NZ TRANSPORT AGENCY
WAKA KOTAHI

Annual weigh-in-motion (WiM) report 2017

This report has been prepared for the benefit of the NZ Transport Agency. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Quality Assurance Statement

Prepared by: Glenn Peoples
Reviewed by: Gavin Armstong
Approved for issue by:

Revision Schedule

Rev. No	Date	Description	Prepared by	Reviewed by	Approved by
1	18 December 2018		Glenn Peoples	Gavin Armstrong	

Contents

1.0 DISCLAIMER

The data contained in this report is intended to be used as an approximate indication of traffic loading and vehicle weights at weigh-in-motion (WiM) sites. The limitations of the equipment and their installation, congestion effects and various analysis procedures contribute to a level of approximation in the data. These factors should be taken into account when using the data.

The NZ Transport Agency and its employees or agents involved in preparation of this information cannot accept liability for its contents or for any consequences arising from its use. People using the contents of the report should apply, and rely upon, their own skill and judgement. The contents should not be used in isolation from other sources of advice and information.

2.0 GLOSSARY

44T	Maximum gross weight allowed for standard vehicles in New Zealand.
50MAX	A new generation of truck that allows for safe and more efficient transport of freight goods. These trucks are slightly longer than standard 44 tonne vehicles, have an additional axle (nine in total) and can have a total weight of up to 50 tonnes on certain designated routes.
A Train	A rigid vehicle connected to a semi-trailer that tows a full trailer.
ASTM	American Standard Test Method
AADT	Annual average daily traffic – an estimation of the number of vehicles crossing a site on an average day of the year.
Articulated vehicle	An articulated vehicle has a driver's position, a steering system, motive power and two rigid sections that articulate relative to each other.
B Train	A rigid vehicle attached to two semi-trailers.
Description	The description stated in tables refers to the PAT type illustration by providing indication of the spacing between axles.
ESA	Equivalent Standard Axle
GHVM	Gross heavy vehicle mass
HCV I	Heavy commercial vehicle **I.** Rigid trucks with or without a trailer, or articulated vehicle, with three or four axles in total.
HCV II	Heavy commercial vehicle II. Trucks and trailers and articulated vehicles with or without trailers with five or more axles in total.
HPMV	A high-productivity motor vehicle exceeds a mass of 44,000kg and/or the maximum length dimensions allowed for standard vehicles, but meets higher individual axle and axle group limits and is no wider or higher than a standard vehicle. It operates under a route specific HPMV permit issued by a road controlling authority (RCA).
kN	Kilo newton
MCV	Medium commercial vehicle. Two axle heavy trucks without a trailer, over 3.5 tonnes gross laden weight.
Overweight vehicle	A vehicle that exceed its general access load limits. Vehicles with a permit to carry a greater weight may exceed general access load limits, but WiM data does not identify vehicles and whether or not they have a permit. All vehicles that exceed the general access load limits are counted as overweight in this report.
PAT Class	The scheme used by the Transport Agency's WiM system to uniquely identify axle set configurations according to their space code relating to the axle configuration.
QADT	Quad axle dual tyre
RS	Reference station
Rigid vehicle	A rigid vehicle has two axle sets, a driver's position, a steering system, motive power and a single rigid chassis.
SADT	Single axle dual tyre
SAST	Single axle single tyre
SH	State highway
T&T	Truck and trailer
TADT	Tandem axle dual tyre
TSST	Twin steer single tyre
TRDT	Triple axle dual tyre
Total volume	This indicates the number of heavy vehicles for each PAT class.
VDAM	Vehicle dimension and mass
WiM	Weigh-in-motion system is a device that measures the dynamic axle mass of moving vehicles to estimate the corresponding static axle mass.

3.0 EXECUTIVE SUMMARY

Key Findings

- The total number of heavy vehicles that went through WiM sites in 2017 was just over 4.3 million (4,301,095). This was a slight decrease (0.4%) from 2016 (4,317,522), and the same WiM sites are involved for each of those years.
- However, there was a slight increase in the total mass of vehicles in WiM sites, up 0.9% to 101.6 million tonnes.

Increased number of heavier vehciles

- In spite of the overall heavy vehicle volume not increasing, there are more vehicles that exceed their maximum standard mass limit. There were 590,448 of these in 2016 (13.7% of all heavy vehicles), and 601,751 in 2017 (14% of all heavy vehicles).
- The number of vehicles recorded with gross mass 44 tonnes and over has increased overall by 2.8%, from 502,830 in 2016 to 516,906 in 2017. The only sites where the volume of these vehicles decreased were Kairua and Rakaia.
- The number of vehicles recorded with gross mass 50 tonnes and over has remained virtually unchanged, decreasing by just .8%, from 117,293 in 2016 to 116,356 in 2017 (table 13.1)

Drury WiM site busiest for heavy vehciles with 40.2% of all heavy vehicles

- Because it is located on the route which links Auckland to all other major centers, the Drury WiM site is the busiest one in terms of heavy vehicles volumes. It accounted for about 38% of all heavy vehicles recorded and 35.8% of all gross mass recorded across all the WiM sites. Drury therefore has a significant influence on the overall vehicle fleet data analysis.

Overweight and larger heavy vehicles

- A steady increase in the annual average daily number of overweight heavy vehicles began with an increase in 2013 and continued to 2016. However in 2017 there was a slight decrease (-1.6%) in the average number of daily overweight vehicles (253).
- 56.1% of all overweight heavy vehicles are now 9 axle trucks, continuing the trend of increase.
- Heavy commercial vehicle II (with five or or more axles in total) accounted for 81.7% of all recorded gross mass, and 55.7% of total number of heavy vehicles recorded. In 2016, they were 81% and 54.5%, respectively.
- Heavy commercial vehicle I (with three or four axles in total) accounted for 6.3% of all recorded gross mass, and 8.7% of total number of heavy vehicles recorded (8% were PAT class 45). In 2016, they were 6.3% and 8.8%, respectively.
- Medium commercial vehicles (Two axle heavy trucks) accounted for 6.7% of all recorded gross mass, and 26.6% of total number of heavy vehicles recorded.
- For the first time, 9-axle vehicles (making up 19.7% of all heavy vehicles) outnumbered 8-axle vehicles (18.5%) in 2017. 9-axle vehicles also accounted for more gross mass than 8-axle vehicles (32.7% and 26.8%, respectively).
- PAT class 915 continues to make up the largest proportion of all overweight vehicle volumes at 47.5% (up from 42.3% in 2016).

All heavy vehicles (recorded by WiM site with gross mass over 3.5 tonnes) are referred to as *vehicles* or *heavy vehicles* in this report. Those heavy vehicles that exceed specified mass limits by more than one tonne are described as *overweight heavy vehicles* or *overweight vehicles* (but this includes permitted overweight).

Chart 1 | Vehicle percentage distribution by vehicle type

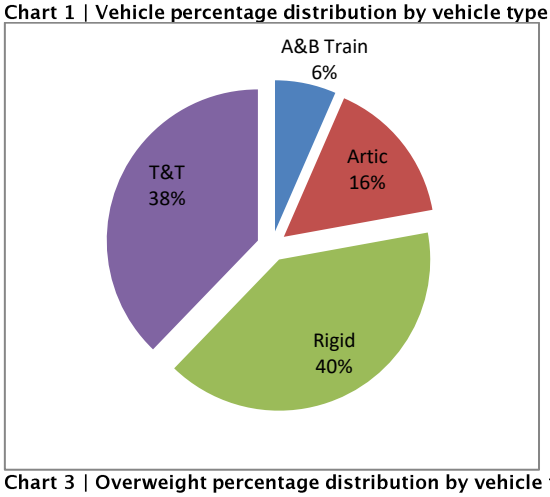


Chart 2 | Gross Mass percentage distribution by vehicle type

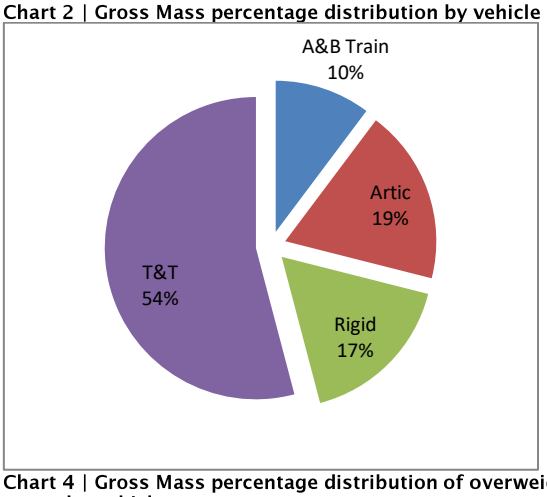


Chart 3 | Overweight percentage distribution by vehicle type

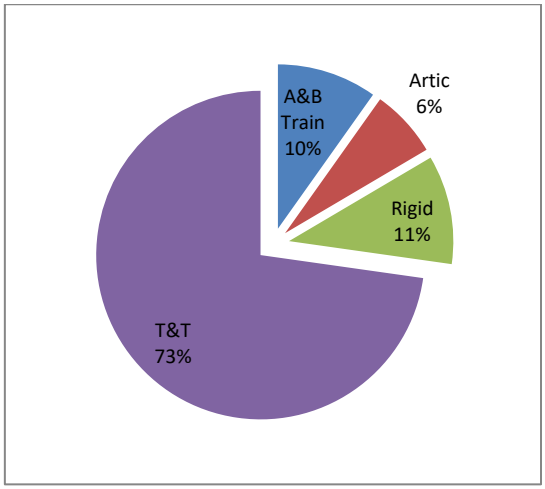


Chart 4 | Gross Mass percentage distribution of overweight vehicle by vehicle type

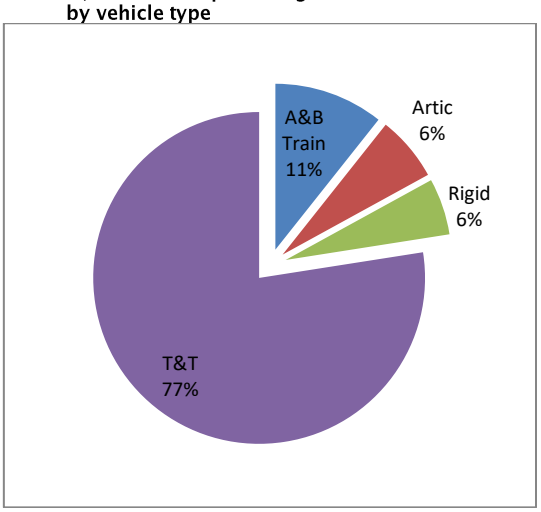


Table 1.0 | Vehicle frequency and estimated GHVM by vehicle type

Vehicle Type	Heavy Vehicles[1]				Overweight Heavy Vehicles[2]				Percentage of Recorded Vehicles Overweight		Estimated Gross Mass per Vehicle	
	Recorded		Gross Mass		Recorded		Gross Mass		Recorded	Gross Mass	Overall	Overweight
	f	*%*[3]	*Tonne*	*%*[3]	*f*	*%*[3]	*Tonne*	*%*[3]	*%*[4]	*%*[4]	*Tonne*	*Tonne*
A&B Train	281,096	*6.5*	10,403,097	*10.2*	59,142	*9.8*	2,876,336	*10.4*	*21.0*	*27.6*	*37.0*	*48.6*
Artic	671,115	*15.6*	*18,996,278*	*18.7*	40,259	*6.7*	1,777,208	*6.4*	*6.0*	*9.4*	*28.3*	*44.1*
Rigid	1,723,409	*40.1*	*17,218,456*	*17.0*	64,515	*10.7*	1,399,686	*5.1*	*3.7*	*8.1*	*10.0*	*21.7*
T&T	1,625,475	*37.8*	*54,942,494*	*54.1*	437,835	*72.8*	21,529,732	*78.1*	*26.9*	*39.2*	*33.8*	*49.2*
Total	4,301,095	*100.0*	101,560,324	*100.0*	601,751	*100.0*	27,582,961	*100.0*	*14.0*	*27.2*	*23.6*	*45.8*

Note:

1 Total number of vehicles recorded or the total estimated weight (including vehicle and load mass) during the accepted days of operations.

2 Total number of vehicles recorded or the total estimated weight (including vehicle and load mass) that exceed their maximum weight limit during the accepted days of operations.

3 The proportion of each vehicle type from the given column total. For example, 15.6 percent of the overall total of heavy vehicles recorded as Artic vehicles.

4 The proportion of overweight vehicles or overweigth mass over the total heavy vehicles recorded or total mass measured for each vehicle type. For example, approximately 26.9 percent of T&T type vehicles were overweight.

Chart 5 | Vehicle frequency distribution by WiM site and by vehicle type

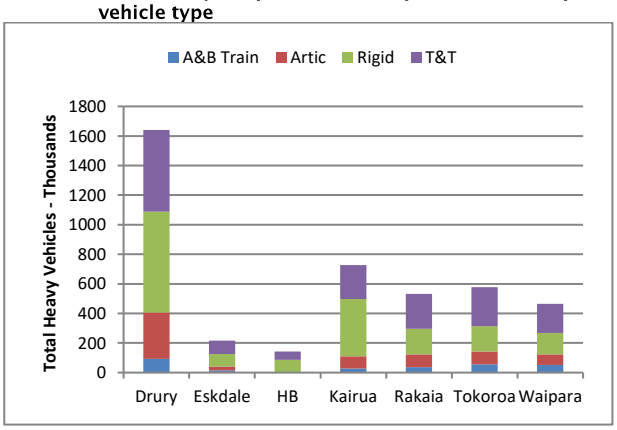


Chart 5.1 | Vehicle per day frequency distribution by vehicle type

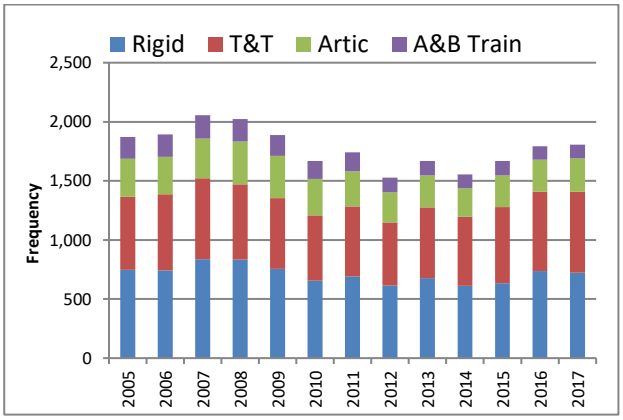
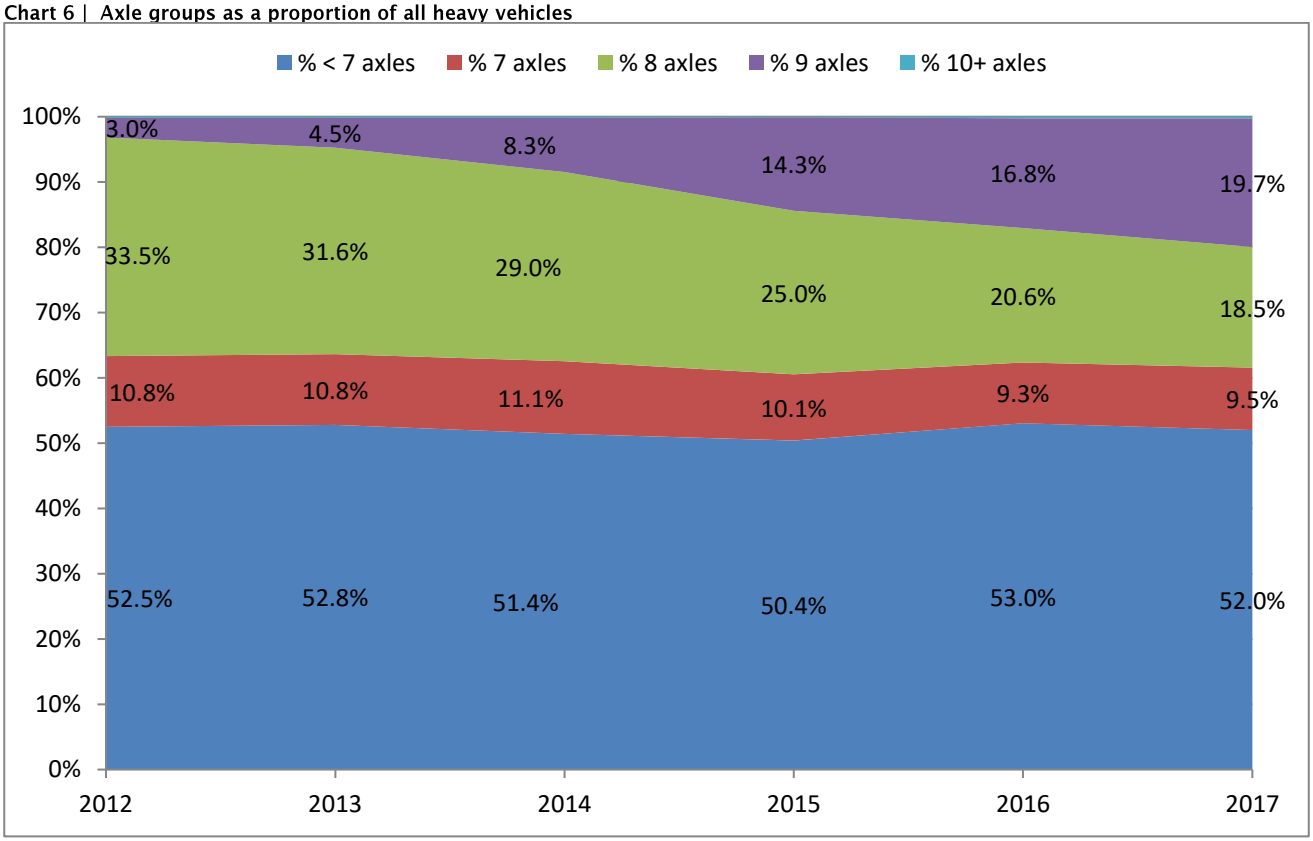


Chart 6 | Axle groups as a proportion of all heavy vehicles



Vehicle fleet

- Overall, there are no major changes to the each distribution by vehicle type, (Chart1, chart 2 Chart 3 and chart 4), compared with the last year's chart.
- Overall, annual average daily heavy vehicles recorded were 1,858, an increase of 3.6% compared to 2016 (see Table 8).
- 9-axle vehicles now outnumber 8-axle vehicles, and the proportion of heavy vehicles with 8 axles continues to decrease.
- For vehicles with estimated gross mass >50 tonnes, the most common PAT classes were 915 (on 80.6%, compared with 78.8% in 2016), 951 (9%, down from 9.3% in 2016), and 891 (4.8%, down from 5% in 2016). Combined, they account for 94.4 percent of the total heavy vehicles over 50T. (see table 13.1)

Chart 7 | Overweight vehicle frequency distribution by WiM site and by vehicle type

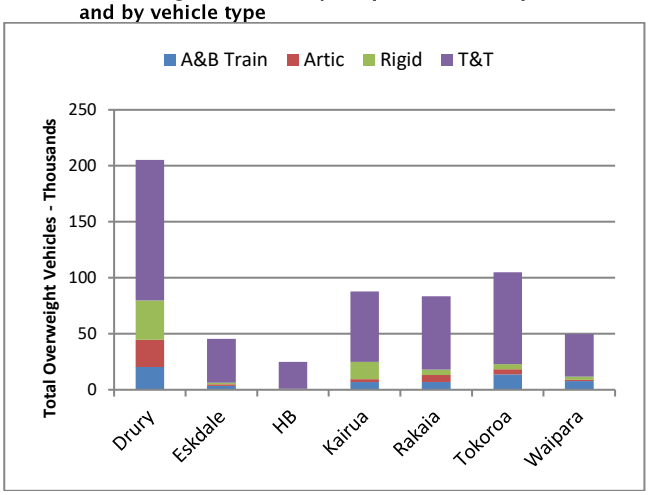
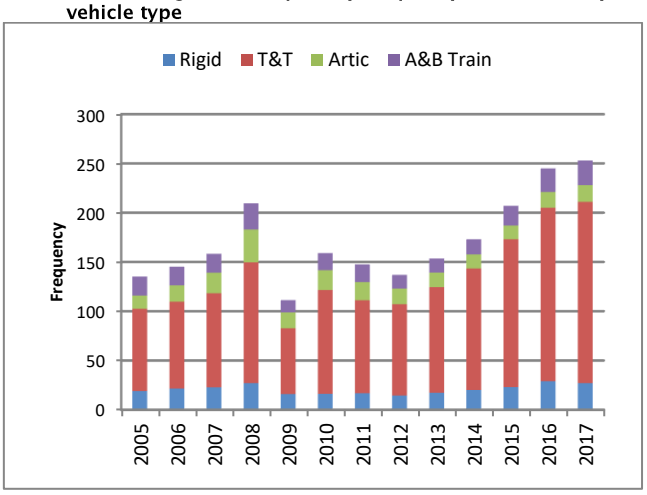


Chart 8 | Overweight vehicle per day frequency distribution by vehicle type



Vehicle fleet overweight

- There continues to be an increasing trend for the average number of overweight heavy vehicles per day since 2013 (See Chart 8). This includes those vehicles that may be permitted to carry weights in excess of the standard weight limits for their class.
- The increase in the frequency of overweight vehicles (i.e. vehicles that exceed standard weight limits) is reflected in an increase in permits, so does not necessarily indicate worsening compliance.
    - The number of 50MAX permits that were current on 31 December 2017 was 10,212. This represents a substantial increase from 31 December 2016 (when the total was 3,280).
    - The number of HPMV permits for high mass that were current on 31 December 2016 was 6,994. The total was 2,179 on December 2016.
- For the Drury site, the total number of vehicles recorded with gross mass 50 tonnes and over has continued to increase significantly. The number increased from 6,301 in 2014 to 24,227 in 2015 (an annual increase of 280%), to 32,519 in 2016 (an annual increase of 34%), and to 37,210 in 2017 (an annual increase of 14.4%). (Table 13.1)
- Annual average daily overweight heavy vehicles increased by 3.3 percent to 253 overweight heavy vehicles per day compared to 245 in 2016. (Table 11.0)
- The estimated average gross mass for overweight vehicles was 45.8 tonnes, barely changed from 2016 (when it was 45.6 tonnes).

Table 2 shows the frequency and percentage distributions of all heavy and overweight vehicles by vehicle type and WiM site in 2017.

Table 2.0 | Vehicle type by WiM site (2017)

Vehicle Type	WiM Site							Total
	Drury	Eskdale	Hamanatua Bridge	Kairua	Rakaia	Tokoroa	Waipara	
Number of Heavy vehicles								
A&B Train	92,213	15,140	553	28,139	36,073	56,899	52,079	281,096
Artic	314,613	25,886	2,872	82,709	87,431	86,415	71,189	671,115
Rigid	682,561	84,177	83,028	385,942	172,928	170,925	143,848	1,723,409
T&T	550,916	91,300	55,646	230,100	235,531	263,467	198,515	1,625,475
Total	1,640,303	216,503	142,099	726,890	531,963	577,706	465,631	4,301,095
Number of Overweight vehicles								
A&B Train	20,349	3,484	19	6,907	6,929	13,728	7,726	59,142
Artic	24,192	1,301	115	2,439	6,244	4,700	1,268	40,259
Rigid	35,173	1,473	701	15,415	4,764	4,350	2,639	64,515
T&T	125,501	39,076	24,154	63,052	65,647	82,229	38,176	437,835
Total	205,215	45,334	24,989	87,813	83,584	105,007	49,809	601,751
Percentage of vehicles overweight (%)								
A&B Train	*22.1*	*23.0*	*3.4*	*24.5*	*19.2*	*24.1*	*14.8*	*21.0*
Artic	*7.7*	*5.0*	*4.0*	*2.9*	*7.1*	*5.4*	*1.8*	*6.0*
Rigid	*5.2*	*1.7*	*0.8*	*4.0*	*2.8*	*2.5*	*1.8*	*3.7*
T&T	*22.8*	*42.8*	*43.4*	*27.4*	*27.9*	*31.2*	*19.2*	*26.9*
Total	*12.5*	*20.9*	*17.6*	*12.1*	*15.7*	*18.2*	*10.7*	*14.0*
Estimated gross mass								
A&B Train	3,396,134	564,283	18,069	974,316	1,311,410	2,190,600	1,948,287	10,403,097
Artic	8,785,907	720,676	65,421	2,239,663	2,517,797	2,584,079	2,082,738	18,996,278
Rigid	6,527,649	897,664	1,068,948	3,931,738	1,642,241	1,726,429	1,423,788	17,218,456
T&T	17,644,773	3,524,181	2,271,179	7,693,070	7,818,224	9,524,897	6,466,172	54,942,494
Total	36,354,461	5,706,803	3,423,616	14,838,786	13,289,672	16,026,003	11,920,984	101,560,324
Estimated overweight vehicles gross mass								
A&B Train	987,047	172,693	883	347,979	337,562	665,828	364,345	2,876,336
Artic	1,055,560	59,187	5,221	107,014	281,086	212,114	57,026	1,777,208
Rigid	777,088	31,183	14,376	330,332	98,512	93,411	54,786	1,399,686
T&T	6,197,569	1,931,345	1,145,431	3,117,655	3,290,407	4,020,660	1,826,667	21,529,732
Total	9,017,263	2,194,408	1,165,910	3,902,979	4,007,567	4,992,013	2,302,823	27,582,961
Estimated Gross Mass per vehicle (tonne)								
A&B Train	*36.8*	*37.3*	*32.7*	*34.6*	*36.4*	*38.5*	*37.4*	*37.0*
Artic	*27.9*	*27.8*	*22.8*	*27.1*	*28.8*	*29.9*	*29.3*	*28.3*
Rigid	*9.6*	*10.7*	*12.9*	*10.2*	*9.5*	*10.1*	*9.9*	*10.0*
T&T	*32.0*	*38.6*	*40.8*	*33.4*	*33.2*	*36.2*	*32.6*	*33.8*
Total	*22.2*	*26.4*	*24.1*	*20.4*	*25.0*	*27.7*	*25.6*	*23.6*
Estimated overweight vehicles gross mass per vehicle (tonne)								
A&B Train	*48.5*	*49.6*	*46.4*	*50.4*	*48.7*	*48.5*	*47.2*	*48.6*
Artic	*43.6*	*45.5*	*45.4*	*43.9*	*45.0*	*45.1*	*45.0*	*44.1*
Rigid	*22.1*	*21.2*	*20.5*	*21.4*	*20.7*	*21.5*	*20.8*	*21.7*
T&T	*49.4*	*49.4*	*47.4*	*49.4*	*50.1*	*48.9*	*47.8*	*49.2*
Total	*43.9*	*48.4*	*46.7*	*44.4*	*47.9*	*47.5*	*46.2*	*45.8*

Interpretation:

- Across all WiM sites there were 14 overweight vehicles for every 100 heavy vehicles. This percentage was 13.7 in 2016 and 12.4 in 2015. There has been a continual increase since 2013.
- While 14% of all heavy vehicles were overweight, 26.9% of all T&T vehicles (across all sites) were overweight (barely changed from 26.2% in 2016).

4.0 INTRODUCTION

The data used in this report was collected from the seven WiM sites on the state highway network during 2016.

Table 4.0 | WiM site location

Region	SH	RS	Description
02 – Auckland	1N	461	DRURY –Telemetry Site 48 (WiM Site 1205)
03 – Waikato	1N	625	TOKOROA – Telemetry Site 51 (WiM Site 421)
04 – Bay of Plenty	2	164	KAIRUA – Telemetry Site 120 (WiM Site 8961)
05 – Gisborne	35	321	HAMANATUA BRIDGE – Telemetry Site 108 (WiM Site 6281)
06 – Hawkes Bay	5	259	ESKDALE – Telemetry Site 101 (WiM Site 5721)
11 – Canterbury	1S	284	WAIPARA – Telemetry Site 52 (WiM Site 518)
11 – Canterbury	1S	381	RAKAIA – Telemetry Site 121 (WiM Site 8821)

All data used in this report was collected during the 2016 calendar year and is available to selected users, through the Transport Agency's state highway traffic monitoring system (TMS). This report is intended to provide an insight into available heavy vehicle collected data for further or more detailed analysis by TMS users.

5.0 OTHER DOCUMENTS

The documents below provide information relating to traffic monitoring practices used on state highways by the Transport Agency. These can be downloaded from our website www.nzta.govt.nz

- State highway traffic volume booklet
- Traffic monitoring for state highways manual SM052

6.0 TECHNOLOGY

The Transport Agency uses PAT bending plate technology at a total of seven WiM sites. Two further sites at Auckland Harbour Bridge are used for a special study. All sites are continuously collecting individual vehicle records, and the data is normally downloaded weekly into TMS.

7.0 DATA QUALITY REQUIREMENTS

Readers of this report should take note of the accuracy tolerances required during the collection of data.

Accuracy is as defined for high speed weigh-in motion in ASTM E1318 (or latest revision):

for 95% of confidence:

Gross Vehicle Weight: ± 10%

Axle group load: ± 15%

With a good (new) pavement, the above weight errors are reduced by a factor of 1.5

Requisite quality is determined by the final use of data, in simple terms:

- pavement is periodically checked for level and rectified
- calibration is carried out with vehicle of known axle weights and speed.
- data is monitored for errors and deviation.

Other factors affecting data accuracy

- pavement smoothness astrucks bouncing onto scales will affect accuracy.
- truck driver behavior

- strong winds

8.0 DERIVATIONS

Overweight
This report contains the number of overweight vehicles data by vehicle type (PAT class rigid, T&T and others). The data has been sourced from the 'Distribution by Gross Vehicle Mass' report in the TMS.

Overweight data in each vehicle fleet category is computed based on a tonne above the specified legal weight limit of the vehicle. For example, vehicle fleet of PAT class 21 legal limit is 14 tonnes. For this PAT class (21) only vehicles with gross mass greater than or equal to 15 tonnes are considered as overweight.

In order to compute the number of overweight vehicles by vehicle type, simply take the sum of the overweight vehicles in all vehicle fleets which belong to a certain vehicle type *(refer to Table 5 for the classification scheme)*. For example, in 2016 there were 38,549 overweight rigid heavy vehicles recorded at the Drury WiM site. This is the sum of PAT classes 20, 21, 31, 34, 45, 47, 301, and 511, which are the PAT classes within the rigid type. For the overall total overweight vehicles, simply add all the overweight vehicles in all WiM sites.

Note that the overweight vehicles comprises vehicles that exceeded specified limits regardless of whether or not they are permitted to carry more than their standard limit.

Estimated GHVM
The WiM daily weight table in TMS contains the collected GHVM for each WiM site in daily breakdown. However, this information contains mass of PAT classes lower than the PAT class 20. In this report, the estimated GHVM data were derived from WIM Distribution within GHVM Range table. In deriving the estimated GHVM, simply multiply the vehicle frequency to the mass mid-range and sum the product for every PAT class of each WiM site. The same principle is applied for overweight vehicles, except it starts on the above mid-range of the maximum limit of each PAT class.

Average estimated gross mass per vehicle
To compute the average estimated GHVM per vehicle, divide the computed estimated gross mass over the number of heavy vehicle for given PAT class for each WiM site. This is similar to the computation for overweight vehicles.

9.0 PERMITTED VEHICLES

Heavy vehicles travelling on New Zealand roads must be within certain size and weight capacity requirements. This is important for maintaining road safety on the network. This benefits all road users by increasing productivity by delivering goods and services on time and in good condition, while keeping the network in best condition.

The maximum size and weight dimensions for heavy vehicles are stated in the Land Transport Rule: Vehicle Dimensions and Mass (2002 and 2010) and 50MAX (or visit http://www.nzta.govt/50MAX)
In the event that a heavy vehicle needs to be larger and carry more loads, the operator must apply for a permit before heading out on road. Three types of permits can be applied for:

Overweight vehicles – the road user must secure this permit before travelling if the vehicle exceeds the limits of a carrying load or the vehicle's design.

- Overweight vehicles – the road user must secure this permit before travelling if the vehicle exceeds the limits of a carrying load or the vehicle's design.
- Over dimension vehicles – when travelling with a longer and wider load.
- High productivity motor vehicles (HPMV/50MAX) – this permit is issued to road user for vehicles that will be used to carry divisible loads, such as logs, milk powder or freight, more productively. Permitted vehicles must also be able to travel on routes that are suitable for the vehicle and load being approved. There are three types of HPMV permit: a) HPMV over mass; b) HPMV over length; and c) both a and b. Most of 50MAX heavy vehicles hold combination permits. (Note: In 2012, HPMV permits were valid only for one year. Permit validity was increased to two years in 2013.)

Any vehicle holding any type of permit as mentioned above is a permitted vehicle.

This is an important caveat when reading data about "overweight" vehicles and mass, some of which represents non compliance and some of which represents permitted vehicles, but there are no means of making this distinction in the current system.

PAT Type 69, six axle artic and the PAT Type 791, seven axle artic are legally limited to below 44 tonne gross, but may be operating on overweight permits at 44 tonne gross.

10.0 CLASSIFICATION SCHEME

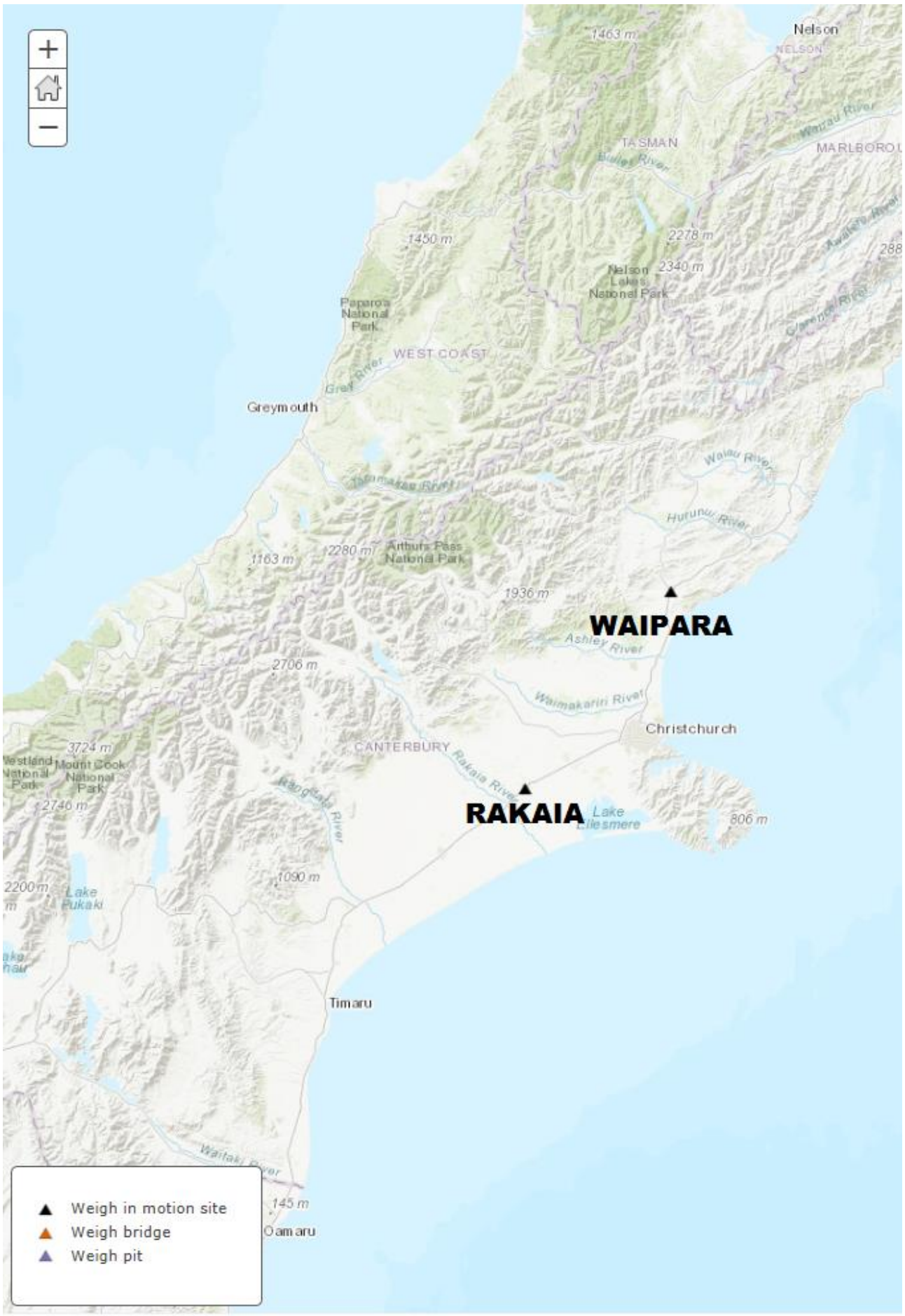
Table 5.0 | Heavy vehicle classification 2011 scheme

EEM (PEM) class	Vehicle type group	PAT class	Vehicle types in class	Axles	Group	New max limit	Criteria
Bus & MCV	Rigid	20	o--o (short truck or bus)	2	2	14	2ax, AS1-2/GVW
		21	o----o (truck or bus)	2	2	14	2ax AS 1criterion
	T&T	300	o--o--o (truck towing light trailer)	3	3	20	3 ax, AS 1,2 criteria
		401	o--o--oo (truck tow light 2 ax trailer)	4	3	18	4 ax, AS 1,3 criteria
Bus & HCV1	Rigid	31	o--oo (truck or bus/coach)	3	2	18	3 axles, 2 groups
		301	o--oo (tractor without semi-trailer)	3	2	21	3 axles, 2 groups
		34	oo--o (twin steer truck)	3	2	19	3 axles, 2 groups
	T&T	402	o--oo---o (truck tow light 1 ax trailer)	4	3	29	4 ax, AS 1,2,3 criteria
		44	oo--o---o (twin steer tow 1 ax trailer)	4	3	27	4 ax, AS 1,3 criteria
HCV1	Rigid	45	oo--oo (heavy truck)	4	2	26	
		47	o--ooo (heavy truck)	4	2	24	4,5 axles, 2 groups
		511	oo--ooo (heavy truck)	5	2	28	
	Artic	30	o--o-----o (artic e.g. bread truck)	3	3	26	3 ax, AS 1,2 criteria
		41	o--o--oo (artic A112)	4	3	29	4 ax, AS 1,2,3 criteria
		42	o--oo--o (artic A121)	4	3	23	4 ax, AS 1,2,3 criteria
	T&T	40	o--o--o--o (truck tow heavy trailer)	4	4	30	4 axles, 4 groups
HCV2	Artic	50[1]	o-o-o-o-o (mobile crane)	5	3	40	5 axles
		53	o--oo—oo	5	3	36	5 axles
		57	o--o-----ooo	5	3	32	
		69	o--oo--ooo	6	3	39	
		68	oo--oo--oo	6	3	41	
		747	o--ooo--ooo	7	3	42	6-8 axles
		791	o--oo--oooo	7	3	41	3 groups
		713	oo--oo--ooo	7	3	44	
		826	oo--oo--oooo	8	3	44	
		847	o--ooo--oooo	8	3	44	
	A Train	622	o--o--oo--o-o	6	5	39	
		74	o--oo--oo--o-o	7	5	39	(AS 1 criterion)
		85	o--oo--oo--o-oo	8	5	39	not twin steer
		89	o--oo--ooo--o-o	8	5	39	(AS 1 criterion)
		810	o--oo--ooo--o-oo	8	5	39	
	B Train	751[2]	o--oo--oo--oo	7	4	44	7 axles, not twin steer
		851	o--oo--ooo-oo	8	4	44	
		811	o--oo--oo--ooo	8	4	44	
		951	o--oo--ooo-ooo	9	4	44	
		1032	o--oo--ooo-oooo	10	4	44	8-11 axles
	T&T	503	o--oo--oo (truck tow light trailer)	5	3	25	
		52	o--oo--o--o	5	4	37	3,4,5 groups
		63	o--oo--o-oo	6	4	44	
		66	oo--oo--o--o	6	4	42	6 axles
		62	o--oo--o-o-o	6	5	42	4,5 groups
		61	o-o--o-o--oo	6	5	42	
		751[2]	o--oo--oo-oo	7	4	44	
		77	oo--oo--o-oo	7	4	44	
		771	oo--o--oo--oo	7	4	39	
		891	oo--oo--oo-oo	8	4	44	
		915	oo--oo--oo-ooo	9	4	44	7-11 axles
		914	oo--oo--ooo-oo	9	4	44	twin steer
		1020	oo--oo--ooo-ooo	10	4	44	(AS 1 criterion)
		1020	oo--ooo--oo--ooo	10	4	44	
		1133	oo--oo--ooo-oooo	11	4	44	
		x	various (twin steer A train)	7-11	5		
		999	Not classified	any	-		Everything else

Symbol: - decreased in new maximum limit
- increased in new maximum limit

Note: [1]PAT class 50 mobile crane is a unique vehicle type but in the table above and succeeding tables this PAT class is included in Artic vehicle category.
[2]The new Transport Agency 2011 heavy vehicle classification, PAT class 751 has been split in two vehicle type categories, T&T and B Train. This PAT class was tabulated under T&T vehicle type category.

11.0 WiM SITE MAPS


Nelson
1463 m
TASMAN
MARLBOROU
2278 m
1450 m
2340 m
Nelson Lakes National Park
Paparoa National Park
WEST COAST
Greymouth
Hurunui River
1163 m
2280 m
Arthurs Pass National Park
1936 m
WAIPARA
Ashley River
2706 m
Waimakariri River
Christchurch
CANTERBURY
3724 m
Mount Cook National Park
2746 m
Rangitata River
RAKAIA
Lake Ellesmere
806 m
1090 m
2200 m
Lake Pukaki
Timaru
145 m
Oamaru
Weigh in motion site
Weigh bridge
Weigh pit

12.0 ANNUAL AVERAGE DAILY TRAFFIC (AADT) BY SITE

Table 6 shows general information of a WiM site, such as the code, state highway number where the WiM site is situated, telemetry site ID, AADT, heavy vehicle frequency and proportion of heavy vehicles over AADT.

AADT provides an estimation of the number of all vehicles (light and heavy) crossing a site on an average day.

Table 6.0 | Annual average daily traffic by WiM site

WiM Site	SH	Description	AADT 2017	Number of heavies per day	% Heavy
1205	1N	Drury – Telemetry Site 48	51,570	6,034	*11.7*
5721	5	Eskdale – Telemetry Site 101	4,273	662	*15.5*
6281	35	Hamanatua Bridge – Telemetry Site 108	5,024	462	*9.2*
8961	2	Kairua – Telemetry Site 120	32,930	2,733	*8.3*
8821	1S	Rakaia – Telemetry Site 121	13,176	1,871	*14.2*
421	1N	Tokoroa – Telemetry Site 51	10,324	1,755	*17.0*
518	1S	Waipara – Telemetry Site 52	8,510	1,481	*17.4*

% Heavy – is the estimate of the proportion of the heavy vehicles per day over AADT.

Chart 9 | AADT frequency distribution by WiM site and by vehicle class

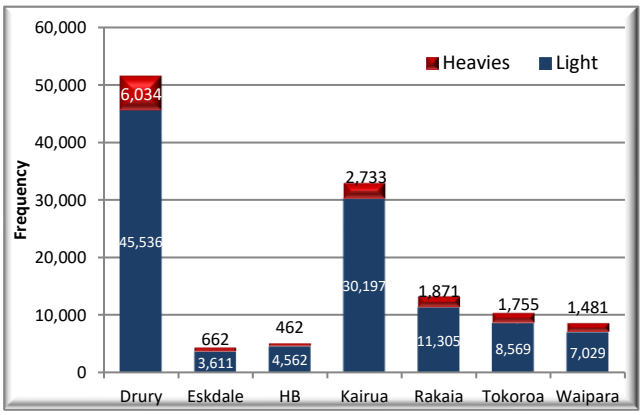
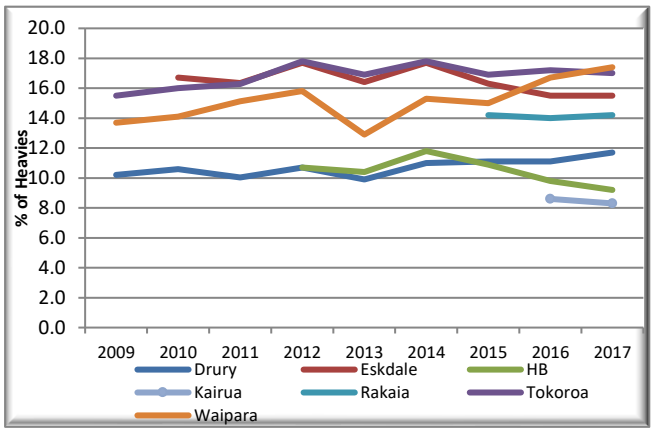


Chart 10 | Heavy vehicles proportion from AADT



13.0 VEHICLE FLEET DISTRIBUTION TABLES

PAT class – This is the code used in the PAT system to represent different axle configurations.
Description – This illustrates the PAT type by providing an indication of the spacing between axles.
Total volume – This indicates the number of heavy vehicles for each PAT class.

Table 7.0 | Heavy vehicles frequency and percentage distributions by vehicle type, by PAT class, and by WiM site

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Rakaia		Waipara		Eskdale		Kairua		Hamanatua Bridge		Total Volume	%
				Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%		
A&B Train	HCV2	74	o-oo--oo-o--oATrain	80	0.0	70	0.0	5	0.0	1	0.0	1	0.0	26	0.0	11	0.0	194	0.0
		622	o--o--oo--o-o(Atrain)	29	0.0	26	0.0	25	0.0	2	0.0	4	0.0	.	.	1	0.0	87	0.0
		811	o--oo--oo--ooo(Btrain)	654	0.0	330	0.1	287	0.1	152	0.0	186	0.1	907	0.1	117	0.1	2,633	0.1
		851	o-oo--ooo--ooBTrain	26,867	1.6	13,227	2.3	15,783	3.0	14,688	3.2	5,653	2.6	10,178	1.4	394	0.3	86,790	2.0
		951	o-oo-ooo-oooBTrain	64,570	3.9	43,246	7.5	19,973	3.8	37,236	8.0	9,296	4.3	17,027	2.3	30	0.0	191,378	4.4
		1032	o-oo-ooo-ooooBTrain	13	0.0	.	.	.	.	.	.	.	.	1	0.0	.	.	14	0.0
Artic	Bus&HCV1	30	o-o--o	2,544	0.2	1,195	0.2	1,364	0.3	843	0.2	567	0.3	463	0.1	21	0.0	6,997	0.2
	HCV1	41	o-o--oo	17,948	1.1	4,405	0.8	2,804	0.5	1,603	0.3	2,421	1.1	2,360	0.3	131	0.1	31,672	0.7
		42	o-oo--o	56	0.0	26	0.0	91	0.0	51	0.0	4	0.0	24	0.0	.	.	252	0.0
	HCV2	53	o-oo--ooT&T	35,747	2.2	5,176	0.9	3,602	0.7	3,417	0.7	1,617	0.7	5,259	0.7	1,536	1.1	56,354	1.3
		57	o--o-----ooo(artic)	3,352	0.2	1,539	0.3	995	0.2	1,326	0.3	1,037	0.5	1,527	0.2	47	0.0	9,823	0.2
		68	oo--oo--ooT&T	16,548	1.0	9,680	1.7	4,425	0.8	4,725	1.0	1,361	0.6	1,230	0.2	221	0.2	38,190	0.9
		69	o-oo--ooo	98,479	6.0	17,985	3.1	22,813	4.3	15,623	3.4	4,765	2.2	28,198	3.9	663	0.5	188,526	4.4
		713	oo-oo--oooTriArtic	15,169	0.9	3,185	0.6	4,683	0.9	2,456	0.5	1,290	0.6	5,213	0.7	5	0.0	32,001	0.7
		747	o--ooo---oooTriArtic	29	0.0	7	0.0	5	0.0	13	0.0	1	0.0	1	0.0	.	.	56	0.0
		791	o-oo-ooooQuadArtic	45,806	2.8	16,571	2.9	18,420	3.5	21,114	4.5	3,285	1.5	6,274	0.9	218	0.2	111,688	2.6
		826	oo-oo--ooooQuadArtic	78,778	4.8	26,629	4.6	28,202	5.3	19,931	4.3	9,537	4.4	32,156	4.4	30	0.0	195,263	4.5
		847	o--ooo---ooooQuadArtic	157	0.0	17	0.0	27	0.0	87	0.0	1	0.0	4	0.0	.	.	293	0.0
Rigid	Bus&HCV1	31	o--oo	173,412	10.6	33,998	5.9	37,266	7.0	24,047	5.2	12,194	5.6	75,164	10.3	5,008	3.5	361,089	8.4
		34	oo--o	411	0.0	90	0.0	126	0.0	106	0.0	197	0.1	97	0.0	10	0.0	1,037	0.0
		301	o--oo(tractorwithoutsemi-trailer)	1,846	0.1	304	0.1	686	0.1	445	0.1	77	0.0	1,610	0.2	91	0.1	5,059	0.1
	Bus&MCV	20	o-o(wb2.0-3.2m,gw>=3.5t)	66,763	4.1	9,195	1.6	10,543	2.0	10,325	2.2	4,999	2.3	45,109	6.2	9,285	6.5	156,219	3.6
		21	o--o(wb>3.2m,gw>=3.5t)	355,449	21.7	89,228	15.4	100,118	18.8	74,989	16.1	38,364	17.7	175,172	24.1	22,578	15.9	855,898	19.9
	HCV1	45	oo--oo	83,478	5.1	37,981	6.6	24,115	4.5	33,820	7.3	28,293	13.1	88,385	12.2	46,010	32.4	342,082	8.0
		47	o--ooo	67	0.0	9	0.0	22	0.0	12	0.0	6	0.0	7	0.0	4	0.0	127	0.0
		511	oo--ooo(heavytruck)	1,135	0.1	120	0.0	52	0.0	104	0.0	47	0.0	398	0.1	42	0.0	1,898	0.0
T&T	Bus&HCV1	44	oo-o--o	20	0.0	4	0.0	29	0.0	2	0.0	3	0.0	8	0.0	.	.	66	0.0
		402	o--oo---o(trucktowlight1axtrailer)	3,123	0.2	1,161	0.2	1,286	0.2	911	0.2	583	0.3	722	0.1	97	0.1	7,883	0.2
	Bus&MCV	300	o--o--o(trucktowinglighttrailer)	30,658	1.9	4,711	0.8	9,917	1.9	5,867	1.3	2,420	1.1	6,015	0.8	927	0.7	60,515	1.4
		401	o--o--oo(trucktowlight2axtrailer)	22,652	1.4	6,987	1.2	11,095	2.1	12,009	2.6	3,573	1.7	14,155	1.9	1,557	1.1	72,028	1.7
	HCV2	52	o--oo-o--oT&T	3,270	0.2	571	0.1	1,182	0.2	725	0.2	277	0.1	1,064	0.1	228	0.2	7,317	0.2
		61	o-o--o-o--ooT&T	4	0.0	1	0.0	12	0.0	5	0.0	.	.	4	0.0	.	.	26	0.0
		62	o--oo--o-o-o(T+T)	2,054	0.1	1,246	0.2	862	0.2	1,708	0.4	984	0.5	785	0.1	339	0.2	7,978	0.2
		63	o--oo-o--ooT&T	9,648	0.6	2,089	0.4	4,407	0.8	2,499	0.5	220	0.1	2,234	0.3	324	0.2	21,421	0.5
		66	oo--oo-o--oT&T	1,173	0.1	389	0.1	806	0.2	274	0.1	231	0.1	322	0.0	330	0.2	3,525	0.1
		77	oo--oo-o--oo	9,536	0.6	3,253	0.6	4,201	0.8	4,683	1.0	1,375	0.6	3,625	0.5	3,032	2.1	29,705	0.7
		503	o--oo--oo(trucktowlighttrailer)	199	0.0	139	0.0	205	0.0	173	0.0	56	0.0	74	0.0	14	0.0	860	0.0
		751	o-oo--oo--ooB-trainorT&T	141,554	8.6	23,582	4.1	12,949	2.4	14,716	3.2	6,212	2.9	34,398	4.7	3,239	2.3	236,650	5.5
		771	oo--o--oo--oo(T+T)	13	0.0	1	0.0	.	.	1	0.0	1	0.0	1	0.0	.	.	17	0.0
T&T	HCV2	891	oo--oo-oo--ooT&T	148,673	9.1	91,783	15.9	73,638	13.8	63,911	13.7	31,856	14.7	73,976	10.2	26,687	18.8	510,524	11.9
		914	oo-oo--ooo-ooT&T	864	0.1	248	0.0	399	0.1	616	0.1	56	0.0	1,045	0.1	4	0.0	3,232	0.1
		915	oo-oo--oo-oooT&T	175,720	10.7	125,951	21.8	113,975	21.4	88,059	18.9	42,906	19.8	88,397	12.2	18,868	13.3	653,876	15.2
		1020	oo-oo-ooo-oooBTrain	1,754	0.1	1,351	0.2	568	0.1	2,356	0.5	547	0.3	3,275	0.5	.	.	9,851	0.2
		1133	oo-oo-ooo-ooooBTrain	1	0.0	.	.	.	.	.	.	.	.	.	.	.	.	1	0.0
Total				1,640,303	100	577,706	100	531,963	100	465,631	100	216,503	100	726,890	100	142,099	100	4,301,095	100
Percentage from the total				*38.1*		*13.4*		*12.4*		*10.8*		*5.0*		*16.9*		*3.3*		*100.0*	

Symbol: - no data
Top 5 with highest frequency in each WiM site
Top 5 with highest frequency across all WiM sites

Note: [1]Percentage of each PAT class from the total number of heavy vehicles per WiM site.
[2]Percentage of each WiM site total from the overall total of heavy vehicles at all WiM sites.
[3]In the new NZTA heavy vehicle classification, PAT class 751 has been split in two vehicle type categories, T&T and B Train. However, this PAT class was reported under T&T vehicle type category.

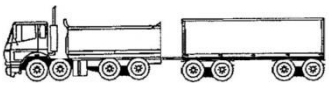
Interpretation: The 5 most frequent PAT classes in 2017 were 21 (19.9%), 915 (15.2%), 891 (11.9%), 31 (8.4%) and 45 (8%) across all WiM sites. This is the same top five as in 2016, although PAT class 915 now ranks second, rather than third as it did in 2016.

Fig. 1 | The most common PAT classes in 2017 are 21, 891, 915, 31, 45, and 751

PAT class 21:
(19.9%)

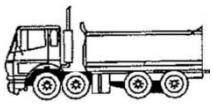
PAT class 915
(15.2%)

PAT class 891:
(11.9%)

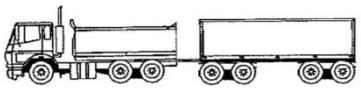


PAT class 31:
(8.4%)

PAT class 45:
(8%)



PAT class 751:
(5.5%)



- PAT classes PAT 21 is typically used for delivery goods in a local area. PAT 31 and PAT 45 are more likely used for construction activity. PAT 751, PAT 891 and PAT 915 are more typically used for long-haul trucking.
- PAT 751 and PAT 891 may get a permit for HPMV, but not for 50MAX. It has a limited access to the whole road network with a HPMV permit.
- PAT 915 may get a permit for both HPMV and 50MAX. It can have a much wider access to the whole road network with 50MAX permit.

Table 8.0 | Annual average daily heavy vehicles frequency by vehicle type and by WiM site (2013-2017)

Year	Vehicle Type	WiM Site								Average
		Drury	Eskdale	Hamanatua Bridge	Te Puke	Rakaia	Tokoroa	Waipara	Kairua	
2013	Rigid	1,744	232	267	858	-	426	369		678
	T&T	1,327	247	194	679	-	617	438		599
	Artic	829	68	8	248	-	234	144		268
	A&B Train	312	48	2	79	-	166	124		123
2013 Total		4,212	596	470	1,864	-	1,443	1,074		1,668
2014	Rigid	1,871	235	278	533	-	441	314		613
	T&T	1,455	274	204	420	-	656	484		583
	Artic	861	67	8	134	-	236	151		244
	A&B Train	305	46	1	45	-	161	131		115
2014 Total		4,492	623	492	1,132		1,495	1,080		1,554
2015	Rigid	2,028	212	265	.	508	431	290		634
	T&T	1,586	249	186	.	697	659	446		644
	Artic	887	66	8	.	265	234	128		269
	A&B Train	302	42	1	.	111	149	116		121
2015 Total		4,803	569	460	-	1,581	1,473	980		1,668
2016	Rigid	2,158	214	244	.	523	471	343	1,167	736
	T&T	1,696	233	168	.	694	683	477	779	673
	Artic	936	66	8	.	253	243	136	250	269
	A&B Train	299	42	2	.	112	155	117	100	116
2016 Total		5,089	554	422	.	1,581	1,552	1,073	2,295	1,794
2017	Rigid	2,113	233	239	.	527	484	398	1,261	724
	T&T	1,706	252	160	.	718	746	550	752	683
	Artic	974	72	8	.	267	245	197	270	282
	A&B Train	285	42	2	.	110	161	144	92	118
2017 Total		5,078	598	408	.	1,622	1,637	1,290	2,375	1,858

Symbol: - no data / site not included.
Note: [1]Annual average daily heavy vehicles referring to the number of heavy vehicles that passed per day in a given year for each or all WiM site(s). This was computed by dividing the total heavy vehicles recorded over the total accepted days for each WiM site.
[2]Average was computed by dividing the overall total heavy vehicles by the total accepted days.

- The overall annual average daily traffic for heavy vehicles increased. Unlike in previous years, the increase is not driven by Drury, where there was a negligible decrease (from 5,089 in 2016 to 5,078 in 2017). The increase was spread across Eskdale (increase of 7.9%), Rakaia (increase of 2.6%), especially Waipara (increase of 20.2%), and Kairua (increase of 3.5%).
- The annual average daily frequency of articulated trucks increased more than any other type (with rigid vehicles seeing a small decrease). This increase was seen across all sites except Hamantua bridge, where the annual average daily volume of Artic vehicles remained the same as in 2016.

Table 9.0 | Annual daily average heavy vehicles frequency by selected PAT class and by WiM site (2013–2017)

Year	Vehicle Type	WiM Site								Average
		Drury	Eskdale	Hamanatua Bridge	Kairua	Te Puke	Rakaia	Tokoroa	Waipara	
2013	21	909	88	64	–	397	–	204	207	323
	31	412	29	20	–	155	–	83	52	133
	45	219	101	154	–	251	–	111	55	156
	751	335	30	17	–	122	–	79	37	110
	891	698	170	155	–	426	–	424	299	368
	Others	1,640	177	62	–	513	–	542	423	578
2013 Total		4,212	596	470	–	1,864	–	1,443	1,074	1,668
2014	21	952	85	63	–	253	–	221	183	293
	31	469	30	18	–	91	–	87	54	125
	45	239	107	165	–	146	–	105	57	137
	751	406	32	16	–	80	–	81	39	109
	891	618	163	159	–	226	–	398	301	311
	Others	1,808	206	71	–	336	–	601	447	578
2014 Total		4,492	623	492	–	1,132	–	1,493	1,081	1,552
2015	21	1,031	88	62	–	.	285	226	165	315
	31	515	25	18	–	.	115	84	48	137
	45	250	86	153	–	.	79	96	59	122
	751	395	25	11	–	.	46	62	30	97
	891	569	125	132	–	.	315	339	225	287
	Others	2,043	222	84	–	.	741	665	452	710
2015 Total		4,804	570	460	–	.	1,580	1,472	979	1,668
2016	21	1,114	99	61	527	.	306	248	191	365
	31	555	27	15	223	.	110	91	51	154
	45	266	73	137	263	.	73	101	78	143
	751	422	17	10	141	.	39	57	27	102
	891	526	96	106	265	.	253	292	189	246
	915	466	96	28	267		304	273	189	231
	Others	1,740	146	65	609	.	495	489	347	554
2016 Total		5,089	554	422	2,295	.	1,581	1,552	1,073	1,794
2017	21	1,100	106	65	572	.	305	253	208	359
	31	537	34	14	246	.	114	96	67	152
	45	258	78	132	289	.	74	108	94	144
	751	438	17	9	112	.	39	67	41	99
	891	460	88	77	242	.	225	260	177	214
	915	544	119	54	289	.	347	357	244	275
	Others	1,740	157	57	625	.	518	496	460	563
2017 Total		5,078	598	408	2,375	.	1,622	1,637	1,290	1,806

- The annual daily average number of PAT class 891 vehicles has consistently decreased across all the WiM sites over the last five years.
- PAT class 915 vehicles has been growing, and we have included this class for 2016 onwards.

Table 9.1 | Annual number of heavy vehicles by number of axles and site (2012–2016)

Year	Site	Vehicles < 7 axles	Vehicles 7 axles	Vehicles 8 axles	Vehicles 9 axles	Vehicles 10+ axles	Total Vehicles
	Drury	855,264	188,872	423,119	41,750	3,504	1,512,509
	Eskdale	102,100	20,304	93,379	5,171	33	220,987
	Hamanatua Bridge	98,418	12,249	48,473	38	–	159,178
	Te Puke	244,406	44,339	144,584	5,132	2,009	440,470
	Tokoroa	179,976	40,693	196,214	24,235	100	441,218
	Waipara	146,144	29,402	132,172	16,590	39	324,347
2012	Total	1,626,308	335,859	1,037,941	92,916	5,685	3,098,709
	Drury	865,372	197,071	404,623	63,278	3,003	1,533,347
	Eskdale	95,015	18,285	81,608	9,350	9	204,267
	Hamanatua Bridge	103,952	10,086	56,992	228	–	171,258
	Te Puke	331,616	54,202	178,388	19,626	3,270	587,102
	Tokoroa	199,626	50,931	210,697	39,332	96	500,682
	Waipara	86,406	15,180	75,604	12,781	170	190,141
2013	Total	1,681,987	345,755	1,007,912	144,595	6,548	3,186,797
	Drury	877,959	208,077	354,783	106,770	2,201	1,549,790
	Eskdale	102,216	19,853	81,608	22,917	105	226,699
	Hamanatua Bridge	103,851	10,016	56,002	1,667	1	171,537
	Te Puke	208,519	34,962	96,384	23,984	2,764	366,613
	Tokoroa	214,968	54,361	204,915	67,701	622	542,567
	Waipara	131,907	27,724	129,985	40,358	499	330,473
2014	Total	1,639,420	354,993	923,677	263,397	6,192	3,187,679
	Drury	999,446	218,831	339,911	193,434	1,664	1,753,286
	Eskdale	85,358	13,794	59,247	31,130	194	189,723
	Hamanatua Bridge	103,569	8,785	48,781	6,798	–	167,933
	Rakaia	236,029	42,786	151,716	101,550	471	532,552
	Tokoroa	209,997	44,864	172,759	102,789	949	531,358
	Waipara	136,004	27,378	106,652	67,270	609	337,913
2015	Total	1,770,403	356,438	879,066	502,971	3,887	3,512,765
	Drury	999,992	210,696	298,567	223,457	2,683	1,735,395
	Eskdale	94,794	11,146	51,926	43,143	475	201,484
	Hamanatua Bridge	95,790	8,345	39,165	10,334	–	153,634
	Kairua	503,899	67,147	145,791	118,241	4,947	840,025
	Rakaia	258,056	41,465	138,384	130,620	661	569,186
	Tokoroa	213,246	39,480	143,615	128,594	1,109	526,044
	Waipara	124,547	22,356	71,913	72,699	239	291,754
2016	Total	2,290,324	400,635	889,361	727,088	10,114	4,317,522
	Drury	930,065	212,187	255,129	241,154	1,768	1,640,303
	Eskdale	104,300	12,165	47,233	52,258	547	216,503
	Hamanatua Bridge	89,464	6,505	27,228	18,902	–	142,099
	Kairua	450,386	49,538	117,221	106,469	3,276	726,890
	Rakaia	238,848	40,263	117,937	134,347	568	531,963
	Tokoroa	228,255	46,669	131,986	169,445	1,351	577,706
	Waipara	195,611	42,984	98,769	125,911	2,356	465,631
2017	Total	2,236,929	410,311	795,503	848,486	9,866	4,301,095

Interpretation:

- Vehicles with 8 axles no longer have the largest proportion of all vehicles for those with 7 or more. (See Chart 6 in the executive summary for percentages.) As a result there will be more longer and heavier trucks on the road.
- In 2016 there was a sharp increase in the number of vehicles with 10 or more axles. This increase has not continued, with the number of these vehicles falling slightly in 2017.

14.0 VEHICLE FLEET OVERWEIGHT TABLES

Description – This illustrates the PAT type by providing an indication of the spacing between axles.

Table 10.0 | Overweight vehicles frequency and percentage distributions by vehicle type, PAT class, and by WiM site

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Rakaia		Waipara		Eskdale		Hamanatua Bridge		Kairua		Total Volume	%
				Total Vol	%	Total Vol	%	Total Vol	%	Total Vol	%	Total Vol	%	Total Vol	%	Total Vol	%		
A&B Train	HCV2	74	o-oo--oo-o--o A Train	1	0.0	3	0.0	.	.	.	.	.	.	.	.	.	.	4	0.0
	HCV2	622	o--o--oo--o-o (A train)	.	.	.	.	1	0.0	.	.	.	.	.	.	.	.	1	0.0
	HCV2	811	o--oo--oo--ooo (B train)	147	0.1	59	0.1	160	0.2	40	0.1	47	0.1	15	0.1	386.0	0.4	854	0.1
	HCV2	851	o-oo--ooo--oo B Train	2,569	1.3	1,268	1.2	1,682	2.0	597	1.2	444	1.0	3	0.0	717.0	0.8	7,280	1.2
	HCV2	951	o-oo-ooo-ooo B Train	17,626	8.6	12,398	11.8	5,086	6.1	7,089	14.2	2,993	6.6	1	0.0	5803.0	6.6	50,996	8.5
	HCV2	1032	o-oo-ooo-oooo B Train	6	0.0	.	.	.	.	.	.	.	.	.	.	1.0	0.0	7	0.0
Artic	Bus & HCV1	30	o-o--o	.	.	.	.	.	.	.	.	.	.	.	.	1.0	0.0	1	0.0
	HCV1	41	o-o--oo	31	0.0	2	0.0	.	.	.	.	.	.	.	.	3.0	0.0	36	0.0
	HCV1	42	o-oo--o	.	.	3	0.0	1	0.0	.	.	1	0.0	.	.	7.0	0.0	12	0.0
	HCV2	53	o-oo--oo T&T	2,902	1.4	41	0.0	32	0.0	9	0.0	6	0.0	9	0.0	69.0	0.1	3,068	0.5
	HCV2	57	o--o-----ooo (artic)	31	0.0	1	0.0	.	.	.	.	4	0.0	.	.	.	.	36	0.0
	HCV2	68	oo--oo--oo T & T	12	0.0	11	0.0	2	0.0	1	0.0	2	0.0	.	.	5.0	0.0	33	0.0
	HCV2	69	o-oo--ooo	7,903	3.9	914	0.9	1,490	1.8	245	0.5	258	0.6	55	0.2	1069.0	1.2	11,934	2.0
	HCV2	713	oo-oo--ooo Tri Artic	169	0.1	21	0.0	32	0.0	2	0.0	21	0.0	1	0.0	3.0	0.0	249	0.0
	HCV2	747	o--ooo---ooo Tri Artic	4	0.0	.	.	.	.	.	.	.	.	.	.	.	.	4	0.0
	HCV2	791	o-oo-oooo Quad Artic	3,847	1.9	1,060	1.0	1,238	1.5	541	1.1	173	0.4	49	0.2	247.0	0.3	7,155	1.2
	HCV2	826	oo-oo--oooo Quad Artic	9,273	4.5	2,645	2.5	3,449	4.1	465	0.9	836	1.8	1	0.0	1035.0	1.2	17,704	2.9
	HCV2	847	o--ooo---oooo Quad Artic	20	0.0	2	0.0	.	.	5	0.0	.	.	.	.	.	.	27	0.0
Rigid	Bus & HCV1	31	o--oo	30,356	14.8	3,770	3.6	4,257	5.1	2,388	4.8	1,286	2.8	673	2.7	14166.0	16.1	56,896	9.5
	Bus & HCV1	34	oo--o	21	0.0	2	0.0	16	0.0	1	0.0	.	.	3	0.0	2.0	0.0	45	0.0
	Bus & HCV1	301	o--oo (tractor without semi-trailer)	168	0.1	28	0.0	9	0.0	8	0.0	3	0.0	.	.	50.0	0.1	266	0.0
	Bus & MCV	203	o-o (wb 2.0-3.2m, gw >= 3.5t)	1	0.0	4	0.0	14	0.0	9	0.0	1	0.0	.	.	6.0	0.0	35	0.0
	Bus & MCV	213	o--o (wb >3.2m, gw >= 3.5t)	831	0.4	224	0.2	239	0.3	128	0.3	74	0.2	8	0.0	323.0	0.4	1,827	0.3
	HCV1	45	oo--oo	3,551	1.7	321	0.3	211	0.3	102	0.2	104	0.2	15	0.1	862.0	1.0	5,166	0.9
	HCV1	47	o--ooo	7	0.0	.	.	6	0.0	.	.	.	.	1	0.0	.	.	14	0.0
	HCV1	511	oo--ooo (heavy truck)	238	0.1	1	0.0	12	0.0	3	0.0	5	0.0	1	0.0	6.0	0.0	266	0.0
T&T	Bus & HCV1	402	o--oo---o(truck tow light 1 ax trailer)	1	0.0	1	0.0	8	0.0	1	0.0	.	.	.	.	.	.	11	0.0
	Bus & MCV	300	o--o--o(truck towing light trailer)	.	.	2	0.0	1	0.0	4	0.0	1	0.0	.	.	.	.	8	0.0
	Bus & MCV	401	o--o--oo(truck tow light 2 ax trailer)	18	0.0	.	.	1	0.0	.	.	.	.	.	.	.	.	19	0.0
	HCV2	52	o--oo-o--o T&T	15	0.0	1	0.0	1	0.0	2	0.0	.	.	.	.	2.0	0.0	21	0.0
	HCV2	62	o--oo--o-o-o (T+T)	410	0.2	642	0.6	306	0.4	694	1.4	350	0.8	150	0.6	233.0	0.3	2,785	0.5
	HCV2	63	o--oo-o--oo T & T	521	0.3	12	0.0	158	0.2	2	0.0	.	.	2	0.0	15.0	0.0	710	0.1
	HCV2	66	oo--oo-o--o T & T	7	0.0	1	0.0	2	0.0	.	.	.	.	1	0.0	1.0	0.0	12	0.0
	HCV2	77	oo--oo-o--oo	1,518	0.7	570	0.5	332	0.4	273	0.5	420	0.9	204	0.8	373.0	0.4	3,690	0.6
	HCV2	503	o--oo--oo (truck tow light trailer)	2	0.0	1	0.0	2	0.0	2	0.0	.	.	.	.	1.0	0.0	8	0.0
	HCV2	751	o-oo--oo--oo B-train or T&T	32,366	15.8	3,510	3.3	2,301	2.8	703	1.4	1,977	4.4	321	1.3	2232.0	2.5	43,410	7.2
	HCV2	771	oo--o--oo--oo (T+T)	2	0.0	.	.	.	.	.	.	.	.	.	.	.	.	2	0.0
	HCV2	891	oo--oo-oo--ooT&T	22,546	11.0	18,541	17.7	13,314	15.9	6,254	12.6	14,140	31.2	7,379	29.5	13594.0	15.5	95,768	15.9
	HCV2	914	oo-oo--ooo-ooT&T	185	0.1	40	0.0	104	0.1	33	0.1	9	0.0	.	.	61.0	0.1	432	0.1
	HCV2	915	oo-oo--oo-ooo T&T	67,371	32.8	58,434	55.6	48,883	58.5	29,115	58.5	21,977	48.5	16,097	64.4	44092.0	50.2	285,969	47.5
	HCV2	1020	oo-oo-ooo-ooo B Train	538	0.3	474	0.5	234	0.3	1,093	2.2	202	0.4	.	.	2448.0	2.8	4,989	0.8
	HCV2	1133	oo-oo-ooo-oooo B Train	1	0.0	.	.	.	.	.	.	.	.	.	.	.	.	1	0.0
Total				205,215	100	105,007	100	83,584	100	49,809	100	45,334	100	24,989	100	87,813	100	601,751	100
Percentage from the total				34.1		17.5		13.9		8.3		7.5		4.2				100.0	

Symbol: - no data

Top 5 with highest frequency in each WiM site

Top 5 with highest frequency across all WiM sites

Note:

[1]Percentage of each PAT class from the total number of overweight vehicles per WiM site.

[2]Percentage of overweight vehicle at each WiM site from the overall total of overweight at all WiM sites.

[3]In the new Transport Agency heavy vehicle classification, PAT class 751 has been split in two vehicle type categories, T&T and B Train. However, this PAT class was reported under T&T vehicle type category.

Interpretation: The vehicle with the largest proportion of overweight vehicles in 2017 was PAT 915 for all sites other than Hamanatua Bridge, which was also true in 2016.

Table 11.0 | Annual average daily overweight vehicles frequency[1] by vehicle type and by WiM site

Year	Vehicle Type	WiM Site								Average
		Drury	Eskdale	Hamanatua Bridge	Kairua	Te Puke	Rakaia	Tokoroa	Waipara	
2013	Rigid	60	3	2	-	18	-	8	5	17
	T&T	186	63	53	-	154	-	97	81	107
	Artic	36	3	…	-	25	-	15	6	15
	A&B Train	34	5	…	-	14	-	19	13	14
2013 Total		315	74	54	-	212	-	138	105	154
2014	Rigid	84	3	2	-	15	-	11	5	20
	T&T	249	95	43	-	129	-	148	71	123
	Artic	44	3	0	-	18	-	17	3	14
	A&B Train	39	5	0	-	11	-	25	11	15
2014 Total		395	112	44	-	178	-	210	157	173
2015	Rigid	100	2	2	-	-	16	9	4	23
	T&T	328	106	56	-	-	172	160	70	150
	Artic	49	3	0	-	-	15	12	2	14
	A&B Train	53	7	0	-	-	20	25	12	20
2015 Total		530	119	59	-	-	223	206	88	207
2016	Rigid	113	3	2	49	-	15	12	6	29
	T&T	345	94	55	211	-	195	214	118	176
	Artic	51	3	0	14	-	19	20	5	16
	A&B Train	57	9	0	22	-	24	40	22	24
2016 Total		566	108	57	296	-	252	287	150	245
2017	Rigid	109	4	2	50	-	15	12	7	27
	T&T	389	108	69	206	-	200	233	106	184
	Artic	75	4	0	8	-	19	13	4	17
	A&B Train	63	10	0	23	-	21	39	21	25
2017 Total		635	125	72	287	-	255	297	138	253

Symbol: - no data
… Below the number of accepted days

Note: [1]Annual average daily overweight heavy vehicles refers to the average number of overweight heavy vehicles that passed during a 24-hour period in a given year in each or all WiM site(s). This was computed by dividing the total overweight heavy vehicles recorded by the total accepted days for each WiM site.
[2]The average overweight vehicle per day was computed by dividing the total number overweight heavy vehicles by the total number of accepted days.
Accepted days refer to days with recorded data, which excludes shutdowns and site maintenance.

Table 12.0 | Annual average daily overweight vehicles frequency by selected PAT class and by WiM site

Year	Vehicle Type	WiM Site								Average
		Drury	Eskdale	Hamanatua Bridge	Kairua	Te Puke	Rakaia	Tokoroa	Waipara	
2013	31	54	2	2	_	16	-	7	4	15
	751	66	8	2	_	20	-	12	8	20
	826	13	2	0	_	15	-	8	2	7
	851	21	3	…	_	10	-	10	8	9
	891	94	45	48	_	104	-	68	59	70
	Others	67	14	3	_	47	-	33	24	32
2013 Total		315	74	55	_	212	-	138	105	154
2014	31	76	2	2	_	13	-	10	4	21
	751	83	8	1	_	23	-	13	5	26
	826	19	2	0	_	9	-	9	1	8
	851	21	3	0	_	7	-	11	5	8
	891	91	55	37	_	70	-	84	40	67
	Others	127	35	5	_	51	-	74	35	58
2014 Total		417	105	45	_	173	-	201	90	188
2015	31	90	2	2	_	.	14	8	4	20
	751	86	6	1	_	.	8	7	3	19
	826	20	2	0	_	.	7	6	1	6
	851	18	3	0	_	.	8	6	2	6
	891	83	54	39	_	.	56	63	24	53
	915	150	42	15	_	.	106	85	41	73
	Others	82	10	2	-	.	25	31	14	28
2015 Total		530	119	59	-	.	223	206	88	206
2016	31	103	2	2	43	.	13	10	5	26
	751	85	4	1	16	.	8	11	3	19
	826	21	2	0	6	.	10	11	2	7
	851	12	2	0	3	.	8	6	3	5
	891	71	36	30	52	.	51	65	34	49
	915	183	52	23	129	.	133	133	74	104
	Others	92	10	2	46	.	30	50	28	36
2016 Total		566	108	57	296	.	252	287	150	245
2017	31	94	4	2	46	.	13	11	7	24
	751	100	5	1	7	.	7	10	2	18
	826	29	2	0	3	.	11	7	1	7
	851	8	1	0	2	.	5	4	2	3
	891	70	39	21	44	.	41	53	17	40
	915	209	61	46	144	.	149	166	81	120
	Others	126	13	1	39	.	30	48	28	40
2017 Total		635	125	72	287	.	255	297	138	253

Interpretation (for tables 11 and 12):

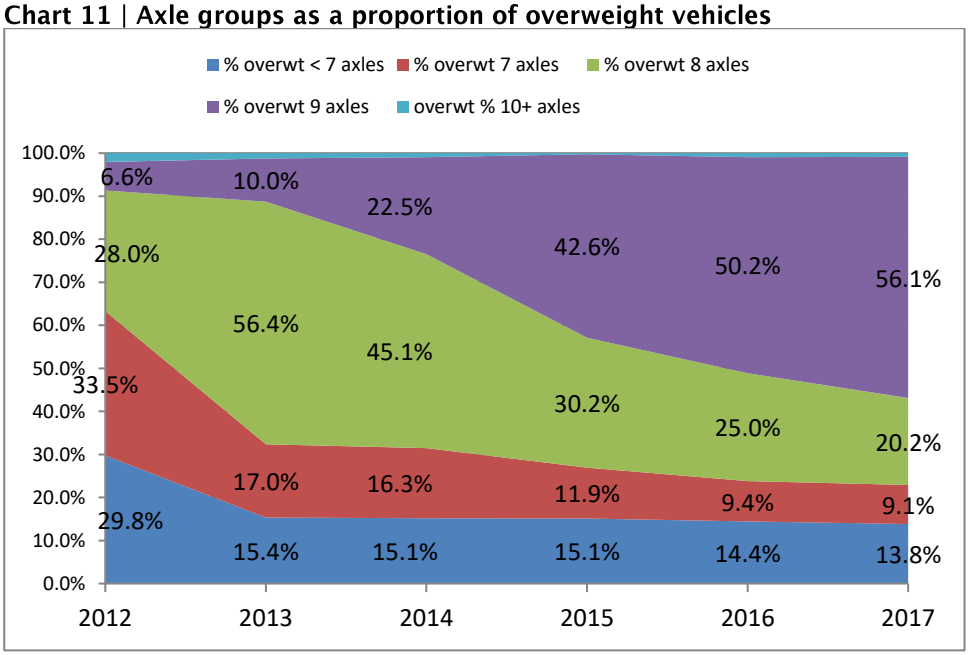
- Overall, T&T vehicles were the most frequent overweight vehicle per day in all WiM sites by a considerable margin (daily average of 184 in 2017), and that continues to be where the growth in overweight vehicle frequency is strongest.

- Overall, class 915 was the most again the most frequently overweight (daily average of 120)

Table 12.1 | Number of overweight vehicles by no. of axles and site

Year	Site	Overweight < 7 axles	Overweight 7 axles	Overweight 8 axles	Overweight 9 axles	Overweight 10+ axles	Total Overweight
	Drury	27,861	28,152	47,713	9,560	1,368	114,654
	Eskdale	1,338	4,578	17,177	2,148	–	25,241
	Hamanatua Bridge	897	1,561	17,508	57	–	20,023
	Te Puke	9,006	7,331	40,547	7,650	2,239	66,773
	Tokoroa	4,558	6,178	30,039	7,242	28	48,045
	Waipara	1,363	2,138	12,292	2,664	42	18,499
2013	Total	45,023	49,938	165,276	29,321	3,677	293,235
	Drury	35,873	33,144	45,351	28,751	813	143,932
	Eskdale	1,391	5,054	21,889	10,042	37	38,413
	Hamanatua Bridge	900	1,112	13,069	899	–	15,980
	Te Puke	7,456	9,002	28,026	9,609	2,047	56,140
	Tokoroa	6,005	7,265	37,687	21,542	245	72,744
	Waipara	2,115	2,376	13,982	9,168	64	27,705
2014	Total	53,740	57,953	160,004	80,011	3,206	354,914
	Drury	44,998	35,802	44,290	67,844	434	193,368
	Eskdale	147	238	1,603	1,261	–	3,249
	Hamanatua Bridge	1,041	774	14,183	5,428	–	21,426
	Rakaia	7,143	4,188	23,725	39,793	185	75,034
	Tokoroa	4,788	4,459	27,122	37,740	356	74,465
	Waipara	1,936	1,744	9,117	17,420	35	30,252
2015	Total	60,053	47,205	120,040	169,486	1,010	397,794
	Drury	46,451	32,683	35,433	77,447	958	192,972
	Eskdale	1,296	1,979	14,626	21,408	157	39,466
	Hamanatua Bridge	818	573	11,117	8,316	–	20,824
	Kairua	20,669	7,225	23,312	53,413	3,665	108,284
	Rakaia	7,330	4,620	24,543	53,916	246	90,655
	Tokoroa	6,283	6,049	28,100	56,483	461	97,376
	Waipara	2,172	2,610	10,687	25,330	72	40,871
2016	Total	85,019	55,739	147,818	296,313	5,559	590,448
	Drury	47,026	37,907	34,555	85,182	544	205,215
	Eskdale	2,095	2,591	15,467	24,979	202	45,334
	Hamanatua Bridge	918	575	7,398	16,098	–	24,989
	Kairua	16,821	2,855	15,732	49,956	2,449	87,813
	Rakaia	6,769	3,903	18,605	54,073	234	83,584
	Tokoroa	5,982	5,164	22,515	70,872	474	105,007
	Waipara	3,599	1,519	7,361	36,237	1,093	49,809
2017	Total	83,210	54,514	121,633	337,397	4,996	601,751

Chart 11 | Axle groups as a proportion of overweight vehicles



15.0 VEHICLE FLEET >44T/50T DISTRIBUTION TABLES

PAT type – This is the code relating to the axle configuration.
Description – This illustrates the number of axles and an indication of the spacing between axles.

Table 13.0 | Frequency and percentage distributions of heavy vehicles >44T by vehicle type, PAT class and by WiM site

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Rakaia		Waipara		Eskdale		Hamanatua Bridge		Kairua		Total Volume	%
				Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%		
A&B Train	HCV 2	811	o--oo--oo--ooo (B train)	147	0.1	59	0.1	160	0.2	40	0.1	47	0.1	15	0.1	386	0.5	854	0.2
		851	o-oo--ooo--oo B Train	2,569	1.6	1,268	1.3	1,682	2.2	597	1.3	444	1.0	3	0.0	717	1.0	7,280	1.4
		951	o-oo-ooo-ooo B Train	17,626	11.3	12,398	12.5	5,086	6.7	7,089	15.3	2,993	6.9	1	0.0	5,803	8.2	50,996	9.9
		1032	o-oo-ooo-oooo B Train	6	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	1	0.0	7	0.0
Artic	HCV 2	53	o-oo--oo T&T	7	0.0	–	0.0	–	0.0	8	0.0	1	0.0	–	0.0	12	0.0	28	0.0
		68	oo--oo--oo T & T	1	0.0	7	0.0	2	0.0	1	0.0	1	0.0	–	0.0	4	0.0	16	0.0
		69	o-oo--ooo	422	0.3	113	0.1	91	0.1	60	0.1	22	0.1	23	0.1	72	0.1	803	0.2
		713	oo-oo--ooo Tri Artic	169	0.1	21	0.0	32	0.0	2	0.0	21	0.0	1	0.0	3	0.0	249	0.0
		747	o--ooo---ooo Tri Artic	3	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	3	0.0
		791	o-oo-oooo Quad Artic	845	0.5	168	0.2	252	0.3	108	0.2	43	0.1	28	0.1	68	0.1	1,512	0.3
		826	oo-oo--oooo Quad Artic	9,273	5.9	2,645	2.7	3,449	4.5	465	1.0	836	1.9	1	0.0	1,035	1.5	17,704	3.4
		847	o--ooo---oooo Quad Artic	20	0.0	2	0.0	–	0.0	5	0.0	–	0.0	–	0.0	–	0.0	27	0.0
T&T	HCV 2	52	o--oo-o--o T&T	–	0.0	–	0.0	–	0.0	1	0.0	–	0.0	–	0.0	–	0.0	1	0.0
		62	o--oo--o-o-o (T+T)	335	0.2	592	0.6	275	0.4	591	1.3	315	0.7	136	0.6	212	0.3	2,456	0.5
		63	o--oo-o--oo T & T	521	0.3	12	0.0	158	0.2	2	0.0	–	0.0	2	0.0	15	0.0	710	0.1
		66	oo--oo-o--o T & T	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	1	0.0	1	0.0
		77	oo--oo-o--oo	1,518	1.0	570	0.6	332	0.4	273	0.6	420	1.0	204	0.8	373	0.5	3,690	0.7
		751	o-oo--oo--oo B-train or T&T	32,366	20.7	3,510	3.6	2,301	3.0	703	1.5	1,977	4.6	321	1.3	2,232	3.1	43,410	8.4
		891	oo--oo-oo--ooT&T	22,546	14.4	18,541	18.8	13,314	17.4	6,254	13.5	14,140	32.5	7,379	30.5	13,594	19.1	95,768	18.5
		914	oo-oo--ooo-ooT&T	185	0.1	40	0.0	104	0.1	33	0.1	9	0.0	–	0.0	61	0.1	432	0.1
		915	oo-oo--oo-ooo T&T	67,371	43.1	58,434	59.1	48,883	64.0	29,115	62.7	21,977	50.6	16,097	66.5	44,092	62.0	285,969	55.3
		1020	oo-oo-ooo-ooo B Train	538	0.3	474	0.5	234	0.3	1,093	2.4	202	0.5	–	0.0	2,448	3.4	4,989	1.0
		1133	oo-oo-ooo-oooo B Train	1	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	1	0.0
Total				156,469	100	98,854	100	76,355	100	46,440	100	43,448	100	24,211	100	71,129	100	516,906	100
Percentage from the total				30.3		19.1		14.8		9.0		8.4		4.7		13.8		100.0	

Symbol: – no data
Top 5 with highest frequency in each WiM site
Top 5 with highest frequency across all WiM sites

Note: [1]Percentage of each PAT class from the total number of heavy vehicles recorded as >44T per WiM site.
[2]Percentage of each WiM site from the overall total number of heavy vehicles recorded as >44T at all WiM sites.
[3]In the new Transport Agency heavy vehicle classification, PAT class 751 has been split in two vehicle type categories, T&T and B Train. This PAT class was reported under T&T vehicle type category.

Interpretation:

- In 2017, PAT Class 915 was the most frequent class of all vehicles weighing more than 44 tones gross mass, comprising 55.3 percent of vehicles across all WiM sites (increasing from 49.7 percent in 2016).
- The number of vehicles over 44 tonnes decreased in Rakaia and Kairua from 2016 to 2017, but increased in all other sites.

Table 13.1 | Frequency and percentage distributions of heavy vehicles >50T by vehicle type, PAT class and by WiM site

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Rakaia		Waipara		Eskdale		Hamamanaua Bridge		Kairua		Total Volume	%
				Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%		
A&B Train	HCV2	811	o--oo--oo--ooo (B train)	21	0.1	17	0.1	7	0.0	4	0.1	3	0.0	5	3.0	465	1.7	522	0.4
		851	o-oo--ooo--oo B Train	189	0.6	197	1.0	135	0.6	45	0.7	64	0.9	–	0.0	58	0.2	688	0.6
		951	o-oo-ooo-ooo B Train	2,725	8.4	2,642	14.1	1,309	5.5	686	9.9	689	9.8	–	0.0	2,902	10.4	10,953	9.3
Artic	HCV2	53	o-oo--oo T&T	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	3	0.0	3	0.0
		68	oo--oo--oo T & T	1	0.0	6	0.0	–	0.0	1	0.0	–	0.0	–	0.0	2	0.0	10	0.0
		69	o-oo--ooo	13	0.0	61	0.3	14	0.1	12	0.2	–	0.0	6	3.6	13	0.0	119	0.1
		713	oo-oo--ooo Tri Artic	–	0.0	4	0.0	–	0.0	1	0.0	–	0.0	–	0.0	1	0.0	6	0.0
		791	o-oo-oooo Quad Artic	6	0.0	20	0.1	11	0.0	4	0.1	–	0.0	–	0.0	5	0.0	46	0.0
		826	oo-oo--oooo Quad Artic	42	0.1	201	1.1	36	0.2	17	0.2	3	0.0	–	0.0	5	0.0	304	0.3
T&T	HCV2	62	o--oo--o-o-o (T+T)	80	0.2	347	1.8	159	0.7	191	2.8	81	1.2	83	49.4	169	0.6	1,110	0.9
		63	o--oo-o--oo T & T	5	0.0	2	0.0	1	0.0	–	0.0	–	0.0	4	2.4	1	0.0	13	0.0
		66	oo--oo-o--o T & T	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	1	0.0	1	0.0
		77	oo--oo-o--oo	16	0.0	38	0.2	3	0.0	28	0.4	–	0.0	–	0.0	7	0.0	92	0.1
		751	o-oo--oo--oo B-train or T&T	721	2.2	295	1.6	33	0.1	11	0.2	6	0.1	1	0.6	51	0.2	1,118	1.0
		891	oo--oo-oo--oo T&T	2,226	6.8	1,129	6.0	882	3.7	347	5.0	297	4.2	3	1.8	930	3.3	5,814	5.0
		914	oo-oo--ooo-oo T&T	4	0.0	3	0.0	13	0.1	1	0.0	–	0.0	–	0.0	–	0.0	21	0.0
		915	oo-oo--oo-ooo T&T	25,777	79.3	13,642	72.7	21,290	88.9	5,565	80.5	5,852	83.4	66	39.3	20,278	72.6	92,470	78.8
		1020	oo-oo-ooo-ooo B Train	693	2.1	166	0.9	67	0.3	2	0.0	19	0.3	–	0.0	3,056	10.9	4,003	3.4
Total				32,519	100	18,770	100	23,960	100	6,915	100	7,014	100	168	100	27,947	100	117,293	100
Percentage from the total				27.7		16.0		20.4		5.9		6.0		0.1		23.8		100.0	

Symbol: – no data
Top 5 with highest frequency in each WiM site
Top 5 with highest frequency across all WiM sites

Note: [1]Percentage of each PAT class from the total number of overweight vehicles recorded as >50T per WiM site.
[2]Percentage of each WiM site from the overall total number of overweight vehicles recorded as >50T at all WiM sites.

Interpretation:

- Among all heavy vehicles with gross mass more than 50 tonnes, PAT Class 915 was the most frequent (80.6%) The proportion made up by classes 891, 951 and 1020 are similar to 2016 (decreasing by .2%, .3% and 1.4%, respectively).
- The proportion of all vehicles over 50 tonnes that have 8 axles (PAT classes 811, 851, 826, and 891) has declined slightly, from 6.3% in 2016 to 5.3% in 2017.
- Drury continues to have major growth in vehicles over 50 tonnes, with 6,301 in 2014, 24,227 in 2015, 32,519 in 2016, and 37,210 in 2017. Eskdale also saw considerab;e growth, from 7,014 in 2016 to 12,561 in 2016. Tokoroa remained virtually unchanged in terms of volume, Waipara and Kairua declined (by 2,923 and 8,785, respectively). Waipara and Hamanatua Bridge experienced very slight growth for vehicles over 50 tonnes.

16.0 VEHICLE FLEET ESTIMATED GROSS MASS

The total estimated GHVM is the total estimated mass recorded that includes the heavy vehicle mass and its load for each PAT type, vehicle group and by WiM site.

Table 14.0 | Vehicle estimated gross mass and percentage distribution by group, PAT class, and by WiM Site

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Rakaia		Waipara		Eskdale		Hamamanaua Bridge		Kairua		Tonne	%
				Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%		
A&B Train	HCV2	74	o-oo--oo-o--o A Train	1,813	0.0	1,893	0.0	135	0.0	33	0.0	28	0.0	351	0.0	870	0.0	5,121	0.0
A&B Train	HCV2	622	o--o--oo--o-o (A train)	315	0.0	362	0.0	479	0.0	31	0.0	58	0.0	13	0.0	–	0.0	1,257	0.0
A&B Train	HCV2	811	o--oo--oo--ooo (B train)	21,514	0.1	10,859	0.1	11,121	0.1	4,969	0.0	6,943	0.1	4,073	0.1	32,009	0.2	91,486	0.1
A&B Train	HCV2	851	o-oo--ooo--oo B Train	890,960	2.5	462,012	2.9	536,112	4.0	512,904	4.3	193,249	3.4	12,769	0.4	320,243	2.2	2,928,248	2.9
A&B Train	HCV2	951	o-oo-ooo-ooo B Train	2,480,985	6.8	1,715,475	10.7	763,565	5.7	1,430,351	12.0	364,006	6.4	864	0.0	621,144	4.2	7,376,388	7.3
A&B Train	HCV2	1032	o-oo-ooo-oooo B Train	548	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	51	0.0	598	0.0
Artic	Bus & HCV1	30	o-o--o	27,903	0.1	13,249	0.1	13,725	0.1	8,194	0.1	7,740	0.1	271	0.0	5,007	0.0	76,087	0.1
Artic	HCV1	41	o-o--oo	272,302	0.7	71,727	0.4	42,552	0.3	23,552	0.2	39,705	0.7	1,765	0.1	34,367	0.2	485,968	0.5
Artic	HCV1	42	o-oo--o	358	0.0	297	0.0	750	0.0	311	0.0	59	0.0	–	0.0	442	0.0	2,216	0.0
Artic	HCV2	53	o-oo--oo T&T	868,923	2.4	122,921	0.8	80,924	0.6	77,133	0.6	35,367	0.6	32,632	1.0	114,617	0.8	1,332,516	1.3
Artic	HCV2	57	o--o-----ooo (artic)	56,635	0.2	26,167	0.2	13,579	0.1	15,488	0.1	17,473	0.3	370	0.0	13,447	0.1	143,157	0.1
Artic	HCV2	68	oo--oo--oo T & T	506,793	1.4	307,014	1.9	132,946	1.0	148,853	1.2	37,967	0.7	4,758	0.1	32,410	0.2	1,170,739	1.2
Artic	HCV2	69	o-oo--ooo	2,659,938	7.3	486,700	3.0	618,505	4.7	403,222	3.4	125,094	2.2	17,829	0.5	730,652	4.9	5,041,939	5.0
Artic	HCV2	713	oo-oo--ooo Tri Artic	435,486	1.2	94,470	0.6	135,944	1.0	69,457	0.6	37,923	0.7	172	0.0	142,602	1.0	916,052	0.9
Artic	HCV2	747	o--ooo---ooo Tri Artic	1,091	0.0	236	0.0	146	0.0	472	0.0	27	0.0	–	0.0	21	0.0	1,990	0.0
Artic	HCV2	791	o-oo-oooo Quad Artic	1,366,084	3.8	534,841	3.3	564,641	4.2	657,779	5.5	97,059	1.7	6,767	0.2	178,703	1.2	3,405,873	3.4
Artic	HCV2	826	oo-oo--oooo Quad Artic	2,584,371	7.1	925,820	5.8	913,140	6.9	675,190	5.7	322,239	5.6	859	0.0	987,242	6.7	6,408,860	6.3
Artic	HCV2	847	o--ooo---oooo Quad Artic	6,025	0.0	641	0.0	948	0.0	3,090	0.0	27	0.0	–	0.0	156	0.0	10,885	0.0
Rigid	Bus & HCV1	31	o--oo	2,489,571	6.8	469,123	2.9	534,327	4.0	330,949	2.8	172,200	3.0	70,286	2.1	1,067,535	7.2	5,133,991	5.1
Rigid	Bus & HCV1	34	oo--o	5,124	0.0	962	0.0	1,816	0.0	1,087	0.0	1,214	0.0	134	0.0	1,003	0.0	11,339	0.0
Rigid	Bus & HCV1	301	o--oo (tractor without semi-trailer)	25,110	0.1	3,435	0.0	5,586	0.0	4,370	0.0	945	0.0	1,146	0.0	24,092	0.2	64,683	0.1
Rigid	Bus & MCV	20	o-o (wb 2.0-3.2m, gw >= 3.5t)	281,705	0.8	42,591	0.3	46,860	0.4	46,115	0.4	20,718	0.4	39,032	1.1	194,600	1.3	671,618	0.7
Rigid	Bus & MCV	21	o--o (wb >3.2m, gw >= 3.5t)	2,247,794	6.2	568,310	3.5	638,437	4.8	462,869	3.9	236,950	4.2	143,212	4.2	1,129,211	7.6	5,426,782	5.3
Rigid	HCV1	45	oo--oo	1,449,370	4.0	639,204	4.0	413,599	3.1	575,585	4.8	464,514	8.1	814,027	23.8	1,506,378	10.2	5,862,675	5.8
Rigid	HCV1	47	o--ooo	1,040	0.0	111	0.0	402	0.0	165	0.0	100	0.0	70	0.0	109	0.0	1,996	0.0
Rigid	HCV1	511	oo--ooo (heavy truck)	27,937	0.1	2,694	0.0	1,215	0.0	2,650	0.0	1,025	0.0	1,042	0.0	8,812	0.1	45,374	0.0
T&T	Bus & HCV1	44	oo-o--o	108	0.0	25	0.0	448	0.0	14	0.0	42	0.0	–	0.0	77	0.0	713	0.0
T&T	Bus & HCV1	402	o--oo---o(truck tow light 1 ax trailer)	33,807	0.1	14,276	0.1	14,279	0.1	8,430	0.1	5,877	0.1	893	0.0	7,597	0.1	85,157	0.1
T&T	Bus & MCV	300	o--o--o(truck towing light trailer)	173,758	0.5	25,724	0.2	55,020	0.4	29,460	0.2	13,338	0.2	5,191	0.2	31,158	0.2	333,647	0.3
T&T	Bus & MCV	401	o--o--oo(truck tow light 2 ax trailer)	145,451	0.4	49,537	0.3	68,485	0.5	73,885	0.6	23,826	0.4	9,139	0.3	83,879	0.6	454,199	0.4
T&T	HCV2	52	o--oo-o--o T&T	69,143	0.2	12,910	0.1	27,232	0.2	16,044	0.1	5,988	0.1	5,512	0.2	22,984	0.2	159,812	0.2
T&T	HCV2	61	o-o--o-o--oo T & T	33	0.0	7	0.0	183	0.0	40	0.0	–	0.0	–	0.0	29	0.0	291	0.0
T&T	HCV2	62	o--oo--o-o-o (T+T)	67,765	0.2	51,659	0.3	32,778	0.2	65,753	0.6	35,350	0.6	13,385	0.4	27,503	0.2	294,192	0.3
T&T	HCV2	63	o--oo-o--oo T & T	278,155	0.8	55,952	0.3	134,711	1.0	68,748	0.6	5,539	0.1	9,091	0.3	59,841	0.4	612,036	0.6
T&T	HCV2	66	oo--oo-o--o T & T	29,371	0.1	9,540	0.1	20,221	0.2	6,697	0.1	5,576	0.1	8,701	0.3	7,401	0.0	87,506	0.1
T&T	HCV2	77	oo--oo-o--oo	300,504	0.8	121,473	0.8	133,707	1.0	167,643	1.4	53,196	0.9	113,034	3.3	129,845	0.9	1,019,400	1.0
T&T	HCV2	503	o--oo--oo (truck tow light trailer)	3,101	0.0	2,103	0.0	3,432	0.0	2,586	0.0	936	0.0	221	0.0	1,305	0.0	13,682	0.0
T&T	HCV2	751	o-oo--oo--oo B-train or T&T	4,726,477	13.0	787,541	4.9	433,396	3.3	458,247	3.8	239,889	4.2	102,925	3.0	1,078,368	7.3	7,826,841	7.7
T&T	HCV2	771	oo--o--oo--oo (T+T)	322	0.0	26	0.0	–	0.0	23	0.0	32	0.0	–	0.0	9	0.0	410	0.0
T&T	HCV2	891	oo--oo-oo--ooT&T	4,908,195	13.5	3,226,432	20.1	2,479,393	18.7	2,195,401	18.4	1,287,135	22.6	1,131,098	33.0	2,560,105	17.3	17,787,757	17.5
T&T	HCV2	914	oo-oo--ooo-ooT&T	31,291	0.1	8,805	0.1	15,288	0.1	21,726	0.2	1,990	0.0	136	0.0	32,670	0.2	111,905	0.1
T&T	HCV2	915	oo-oo--oo-ooo T&T	6,808,152	18.7	5,103,700	31.8	4,379,086	33.0	3,261,185	27.4	1,823,188	31.9	871,855	25.5	3,496,479	23.6	25,743,644	25.3
T&T	HCV2	1020	oo-oo-ooo-ooo B Train	69,096	0.2	55,193	0.3	20,569	0.2	90,295	0.8	22,284	0.4	–	0.0	153,823	1.0	411,260	0.4
T&T	HCV2	1133	oo-oo-ooo-oooo B Train	46	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	46	0.0
Tonne				36,354,461	100	16,026,003	100	13,289,672	100	11,920,984	100	5,706,803	100	3,423,616	100	14,838,786	100	101,560,324	100
Percentage from the total				*35.8*		*15.8*		*13.1*		*11.7*		*5.6*		*3.4*		*14.6*		*100.0*	

Symbol: – no data
Top 5 with highest frequency in each WiM site
Top 5 with highest frequency across all WiM sites

Note: [1]Percentage of each PAT class from the overall gross mass per WiM site.
[2]Percentage of each WiM site from the overall gross mass at all WiM sites.

Interpretation:

- In 2017, PAT class 915 had the highest estimated gross mass recorded across all PAT classes, with 25.3% of all mass (up from 21.8% in 2016), followed by PAT class 891 at 17.5% (down from 20.7% in 2016).

The table below shows the total estimated gross mass that exceeded the standard limit of each PAT type by group for each WiM site.

Table 15.0 | Overweight vehicle estimated gross mass and percentage distribution by group, PAT class, and by WiM site

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Rakaia		Waipara		Eskdale		Hamamanaua Bridge		Kairua		Tonne	%
				Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%		
A&B Train	HCV2	74	o–oo–-oo–o–-o A Train	42	0.0	124	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	165	0.0
A&B Train	HCV2	622	o–-o–-oo–-o–o (A train)	–	0.0	–	0.0	43	0.0	–	0.0	–	0.0	–	0.0	–	0.0	43	0.0
A&B Train	HCV2	811	o–-oo–-oo–-ooo (B train)	7,443	0.1	2,914	0.1	7,908	0.2	1,876	0.1	2,383	0.1	701	0.1	19,400	0.5	42,623	0.2
A&B Train	HCV2	851	o–oo–-ooo–-oo B Train	120,706	1.3	59,265	1.2	79,535	2.0	27,641	1.2	21,029	1.0	137	0.0	33,548	0.9	341,859	1.2
A&B Train	HCV2	951	o–oo–ooo–ooo B Train	858,574	9.5	603,526	12.1	250,077	6.2	334,829	14.5	149,282	6.8	46	0.0	294,982	7.6	2,491,314	9.0
A&B Train	HCV2	1032	o–oo–ooo–oooo B Train	283	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	51	0.0	334	0.0
Artic	HCV1	41	o–o–-oo	962	0.0	73	0.0	–	0.0	–	0.0	–	0.0	–	0.0	97	0.0	1,131	0.0
Artic	HCV1	42	o–oo–-o	–	0.0	81	0.0	32	0.0	–	0.0	30	0.0	–	0.0	200	0.0	341	0.0
Artic	HCV2	53	o–oo–-oo T&T	112,761	1.3	1,583	0.0	1,282	0.0	453	0.0	235	0.0	343	0.0	2,825	0.1	119,481	0.4
Artic	HCV2	57	o–-o–----ooo (artic)	1,052	0.0	34	0.0	–	0.0	–	0.0	142	0.0	–	0.0	–	0.0	1,227	0.0
Artic	HCV2	68	oo–-oo–-oo T & T	522	0.0	569	0.0	117	0.0	60	0.0	88	0.0	–	0.0	259	0.0	1,614	0.0
Artic	HCV2	69	o–oo–-ooo	329,788	3.7	38,832	0.8	62,566	1.6	10,810	0.5	10,803	0.5	2,515	0.2	44,824	1.1	500,138	1.8
Artic	HCV2	713	oo–oo–-ooo Tri Artic	7,893	0.1	958	0.0	1,489	0.0	92	0.0	976	0.0	53	0.0	141	0.0	11,600	0.0
Artic	HCV2	747	o–-ooo–--ooo Tri Artic	186	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	186	0.0
Artic	HCV2	791	o–oo–oooo Quad Artic	169,576	1.9	46,363	0.9	54,489	1.4	23,777	1.0	7,648	0.3	2,263	0.2	10,920	0.3	315,035	1.1
Artic	HCV2	826	oo–oo–-oooo Quad Artic	431,896	4.8	123,532	2.5	161,112	4.0	21,604	0.9	39,266	1.8	49	0.0	47,721	1.2	825,178	3.0
Artic	HCV2	847	o–-ooo–--oooo Quad Artic	926	0.0	92	0.0	–	0.0	231	0.0	–	0.0	–	0.0	–	0.0	1,249	0.0
Rigid	Bus & HCV1	31	o–-oo	650,357	7.2	78,710	1.6	87,201	2.2	49,091	2.1	26,717	1.2	13,694	1.2	297,711	7.6	1,203,480	4.4
Rigid	Bus & HCV1	34	oo–-o	433	0.0	59	0.0	384	0.0	23	0.0	–	0.0	71	0.0	46	0.0	1,015	0.0
Rigid	Bus & HCV1	301	o–-oo (tractor without semi–trailer)	3,901	0.0	855	0.0	235	0.0	206	0.0	68	0.0	–	0.0	1,148	0.0	6,412	0.0
Rigid	Bus & MCV	20	o–o (wb 2.0–3.2m, gw >= 3.5t)	16	0.0	62	0.0	229	0.0	147	0.0	16	0.0	–	0.0	103	0.0	572	0.0
Rigid	Bus & MCV	21	o–-o (wb >3.2m, gw >= 3.5t)	13,279	0.1	4,106	0.1	3,788	0.1	2,050	0.1	1,177	0.1	124	0.0	5,136	0.1	29,659	0.1
Rigid	HCV1	45	oo–-oo	101,519	1.1	9,588	0.2	6,122	0.2	3,179	0.1	3,054	0.1	430	0.0	26,009	0.7	149,899	0.5
Rigid	HCV1	47	o–-ooo	199	0.0	–	0.0	173	0.0	–	0.0	–	0.0	28	0.0	–	0.0	399	0.0
Rigid	HCV1	511	oo–-ooo (heavy truck)	7,386	0.1	32	0.0	382	0.0	91	0.0	152	0.0	31	0.0	179	0.0	8,251	0.0
T&T	Bus & HCV1	402	o–-oo–--o(truck tow light 1 ax trailer)	33	0.0	31	0.0	250	0.0	31	0.0	–	0.0	–	0.0	–	0.0	344	0.0
T&T	Bus & MCV	300	o–-o–-o(truck towing light trailer)	–	0.0	50	0.0	25	0.0	114	0.0	29	0.0	–	0.0	–	0.0	217	0.0
T&T	Bus & MCV	401	o–-o–-oo(truck tow light 2 ax trailer)	354	0.0	–	0.0	21	0.0	–	0.0	–	0.0	–	0.0	–	0.0	375	0.0
T&T	HCV2	52	o–-oo–o–-o T&T	600	0.0	42	0.0	39	0.0	98	0.0	–	0.0	–	0.0	81	0.0	859	0.0
T&T	HCV2	62	o–-oo–-o–o–o (T+T)	20,222	0.2	33,717	0.7	15,693	0.4	35,142	1.5	18,160	0.8	7,821	0.7	12,092	0.3	142,846	0.5
T&T	HCV2	63	o–-oo–o–-oo T & T	24,251	0.3	561	0.0	7,402	0.2	92	0.0	–	0.0	120	0.0	701	0.0	33,126	0.1
T&T	HCV2	66	oo–-oo–o–-o T & T	308	0.0	44	0.0	87	0.0	–	0.0	–	0.0	45	0.0	55	0.0	537	0.0
T&T	HCV2	77	oo–-oo–o–-oo	71,465	0.8	26,574	0.5	15,550	0.4	12,668	0.6	19,480	0.9	9,423	0.8	17,295	0.4	172,455	0.6
T&T	HCV2	503	o–-oo–-oo (truck tow light trailer)	57	0.0	32	0.0	53	0.0	55	0.0	–	0.0	–	0.0	40	0.0	236	0.0
T&T	HCV2	751	o–oo–-oo–-oo B–train or T&T	1,531,510	17.0	164,709	3.3	107,417	2.7	32,479	1.4	92,598	4.2	14,897	1.3	103,484	2.7	2,047,092	7.4
T&T	HCV2	771	oo–-o–-oo–-oo (T+T)	82	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	82	0.0
T&T	HCV2	891	oo–-oo–oo–-ooT&T	1,080,605	12.0	868,119	17.4	633,191	15.8	294,252	12.8	675,283	30.8	341,447	29.3	638,180	16.4	4,531,075	16.4
T&T	HCV2	914	oo–oo–-ooo–ooT&T	8,781	0.1	1,854	0.0	4,957	0.1	1,514	0.1	434	0.0	–	0.0	2,827	0.1	20,365	0.1
T&T	HCV2	915	oo–oo–-oo–ooo T&T	3,431,599	38.1	2,901,226	58.1	2,494,200	62.2	1,395,924	60.6	1,115,364	50.8	771,680	66.2	2,209,529	56.6	14,319,520	51.9
T&T	HCV2	1020	oo–oo–ooo–ooo B Train	27,660	0.3	23,704	0.5	11,525	0.3	54,299	2.4	10,000	0.5	–	0.0	133,374	3.4	260,561	0.9
T&T	HCV2	1133	oo–oo–ooo–oooo B Train	46	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	46	0.0
Tonne				9,017,263	100	4,992,013	100	4,007,567	100	2,302,823	100	2,194,408	100	1,165,910	100	3,902,949	100	27,582,932	100
Percentage from the total				*32.7*		*18.1*		*14.5*		*8.3*		*8.0*		*4.2*		*14.1*		*100.0*	

Symbol: – no data
Top 5 with highest frequency in each WiM site
Top 5 with highest frequency across all WiM sites

Note: [1]Percentage of each PAT class from the overall overweight gross mass per WiM site.
[2]Percentage of each WiM site from the overall overweight gross mass at all WiM sites.

Interpretation:

- The estimated gross mass of overweight vehicles across all sites and PAT types in 2017 was 27.6 million tonnes, up 2.5% from 26.9 million tonnes in 2016.
- PAT Class 915 and 891 together contributed 68.3% of the total estimated gross mass of overweight vehicles (in 2016 this was 67.3%).
- For the first time, PAT class 915 alone made up the majority of all overweight mass, at 51.9%. In 2016 this was 46.8%.

17.0 AVERAGE ESTIMATED GHVM PER VEHICLE

The average estimated GHVM per vehicle is derived by dividing the total estimated gross mass for a PAT type by the heavy vehicle frequency in that PAT type, per WiM site and overall.

Table 16.0 | Average estimated gross mass per vehicle and rank distribution by group, PAT class, and by WiM site

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Rakaia		Waipara		Eskdale		Hamanatua Bridge		Kairua		Tonne	Rank
				Tonne	Rank	Tonne	Rank	Tonne	Rank	Tonne	Rank	Tonne	Rank	Tonne	Rank	Tonne	Rank		
A&B Train	HCV2	74	o-oo--oo-o--o A Train	22.7	25	27.0	18	26.9	19	32.5	13	27.5	16	31.9	9	33.5	10	26.40	21
A&B Train	HCV2	622	o--o--oo--o-o (A train)	10.8	36	13.9	29	19.1	24	15.5	26	14.5	31	12.5	29	.	.	14.40	32
A&B Train	HCV2	811	o--oo--oo--ooo (B train)	32.9	13	32.9	13	38.7	1	32.7	12	37.3	7	34.8	5	35.3	7	34.70	10
A&B Train	HCV2	851	o-oo--ooo--oo B Train	33.2	10	34.9	9	34.0	8	34.9	9	34.2	10	32.4	8	31.5	11	33.70	13
A&B Train	HCV2	951	o-oo-ooo-ooo B Train	38.4	5	39.7	4	38.2	4	38.4	2	39.2	4	28.8	12	36.5	5	38.50	5
A&B Train	HCV2	1032	o-oo-ooo-oooo B Train	42.1	2	.	.	.	.	.	.	.	.	.	.	50.5	1	42.70	2
Artic	Bus & HCV1	30	o-o--o	11.0	35	11.1	35	10.1	35	9.7	34	13.6	34	12.9	27	10.8	32	10.90	36
Artic	HCV1	41	o-o--oo	15.2	31	16.3	27	15.2	30	14.7	28	16.4	28	13.5	25	14.6	30	15.30	30
Artic	HCV1	42	o-oo--o	6.4	39	11.4	33	8.2	36	6.1	40	14.8	30	.	.	18.4	25	8.80	40
Artic	HCV2	53	o-oo--oo T&T	24.3	24	23.7	22	22.5	23	22.6	22	21.9	22	21.2	20	21.8	22	23.60	25
Artic	HCV2	57	o--o-----ooo (artic)	16.9	28	17.0	25	13.6	33	11.7	31	16.8	25	7.9	31	8.8	36	14.60	31
Artic	HCV2	68	oo--oo--oo T & T	30.6	16	31.7	15	30.0	15	31.5	14	27.9	15	21.5	19	26.3	18	30.70	16
Artic	HCV2	69	o-oo--ooo	27.0	20	27.1	17	27.1	18	25.8	19	26.3	19	26.9	15	25.9	19	26.70	20
Artic	HCV2	713	oo-oo--ooo Tri Artic	28.7	19	29.7	16	29.0	17	28.3	17	29.4	14	34.3	6	27.4	16	28.60	18
Artic	HCV2	747	o--ooo---ooo Tri Artic	37.6	7	33.6	11	29.1	16	36.3	5	26.5	17	.	.	20.5	24	35.50	8
Artic	HCV2	791	o-oo-oooo Quad Artic	29.8	17	32.3	14	30.7	13	31.2	15	29.5	13	31.0	11	28.5	15	30.50	17
Artic	HCV2	826	oo-oo--oooo Quad Artic	32.8	14	34.8	10	32.4	11	33.9	11	33.8	11	28.6	13	30.7	14	32.80	15
Artic	HCV2	847	o--ooo---oooo Quad Artic	38.4	5	37.7	5	35.1	7	35.5	7	26.5	17	.	.	39.0	4	37.10	6
Rigid	Bus & HCV1	31	o--oo	14.4	32	13.8	30	14.3	32	13.8	29	14.1	32	14.0	24	14.2	31	14.20	33
Rigid	Bus & HCV1	34	oo--o	12.5	34	10.7	36	14.4	31	10.3	32	6.2	38	13.4	26	10.3	34	10.90	36
Rigid	Bus & HCV1	301	o--oo (tractor without semi-trailer)	13.6	33	11.3	34	8.1	37	9.8	33	12.3	35	12.6	28	15.0	29	12.80	34
Rigid	Bus & MCV	20	o-o (wb 2.0-3.2m, gw >= 3.5t)	4.2	44	4.6	42	4.4	41	4.5	42	4.1	41	4.2	35	4.3	42	4.30	44
Rigid	Bus & MCV	21	o--o (wb >3.2m, gw >= 3.5t)	6.3	41	6.4	39	6.4	38	6.2	38	6.2	38	6.3	32	6.4	39	6.30	41
Rigid	HCV1	45	oo--oo	17.4	27	16.8	26	17.2	26	17.0	25	16.4	28	17.7	21	17.0	27	17.10	27
Rigid	HCV1	47	o--ooo	15.5	30	12.3	31	18.3	25	13.8	29	16.7	26	17.5	22	15.5	28	15.70	29
Rigid	HCV1	511	oo--ooo (heavy truck)	24.6	23	22.5	24	23.4	21	25.5	20	21.8	23	24.8	17	22.1	21	23.90	24
T&T	Bus & HCV1	44	oo-o--o	5.4	43	6.3	40	15.4	28	7.0	37	13.8	33	.	.	9.6	35	10.80	38
T&T	Bus & HCV1	402	o--oo---o(truck tow light 1 ax trailer)	10.8	36	12.3	31	11.1	34	9.3	35	10.1	36	9.2	30	10.5	33	10.80	38
T&T	Bus & MCV	300	o--o--o(truck towing light trailer)	5.7	42	5.5	41	5.5	40	5.0	41	5.5	40	5.6	34	5.2	41	5.50	43
T&T	Bus & MCV	401	o--o--oo(truck tow light 2 ax trailer)	6.4	39	7.1	37	6.2	39	6.2	38	6.7	37	5.9	33	5.9	40	6.30	41
T&T	HCV2	52	o--oo-o--o T&T	21.1	26	22.6	23	23.0	22	22.1	24	21.6	24	24.2	18	21.6	23	21.80	26
T&T	HCV2	61	o-o--o-o--oo T & T	8.3	38	6.5	38	15.3	29	7.9	36	.	.	.	.	7.3	38	11.20	35
T&T	HCV2	62	o--oo--o-o-o (T+T)	33.0	11	41.5	1	38.0	5	38.5	1	35.9	8	39.5	3	35.0	8	36.90	7
T&T	HCV2	63	o--oo-o--oo T & T	28.8	18	26.8	19	30.6	14	27.5	18	25.2	20	28.1	14	26.8	17	28.60	18
T&T	HCV2	66	oo--oo-o--o T & T	25.0	21	24.5	21	25.1	20	24.4	21	24.1	21	26.4	16	23.0	20	24.80	22
T&T	HCV2	77	oo--oo-o--oo	31.5	15	37.3	6	31.8	12	35.8	6	38.7	5	37.3	4	35.8	6	34.30	12
T&T	HCV2	503	o--oo--oo (truck tow light trailer)	15.6	29	15.1	28	16.7	27	14.9	27	16.7	26	15.8	23	17.6	26	15.90	28
T&T	HCV2	751	o-oo--oo--oo B-train or T&T	33.4	9	33.4	12	33.5	10	31.1	16	38.6	6	31.8	10	31.3	12	33.10	14
T&T	HCV2	771	oo--o--oo--oo (T+T)	24.7	22	25.5	20	.	.	22.5	23	31.5	12	.	.	8.5	37	24.10	23
T&T	HCV2	891	oo--oo-oo--ooT&T	33.0	11	35.2	8	33.7	9	34.4	10	40.4	3	42.4	2	34.6	9	34.80	9
T&T	HCV2	914	oo-oo--ooo-ooT&T	36.2	8	35.5	7	38.3	3	35.3	8	35.5	9	34.0	7	31.3	12	34.60	11
T&T	HCV2	915	oo-oo--oo-ooo T&T	38.7	4	40.5	3	38.4	2	37.0	4	42.5	1	46.2	1	39.6	3	39.40	4
T&T	HCV2	1020	oo-oo-ooo-ooo B Train	39.4	3	40.9	2	36.2	6	38.3	3	40.7	2	.	.	47.0	2	41.70	3
T&T	HCV2	1133	oo-oo-ooo-oooo B Train	45.5	1	.	.	.	.	.	.	.	.	.	.	.	.	45.50	1
Tonne				22.2		27.7		25.0		25.6		26.4		24.1		20.4		23.6	

Symbol: - no data
Top 5 with highest frequency in each WiM site
Top 5 with highest frequency across all WiM sites

Interpretation:

- During 2017, the average estimated gross mass per vehicle was 23.6 tonnes regardless of PAT class. For 2016 and 2015 this was 23.3 and 24 tonnes, respectively.
- The average estimated gross mass for PAT 915 was 39.4 tonnes, with little change from 2016 (when it was 39.5 tonnes). The average mass for PAT 891 was 34.8 (it was 35.2 in 2016 and 35.3 tonnes in 2015).
- PAT class 1020 had an average mass of 41.7 (it was 43.9 in 2016 and 39 tonnes in 2015).

Table 17.0 | Overweight average estimated gross mass per vehicle and rank distribution by group, PAT class, and by WiM site

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Rakaia		Waipara		Eskdale		Hamamanaua Bridge		Kairua		Tonne	Rank
				Tonne	Rank	Tonne	Rank	Tonne	Rank	Tonne	Rank	Tonne	Rank	Tonne	Rank	Tonne	Rank		
A&B Train	HCV2	74	o-oo--oo-o--o A Train	41.5	22	41.2	20	.	.	.	.	.	.	.	.	.	.	41.3	23
A&B Train	HCV2	622	o--o--oo--o-o (A train)	.	.	.	.	42.5	17	.	.	.	.	.	.	.	.	42.5	21
A&B Train	HCV2	811	o--oo--oo--ooo (B train)	50.6	3	49.4	5	49.4	4	46.9	9	50.7	3	46.7	6	50.3	7	49.9	4
A&B Train	HCV2	851	o-oo--ooo--oo B Train	47.0	11	46.7	10	47.3	9	46.3	12	47.4	8	45.5	12	46.8	10	47.0	11
A&B Train	HCV2	951	o-oo-ooo-ooo B Train	48.7	5	48.7	6	49.2	6	47.2	7	49.9	4	45.5	12	50.8	5	48.9	5
A&B Train	HCV2	1032	o-oo-ooo-oooo B Train	47.2	9	.	.	.	.	.	.	.	.	.	.	50.5	6	47.6	7
Artic	HCV1	41	o-o--oo	31.0	28	36.5	22	.	.	.	.	.	.	.	.	32.2	22	31.4	28
Artic	HCV1	42	o-oo--o	.	.	26.8	30	31.5	22	.	.	29.5	19	.	.	28.5	25	28.4	34
Artic	HCV2	53	o-oo--oo T&T	38.9	25	38.6	21	40.1	19	50.3	3	39.2	16	38.1	15	40.9	19	38.9	26
Artic	HCV2	57	o--o-----ooo (artic)	33.9	26	33.5	23	.	.	.	.	35.5	17	.	.	.	.	34.1	27
Artic	HCV2	68	oo--oo--oo T & T	43.5	20	51.7	2	58.5	1	59.5	1	44.0	14	.	.	51.8	4	48.9	5
Artic	HCV2	69	o-oo--ooo	41.7	21	42.5	18	42.0	18	44.1	18	41.9	15	45.7	11	41.9	18	41.9	22
Artic	HCV2	713	oo-oo--ooo Tri Artic	46.7	12	45.6	15	46.5	14	46.0	15	46.5	11	52.5	2	46.8	10	46.6	14
Artic	HCV2	747	o--ooo---ooo Tri Artic	46.5	14	.	.	.	.	.	.	.	.	.	.	.	.	46.5	16
Artic	HCV2	791	o-oo-oooo Quad Artic	44.1	18	43.7	16	44.0	15	44.0	19	44.2	13	46.2	9	44.2	17	44.0	20
Artic	HCV2	826	oo-oo--oooo Quad Artic	46.6	13	46.7	10	46.7	12	46.5	10	47.0	9	48.5	4	46.1	16	46.6	14
Artic	HCV2	847	o--ooo---oooo Quad Artic	46.3	16	46.0	14	.	.	46.1	14	.	.	.	.	.	.	46.2	17
Rigid	Bus & HCV1	31	o--oo	21.4	34	20.9	32	20.5	30	20.6	27	20.8	23	20.3	20	21.0	28	21.2	38
Rigid	Bus & HCV1	34	oo--o	20.6	35	29.5	29	24.0	29	22.5	26	.	.	23.5	19	23.0	26	22.5	37
Rigid	Bus & HCV1	301	o--oo (tractor without semi-trailer)	23.2	33	30.5	26	26.1	27	25.8	25	22.5	22	.	.	23.0	26	24.1	36
Rigid	Bus & MCV	20	o-o (wb 2.0-3.2m, gw >= 3.5t)	15.5	38	15.5	34	16.4	32	16.3	28	15.5	25	.	.	17.2	29	16.3	40
Rigid	Bus & MCV	21	o--o (wb >3.2m, gw >= 3.5t)	16.0	37	18.3	33	15.8	33	16.0	29	15.9	24	15.5	21	15.9	30	16.2	41
Rigid	HCV1	45	oo--oo	28.6	30	29.9	28	29.0	24	31.2	20	29.4	20	28.6	17	30.2	23	29.0	32
Rigid	HCV1	47	o--ooo	28.4	32	.	.	28.8	25	.	.	.	.	27.5	18	.	.	28.5	33
Rigid	HCV1	511	oo--ooo (heavy truck)	31.0	28	31.5	24	31.8	21	30.2	22	30.3	18	30.5	16	29.8	24	31.0	30
T&T	Bus & HCV1	402	o--oo---o(truck tow light 1 ax trailer)	32.5	27	30.5	26	31.3	23	30.5	21	.	.	.	.	.	.	31.2	29
T&T	Bus & MCV	300	o--o--o(truck towing light trailer)	.	.	25.0	31	24.5	28	28.5	23	28.5	21	.	.	.	.	27.1	35
T&T	Bus & MCV	401	o--o--oo(truck tow light 2 ax trailer)	19.7	36	.	.	20.5	30	.	.	.	.	.	.	.	.	19.7	39
T&T	HCV2	52	o--oo-o--o T&T	40.0	24	41.5	19	38.5	20	49.0	5	.	.	.	.	40.5	20	40.9	25
T&T	HCV2	62	o--oo--o-o-o (T+T)	49.3	4	52.5	1	51.3	2	50.6	2	51.9	1	52.1	3	51.9	3	51.3	2
T&T	HCV2	63	o--oo-o--oo T & T	46.5	14	46.8	8	46.8	10	46.0	15	.	.	60.0	1	46.7	12	46.7	12
T&T	HCV2	66	oo--oo-o--o T & T	43.9	19	43.5	17	43.5	16	.	.	.	.	44.5	14	54.5	1	44.8	19
T&T	HCV2	77	oo--oo-o--oo	47.1	10	46.6	12	46.8	10	46.4	11	46.4	12	46.2	9	46.4	13	46.7	12
T&T	HCV2	503	o--oo--oo (truck tow light trailer)	28.5	31	31.5	24	26.5	26	27.5	24	.	.	.	.	39.5	21	29.5	31
T&T	HCV2	751	o-oo--oo--oo B-train or T&T	47.3	8	46.9	7	46.7	12	46.2	13	46.8	10	46.4	7	46.4	13	47.2	9
T&T	HCV2	771	oo--o--oo--oo (T+T)	41.0	23	.	.	.	.	.	.	.	.	.	.	.	.	41.0	24
T&T	HCV2	891	oo--oo-oo--ooT&T	47.9	6	46.8	8	47.6	8	47.1	8	47.8	7	46.3	8	46.9	9	47.3	8
T&T	HCV2	914	oo-oo--ooo-ooT&T	47.5	7	46.4	13	47.7	7	45.9	17	48.2	6	.	.	46.3	15	47.1	10
T&T	HCV2	915	oo-oo--oo-ooo T&T	50.9	2	49.6	4	51.0	3	47.9	6	50.8	2	47.9	5	50.1	8	50.1	3
T&T	HCV2	1020	oo-oo-ooo-ooo B Train	51.4	1	50.0	3	49.3	5	49.7	4	49.5	5	.	.	54.5	1	52.2	1
T&T	HCV2	1133	oo-oo-ooo-oooo B Train	45.5	17	.	.	.	.	.	.	.	.	.	.	.	.	45.5	18
			Tonne	43.9		47.5		47.9		46.2		48.4		46.7				45.8	

Symbol: - no data
Top 5 with highest frequency in each WiM site
Top 5 with highest frequency across all WiM sites

Interpretation:

- The overall mass of overweight vehicles was 45.5 tonnes in 2017. It was 45.6 tonnes in 2016, 45.1 tonnes in 2015 and 44.3 tonnes in 2014. There is an overall slight increasing trend, but there was no increase in 2017.

18.0 AXLE GROUP LOAD DISTRIBUTION TABLES

The maximum axle load on an axle group is defined in the Land Transport Rule: Vehicle Dimensions and Mass 2002.

Axle limits are designed to manage the impact of heavy vehicles on pavements.

Load (kN) – kilo newton is the load imposed by each axle type.

Table 18.0 | Axle group approximate maximum mass limit

Axle group	Approximate maximum mass limit (kN)
SAST – Single Axle Single Tyre	60
SADT – Single Axle Dual Tyre	80
TADT – Tandem Axle Dual Tyre	150
TSST – Twin Steer Single Tyre	110
TRDT – Triple Axle Dual Tyre	180
QADT – Quad Axle Dual Tyre	200

Note that the current WiM data from which the following table is derived cannot distinguish between single and dual tyres. It is assumed that steer axles are single tyred and all others are dual tyred. From observation, there is an increase in the use of 'super single' type tyres in the SADT, TADT, TAST and TRDT groups. However, the impact or significance cannot be measured or derived from the technology currently used. Despite the QADT description, 80–90 percent of quad axles are single tyred. The highlighted sections indicate the peaks in load per axle group.

Table 19.0 | Site: 01N00463 (Drury)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	0.4%	6.5%	0.3%	.	.	.
20	23.2%	31.8%	2.2%	0.0%	0.0%	.
30	16.3%	25.1%	4.0%	0.1%	0.2%	0.0%
40	10.7%	13.8%	8.8%	0.3%	2.2%	0.2%
50	18.9%	9.0%	8.2%	0.6%	8.0%	1.4%
60	23.2%	6.0%	8.9%	2.4%	8.3%	5.3%
70	6.4%	3.9%	6.8%	11.7%	8.3%	8.3%
80	0.8%	2.4%	5.9%	22.2%	7.0%	10.0%
90	0.0%	1.0%	5.7%	22.5%	6.3%	6.9%
100	0.0%	0.3%	6.7%	23.1%	6.5%	5.1%
110	.	0.1%	8.1%	13.3%	6.4%	4.5%
120	.	0.0%	8.4%	3.3%	6.2%	4.1%
130	.	0.0%	7.8%	0.5%	6.2%	3.8%
140	.	0.0%	6.9%	0.1%	6.4%	4.0%
150	.	0.0%	5.3%	0.0%	6.2%	4.2%
160	.	0.0%	3.2%	0.0%	5.6%	4.3%
170	.	.	1.6%	0.0%	5.0%	4.6%
180	.	.	0.7%	.	4.5%	5.1%
190	.	.	0.3%	.	3.3%	6.3%
200	.	.	0.1%	.	1.7%	7.8%
210	.	.	0.0%	.	0.7%	7.5%
220	.	.	0.0%	.	0.4%	3.9%
230	.	.	0.0%	.	0.2%	1.6%
240	.	.	0.0%	.	0.1%	0.6%
250	.	.	0.0%	0.0%	0.0%	0.2%
260	.	.	0.0%	.	0.0%	0.1%
270	.	.	.	.	0%	0%

Symbol: . – no data
— approximate axle group mass legal limit

Table 19.1 | Site: 00500259 (Eskdale)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	1.9%	5.5%	0.3%	.	.	.
20	32.9%	36.5%	2.9%	0.0%	0.0%	.
30	14.5%	24.1%	2.5%	0.1%	0.5%	0.0%
40	9.6%	10.2%	3.4%	0.3%	1.3%	0.4%
50	18.5%	8.0%	4.3%	0.9%	3.9%	1.3%
60	18.7%	6.1%	4.9%	3.7%	6.4%	2.3%
70	3.7%	4.9%	5.1%	13.0%	6.6%	4.4%
80	0.2%	2.7%	6.3%	22.3%	5.7%	7.0%
90	0.0%	1.1%	8.2%	25.5%	4.8%	6.3%
100	0.0%	0.4%	10.1%	23.9%	5.6%	5.7%
110	.	0.2%	11.2%	9.0%	6.4%	5.9%
120	.	0.2%	11.7%	1.1%	6.8%	5.6%
130	.	0.1%	10.2%	0.1%	7.3%	5.5%
140	.	0.0%	8.7%	0.0%	8.8%	6.0%
150	.	0.0%	6.4%	0.0%	9.7%	5.7%
160	.	0.0%	3.0%	0.0%	9.5%	5.7%
170	.	.	0.8%	0.0%	7.5%	6.5%
180	.	.	0.2%	0.0%	4.6%	7.4%
190	.	.	0.0%	0.0%	2.6%	7.0%
200	.	.	0.0%	0.0%	1.3%	6.7%
210	.	.	0.0%	.	0.5%	4.9%
220	.	.	0.0%	.	0.2%	3.1%
230	.	.	0.0%	.	0.1%	1.5%
240	.	.	0.0%	.	0.0%	0.7%
250	.	.	0.0%	.	0.0%	0.2%
260	.	.	0.0%	.	0.0%	0.1%
270	.	.	.	.	0.0%	0.1%

Table 19.2 | Site: 00200166 (Kairua)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	2%	3%	1%	.	0%	.
20	27%	34%	3%	0%	0%	.
30	23%	26%	3%	0%	0%	0%
40	13%	14%	9%	0%	2%	0.0%
50	20%	10%	7%	0%	9%	0.4%
60	14%	6%	10%	4%	13%	4.1%
70	3%	4%	6%	20%	9%	12.0%
80	0%	2%	5%	28%	5%	12.3%
90	0%	1%	6%	22%	3%	14.9%
100	0%	0%	8%	19%	3%	5.0%
110	.	0%	10%	7%	4%	3.0%
120	.	0%	8%	1%	4%	1.9%
130	.	0%	6%	0%	5%	1.7%
140	.	0%	7%	0%	8%	1.6%
150	.	0%	6%	0%	9%	1.8%
160	.	.	3%	0%	8%	2.5%
170	.	.	1%	0%	7%	4.5%
180	.	.	0%	0%	6%	7.1%
190	.	.	0%	0%	3%	10.9%
200	.	.	0%	0%	1%	9.9%
210	.	.	0%	0%	0%	4%
220	.	.	0%	.	0%	1%
230	.	.	0%	0%	0%	0%
240	.	.	0%	.	0%	0%
250	.	.	0%	.	0%	0%
260	.	.	0%	.	0%	0%
270	.	.	0%	.	0%	0%

Table 19.3 | Site: 03500321 (Hamanatua Bridge)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	1%	4%	1%	.	.	.
20	42%	40%	3%	0%	0%	.
30	27%	26%	1%	0%	0%	.
40	9%	10%	2%	0%	0%	.
50	11%	6%	2%	0%	1%	.
60	8%	4%	3%	1%	2%	.
70	2%	4%	2%	14%	3%	3%
80	0%	4%	3%	42%	1%	4%
90	0%	1%	8%	31%	1%	17%
100	0%	0%	18%	9%	1%	24%
110	.	0%	19%	1%	1%	1%
120	.	0%	11%	0%	3%	2%
130	.	0%	4%	0%	12%	1%
140	.	0%	7%	0%	33%	2%
150	.	0%	11%	0%	29%	3%
160	.	.	4%	0%	10%	2%
170	.	.	0%	0%	2%	2%
180	.	.	0%	.	0%	1%
190	.	.	0%	.	0%	4%
200	.	.	0%	.	0%	5%
210	.	.	0%	.	0%	6%
220	.	.	.	.	0%	1%
230	.	.	.	.	0%	3%
240	.	.	.	.	0%	6%
250	.	.	.	.	0%	5%
260	.	.	0%	.	0%	4%
270	.	.	.	.	0%	2%

Table 19.4 | Site: 01S00401 (Rakaia)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	2%	7%	1%	.	.	.
20	34%	38%	4%	0%	0%	.
30	14%	23%	2%	0%	0%	.
40	8%	11%	9%	0%	1%	0%
50	19%	7%	7%	0%	12%	0%
60	18%	5%	10%	1%	8%	2%
70	3%	4%	7%	11%	8%	4%
80	0%	3%	7%	26%	7%	10%
90	0%	1%	6%	21%	5%	11%
100	0%	0%	7%	22%	5%	10%
110	.	0%	8%	14%	5%	6%
120	.	0%	8%	3%	5%	4%
130	.	0%	8%	0%	6%	4%
140	.	0%	7%	0%	7%	4%
150	.	0%	5%	0%	8%	4%
160	.	0%	3%	0%	7%	4%
170	.	.	1%	0%	6%	5%
180	.	.	0%	0%	5%	5%
190	.	.	0%	0%	2%	6%
200	.	.	0%	0%	1%	6%
210	.	.	0%	.	1%	6%
220	.	.	0%	.	0%	4%
230	.	.	0%	.	0%	2%
240	.	.	0%	.	0%	1%
250	.	.	.	.	0%	0%
260	.	.	.	.	0%	0%
270	.	.	0%	0%	0%	0%

Table 19.5 | Site: 01N00628 (Tokoroa)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	1%	4%	0%	.	.	.
20	22%	30%	1%	0%	0%	.
30	14%	24%	3%	0%	0%	0%
40	11%	13%	8%	0%	2%	0%
50	19%	12%	6%	0%	5%	0%
60	27%	8%	7%	1%	6%	1%
70	5%	5%	5%	8%	6%	3%
80	0%	3%	6%	25%	5%	5%
90	0%	1%	7%	26%	5%	6%
100	0%	0%	10%	29%	6%	6%
110	.	0%	12%	9%	7%	6%
120	.	0%	10%	1%	8%	5%
130	.	0%	9%	0%	9%	6%
140	.	0%	8%	0%	10%	6%
150	.	0%	5%	0%	11%	6%
160	.	0%	2%	0%	8%	7%
170	.	.	1%	0%	5%	7%
180	.	.	0%	0%	3%	8%
190	.	.	0%	0%	2%	8%
200	.	.	0%	.	1%	8%
210	.	.	0%	.	0%	6%
220	.	.	0%	.	0%	3%
230	.	.	0%	.	0%	1%
240	.	.	0%	.	0%	1%
250	.	.	0%	.	0%	0%
260	.	.	0%	.	0%	0%
270	.	.	0%	.	0%	0%

Table 19.6 | Site: 01S00285 (Waipara)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	3%	6%	1%	.	.	.
20	32%	42%	4%	0%	0%	.
30	12%	22%	4%	0%	1%	0%
40	8%	9%	7%	0%	5%	0%
50	22%	8%	7%	0%	6%	0%
60	22%	5%	7%	2%	6%	1%
70	2%	4%	5%	10%	6%	3%
80	0%	3%	6%	32%	5%	5%
90	0%	1%	8%	29%	5%	6%
100	0%	0%	10%	22%	7%	6%
110	.	0%	11%	4%	8%	6%
120	.	0%	9%	0%	9%	6%
130	.	0%	8%	0%	10%	7%
140	.	0%	7%	0%	10%	7%
150	.	0%	4%	0%	9%	7%
160	.	0%	1%	0%	6%	8%
170	.	.	0%	0%	3%	9%
180	.	.	0%	0%	2%	9%
190	.	.	0%	0%	0%	8%
200	.	.	0%	0%	0%	6%
210	.	.	0%	.	0%	3%
220	.	.	0%	.	0%	1%
230	.	.	0%	.	0%	0%
240	.	.	0%	.	0%	0%
250	.	.	0%	.	0%	0%
260	.	.	0%	.	0%	0%
270	.	.	0%	.	0%	0%

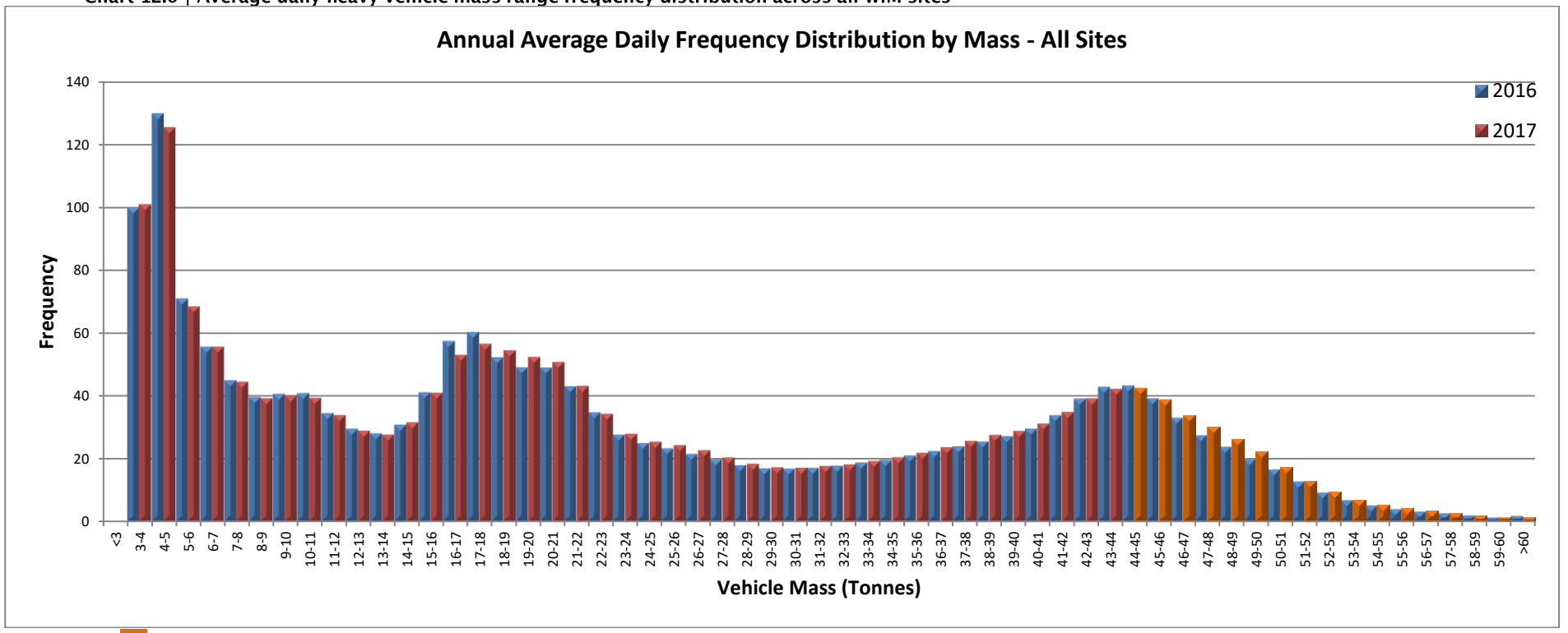
Interpretation:

- There is a small portion of the axle loads that are over the legal limit. Just as in previous years, it occurs mostly from in the QADT axle group across all the WiM sites. This will result in an increasing damage to the pavement, compared to the axle load less than the maximum limits.

19.0 APPENDIX A – HEAVY VEHICLES MASS RANGE FREQUENCY DISTRIBUTION BY WiM SITE CHARTS

NOTE: For all comparisons of Annual Average Daily Traffic across different years, note that this figure is based on an extrapolation from the actual time period surveyed to obtain average figures, which may not be the same from one year to the next. Different times of the year have different traffic characteristics, which can impact the calculated Annual Average Daily Traffic.

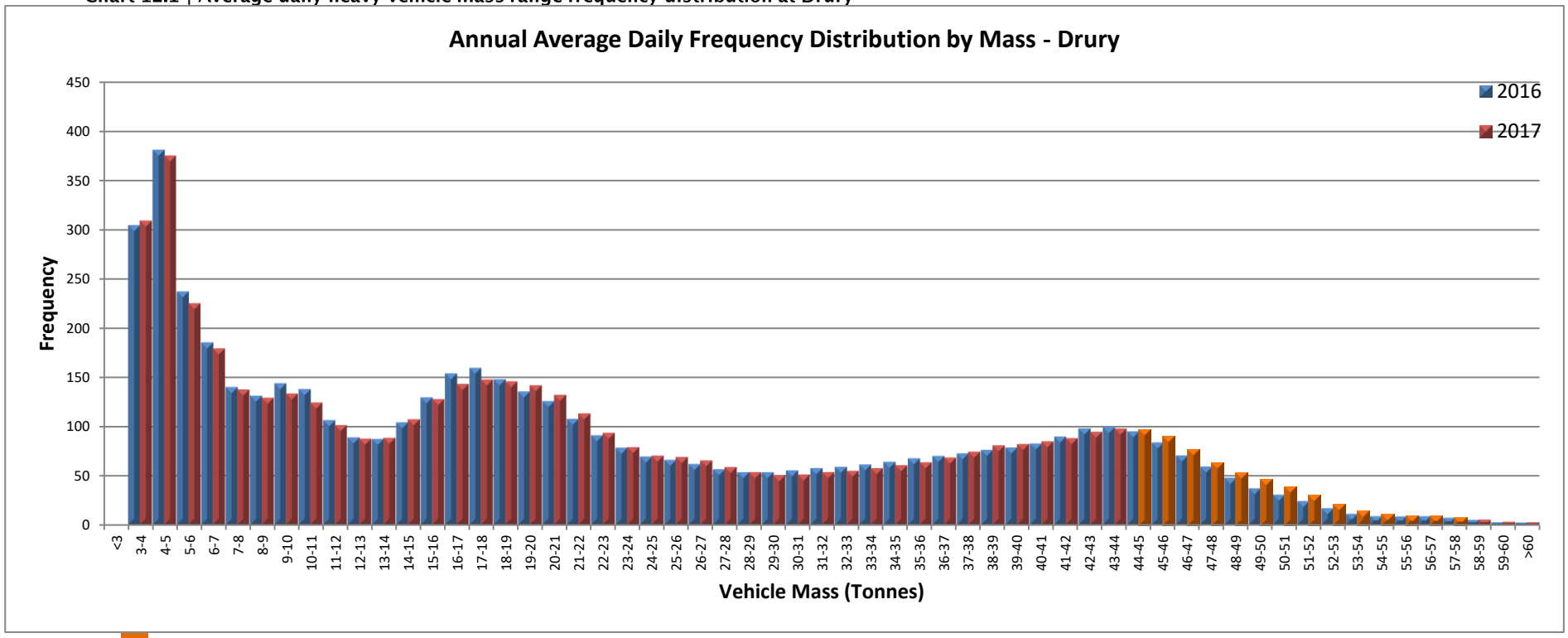
Chart 12.0 | Average daily heavy vehicle mass range frequency distribution across all WiM sites



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Between the two years, the peaks in the distributon remained roughly at at 4–5 tonnes, 16–23 tonnes, and 42–48 tonnes. The overall change from 2016 to 2017 is that volumes increased for 18–21 tonnes and they also increased for 46 tonnes or more. For the weight bands 15–18 tonnes there was a slight decrease from 2016 to 2017, indicating a shift from this range up into the 18–21 range.

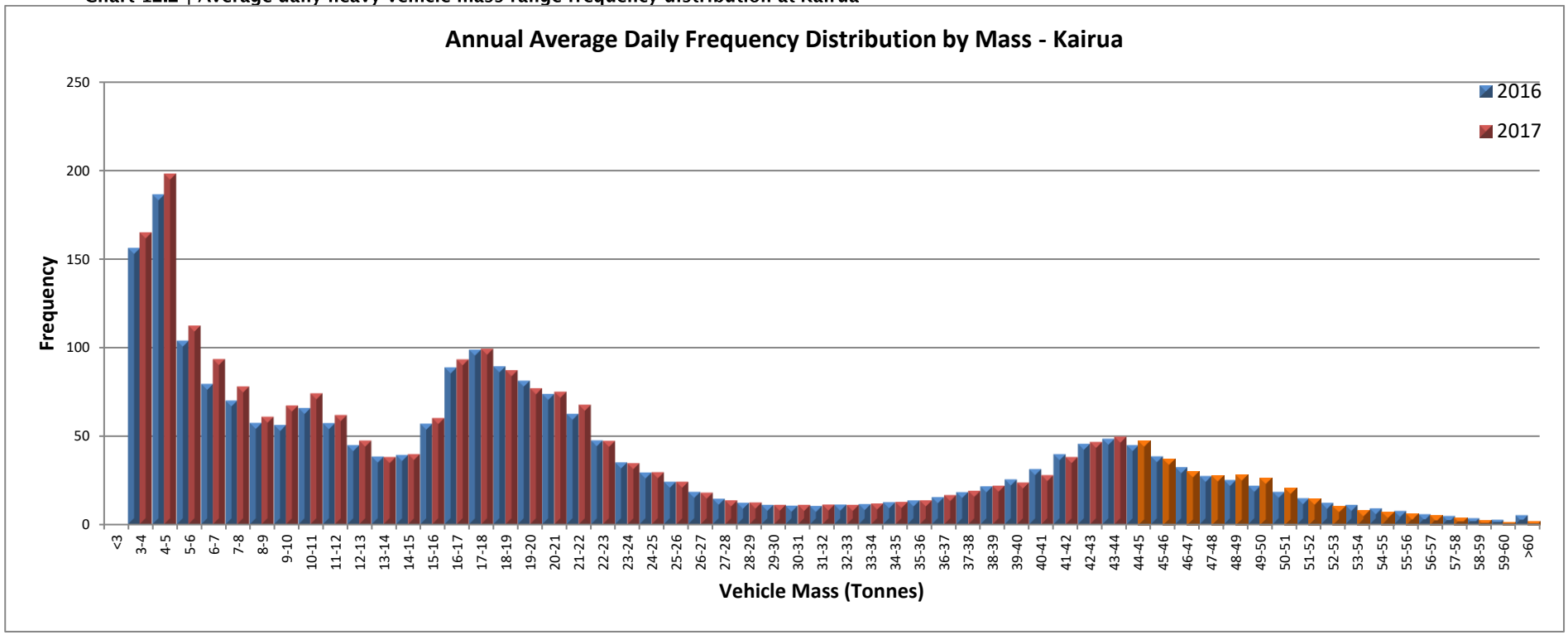
Chart 12.1 | Average daily heavy vehicle mass range frequency distribution at Drury



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Drury site reflects the overall changes described above – especially for 46 tonnes and over. The fact that Drury is such a high-voume site means that Drury had a moderating effect on the more marked changes seen at other sites.

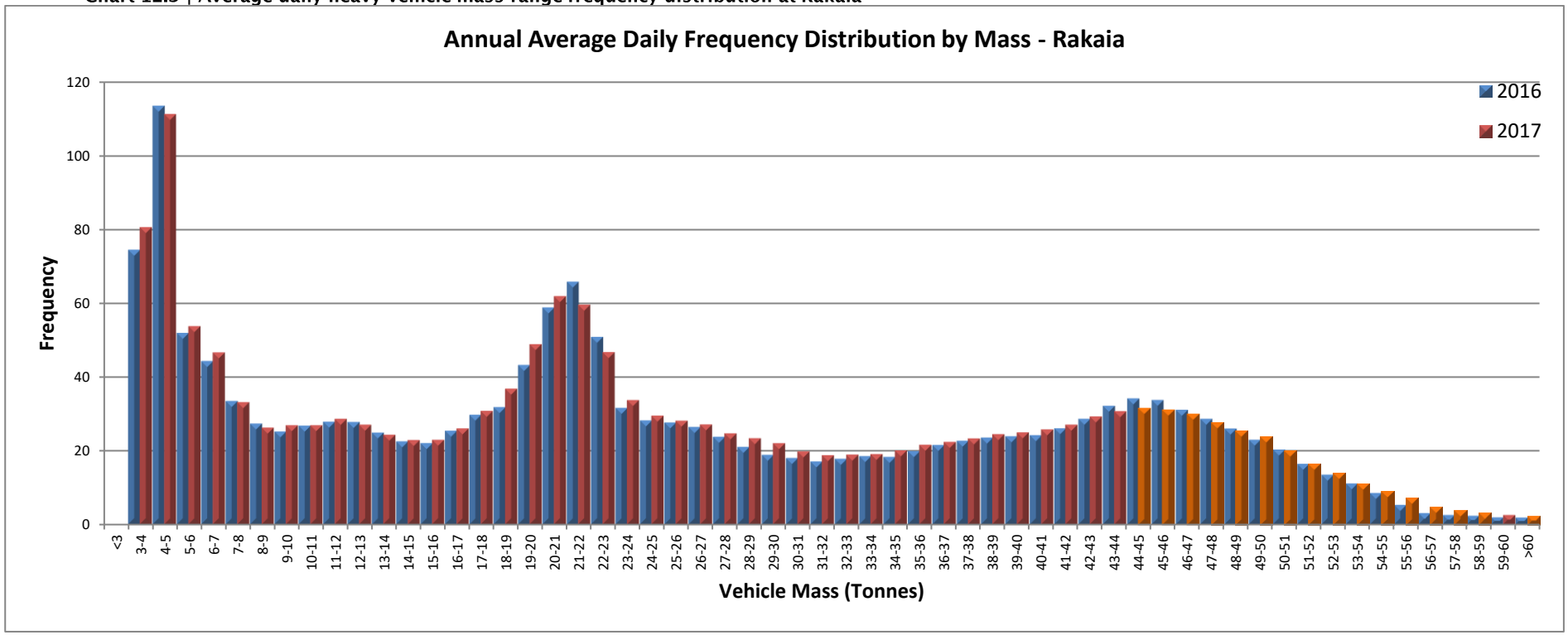
Chart 12.2 | Average daily heavy vehicle mass range frequency distribution at Kairua*



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

In Kairua, most of the increase in volume for 2017 was in the weight bands 13 tonnes and less, although there was also some increase in the 19–22 tonnes and 43–52 tonne range, which is more in keeping with the pattern across all sites.

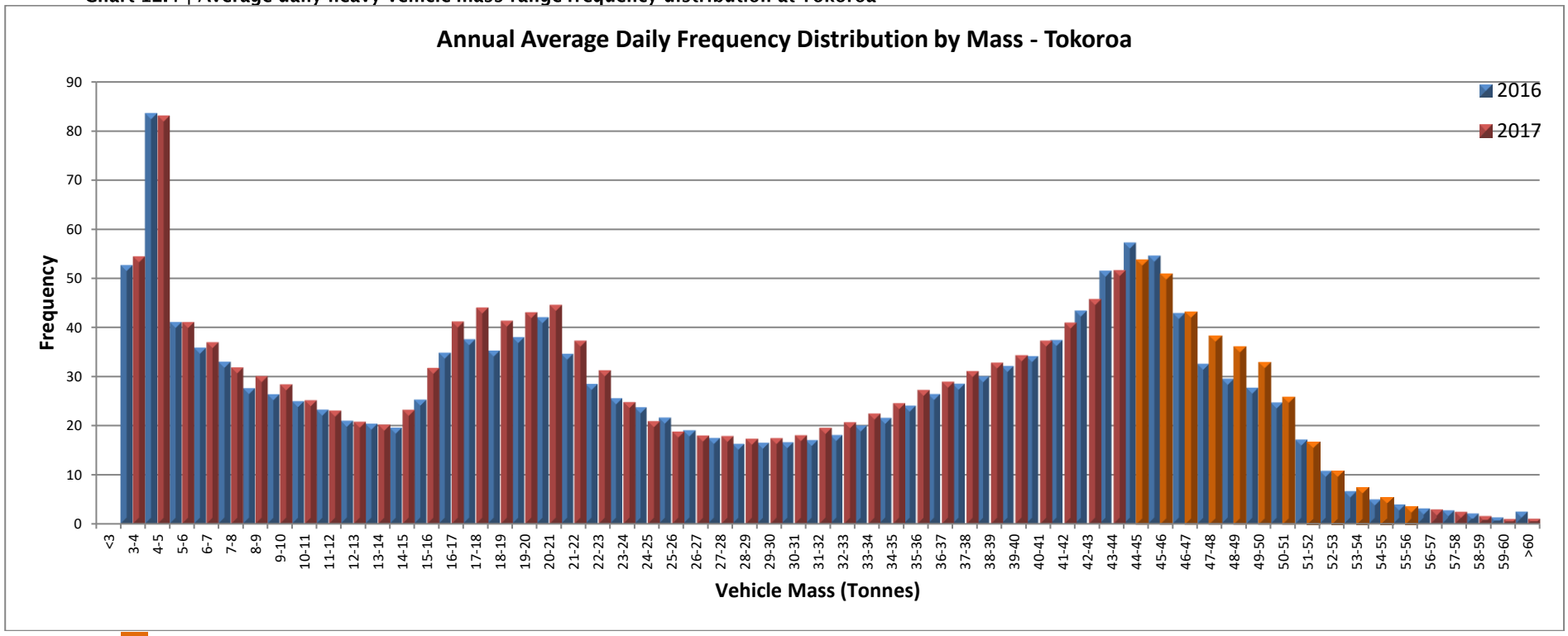
Chart 12.3 | Average daily heavy vehicle mass range frequency distribution at Rakaia



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Unlike in 2016 (where there were marked increases in volumes in the higher weight bands 44 tonnes and over), in 2017 there was little change in the volume of vehicles based on mass at Rakaia, with increases between 18 and 21 tonnes, decreases from 21–23 tonnes but this is compensated for by increases from 23 to 31 tonnes. There were also small increases for the heaviest weight bands above 50 tonnes.

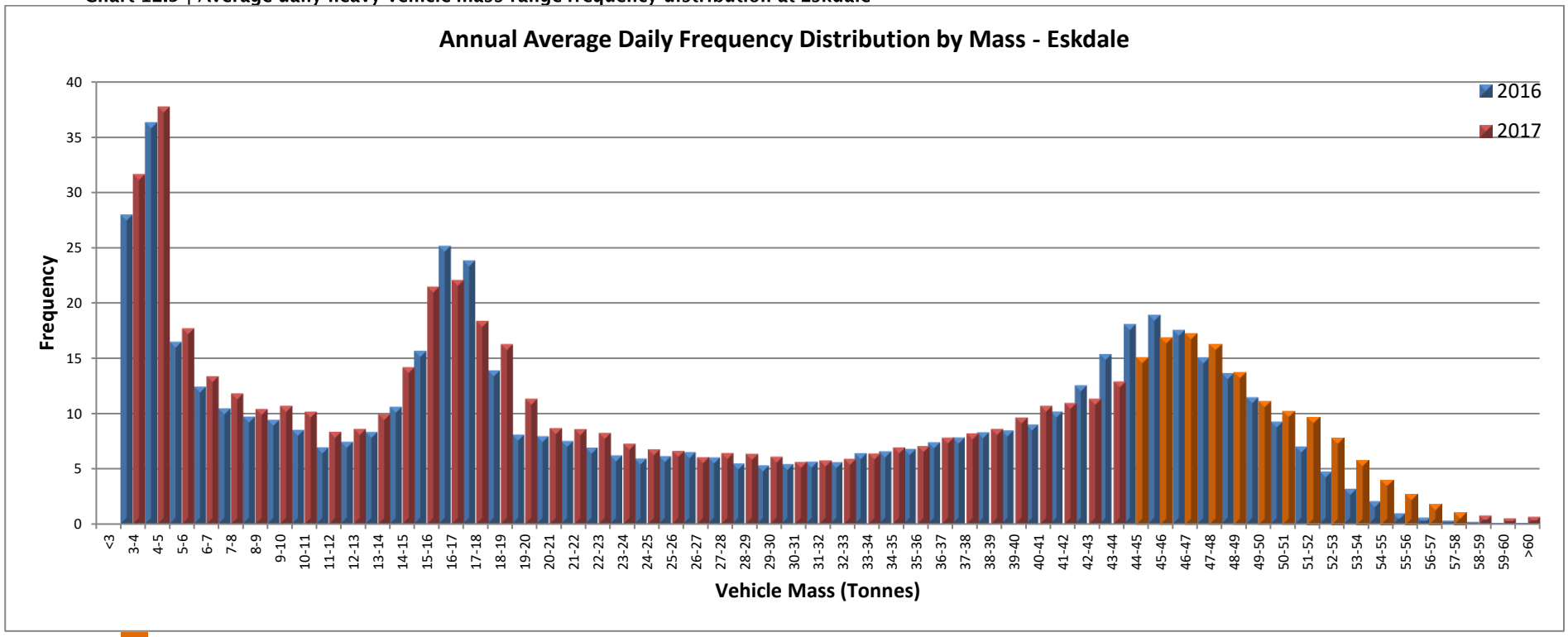
Chart 12.4 | Average daily heavy vehicle mass range frequency distribution at Tokoroa



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Tokoroa has contributed significantly to the overall trend, with marked increases from 206–2017 in the ranges 14–23 tonnes and 47–50 tonnes, as well as slight decreases in the range 44–46 tonnes.

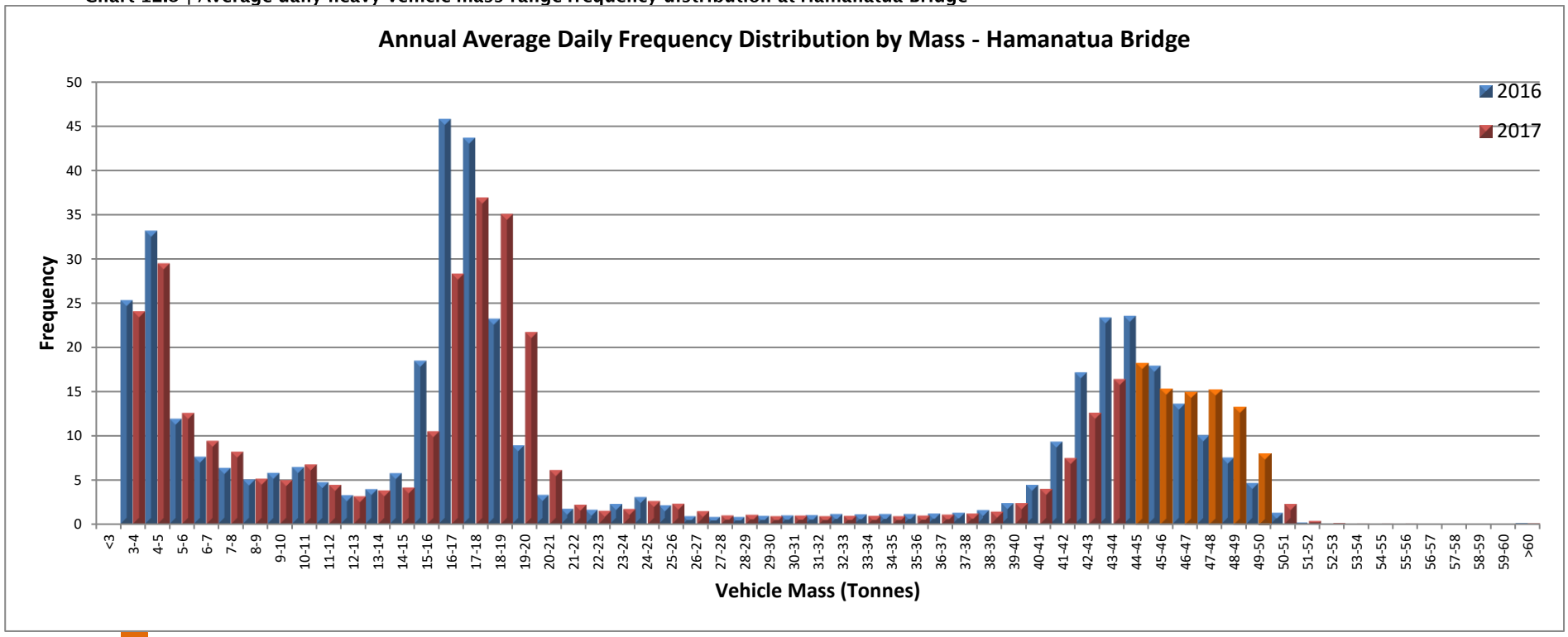
Chart 12.5 | Average daily heavy vehicle mass range frequency distribution at Eskdale



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

At the Eskdale site from 2016–2017 there was a shift in volume from 16–18 tonnes to 18–30 tonnes, and from 42–47 tonnes to greater than 47 tonnes.

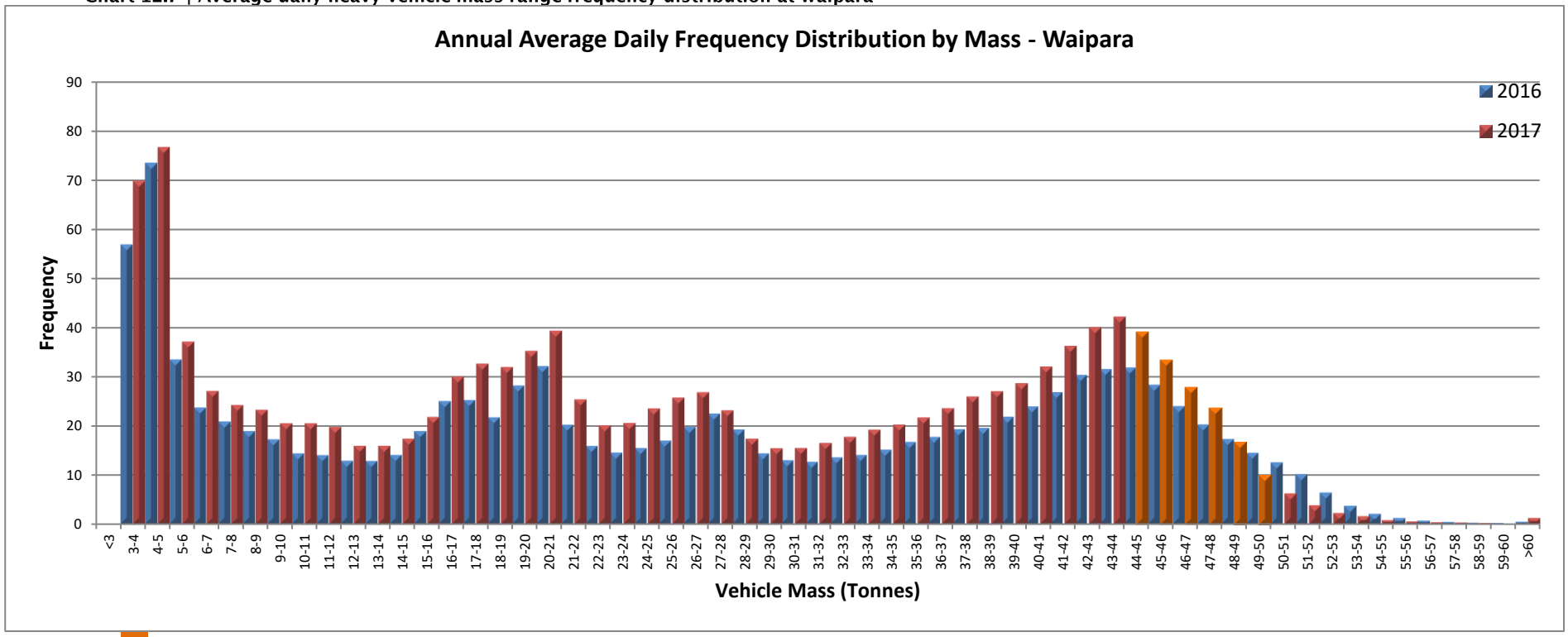
Chart 12.6 | Average daily heavy vehicle mass range frequency distribution at Hamanatua Bridge



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

The vehicles passed the Hamanatua WiM site are mostly logging trucks. The group of the vehicle mass between 15 and 20 are mainly empty logging trucks. The group of the vehicle mass more than 40 tonnes are mainly loaded logging trucks, which explains why the weight ranges in between these two groups had so few vehicles. Each of these two groups got heavier in 2017, which would indicate more vehicles with more axles (so they are heavier even when unladen).

Chart 12.7 | Average daily heavy vehicle mass range frequency distribution at Waipara



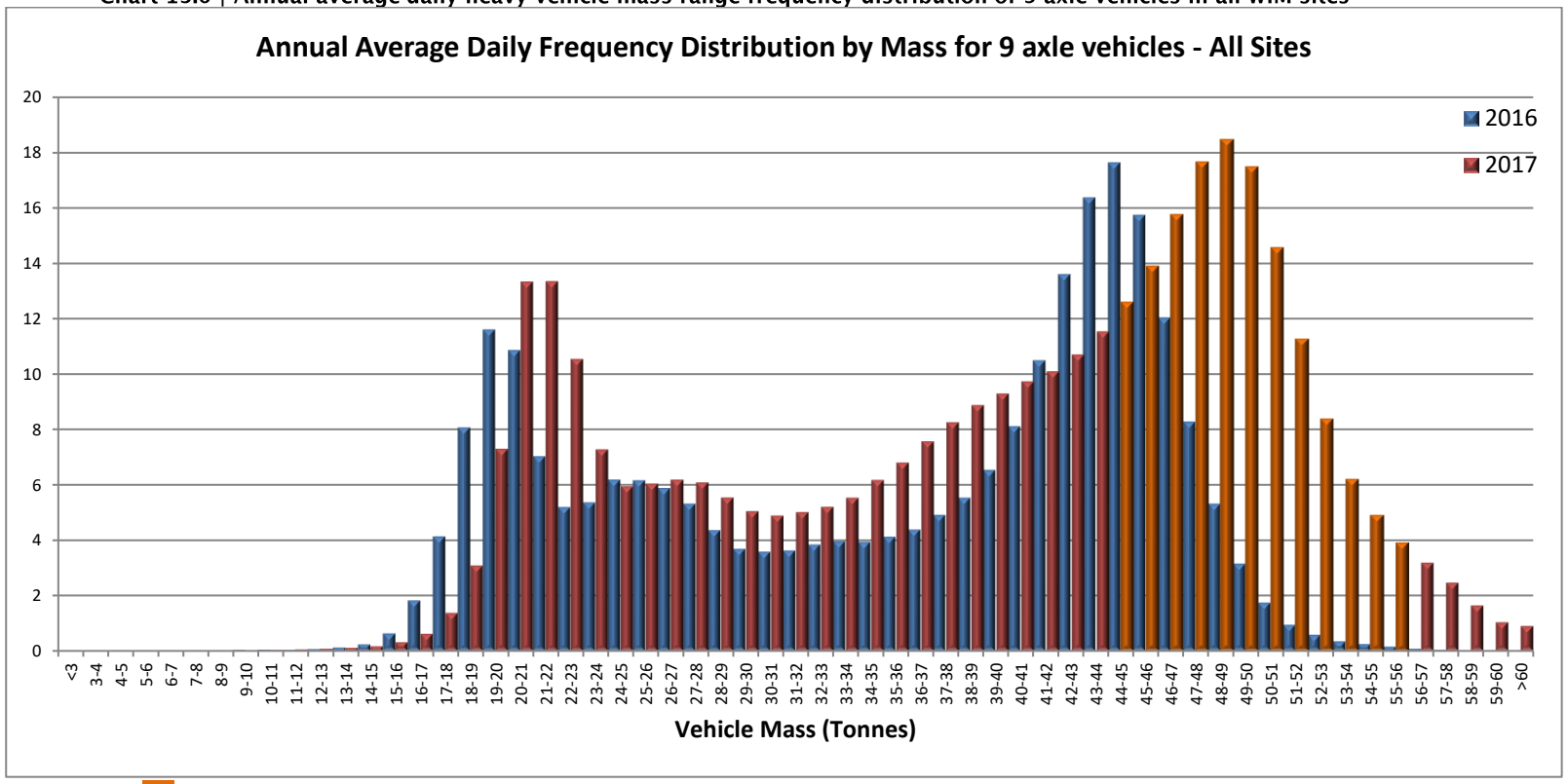
Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Waipara was an anomaly among WiM sites, seeing increased volumes for all weight bands except for 48 tonnes and over.

20.0 APPENDIX B – 9 AXLE VEHICLE MASS RANGE FREQUENCY DISTRIBUTION BY WiM SITE CHARTS

USERS PLEASE NOTE: Up until the report for 2015 this appendix was for PAT class 815. It is now for 9 axle vehicles due to the growth of this group.

Chart 13.0 | Annual average daily heavy vehicle mass range frequency distribution of 9 axle vehicles in all WiM sites

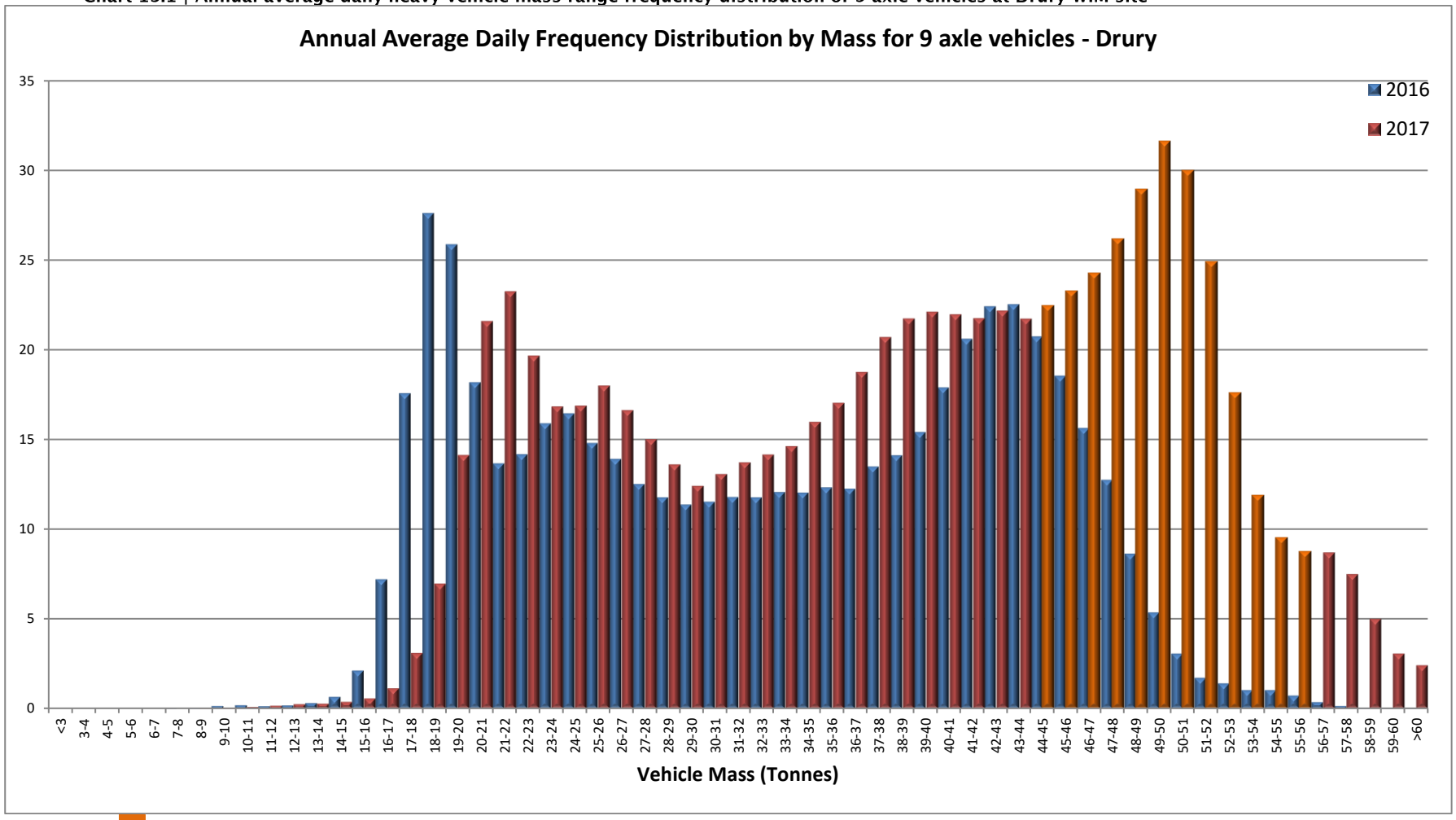


Key: = 2017 over 44 tones (legal limit without HPMV or overweight permit.)

Interpretation: The main differences in the average daily frequency distribution by mass for 9-axle vehicles between 2016 and 2017 were:

- A shift in the peak of vehicles between 18 and 22 tonnes. This peak is now from 19-24 tonnes**.**
- Asignificant shift in the peak of vehicles from roughly 4048 tonnes. This peak is now much broader, but the high point is from roughly 43-52 tonnes.
- The frequency of 9 axle vehicles above 50 tonnes was much higher in 2017 than it was in 2016 (this had declined from 2015 to 2016).

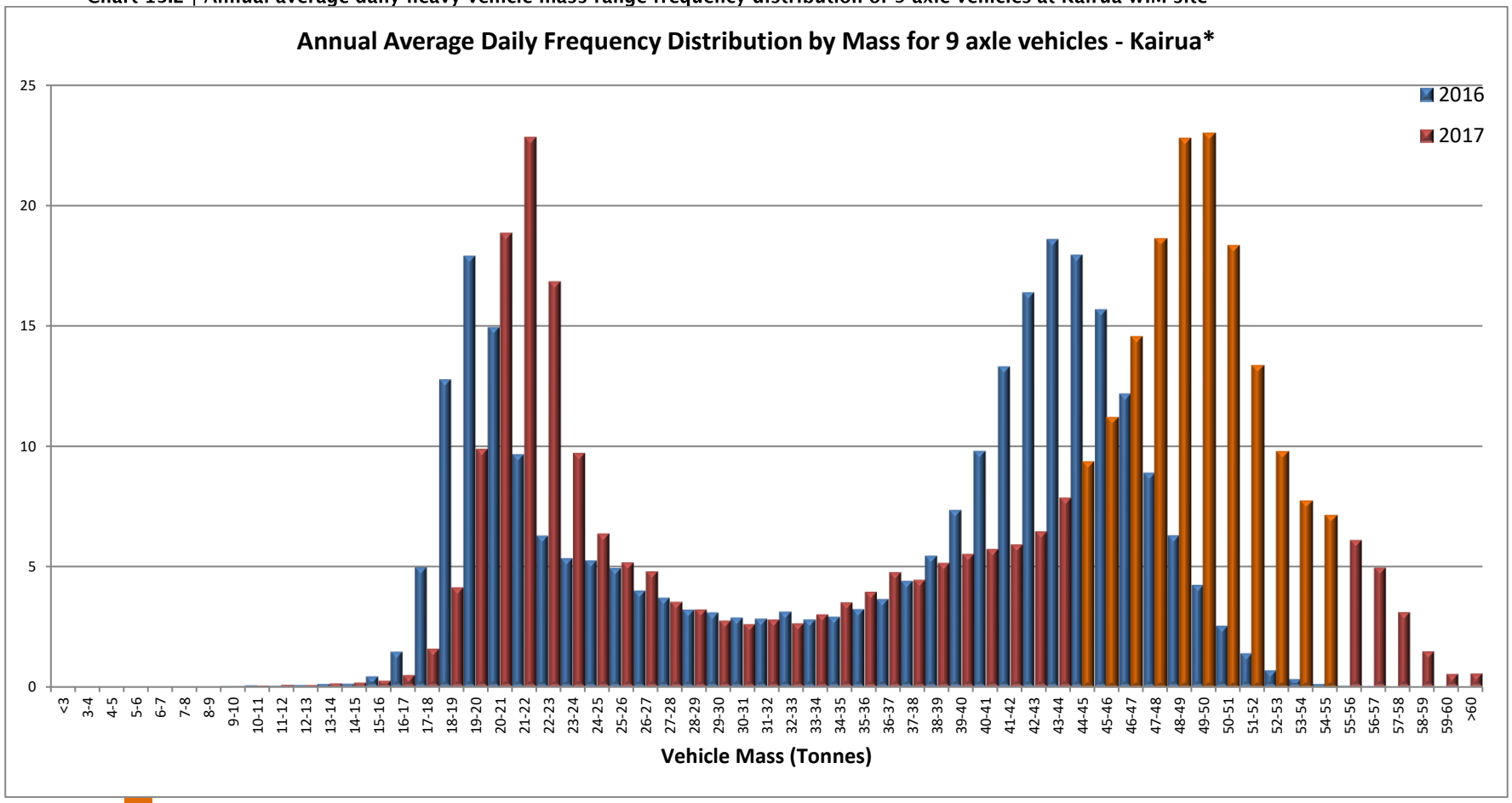
Chart 13.1 | Annual average daily heavy vehicle mass range frequency distribution of 9 axle vehicles at Drury WiM site



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: Drury reflected the national trend for most mass bands. There was growth in all virtually mass bands 20 tonnes and over, and especially above 44 tonnes, where the peak shifted up the mass range from 2016.

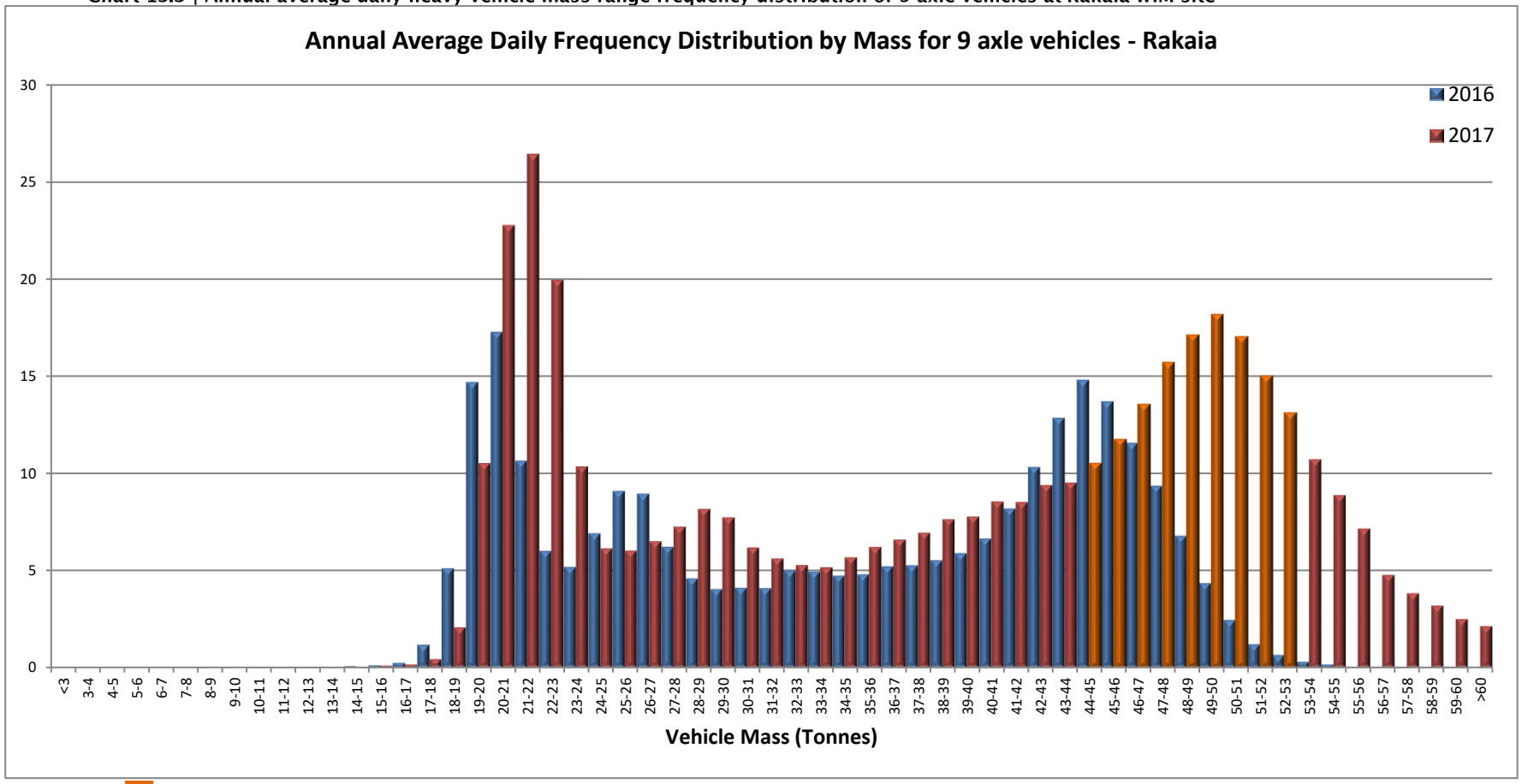
Chart 13.2 | Annual average daily heavy vehicle mass range frequency distribution of 9 axle vehicles at Kairua WiM site



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: As at other sites, the peak of 9-axle vehicles 40-48 tonnes in 2016 has moved to approximately 46-53 tonnes in 2017 at the Kairua WiM site.

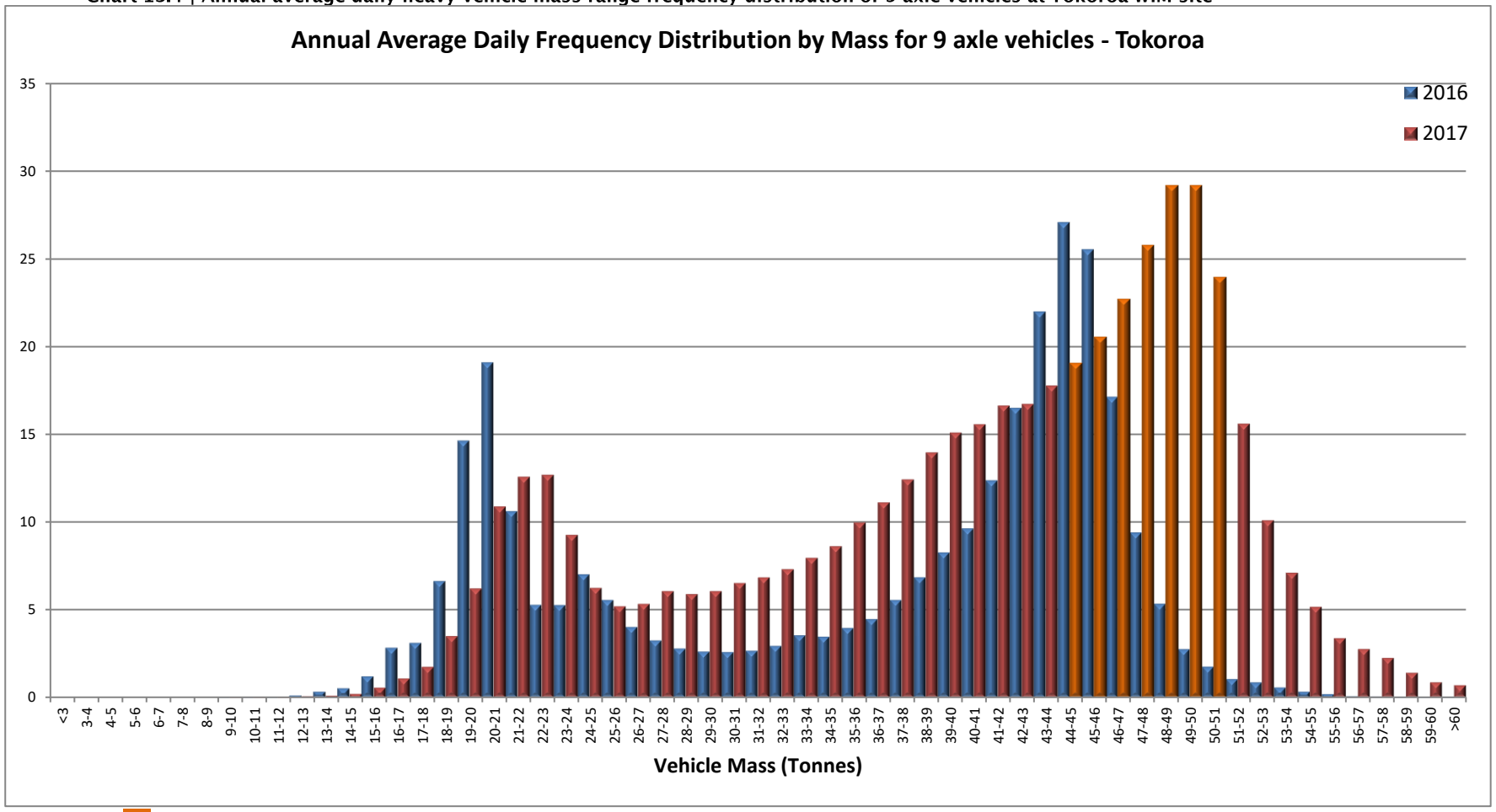
Chart 13.3 | Annual average daily heavy vehicle mass range frequency distribution of 9 axle vehicles at Rakaia WiM site



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: 9-axle vehicles at Rakaia followed the overall national trend.

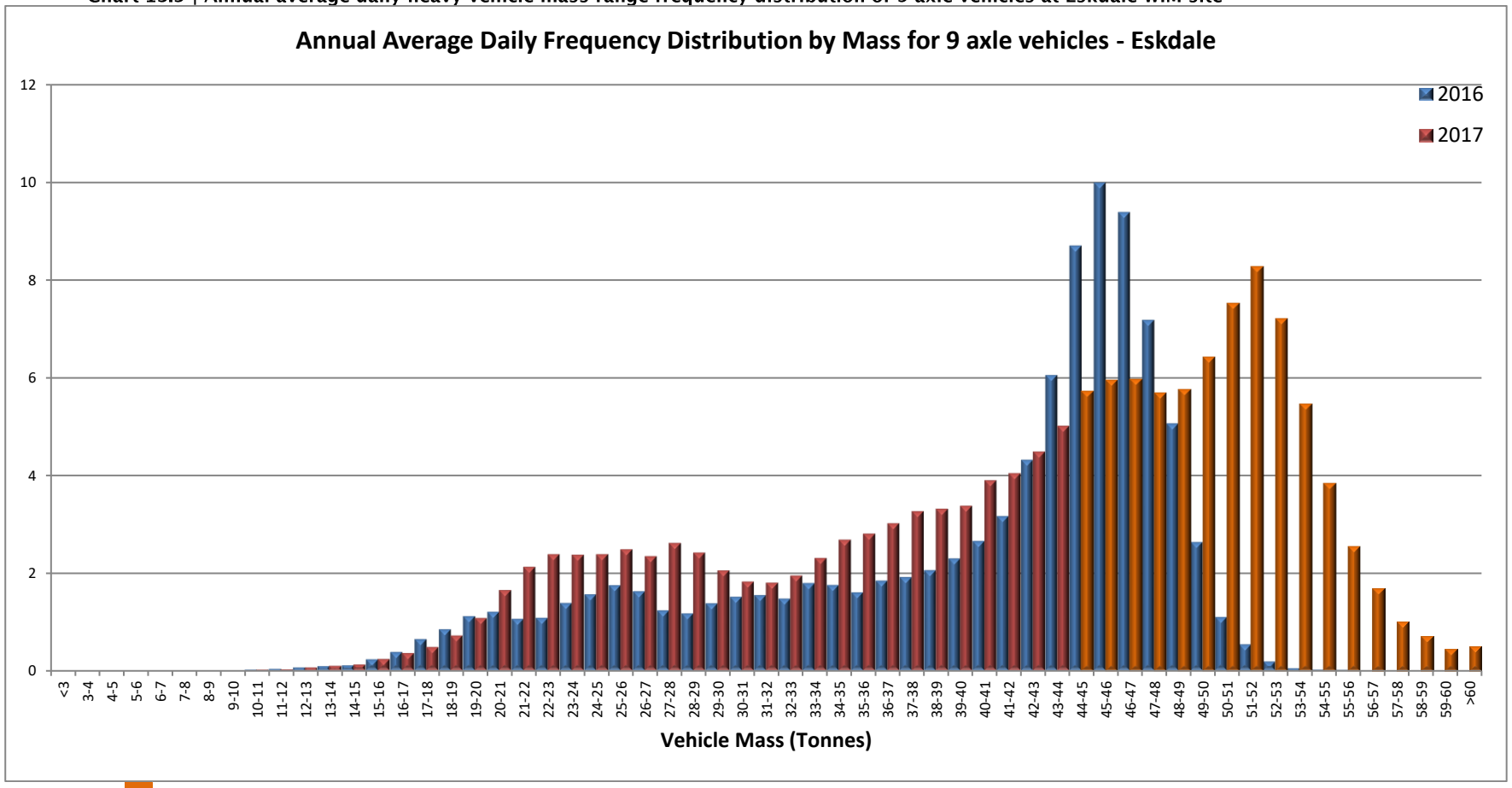
Chart 13.4 | Annual average daily heavy vehicle mass range frequency distribution of 9 axle vehicles at Tokoroa WiM site



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: 9 axle vehicles at Tokoroa followed the overall national trend.

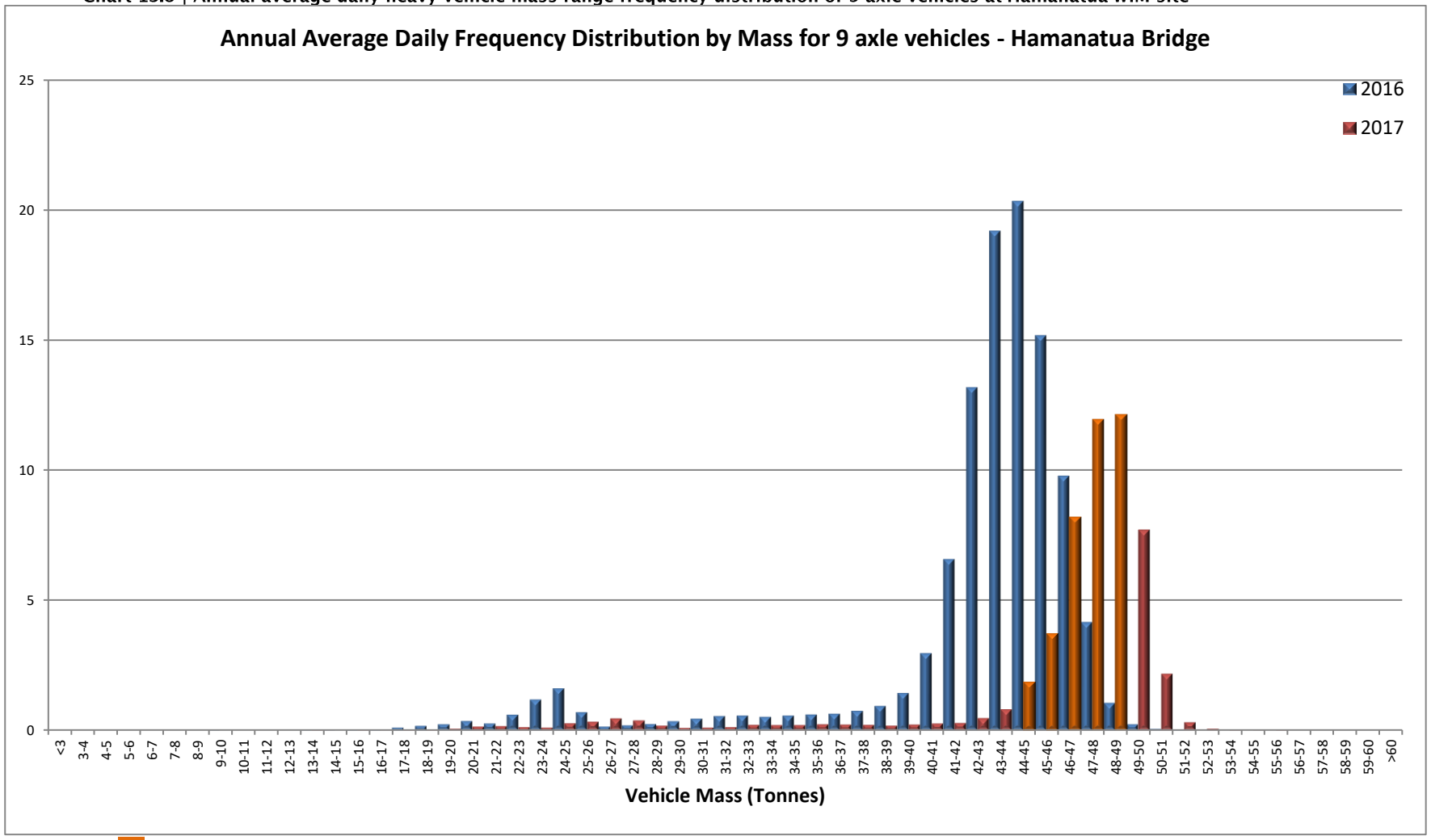
Chart 13.5 | Annual average daily heavy vehicle mass range frequency distribution of 9 axle vehicles at Eskdale WiM site



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: As in 2016, Eskdale's distribution of 9 axle vehicles by mass differs from the national pattern in that there was no marked peak in the 19–24 tonne range in 2017. However, as with other sites, the peak from 43–48 tonnes has moved to 49–54 tonnes, although the volume of heavier vehicles is lower than it was in 2016, and the volume of 9-axle vehicles from 19–44 tonnes has grown. The most obvious growth for 9-axle vehicles in 2017 was in ranges 49 tonnes and over, especially 53 tonnes and over where there were none in 2016.

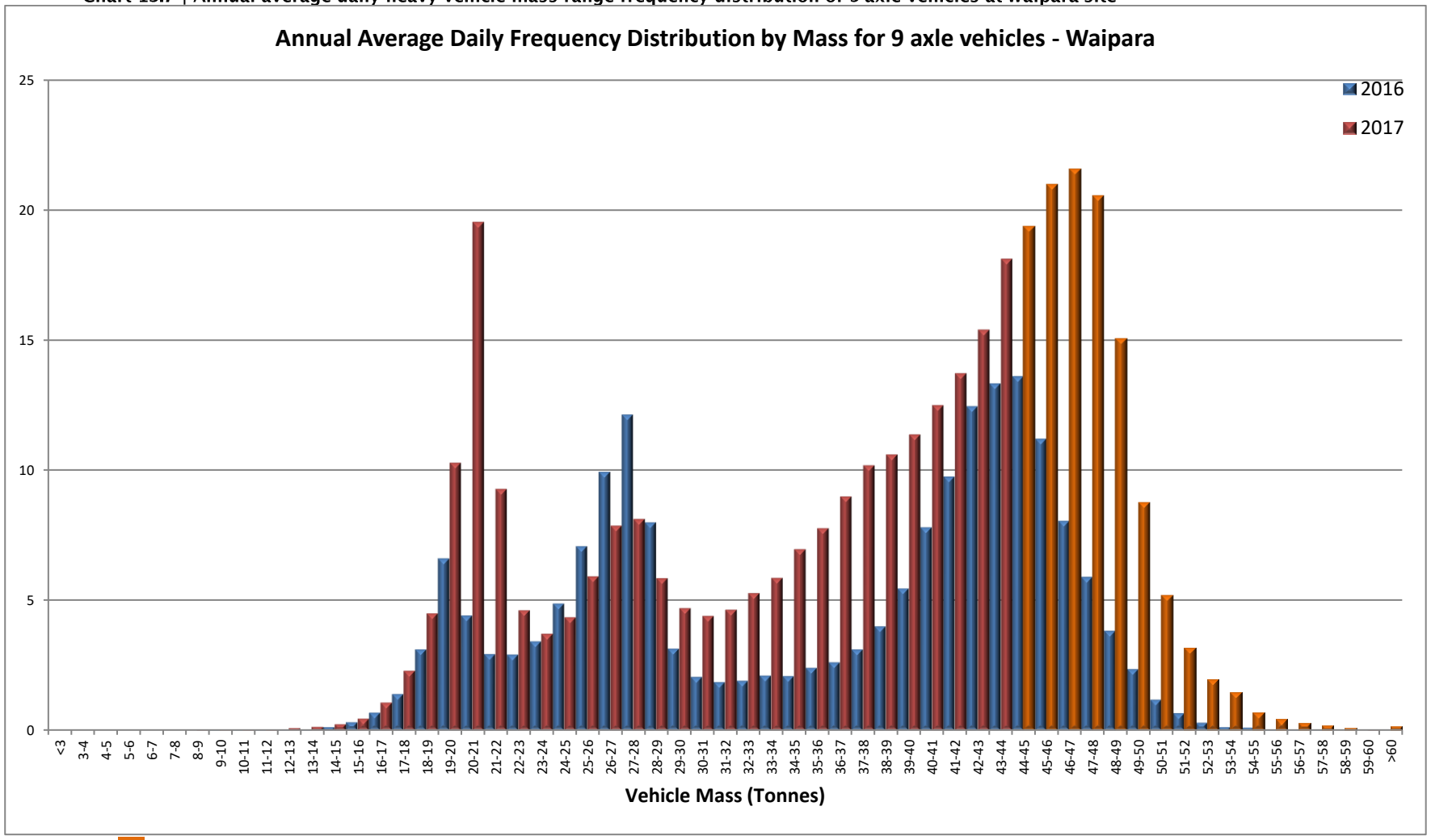
Chart 13.6 | Annual average daily heavy vehicle mass range frequency distribution of 9 axle vehicles at Hamanatua WiM site



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: 9-axle vehicles at Hamanatua Bridge followed the overall national trend when it comes to the upper ranges that increased the most – there was a movement in the peak towards heavier vehicles. As with Eskdale, there is not a significant peak in the 19-24 tonne range.There was a decrease in volume of 9-axle vehicles at this site in 2017, although volumes still remain more than double what they were in 2015.

Chart 13.7 | Annual average daily heavy vehicle mass range frequency distribution of 9 axle vehicles at Waipara site



Key: = 2017 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: 9-axle vehicles at the Waipara site increased in volume for all mass bands other than 24-28 tonnes, and as for most sites, the significant peak for 41-46 tonnes shifted to approximately 42-49 tonnes.

21.0 APPENDIX C - VEHICLE FLEET OVERWEIGHT CHARTS

The following charts depict the time of 24-hour distribution of the vehicle fleet deemed overweight at each site.

Chart 14.0 | All sites overweight time distribution 2017

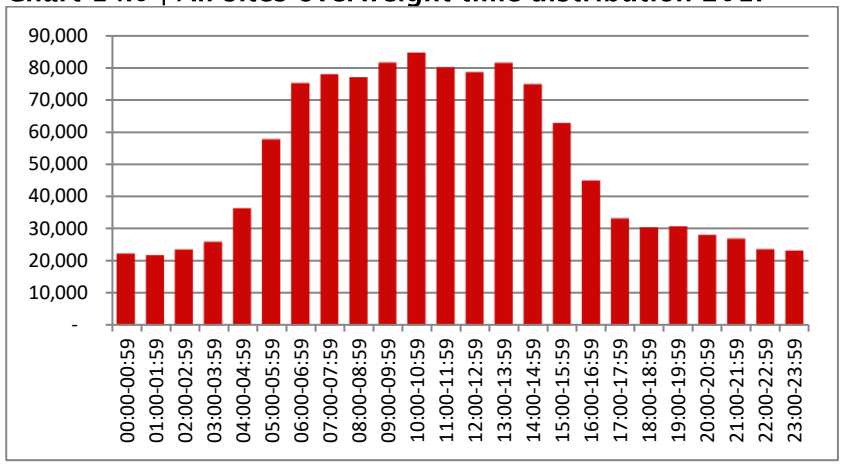


Chart 14.1 | Drury overweight time distribution 2017

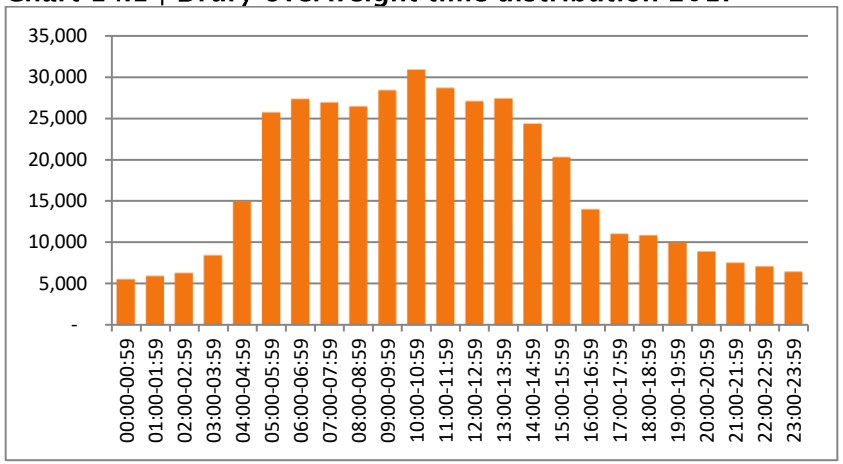


Chart 14.2 | Eskdale overweight time distribution 2017

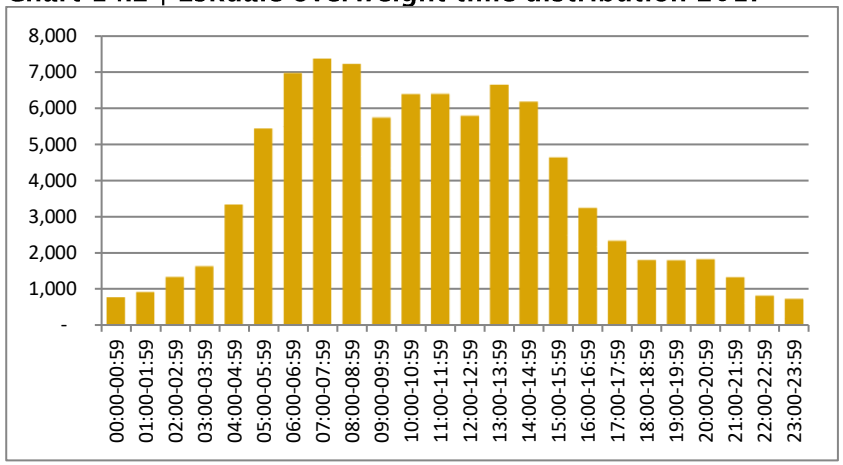


Chart 14.3 | Hamanatua Bridge overweight time distribution 2017

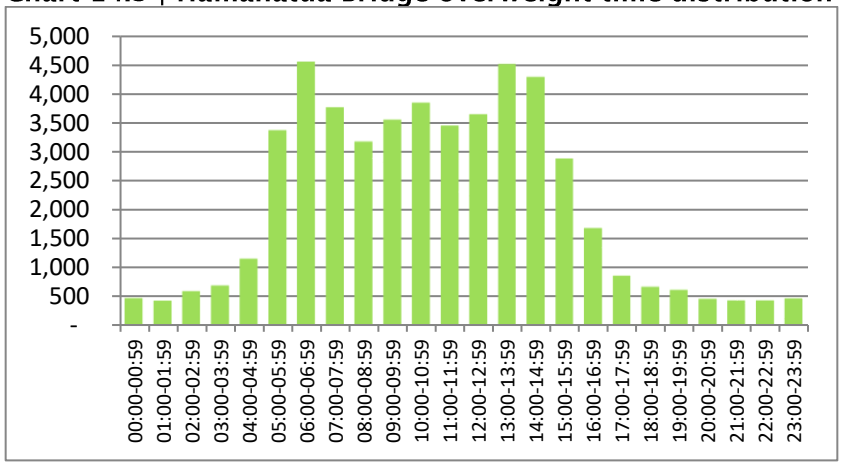


Chart 14.4 | Kairua overweight time distribution 2017

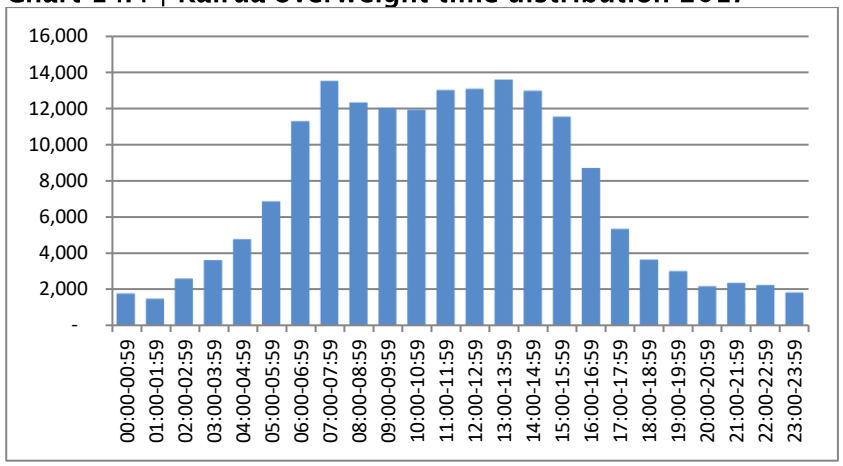


Chart 14.5 | Rakaia overweight time distribution 2017

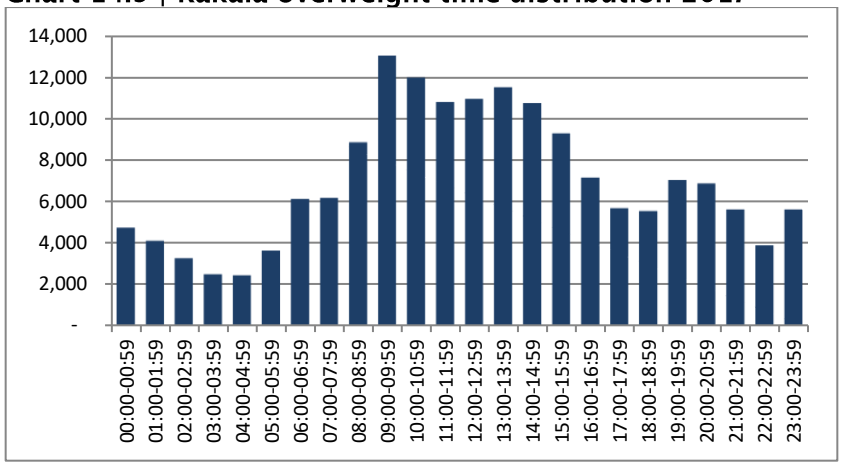


Chart 14.6 | Tokoroa overweight time distribution 2017

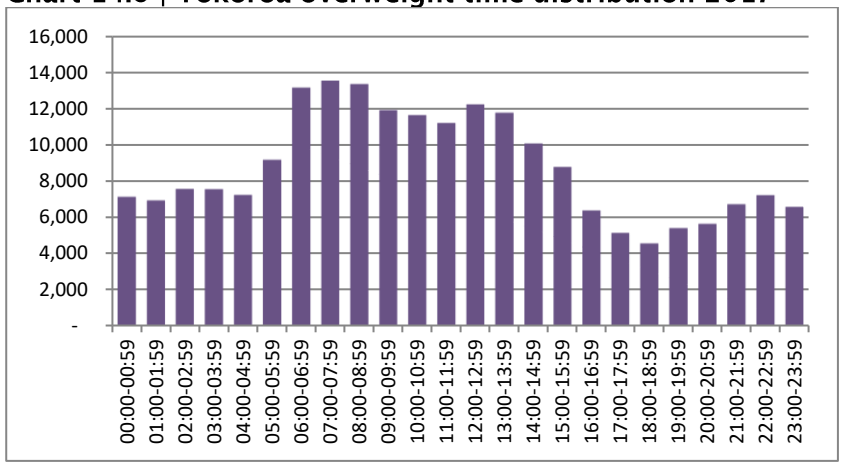
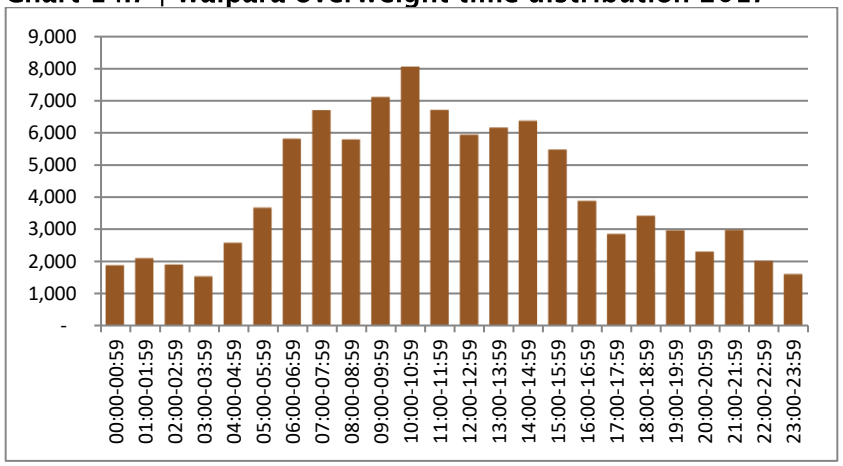


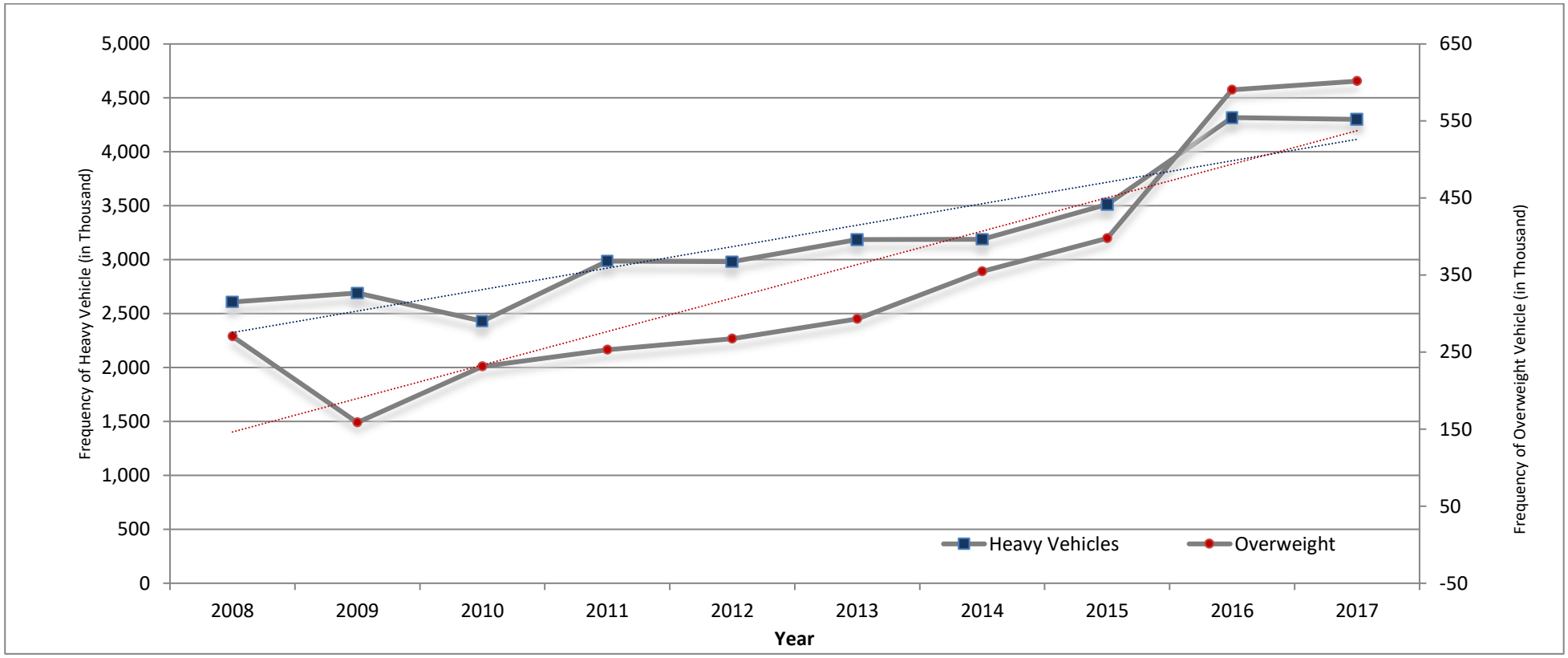
Chart 14.7 | Waipara overweight time distribution 2017



Interpretation: Patterns in 2017 are similar to what they were in 2016. All sites had their peak volume of overweight vehicles between approximately 5am and 5pm, with subtle differences as to when the greatest frequency was within this range. Sites differ on how much the frequency of overweight vehicles declines overnight. Eskdale, Hamanatua Bridge, and Karirua sites saw the clearest decline in volume overnight, while Rakaia and Tokoroa saw the least marked decline overnight.

22.0 APPENDIX D – HEAVY VEHICLES LOAD/OVERWEIGHT TRENDS

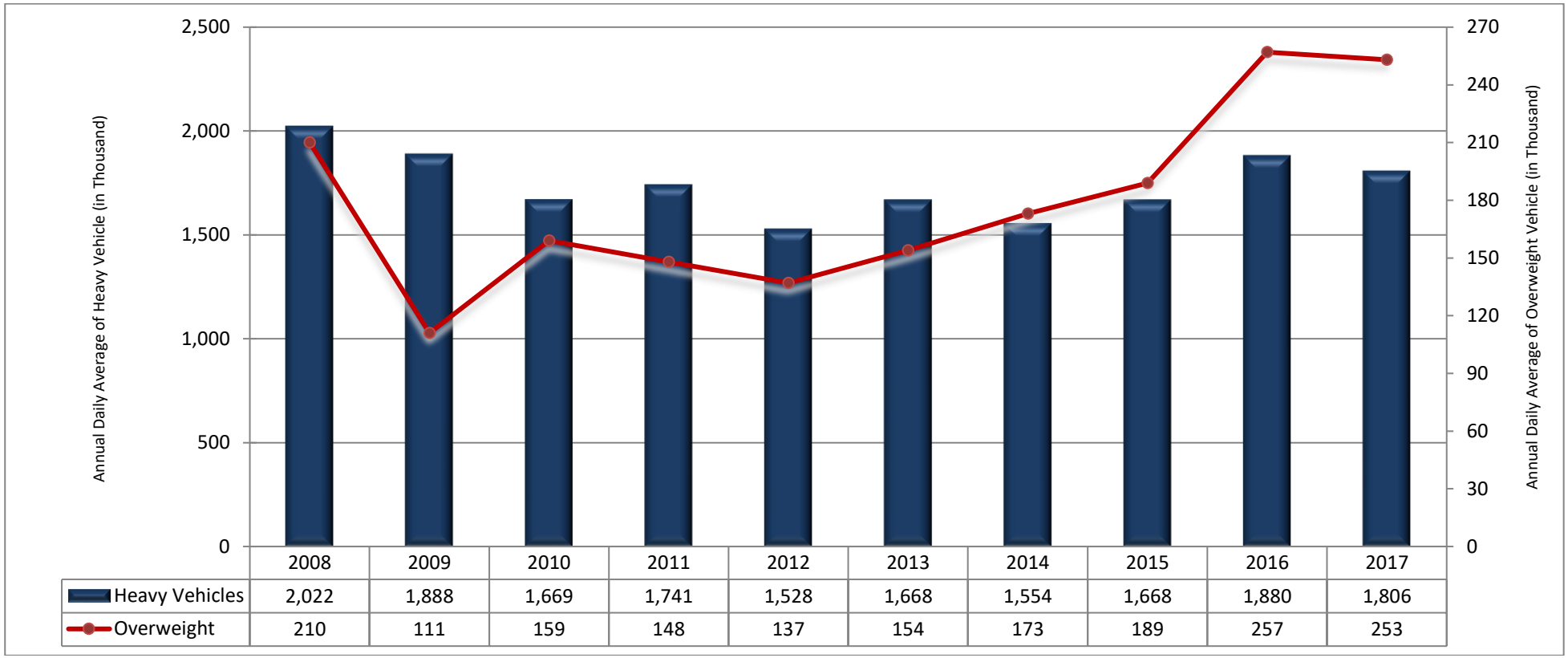
Chart 15.0 | Heavy vehicle weight/overweight trends in all WiM sites



Interpretation: Growth in the frequency of overweight vehicles continues to outpace the growth in all heavy vehicles. In 2017 there was a slight decrease in the number of heavy vehicles (down by just 0.4%), but the frequency of overweight vehicles still increased, by 1.9%.
(The sharp growth in the frequency of heavy vehicles and overweight vehicles in 2016 was due to an additional WiM site being added, although the growth in overweight vehicles (32.6%) was greater than the growth in all heavy vehicles (18.6%).)

23.0 APPENDIX E – ANNUAL AVERAGE DAILY HEAVY VEHICLES LOAD/OVERWEIGHT TRENDS

Chart 15.1 | Annual average daily heavy vehicle load and overweight in all WiM sites



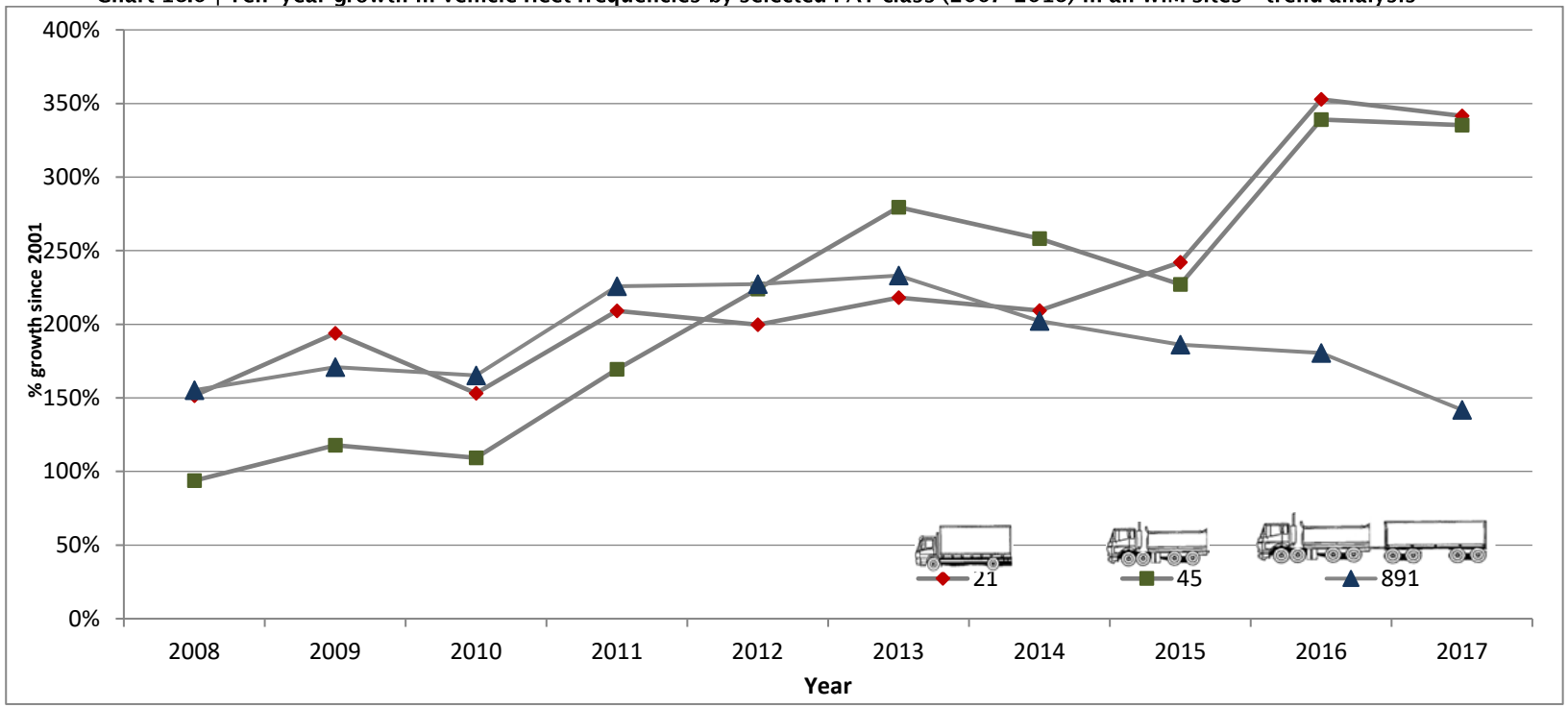
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Heavy Vehicles	2,022	1,888	1,669	1,741	1,528	1,668	1,554	1,668	1,880	1,806
Overweight	210	111	159	148	137	154	173	189	257	253

Note: The average of heavy and overweight vehicles per day across all WiMs site in a given year.

Interpretation: The overall number of days added up across all sites was larger in 2017 (2,318 days) than it was in 2016 (2,296 days). As a result, even though the number of overweight vehicles grew slightly from 2016 to 2017, the average number of heavy vehicles per day declined. The average daily number of heavy vehicles for 2017 fell by 4.1%, and the average daily number of overweight vehicles fell by 1.6%.

24.0 APPENDIX F – VEHICLE FLEET TRENDS

Chart 16.0 | Ten-year growth in vehicle fleet frequencies by selected PAT class (2007-2016) in all WiM sites – trend analysis



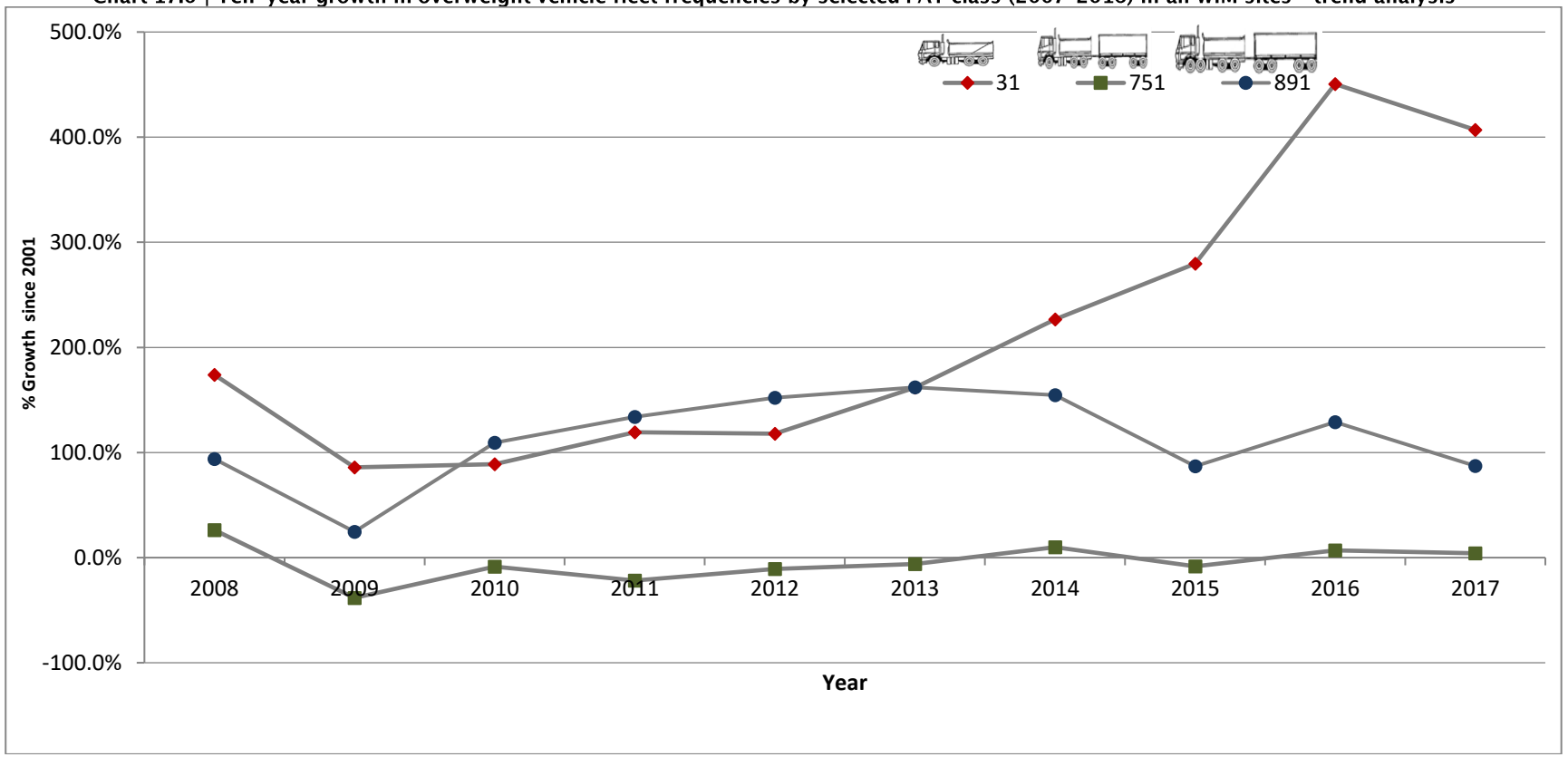
NOTES:

- We had intended to include PAT class 915 because of its high frequency. However, this presented two difficulties. Firstly, this data presents growth in vehicle frequency compared to 2001 volumes, and PAT class 915 did not appear in the 2001 data. Secondly, PAT class 915 began to appear in 2008, and the growth since then has been so rapid that on this graph PAT class 915 would dwarf all the other classes, making the graph impossible to read. PAT class 915 should be included in several years time, when we can begin to measure growth against a later year (e.g. 2014). The same applies to chart 17.
- In previous versions of the graph, the vertical axis had been labelled "% Growth (normalised, 2001)." This was not correct. Actually the numbers on the axis were a measure of volumes as a proportion of 2001 volumes. E.g. 1.5 meant that the volume was 1.5 times the volume of 2001 (i.e. 150%). This was corrected for the last (2016) report, so the vertical axis now measures growth as a percentage of 2001 volumes (so 200% means that the volumes for that PAT class have increased by 200% since 2001, so if there were 100 vehicles in 2001, there are now 300). The same applies to chart 17, 18, and 18.1.

Interpretation: In 2017, PAT class 891 cotinues the decline in growth compared to 2001 that began in 2014 . PAT class 21 had been growing in frequency, but it's rate of growth declined slightly from 2016 to 1017 (from 353% growth since 2001 to %342). PAT class 45 has also decreased slightly, from 339% to 335%.

25.0 APPENDIX G – VEHICLE FLEET OVERWEIGHT TRENDS

Chart 17.0 | Ten-year growth in overweight vehicle fleet frequencies by selected PAT class (2007-2016) in all WiM sites – trend analysis



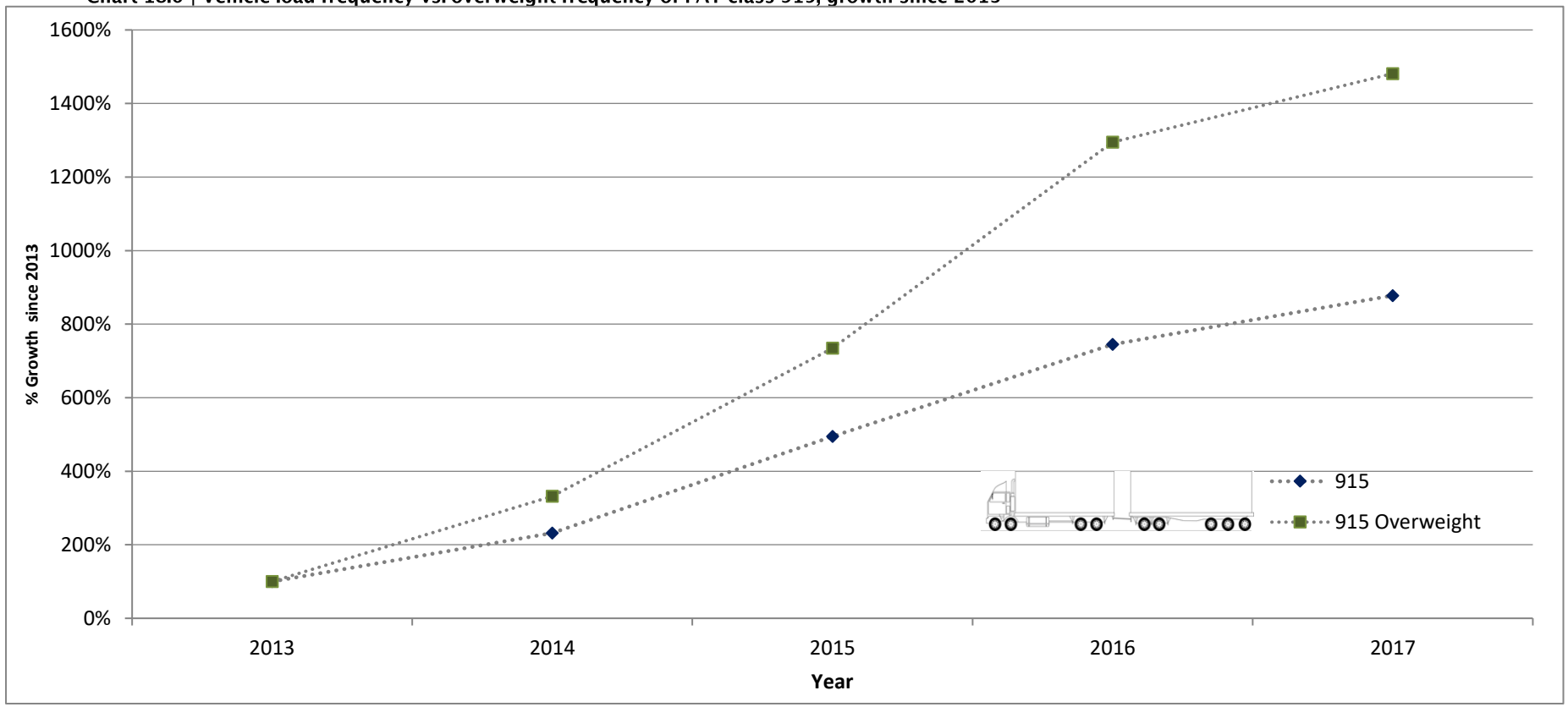
NOTE: As noted above, in a future year we will include PAT classes 915 in this chart.

Interpretation: The 5 most frequent PAT classes in 2017 were 21 (19.9%), 915 (15.2%), 891 (11.9%), 31 (8.4%) and 45 (8%) across all WiM sites. As PAT 915 and 951 began to be prominent only recently, they are not included in this graph, which measures change since 2001.
All three PAT classes recorded here have declined in growth (ending a long increase for PAT class 31). As in previous years, PAT class 751 is barely higher than 2001 volumes (and for most years since 2001 it has been less frequent than it was in 2001).

26.0 APPENDIX H – VEHICLE FLEET FREQUENCY vs OVERWEIGHT CHARTS

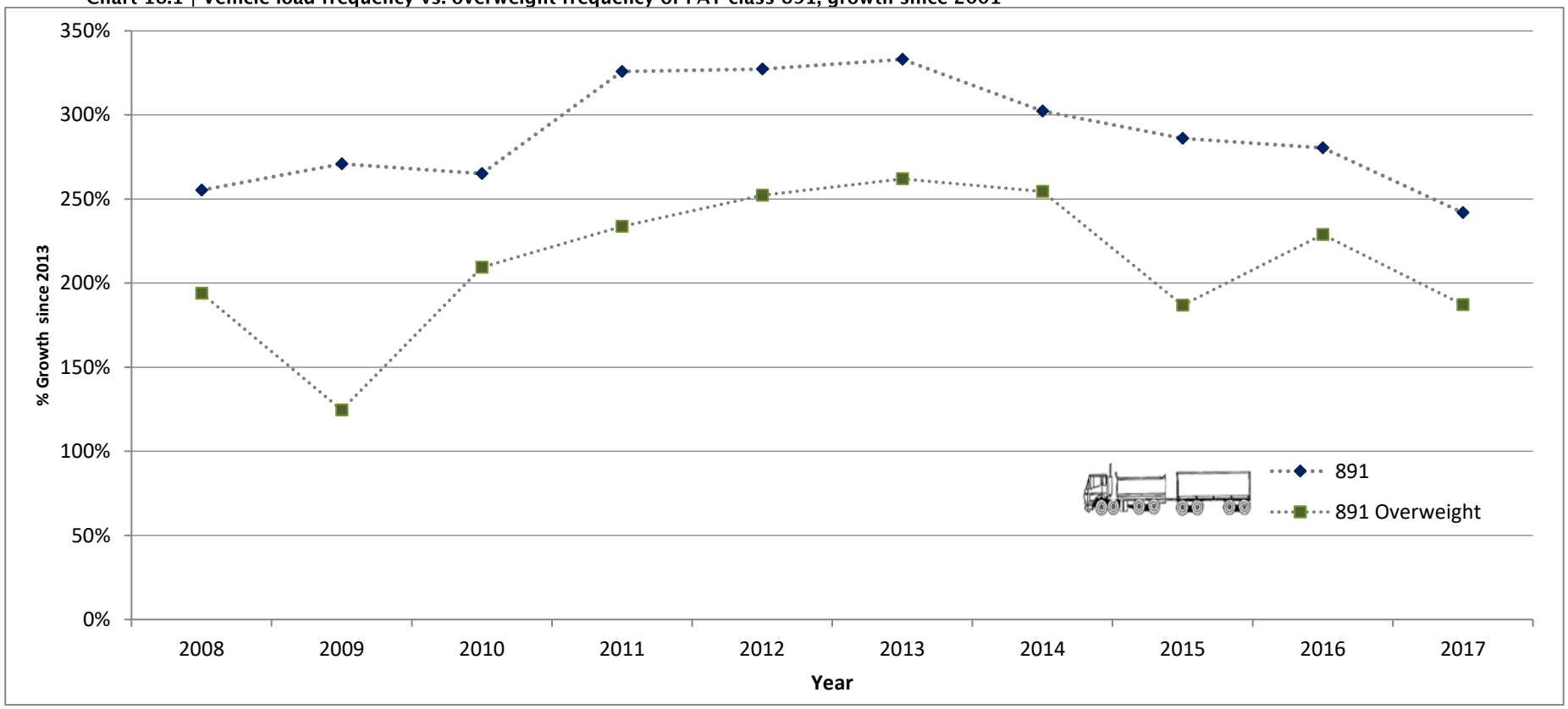
NOTE: Until 2015 we showed trends for PAT class 891. However, PAT class 915 is now the most common overweight vehicle. As this PAT class was not in this report in 2001, from where we measure change for PAT class 891, Chart 18.0 shows the percentage change compared to 2013 for PAT class 915, and chart 18.1 shows the change compared to 2001 for PAT class 891.

Chart 18.0 | Vehicle load frequency vs. overweight frequency of PAT class 915, growth since 2013



Interpretation: In 2017, PAT class 915 had increased by 878% since 2013, but PAT class 915 vehicles that were overweight had increased in frequency by 1,481% since 2013, indicating the popularity of this PAT class for 50MAX / HPMV.

Chart 18.1 | Vehicle load frequency vs. overweight frequency of PAT class 891, growth since 2001



Interpretation: The growth in the total frequency of PAT class 891 (since 2001) continues to decline since its peak in 2013 (where it had grown 233% since 2001). In 2017 its growth from 2001 declined further, from 280% to 242%. For overweight vehicles in this class, the dip in 2015 was an anomaly so there was an increase in 2016, but there was a decline in growth from 2016 (229%) to 2017 (187%).