%	11%	10%
Organic	20%	26%	7%	24%	26%	16%	24%	30%	19%
Ferrous metals	5%	5%	2%	3%	3%	2%	3%	3%	2%
Nonferrous metals	1%	0%	1%	1%	1%	1%	0%	1%	1%
Glass	6%	8%	6%	5%	5%	12%	5%	5%	11%
Textiles	2%	5%	14%	3%	6%	6%	4%	5%	6%
Sanitary paper	2%	5%	3%	3%	4%	3%	4%	5%	3%
Rubble	14%	8%	9%	11%	7%	15%	11%	7%	14%
Timber	33%	21%	20%	24%	20%	19%	23%	15%	17%
Rubber	1%	0%	0%	1%	1%	1%	1%	1%	1%
Potentially hazardous	1%	0%	0%	3%	7%	5%	3%	5%	5%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

6.2.6 Construction and demolition waste – 2008, 2012, and 2016

Table 6-7 compares the weekly tonnage of construction and demolition waste from the three disposal sites in August 2008, February/March 2012, and August 2016. 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 6-7 – C&D waste – 2008, 2012, and 2016 surveys

Construction and demolition waste – 2008-2016	August 2008	February/March 2012	August 2016
Wanaka transfer station	42 T/week	37 T/week	57 T/week
Frankton transfer station	55 T/week	46 T/week	139 T/week
Direct to Victoria Flats landfill	82 T/week	17 T/week	17 T/week
TOTAL	**179 T/week**	**100 T/week**	**213 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. The percentage increase was higher at Frankton transfer station than at either of the other two sites.

6.3 Analysis of kerbside waste collections

'Kerbside waste collections' is taken to include the following in this analysis:

- waste classified as 'QLDC Coll' at Wanaka and Frankton transfer stations. This waste includes the Council 'blue bags' and the contractor's subscription wheelie bins and is from both residential and commercial premises
- other waste transported by private operators' side-loading and rear-loading compactor trucks to Wanaka and Frankton transfer stations. This waste comprises wheelie bin waste collected by the private collectors from commercial premises.
- waste classified as 'HHC' at Victoria Flats landfill
- waste classified as 'AH blue bag bin' at Wanaka transfer station. This waste includes primarily Council's blue bags, assumed to be primarily from residential premises.

The analysis of kerbside waste collections in Table 6-8 used the following information:

- weighbridge records from Wanaka and Frankton transfer stations for 2015/16, broken down by product classifications
- annual data for 2015/16 on sales of Council's blue refuse bags (assumed 6.5 kg/bag)
- extrapolation to an annual basis of SWAP survey data on private kerbside collections at Wanaka and Frankton transfer stations
- estimates by AllWaste of the breakdown of each kerbside collection into domestic and commercial waste.

Table 6-8 – Analysis of kerbside waste collections - 2015/16

Analysis of kerbside waste collections - 2015/16	
QLDC kerbside collection	5,613 T/annum
Private kerbside collections	3,994 T/annum
Total kerbside collections	**9,607 T/annum**
QLDC kerbside collection as % of all kerbside collections	58%
QLDC blue bag tonnes (assumed 6.5 kg/bag)	2,291 T/annum
QLDC blue bag tonnes as % of QLDC kerbside collections	41%
Domestic kerbside waste from residential premises	5,024 T/annum
Kerbside waste from commercial premises	4,583 T/annum
Total domestic and commercial combined	**9,607 T/annum**
Domestic kerbside waste as % of all kerbside waste	**52%**

An estimated 9,607 tonnes of kerbside waste was collected in the District from July 2015 to June 2016. Of this total, approximately 58%, by weight, was collected by Council's kerbside collection. Of the 5,613 tonnes of waste collected by Council's kerbside collection, approximately 41% was contained in Council's user-pays blue bags. The other 59%, by weight, was from the collection contractor's subscription wheelie bins.

Kerbside waste from residential premises comprised approximately 52% of the 9,607 tonnes of kerbside waste collected from July 2015 to June 2016. The remainder was collected from commercial premises.

6.4 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 a 2015 usually resident population estimate[1] and annualising the weekly disposal data for the District in Table 5-4, the per capita per annum waste to Class 1 landfill in 2014/15 from Queenstown Lakes District can be calculated, as shown in Table 6-9 below. The estimate includes special wastes.

The population estimate is based on the Stats NZ 2013 census results. It should be noted that the Stats NZ usually resident population count of an area is 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.

A more accurate estimate of the annual tonnage of waste from Queenstown Lakes District could be calculated by analysing Victoria Flats landfill records for a one-year period rather than annualising data from a two-month period.

Table 6-9 – Waste disposal per capita - Queenstown Lakes District

Calculation of per capita waste to Class 1 landfills from Queenstown Lakes District	
Estimated usually resident population 2015	30,700
Weekly tonnage of waste to Victoria Flats landfill from Queenstown Lakes District	649 T/week
Annualised tonnage of waste to Victoria Flats landfill from Queenstown Lakes District	33,865 T/annum
Tonnes/capita/annum of waste to Class 1 landfills	**1,103 T/capita/annum**

It is estimated that approximately 1.103 tonnes of levied waste was disposed of annually at Class 1 landfills 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 6-10 on the next page. The data for other districts has

[1] http://www.qldc.govt.nz/assets/Uploads/Planning/District-Plan/District-Plan-Review-2015-s32-Links/Queenstown-Town-Centre/QLDC-Growth-Projections-to-2065-Draft-for-Client.pdf

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

The national average in Table 6-10 has been calculated using data from MfE's waste levy data [2] and Stats NZ usually resident population estimates[3].

Table 6-10 – 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 2010	0.305
Waimakariri District 2012	0.311
Westland District 2011	0.331
Ashburton District 2015	0.366
Southland region 2011	0.500
Tauranga and WBOP District 2014/15	0.524
Christchurch City 2012	0.524
Taupo District 2013	0.528
Napier/Hastings 2016	0.548
Wellington region 2016	0.608
Hamilton City 2013	0.668
New Zealand 2016	0.713
Queenstown Lakes District 2012	**0.735**
Rotorua District 2009	0.736
Auckland region 2012	0.800
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 Rotorua and Queenstown Lakes Districts.

The 2016 per capita disposal rate for Queenstown Lakes District is the highest of any district measured by Waste Not Consulting Ltd. The disposal rate for 2016 is 50% higher than the comparable result for 2012.

Using the estimate of 1.103 T/capita/annum, Queenstown Lakes District disposes of 55% more waste per capita than the national average.

[2] http://www.mfe.govt.nz/waste/waste-disposal-levy/monthly-levy-graph
[3] http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/NationalPopulationEstimates_HOTPAt30Jun16.aspx

7 Summary of waste flows

Figure 7.1 below summarises the waste flows and tonnages to Victoria Flats landfill for July and August 2016, based on the data analysis presented in this report.

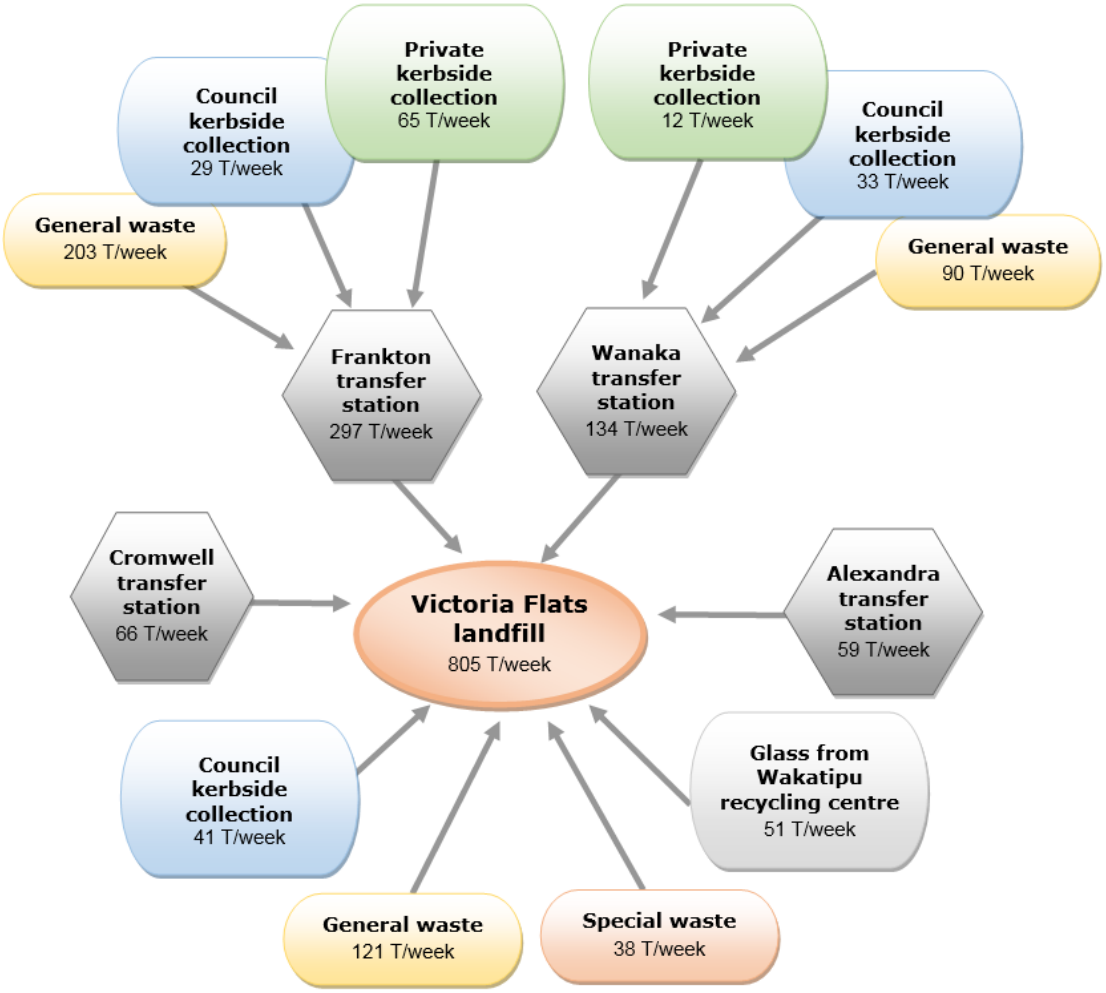

Figure 7-1 – Victoria Flats landfill waste flows – July and August 2016

Appendix 1 – Wanaka transfer station

Wanaka transfer station – general and overall waste – 8-13 August 2016		General waste (excludes kerbside waste)		Overall waste (includes kerbside waste)	
		% of total	T/week	% of total	T/week
Paper	Recyclable	3.1%	3 T/week	6.0%	8 T/week
	Cardboard	6.5%	6 T/week	5.1%	7 T/week
	Multimaterial/other	0.8%	1 T/week	1.4%	2 T/week
	Subtotal	**10.5%**	**9 T/week**	**12.4%**	**17 T/week**
Plastics	Recyclable	0.4%	0 T/week	1.7%	2 T/week
	Multimaterial/other	10.6%	9 T/week	10.0%	13 T/week
	Subtotal	**11.0%**	**10 T/week**	**11.7%**	**16 T/week**
Organic	Kitchen waste	3.9%	3 T/week	13.8%	18 T/week
	Compostable greenwaste	1.1%	1 T/week	1.3%	2 T/week
	Non-compostable g'waste	0.2%	0 T/week	2.9%	4 T/week
	Multimaterial/other	0.5%	0 T/week	1.2%	2 T/week
	Subtotal	**5.7%**	**5 T/week**	**19.1%**	**26 T/week**
Ferrous metals	Primarily ferrous	1.8%	2 T/week	1.7%	2 T/week
	Multimaterial/other	1.1%	1 T/week	1.0%	1 T/week
	Subtotal	**2.9%**	**3 T/week**	**2.6%**	**4 T/week**
Nonferrous metals		**0.3%**	**0 T/week**	**0.5%**	**1 T/week**
Glass	Recyclable	1.1%	1 T/week	2.6%	3 T/week
	Multimaterial/other	1.0%	1 T/week	0.9%	1 T/week
	Subtotal	**2.1%**	**2 T/week**	**3.4%**	**5 T/week**
Textiles	Clothing/textiles	1.3%	1 T/week	1.6%	2 T/week
	Multimaterial/other	3.6%	3 T/week	2.9%	4 T/week
	Subtotal	**4.9%**	**4 T/week**	**4.6%**	**6 T/week**
Sanitary paper		**1.7%**	**2 T/week**	**3.6%**	**5 T/week**
Rubble	Cleanfill	1.5%	1 T/week	1.1%	1 T/week
	New plasterboard	17.0%	15 T/week	11.4%	15 T/week
	Other	11.3%	10 T/week	8.0%	11 T/week
	Subtotal	**29.8%**	**27 T/week**	**20.4%**	**27 T/week**
Timber	Reusable	6.0%	5 T/week	4.0%	5 T/week
	Unpainted & untreated	5.4%	5 T/week	3.6%	5 T/week
	Multimaterial/other	18.4%	16 T/week	12.6%	17 T/week
	Subtotal	**29.7%**	**27 T/week**	**20.2%**	**27 T/week**
Rubber		**0.8%**	**1 T/week**	**0.6%**	**1 T/week**
Potentially hazardous		**0.6%**	**1 T/week**	**0.7%**	**1 T/week**
TOTAL		**100.0%**	**90 T/week**	**100.0%**	**134 T/week**

Wanaka general waste – by activity source – 8-13 August 2016		C&D	ICI	Landscaping	Residential
Paper	Recyclable	1.6%	6.8%	0.0%	4.2%
	Cardboard	4.0%	11.2%	0.0%	11.6%
	Multimaterial/other	0.1%	2.8%	0.0%	0.8%
	Subtotal	**5.7%**	**20.8%**	**0.0%**	**16.6%**
Plastics	Recyclable	0.0%	1.3%	0.0%	0.7%
	Multimaterial/other	5.1%	22.9%	6.8%	15.4%
	Subtotal	**5.1%**	**24.2%**	**6.8%**	**16.2%**
Organic	Kitchen waste	0.1%	13.5%	0.0%	4.1%
	Compostable greenwaste	0.0%	1.5%	19.2%	4.1%
	Non-compostable g'waste	0.0%	0.7%	0.0%	0.2%
	Multimaterial/other	0.0%	2.1%	0.0%	0.2%
	Subtotal	**0.2%**	**17.8%**	**19.2%**	**8.6%**
Ferrous metals	Primarily ferrous	2.0%	1.2%	0.0%	2.1%
	Multimaterial/other	0.2%	2.1%	0.0%	4.4%
	Subtotal	**2.2%**	**3.3%**	**0.0%**	**6.5%**
Nonferrous metals		**0.0%**	**0.7%**	**0.0%**	**0.8%**
Glass	Recyclable	0.0%	3.9%	0.0%	1.0%
	Multimaterial/other	0.3%	2.0%	0.0%	3.5%
	Subtotal	**0.3%**	**6.0%**	**0.0%**	**4.5%**
Textiles	Clothing/textiles	0.0%	2.4%	0.0%	6.6%
	Multimaterial/other	0.1%	5.6%	0.0%	20.4%
	Subtotal	**0.1%**	**8.0%**	**0.0%**	**27.0%**
Sanitary paper		**0.0%**	**6.4%**	**0.0%**	**1.2%**
Rubble	Cleanfill	2.0%	0.4%	0.0%	1.3%
	New plasterboard	26.8%	0.0%	0.0%	0.2%
	Other	15.4%	1.3%	74.0%	2.6%
	Subtotal	**44.1%**	**1.7%**	**74.0%**	**4.0%**
Timber	Reusable	9.3%	0.1%	0.0%	0.3%
	Unpainted & untreated	6.8%	4.1%	0.0%	0.8%
	Multimaterial/other	26.0%	2.9%	0.0%	10.9%
	Subtotal	**42.0%**	**7.1%**	**0.0%**	**12.0%**
Rubber		**0.0%**	**2.4%**	**0.0%**	**1.8%**
Potentially hazardous		**0.1%**	**1.5%**	**0.0%**	**0.8%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**

Wanaka general waste – by vehicle type – 8-13 August 2016		Car	Front-loader	Gantry truck	Other truck	Trailer
Paper	Recyclable	10.9%	6.8%	1.5%	2.4%	4.4%
	Cardboard	6.1%	9.1%	5.6%	2.4%	7.7%
	Multimaterial/other	0.4%	1.1%	0.3%	2.6%	1.5%
	Subtotal	**17.5%**	**17.0%**	**7.4%**	**7.4%**	**13.6%**
Plastics	Recyclable	0.4%	1.1%	0.3%	0.4%	0.3%
	Multimaterial/other	16.3%	17.0%	6.8%	38.8%	12.1%
	Subtotal	**16.7%**	**18.2%**	**7.2%**	**39.2%**	**12.5%**
Organic	Kitchen waste	14.1%	17.0%	1.9%	1.7%	3.4%
	Compostable greenwaste	11.3%	3.4%	0.5%	1.9%	0.7%
	Non-compostable g'waste	0.4%	1.1%	0.1%	0.1%	0.1%
	Multimaterial/other	0.6%	4.5%	0.1%	0.2%	0.3%
	Subtotal	**26.3%**	**26.1%**	**2.6%**	**3.8%**	**4.5%**
Ferrous metals	Primarily ferrous	0.5%	1.1%	2.8%	1.1%	0.7%
	Multimaterial/other	1.5%	2.3%	0.6%	5.5%	1.2%
	Subtotal	**2.0%**	**3.4%**	**3.4%**	**6.6%**	**1.9%**
Nonferrous metals		**0.7%**	**1.1%**	**0.2%**	**0.4%**	**0.1%**
Glass	Recyclable	2.6%	1.7%	0.9%	0.4%	1.2%
	Multimaterial/other	3.8%	2.3%	0.5%	5.5%	1.0%
	Subtotal	**6.4%**	**4.0%**	**1.4%**	**5.9%**	**2.2%**
Textiles	Clothing/textiles	0.9%	4.5%	1.1%	1.5%	0.7%
	Multimaterial/other	12.4%	5.7%	3.0%	9.7%	3.0%
	Subtotal	**13.3%**	**10.2%**	**4.1%**	**11.1%**	**3.8%**
Sanitary paper		**3.8%**	**5.7%**	**0.9%**	**0.5%**	**2.1%**
Rubble	Cleanfill	4.1%	1.1%	1.1%	0.3%	2.2%
	New plasterboard	0.0%	0.0%	17.0%	0.7%	23.3%
	Other	4.1%	1.1%	12.1%	1.1%	13.7%
	Subtotal	**8.1%**	**2.3%**	**30.1%**	**2.1%**	**39.2%**
Timber	Reusable	0.1%	0.0%	11.3%	1.1%	0.1%
	Unpainted & untreated	0.2%	1.1%	7.8%	11.2%	2.6%
	Multimaterial/other	3.8%	2.3%	22.9%	8.6%	16.9%
	Subtotal	**4.0%**	**3.4%**	**42.1%**	**21.0%**	**19.6%**
Rubber		**0.6%**	**5.7%**	**0.4%**	**1.0%**	**0.2%**
Potentially hazardous		**0.5%**	**2.8%**	**0.3%**	**0.8%**	**0.3%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Appendix 2 – Frankton transfer station

Frankton transfer station – general and overall waste – 8-13 August 2016		General waste		Overall waste	
		% of total	T/week	% of total	T/week
Paper	Recyclable	2.0%	4 T/week	5.1%	15 T/week
	Cardboard	5.5%	11 T/week	4.5%	13 T/week
	Multimaterial/other	1.4%	3 T/week	1.7%	5 T/week
	Subtotal	**8.8%**	**18 T/week**	**11.2%**	**33 T/week**
Plastics	Recyclable	0.4%	1 T/week	1.4%	4 T/week
	Multimaterial/other	6.5%	13 T/week	7.2%	21 T/week
	Subtotal	**7.0%**	**14 T/week**	**8.6%**	**26 T/week**
Organic	Kitchen waste	1.6%	3 T/week	12.9%	38 T/week
	Compostable greenwaste	2.7%	6 T/week	2.4%	7 T/week
	Non-compostable g'waste	0.4%	1 T/week	1.8%	5 T/week
	Multimaterial/other	0.1%	0 T/week	0.6%	2 T/week
	Subtotal	**4.9%**	**10 T/week**	**17.7%**	**53 T/week**
Ferrous metals	Primarily ferrous	1.2%	2 T/week	1.3%	4 T/week
	Multimaterial/other	0.8%	2 T/week	0.7%	2 T/week
	Subtotal	**2.0%**	**4 T/week**	**2.0%**	**6 T/week**
Nonferrous metals		**0.5%**	**1 T/week**	**0.6%**	**2 T/week**
Glass	Recyclable	0.4%	1 T/week	3.1%	9 T/week
	Multimaterial/other	1.7%	3 T/week	1.3%	4 T/week
	Subtotal	**2.1%**	**4 T/week**	**4.4%**	**13 T/week**
Textiles	Clothing/textiles	0.9%	2 T/week	1.3%	4 T/week
	Multimaterial/other	5.6%	11 T/week	4.3%	13 T/week
	Subtotal	**6.5%**	**13 T/week**	**5.6%**	**17 T/week**
Sanitary paper		**0.9%**	**2 T/week**	**2.5%**	**7 T/week**
Rubble	Cleanfill	11.0%	22 T/week	7.7%	23 T/week
	New plasterboard	6.3%	13 T/week	4.3%	13 T/week
	Other	12.5%	25 T/week	8.9%	26 T/week
	Subtotal	**29.8%**	**61 T/week**	**20.9%**	**62 T/week**
Timber	Reusable	4.2%	8 T/week	2.9%	9 T/week
	Unpainted & untreated	9.0%	18 T/week	6.2%	18 T/week
	Multimaterial/other	23.9%	49 T/week	16.6%	49 T/week
	Subtotal	**37.1%**	**75 T/week**	**25.7%**	**76 T/week**
Rubber		**0.2%**	**0 T/week**	**0.3%**	**1 T/week**
Potentially hazardous		**0.2%**	**0 T/week**	**0.4%**	**1 T/week**
TOTAL		**100.0%**	**203 T/week**	**100.0%**	**297 T/week**

Frankton general waste – by activity source – 8-13 August 2016		C&D	ICI	Landscaping	Residential
Paper	Recyclable	0.1%	7.1%	0.1%	2.9%
	Cardboard	2.7%	12.1%	3.6%	10.8%
	Multimaterial/other	0.5%	4.5%	0.0%	0.4%
	Subtotal	**3.4%**	**23.8%**	**3.7%**	**14.1%**
Plastics	Recyclable	0.0%	1.6%	0.0%	0.4%
	Multimaterial/other	3.0%	16.6%	1.4%	9.4%
	Subtotal	**3.0%**	**18.2%**	**1.4%**	**9.8%**
Organic	Kitchen waste	0.4%	4.1%	0.3%	5.6%
	Compostable greenwaste	0.2%	3.1%	66.4%	10.6%
	Non-compostable g'waste	0.1%	0.2%	18.0%	0.2%
	Multimaterial/other	0.0%	0.4%	0.0%	0.2%
	Subtotal	**0.6%**	**7.8%**	**84.7%**	**16.6%**
Ferrous metals	Primarily ferrous	1.3%	1.0%	0.1%	1.1%
	Multimaterial/other	0.2%	1.2%	0.2%	6.1%
	Subtotal	**1.5%**	**2.2%**	**0.3%**	**7.2%**
Nonferrous metals		**0.2%**	**1.3%**	**0.0%**	**0.4%**
Glass	Recyclable	0.0%	1.4%	0.0%	0.6%
	Multimaterial/other	0.2%	5.9%	0.0%	3.3%
	Subtotal	**0.2%**	**7.4%**	**0.0%**	**3.9%**
Textiles	Clothing/textiles	0.0%	2.1%	0.0%	5.7%
	Multimaterial/other	1.9%	13.3%	0.6%	17.4%
	Subtotal	**2.0%**	**15.4%**	**0.6%**	**23.1%**
Sanitary paper		**0.0%**	**3.5%**	**0.1%**	**1.5%**
Rubble	Cleanfill	16.0%	0.1%	0.0%	0.2%
	New plasterboard	9.2%	0.0%	0.0%	0.4%
	Other	16.6%	4.1%	6.8%	1.6%
	Subtotal	**41.8%**	**4.2%**	**6.8%**	**2.3%**
Timber	Reusable	5.7%	0.9%	0.0%	1.1%
	Unpainted & untreated	10.8%	6.4%	0.7%	1.1%
	Multimaterial/other	30.5%	7.9%	1.6%	17.7%
	Subtotal	**47.0%**	**15.3%**	**2.3%**	**19.9%**
Rubber		**0.1%**	**0.5%**	**0.0%**	**0.8%**
Potentially hazardous		**0.1%**	**0.4%**	**0.0%**	**0.5%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**

Frankton general waste – by vehicle type – 8-13 August 2016		Car	Gantry truck	Other truck	Trailer
Paper	Recyclable	4.9%	0.4%	12.4%	2.4%
	Cardboard	9.8%	4.6%	3.6%	7.9%
	Multimaterial/other	0.6%	0.6%	10.9%	0.6%
	Subtotal	**15.3%**	**5.6%**	**26.9%**	**10.9%**
Plastics	Recyclable	0.6%	0.1%	3.7%	0.3%
	Multimaterial/other	11.1%	4.0%	14.4%	10.2%
	Subtotal	**11.7%**	**4.1%**	**18.1%**	**10.5%**
Organic	Kitchen waste	18.7%	0.7%	0.0%	3.4%
	Compostable greenwaste	22.0%	1.2%	0.2%	6.2%
	Non-compostable g'waste	2.9%	0.0%	0.0%	1.4%
	Multimaterial/other	0.8%	0.0%	0.0%	0.3%
	Subtotal	**44.5%**	**1.9%**	**0.2%**	**11.2%**
Ferrous metals	Primarily ferrous	0.6%	1.6%	0.0%	0.6%
	Multimaterial/other	3.1%	0.6%	0.5%	1.4%
	Subtotal	**3.7%**	**2.2%**	**0.5%**	**1.9%**
Nonferrous metals		**0.5%**	**0.2%**	**0.0%**	**1.2%**
Glass	Recyclable	1.2%	0.1%	0.0%	1.1%
	Multimaterial/other	2.3%	0.3%	6.0%	3.9%
	Subtotal	**3.5%**	**0.4%**	**6.0%**	**5.0%**
Textiles	Clothing/textiles	1.5%	0.6%	3.9%	0.7%
	Multimaterial/other	3.2%	2.5%	8.7%	12.6%
	Subtotal	**4.7%**	**3.1%**	**12.5%**	**13.3%**
Sanitary paper		**5.2%**	**0.3%**	**0.0%**	**2.5%**
Rubble	Cleanfill	0.5%	15.5%	1.3%	3.3%
	New plasterboard	0.0%	7.0%	0.3%	7.1%
	Other	1.2%	15.0%	9.4%	7.9%
	Subtotal	**1.7%**	**37.5%**	**10.9%**	**18.4%**
Timber	Reusable	0.1%	5.7%	0.6%	1.7%
	Unpainted & untreated	0.2%	11.7%	3.7%	4.2%
	Multimaterial/other	7.6%	26.9%	20.6%	18.5%
	Subtotal	**7.9%**	**44.3%**	**24.9%**	**24.3%**
Rubber		**0.7%**	**0.2%**	**0.0%**	**0.4%**
Potentially hazardous		**0.6%**	**0.2%**	**0.0%**	**0.3%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**

Appendix 3 – Victoria Flats landfill

Victoria Flats landfill – general and overall waste – 8-13 August 2016		General waste		Overall waste	
		% of total	T/week	% of total	T/week
Paper	Recyclable	6.2%	7 T/week	5.0%	41 T/week
	Cardboard	10.8%	13 T/week	4.9%	39 T/week
	Multimaterial/other	4.0%	5 T/week	2.4%	20 T/week
	Subtotal	**20.9%**	**25 T/week**	**12.3%**	**99 T/week**
Plastics	Recyclable	1.4%	2 T/week	1.6%	13 T/week
	Multimaterial/other	14.7%	18 T/week	8.6%	69 T/week
	Subtotal	**16.1%**	**19 T/week**	**10.2%**	**82 T/week**
Organic	Kitchen waste	3.6%	4 T/week	13.4%	108 T/week
	Compostable greenwaste	2.7%	3 T/week	2.2%	18 T/week
	Non-compostable g'waste	0.2%	0 T/week	2.4%	19 T/week
	Multimaterial/other	0.3%	0 T/week	0.9%	7 T/week
	Subtotal	**6.8%**	**8 T/week**	**18.9%**	**152 T/week**
Ferrous metals	Primarily ferrous	1.0%	1 T/week	1.1%	9 T/week
	Multimaterial/other	1.1%	1 T/week	0.9%	8 T/week
	Subtotal	**2.1%**	**3 T/week**	**2.0%**	**16 T/week**
Nonferrous metals		**1.1%**	**1 T/week**	**0.7%**	**6 T/week**
Glass	Recyclable	1.2%	1 T/week	9.1%	73 T/week
	Multimaterial/other	5.1%	6 T/week	1.5%	12 T/week
	Subtotal	**6.4%**	**8 T/week**	**10.6%**	**86 T/week**
Textiles	Clothing/textiles	1.8%	2 T/week	1.2%	10 T/week
	Multimaterial/other	11.7%	14 T/week	4.3%	35 T/week
	Subtotal	**13.6%**	**16 T/week**	**5.6%**	**45 T/week**
Sanitary paper		**3.0%**	**4 T/week**	**3.5%**	**28 T/week**
Rubble	Cleanfill	2.3%	3 T/week	3.4%	28 T/week
	New plasterboard	1.3%	2 T/week	4.0%	32 T/week
	Other	5.8%	7 T/week	6.2%	50 T/week
	Subtotal	**9.5%**	**11 T/week**	**13.6%**	**109 T/week**
Timber	Reusable	1.6%	2 T/week	2.1%	17 T/week
	Unpainted & untreated	7.1%	9 T/week	4.2%	34 T/week
	Multimaterial/other	11.1%	13 T/week	10.4%	84 T/week
	Subtotal	**19.7%**	**24 T/week**	**16.7%**	**135 T/week**
Rubber		**0.4%**	**1 T/week**	**0.9%**	**7 T/week**
Potentially hazardous		**0.4%**	**0 T/week**	**5.0%**	**40 T/week**
TOTAL		**100.0%**	**121 T/week**	**100.0%**	**805 T/week**

Victoria Flats landfill – overall waste from Queenstown Lakes District – 8-13 August 2016		Overall waste from Queenstown Lakes District	
		% of total	T/week
Paper	Recyclable	5.2%	34 T/week
	Cardboard	4.8%	31 T/week
	Multimaterial/other	1.8%	12 T/week
	Subtotal	**11.8%**	**77 T/week**
Plastics	Recyclable	1.5%	10 T/week
	Multimaterial/other	8.1%	53 T/week
	Subtotal	**9.6%**	**62 T/week**
Organic	Kitchen waste	11.3%	73 T/week
	Compostable greenwaste	1.9%	12 T/week
	Non-compostable g'waste	2.1%	14 T/week
	Multimaterial/other	0.7%	5 T/week
	Subtotal	**16.0%**	**104 T/week**
Ferrous metals	Primarily ferrous	1.2%	8 T/week
	Multimaterial/other	0.7%	5 T/week
	Subtotal	**1.9%**	**12 T/week**
Nonferrous metals		**0.6%**	**4 T/week**
Glass	Recyclable	10.2%	66 T/week
	Multimaterial/other	1.6%	10 T/week
	Subtotal	**11.8%**	**77 T/week**
Textiles	Clothing/textiles	1.3%	9 T/week
	Multimaterial/other	4.4%	29 T/week
	Subtotal	**5.8%**	**38 T/week**
Sanitary paper		**2.8%**	**18 T/week**
Rubble	Cleanfill	4.1%	26 T/week
	New plasterboard	4.5%	29 T/week
	Other	6.7%	43 T/week
	Subtotal	**15.3%**	**99 T/week**
Timber	Reusable	2.4%	15 T/week
	Unpainted & untreated	4.6%	30 T/week
	Multimaterial/other	11.9%	77 T/week
	Subtotal	**18.9%**	**123 T/week**
Rubber		**0.6%**	**4 T/week**
Potentially hazardous		**4.8%**	**31 T/week**
TOTAL		**100.0%**	**649 T/week**

Appendix 4 – Waste 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 5 – Assumed waste compositions

Assumed waste compositions		Council kerbside collections	Commercial kerbside collections	Central Otago District waste to landfill	Special waste to Victoria Flat landfill
Paper	Recyclable	11.6%	11.9%	4.3%	0%
	Cardboard	2.0%	2.5%	4.2%	0%
	Multimaterial/other	2.5%	2.1%	5.6%	0%
	Subtotal	**16.1%**	**16.5%**	**14.1%**	**0%**
Plastics	Recyclable	4.6%	3.0%	2.5%	0%
	Multimaterial/other	9.0%	8.5%	10.3%	0%
	Subtotal	**13.6%**	**11.5%**	**12.8%**	**0%**
Organic	Kitchen waste	31.4%	40.5%	26.9%	0%
	Compostable greenwaste	1.8%	1.5%	4.3%	0%
	Non-compostable g'waste	10.8%	1.9%	4.3%	0%
	Multimaterial/other	2.9%	1.0%	2.0%	0%
	Subtotal	**46.9%**	**44.9%**	**37.5%**	**0%**
Ferrous metals	Primarily ferrous	1.5%	1.5%	0.6%	0%
	Multimaterial/other	0.7%	0.5%	2.0%	0%
	Subtotal	**2.1%**	**2.0%**	**2.6%**	**0%**
Nonferrous metals		**1.0%**	**0.7%**	**1.1%**	0%
Glass	Recyclable	3.2%	11.9%	5.3%	0%
	Multimaterial/other	0.7%	0.5%	0.6%	0%
	Subtotal	**3.8%**	**12.4%**	**5.9%**	**0%**
Textiles	Clothing/textiles	2.4%	2.0%	0.7%	0%
	Multimaterial/other	1.7%	1.5%	2.5%	0%
	Subtotal	**4.1%**	**3.5%**	**3.2%**	**0%**
Sanitary paper		**8.4%**	**4.5%**	**7.2%**	**0%**
Rubble	Cleanfill	0.0%	0.8%	0.5%	0%
	New plasterboard	0.0%	0.0%	2.0%	0%
	Other	1.4%	0.8%	4.0%	0%
	Subtotal	**1.4%**	**1.6%**	**6.5%**	**0%**
Timber	Reusable	0.0%	0.1%	0.7%	0%
	Unpainted & untreated	0.0%	0.2%	2.0%	0%
	Multimaterial/other	1.1%	0.7%	3.0%	0%
	Subtotal	**1.1%**	**1.0%**	**5.7%**	**0%**
Rubber		**0.3%**	**0.5%**	**2.2%**	**6%**
Potentially hazardous		**1.2%**	**0.9%**	**1.2%**	**94%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**

Appendix 6 – Types of waste disposal vehicles

FRONT-LOADER TRUCKS

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

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

GANTRY TRUCK

"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 waste removal. Some commercial customers, such as hotels and supermarkets, use portable, stationary waste 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 waste 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.

HOOK TRUCK

"Hook" trucks transport bins that can be loaded and unloaded from the rear of the truck for transport and that can be emptied quickly like a tip truck. Hook bins are used by large-scale waste generators, either for regular waste disposal or one-off waste removal. Hook trucks are often used for transporting 30-cubic metre bins from transfer stations to landfills. Hook bins are also used for large-scale transport of recovered materials, such as cardboard and metal. Hook bins are rarely used for residential waste disposal.

The potential for material recovery from hook bins is similar to that for gantry bins.

KERBSIDE COLLECTION COMPACTOR

Side-loading and rear-loading compactors are commonly used for the kerbside collection of residential and small business waste. They can be designed to service bagged waste collections, wheelie bin waste 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 waste from a large number of customers and the waste is heavily compacted, there is little opportunity for manually recovering materials from the waste.

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 7 – Divertable materials in waste

Cardboard in commercial gantry load

Cardboard in commercial gantry load

Reusable framing timber in trailer load of construction waste

HVAC ducts

Reusable framing timber in trailer load of construction waste

Hardware and peripherals from computer repair