NZ TRANSPORT AGENCY
WAKA KOTAHI

Annual weigh-in-motion (WiM) report 2015

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Quality Assurance Statement

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Approved for issue by:	

Revision Schedule

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1		First draft	Glenn Peoples		
2	October 2016	Final version	Gerald Wen	Glenn Peoples	

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.

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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.
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	High-productivity motor vehicle is a vehicle permitted to carry a divisible load that may be over-length and /or over-weight but not over-width or over-height.
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. There are two situations in which a vehicle is properly overweight: 1. A vehicle has no permit but exceeds its general access load limits. 2. A vehicle has a permit and exceeds its general access load limits. However, WiM data does not identify vehicles and whether or not they have a permit, so 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

- There are more larger and heavier vehicles recorded in 2015 than 2014. The total number of vehicles recorded with gross mass 50 tonnes and over has increased by 280% from 6,301 in 2014 to 24,227 in 2015 at Drury site. This reflects there are more truck operators have been taken up 50Max.
- The total 50MAX permit issued increased by 114% from 1842 in 2014 to 3948 in 2015. The total HPMV permit issued increased by 120% from 2384 in 2014 to 5250 in 2015.
- Because it is located on the route which links Auckland to all other major centres, the Drury WiM site is the busiest one in terms of heavy vehicles volumes. (see chart 5) It accounted for about half (49.9%) of all heavy vehicles recorded and 45.8% of all gross mass recorded across all the WiM sites. Drury therefore has a significant influence on the overall vehicle fleet data analysis.
- Annual average daily overweight (more accurately it should be over general access load limits) heavy vehicles increased by 19.6 percent compared with 2014 and is on the increase trend since 2013. This includes those vehicles that may be permitted to carry weights in excess of the general access load limits for their class. Currently we cannot identify what percentage of the vehicles which over general access load limits without a permit. (The weigh right project underway is aiming to identify which of these vehicles without a permit.)
- In 2015, for the first time, there are more 9 axle's trucks than 8 axles trucks recorded over general access load limits. The vehicle class with the largest proportion of all over general access load limits vehicles was PAT classes 915 (35.6% of the total vehicles over general access load limits).
- Heavy commercial vehicle II (with five or more axles in total) accounted for 81% of all recorded gross mass and 52% of total number of heavy vehicles recorded. In 2014, they were 82% and 59%, respectively. This indicates that in general, weight of heavy commercial vehicles II were heavier than 2014.
- The heavy vehicles with 8 axles are still the largest proportion (36%) in all recorded gross mass, and accounted for 25% of total number of heavy vehicles recorded, across all axles groups.
- However, the proportion of heavy vehicles with 9 axles is quickly increasing: 8.3% and 14.3% for the last three years, while vehicles with 8 axles are continuing to decline, from 29% in 2014 to 25% in 2015, likely due to more truck companies have been taking up 50MAX.

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 *over general access load limits vehicles* or *overweight vehicles* (but this includes permitted overweight vehicles such as 50MAX and HPMVs).

Chart 1 | Vehicle percentage distribution by vehicle type

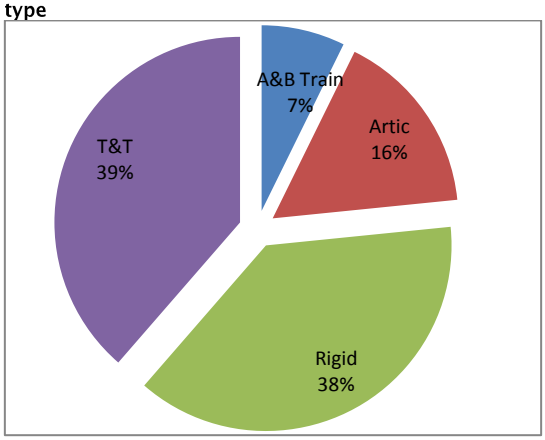


Chart 2 | GHVM percentage distribution by vehicle type

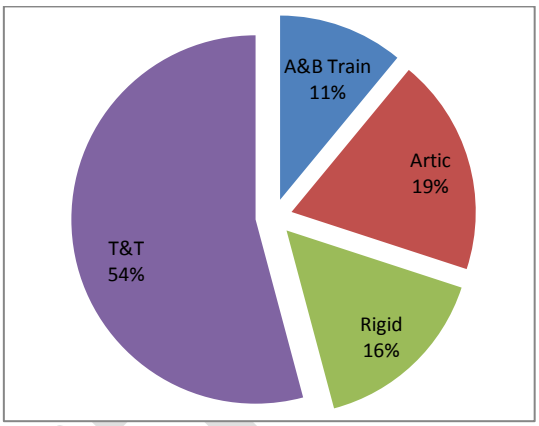


Chart 3 | Overweight percentage distribution by vehicle type

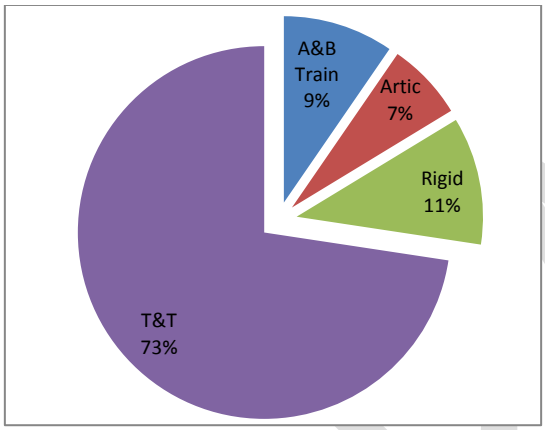


Chart 4 | GHVM percentage distribution of overweight vehicle by vehicle type

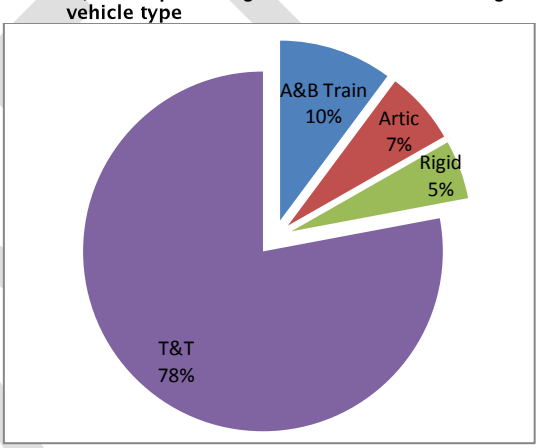


Table 1.0 | Vehicle frequency and estimated GHVM by vehicle type

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	255,657	*7.3*	9,262,959	*11.0*	41,646	*9.6*	1,992,651	*10.2*	*16.3*	*21.5*	*36.2*	*47.8*
Artic	566,342	*16.1*	*16,047,072*	*19.0*	29,172	*6.7*	1,287,909	*6.6*	*5.2*	*8.0*	*28.3*	*44.1*
Rigid	1,334,354	*38.0*	*13,340,085*	*15.8*	48,118	*11.1*	1,034,876	*5.3*	*3.6*	*7.8*	*10.0*	*21.5*
T&T	1,356,412	*38.6*	*45,661,760*	*54.2*	315,255	*72.6*	15,263,210	*78.0*	*23.2*	*33.4*	*33.7*	*48.4*
Total	3,512,765	*100.0*	84,311,876	*100.0*	434,191	*100.0*	19,578,645	*100.0*	*12.4*	*23.2*	*24.0*	*45.1*

Note: [1]Total number of vehicles recorded or the estimated gross mass (both vehicle and load mass) during the accepted days of operations.
[2]Total number of vehicles recorded and the estimated gross mass (both vehicle and load mass) that exceed their maximum limit of each PAT class during the accepted days of operations.
[3]The proportion of each vehicle type from the given column total. For example, 16.1 percent of the overall total of heavy vehicles recorded was Artic vehicles.
[4]The proportion of overweight heavy vehicles over the total heavy vehicles recorded and the total mass of the excess tonne go above the legal limit of each PAT class against the overall gross mass of each vehicle type. For example, 23.2 percent of 1,512,765 T&T Train vehicles were overweight.

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

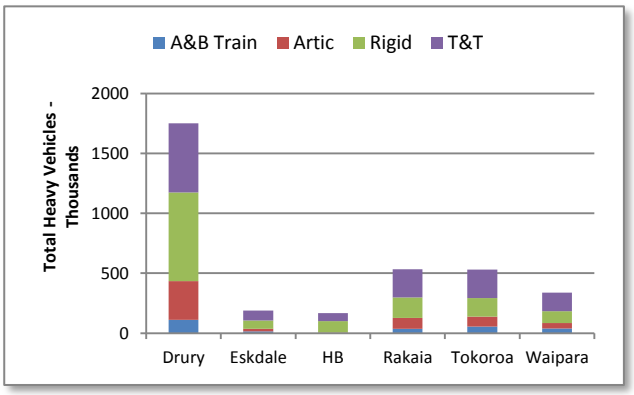


Chart 5.1 | Vehicle per day frequency distribution by vehicle type

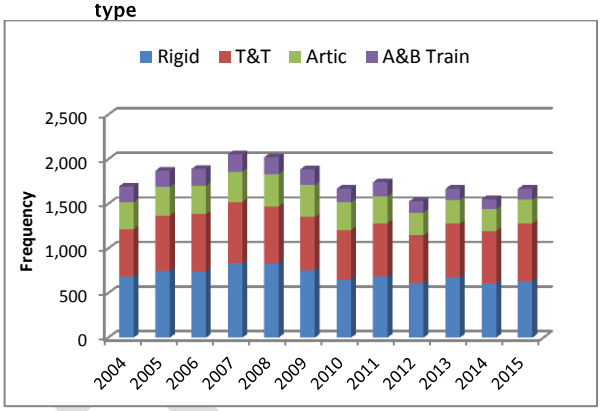
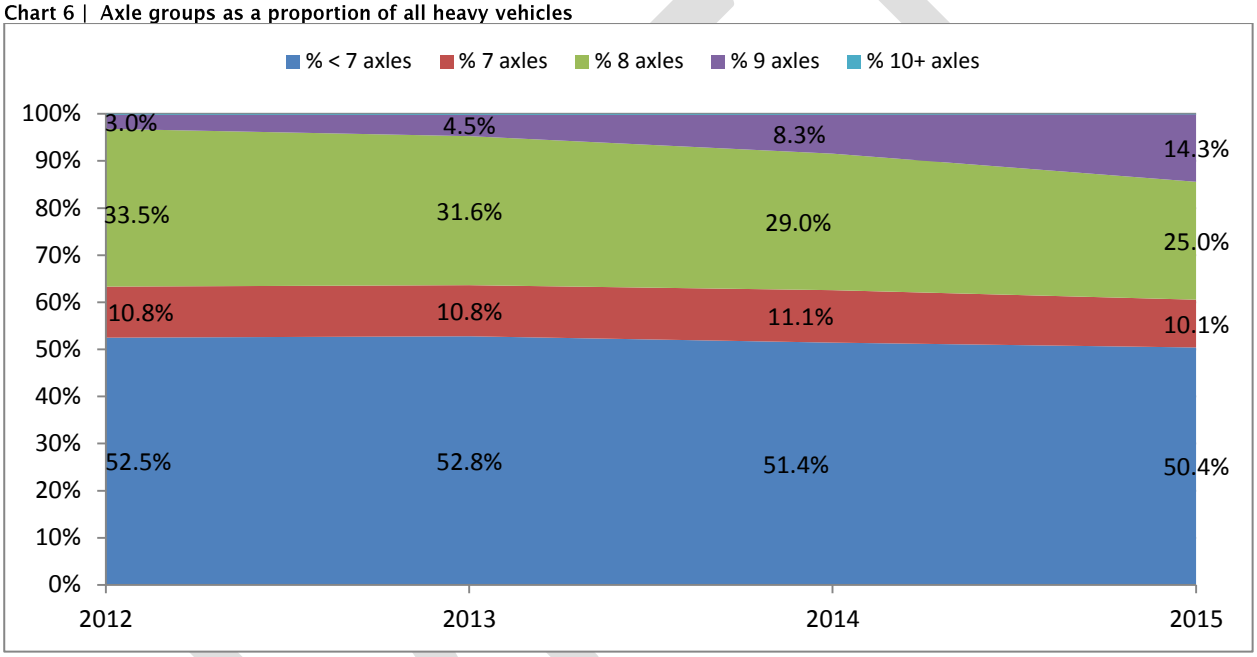


Chart 6 | Axle groups as a proportion of all heavy vehicles



Vehicle fleet

- Overall, there are no notable changes to the distribution by vehicle type, (Chart1, chart 2 Chart 3 and chart4), compared with the last year's chart.
- Overall, annual average daily heavy vehicles recorded were 1644, this grew by 5.7%, compared to 2014, but this was mainly driven by the growth of 6.9% from Drury site (see Table 8).
- As shown in Chart 6, the overall daily heavy vehicles frequency have been floating at a lower level since 2010, compared to the levels in 2007 and 2008. This could be a result of number of factors, one of the know factor is the Vehicle Dimensions and Mass Amendment 2010, Rule 41001/5, came into effect on 1 May 2010, which aims to decrease truck trips for the same freight task from increased truck mass and /or length.
- PAT class 891(8 axles) still had the highest proportion of estimated gross mass recorded (25.3%) in 2015, but this is a decrease from 2014 (30%). and this class no longer has the highest proportion of overweight vehicles as it did in 2014 (37%). PAT class 915 had the highest proportion of overweight vehicles.(35.6%)
- The makeup of heavy vehicles with 8 or more axles continues to change (see Chart 6). The proportion of heavy vehicles with 8 axles continues to decrease (31.6%, 29% and 25% for the last three years), and

the proportion of heavy vehicles with 9 axles is quickly increasing (4.5%, 8.3% and 14.3%) for the last three years.

- For vehicles with estimated gross mass >50 tonnes, the most common PAT classes were 915 (82%). (See table 13.1).
- It is also notable that PAT 915 (9 axles) accounted for 35.6% of all over general access load limits vehicles, the highest of all PAT classes, indicating that more truck operators are moving to 50MAX vehicles.
- PAT 915 vehicle combinations have one more axle then conventional 44-tonne vehicles combinations, meaning the overall truck load is spread further and there is no additional were on roads per tonne of freight and increased payloads of 50MAX can lead to economic benefits for operators, customers and our communities.

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

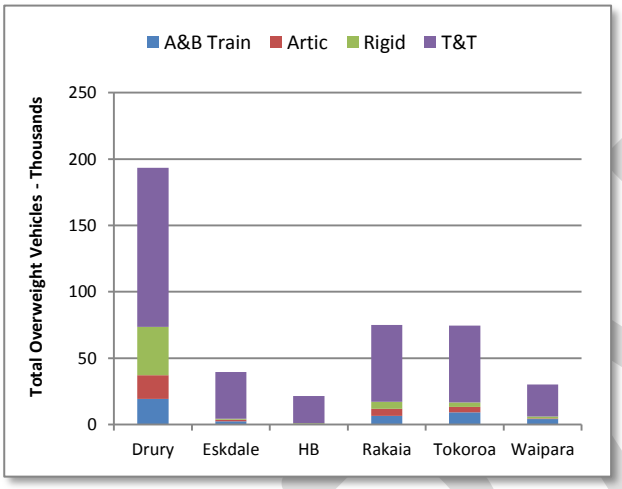
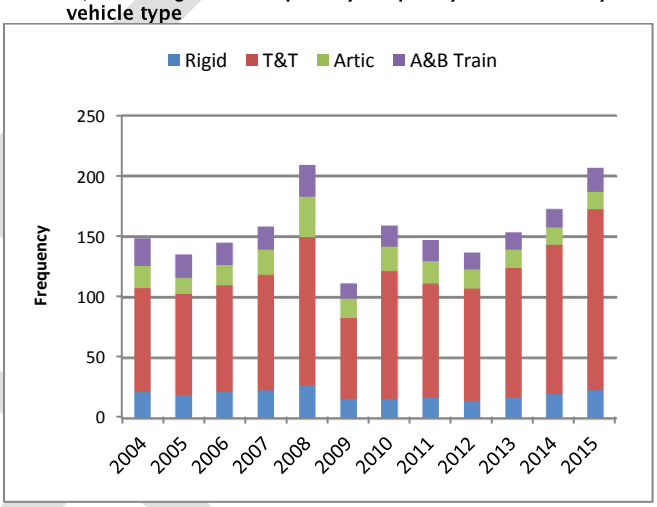


Chart 8 | Overweight vehicle per day frequency distribution by vehicle type



Vehicle fleet overweight

- Overweight heavy vehicles per day frequency have been increasing each year since 2013 (See Chart 8). It reflects the increased number of vehicles that have permit to carry weights in excess of the standard weight limits for their class.
- The total 50MAX permit issued increased by 114% from 1842 in 2014 to 3948 in 2015. The total HPMV permit issued increased by 120% from 2384 in 2014 to 5250 in 2015. (Sourced from Freight & Register records team.)
- For Drury site, the total number of vehicles recorded with gross mass 50 tonnes and over has increased by 280% from 6,301 in 2014 to 24,227 in 2015, possibly as a result of more 50MAX and HPMV permits issued. It may indicate the vehicles with 50MAX permit made more trips than 2014.
- Annual average daily overweight heavy vehicles increased by 19.6 percent to 207 overweight heavy vehicles per day compared to 173 in 2014. (Table 11.0)
- The estimated average gross mass for overweight vehicles was 45.1 tonnes (up 1.8% from 44.3 tonnes in 2014), this could be a result of number of factors including HPMV/50Max or the truck companies try to use the police weighing tolerance which is 1,500kg on 44,000kg.
- The consequence of the increased number of overweight vehicles could mean improved production activities if those overweight vehicles were permitted to carry more weights. Otherwise, if those overweight vehicles didn't meet the requirement and were not permitted, they will damage the road infrastructure.

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

Table 2.0 | Vehicle type by WiM site (2015)

Vehicle Type	WiM Site						Total
	Drury	Eskdale	Hamanatua Bridge	Rakaia	Tokoroa	Waipara	
Number of Heavy vehicles							
A&B Train	110,262	14,138	441	37,260	53,657	39,899	255,657
Artic	323,707	21,999	2,766	89,251	84,387	44,232	566,342
Rigid	740,376	70,750	96,676	171,130	155,499	99,923	1,334,354
T&T	578,941	82,836	68,050	234,911	237,815	153,859	1,356,412
Total	1,753,286	189,723	167,933	532,552	531,358	337,913	3,512,765
Number of Overweight vehicles							
A&B Train	19,361	2,445	12	6,611	9,124	4,093	41,646
Artic	17,878	1,138	92	5,192	4,223	649	29,172
Rigid	36,454	745	871	5,261	3,337	1,450	48,118
T&T	119,675	35,318	20,451	57,970	57,781	24,060	315,255
Total	193,368	39,646	21,426	75,034	74,465	30,252	434,191
Percentage of vehicles overweight (%)							
A&B Train	*17.6*	*17.3*	*2.7*	*17.7*	*17.0*	*10.3*	*16.3*
Artic	*5.5*	*5.2*	*3.3*	*5.8*	*5.0*	*1.5*	*5.2*
Rigid	*4.9*	*1.1*	*0.9*	*3.1*	*2.1*	*1.5*	*3.6*
T&T	*20.7*	*42.6*	*30.1*	*24.7*	*24.3*	*15.6*	*23.2*
Total	*11.0*	*20.9*	*12.8*	*14.1*	*14.0*	*9.0*	*12.4*
Estimated gross mass							
A&B Train	3,946,499	517,484	14,417	1,326,709	2,004,273	1,453,578	9,262,959
Artic	9,022,306	623,523	61,946	2,536,383	2,508,622	1,294,294	16,047,072
Rigid	7,108,133	784,189	1,224,932	1,703,826	1,559,690	959,316	13,340,085
T&T	18,575,274	3,200,083	2,723,725	7,746,265	8,410,175	5,006,240	45,661,760
Total	38,652,212	5,125,279	4,025,019	13,313,182	14,482,759	8,713,427	84,311,876
Estimated overweight vehicles gross mass							
A&B Train	928,059	118,321	559	318,071	434,220	193,423	1,992,651
Artic	781,963	51,540	4,179	231,079	190,562	28,588	1,287,909
Rigid	789,525	15,713	17,998	110,579	71,073	29,990	1,034,876
T&T	5,821,884	1,707,825	955,824	2,850,189	2,774,535	1,152,953	15,263,210
Total	8,321,430	1,893,398	978,559	3,509,918	3,470,389	1,404,953	19,578,645
Estimated Gross Mass per vehicle (tonne)							
A&B Train	*35.8*	*36.6*	*32.7*	*35.6*	*37.4*	*36.4*	*36.2*
Artic	*27.9*	*28.3*	*22.4*	*28.4*	*29.7*	*29.3*	*28.3*
Rigid	*9.6*	*11.1*	*12.7*	*10.0*	*10.0*	*9.6*	*10.0*
T&T	*32.1*	*38.6*	*40.0*	*33.0*	*35.4*	*32.5*	*33.7*
Total	*22.0*	*27.0*	*24.0*	*25.0*	*27.3*	*25.8*	*24.0*
Estimated overweight vehicles gross mass per vehicle (tonne)							
A&B Train	*47.9*	*48.4*	*46.5*	*48.1*	*47.6*	*47.3*	*47.8*
Artic	*43.7*	*45.3*	*45.4*	*44.5*	*45.1*	*44.0*	*44.1*
Rigid	*21.7*	*21.1*	*20.7*	*21.0*	*21.3*	*20.7*	*21.5*
T&T	*48.6*	*48.4*	*46.7*	*49.2*	*48.0*	*47.9*	*48.4*
Total	*43.0*	*47.8*	*45.7*	*46.8*	*46.6*	*46.4*	*45.1*

Interpretation:

- Overweight heavy vehicles per day frequency have been increasing each year since 2013. Across all WiM sites there were 12.4% of recorded vehicles over general access load limits. It was 11.6% in 2014 and 9.2% in 2013. This reflects the increased number of vehicles that have permit to carry weights in excess of the standard weight limits for their class.

- While 23.2% of all T&T vehicles (across all sites) were over general access load limits, there were 77.9% of total estimated overweight vehicles gross mass were taken by them. It suggests the majority of 50MAX/HPMV permits were issued to T&T vehicle combinations.

4.0 INTRODUCTION

The data used in this report was collected from the six WiM sites on the state highway network during 2015. We will be reporting on a seventh site in Kairua on TEL (operated from August 2015), which will be included in the 2016 report.
Te Puke site (WiM site 24) was made obsolete in June 2015 due to the network change.
The current sites are as follows:

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)
05 – Gisborne	35	321	HAMANATUA BRIDGE – Telemetry Site 108 (WiM Site)
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 in the 2015 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 six 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 as trucks 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 2015 there were 36,454 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 without permit and those permitted vehicles that are allowed to carry over limits.

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

10.0 CLASSIFICATION SCHEME

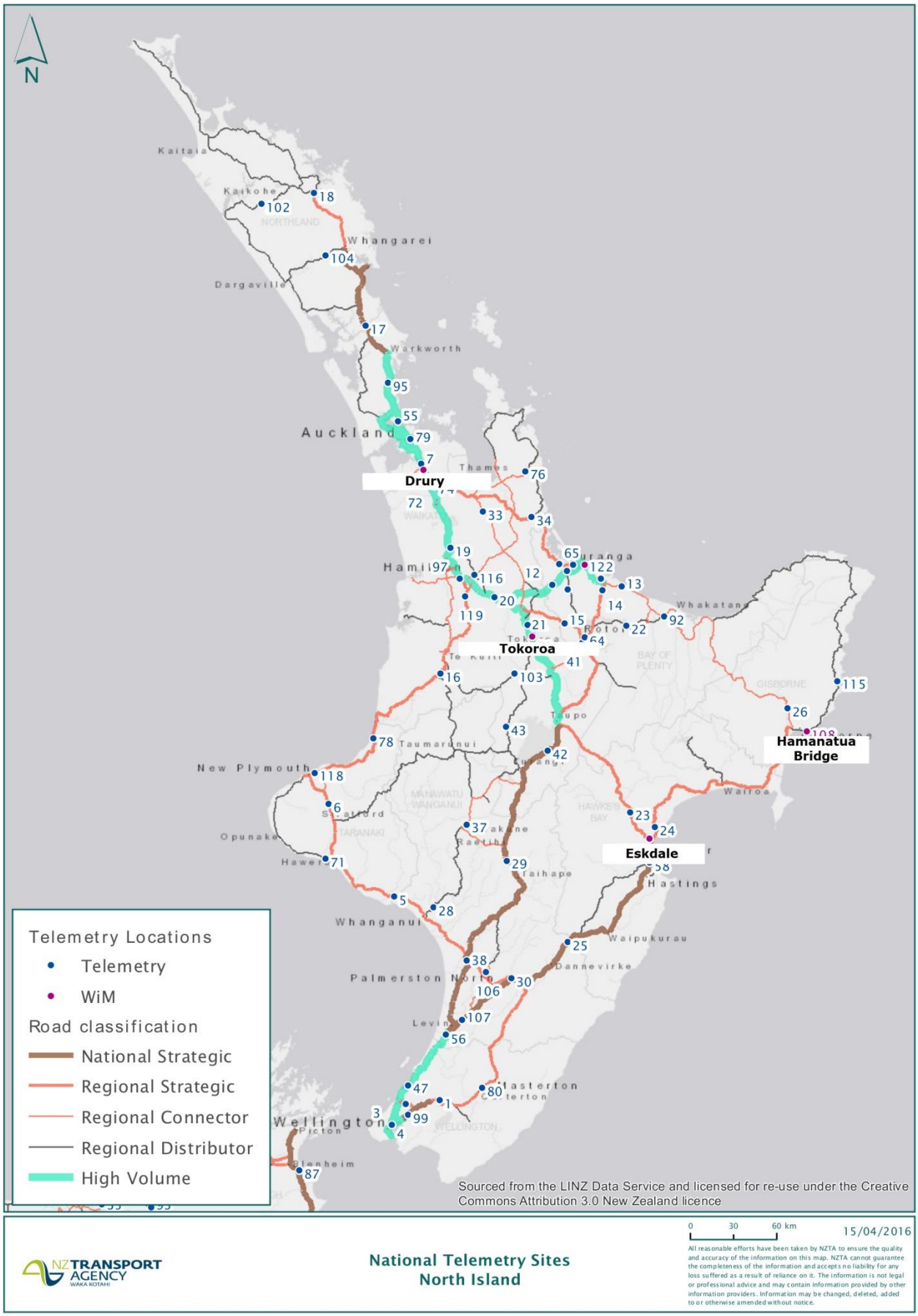
Table 5.0 | Heavy vehicle classification 2011 scheme

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

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Telemetry Locations
Telemetry
WiM
Road classification
National Strategic
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Regional Distributor
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NZ TRANSPORT AGENCY
WAKA KOTAHI
National Telemetry Sites
South Island
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15/04/2016
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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 2015	Number of heavies per day	% Heavy
1205	1N	Drury – Telemetry Site 48	48,017	5,330	*11.1*
5721	5	Eskdale – Telemetry Site 101	3,841	626	*16.3*
6281	35	Hamanatua Bridge – Telemetry Site 108	4,625	504	*10.9*
8821	1S	Rakaia – Telemetry Site 121	12,691	1,802	*14.2*
421	1N	Tokoroa – Telemetry Site 51	9,451	1,597	*16.9*
518	1S	Waipara – Telemetry Site 52	8,252	1,238	*15.0*

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

Source: State Highway Traffic Data Booklet 2010–2015, published in March 2016.

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

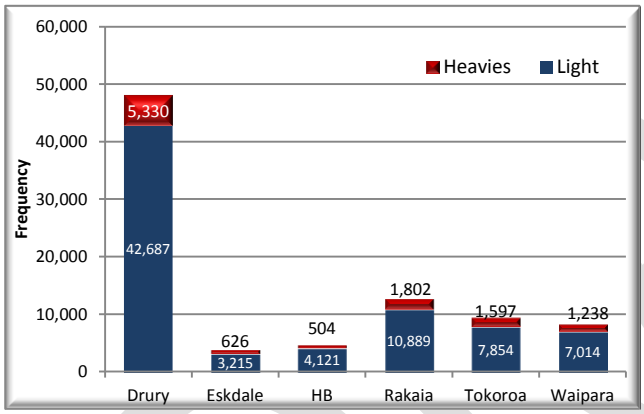
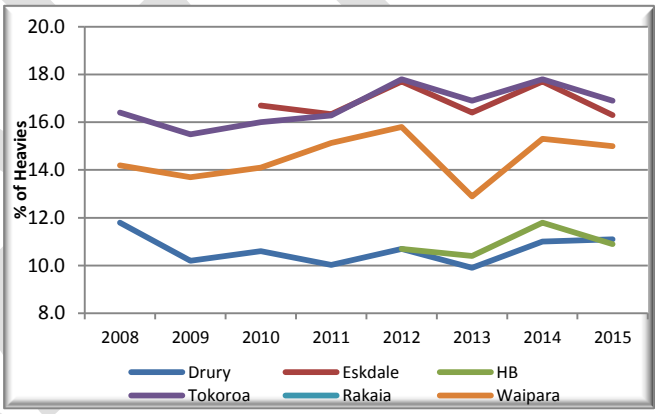


Chart 10 | Heavy vehicles proportion from AADT



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		Hamanatua Bridge		Total Volume	%
				Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%		
A&B Train	HCV2	74	o-oo--oo-o--o A Train	26	0.0	77	0.0	2	0.0	1	0.0	.	.	3	0.0	109	0.0
		622	o--o--oo--oo--o-o (A train)	40	0.0	18	0.0	20	0.0	8	0.0	.	.	1	0.0	87	0.0
		811	o--oo--oo--ooo (B train)	1,088	0.1	329	0.1	56	0.0	18	0.0	205	0.1	6	0.0	1,702	0.0
		851	o-oo--ooo--oo B Train	52,253	3.0	22,893	4.3	20,301	3.8	18,186	5.4	7,949	4.2	417	0.2	121,999	3.5
		951	o-oo-ooo-ooo B Train	56,855	3.2	30,340	5.7	16,881	3.2	21,686	6.4	5,984	3.2	14	0.0	131,760	3.8
Artic	Bus & HCV1	30	o-o--o	3,395	0.2	1,093	0.2	1,562	0.3	767	0.2	517	0.3	46	0.0	7,380	0.2
	HCV1	41	o-o--oo	16,961	1.0	3,936	0.7	2,577	0.5	1,746	0.5	1,765	0.9	210	0.1	27,195	0.8
		42	o-oo--o	88	0.0	22	0.0	64	0.0	52	0.0	4	0.0	2	0.0	232	0.0
	HCV2	53	o-oo--oo T&T	30,030	1.7	3,793	0.7	3,987	0.7	2,626	0.8	1,052	0.6	1,225	0.7	42,713	1.2
		57	o--o-----ooo (artic)	4,171	0.2	1,494	0.3	1,378	0.3	419	0.1	822	0.4	20	0.0	8,304	0.2
		68	oo--oo--oo T & T	18,491	1.1	9,425	1.8	3,975	0.7	4,540	1.3	1,055	0.6	206	0.1	37,692	1.1
		69	o-oo--ooo	111,006	6.3	19,050	3.6	27,548	5.2	10,228	3.0	3,518	1.9	737	0.4	172,087	4.9
		713	oo-oo--ooo Tri Artic	16,573	0.9	4,076	0.8	5,627	1.1	1,695	0.5	1,075	0.6	4	0.0	29,050	0.8
		747	o--ooo---ooo Tri Artic	44	0.0	26	0.0	23	0.0	14	0.0	1	0.0	.	.	108	0.0
		791	o-oo-oooo Quad Artic	44,122	2.5	14,253	2.7	17,358	3.3	11,396	3.4	2,619	1.4	294	0.2	90,042	2.6
		826	oo-oo--oooo Quad Artic	78,614	4.5	27,177	5.1	25,081	4.7	10,694	3.2	9,570	5.0	22	0.0	151,158	4.3
		847	o--ooo---oooo Quad Artic	212	0.0	42	0.0	71	0.0	55	0.0	1	0.0	.	.	381	0.0
Rigid	Bus & HCV1	31	o--oo	188,052	10.7	30,393	5.7	38,799	7.3	16,722	4.9	8,208	4.3	6,447	3.8	288,621	8.2
		34	oo--o	260	0.0	152	0.0	323	0.1	71	0.0	228	0.1	14	0.0	1,048	0.0
		301	o--oo (tractor without semi-trailer)	2,164	0.1	318	0.1	1,079	0.2	358	0.1	52	0.0	100	0.1	4,071	0.1
	Bus & MCV	20	o-o (wb 2.0-3.2m, gw >= 3.5t)	81,262	4.6	8,189	1.5	8,404	1.6	5,443	1.6	4,277	2.3	11,502	6.8	119,077	3.4
		21	o--o (wb >3.2m, gw >= 3.5t)	376,372	21.5	81,694	15.4	95,948	18.0	56,991	16.9	29,308	15.4	22,686	13.5	662,999	18.9
	HCV1	45	oo--oo	91,182	5.2	34,607	6.5	26,514	5.0	20,228	6.0	28,632	15.1	55,924	33.3	257,087	7.3
		47	o--ooo	63	0.0	27	0.0	16	0.0	44	0.0	13	0.0	2	0.0	165	0.0
		511	oo--ooo (heavy truck)	1,021	0.1	119	0.0	47	0.0	66	0.0	32	0.0	1	0.0	1,286	0.0
T&T	Bus & HCV1	44	oo-o--o	21	0.0	29	0.0	4	0.0	8	0.0	8	0.0	3	0.0	73	0.0
		402	o--oo---o(truck tow light 1 ax trailer)	4,081	0.2	1,420	0.3	1,204	0.2	934	0.3	375	0.2	132	0.1	8,146	0.2
	Bus & MCV	300	o--o--o(truck towing light trailer)	31,351	1.8	3,833	0.7	7,931	1.5	4,545	1.3	1,509	0.8	861	0.5	50,030	1.4
		401	o--o--oo(truck tow light 2 ax trailer)	20,524	1.2	5,906	1.1	8,830	1.7	7,098	2.1	2,742	1.4	1,997	1.2	47,097	1.3
	HCV2	52	o--oo-o--o T&T	4,265	0.2	483	0.1	1,065	0.2	705	0.2	144	0.1	506	0.3	7,168	0.2
		61	o-o--o-o--oo T & T	9	0.0	3	0.0	6	0.0	1	0.0	.	.	.	.	19	0.0
		62	o--oo--o-o-o (T+T)	1,521	0.1	895	0.2	965	0.2	682	0.2	505	0.3	327	0.2	4,895	0.1
		63	o--oo-o--oo T & T	10,954	0.6	2,556	0.5	2,912	0.5	1,066	0.3	217	0.1	506	0.3	18,211	0.5
		66	oo--oo-o--o T & T	1,870	0.1	377	0.1	645	0.1	236	0.1	318	0.2	88	0.1	3,534	0.1
		77	oo--oo-o--oo	13,809	0.8	4,036	0.8	4,269	0.8	4,094	1.2	1,806	1.0	4,612	2.7	32,626	0.9
		503	o--oo--oo (truck tow light trailer)	292	0.0	165	0.0	226	0.0	420	0.1	57	0.0	26	0.0	1,186	0.0
		751	o-oo--oo--oo B-train or T&T	144,257	8.2	22,381	4.2	15,507	2.9	10,178	3.0	8,291	4.4	3,872	2.3	204,486	5.8
		771	oo--o--oo--oo (T+T)	.	.	15	0.0	.	.	.	.	2	0.0	.	.	17	0.0
		891	oo--oo-oo--ooT&T	207,744	11.8	122,318	23.0	106,207	19.9	77,699	23.0	41,522	21.9	48,336	28.8	603,826	17.2
		914	oo-oo--ooo-ooT&T	857	0.0	401	0.1	459	0.1	826	0.2	137	0.1	3	0.0	2,683	0.1
		915	oo-oo--oo-ooo T&T	135,722	7.7	72,048	13.6	84,210	15.8	44,758	13.2	25,009	13.2	6,781	4.0	368,528	10.5
		1020	oo-oo-ooo-ooo B Train	1,664	0.1	949	0.2	471	0.1	609	0.2	194	0.1	.	.	3,887	0.1
Total				1,753,286	100	531,358	100	532,552	100	337,913	100	189,723	100	167,933	100	3,512,765	100
Percentage from the total				*49.9*		*15.1*		*15.2*		*9.6*		*5.4*		*4.8*		*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 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:

- 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 half

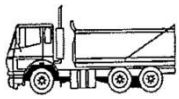
(49.9%) of all heavy vehicles recorded and 45.8% of all gross mass recorded across all the WiM sites. Drury therefore has a significant influence on the overall vehicle fleet data analysis.

- Medium commercial vehicles (Two axle heavy trucks without a trailer) accounted for 6% of all recorded gross mass, and 22% of total number of heavy vehicles recorded. There was almost no change compared to last year.
- Heavy commercial vehicle I (with three or four axles in total) accounted for 13% of all recorded gross mass and 26% of total number of heavy vehicles recorded. In 2014, they were 12% and 19%, respectively
- Heavy commercial vehicle II (with five or more axles in total) accounted for 81% of all recorded gross mass and 52% of total number of heavy vehicles recorded. In 2014, they were 82% and 59%, respectively.
- The most common vehicle type (in PAT classes) remained almost the same as in 2014.
- The notable changes are the percentage of PAT 891 down from 20% in 2014 to 17% in 2015 and PAT 915 up from 5.4% in 2014 to 11% in 2015, likely due to more truck companies have been taking up 50MAX.

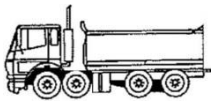
Fig. 1 | The most common PAT classes in 2015 are 21, 31, 45, 891, 751, 891 and 915

PAT type 21:
(19%)

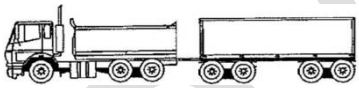
PAT type 31:
(8%)



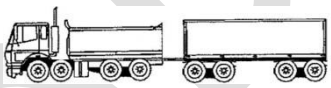
PAT type 45:
(7%)



PAT type 751:
(6%)



PAT type 891:
(17%)



PAT type 915
(11%)

Interpretation:

- 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 (2011-2015)

Year	Vehicle Type	WiM Site							Average
		Drury	Eskdale	Hamanatua Bridge	Te Puke	Rakaia	Tokoroa	Waipara	
2011	Rigid	1,724	227	-	758	-	390	361	690
	T&T	1,173	231	-	636	-	552	376	594
	Artic	818	68	-	253	-	208	135	298
	A&B Train	331	47	-	96	-	176	136	160
2011 Total		4,046	573	-	1,744	-	1,327	1,007	1,741
2012	Rigid	1,691	229	249	737	-	420	334	614
	T&T	1,237	249	173	579	-	573	387	533
	Artic	826	73	8	244	-	223	132	255
	A&B Train	319	51	2	86	-	168	123	126
2012 Total		4,072	603	432	1,645	-	1,384	976	1,528
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	1,644

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.

Interpretation:

- Average daily heavy vehicle have been increasing each year at Drury site. But that trend didn't show at other sites. One possible reason could be the strong business demand driven by growing population in Auckland regional.
- The trends below observed at Drury site, but not apply to all other sites, possibly because the different location and economic activity:
    - A&B Train truck show a decreasing trend.
    - Artic truck appears to stay on at a stable level.
    - Both Rigid and T&T truck show an increasing trend.

Table 9.0 | Annual daily average heavy vehicles frequency by selected PAT class and by WiM site (2010-2015)

Year	PAT code	WiM Site							Average
		Drury	Eskdale	Hamanatua Bridge	Te Puke	Rakaia	Tokoroa	Waipara	
2011	21	913	87	-	367	-	188	194	349
	31	387	32	-	145	-	84	57	141
	45	205	93	-	191	-	87	54	124
	751	289	31	-	148	-	73	42	115
	891	716	171	-	417	-	422	274	401
	Others	1,537	159	-	475	-	473	386	611
2011 Total		4,046	573	-	1,744	-	1,327	1,007	1,741
2012	21	883	87	66	361	-	201	177	298
	31	385	32	21	140	-	81	55	120
	45	213	96	130	181	-	106	60	130
	751	314	36	22	123	-	66	38	101
	891	723	185	130	384	-	435	276	354
	Others	1,554	167	63	456	-	495	370	525
2012 Total		4,072	603	432	1,645	-	1,384	976	1,528
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

Interpretation

- The daily average number of PAT class 891 and 751 decreased across all the WiM sites in 2015 compared to 2014, most likely replaced by 9-axle vehicle PAT 915.
- PAT 21 and PAT 31 have been increasing at Drury site since 2013, but this is not the case for other sites. The possible reason could be Drury site is located between the major urben areas, there are strong demand for delivery goods in the local area and contruction activity than other sites.

Table 9.1 | Annual number of heavy vehicles by number of axles and site (2012–2015)

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

Interpretation:

- Although the vehicles with 8 axles still have the largest proportion of vehicles with 7 or more axles, this figure is declining, while the number of vehicles with 9 axles is consistently and markedly increasing each year, most likely as a result of more long-haul freight trucks taken on 50MAX/HPMV.

14.0 VEHICLE FLEET OVERWEIGHT TABLES

PAT class – This is the code relating to the axle configuration.
Description – This illustrates the PAT type by providing an indication of the spacing between axles.
Total overweight – This indicates the number of heavy vehicles overweight for each PAT type.

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		Total Volume	%
				Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%		
A&B Train	HCV2	74	o-oo--oo-o--o A Train	1	0.0	.	.	.	.	.	.	.	.	1	0.0	2	0.0
A&B Train	HCV2	811	o--oo--oo--ooo (B train)	115	0.1	34	0.0	33	0.0	3	0.0	21	0.1	2	0.0	208	0.0
A&B Train	HCV2	851	o-oo--ooo--oo B Train	6,414	3.3	2,171	2.9	2,561	3.4	785	2.6	862	2.2	9	0.0	12,802	2.9
A&B Train	HCV2	951	o-oo-ooo-ooo B Train	12,831	6.6	6,919	9.3	4,017	5.4	3,305	10.9	1,562	3.9	.	.	28,634	6.6
Artic	HCV1	41	o-o--oo	13	0.0	.	.	.	.	.	.	1	0.0	.	.	14	0.0
Artic	HCV1	42	o-oo--o	.	.	1	0.0	.	.	.	.	.	.	.	.	1	0.0
Artic	HCV2	53	o-oo--oo T&T	1,264	0.7	22	0.0	13	0.0	3	0.0	12	0.0	2	0.0	1,316	0.3
Artic	HCV2	57	o--o-----ooo (artic)	5	0.0	1	0.0	2	0.0	.	.	6	0.0	.	.	14	0.0
Artic	HCV2	68	oo--oo--oo T & T	7	0.0	8	0.0	2	0.0	.	.	.	.	.	.	17	0.0
Artic	HCV2	69	o-oo--ooo	6,324	3.3	941	1.3	1,529	2.0	176	0.6	203	0.5	39	0.2	9,212	2.1
Artic	HCV2	713	oo-oo--ooo Tri Artic	62	0.0	26	0.0	35	0.0	6	0.0	9	0.0	.	.	138	0.0
Artic	HCV2	747	o--ooo---ooo Tri Artic	1	0.0	.	.	4	0.0	2	0.0	1	0.0	.	.	8	0.0
Artic	HCV2	791	o-oo-oooo Quad Artic	2,716	1.4	1,106	1.5	1,182	1.6	265	0.9	111	0.3	51	0.2	5,431	1.3
Artic	HCV2	826	oo-oo--oooo Quad Artic	7,465	3.9	2,114	2.8	2,414	3.2	195	0.6	795	2.0	.	.	12,983	3.0
Artic	HCV2	847	o--ooo---oooo Quad Artic	21	0.0	4	0.0	11	0.0	2	0.0	.	.	.	.	38	0.0
Rigid	Bus & HCV1	31	o--oo	32,990	17.1	2,864	3.8	4,579	6.1	1,238	4.1	666	1.7	830	3.9	43,167	9.9
Rigid	Bus & HCV1	34	oo--o	2	0.0	1	0.0	11	0.0	.	.	.	.	3	0.0	17	0.0
Rigid	Bus & HCV1	301	o--oo (tractor without semi-trailer)	94	0.0	41	0.1	23	0.0	4	0.0	.	.	.	.	162	0.0
Rigid	Bus & MCV	20	o-o (wb 2.0-3.2m, gw >= 3.5t)	1	0.0	.	.	14	0.0	.	.	.	.	1	0.0	16	0.0
Rigid	Bus & MCV	21	o--o (wb >3.2m, gw >= 3.5t)	757	0.4	162	0.2	271	0.4	119	0.4	30	0.1	12	0.1	1,351	0.3
Rigid	HCV1	45	oo--oo	2,366	1.2	267	0.4	347	0.5	79	0.3	45	0.1	25	0.1	3,129	0.7
Rigid	HCV1	47	o--ooo	3	0.0	.	.	6	0.0	1	0.0	3	0.0	.	.	13	0.0
Rigid	HCV1	511	oo--ooo (heavy truck)	241	0.1	2	0.0	10	0.0	9	0.0	1	0.0	.	.	263	0.1
T&T	Bus & HCV1	44	oo-o--o	.	.	.	.	.	.	.	.	.	.	1	0.0	1	0.0
T&T	Bus & HCV1	402	o--oo---o(truck tow light 1 ax trailer)	1	0.0	.	.	2	0.0	.	.	.	.	.	.	3	0.0
T&T	Bus & MCV	300	o--o--o(truck towing light trailer)	3	0.0	.	.	1	0.0	.	.	.	.	.	.	4	0.0
T&T	Bus & MCV	401	o--o--oo(truck tow light 2 ax trailer)	5	0.0	1	0.0	.	.	.	.	.	.	.	.	6	0.0
T&T	HCV2	52	o--oo-o--o T&T	11	0.0	9	0.0	4	0.0	3	0.0	1	0.0	1	0.0	29	0.0
T&T	HCV2	62	o--oo--o-o-o (T+T)	243	0.1	451	0.6	308	0.4	289	1.0	169	0.4	119	0.6	1,579	0.4
T&T	HCV2	63	o--oo-o--oo T & T	652	0.3	14	0.0	17	0.0	6	0.0	2	0.0	8	0.0	699	0.2
T&T	HCV2	66	oo--oo-o--o T & T	12	0.0	.	.	.	.	7	0.0	2	0.0	.	.	21	0.0
T&T	HCV2	77	oo--oo-o--oo	1,461	0.8	738	1.0	344	0.5	572	1.9	905	2.3	405	1.9	4,425	1.0
T&T	HCV2	503	o--oo--oo (truck tow light trailer)	4	0.0	3	0.0	4	0.0	2	0.0	.	.	.	.	13	0.0
T&T	HCV2	751	o-oo--oo--oo B-train or T&T	31,561	16.3	2,588	3.5	2,623	3.5	899	3.0	2,063	5.2	317	1.5	40,051	9.2
T&T	HCV2	771	oo--o--oo--oo (T+T)	.	.	1	0.0	.	.	.	.	.	.	.	.	1	0.0
T&T	HCV2	891	oo--oo-oo--ooT&T	30,275	15.7	22,799	30.6	18,706	24.9	8,132	26.9	18,103	45.7	14,172	66.1	112,187	25.8
T&T	HCV2	914	oo-oo--ooo-ooT&T	168	0.1	90	0.1	81	0.1	64	0.2	40	0.1	.	.	443	0.1
T&T	HCV2	915	oo-oo--oo-ooo T&T	54,845	28.4	30,731	41.3	35,695	47.6	14,051	46.4	13,979	35.3	5,428	25.3	154,729	35.6
T&T	HCV2	1020	oo-oo-ooo-ooo B Train	434	0.2	356	0.5	185	0.2	35	0.1	54	0.1	.	.	1,064	0.2
			Total	193,368	100	74,465	100	75,034	100	30,252	100	39,646	100	21,426	100	434,191	100
			Percentage from the total	44.5		17.2		17.3		7.0		9.1		4.9		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 percentage of vehicles with gross mass of over general access load limits vehicles across all sites and PAT types from the total number of vehicles recorded has increased from 11% in 2014 to 12% in 2015.
- The vehicle with the largest proportion of all over general access load limits is PAT 915 for most sites, but not for Eskdale site and Hamanatau Bridge site. This indicats that the majority of logging trucks recorded at these two sites were still PAT 891, because the majority of trucks that pass these two sites are logging trucks going to the port.

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	Te Puke	Rakaia	Tokoroa	Waipara	
2011	Rigid	52	4	-	16	-	8	5	17
	T&T	169	66	-	73	-	76	85	94
	Artic	56	4	-	14	-	11	6	18
	A&B Train	37	7	-	10	-	18	16	18
2011 Total		314	80	-	113	-	114	111	148
2012	Rigid	49	3	2	18	-	10	4	14
	T&T	170	70	19	138	-	125	46	93
	Artic	42	4	...	31	-	19	3	16
	A&B Train	31	6	...	17	-	24	8	14
2012 Total		293	83	21	203	-	178	60	137
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

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.

Interpretation

- Overall, average daily overweight of T&T vehicles have been on an increasing trend since 2013, mainly driven by Drury site.
- Overall, T&T vehicles were the most frequent overweight vehicle per day in all WiM sites by a considerable margin of over 70% of the total daily average number.
- This indicats T&T vehicles are more flexible (by make changes to trailer) than other type of vehicles and easier to get overweight permits including 50MAX/HPMV.
- It is noted that average daily overweight of Rigid truck type at Drury site also shows an increasing trend since 2013. This may need some attention from the Commercial Vehicle Investigation Unit.

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	Te Puke	Rakaia	Tokoroa	Waipara	
2011	31	43	3	-	14	-	7	4	14
	751	51	9	-	11	-	11	11	19
	826	20	3	-	5	-	7	2	7
	851	25	4	-	10	-	10	11	12
	891	109	52	-	59	-	61	66	70
	Others	65	9	-	13	-	18	17	25
2011 Total		314	80	-	113	-	114	111	148
2012	31	42	3	2	16	-	8	4	13
	751	57	9	2	24	-	18	5	19
	826	17	2	-	17	-	10	1	7
	851	21	4	0	14	-	15	5	10
	891	101	57	16	103	-	99	33	66
	Others	56	8	2	30	-	28	13	22
2012 Total		293	83	21	203	-	178	60	137
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

Interpretation

- Overall, PAT915 was the most frequently truck of over general access load limits in 2015. The most frequently truck of over general access load limits used to be PAT891 for last many years. This significant change indicates PAT951 is becoming more common for long-haul trucking, as the result of the implementation of 50MAX project.
- It is noted that PAT31 which is more likely used for construction activity shows an increasing number of trucks of over general access load limits at Drury site since 2013. This may need some attention from the Commercial Vehicle Investigation Unit.

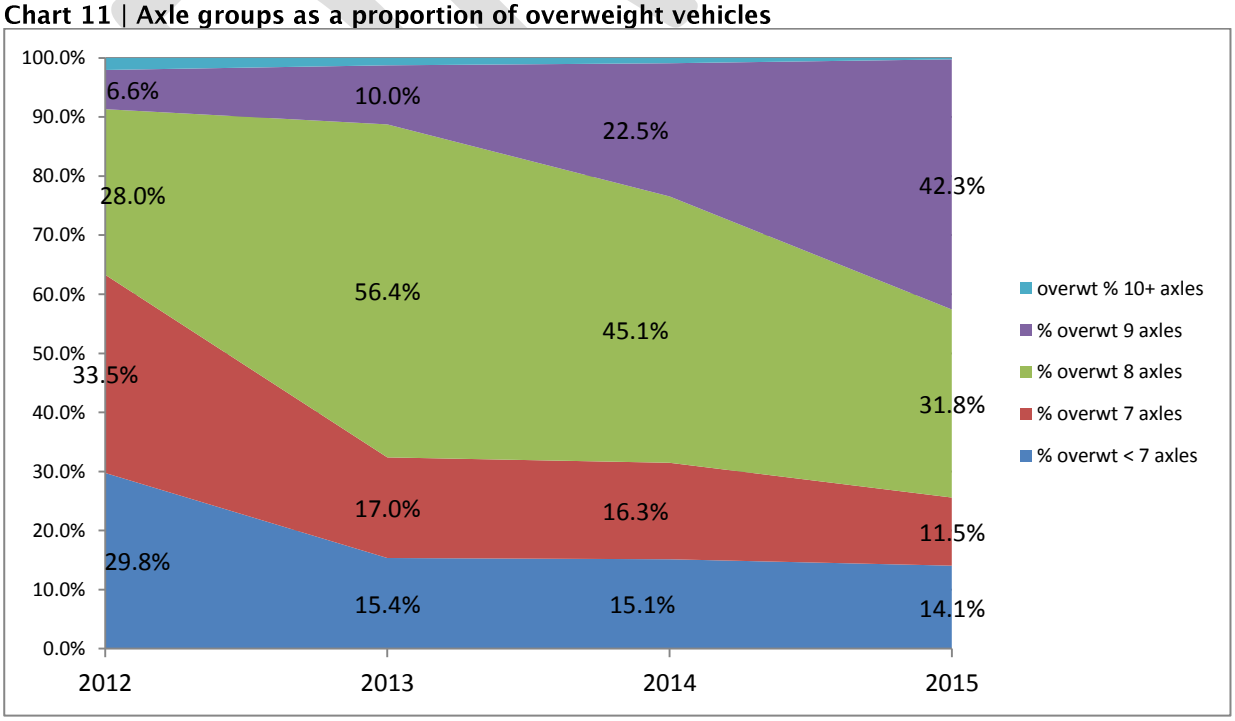
Table 12.1 | Number of overweight vehicles by no. of axles and site

Year	Site	Overweight < 7 axles	Overweight 7 axles	Overweight 8 axles	Overweight 9 axles	Overweight 10+ axles	Total Overweight
	Drury	25,800	24,661	16,295	3,460	1,623	71,839
	Eskdale	1,771	4,684	2,663	675	4	9,797
	Hamanatua Bridge	940	919	29	–	–	1,888
	Te Puke	7,995	7,347	10,357	1,473	1,314	28,486
	Tokoroa	4,962	8,112	9,106	2,983	18	25,181
	Waipara	1,813	3,082	2,316	1,065	7	8,283
2012	Total	43,281	48,805	40,766	9,656	2,966	145,474
	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	1,141	3,089	19,781	15,581	54	39,646
	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	61,047	50,056	138,218	183,806	1,064	434,191

Interpretation:

- The number of over general access load limits for 10 axle truck in 2015 declined significantly. This suggests they are either not easy to get HPMV permit or have limited access to the road network than 50MAX permit.
- In 2015, for the first time, there are more 9 axle trucks than 8 axle trucks recorded over general access load limits and the proportion of over general access load limits for 9 axle trucks was nearly doubled compared to 2014. This indicats operators prefer 50MAX, because it can have a much wider access to the whole road network than HPMV permit.

Chart 11 | Axle groups as a proportion of overweight vehicles



5.0 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		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)	115	0.1	34	0.0	33	0.0	3	0.0	21	0.1	2	0.0	208	0.1
		851	o-oo--ooo--oo B Train	6,414	4.4	2,171	3.1	2,561	3.8	785	2.8	862	2.2	9	0.0	12,802	3.4
		951	o-oo-ooo-ooo B Train	12,831	8.7	6,919	10.0	4,017	6.0	3,305	11.7	1,562	4.0	–	0.0	28,634	7.7
Artic	HCV2	53	o-oo--oo T&T	9	0.0	6	0.0	1	0.0	1	0.0	2	0.0	–	0.0	19	0.0
		68	oo--oo--oo T & T	1	0.0	8	0.0	1	0.0	–	0.0	–	0.0	–	0.0	10	0.0
		69	o-oo--ooo	257	0.2	225	0.3	75	0.1	25	0.1	24	0.1	16	0.1	622	0.2
		713	oo-oo--ooo Tri Artic	62	0.0	26	0.0	35	0.1	6	0.0	9	0.0	–	0.0	138	0.0
		747	o--ooo---ooo Tri Artic	–	0.0	–	0.0	1	0.0	1	0.0	–	0.0	–	0.0	2	0.0
		791	o-oo-oooo Quad Artic	400	0.3	251	0.4	222	0.3	32	0.1	21	0.1	30	0.1	956	0.3
		826	oo-oo--oooo Quad Artic	7,465	5.1	2,114	3.0	2,414	3.6	195	0.7	795	2.1	–	0.0	12,983	3.5
		847	o--ooo---oooo Quad Artic	21	0.0	4	0.0	11	0.0	2	0.0	–	0.0	–	0.0	38	0.0
Rigid	HCV1	45	oo--oo	–	0.0	–	0.0	1	0.0	–	0.0	–	0.0	–	0.0	1	0.0
T&T	HCV2	52	o--oo-o--o T&T	–	0.0	1	0.0	–	0.0	–	0.0	–	0.0	–	0.0	1	0.0
		62	o--oo--o-o-o (T+T)	189	0.1	430	0.6	273	0.4	253	0.9	149	0.4	112	0.5	1,406	0.4
		63	o--oo-o--oo T & T	652	0.4	14	0.0	17	0.0	6	0.0	2	0.0	8	0.0	699	0.2
		66	oo--oo-o--o T & T	2	0.0	–	0.0	–	0.0	1	0.0	–	0.0	–	0.0	3	0.0
		77	oo--oo-o--oo	1,461	1.0	738	1.1	344	0.5	572	2.0	905	2.3	405	2.0	4,425	1.2
		751	o-oo--oo--oo B-train or T&T	31,561	21.4	2,588	3.7	2,623	3.9	899	3.2	2,063	5.3	317	1.5	40,051	10.8
		891	oo--oo-oo--oo T&T	30,275	20.6	22,799	32.8	18,706	27.8	8,132	28.7	18,103	46.9	14,172	69.1	112,187	30.2
		914	oo-oo--ooo-oo T&T	168	0.1	90	0.1	81	0.1	64	0.2	40	0.1	–	0.0	443	0.1
		915	oo-oo--oo-ooo T&T	54,845	37.3	30,731	44.2	35,695	53.0	14,051	49.5	13,979	36.2	5,428	26.5	154,729	41.7
		1020	oo-oo-ooo-ooo B Train	434	0.3	356	0.5	185	0.3	35	0.1	54	0.1	–	0.0	1,064	0.3
Total				147,162	100	69,505	100	67,296	100	28,368	100	38,591	100	20,499	100	371,421	100
Percentage from the total				39.6		18.7		18.1		7.6		10.4		5.5		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 2015, the top three PAT classes (915, 891 and 751) accounted for the highest proportion of the total trucks weighing more than 44t tones gross mass unchanged from last year.

- However, their proportions in the total numbers recorded have changed remarkably. PAT915 accounted for 41.7% (last year was 21.4%). PAT891 accounted for 30.2% (last year was 43.4%). Pat751 accounted for 10.8% (last year was 15.3%). This indicating that more operators are willing to carry more load for the same trip by taking on 50MAX, because only PAT915 in this top three list can get 50MAX permit.

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		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)	13	0.1	6	0.1	6	0.0	2	0.1	–	0.0	1	0.6	28	0.0
		851	o-oo--ooo--oo B Train	243	1.0	49	0.6	79	0.5	2	0.1	84	1.3	–	0.0	457	0.8
		951	o-oo-ooo-ooo B Train	1,684	7.0	587	7.5	705	4.4	169	5.1	363	5.6	–	0.0	3,508	6.0
Artic	HCV2	53	o-oo--oo T&T	–	0.0	2	0.0	1	0.0	1	0.0	1	0.0	–	0.0	5	0.0
		68	oo--oo--oo T & T	–	0.0	8	0.1	1	0.0	–	0.0	–	0.0	–	0.0	9	0.0
		69	o-oo--ooo	9	0.0	70	0.9	12	0.1	6	0.2	7	0.1	5	3.1	109	0.2
		713	oo-oo--ooo Tri Artic	–	0.0	4	0.1	1	0.0	–	0.0	1	0.0	–	0.0	6	0.0
		791	o-oo-oooo Quad Artic	9	0.0	2	0.0	8	0.0	–	0.0	1	0.0	–	0.0	20	0.0
		826	oo-oo--oooo Quad Artic	21	0.1	4	0.1	17	0.1	1	0.0	3	0.0	–	0.0	46	0.1
		847	o--ooo---oooo Quad Artic	–	0.0	–	0.0	4	0.0	–	0.0	–	0.0	–	0.0	4	0.0
T&T	HCV2	62	o--oo--o-o-o (T+T)	32	0.1	301	3.8	154	1.0	142	4.3	82	1.3	74	45.4	785	1.4
		63	o--oo-o--oo T & T	19	0.1	1	0.0	3	0.0	–	0.0	–	0.0	6	3.7	29	0.0
		77	oo--oo-o--oo	20	0.1	8	0.1	3	0.0	2	0.1	–	0.0	–	0.0	33	0.1
		751	o-oo--oo--oo B-train or T&T	919	3.8	17	0.2	25	0.2	3	0.1	2	0.0	2	1.2	968	1.7
		891	oo--oo-oo--ooT&T	2,379	9.8	313	4.0	645	4.0	111	3.3	459	7.1	10	6.1	3,917	6.7
		914	oo-oo--ooo-ooT&T	4	0.0	5	0.1	8	0.0	1	0.0	3	0.0	–	0.0	21	0.0
		915	oo-oo--oo-ooo T&T	18,641	76.9	6,340	81.0	14,391	89.4	2,875	86.7	5,481	84.3	65	39.9	47,793	82.2
		1020	oo-oo-ooo-ooo B Train	234	1.0	110	1.4	30	0.2	1	0.0	16	0.2	–	0.0	391	0.7
Total				24,227	100	7,827	100	16,093	100	3,316	100	6,503	100	163	100	58,129	100
Percentage from the total				41.7		13.5		27.7		5.7		11.2		0.3		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 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:

- Overall, the majority of the trucks weighing more than 50 tonnes is PAT915. The percentage of PAT915 from the total number of vehicles weighing more than 50t tones has increased to 82.2% in 2015, from 63% in 2014.
- For Drury site, the total number of vehicles recorded with gross mass of 50 tonnes and over has increased by 280% from 6,301 in 2014 to 24,227 in 2015. The other sites also show an increase, the range of increase is between from 75% to 148%.

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		Tonne	%
				Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%		
A&B Train	HCV2	74	o-oo--oo-o--oATrain	847	0.0	2,092	0.0	53	0.0	34	0.0	–	0.0	115	0.0	3,140	0.0
		622	o--o--oo--o-o(Atrain)	395	0.0	195	0.0	345	0.0	86	0.0	–	0.0	10	0.0	1,031	0.0
		811	o--oo--oo--ooo(Btrain)	34,455	0.1	11,523	0.1	2,209	0.0	619	0.0	7,673	0.1	260	0.0	56,738	0.1
		851	o-oo--ooo--ooBTrain	1,763,926	4.6	808,211	5.6	698,547	5.2	633,632	7.3	278,311	5.4	13,616	0.3	4,196,241	5.0
		951	o-oo-ooo-oooBTrain	2,146,877	5.6	1,182,253	8.2	625,555	4.7	819,207	9.4	231,501	4.5	418	0.0	5,005,811	5.9
Artic	Bus&HCV1	30	o-o--o	39,644	0.1	12,648	0.1	16,674	0.1	7,472	0.1	7,159	0.1	474	0.0	84,069	0.1
	HCV1	41	o-o--oo	255,979	0.7	63,092	0.4	41,696	0.3	26,196	0.3	29,635	0.6	3,389	0.1	419,986	0.5
		42	o-oo--o	816	0.0	179	0.0	508	0.0	284	0.0	31	0.0	23	0.0	1,841	0.0
	HCV2	53	o-oo--ooT&T	711,768	1.8	86,380	0.6	88,292	0.7	58,605	0.7	20,324	0.4	25,361	0.6	990,729	1.2
		57	o--o-----ooo(artic)	72,714	0.2	25,218	0.2	23,137	0.2	5,226	0.1	14,840	0.3	171	0.0	141,305	0.2
		68	oo--oo--ooT&T	556,120	1.4	289,446	2.0	118,956	0.9	138,853	1.6	29,033	0.6	4,436	0.1	1,136,843	1.3
		69	o-oo--ooo	2,982,919	7.7	517,388	3.6	743,128	5.6	274,601	3.2	94,999	1.9	18,677	0.5	4,631,712	5.5
		713	oo-oo--oooTriArtic	484,713	1.3	118,496	0.8	162,286	1.2	52,512	0.6	30,111	0.6	103	0.0	848,219	1.0
		747	o--ooo---oooTriArtic	1,104	0.0	813	0.0	823	0.0	474	0.0	44	0.0	–	0.0	3,257	0.0
		791	o-oo-ooooQuadArtic	1,321,617	3.4	461,550	3.2	539,094	4.0	361,102	4.1	74,579	1.5	8,688	0.2	2,766,629	3.3
		826	oo-oo--ooooQuadArtic	2,587,155	6.7	931,845	6.4	799,248	6.0	367,098	4.2	322,726	6.3	624	0.0	5,008,695	5.9
		847	o--ooo---ooooQuadArtic	7,760	0.0	1,569	0.0	2,544	0.0	1,873	0.0	45	0.0	–	0.0	13,790	0.0
Rigid	Bus&HCV1	31	o--oo	2,716,444	7.0	417,997	2.9	560,891	4.2	233,190	2.7	114,674	2.2	90,965	2.3	4,134,160	4.9
		34	oo--o	3,062	0.0	1,993	0.0	4,611	0.0	704	0.0	1,449	0.0	168	0.0	11,986	0.0
		301	o--oo(tractorwithoutsemi-trailer)	28,165	0.1	3,706	0.0	9,087	0.1	3,017	0.0	617	0.0	1,122	0.0	45,714	0.1
	Bus&MCV	20	o-o(wb2.0-3.2m,gw>=3.5t)	346,744	0.9	37,995	0.3	37,890	0.3	25,439	0.3	18,379	0.4	48,811	1.2	515,257	0.6
		21	o--o(wb>3.2m,gw>=3.5t)	2,427,379	6.3	527,555	3.6	634,297	4.8	353,608	4.1	182,810	3.6	142,809	3.5	4,268,458	5.1
	HCV1	45	oo--oo	1,560,300	4.0	567,268	3.9	455,636	3.4	341,021	3.9	465,364	9.1	941,008	23.4	4,330,597	5.1
		47	o--ooo	965	0.0	356	0.0	310	0.0	742	0.0	228	0.0	24	0.0	2,624	0.0
		511	oo--ooo(heavytruck)	25,075	0.1	2,822	0.0	1,106	0.0	1,596	0.0	669	0.0	26	0.0	31,292	0.0
T&T	Bus&HCV1	44	oo-o--o	156	0.0	502	0.0	36	0.0	56	0.0	64	0.0	68	0.0	881	0.0
		402	o--oo---o(trucktowlight1axtrailer)	48,152	0.1	18,479	0.1	12,578	0.1	9,190	0.1	3,947	0.1	1,673	0.0	94,018	0.1
		300	o--o--o(trucktowinglighttrailer)	186,314	0.5	20,870	0.1	45,040	0.3	23,858	0.3	8,323	0.2	4,831	0.1	289,233	0.3
		401	o--o--oo(trucktowlight2axtrailer)	137,707	0.4	40,817	0.3	58,462	0.4	46,309	0.5	19,507	0.4	11,833	0.3	314,635	0.4
	HCV2	52	o--oo-o--oT&T	90,566	0.2	11,883	0.1	24,601	0.2	15,526	0.2	3,233	0.1	11,777	0.3	157,584	0.2
		61	o-o--o-o--ooT&T	142	0.0	45	0.0	95	0.0	8	0.0	–	0.0	–	0.0	289	0.0
		62	o--oo--o-o-o(T+T)	48,874	0.1	37,511	0.3	35,591	0.3	26,485	0.3	18,079	0.4	12,585	0.3	179,124	0.2
		63	o--oo-o--ooT&T	324,699	0.8	68,153	0.5	77,971	0.6	27,882	0.3	5,818	0.1	14,415	0.4	518,937	0.6
		66	oo--oo-o--oT&T	45,490	0.1	9,349	0.1	15,978	0.1	6,137	0.1	7,954	0.2	2,334	0.1	87,241	0.1
		77	oo--oo-o--oo	449,709	1.2	154,183	1.1	135,686	1.0	142,431	1.6	75,523	1.5	174,450	4.3	1,131,981	1.3
		503	o--oo--oo(trucktowlighttrailer)	4,242	0.0	2,397	0.0	3,351	0.0	5,302	0.1	857	0.0	426	0.0	16,574	0.0
		751	o-oo--oo--ooB-trainorT&T	4,884,556	12.6	760,656	5.3	523,442	3.9	329,357	3.8	309,706	6.0	127,365	3.2	6,935,081	8.2
		771	oo--o--oo--oo(T+T)	–	0.0	435	0.0	–	0.0	–	0.0	49	0.0	–	0.0	484	0.0
		891	oo--oo-oo--ooT&T	6,983,421	18.1	4,320,851	29.8	3,628,099	27.3	2,671,356	30.7	1,664,088	32.5	2,054,120	51.0	21,321,933	25.3
		914	oo-oo--ooo-ooT&T	31,476	0.1	15,738	0.1	16,319	0.1	30,167	0.3	5,348	0.1	107	0.0	99,153	0.1
		915	oo-oo--oo-oooT&T	5,274,785	13.6	2,908,509	20.1	3,151,660	23.7	1,650,589	18.9	1,069,708	20.9	307,744	7.6	14,362,993	17.0
		1020	oo-oo-ooo-oooBTrain	64,989	0.2	39,802	0.3	17,360	0.1	21,590	0.2	7,883	0.2	–	0.0	151,623	0.2
Tonne				38,652,212	100	14,482,759	100	13,313,182	100	8,713,427	100	5,125,279	100	4,025,019	100	84,311,876	100
Percentage from the total				*45.8*		*17.2*		*15.8*		*10.3*		*6.1*		*4.8*		*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 overall gross mass per WiM site.
[2]Percentage of each WiM site from the overall gross mass at all WiM sites.

Interpretation:

- As in previous years, PAT class 891 had the highest estimated gross mass recorded across all PAT classes, accounting for 25.3%. However this majority is shrinking from last year's 30.3%.
- The notable change is PAT 915 ranked second and increased from 8.9% in 2014 to 17% in 2015. It was only 3.8% in 2013. It indicates that the 50MAX project is making progress.

The table below shows the total estimated gross mass that exceeded the maximum 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		Tonne	%
				Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%	Tonne	%		
A&B Train	HCV2	74	o–oo––oo–o––o A Train	44	0.0	–	0.0	–	0.0	–	0.0	–	0.0	44	0.0	87	0.0
		811	o––oo––oo––ooo (B train)	5,569	0.1	1,661	0.0	1,636	0.0	170	0.0	995	0.1	106	0.0	10,135	0.1
		851	o–oo––ooo––oo B Train	302,013	3.6	101,278	2.9	120,888	3.4	36,465	2.6	40,829	2.2	410	0.0	601,881	3.1
		951	o–oo–ooo–ooo B Train	620,434	7.5	331,282	9.5	195,548	5.6	156,789	11.2	76,497	4.0	–	0.0	1,380,549	7.1
Artic	HCV1	41	o–o––oo	404	0.0	–	0.0	–	0.0	–	0.0	31	0.0	–	0.0	434	0.0
		42	o–oo––o	–	0.0	26	0.0	–	0.0	–	0.0	–	0.0	–	0.0	26	0.0
	HCV2	53	o–oo––oo T&T	49,053	0.6	919	0.0	536	0.0	133	0.0	492	0.0	76	0.0	51,208	0.3
		57	o––o–––-ooo (artic)	172	0.0	36	0.0	72	0.0	–	0.0	205	0.0	–	0.0	484	0.0
		68	oo––oo––oo T & T	306	0.0	475	0.0	104	0.0	–	0.0	–	0.0	–	0.0	884	0.0
		69	o–oo––ooo	262,868	3.2	40,979	1.2	63,782	1.8	7,482	0.5	8,599	0.5	1,778	0.2	385,487	2.0
		713	oo–oo––ooo Tri Artic	2,872	0.0	1,235	0.0	1,619	0.0	279	0.0	421	0.0	–	0.0	6,425	0.0
		747	o––ooo–––ooo Tri Artic	45	0.0	–	0.0	177	0.0	89	0.0	44	0.0	–	0.0	354	0.0
		791	o–oo–oooo Quad Artic	118,617	1.4	48,635	1.4	51,861	1.5	11,496	0.8	4,888	0.3	2,325	0.2	237,820	1.2
		826	oo–oo––oooo Quad Artic	346,658	4.2	98,070	2.8	112,384	3.2	9,018	0.6	36,863	1.9	–	0.0	602,992	3.1
		847	o––ooo–––oooo Quad Artic	971	0.0	188	0.0	546	0.0	92	0.0	–	0.0	–	0.0	1,796	0.0
Rigid	Bus & HCV1	31	o––oo	700,411	8.4	58,765	1.7	94,487	2.7	25,358	1.8	13,838	0.7	16,970	1.7	909,829	4.6
		34	oo––o	41	0.0	21	0.0	267	0.0	–	0.0	–	0.0	70	0.0	398	0.0
		301	o––oo (tractor without semi-trailer)	2,180	0.0	1,247	0.0	571	0.0	101	0.0	–	0.0	–	0.0	4,098	0.0
	Bus & MCV	20	o–o (wb 2.0–3.2m, gw >= 3.5t)	16	0.0	–	0.0	228	0.0	–	0.0	–	0.0	16	0.0	259	0.0
		21	o––o (wb >3.2m, gw >= 3.5t)	11,974	0.1	2,905	0.1	4,299	0.1	1,902	0.1	483	0.0	190	0.0	21,752	0.1
	HCV1	45	oo––oo	67,222	0.8	8,077	0.2	10,252	0.3	2,325	0.2	1,278	0.1	753	0.1	89,905	0.5
		47	o––ooo	79	0.0	–	0.0	175	0.0	35	0.0	80	0.0	–	0.0	368	0.0
		511	oo––ooo (heavy truck)	7,604	0.1	59	0.0	302	0.0	271	0.0	35	0.0	–	0.0	8,270	0.0
T&T	Bus & HCV1	44	oo–o––o	–	0.0	–	0.0	–	0.0	–	0.0	–	0.0	29	0.0	29	0.0
		402	o––oo–––o(truck tow light 1 ax trailer)	32	0.0	–	0.0	63	0.0	–	0.0	–	0.0	–	0.0	95	0.0
	Bus & MCV	300	o––o––o(truck towing light trailer)	66	0.0	–	0.0	25	0.0	–	0.0	–	0.0	–	0.0	90	0.0
		401	o––o––oo(truck tow light 2 ax trailer)	102	0.0	23	0.0	–	0.0	–	0.0	–	0.0	–	0.0	124	0.0
	HCV2	52	o––oo–o––o T&T	442	0.0	378	0.0	156	0.0	117	0.0	40	0.0	40	0.0	1,171	0.0
		62	o––oo––o–o–o (T+T)	11,608	0.1	24,260	0.7	15,870	0.5	14,784	1.1	8,660	0.5	6,338	0.6	81,519	0.4
		63	o––oo–o––oo T & T	30,623	0.4	664	0.0	829	0.0	276	0.0	92	0.0	443	0.0	32,926	0.2
		66	oo––oo–o––o T & T	533	0.0	–	0.0	–	0.0	308	0.0	87	0.0	–	0.0	928	0.0
		77	oo––oo–o––oo	68,308	0.8	34,255	1.0	16,062	0.5	26,525	1.9	42,203	2.2	18,569	1.9	205,921	1.1
		503	o––oo––oo (truck tow light trailer)	128	0.0	84	0.0	119	0.0	55	0.0	–	0.0	–	0.0	386	0.0
		751	o–oo––oo––oo B-train or T&T	1,486,505	17.9	119,857	3.5	122,111	3.5	41,645	3.0	95,890	5.1	14,630	1.5	1,880,636	9.6
		771	oo––o––oo––oo (T+T)	–	0.0	44	0.0	–	0.0	–	0.0	–	0.0	–	0.0	44	0.0
		891	oo––oo–oo––ooT&T	1,437,696	17.3	1,063,716	30.7	883,081	25.2	378,653	27.0	856,468	45.2	654,531	66.9	5,274,145	26.9
		914	oo–oo––ooo–ooT&T	7,941	0.1	4,251	0.1	3,895	0.1	2,993	0.2	1,905	0.1	–	0.0	20,985	0.1
		915	oo–oo––oo–ooo T&T	2,755,308	33.1	1,509,092	43.5	1,799,042	51.3	685,967	48.8	699,811	37.0	261,247	26.7	7,710,466	39.4
		1020	oo–oo–ooo–ooo B Train	22,595	0.3	17,916	0.5	8,939	0.3	1,632	0.1	2,671	0.1	–	0.0	53,751	0.3
Tonne				8,321,430	100	3,470,389	100	3,509,918	100	1,404,953	100	1,893,398	100	978,559	100	19,578,645	100
Percentage from the total				*42.5*		*17.7*		*17.9*		*7.2*		*9.7*		*5.0*		*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 percentage of estimated gross mass of over general access load limits vehicles across all sites and PAT types from the total estimated gross mass has increased from 21% in 2014 to 23% in 2015.
- PAT915 accounted for 39.4% and PAT891 accounted for 26.9%, together they contributed 66.3% of the total estimated gross mass of overweight vehicles in 2015. However in last year, PAT915 accounted for 20.2% and PAT891 accounted for 38.8%. This indicats PAT915 is replacing the position of PAT891in terms of number of the vehicles with gross mass over general access load limits.

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		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	32.6	10	27.2	18	26.5	19	33.5	13	.	.	38.2	5	28.80	17
		622	o--o--oo--o-o (A train)	9.9	35	10.8	37	17.3	25	10.8	30	.	.	9.5	32	11.80	33
		811	o--oo--oo--ooo (B train)	31.7	13	35.0	10	39.4	1	34.4	8	37.4	9	43.3	2	33.30	11
		851	o-oo--ooo--oo B Train	33.8	7	35.3	8	34.4	9	34.8	6	35.0	12	32.7	9	34.40	9
		951	o-oo-ooo-ooo B Train	37.8	3	39.0	5	37.1	3	37.8	2	38.7	8	29.9	10	38.00	3
Artic	Bus & HCV1	30	o-o--o	11.7	34	11.6	36	10.7	33	9.7	33	13.8	30	10.3	31	11.40	35
	HCV1	41	o-o--oo	15.1	28	16.0	28	16.2	28	15.0	26	16.8	26	16.1	24	15.40	28
		42	o-oo--o	9.3	36	8.1	38	7.9	37	5.5	39	7.8	34	11.5	29	7.90	38
	HCV2	53	o-oo--oo T&T	23.7	22	22.8	24	22.1	23	22.3	22	19.3	23	20.7	21	23.20	23
		57	o--o-----ooo (artic)	17.4	24	16.9	26	16.8	27	12.5	29	18.1	24	8.6	33	17.00	25
		68	oo--oo--oo T & T	30.1	14	30.7	15	29.9	15	30.6	17	27.5	16	21.5	20	30.20	14
		69	o-oo--ooo	26.9	18	27.2	18	27.0	17	26.8	18	27.0	17	25.3	17	26.90	20
		713	oo-oo--ooo Tri Artic	29.2	17	29.1	16	28.8	16	31.0	16	28.0	15	25.8	15	29.20	16
		747	o--ooo---ooo Tri Artic	25.1	19	31.3	14	35.8	6	33.9	12	43.5	2	.	.	30.20	14
		791	o-oo-oooo Quad Artic	30.0	15	32.4	13	31.1	14	31.7	15	28.5	14	29.6	11	30.70	13
		826	oo-oo--oooo Quad Artic	32.9	9	34.3	11	31.9	12	34.3	10	33.7	13	28.4	13	33.10	12
		847	o--ooo---oooo Quad Artic	36.6	5	37.4	7	35.8	6	34.0	11	44.5	1	.	.	36.20	6
Rigid	Bus & HCV1	31	o--oo	14.4	30	13.8	31	14.5	31	13.9	27	14.0	29	14.1	25	14.30	30
		34	oo--o	11.8	32	13.1	33	14.3	32	9.9	31	6.4	36	12.0	27	11.40	35
		301	o--oo (tractor without semi-trailer)	13.0	31	11.7	35	8.4	36	8.4	34	11.9	31	11.2	30	11.20	37
	Bus & MCV	20	o-o (wb 2.0-3.2m, gw >= 3.5t)	4.3	41	4.6	42	4.5	41	4.7	41	4.3	39	4.2	37	4.30	42
		21	o--o (wb >3.2m, gw >= 3.5t)	6.4	39	6.5	40	6.6	38	6.2	38	6.2	37	6.3	34	6.40	40
	HCV1	45	oo--oo	17.1	25	16.4	27	17.2	26	16.9	24	16.3	27	16.8	22	16.80	26
		47	o--ooo	15.3	27	13.2	32	19.4	24	16.9	24	17.5	25	12.0	27	15.90	27
		511	oo--ooo (heavy truck)	24.6	20	23.7	23	23.5	21	24.2	21	20.9	22	25.5	16	24.30	22
T&T	Bus & HCV1	44	oo-o--o	7.4	37	17.3	25	9.0	35	7.0	36	8.0	33	22.5	19	12.10	32
		402	o--oo---o(truck tow light 1 ax trailer)	11.8	32	13.0	34	10.4	34	9.8	32	10.5	32	12.7	26	11.50	34
	Bus & MCV	300	o--o--o(truck towing light trailer)	5.9	40	5.4	41	5.7	40	5.2	40	5.5	38	5.6	36	5.80	41
		401	o--o--oo(truck tow light 2 ax trailer)	6.7	38	6.9	39	6.6	38	6.5	37	7.1	35	5.9	35	6.70	39
	HCV2	52	o--oo-o--o T&T	21.2	23	24.6	22	23.1	22	22.0	23	22.5	21	23.3	18	22.00	24
		61	o-o--o-o--oo T & T	15.7	26	14.8	29	15.8	29	7.5	35	.	.	.	.	15.20	29
		62	o--oo--o-o-o (T+T)	32.1	12	41.9	1	36.9	4	38.8	1	35.8	11	38.5	4	36.60	5
		63	o--oo-o--oo T & T	29.6	16	26.7	20	26.8	18	26.2	19	26.8	18	28.5	12	28.50	18
		66	oo--oo-o--o T & T	24.3	21	24.8	21	24.8	20	26.0	20	25.0	19	26.5	14	24.70	21
		77	oo--oo-o--oo	32.6	10	38.2	6	31.8	13	34.8	6	41.8	4	37.8	6	34.70	8
		503	o--oo--oo (truck tow light trailer)	14.5	29	14.5	30	14.8	30	12.6	28	15.0	28	16.4	23	14.00	31
		751	o-oo--oo--oo B-train or T&T	33.9	6	34.0	12	33.8	11	32.4	14	37.4	9	32.9	8	33.90	10
		771	oo--o--oo--oo (T+T)	.	.	29.0	17	.	.	.	.	24.5	20	.	.	28.40	19
		891	oo--oo-oo--ooT&T	33.6	8	35.3	8	34.2	10	34.4	8	40.1	6	42.5	3	35.30	7
		914	oo-oo--ooo-ooT&T	36.7	4	39.2	4	35.6	8	36.5	4	39.0	7	35.5	7	37.00	4
		915	oo-oo--oo-ooo T&T	38.9	2	40.4	3	37.4	2	36.9	3	42.8	3	45.4	1	39.00	1
		1020	oo-oo-ooo-ooo B Train	39.1	1	41.9	1	36.9	4	35.5	5	40.6	5	.	.	39.00	1
Tonne				22.0		27.3		25.0		25.8		27.0		24.0		24.0	

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

Interpretation:

- In general, daily average weights measured at various WIM stations are higher in 2015 than in 2014. This possibly because the weight of trucks were getting heavier as the clients wanted to send more product at less cost to their customers.

- Comparing the three most common long-haul trucks (PAT 915, 891 and 751), the average estimated gross mass of PAT 915 was 39 tonnes which is nearly 4 tonnes more than PAT 891 (35.3t) and nearly 5 tonnes more than PAT 751 (33.9t). This suggests PAT 915 was moving more freight in a trip than other two PAT types.

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		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	43.5	19	.	.	.	.	.	.	.	.	43.5	11	43.5	19
		811	o--oo--oo--ooo (B train)	48.4	3	48.8	5	49.6	4	56.5	1	47.4	6	52.8	3	48.7	5
		851	o-oo--ooo--oo B Train	47.1	8	46.7	11	47.2	10	46.5	8	47.4	6	45.5	10	47.0	10
		951	o-oo-ooo-ooo B Train	48.4	3	47.9	6	48.7	6	47.4	4	49.0	4	.	.	48.2	6
Artic	HCV1	41	o-o--oo	31.0	27	.	.	.	.	.	.	30.5	22	.	.	31.0	27
		42	o-oo--o	.	.	25.5	26	.	.	.	.	.	.	.	.	25.5	32
	HCV2	53	o-oo--oo T&T	38.8	22	41.8	20	41.2	19	44.2	16	41.0	18	38.0	13	38.9	23
		57	o--o-----ooo (artic)	34.3	23	35.5	21	36.0	21	.	.	34.2	21	.	.	34.6	24
		68	oo--oo--oo T & T	43.6	18	59.4	1	51.8	1	.	.	.	.	.	.	52.0	1
		69	o-oo--ooo	41.6	20	43.5	17	41.7	18	42.5	19	42.4	17	45.6	8	41.8	21
		713	oo-oo--ooo Tri Artic	46.3	13	47.5	7	46.2	15	46.5	8	46.7	9	.	.	46.6	13
		747	o--ooo---ooo Tri Artic	44.5	15	.	.	44.3	16	44.5	15	43.5	15	.	.	44.3	16
		791	o-oo-oooo Quad Artic	43.7	17	44.0	16	43.9	17	43.4	18	44.0	14	45.6	8	43.8	18
		826	oo-oo--oooo Quad Artic	46.4	12	46.4	13	46.6	13	46.2	12	46.4	12	.	.	46.4	15
		847	o--ooo---oooo Quad Artic	46.2	14	47.0	10	49.6	4	46.0	13	.	.	.	.	47.3	8
Rigid	Bus & HCV1	31	o--oo	21.2	32	20.5	28	20.6	30	20.5	26	20.8	25	20.4	17	21.1	36
		34	oo--o	20.5	33	20.5	28	24.2	29	.	.	.	.	23.2	16	23.4	34
		301	o--oo (tractor without semi-trailer)	23.2	30	30.4	22	24.8	27	25.3	25	.	.	.	.	25.3	33
	Bus & MCV	20	o-o (wb 2.0-3.2m, gw >= 3.5t)	15.5	36	.	.	16.3	31	.	.	.	.	15.5	19	16.2	38
		21	o--o (wb >3.2m, gw >= 3.5t)	15.8	35	17.9	30	15.9	32	16.0	27	16.1	26	15.8	18	16.1	39
	HCV1	45	oo--oo	28.4	28	30.2	23	29.5	25	29.4	23	28.4	23	30.1	14	28.7	29
		47	o--ooo	26.2	29	.	.	29.2	26	34.5	21	26.5	24	.	.	28.3	31
		511	oo--ooo (heavy truck)	31.5	25	29.5	24	30.2	23	30.1	22	34.5	20	.	.	31.4	26
T&T	Bus & HCV1	44	oo-o--o	.	.	.	.	.	.	.	.	.	.	28.5	15	28.5	30
		402	o--oo---o(truck tow light 1 ax trailer)	31.5	25	.	.	31.5	22	.	.	.	.	.	.	31.5	25
	Bus & MCV	300	o--o--o(truck towing light trailer)	21.8	31	.	.	24.5	28	.	.	.	.	.	.	22.5	35
		401	o--o--oo(truck tow light 2 ax trailer)	20.3	34	22.5	27	.	.	.	.	.	.	.	.	20.7	37
	HCV2	52	o--oo-o--o T&T	40.1	21	41.9	19	39.0	20	38.8	20	39.5	19	39.5	12	40.4	22
		62	o--oo--o-o-o (T+T)	47.8	5	53.8	2	51.5	2	51.2	2	51.2	1	53.3	2	51.6	2
		63	o--oo-o--oo T & T	47.0	10	47.4	8	48.7	6	46.0	13	46.0	13	55.3	1	47.1	9
		66	oo--oo-o--o T & T	44.4	16	.	.	.	.	43.9	17	43.5	15	.	.	44.2	17
		77	oo--oo-o--oo	46.8	11	46.4	13	46.7	12	46.4	10	46.6	10	45.8	7	46.5	14
		503	o--oo--oo (truck tow light trailer)	32.0	24	27.8	25	29.8	24	27.5	24	.	.	.	.	29.7	28
		751	o-oo--oo--oo B-train or T&T	47.1	8	46.3	15	46.6	13	46.3	11	46.5	11	46.1	6	47.0	10
		771	oo--o--oo--oo (T+T)	.	.	43.5	17	.	.	.	.	.	.	.	.	43.5	19
		891	oo--oo-oo--ooT&T	47.5	6	46.7	11	47.2	10	46.6	6	47.3	8	46.2	5	47.0	10
		914	oo-oo--ooo-ooT&T	47.3	7	47.2	9	48.1	9	46.8	5	47.6	5	.	.	47.4	7
		915	oo-oo--oo-ooo T&T	50.2	2	49.1	4	50.4	3	48.8	3	50.1	2	48.1	4	49.8	4
		1020	oo-oo-ooo-ooo B Train	52.1	1	50.3	3	48.3	8	46.6	6	49.5	3	.	.	50.5	3
Tonne				43.0		46.6		46.8		46.4		47.8		45.7		45.1	

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

Interpretation:

- The average mass of overweight vehicles continues to increase. The overall average was 45.1 tonnes in 2015, up from 44.3 tonnes in 2014. This could mean that some truck operators try to use the police weighing tolerance of 1.5 tonnes.

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: 01S00401 (Rakaia)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	2%	6%	1%	.	.	.
20	30%	36%	4%	0%	0%	.
30	15%	23%	2%	0%	0%	0%
40	9%	12%	10%	0%	1%	0%
50	21%	8%	6%	0%	13%	0%
60	20%	6%	10%	1%	8%	1%
70	3%	4%	7%	11%	8%	5%
80	0%	3%	7%	28%	7%	10%
90	0%	2%	6%	20%	5%	13%
100	0%	0%	7%	24%	5%	8%
110	.	0%	9%	13%	5%	5%
120	.	0%	9%	2%	5%	4%
130	.	0%	8%	0%	6%	4%
140	.	0%	6%	0%	7%	4%
150	.	0%	4%	0%	9%	5%
160	.	0%	2%	0%	7%	5%
170	.	.	1%	0%	6%	5%
180	.	.	0%	0%	4%	5%
190	.	.	0%	0%	2%	7%
200	.	.	0%	0%	1%	7%
210	.	.	0%	0%	0%	5%
220	.	.	0%	.	0%	3%
230	.	.	0%	.	0%	2%
240	.	.	0%	.	0%	1%
250	.	.	0%	.	0%	0%
260	.	.	0%	.	0%	0%
270	.	.	.	.	0%	0%

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

Table 19.1 | Site: 01N00463 (Drury)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	0.5%	6.7%	0.4%	.	.	.
20	22.8%	31.4%	2.3%	0.0%	0.0%	.
30	17.2%	25.1%	3.5%	0.1%	0.2%	0.0%
40	10.6%	13.3%	8.4%	0.2%	2.0%	0.1%
50	20.1%	8.8%	7.7%	0.5%	7.5%	1.3%
60	22.8%	6.5%	8.9%	2.6%	7.8%	6.7%
70	5.4%	4.2%	7.2%	12.8%	8.2%	7.1%
80	0.6%	2.6%	6.3%	22.0%	7.0%	8.8%
90	0.0%	1.0%	6.1%	23.7%	6.7%	6.4%
100	0.0%	0.3%	7.0%	23.0%	6.6%	5.4%
110	.	0.1%	8.4%	12.1%	6.4%	5.0%
120	.	0.0%	9.0%	2.6%	6.3%	4.3%
130	.	0.0%	8.1%	0.3%	6.4%	4.1%
140	.	0.0%	6.8%	0.0%	6.8%	4.3%
150	.	0.0%	5.1%	0.0%	6.3%	4.3%
160	.	.	2.8%	0.0%	5.6%	4.2%
170	.	.	1.3%	0.0%	5.0%	4.6%
180	.	.	0.5%	0.0%	4.7%	5.0%
190	.	.	0.2%	.	3.4%	6.3%
200	.	.	0.1%	0.0%	1.7%	9.1%
210	.	.	0.0%	0.0%	0.7%	7.6%
220	.	.	0.0%	0.0%	0.3%	3.5%
230	.	.	0.0%	.	0.2%	1.3%
240	.	.	0.0%	.	0.1%	0.5%
250	.	.	0.0%	.	0.0%	0.2%
260	.	.	0.0%	.	0.0%	0.1%
270	.	.	.	.	0%	0%

Table 19.2 | Site: 01N00628 (Tokoroa)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	2%	4%	0%	.	.	.
20	20%	27%	2%	0%	0%	.
30	15%	24%	4%	0%	0%	.
40	11%	14%	7%	0%	1%	0%
50	22%	13%	6%	0%	4%	0%
60	26%	8%	6%	2%	6%	1%
70	3%	5%	5%	10%	6%	4%
80	0%	3%	6%	26%	6%	5%
90	0%	1%	8%	27%	6%	6%
100	0%	0%	11%	27%	8%	6%
110	.	0%	12%	7%	8%	6%
120	.	0%	10%	1%	9%	5%
130	.	0%	8%	0%	9%	5%
140	.	0%	8%	0%	10%	6%
150	.	0%	5%	0%	10%	6%
160	.	0%	2%	0%	7%	6%
170	.	.	1%	0%	5%	7%
180	.	.	0%	0%	3%	7%
190	.	.	0%	0%	1%	8%
200	.	.	0%	0%	0%	8%
210	.	.	0%	.	0%	6%
220	.	.	0%	.	0%	4%
230	.	.	0%	.	0%	1%
240	.	.	0%	.	0%	0%
250	.	.	0%	.	0%	0%
260	.	.	0%	.	0%	0%
270	.	.	0%	.	0%	0%

Table 19.3: Site: 01S00285 (Waipara)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	4%	6%	1%	.	.	.
20	33%	42%	4%	0%	0%	.
30	12%	22%	4%	0%	0%	.
40	8%	9%	6%	0%	5%	0%
50	23%	7%	8%	0%	5%	0%
60	19%	5%	7%	2%	5%	1%
70	1%	3%	5%	13%	5%	2%
80	0%	3%	7%	30%	5%	4%
90	0%	1%	9%	30%	6%	6%
100	0%	0%	11%	22%	8%	7%
110	.	0%	10%	3%	9%	6%
120	.	0%	9%	0%	10%	6%
130	.	0%	8%	0%	10%	7%
140	.	0%	7%	0%	10%	8%
150	.	0%	4%	0%	8%	8%
160	.	.	1%	.	6%	8%
170	.	.	0%	0%	4%	9%
180	.	.	0%	0%	2%	9%
190	.	.	0%	0%	1%	9%
200	.	.	0%	.	0%	6%
210	.	.	0%	.	0%	3%
220	.	.	0%	.	0%	1%
230	.	.	0%	.	0%	1%
240	.	.	0%	.	0%	0%
250	.	.	0%	.	0%	0%
260	.	.	.	.	0%	0%
270	.	.	.	.	0%	0%

Table 19.4 | Site: 00500259 (Eskdale)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	2%	5%	0%	.	.	.
20	29%	35%	2%	0%	0%	.
30	15%	23%	2%	0%	0%	0%
40	9%	11%	4%	0%	1%	0.5%
50	19%	9%	4%	1%	4%	1.2%
60	21%	7%	5%	3%	6%	2.4%
70	4%	6%	5%	12%	7%	5.2%
80	0%	3%	6%	25%	5%	7.8%
90	0%	1%	9%	26%	5%	7.5%
100	0%	0%	10%	24%	6%	6.8%
110	.	0%	12%	7%	6%	5.4%
120	.	0%	12%	1%	7%	5.0%
130	.	0%	10%	0%	8%	5.0%
140	.	0%	9%	0%	9%	5.0%
150	.	0%	7%	0%	10%	5.6%
160	.	.	2%	.	10%	5.0%
170	.	.	0%	0%	8%	5.8%
180	.	.	0%	.	4%	6.3%
190	.	.	0%	.	2%	7.0%
200	.	.	0%	.	1%	7.6%
210	.	.	0%	.	0%	6%
220	.	.	0%	.	0%	3%
230	.	.	0%	.	0%	1%
240	.	.	0%	.	0%	1%
250	.	.	.	.	0%	0%
260	.	.	0%	.	0%	0%
270	.	.	.	.	0%	0%

Table 19.5 | Site: 03500321 (Hamanatua Bridge)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	1%	4%	1%	.	.	.
20	38%	37%	3%	0%	.	.
30	30%	28%	1%	0%	0%	.
40	8%	9%	1%	0%	0%	.
50	12%	6%	2%	1%	2%	.
60	9%	4%	2%	1%	3%	0%
70	2%	6%	3%	15%	4%	2%
80	0%	4%	4%	41%	2%	2%
90	0%	1%	12%	34%	2%	13%
100	0%	0%	20%	7%	2%	31%
110	.	0%	18%	0%	3%	5%
120	.	0%	9%	0%	4%	1%
130	.	0%	5%	0%	11%	1%
140	.	0%	7%	0%	24%	4%
150	.	0%	11%	0%	26%	1%
160	.	.	3%	0%	12%	4%
170	.	.	0%	0%	3%	2%
180	.	.	0%	.	0%	3%
190	.	.	0%	.	0%	4%
200	.	.	0%	.	0%	3%
210	.	.	.	.	0%	3%
220	.	.	0%	.	0%	3%
230	.	.	0%	.	0%	3%
240	.	.	0%	.	0%	4%
250	.	.	0%	.	0%	3%
260	.	.	0%	.	0%	4%
270	.	.	.	.	0%	2%

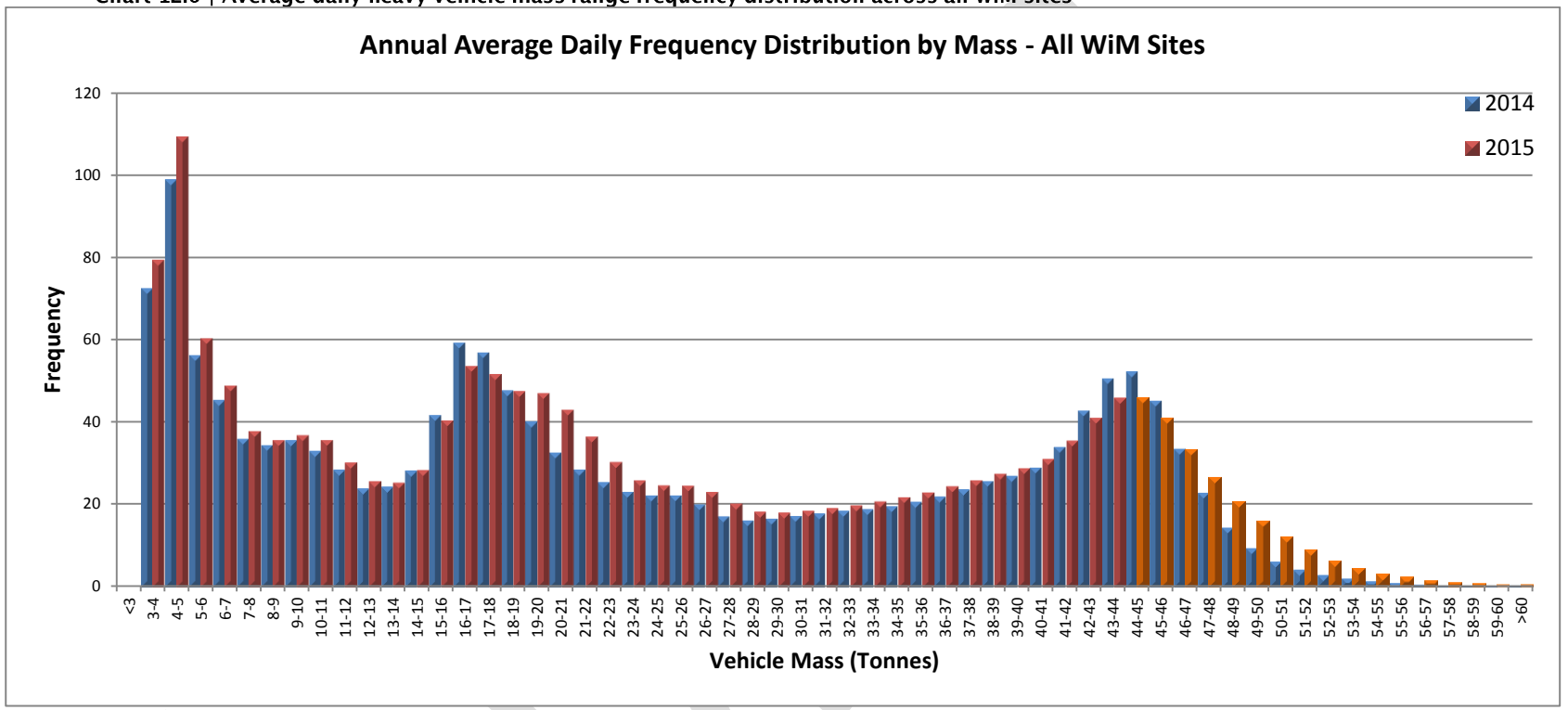
Interpretation:

- It is clear that there is a small portion of the axle loads that are over the legal limit. It occurs mostly from the axle group of QADT 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.
- Overall, the percentage of QADT axle group loading over the legal limit ranged from 5% to 22% across all the WiM sites in 2015, and each site recorded a similar percentage level as in 2014.
- Hamanatua Bridge site recorded the highest percentage number (22%) since 2014, compared to other sites. It may need some attention from the pavement team

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

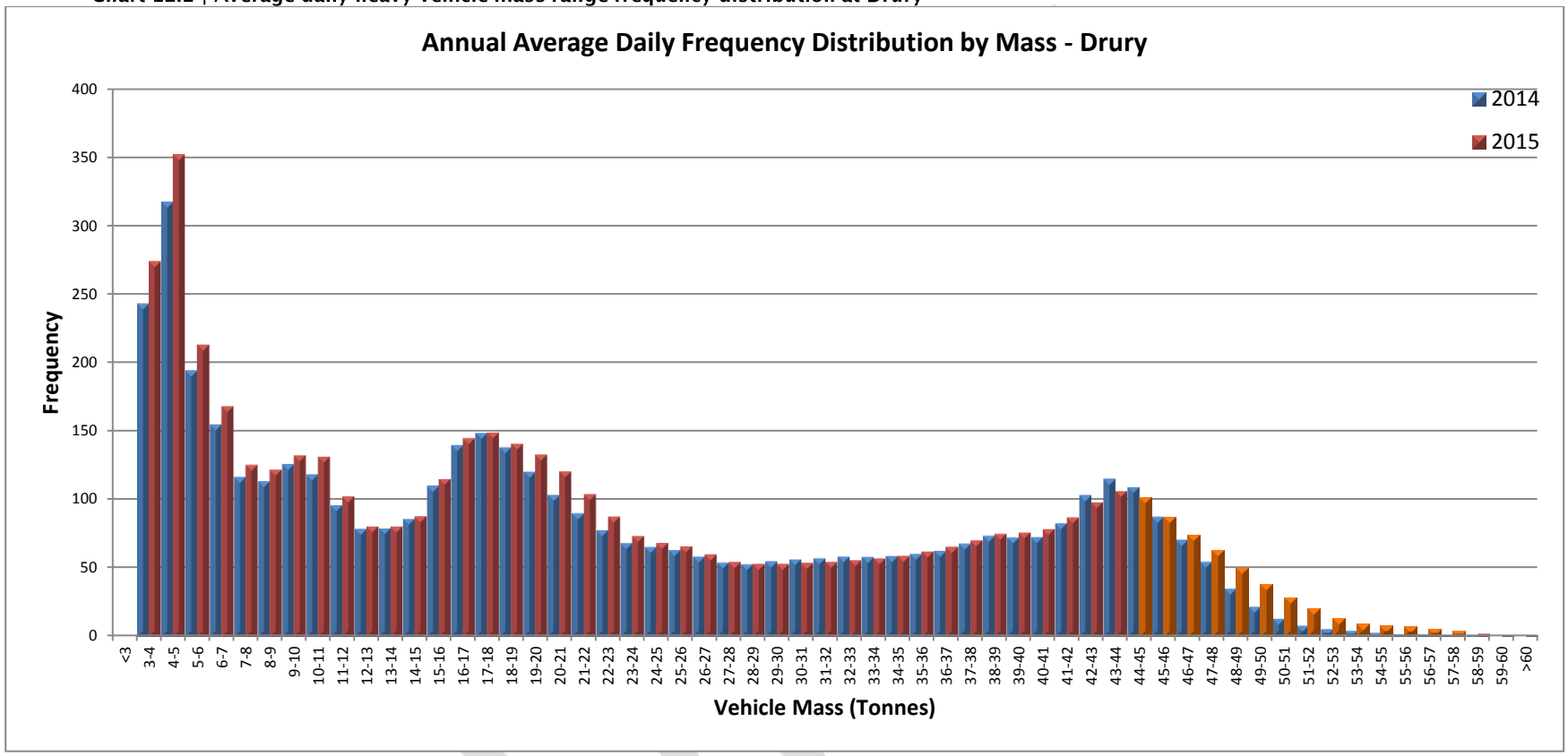


Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation:

- Overall, there are three load distribution peaks appear in 2015 which is same as the previous year. The peaks point remained unchanged from last year.
- Compared to 2014, there was increased number at 3–5 tonnes peak point. But the number decreased at other two peaks point (16–18 tonnes and 43–45 tonnes), however there are more vehicles seems to be shifted towards heavier weight range. This is clearly evidenced by the increased number of trucks over 47 tonnes being recorded and mid-sized vehicles operating in the 19 to 24 tonne range. To a large extent the changes perhaps reflects growth in economic activity over the period and more truck operators taken on 50MAX/HPMV.

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

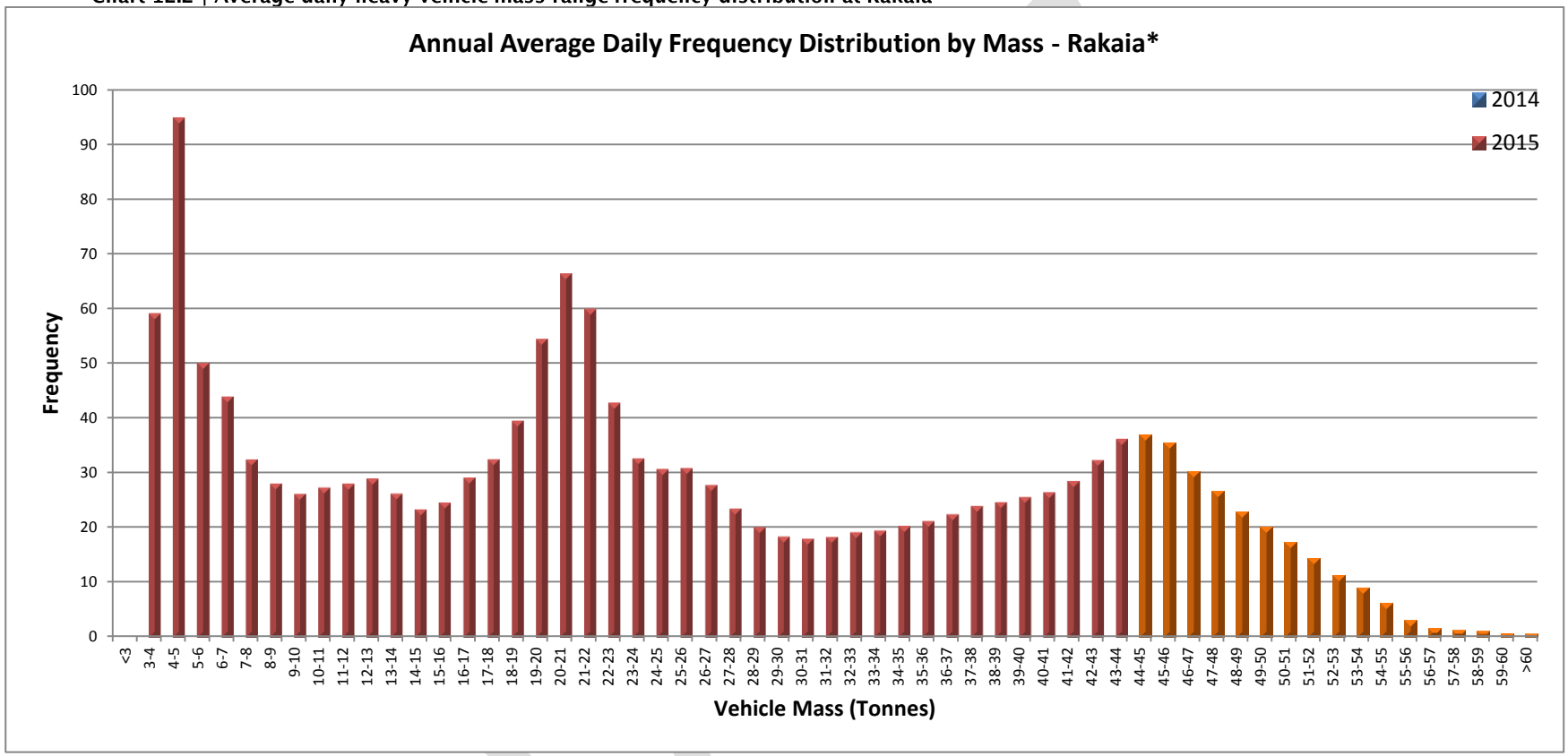


Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation:

- Drury site basically reflects the similar load distribution pattern as of the "All WiM sites", however the average daily frequency level at each peaks point are very different, due to the difference in the size of total traffic volume and traffic characters.
- The average daily frequency level at 3 to 5 tonnes peak point was much higher than at other two peaks point, indicating smaller sized truck for local delivery were the most common trucks than others at Drury.
- Overall, there are increases in most weight ranges in 2015 than in 2014, suggesting the growth in freight demand.

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

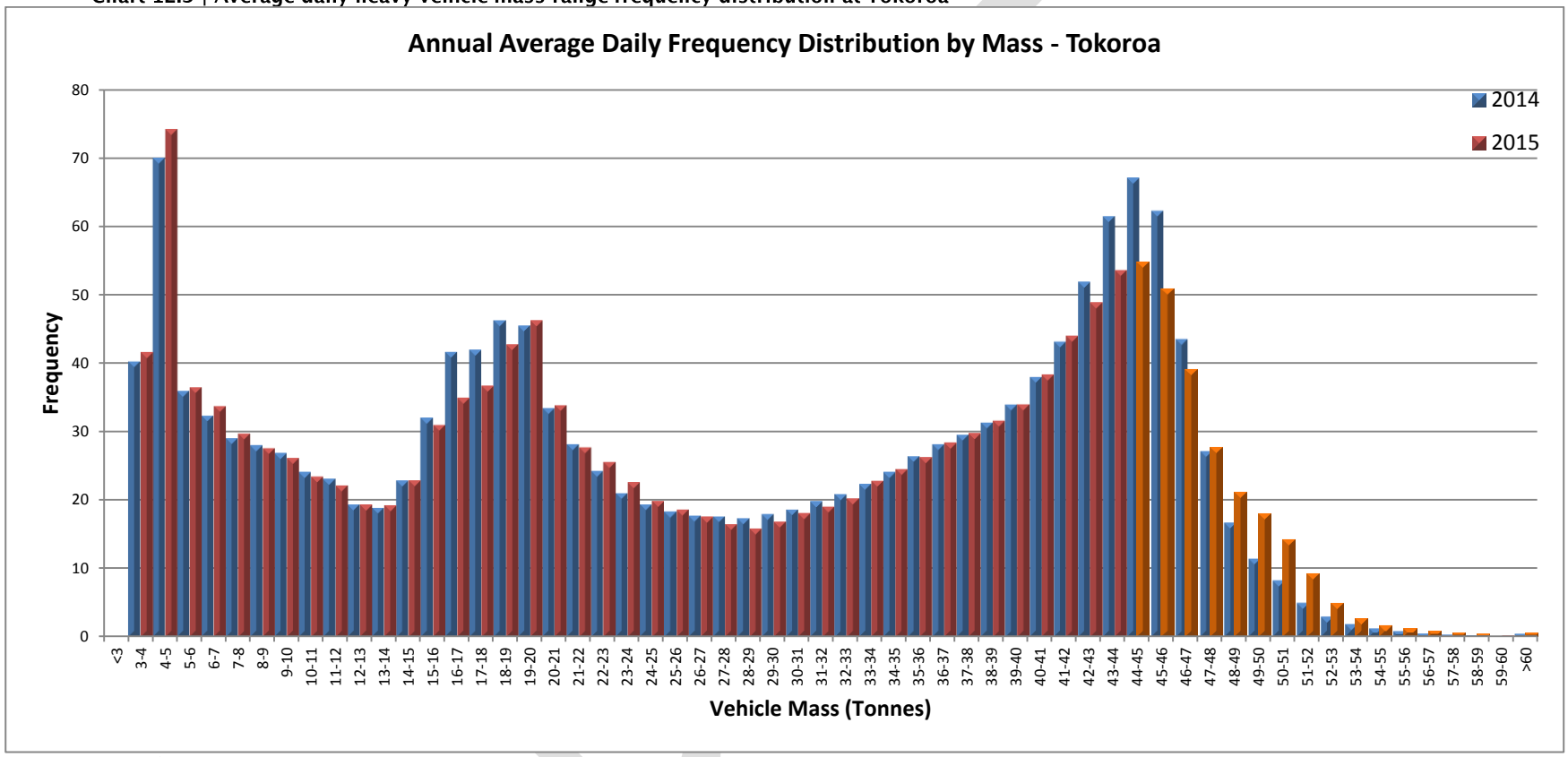


Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: There are three load distribution peaks appear in 2015 which is same as most other sites. Rakaia is a new WiM site, and there was not data in 2014.

20.0 APPENDIX A – HEAVY VEHICLES MASS RANGE FREQUENCY DISTRIBUTION BY WiM SITE CHARTS (continued)

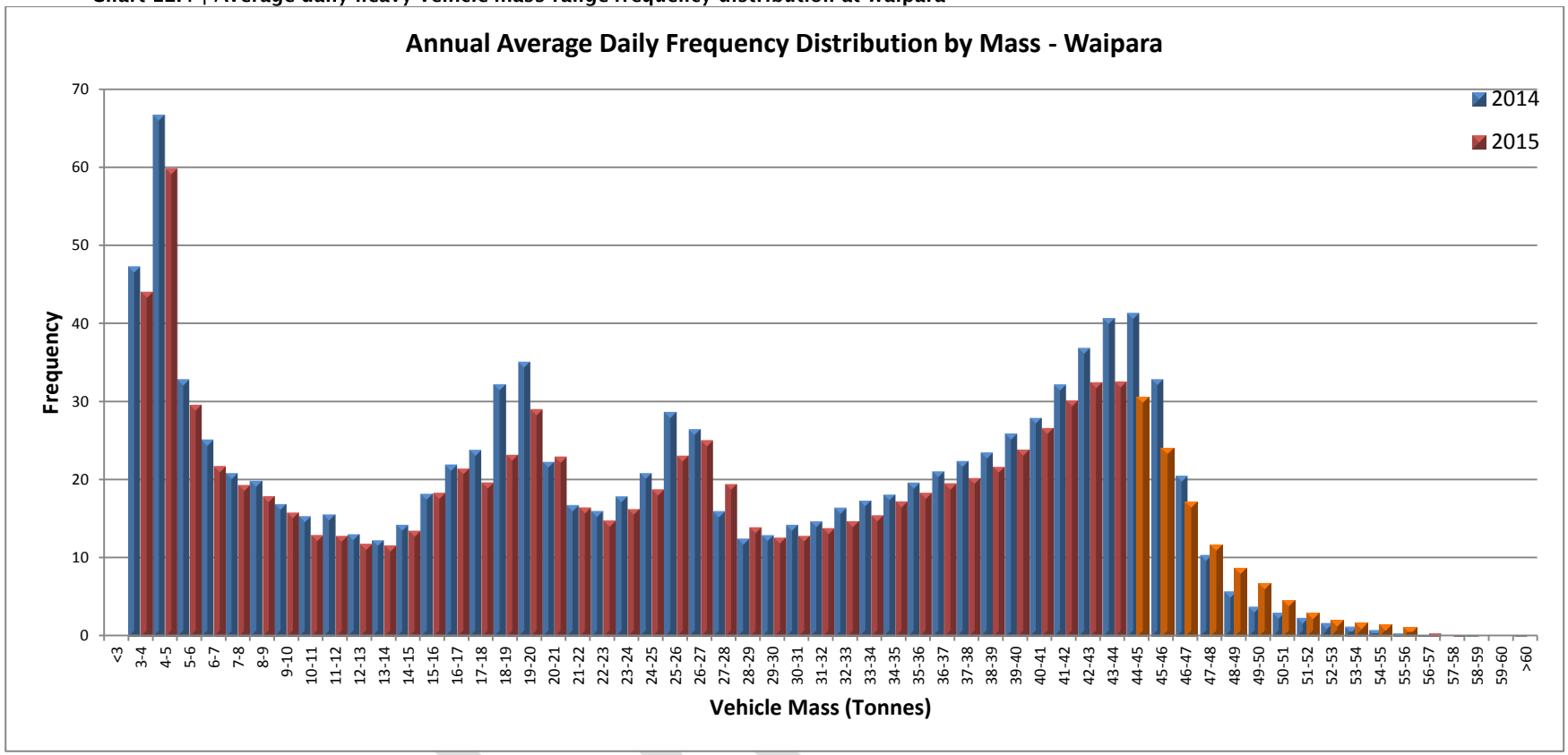
Chart 12.3 | Average daily heavy vehicle mass range frequency distribution at Tokoroa



Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: Following the overall trend of the "All WiM sites, the peak points remained almost unchanged. It appears there were decreases in some weight ranges, the possible reason for mid-sized trucks could be due to the demand of freight passing this site was lesser than the last year. But for large sized trucks, it is more likely because there are more operators taken on 50MAX/HPMV.

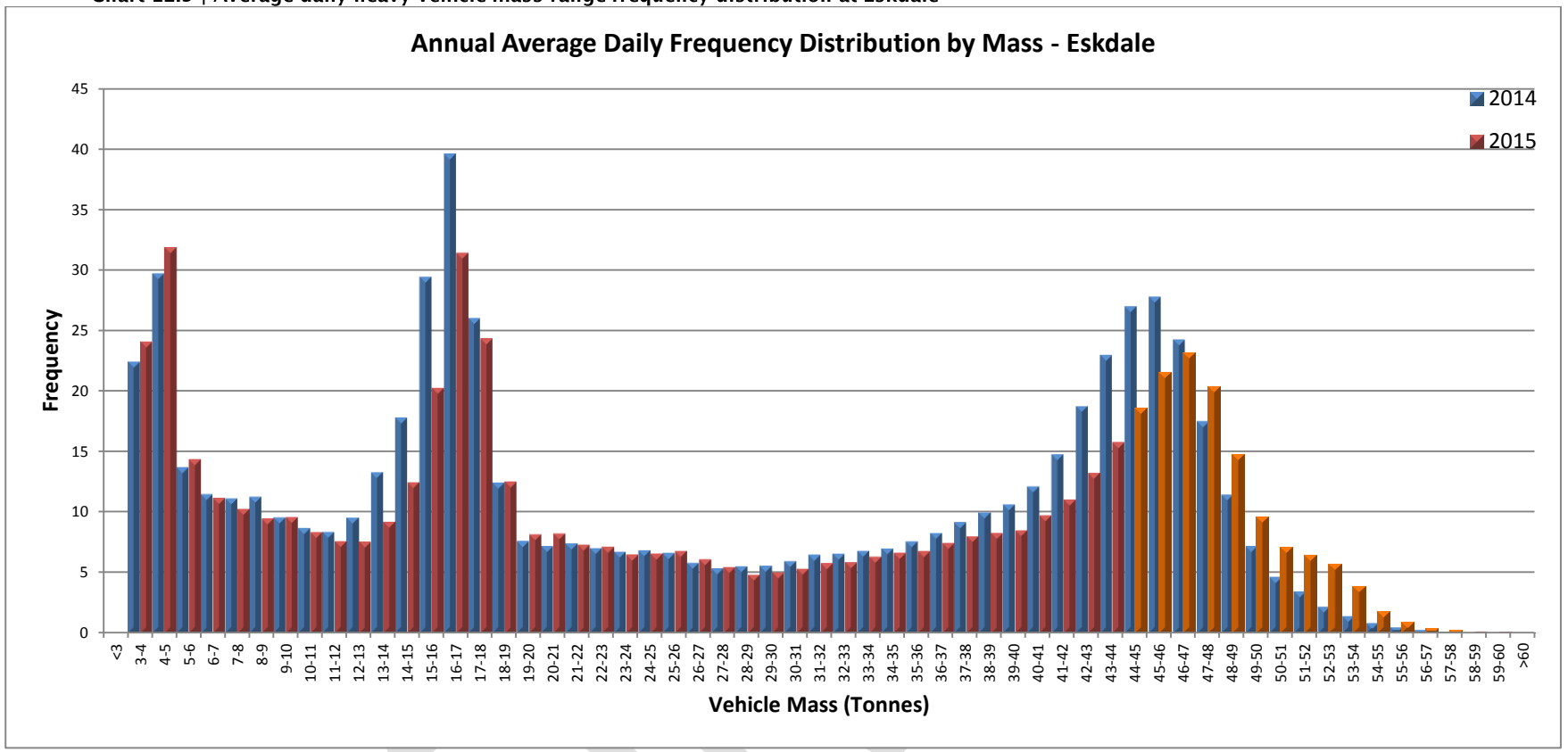
Chart 12.4 | Average daily heavy vehicle mass range frequency distribution at Waipara



Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: There are four load distribution peaks appear at this site which is same as the previous year. The peaks point basically remained unchanged from last year. The mass distribution pattern at the Waipara WiM site was different with other sites, there is an extra distribution peak for the weight range between 18 and 28 tonnes. (The possible reason is there are partly loaded trucks passing the site.) It appears that the recorded numbers for the most of weight ranges were less than 2014, except some increases appear for the vehicles more than 48 tonnes. This perhaps suggests the demand of freight pass this site was less than last year and some of goods delivered by larger trucks.

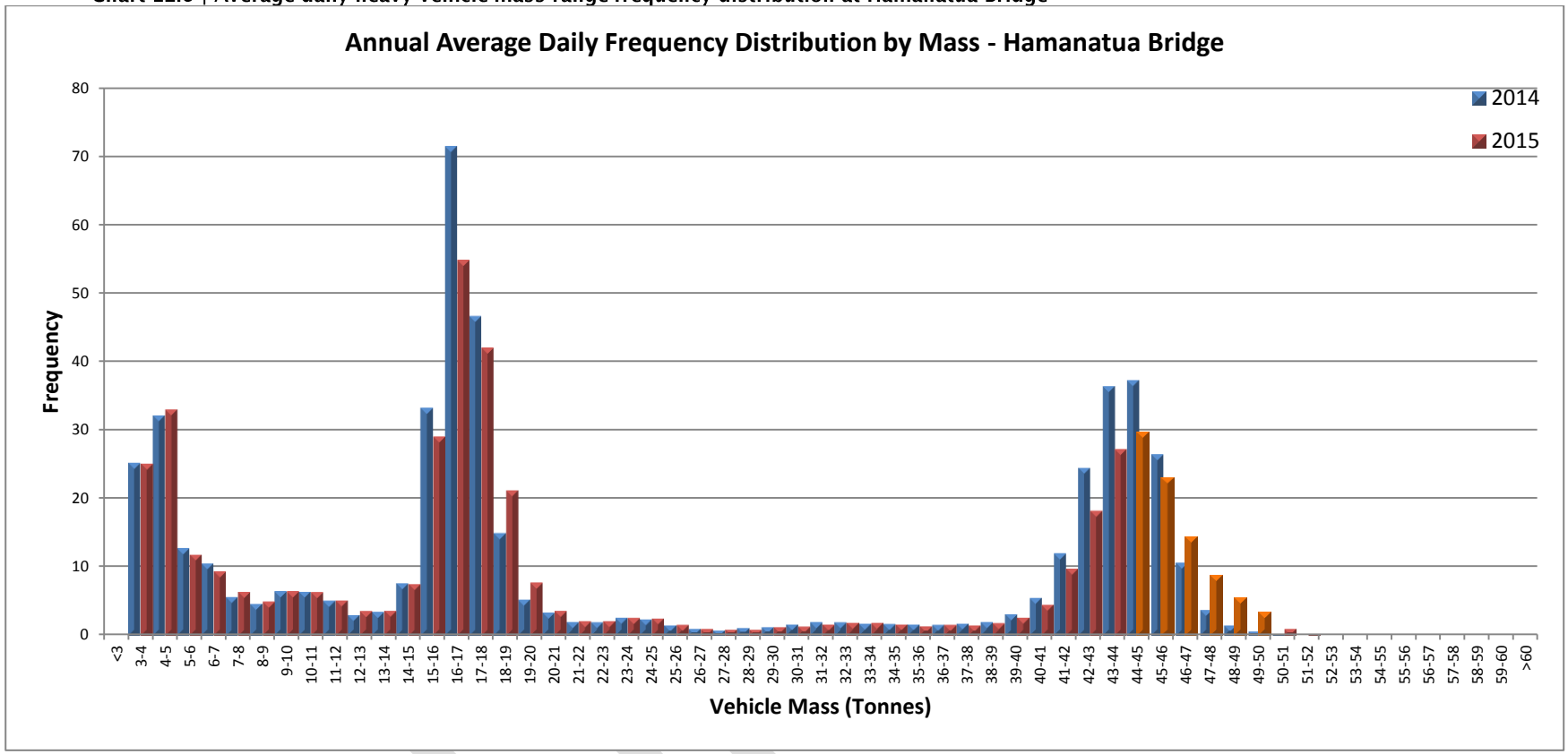
Chart 12.5 | Average daily heavy vehicle mass range frequency distribution at Eskdale



Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: There are three load distribution peaks appear in 2015 which is same as the previous year. But the peak load distribution point of larger trucks have moved from 44–46 tonnes to 46–48 tonnes, indicating there are more trucks were operated at over general access load limits at this site. There were declines for mid–sized trucks in 2015, perhaps reflect the demand decreased. For larger trucks, it is more likely more operators taken on 50MAX/HPMV and more goods delivered by heavier trucks.

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

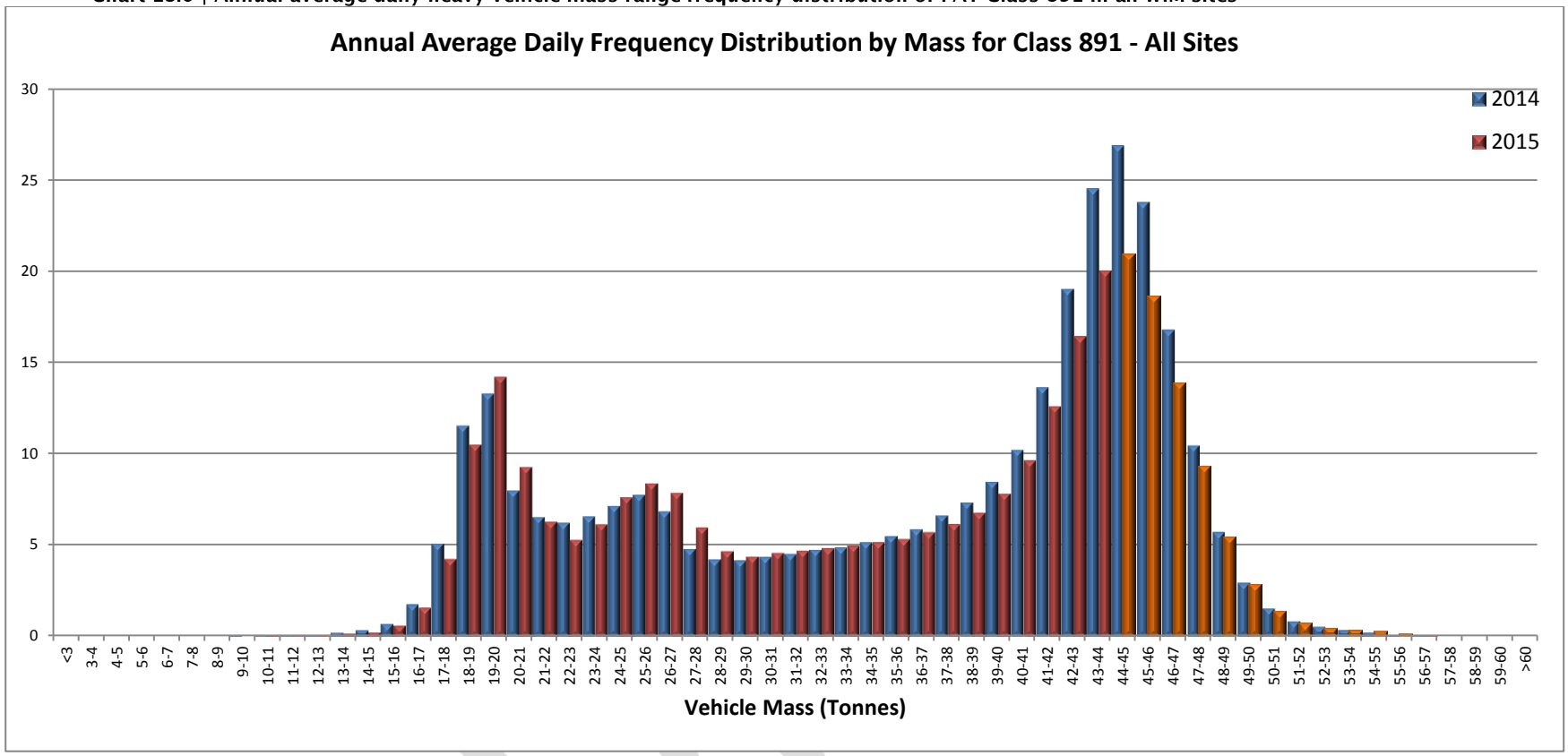


Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: There are three load distribution peaks appear at this site which is same as the previous year. The peaks point basically remained unchanged. There were declines for mid-sized trucks in 2015, perhaps reflect the demand decreased. For larger trucks, it is more likely more operators taken on 50MAX/HPMV and more goods delivered by heavier trucks.

20.0 APPENDIX B – PAT CLASS 891 MASS RANGE FREQUENCY DISTRIBUTION BY WiM SITE CHARTS

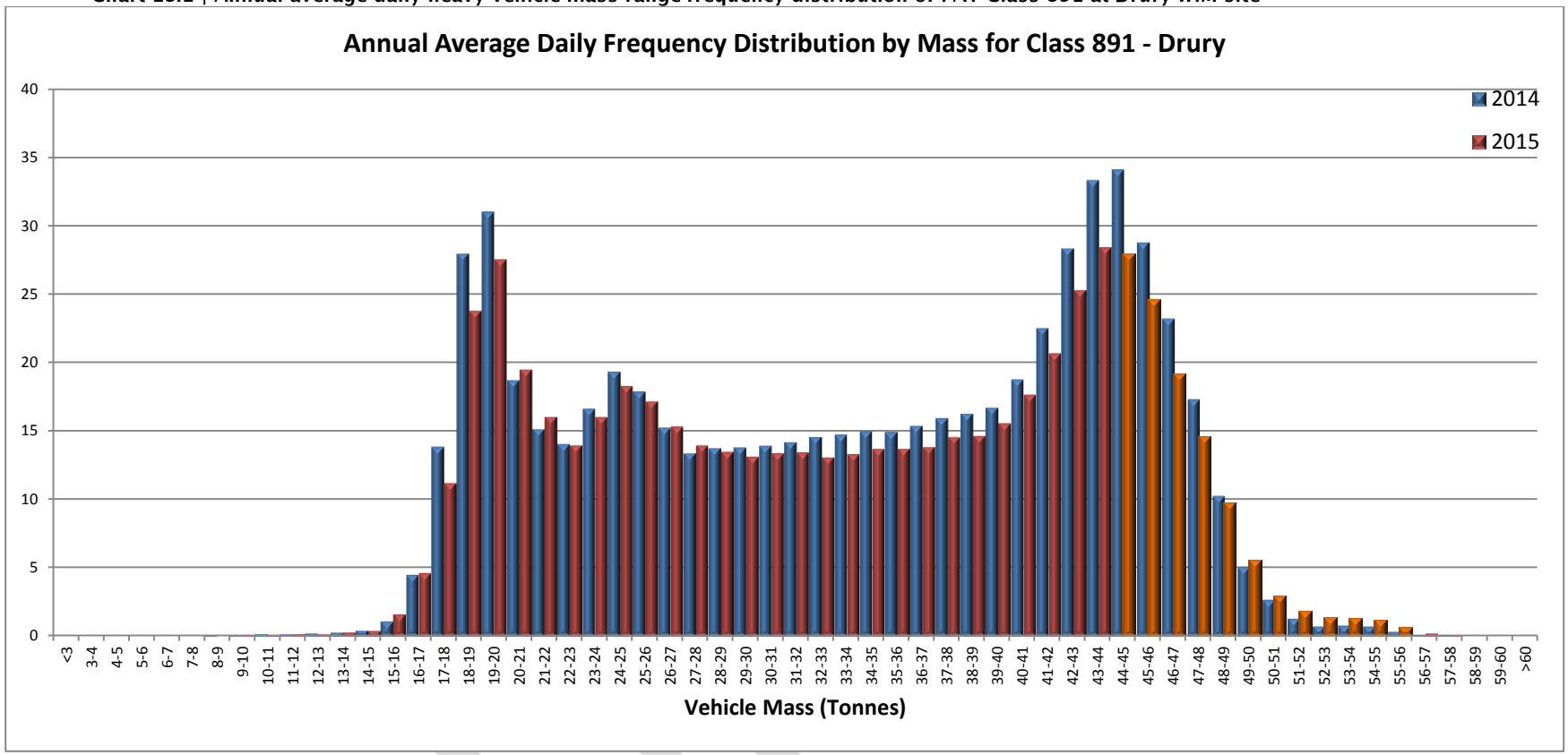
Chart 13.0 | Annual average daily heavy vehicle mass range frequency distribution of PAT Class 891 in all WiM sites



Key: = 2015 over 44 tones (legal limit without HPMV or overweight permit.)

Interpretation:
The decrease in frequency of this type in the 42–48 tonne weight range is likely to reflect that many operators who require maximum weight capacity are switching to 9 axle vehicle combinations, especially "50Max" vehicles which are more cost efficient to operate at up to 50 tonnes and have access to a relatively large proportion of the road network. A small proportion of type 891 vehicles continue to be operated at weights over 48 tonnes. In this weight range, the option of using a 9 axle vehicle under permit may not be available for the operators concerned, or a 9 axle vehicle may not suit their operational requirements. Some operators will have existing HPMV permits for type 891 vehicles on specific routes.

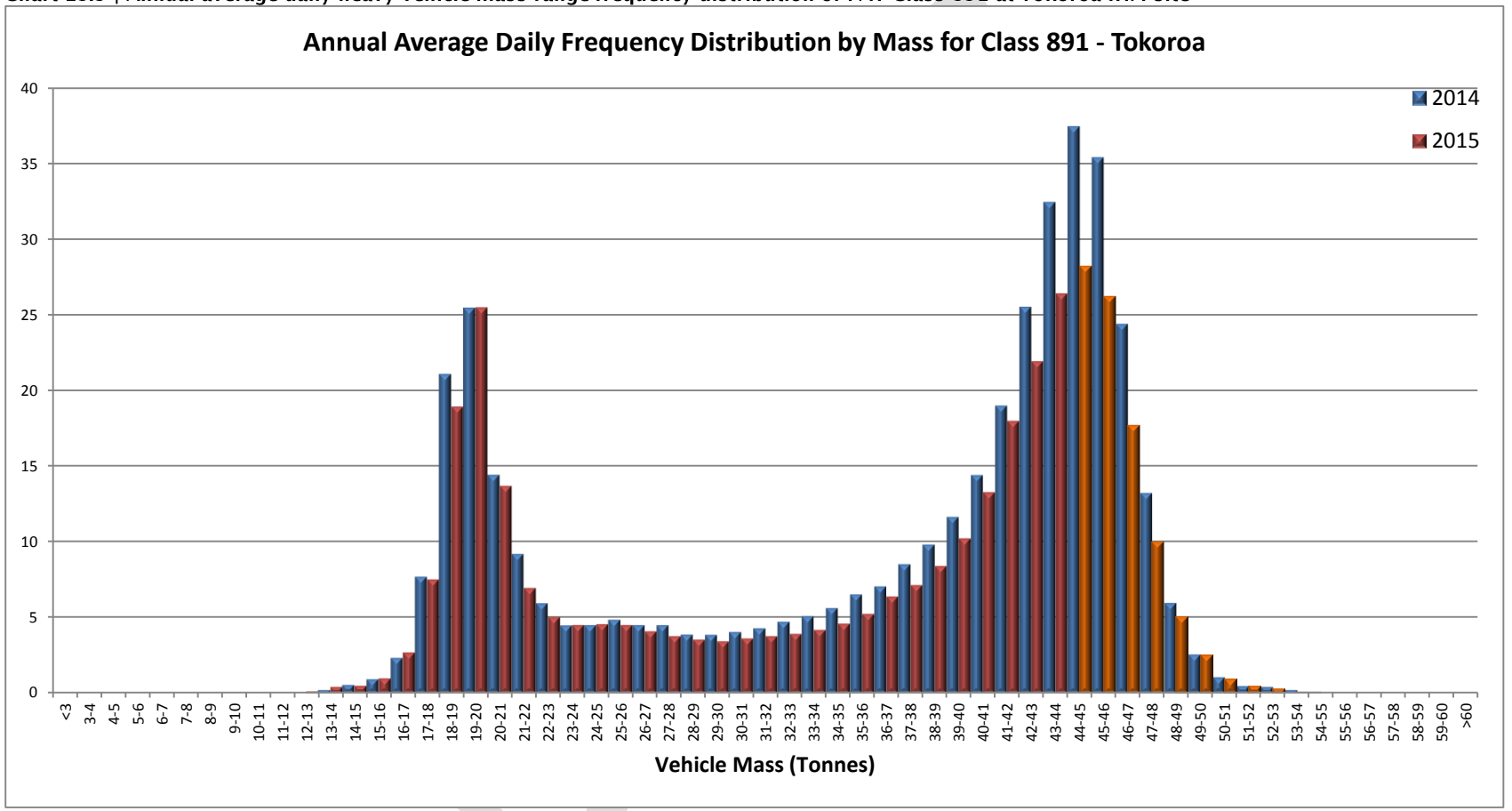
Chart 13.1 | Annual average daily heavy vehicle mass range frequency distribution of PAT Class 891 at Drury WiM site



Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: PAT class 891 at Drury showed decreases for most weight bands below 49 tonnes. For weight bands 50 tonnes and over, the numbers were greater than those in 2014. At Drury, there were 2,379 vehicles with gross masses more than 50 tonnes. This was a 65% increase from 2014 (1,434). This perhaps indicating that some of PAT 891 taken up HPMV.

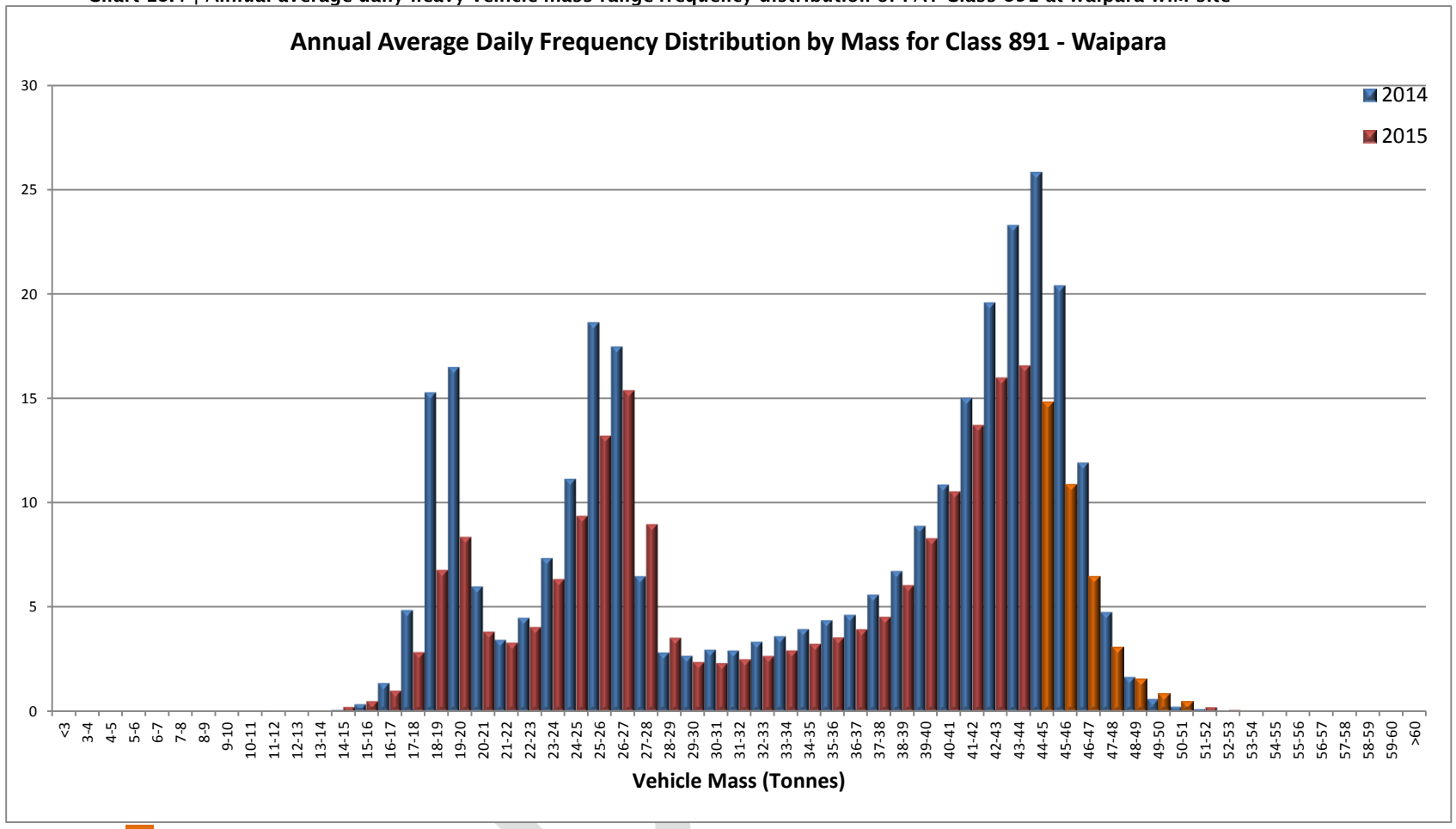
Chart 13.3 | Annual average daily heavy vehicle mass range frequency distribution of PAT Class 891 at Tokoroa WiM site



Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: PAT class 891 at Tokoroa showed decreases for most weight bands, following the overall trend.

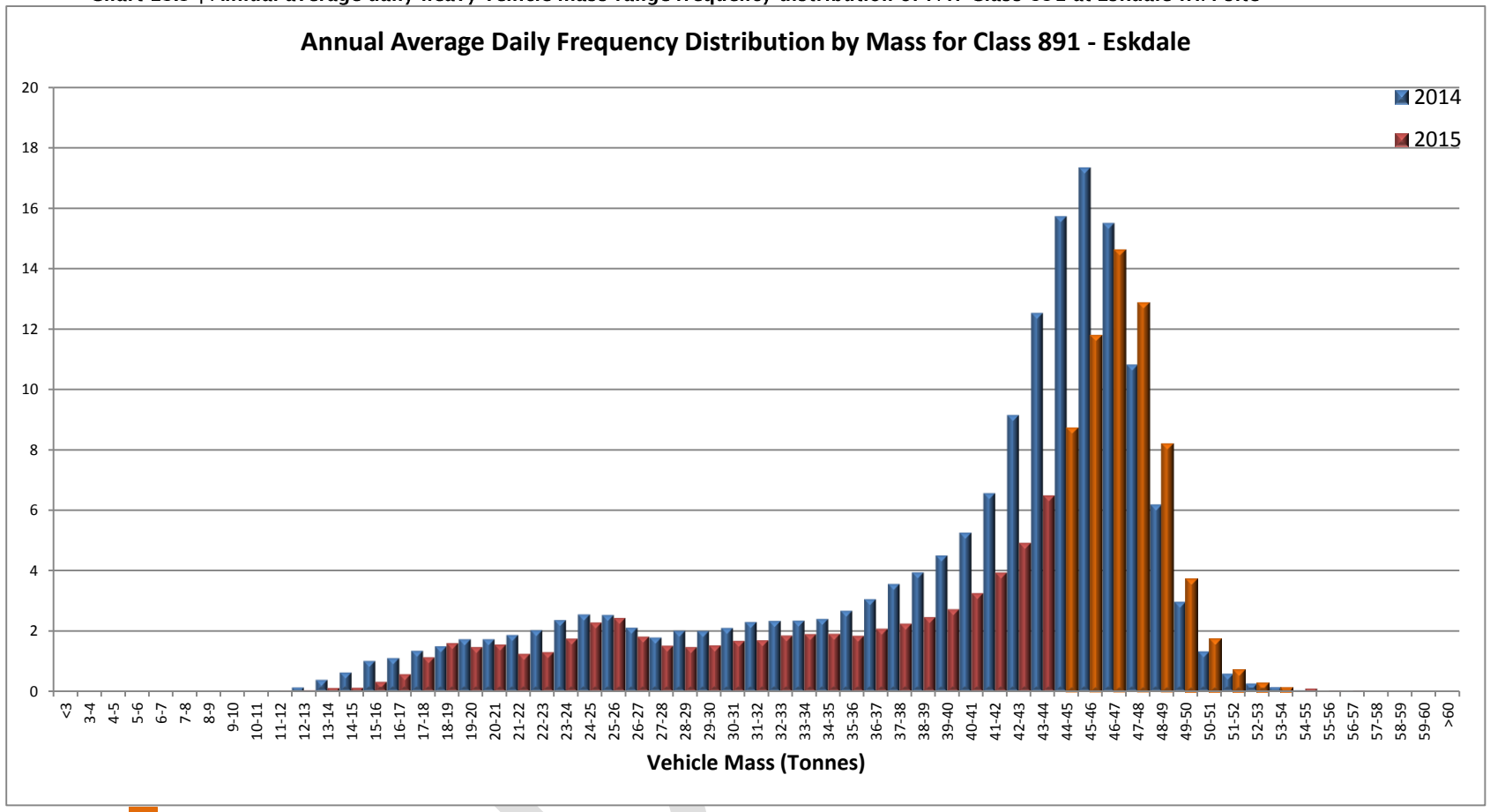
Chart 13.4 | Annual average daily heavy vehicle mass range frequency distribution of PAT Class 891 at Waipara WiM site



Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: PAT class 891 at Waipara showed decreases for most weight bands, following the overall trend. The unusual peak in the mid 20s undoubtedly relates to a high level of partly laden vehicles at this site, which will reflect freight flows in the area. It is speculated the reasons for this may be that the volume of freight heading South is greater than the volume going North, so that trucks tend to be fully laden in one direction but not the other.

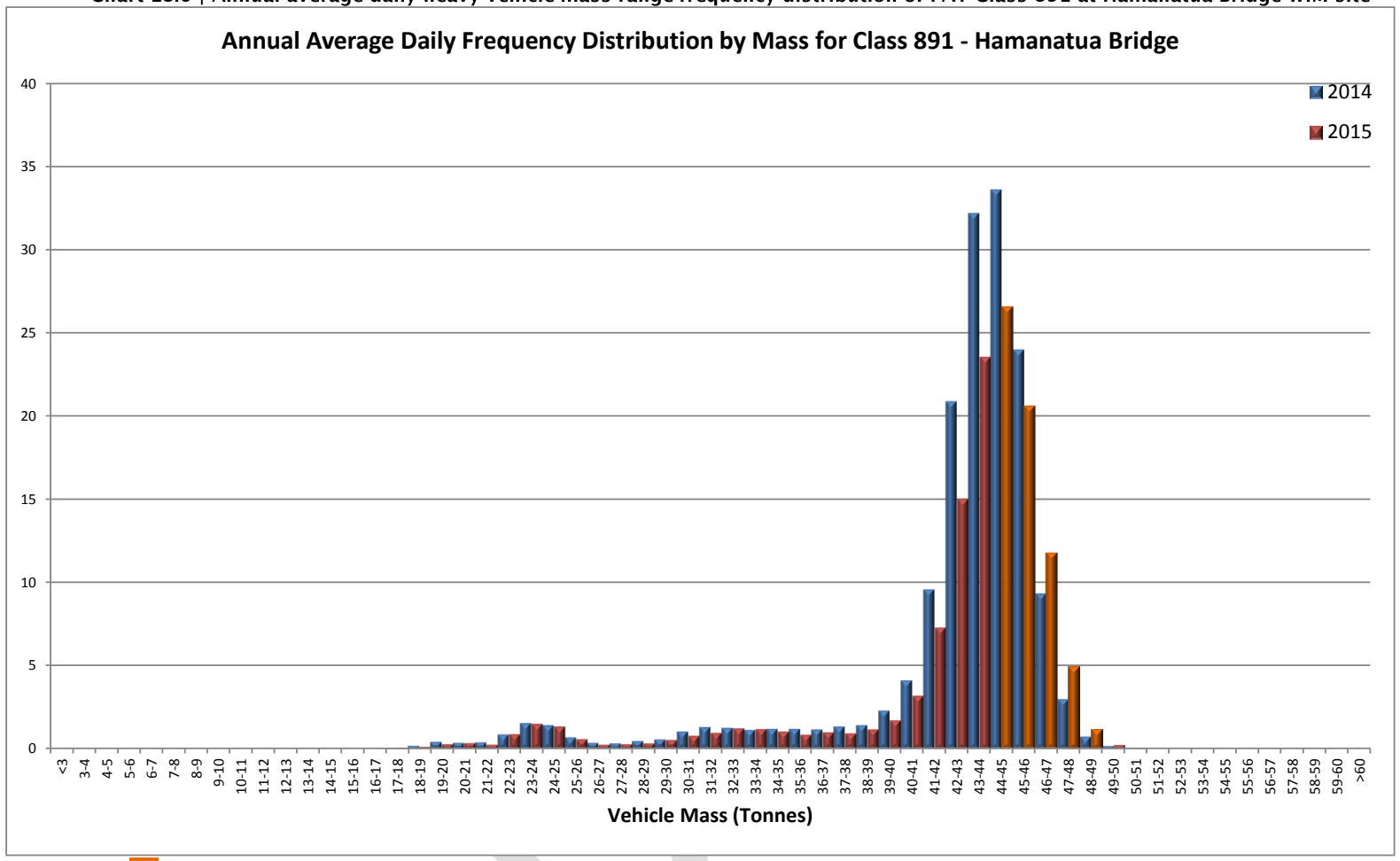
Chart 13.5 | Annual average daily heavy vehicle mass range frequency distribution of PAT Class 891 at Eskdale WiM site



Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation:

Chart 13.6 | Annual average daily heavy vehicle mass range frequency distribution of PAT Class 891 at Hamanatua Bridge WiM site



Key: = 2015 over 44 tonnes (legal limit without HPMV or overweight permit.)

Interpretation: The majority of PAT 891 recorded at the site was loaded logging trucks toward the port in Gisborne, on the way back; these vehicle combinations changed by get the trailer on back of truck (8 axles turn to 4 axles). This why there is only one load distribution peak for PAT 891 at this site. There were number decline for the truck weight less than 47 tonnes, while the number for trucks weight more than 47 tonnes slightly increased. It perhaps suggests the demand for log declined than in 2014.

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 WiM sites

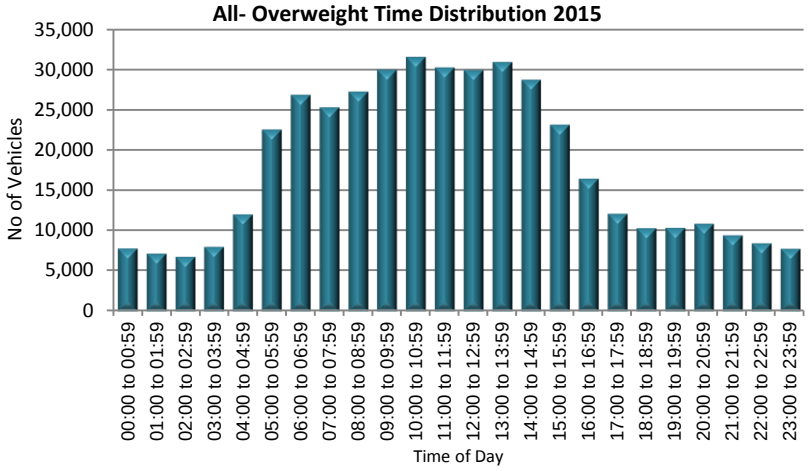


Chart 14.1 | Drury

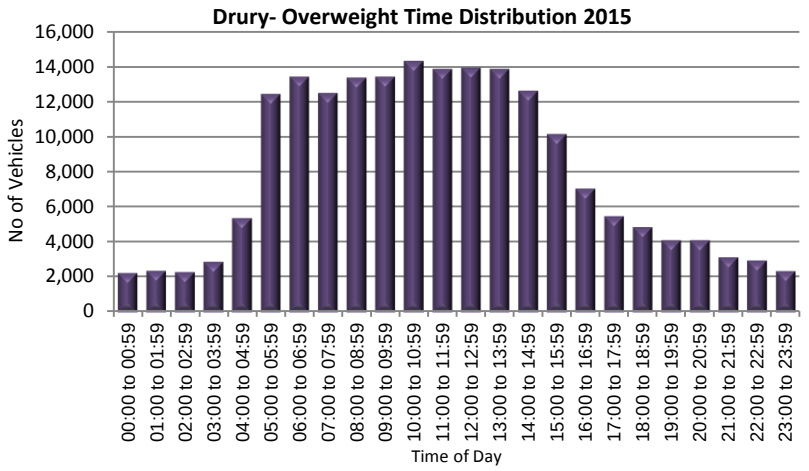


Chart 14.2 | Eskdale

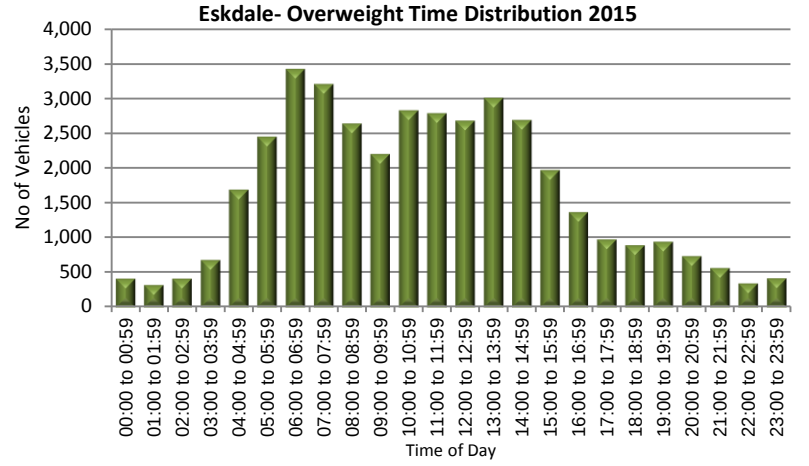


Chart 14.3 | Hamanatua Bridge

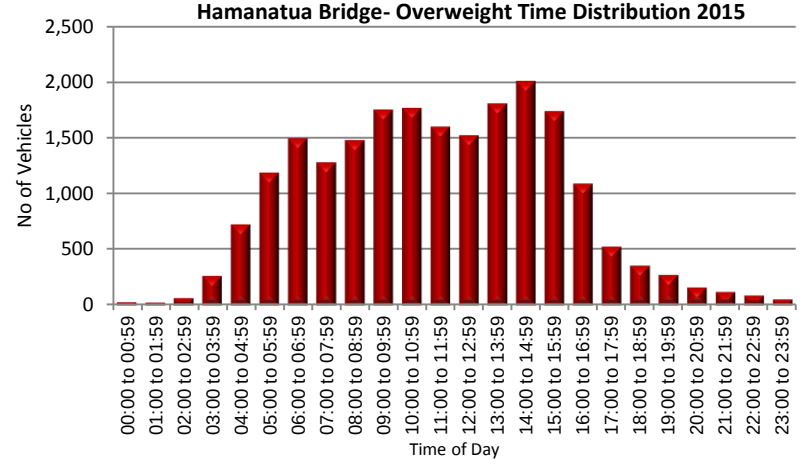


Chart 14.4 | Tokoroa

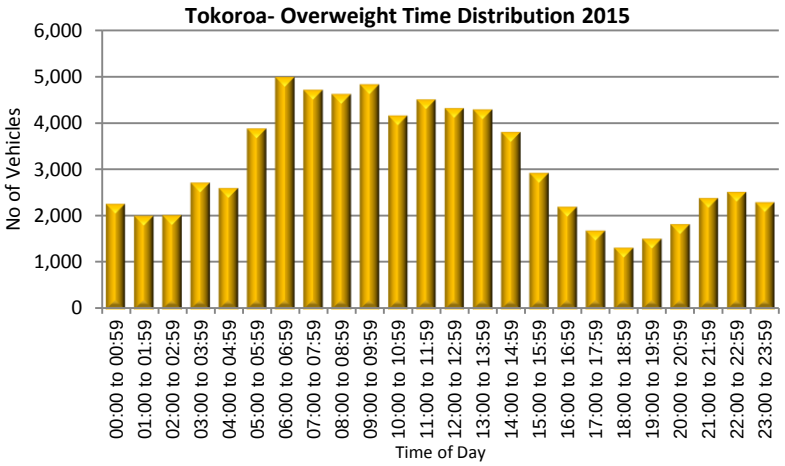
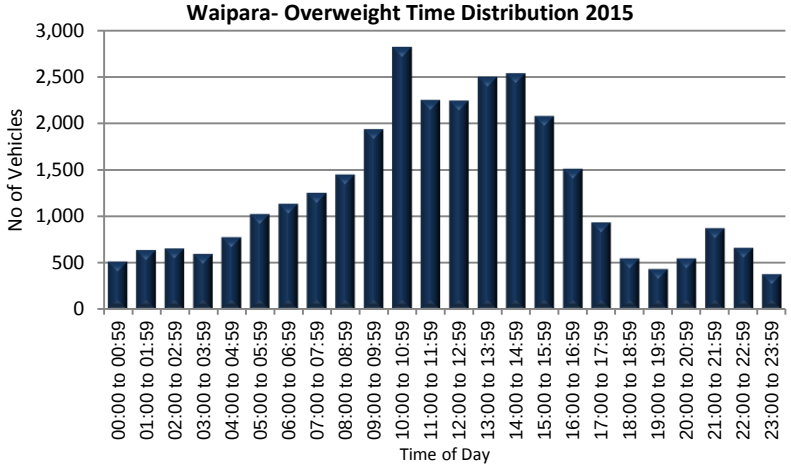


Chart 14.5 | Waipara

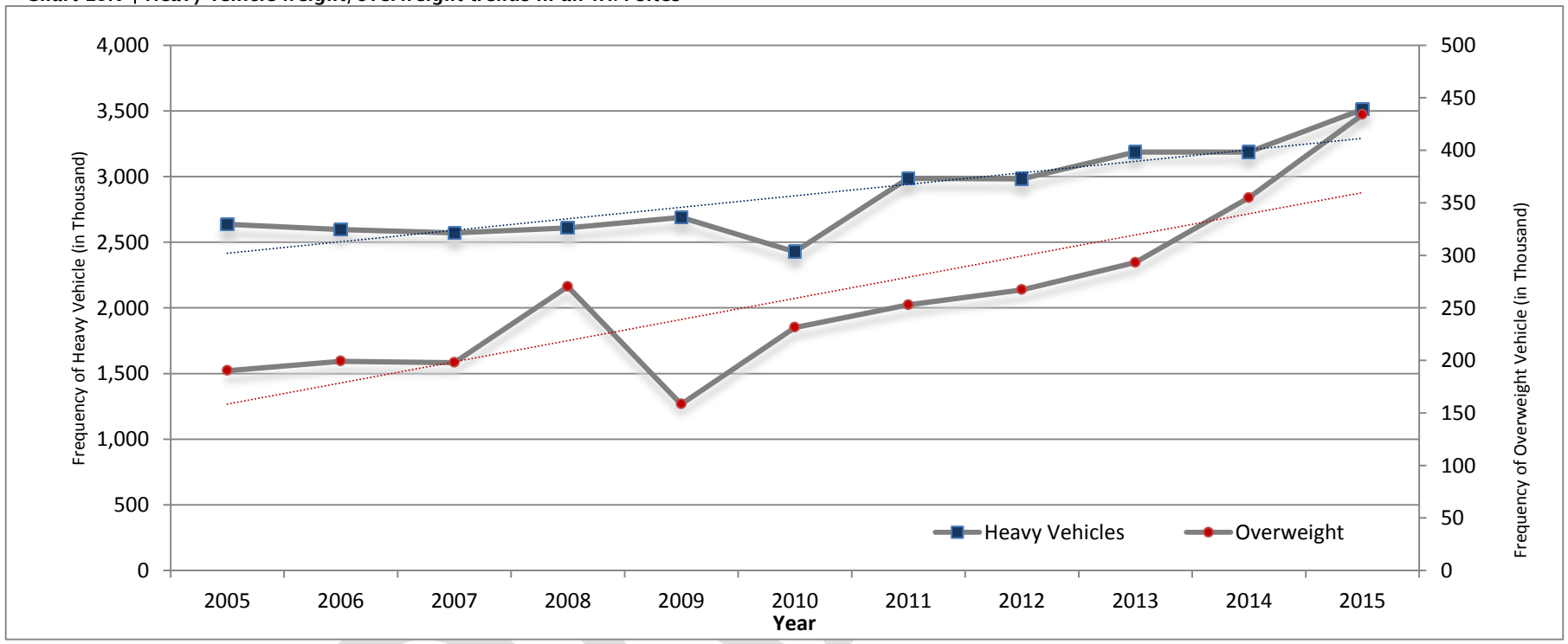


Interpretation:

- In general, the majority of overweight vehicles appear during daytime between 5am to 4pm across all the sites. Although there are slightly different patterns between the site.
- Overall, the overweight time distribution patterns are consistent for each site over the years.
- The intention of providing overweight time distribution patterns was to help CVIU planning their vehicle enforcement programme.

22.0 APPENDIX D – HEAVY VEHICLES LOAD/OVERWEIGHT TRENDS

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

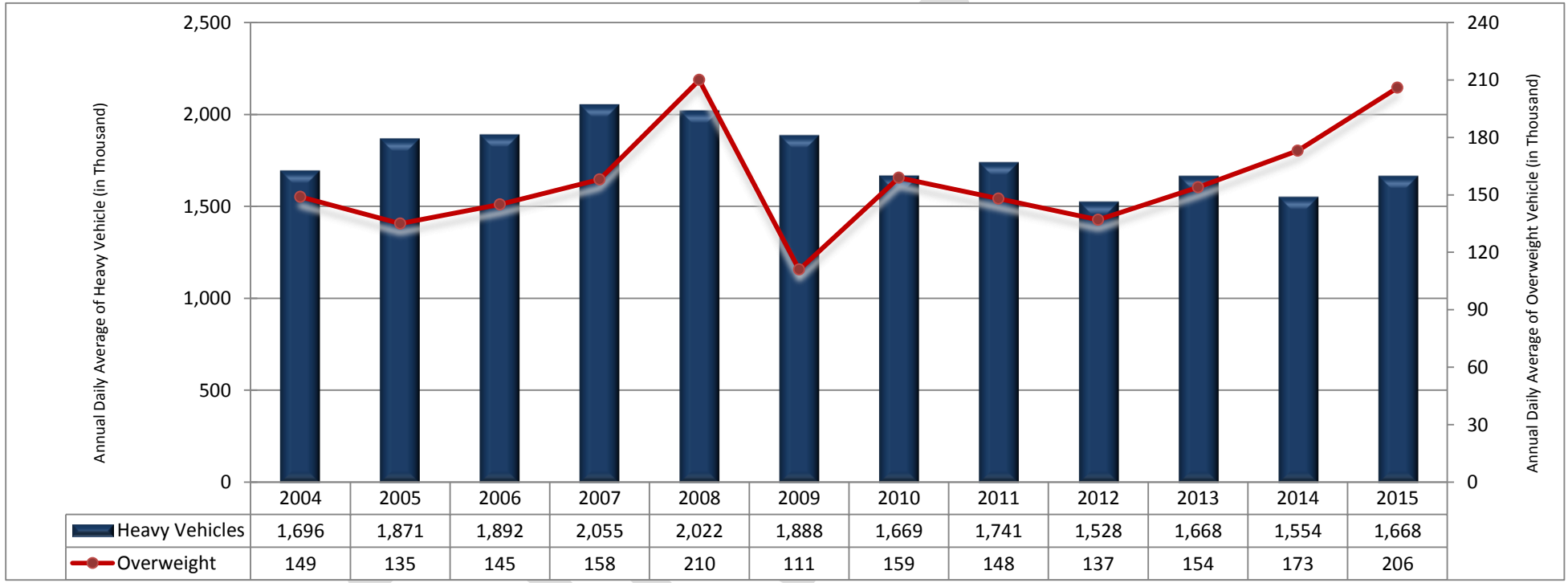


Interpretation:

- In 2015, both heavy and overweight vehicles still show increasing trends in the long term. From 2013, overweight vehicles showed a greater increase than vehicles generally, it was about 10% in 2013, 21% in 2014 and 22% in 2015. This indicates that heavy vehicles have been taking up HPMV/50Max since then.
- The total 50MAX permit issued increased by 114% from 1842 in 2014 to 3948 in 2015. The total HPMV permit issued increased by 120% from 2384 in 2014 to 5250 in 2015. (Sourced from Freight & Register records team.)

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



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Heavy Vehicles	1,696	1,871	1,892	2,055	2,022	1,888	1,669	1,741	1,528	1,668	1,554	1,668
Overweight	149	135	145	158	210	111	159	148	137	154	173	206

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

Interpretation:

- In 2015, the annual average daily number of heavy vehicles increased by 7%, while the annual average daily number of overweight vehicles increased by 19%, compared to 2014. This suggests that because more goods were delivered by trucks of over general access load limits and therefore the growth rate of average daily heavy vehicles is lower than the growth rate of vehicles of over general access load limits.

For more graphs on each PAT class and number of axles, refer to the attached
Weight-in-Motion Dashboard 2015