NZ TRANSPORT AGENCY
WAKA KOTAHI

Annual Weigh-In-Motion (WiM) Report 2010

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1.0 DISCLAIMER

1) The traffic data contained in this report is intended to be used as an approximate indication of traffic loading and vehicle weights at WiM sites. The limitations of the equipment and their installation, congestion effects and various analysis procedures contribute to a level of approximation in the data. These factors should be taken into account when using the data.
   The NZ Transport Agency and its employees or agents involved in preparation of this information cannot accept liability for its contents or for any consequences arising from its use. People using the contents of the report should apply, and rely upon, their own skill and judgement. The contents should not be used in isolation from other sources of advice and information.
2) The legal limits indicated in this report represent the highest legal gross for the axle groups depicted. In certain cases, a lower limit may apply.
3) TNZ Class 9, PAT Type 69, 6 axle artic and the TNZ Class 11, PAT Type 791, 7 axle artic are legally limited to below 44 Tonne Gross, but may be operating on overweight permits at 44 Tonne Gross.

2.0 INTRODUCTION

There are five Weigh in Motion (WiM) sites in New Zealand collecting axle loading data for use nationally in traffic monitoring. An additional source of WiM data is being developed in Auckland and this project will include the provision of loading data to the national system.

The current sites are as follows:

Table 1.0 | WiM Site Locations

Region	SH	RS	Description
02 - Auckland	1N	461	DRURY -Telemetry Site 48 - (WiM Site 1205)
03 - Waikato	1N	625	TOKOROA - Telemetry Site 51 - (WiM Site 421)
04 - Bay of Plenty	2	171	TE PUKE - Telemetry Site 49 - (WiM Site 24)
06 - Hawkes Bay	5	259	ESKDALE* - Telemetry Site 101 - (WiM Site 5721)
11 - Canterbury	1S	284	WAIPARA - Telemetry Site 52 - (WiM Site 518)

*Eskdale WiM site data collection was started in July 2010.

All data used within this report was collected within the 2010 calendar year and is available to selected users, within the NZTA's State Highway Traffic Monitoring System (TMS). This report is proposed to provide an insight into what is available for further, more detailed analysis, to be undertaken by TMS users.

3.0 OTHER DOCUMENTS

The documents below will provide useful information relating to Traffic Monitoring practices used on State Highways by the NZ Transport Agency. These can be downloaded from our website. www.nzta.govt.nz

- Traffic Monitoring for State Highways Manual SM052
- State Highway Traffic Volume Booklet

4.0 TECHNOLOGY

NZTA is using the PAT bending plate technology at a total of five WiM sites and two further sites at the Auckland Harbour Bridge are used for a special study. All sites are continuously collecting individual truck records and statistics generally downloaded weekly.

The first system was installed in 1985 at Pukurua Bay near Wellington, then relocated to Te Puke in the Bay of Plenty in 1997. Four of the original bending plates are still in operation.

The Eskdale site is the newest WiM site located in Hawkes Bay. WiM data collection started on this site in July 2010.

5.0 DATA QUALITY REQUIREMENTS

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

Accuracy or precision is as defined for high speed weigh in motion in ASTM E 1318 (or latest revision):

For 95% of conformity:

Gross Vehicle Weight: ± 10%

Axle group load: ± 15%

5.0 DATA QUALITY REQUIREMENTS (Continued)

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.

Current use of data:

- Average ESA's for pavement design.
- Load distributions for bridge design.
- Network loading analysis.
- Indicators for Police Enforcement.

Potential future use of data:

- Assessments of revenue from Road User Charges.

Other factors affecting data accuracy

- Pavement smoothness. Trucks bouncing onto scales will affect accuracy.
- Truck Driver Behavior
- Strong Winds etc

6.0 OVERWEIGHT DERIVATION

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 the specified weight limit of the vehicle. For example, vehicle fleet of PAT class 21 legal limit is 14 tonnes. To derive the number of overweight vehicles for this fleet the sum of total number of vehicles with loads ranges from 15-16 up to >60 tonnes (the maximum weight category).

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 2010 there were 127,311 rigid heavy vehicles recorded at the Waipara WiM site. This is the sum of all PAT class (20, 21, 31, 34, 45, and 47) under rigid type. For the overall total overweight vehicles, simply add all the overweight vehicles in all WiM sites.

7.0 PERMITTED VEHICLES

Within this report, permitted vehicles were not identified separately. A small proportion of the vehicles identified as being overweight will be operating under a permit.

TNZ Class 9, PAT Type 69, 6 axle artic and the TNZ Class 11, PAT Type 791, 7 axle artic are legally limited to below 44 Tonne Gross, but may be operating on overweight permits at 44 Tonne Gross.

8.0 EXECUTIVE SUMMARY

All heavy vehicles are referred to as vehicles in this report.

Table 2.0 | Vehicle Frequency by Vehicle Type

Vehicle Type	Total Heavy Vehicles Recorded	%[1] Total Heavy Vehicles	Overweight Vehicles (Vehicle Type)	%[1] Overweight Vehicles (Vehicle Type)	%[2]
Rigid	955,091	*39.3*	20,416	*8.9*	*2.1*
T&T	900,445	*37.1*	154,332	*67.3*	*17.1*
Artic	353,661	*14.6*	29,426	*12.8*	*8.3*
A&B Train	221,129	*9.1*	25,296	*11.0*	*11.4*
Total	2,430,326	*100.0*	229,470	*100.0*	*9.4*

Note: [1]The proportion of each vehicle type from the overall total. For example, more than 67 percent of the overall total of overweight vehicles recorded as T&T vehicles.
[2]The proportion of number of overweight vehicles over the total heavy vehicles recorded of each vehicle type. For example, approximately 8 percent of 353,661 Artic type vehicles were overweight.

Vehicle Fleet

- PAT class 891, 21 and 31 *(see Figure 1)* reported as having the largest portion of vehicles across all five WiM Sites (combined they account for approximately 50 percent of the heavy vehicle fleet) (*see Table 7.0)*
- In terms of vehicle type, rigid (39.3 percent) and T&T (37.1 percent) have the highest number of heavy vehicles. *(see Table 2.0)*

Vehicle Fleet Overweight

- PAT class 891 (46.7 percent), 751 (16.6 percent) and 851 (8.7 percent) have the largest portions of vehicles recorded as being over their specific vehicle type limit (combined approximately 72 percent of the total heavy vehicles recorded as overweight) *(see Table 10.0)*
- In the long-term trend (2001-2010), PAT class 891 showed an increasing trend while PAT class 751 and 851 reported decreasing trends *(see Chat 6.0)*

- Table 3 shows the number of heavy vehicles, overweight vehicles, and percentage distribution of overweight vehicles at each WiM site:

Table 3.0 | Heavy Vehicle Type by WiM Site (2010)

Vehicle Type	WiM Site					Total
	Drury	Eskdale*	Te Puke	Tokoroa	Waipara	
Number of Heavy vehicles						
Rigid	393,825	30,786	266,739	136,430	127,311	955,091
T&T	304,176	33,924	221,514	200,190	140,641	900,445
Artic	164,030	8,620	81,081	58,800	41,130	353,661
A&B Train	73,968	6,546	35,793	57,317	47,505	221,129
Total	935,999	79,876	605,127	452,737	356,587	2,430,326
Number of Overweight vehicles						
Rigid	9,226	532	6,212	2,309	2,137	20,416
T&T	37,056	13,259	60,233	21,039	22,745	154,332
Artic	9,022	910	14,421	3,182	1,891	29,426
A&B Train	7,193	1,076	7,958	4,305	4,764	25,296
Total	62,497	15,777	88,824	30,835	31,537	229,470
Percentage of overweight vehicles (%)						
Rigid	*2.3*	*1.7*	*2.3*	*1.7*	*1.7*	*2.1*
T&T	*12.2*	*39.1*	*27.2*	*10.5*	*16.2*	*17.1*
Artic	*5.5*	*10.6*	*17.8*	*5.4*	*4.6*	*8.3*
A&B Train	*9.7*	*16.4*	*22.2*	*7.5*	*10.0*	*11.4*
Total	*6.7*	*19.8*	*14.7*	*6.8*	*8.8*	*9.4*

* Eskdale WiM site data collection was started in July 2010. So, the quantity of data represents 6 months.

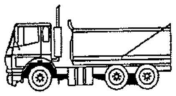
Interpretation: At Waipara WiM site 41,130 Artic type vehicles were recorded, with 1,891 (4.6 percent) recorded as overweight vehicles. Of all the heavy vehicles recorded at the Te Puke WiM site there were 14.7 percent were overweight.

- The T&T vehicle type (154,332) has the highest number of overweight vehicles across all WiM sites, followed by Artic (29,426), which were evident at the Drury and Te Puke WiM sites *(see Table 3.0)*

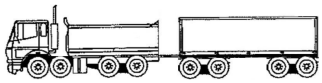
Figure 1.0 | PAT type 21, 31, 891, 751 and 851

PAT type 21:

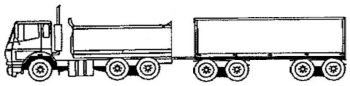
PAT type 31:



PAT type 891:



PAT type 751:



PAT type 851:

Vehicle Fleet > 44T/48T

- PAT class 891, 751 and 851 *(see tables 13.0 and 13.1)* represent the largest frequencies of heavy vehicles recorded at both >44T and >48T (combined they account for approximately 85 percent of the total heavy vehicles recorded for both >44T and >48T, respectively).

Time of Day

- Table 4.0 indicates the times overweight vehicle frequencies peak at each WiM site during an average day:

Table 4.0 | Overweight Peak Distribution Times by WiM Site *(Start to End)*

WiM Site	Start	End
Drury	05:00 – 05:59	17:00 – 17:59
Tokoroa	06:00 – 06:59	17:00 – 17:59
Te Puke	05:00 – 05:59	17:00 – 17:59
Waipara	06:00 – 06:59	16:00 – 16:59
Eskdale*	05:00 – 05:59	16:00 – 16:59

*Eskdale WiM Site data collection was started in July 2010.

- The peaks may represent long-hauls reported across two or more WiM Sites, the smaller peaks may represent local distribution *(see Charts 3.0 – 3.4)*.

- Across all WiM sites, overweight PAT class 891 recorded as >48 Tonnes started to peak in the afternoon except for the Te Puke that started earlier (see Charts 4.0–4.4).

9.0 CLASSIFICATION SCHEME

Table 5.0 | Heavy vehicle classification scheme

PEM Class	NZTA 2011	TNZ Class	PAT Class	Vehicle Type	Axles	Length Range (WiM data)	RUC Class	Group	Axle Group (Pave. Des.)
MCV	4	3	20	o-o (wb2.0-3.2m, gw>=3.5t)	2	4m-11m	2	RIGID	
			21	o--o (wb2.0-3.2m, gw>=3.5t)				RIGID	1s-1d
HCV1	5	4	31	o--oo	3	7m-12m	6	RIGID	1s-2
			34	oo--o			5	RIGID	1s-1s-1d
		5	30	o-o--o	3	6m-15m	2,24	T&T	1s-1d-1d
	6	6	45	oo--oo	4 (truck)	8m-11m	14	RIGID	1s-1s-2
			47	o--ooo			14	RIGID	1s-3
	3/7*	7	40	o--o-o--o	4 (T&T)	11m-19m	2,30	T&T	1s-1d-1d-1d
	5		44	oo-o--o			5,24	T&T	1s-1s-1d-1d
	7		41	o-o--oo			2,29	T&T	1s-1d-2
			42	o-oo--o			6,24	T&T	1s-2-1d
HCV2	8	8	52	o--oo-o--o	5	11m-19m	6,30	T&T	1s-2-1d-1d
			53	o-oo--oo			6,29	ARTIC	1s-2-2
	9	9	69	o-oo--ooo	6	15m-18m	6,33	ARTIC	1s-2-3
			68	oo-oo--oo			14,29	T&T	1s-1s-2-2
	10	10	63	o--oo-o--oo	6 (T&T) (A-Train)	16m-20m	6,37	T&T	1s-2-1d-2
			66	oo--oo-o--o			14,30	T&T	1s-1s-2-1d-1d
			65	oo--o-o--oo			5,37	T&T	1s-1s-1d-1d-2
			61	o-o--o-o--oo			6,29,30	T&T	1s-2-1d-1d-1d
			621	o-oo--o-o--o			?	A TRAIN	
	11	11	751	o-oo--oo--oo	7	18m-21m	6,29	T&T	1s-2-2-2
			74	o-oo--oo-o--o			6,29,30	A TRAIN	1s-2-2-1d-1d
	na		78	o--ooo-o--oo			?	A TRAIN	
			731	o-oo--o-o--oo			?	T&T	
	9		747	o--ooo---ooo			14,33	ARTIC	1s-3-3
			791	o-oo-oooo			6,43	ARTIC	1s-2-4
		12	713	oo-oo--ooo	7-11	15m-21m	?	ARTIC	
	12		77	oo--oo-o--oo			14,37	T&T	1s-1s-2-1d-2
			891	oo--oo-oo--oo			14,43	T&T	1s-1s-2-2-2
			914	oo-oo--ooo-oo			14	T&T	1s-1s-2-2-3
	9		826	oo-oo--oooo			14,43	ARTIC	1s-1s-2-4
	12		915	oo-oo--oo-ooo			14,33,29	T&T	1s-1s-2-3-2
			1020	oo-oo-ooo-ooo			14,33,33	B TRAIN	1s-1s-2-3-3
			1133	oo-oo-ooo-oooo			14,33,43	B TRAIN	1s-1s-3-4
	13	13	851	o-oo--ooo--oo	8-10	19m-21m	6,33,29	B TRAIN	1s-2-3-2
	12		951	o-oo-ooo-ooo			6,33,33	B TRAIN	1s-2-3-3
	13		1032	o-oo-ooo-oooo			?	B TRAIN	1s-2-3-4
			85	o-oo--oo-o--oo			?	A TRAIN	
			89	o-oo--ooo-o--o			?	A TRAIN	
	9		847	o--ooo---oooo			14,43	ARTIC	1s-3-4
	14	14		Not Classified					

Symbol: na not applicable
* TNZ 1999 PAT class 40 was split into two categories in the new NZTA 2011 classifications. The car towing car (o-o--o-o) gone to vehicle type class 3 while the truck tow heavy trailer (o--o--o--o) classified as vehicle type class 7.

Announcement: The new NZTA 2011 heavy vehicle classification scheme was implemented early in 2011. Therefore, the next WiM 2011 annual report will be using the NZTA 2011 classification as its output category. The changes in classification are reflected in the table above.

10.0 ANNUAL AVERAGE DAILY TRAFFIC (AADT) BY SITE

AADT provides an estimation of the number of vehicles crossing a site on an average day.

% Heavy

The % Heavy column provides an estimate of the proportion of the AADT, deemed a heavy vehicle: i.e. greater than 3.5 tonnes for the current year.

Table 6.0 | Annual Average Daily Traffic by WiM Site

WiM Site	SH	AADT (2010)	Number of heavies per day	% Heavy
Drury – Telemetry Site 48	1N	40,740	4,318	*10.6*
Tokoroa – Telemetry Site 51	1N	8,470	1,355	*16.0*
Te Puke – Telemetry Site 49	2	19,143	1,857	*9.7*
Waipara – Telemetry Site 52	1S	7,479	1,055	*14.1*
Eskdale – Telemetry Site 101	5	3,438	574	*16.7*

(Source: State Highway Traffic Data Booklet 2005-2010, to be published April 2011)

11.0 VEHICLE FLEET DISTRIBUTION 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 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

Vehicle Type	PEM Class	PAT Class	Description	Drury		Tokoroa		Te Puke		Waipara		Eskdale	
				Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]
Rigid	MCV	20	o-o (wb2.0-3.2m, gw>=3.5t)	49,320	*5.3*	10,740	*2.4*	25,994	*4.3*	14,965	*4.2*	434	*0.5*
		21	o--o (wb2.0-3.2m, gw>=3.5t)	206,491	*22.1*	65,401	*14.4*	136,021	*22.5*	70,178	*19.7*	12,355	*15.5*
	HCV1	31	o--oo	90,043	*9.6*	29,790	*6.6*	51,161	*8.5*	21,677	*6.1*	4,675	*5.9*
		34	oo--o	250	*0.0*	348	*0.1*	205	*0.0*	164	*0.0*	68	*0.1*
		45	oo--oo	47,694	*5.1*	30,143	*6.7*	53,355	*8.8*	20,115	*5.6*	13,251	*16.6*
		47	o--ooo	27	*0.0*	8	*0.0*	3	*0.0*	212	*0.1*	3	*0.0*
T&T	HCV1	30	o-o--o	14,194	*1.5*	3,936	*0.9*	5,865	*1.0*	7,191	*2.0*	544	*0.7*
		40	o--o-o--o	4,855	*0.5*	1,250	*0.3*	1,838	*0.3*	1,532	*0.4*	139	*0.2*
		41	o-o--oo	17,442	*1.9*	6,872	*1.5*	8,401	*1.4*	7,584	*2.1*	1,444	*1.8*
		42	o-oo--o	1,093	*0.1*	312	*0.1*	224	*0.0*	186	*0.1*	53	*0.1*
		44	oo-o--o	25	*0.0*	21	*0.0*	13	*0.0*	41	*0.0*	2	*0.0*
	HCV2	52	o--oo-o--o T&T	3,324	*0.4*	760	*0.2*	598	*0.1*	827	*0.2*	266	*0.3*
		61	o-o--o-o--oo T & T	814	*0.1*	595	*0.1*	462	*0.1*	396	*0.1*	295	*0.4*
		63	o--oo-o--oo T & T	5,387	*0.6*	3,728	*0.8*	6,295	*1.0*	3,526	*1.0*	225	*0.3*
		65	oo--o-o--oo T & T	-	-	7	*0.0*	-	-	42	*0.0*	-	-
		66	oo--oo-o--o T & T	803	*0.1*	311	*0.1*	343	*0.1*	205	*0.1*	10	*0.0*
		68	oo-oo--oo T & T	9,050	*1.0*	6,165	*1.4*	1,352	*0.2*	2,882	*0.8*	432	*0.5*
		77	oo--oo-o--oo	8,106	*0.9*	5,977	*1.3*	6,515	*1.1*	8,680	*2.4*	1,982	*2.5*
		751	o-oo--oo--oo T&T	71,196	*7.6*	26,701	*5.9*	51,888	*8.6*	14,772	*4.1*	4,769	*6.0*
		891	oo--oo-oo--oo T&T	165,368	*17.7*	142,411	*31.5*	136,036	*22.5*	92,500	*25.9*	23,511	*29.4*
		914	oo-oo--ooo-oo T&T	1,770	*0.2*	703	*0.2*	1,661	*0.3*	183	*0.1*	228	*0.3*
		915	oo-oo--oo-ooo T&T	749	*0.1*	441	*0.1*	23	*0.0*	94	*0.0*	24	*0.0*
Artic	HCV2	53	o-oo--oo	12,107	*1.3*	3,640	*0.8*	4,375	*0.7*	3,389	*1.0*	733	*0.9*
		69	o-oo--ooo	84,036	*9.0*	23,550	*5.2*	44,681	*7.4*	14,579	*4.1*	3,034	*3.8*
		713	oo-oo--ooo Tri Artic	3,308	*0.4*	1,562	*0.3*	647	*0.1*	1,051	*0.3*	412	*0.5*
		747	o--ooo---ooo Tri Artic	128	*0.0*	74	*0.0*	73	*0.0*	13	*0.0*	5	*0.0*
		791	o-oo-oooo Quad Artic	26,845	*2.9*	10,783	*2.4*	6,407	*1.1*	10,241	*2.9*	937	*1.2*
		826	oo-oo--oooo Quad Artic	36,414	*3.9*	18,807	*4.2*	22,915	*3.8*	11,701	*3.3*	3,472	*4.3*
		847	o--ooo---oooo Quad Artic	1,192	*0.1*	384	*0.1*	1,983	*0.3*	156	*0.0*	27	*0.0*
A&B Train	HCV2	74	o-oo--oo-o--o A Train	34	*0.0*	81	*0.0*	64	*0.0*	3	*0.0*	-	-
		851	o-oo--ooo--oo B Train	57,581	*6.2*	41,522	*9.2*	33,819	*5.6*	37,004	*10.4*	5,531	*6.9*
		951	o-oo-ooo-ooo B Train	16,315	*1.7*	15,682	*3.5*	1,906	*0.3*	10,458	*2.9*	1,002	*1.3*
		1020	oo-oo-ooo-ooo B Train	38	*0.0*	32	*0.0*	4	*0.0*	40	*0.0*	13	*0.0*
Total				935,999	*100*	452,737	*100*	605,127	*100*	356,587	*100*	79,876	*100*
Percentage from the total (%)[2]				*38.5*		*18.6*		*24.9*		*14.7*		*3.3*	

Symbol: - no data

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 (2,430,326).

Interpretation: At the Tokoroa WiM site, 6.7 percent (30,143) of all heavy vehicles were PAT type 45. The Drury WiM site has recorded 38.5 percent (935,999) of the overall total vehicles at all sites.

11.0 VEHICLE FLEET DISTRIBUTION TABLES (Continued)

Table 8.0 | Heavy Vehicles Frequency by Vehicle Type and by WiM Site (2006-2010)

Year	Vehicle Type	WiM Site					Grand Total
		Drury	Eskdale[1]	Te Puke	Tokoroa	Waipara	
2006	Rigid	625,355	-	142,300	140,858	110,921	1,019,434
	T&T	474,656	-	193,599	179,472	131,462	979,189
	Artic	218,702	-	47,299	44,543	30,301	340,845
	A&B Train	128,918	-	34,222	53,772	41,347	258,259
2006 Total		1,447,631	-	417,420	418,645	314,031	2,597,727
2007	Rigid	626,082	-	226,074	103,584	89,290	1,045,030
	T&T	478,250	-	203,268	156,745	106,433	944,696
	Artic	211,985	-	57,893	36,236	29,353	335,467
	A&B Train	124,081	-	36,647	47,249	37,326	245,303
2007 Total		1,440,398	-	523,882	343,814	262,402	2,570,496
2008	Rigid	642,897	-	219,177	95,518	117,066	1,074,658
	T&T	464,222	-	192,947	138,152	129,638	924,959
	Artic	228,834	-	63,121	34,072	39,030	365,057
	A&B Train	125,368	-	32,134	40,309	46,423	244,234
2008 Total		1,461,321	-	507,379	308,051	332,157	2,608,908
2009	Rigid	593,983	-	227,298	134,373	122,445	1,078,099
	T&T	449,231	-	183,762	196,658	131,457	961,108
	Artic	239,011	-	67,533	56,789	37,145	400,478
	A&B Train	119,323	-	29,742	57,198	44,169	250,432
2009 Total		1,401,548	-	508,335	445,018	335,216	2,690,117
2010	Rigid	393,825	30,786	266,739	136,430	127,311	955,091
	T&T	304,176	33,924	221,514	200,190	140,641	900,445
	Artic	164,030	8,620	81,081	58,800	41,130	353,661
	A&B Train	73,968	6,546	35,793	57,317	47,505	221,129
2010 Total		935,999	79,876	605,127	452,737	356,587	2,430,326

Symbol: - no data

Note: [1]Eskdale WiM site data collection was started in July 2010. So, the quantity of data represents 6 months.

11.0 VEHICLE FLEET DISTRIBUTION TABLES (Continued)

Table 9.0 | Heavy Vehicles Frequency by Selected[1] PAT Class and by WiM Site (2006-2010)

Year	PAT Class	WiM Site					Grand Total
		Drury	Eskdale[2]	Te Puke	Tokoroa	Waipara	
2006	891	214,519	-	104,238	118,390	90,676	527,823
	21	258,663	-	15,772	32,820	32,900	340,155
	31	154,909	-	44,776	27,739	18,410	245,834
	851	108,552	-	30,970	43,009	34,416	216,947
	69	175,044	-	39,728	35,093	19,097	268,962
	751	146,925	-	58,481	26,248	13,542	245,196
	Others[3]	389,019	-	123,455	135,346	104,990	752,810
2006 Total		1,447,631	-	417,420	418,645	314,031	2,597,727
2007	891	226,813	-	118,459	112,824	73,554	531,650
	21	265,185	-	93,929	25,601	28,014	412,729
	31	153,267	-	45,752	22,507	15,614	237,140
	851	100,887	-	33,526	35,396	29,170	198,979
	69	163,298	-	40,394	26,748	15,173	245,613
	751	142,605	-	54,482	20,878	11,312	229,277
	Others[3]	388,343	-	137,340	99,860	89,565	715,108
2007 Total		1,440,398	-	523,882	343,814	262,402	2,570,496
2008	891	242,935	-	114,655	93,957	87,249	538,796
	21	295,786	-	107,480	35,254	48,949	487,469
	31	139,669	-	43,083	19,710	21,658	224,120
	851	100,876	-	29,528	30,099	35,952	196,455
	69	146,152	-	39,915	20,211	17,954	224,232
	751	117,027	-	51,498	19,191	14,310	202,026
	Others[3]	418,876	-	121,220	89,629	106,085	735,810
2008 Total		1,461,321	-	507,379	308,051	332,157	2,608,908
2009	891	237,569	-	112,842	137,002	84,325	571,738
	21	316,092	-	120,266	64,275	68,943	569,576
	31	135,040	-	42,876	29,005	20,706	227,627
	851	96,336	-	27,886	42,973	34,071	201,266
	69	123,991	-	38,042	23,567	14,321	199,921
	751	111,055	-	43,496	25,532	14,541	194,624
	Others[3]	381,465	-	122,927	122,664	98,309	725,365
2009 Total		1,401,548	-	508,335	445,018	335,216	2,690,117
2010	891	165,368	23,511	136,036	142,411	92,500	559,826
	21	206,491	12,355	136,021	65,401	70,178	490,446
	31	90,043	4,675	51,161	29,790	21,677	197,346
	851	57,581	5,531	33,819	41,522	37,004	175,457
	69	84,036	3,034	44,681	23,550	14,579	169,880
	751	71,196	4,769	51,888	26,701	14,772	169,326
	Others[3]	261,284	26,001	151,521	123,362	105,877	668,045
2010 Total		935,999	79,876	605,127	452,737	356,587	2,430,326

Symbol: - no data

Note: [1]The selection of PAT class was based on the highest frequency recorded in the current year.
[2]Eskdale WiM site data collection was started in July 2010. So, the quantity of data represents 6 months.
[3]All not stated PAT class were included in 'Others' category.

12.0 VEHICLE FLEET OVERWEIGHT TABLES

PAT Type – 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

Vehicle Type	PEM Class	PAT Class	Description	Drury		Tokoroa		Te Puke		Waipara		Eskdale	
				Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]
Rigid	MCV	20	o-o (wb2.0-3.2m, gw>=3.5t)	4	*0.0*	1	*0.0*	4	*0.0*	1	*0.0*	-	-
		21	o--o (wb2.0-3.2m, gw>=3.5t)	124	*0.2*	28	*0.1*	121	*0.1*	36	*0.1*	12	*0.1*
	HCV1	31	o--oo	2,001	*3.2*	412	*1.3*	1,032	*1.2*	537	*1.7*	142	*0.9*
		34	oo--o	5	*0.0*	21	*0.1*	11	*0.0*	1	*0.0*	6	*0.0*
		45	oo--oo	7,087	*11.3*	1,843	*6.0*	5,044	*5.7*	1,561	*4.9*	372	*2.4*
		47	o--ooo	5	*0.0*	4	*0.0*	-	-	1	*0.0*	-	-
T&T	HCV1	30	o-o--o	9	*0.0*	3	*0.0*	-	-	-	-	-	-
		40	o--o-o--o	4	*0.0*	2	*0.0*	4	*0.0*	-	-	-	-
		41	o-o--oo	8	*0.0*	-	-	1	*0.0*	-	-	1	*0.0*
		42	o-oo--o	1	*0.0*	10	*0.0*	1	*0.0*	-	-	-	-
		44	oo-o--o	-	-	8	*0.0*	1	*0.0*	-	-	-	-
	HCV2	52	o--oo-o--o T&T	41	*0.1*	3	*0.0*	5	*0.0*	13	*0.0*	7	*0.0*
		61	o-o--o-o--oo T & T	83	*0.1*	249	*0.8*	134	*0.2*	135	*0.4*	104	*0.7*
		63	o--oo-o--oo T & T	306	*0.5*	89	*0.3*	402	*0.5*	371	*1.2*	14	*0.1*
		66	oo--oo-o--o T & T	4	*0.0*	6	*0.0*	10	*0.0*	-	-	-	-
		68	oo-oo--oo T & T	6	*0.0*	16	*0.1*	30	*0.0*	1	*0.0*	1	*0.0*
		77	oo--oo-o--oo	249	*0.4*	648	*2.1*	1,598	*1.8*	1,896	*6.0*	878	*5.6*
		751	o-oo--oo--oo T&T	14,060	*22.5*	3,331	*10.8*	15,284	*17.2*	3,268	*10.4*	2,162	*13.7*
		891	oo--oo-oo--oo T&T	21,850	*35.0*	16,427	*53.3*	41,934	*47.2*	16,995	*53.9*	10,029	*63.6*
		914	oo-oo--ooo-oo T&T	317	*0.5*	136	*0.4*	822	*0.9*	23	*0.1*	56	*0.4*
		915	oo-oo--oo-ooo T&T	118	*0.2*	111	*0.4*	7	*0.0*	43	*0.1*	7	*0.0*
Artic	HCV2	53	o-oo--oo	249	*0.4*	34	*0.1*	59	*0.1*	1	*0.0*	2	*0.0*
		69	o-oo--ooo	3,871	*6.2*	723	*2.3*	7,280	*8.2*	516	*1.6*	220	*1.4*
		713	oo-oo--ooo Tri Artic	33	*0.1*	22	*0.1*	124	*0.1*	15	*0.0*	11	*0.1*
		747	o--ooo---ooo Tri Artic	7	*0.0*	3	*0.0*	15	*0.0*	1	*0.0*	1	*0.0*
		791	o-oo-oooo Quad Artic	2,015	*3.2*	553	*1.8*	862	*1.0*	561	*1.8*	105	*0.7*
		826	oo-oo--oooo Quad Artic	2,794	*4.5*	1,827	*5.9*	5,508	*6.2*	779	*2.5*	560	*3.5*
		847	o--ooo---oooo Quad Artic	53	*0.1*	20	*0.1*	573	*0.6*	18	*0.1*	11	*0.1*
A&B Train	HCV2	74	o-oo--oo-o--o A Train	9	*0.0*	11	*0.0*	16	*0.0*	-	-	-	-
		851	o-oo--ooo--oo B Train	5,271	*8.4*	2,761	*9.0*	7,527	*8.5*	3,553	*11.3*	802	*5.1*
		951	o-oo-ooo-ooo B Train	1,903	*3.0*	1,519	*4.9*	414	*0.5*	1,203	*3.8*	266	*1.7*
		1020	oo-oo-ooo-ooo B Train	10	*0.0*	14	*0.0*	1	*0.0*	8	*0.0*	8	*0.1*
Total				62,497	*100*	30,835	*100*	88,824	*100*	31,537	*100*	15,777	*100*
Percentage from the total (%)[2]				*27.2*		*13.4*		*38.7*		*13.7*		*6.9*	

Symbol: - no data

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 (229,470).

Interpretation: Around 35 percent of all overweight vehicles crossing Drury WiM site were of PAT class 891. However, 27.2 percent of the overall total overweight vehicles in 2010 passed the same WiM site.

12.0 VEHICLE FLEET OVERWEIGHT TABLES (Continued)

Table 11.0 | Overweight Vehicles Frequency by Vehicle Type and by WiM Site

Year	Vehicle Type	WiM Site					Grand Total
		Drury	Eskdale[1]	Te Puke	Tokoroa	Waipara	
2006	Rigid	13,955	-	3,654	1,490	2,346	21,445
	T&T	49,143	-	16,111	41,941	15,372	122,567
	Artic	14,100	-	1,946	5,084	1,232	22,362
	A&B Train	11,899	-	2,468	8,477	3,054	25,898
2006 Total		89,097	-	24,179	56,992	22,004	192,272
2007	Rigid	14,968	-	3,130	1,034	1,295	20,427
	T&T	66,484	-	18,732	25,143	10,662	121,021
	Artic	17,936	-	2,558	4,451	572	25,517
	A&B Train	13,442	-	3,525	5,534	1,559	24,060
2007 Total		112,830	-	27,945	36,162	14,088	191,025
2008	Rigid	21,927	-	3,242	854	2,578	28,601
	T&T	104,558	-	23,016	10,438	21,176	159,188
	Artic	35,747	-	3,613	1,734	1,615	42,709
	A&B Train	24,115	-	4,328	2,096	3,881	34,420
2008 Total		186,347	-	34,199	15,122	29,250	264,918
2009	Rigid	11,882	-	3,856	1,934	1,899	19,571
	T&T	28,454	-	33,579	14,439	19,249	95,721
	Artic	10,329	-	8,548	2,413	1,334	22,624
	A&B Train	7,062	-	4,645	2,635	3,515	17,857
2009 Total		57,727	-	50,628	21,421	25,997	155,773
2010	Rigid	9,226	532	6,212	2,309	2,137	20,416
	T&T	37,056	13,259	60,233	21,039	22,745	154,332
	Artic	9,022	910	14,421	3,182	1,891	29,426
	A&B Train	7,193	1,076	7,958	4,305	4,764	25,296
2010 Total		62,497	15,777	88,824	30,835	31,537	229,470

Symbol: - no data

Note: [1]Eskdale WiM site data collection was started in July 2010. So, the quantity of data represents 6 months.

12.0 VEHICLE FLEET OVERWEIGHT TABLES (Continued)

Table 12.0 | Overweight Vehicles Frequency on Selected[1] PAT Class and by WiM Site

Year	PAT Class	WiM Site					Grand Total
		Drury	Eskdale	Te Puke	Tokoroa	Waipara	
2006	891	25,024	-	10,594	30,393	10,733	76,744
	751	21,221	-	4,676	8,592	3,035	37,524
	851	9,672	-	2,085	6,437	2,543	20,737
	45	9,704	-	3,071	1,062	1,665	15,502
	69	10,121	-	1,843	3,971	864	16,799
	Other[3]	13,355	-	1,910	6,537	3,164	24,966
2006 Total		89,097	-	24,179	56,992	22,004	192,272
2007	891	30,913	-	13,000	19,429	6,968	70,310
	751	32,218	-	4,937	4,812	1,926	43,893
	851	10,578	-	3,129	3,907	1,180	18,794
	45	11,008	-	2,651	880	976	15,515
	69	11,693	-	1,910	2,362	286	16,251
	Other[3]	16,420	-	2,318	4,772	2,752	26,262
2007 Total		112,830	-	27,945	36,162	14,088	191,025
2008	891	58,416	-	17,722	7,471	15,583	99,192
	751	42,374	-	4,643	2,527	3,038	52,582
	851	19,118	-	4,009	1,321	3,073	27,521
	45	14,552	-	2,936	730	1,692	19,910
	69	18,622	-	2,398	829	695	22,544
	Other[3]	33,265	-	2,491	2,244	5,169	43,169
2008 Total		186,347	-	34,199	15,122	29,250	264,918
2009	891	16,860	-	22,914	10,931	13,025	63,730
	751	10,609	-	9,500	2,682	2,916	25,707
	851	5,350	-	4,377	1,620	2,691	14,038
	45	9,153	-	3,036	1,584	1,430	15,203
	69	3,986	-	4,875	646	508	10,015
	Other[3]	11,769	-	5,926	3,958	5,427	27,080
2009 Total		57,727	-	50,628	21,421	25,997	155,773
2010	891	21,850	10,029	41,934	16,427	16,995	107,235
	751	14,060	2,162	15,284	3,331	3,268	38,105
	851	5,271	802	7,527	2,761	3,553	19,914
	45	7,087	372	5,044	1,843	1,561	15,907
	69	3,871	220	7,280	723	516	12,610
	Other[3]	10,358	2,192	11,755	5,750	5,644	35,699
2010 Total		62,497	15,777	88,824	30,835	31,537	229,470

Symbol: - no data

Note: [1]The selection of PAT class was based on the highest frequency recorded in each year.
[2]Eskdale WiM site data collection was started in July 2010. So, the quantity of data represents 6 months.
[3]All not stated PAT class were included in 'Others' category.

13.0 VEHICLE FLEET >44T/48T 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

Vehicle Type	PEM Class	PAT Class	Description	Drury		Tokoroa		Te Puke		Waipara		Eskdale	
				Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]
Rigid	HCV1	31	o--oo	4	*0.0*	3	*0.0*	-	-	-	-	-	-
		34	oo--o	1	*0.0*	13	*0.0*	-	-	-	-	-	-
		45	oo--oo	3	*0.0*	7	*0.0*	-	-	-	-	-	-
		47	o--ooo	-	-	4	*0.0*	-	-	-	-	-	-
T&T	HCV1	30	o-o—o	4	*0.0*	2	*0.0*	-	-	-	-	-	-
		40	o--o-o—o	-	-	2	*0.0*	-	-	-	-	-	-
		41	o-o—oo	2	*0.0*	-	-	-	-	-	-	-	-
		42	o-oo—o	-	-	10	*0.0*	-	-	-	-	-	-
		44	oo-o—o	-	-	8	*0.0*	-	-	-	-	-	-
	HCV2	52	o--oo-o--o T&T	4	*0.0*	-	-	-	-	-	-	-	-
		61	o-o--o-o--oo T & T	62	*0.1*	215	*0.8*	124	*0.2*	122	*0.4*	98	*0.7*
		63	o--oo-o--oo T & T	107	*0.2*	40	*0.1*	140	*0.2*	136	*0.5*	6	*0.0*
		66	oo--oo-o--o T & T	2	*0.0*	6	*0.0*	-	-	-	-	-	-
		68	oo-oo--oo T & T	6	*0.0*	16	*0.1*	23	*0.0*	1	*0.0*	-	-
		77	oo--oo-o--oo	249	*0.5*	648	*2.4*	1,598	*2.1*	1,896	*6.7*	878	*5.9*
		751	o-oo--oo--oo T&T	14,060	*29.7*	3,331	*12.2*	15,284	*20.5*	3,268	*11.6*	2,162	*14.5*
		891	oo--oo-oo--oo T&T	21,850	*46.2*	16,427	*60.1*	41,934	*56.1*	16,995	*60.2*	10,029	*67.1*
		914	oo-oo--ooo-oo T&T	317	*0.7*	136	*0.5*	822	*1.1*	23	*0.1*	56	*0.4*
		915	oo-oo--oo-ooo T&T	118	*0.2*	111	*0.4*	7	*0.0*	43	*0.2*	7	*0.0*
Artic	HCV2	53	o-oo--oo	16	*0.0*	7	*0.0*	5	*0.0*	-	-	-	-
		69	o-oo--ooo	189	*0.4*	63	*0.2*	372	*0.5*	35	*0.1*	13	*0.1*
		713	oo-oo--ooo Tri Artic	33	*0.1*	22	*0.1*	124	*0.2*	15	*0.1*	11	*0.1*
		747	o--ooo---ooo Tri Artic	3	*0.0*	1	*0.0*	8	*0.0*	-	-	1	*0.0*
		791	o-oo-oooo Quad Artic	252	*0.5*	111	*0.4*	270	*0.4*	121	*0.4*	33	*0.2*
		826	oo-oo--oooo Quad Artic	2,794	*5.9*	1,827	*6.7*	5,508	*7.4*	779	*2.8*	560	*3.7*
		847	o--ooo---oooo Quad Artic	53	*0.1*	20	*0.1*	573	*0.8*	18	*0.1*	11	*0.1*
A&B Train	HCV2	74	o-oo--oo-o--o A Train	4	*0.0*	1	*0.0*	-	-	-	-	-	-
		851	o-oo--ooo--oo B Train	5,271	*11.1*	2,761	*10.1*	7,527	*10.1*	3,553	*12.6*	802	*5.4*
		951	o-oo-ooo-ooo B Train	1,903	*4.0*	1,519	*5.6*	414	*0.6*	1,203	*4.3*	266	*1.8*
		1020	oo-oo-ooo-ooo B Train	10	*0.0*	14	*0.1*	1	*0.0*	8	*0.0*	8	*0.1*
Total				47,317	*100.0*	27,325	*100.0*	74,734	*100.0*	28,216	*100.0*	14,941	*100.0*
Percentage from the total (%)[2]				*24.6*		*14.2*		*38.8*		*14.7*		*7.8*	

Symbol: - no data

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 (192,533).

Interpretation: At the Tokoroa WiM site, PAT class 851 vehicles reported 2,761 (10.1 percent) with loads >44T. The Te Puke WiM site has 38.8 percent of the total heavy vehicles over 44T of the five WiM sites.

13.0 VEHICLE FLEET >44T/48T DISTRIBUTION TABLES (Continued)

Table 13.1 | Frequency and Percentage Distributions of Heavy Vehicles >48T by Vehicle Type, PAT Class and by WiM Site

Vehicle Type	PEM Class	PAT Class	Description	Drury		Tokoroa		Te Puke		Waipara		Eskdale	
				Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]	Total Volume	%[1]
Rigid	HCV1	31	o--oo	4	*0.1*	3	*0.1*	-	-	-	-	-	-
		34	oo--o	-	-	10	*0.3*	-	-	-	-	-	-
		45	oo--oo	2	*0.0*	7	*0.2*	-	-	-	-	-	-
		47	o--ooo	-	-	4	*0.1*	-	-	-	-	-	-
T&T	HCV1	30	o-o--o	2	*0.0*	2	*0.1*	-	-	-	-	-	-
		40	o--o-o--o	-	-	2	*0.1*	-	-	-	-	-	-
		41	o-o--oo	1	*0.0*	-	-	-	-	-	-	-	-
		42	o-oo--o	-	-	10	*0.3*	-	-	-	-	-	-
		44	oo-o--o	-	-	5	*0.1*	-	-	-	-	-	-
	HCV2	52	o--oo-o--o T&T	2	*0.0*	-	-	-	-	-	-	-	-
		61	o-o--o-o--oo T & T	22	*0.5*	153	*4.5*	99	*0.9*	87	*3.8*	70	*3.6*
		63	o--oo-o--oo T & T	13	*0.3*	8	*0.2*	4	*0.0*	1	*0.0*	1	*0.1*
		66	oo--oo-o--o T & T	2	*0.0*	6	*0.2*	-	-	-	-	-	-
		68	oo-oo--oo T & T	3	*0.1*	15	*0.4*	11	*0.1*	1	*0.0*	-	-
		77	oo--oo-o--oo	40	*0.8*	107	*3.2*	58	*0.5*	89	*3.9*	115	*5.9*
		751	o-oo--oo--oo T&T	1,051	*22.0*	448	*13.3*	1,074	*9.8*	486	*21.4*	250	*12.9*
		891	oo--oo-oo--oo T&T	2,645	*55.4*	1,979	*58.6*	7,024	*64.4*	1,254	*55.2*	1,329	*68.4*
		914	oo-oo--ooo-oo T&T	64	*1.3*	23	*0.7*	374	*3.4*	3	*0.1*	17	*0.9*
		915	oo-oo--oo-ooo T&T	10	*0.2*	19	*0.6*	4	*0.0*	5	*0.2*	2	*0.1*
Artic	HCV2	53	o-oo--oo	16	*0.3*	7	*0.2*	1	*0.0*	-	-	-	-
		69	o-oo--ooo	38	*0.8*	26	*0.8*	37	*0.3*	14	*0.6*	4	*0.2*
		713	oo-oo--ooo Tri Artic	17	*0.4*	7	*0.2*	1	*0.0*	4	*0.2*	9	*0.5*
		747	o--ooo---ooo Tri Artic	2	*0.0*	-	-	-	-	-	-	1	*0.1*
		791	o-oo-oooo Quad Artic	44	*0.9*	15	*0.4*	11	*0.1*	38	*1.7*	3	*0.2*
		826	oo-oo--oooo Quad Artic	127	*2.7*	99	*2.9*	585	*5.4*	38	*1.7*	21	*1.1*
		847	o--ooo---oooo Quad Artic	2	*0.0*	1	*0.0*	24	*0.2*	2	*0.1*	-	-
A&B Train	HCV2	851	o-oo--ooo--oo B Train	396	*8.3*	204	*6.0*	1,481	*13.6*	143	*6.3*	59	*3.0*
		951	o-oo-ooo-ooo B Train	271	*5.7*	216	*6.4*	121	*1.1*	105	*4.6*	62	*3.2*
		1020	oo-oo-ooo-ooo B Train	1	*0.0*	1	*0.0*	1	*0.0*	1	*0.0*	-	-
Total				4,775	*100.0*	3,377	*100.0*	10,910	*100.0*	2,271	*100.0*	1,943	*100.0*
Percentage from the total *(%)*[2]				*20.5*		*14.5*		*46.9*		*9.8*		*8.3*	

Symbol: - no data

Note: [1]Percentage of each PAT class from the total number of heavy vehicles recorded as >48T per WiM site.
[2]Percentage of each WiM site from the overall total number of heavy vehicles recorded as >48T at all WiM sites (23,276).

Interpretation: At the Drury WiM site, PAT class 751 vehicles reported 1,051 (22.0 percent) with loads recorded as >48T. Of the five WiM sites the Te Puke WiM site has the highest heavy vehicles frequency, with 46.9 percent of the total heavy vehicles recorded at over 48T.

14.0 AXLE GROUP DISTRIBUTION TABLES

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

Table 14.0 | Axle Group Approximate Load Limit

Axle Group	Approximate Load Limit (kN)
SAST – Single Axle Single Tyre	60
SADT - Single Axle Dual Tyre	60
TADT – Tandem Axle Dual Tyre	-
TSST – Twin Steer Single Tyre	-
TRDT – Triple Axle Dual Tyre	160
QADT - Quad Axle Dual Tyre	200

It is important to note that the weigh-in-motion (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 utilisation of 'super single' type tyres in the SADT, TADT, TAST and TRDT groups, however, the impact or significance can not be measured or derived from this technology. Despite the QADT description, 80-90% of Quad Axles are single tyred. The highlighted sections indicate the peaks in load per axle group.

Table 15.0 | Site: 00200176 (Te Puke)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	0%	1%	-	-	-	-
20	13%	12%	0%	0%	0%	-
30	18%	27%	2%	0%	0%	0%
40	15%	21%	7%	0%	1%	1%
50	28%	19%	9%	1%	3%	2%
60	22%	10%	7%	2%	6%	4%
70	3%	5%	6%	10%	12%	8%
80	0%	3%	6%	24%	13%	8%
90	0%	1%	6%	27%	7%	10%
100	0%	0%	8%	24%	5%	10%
110	-	0%	10%	10%	4%	6%
120	-	0%	11%	2%	4%	3%
130	-	0%	9%	0%	3%	2%
140	-	0%	7%	0%	3%	2%
150	-	0%	6%	0%	4%	2%
160	-	-	3%	0%	5%	2%
170	-	0%	1%	0%	6%	2%
180	-	-	0%	0%	7%	3%
190	-	-	0%	0%	7%	5%
200	-	-	0%	0%	5%	7%
210	-	-	0%	-	3%	10%
220	-	-	0%	-	1%	8%
230	-	-	0%	-	0%	4%
240	-	-	0%	-	0%	1%
250	-	-	0%	-	0%	0%
260	-	-	0%	-	0%	0%
270	-	-	0%	-	0%	0%

Symbol: - no data

= approximate axle group mass legal limit

14.0 AXLE GROUP DISTRIBUTION TABLES (Continued)

Table 15.1 | Site: 01N00463 (Drury)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	0%	2%	-	-	-	-
20	12%	14%	0%	0%	-	-
30	17%	24%	4%	0%	0%	0%
40	16%	22%	9%	0%	3%	0%
50	30%	21%	9%	1%	5%	2%
60	22%	10%	9%	4%	8%	6%
70	3%	4%	8%	17%	8%	9%
80	0%	2%	7%	24%	8%	9%
90	0%	1%	7%	24%	7%	6%
100	0%	0%	8%	19%	6%	5%
110	-	0%	9%	8%	6%	5%
120	-	0%	9%	2%	6%	4%
130	-	0%	8%	0%	6%	4%
140	-	0%	6%	0%	6%	5%
150	-	0%	4%	0%	6%	4%
160	-	0%	2%	0%	6%	4%
170	-	0%	1%	0%	6%	4%
180	-	-	0%	-	6%	4%
190	-	-	0%	0%	4%	6%
200	-	-	0%	0%	2%	9%
210	-	0%	0%	-	1%	8%
220	-	0%	0%	-	0%	4%
230	-	0%	0%	-	0%	1%
240	-	0%	0%	-	0%	0%
250	-	0%	0%	-	0%	0%
260	-	0%	0%	-	0%	0%
270	-	0%	0%	-	0%	0%

Table 15.2 | Site: 01N00628 (Tokoroa)

Load (Kn)	SAST	SADT	TADT	TSST	TRDT	QADT
10	0%	1%	-	-	-	-
20	9%	10%	1%	-	-	-
30	12%	18%	5%	0%	0%	-
40	15%	21%	8%	0%	2%	0%
50	32%	26%	7%	0%	4%	0%
60	28%	14%	6%	2%	5%	2%
70	3%	4%	6%	10%	6%	5%
80	0%	3%	8%	23%	6%	6%
90	0%	1%	10%	26%	7%	6%
100	0%	0%	11%	26%	8%	6%
110	-	0%	11%	11%	8%	6%
120	-	0%	9%	2%	9%	6%
130	-	0%	8%	0%	9%	5%
140	-	0%	5%	0%	9%	6%
150	-	0%	3%	0%	8%	6%
160	-	0%	1%	0%	7%	6%
170	-	0%	0%	0%	6%	6%
180	-	-	0%	0%	4%	6%
190	-	-	0%	0%	2%	7%
200	-	-	0%	0%	1%	7%
210	-	-	0%	-	0%	6%
220	-	-	0%	-	0%	4%
230	-	-	0%	-	0%	2%
240	-	-	0%	-	0%	1%
250	-	-	0%	-	0%	0%
260	-	-	0%	-	0%	0%
270	-	-	0%	-	0%	0%

Symbol: - no data

= approximate axle group mass legal limit

14.0 AXLE GROUP DISTRIBUTION TABLES (Continued)

Table 15.3: Site: 01S00285 (Waipara)

Load (Kn)	SAST	SADT	TADT	TSST	TRDT	QADT
10	0%	2%	-	-	-	-
20	16%	12%	0%	0%	-	-
30	14%	21%	2%	0%	0%	0%
40	17%	19%	5%	1%	0%	0%
50	34%	27%	7%	2%	1%	0%
60	18%	10%	8%	3%	3%	0%
70	1%	4%	7%	12%	5%	1%
80	0%	3%	8%	25%	5%	3%
90	0%	1%	9%	28%	6%	5%
100	0%	0%	11%	22%	7%	6%
110	-	0%	12%	6%	7%	7%
120	-	0%	11%	0%	9%	6%
130	-	0%	9%	0%	10%	7%
140	-	0%	6%	0%	10%	7%
150	-	0%	3%	0%	10%	8%
160	-	-	1%	0%	9%	7%
170	-	-	1%	0%	8%	7%
180	-	-	0%	0%	5%	8%
190	-	-	0%	0%	2%	8%
200	-	-	0%	-	1%	7%
210	-	-	0%	-	0%	5%
220	-	-	0%	-	0%	3%
230	-	-	0%	-	0%	1%
240	-	-	0%	-	0%	1%
250	-	-	0%	-	0%	0%

Table 15.4 | Site: 00500259 (Eskdale)

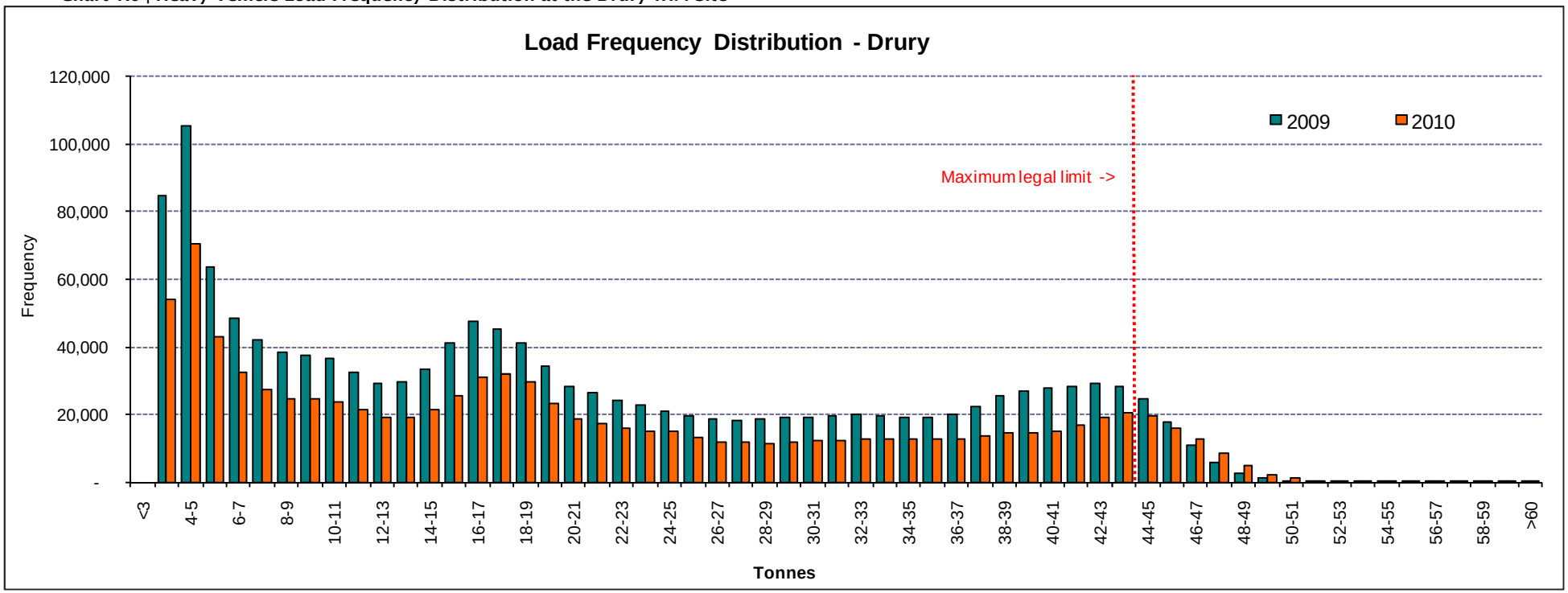
Load (Kn)	SAST	SADT	TADT	TSST	TRDT	QADT
10	0%	1%	-	-	-	-
20	9%	7%	0%	-	0%	-
30	12%	16%	3%	0%	0%	-
40	20%	22%	4%	0%	1%	0%
50	33%	30%	5%	0%	4%	1%
60	22%	12%	4%	2%	6%	4%
70	3%	5%	5%	18%	5%	6%
80	0%	4%	7%	27%	6%	5%
90	0%	2%	9%	29%	6%	5%
100	0%	1%	8%	19%	6%	4%
110	-	0%	12%	5%	7%	4%
120	-	0%	13%	1%	6%	4%
130	-	0%	10%	0%	7%	4%
140	-	0%	8%	0%	7%	4%
150	-	0%	7%	0%	7%	4%
160	-	0%	4%	0%	7%	5%
170	-	0%	1%	0%	9%	6%
180	-	-	0%	0%	7%	7%
190	-	-	0%	-	5%	8%
200	-	-	0%	-	2%	10%
210	-	-	0%	-	1%	9%
220	-	-	0%	-	0%	6%
230	-	-	-	-	0%	3%
240	-	-	0%	-	0%	1%
250	-	-	-	-	0%	0%

Symbol: - no data

= approximate axle group mass legal limit

15.0 APPENDIX A – HEAVY VEHICLES LOAD FREQUENCY DISTRIBUTION BY WiM SITE CHARTS

Chart 1.0 | Heavy Vehicle Load Frequency Distribution at the Drury WiM Site

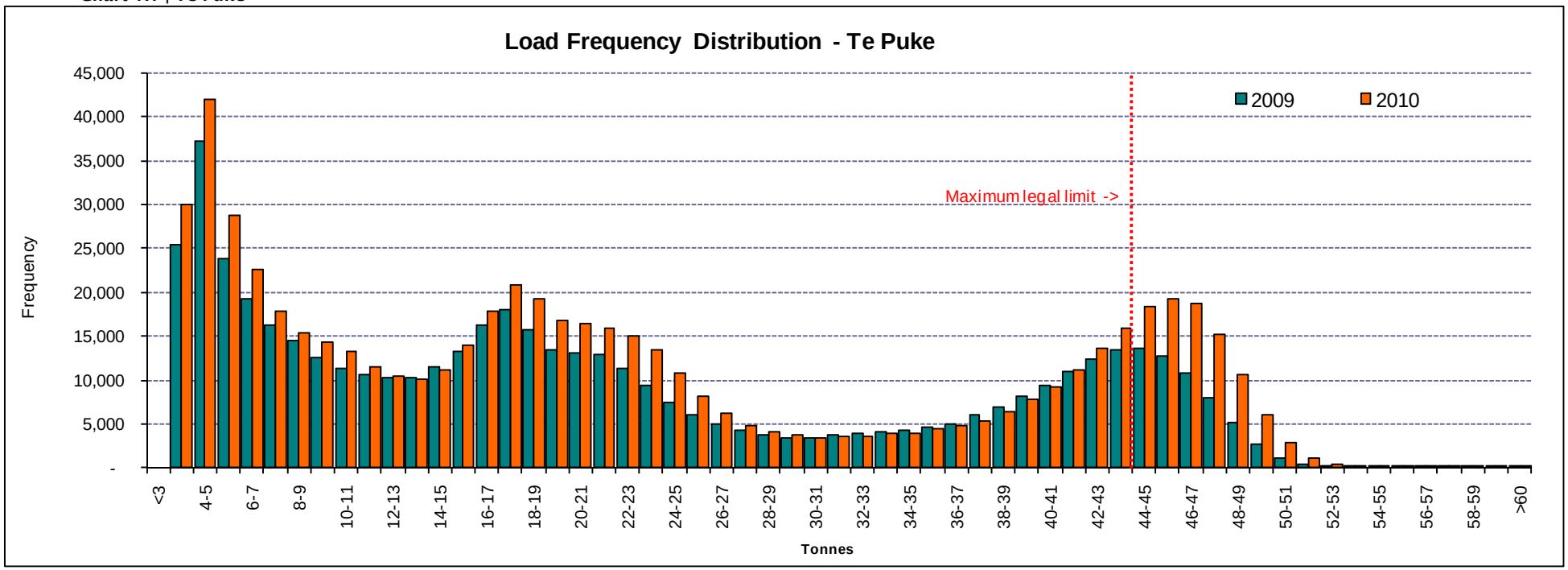


Interpretation: The number of heavy vehicles at the Drury WiM site in 2010 has decreased compared to 2009. There were similar patterns in the first two peaks, which occur approximately at 3-6 and 15-19 tonnes. However, the third peak happened at 38-45 tonnes in 2009, but at 41-46 tonnes in 2010. As the weight reaches 46 tonnes or more, the number of heavy vehicles was higher in 2010 than in 2009.

Note: Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

15.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

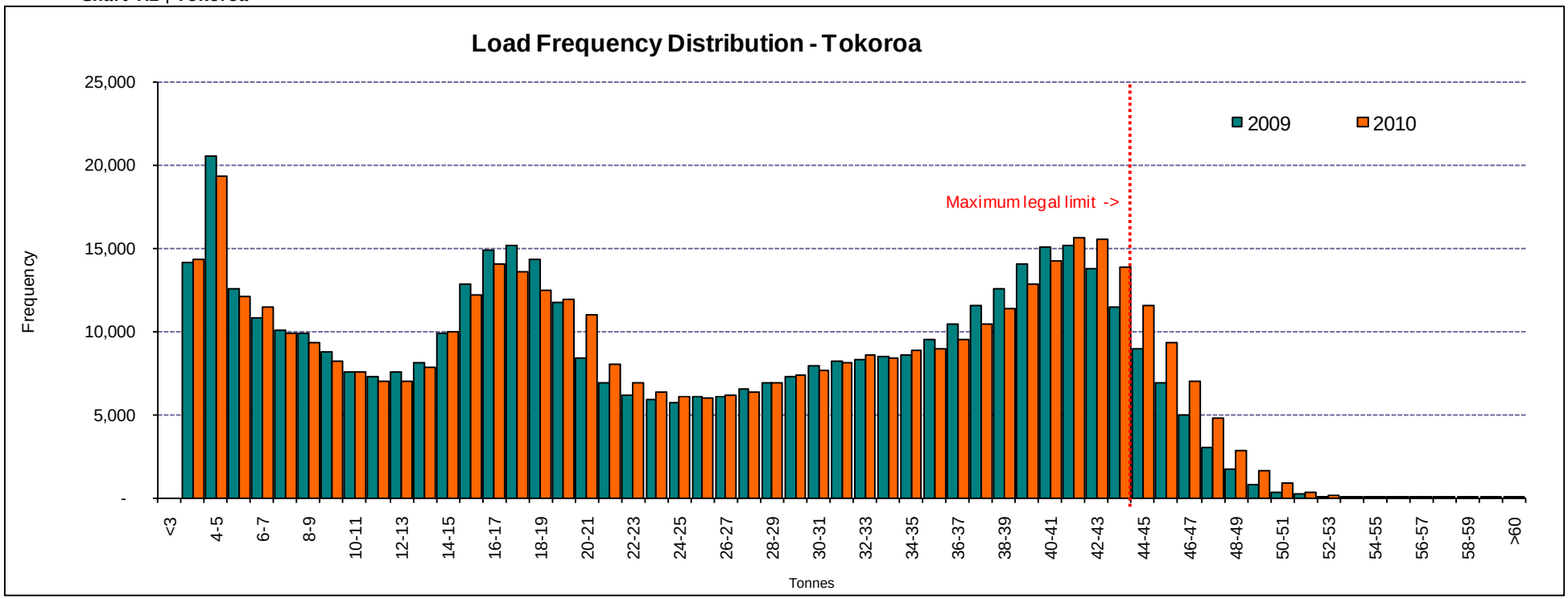
Chart 1.1 | Te Puke



Note: Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

15.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

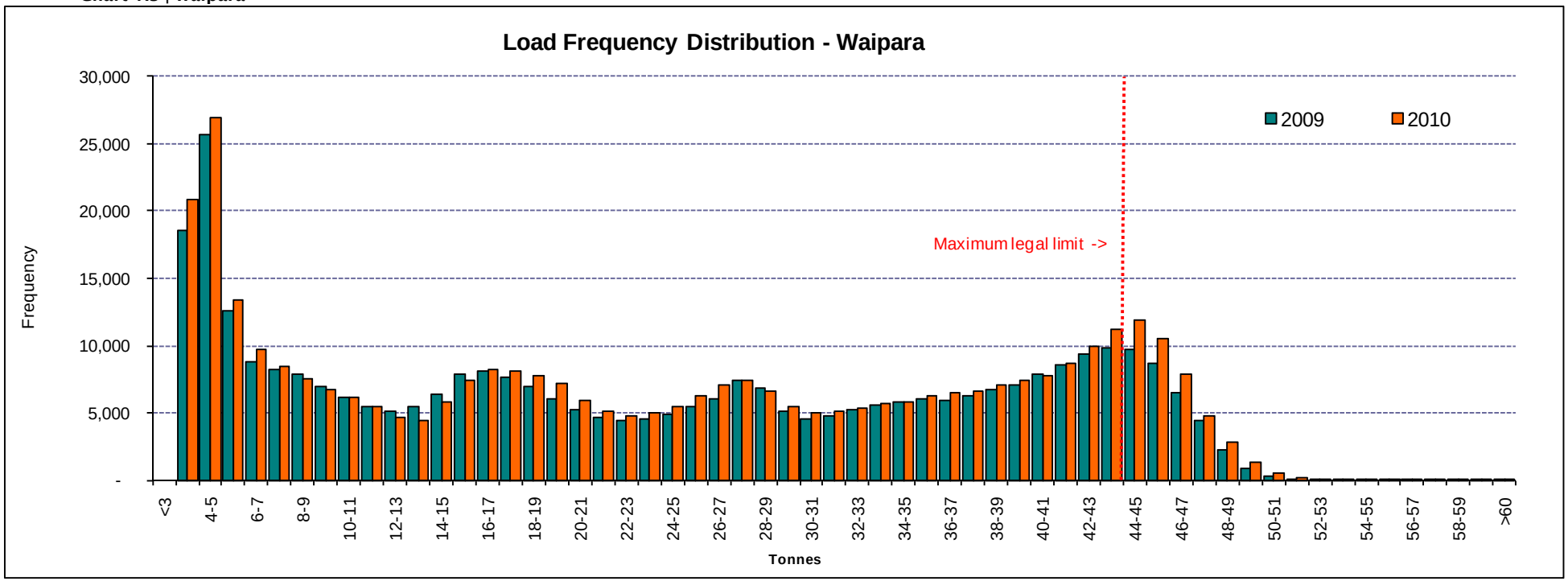
Chart 1.2 | Tokoroa



Note: Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

15.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

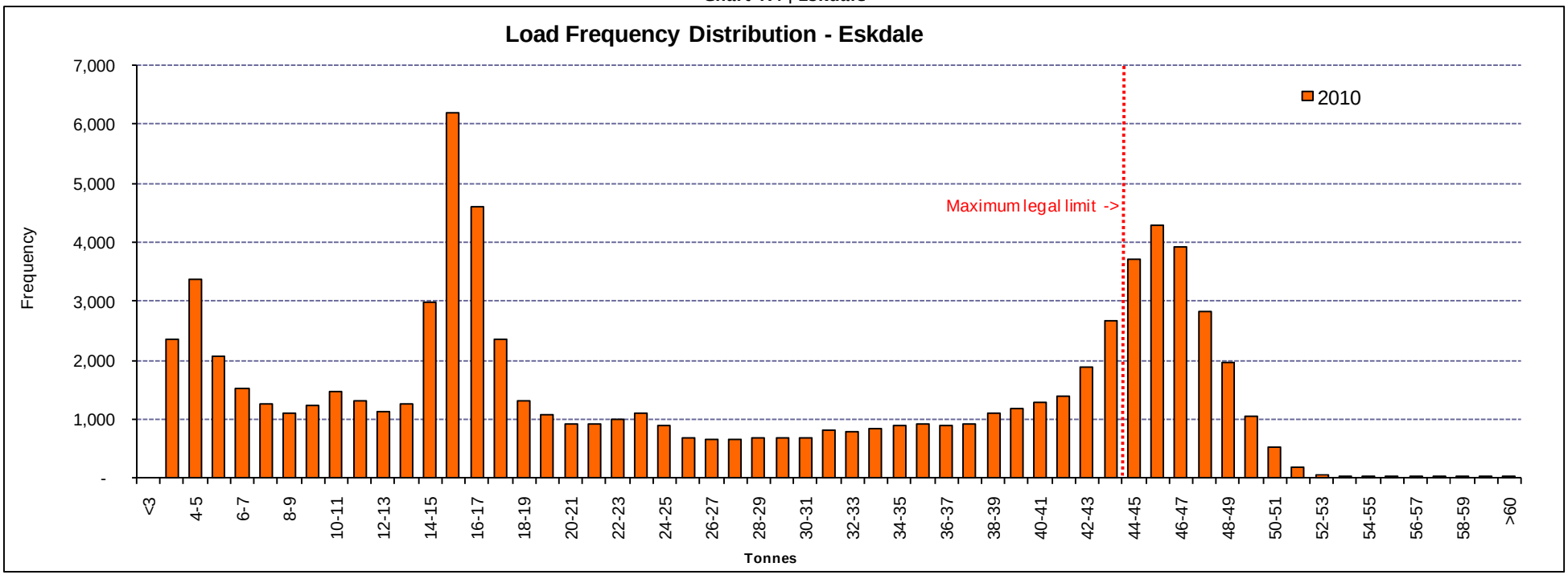
Chart 1.3 | Waipara



Note: Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

15.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

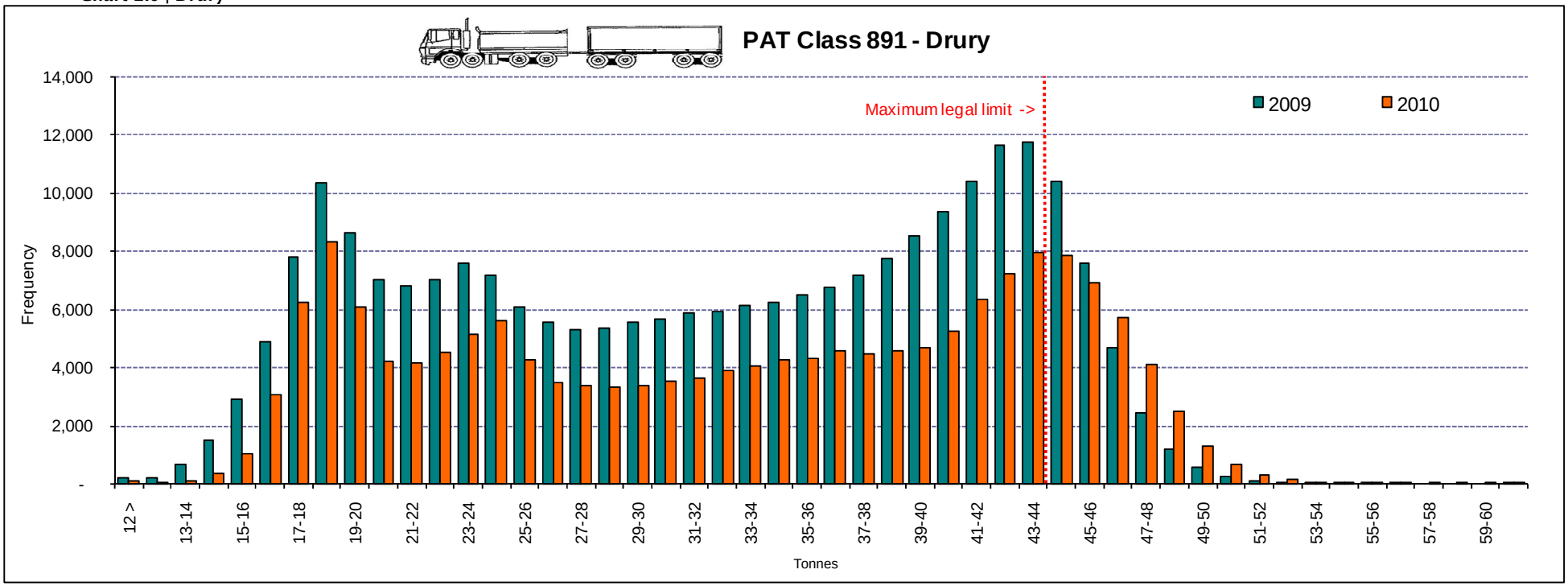
Chart 1.4 | Eskdale



Note: Eskdale WiM site data collection was started in July 2010. So, the quantity of data represents 6 months.
Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

16.0 APPENDIX B – PAT CLASS 891 LOAD FREQUENCY DISTRIBUTION BY WiM SITE CHARTS

Chart 2.0 | Drury

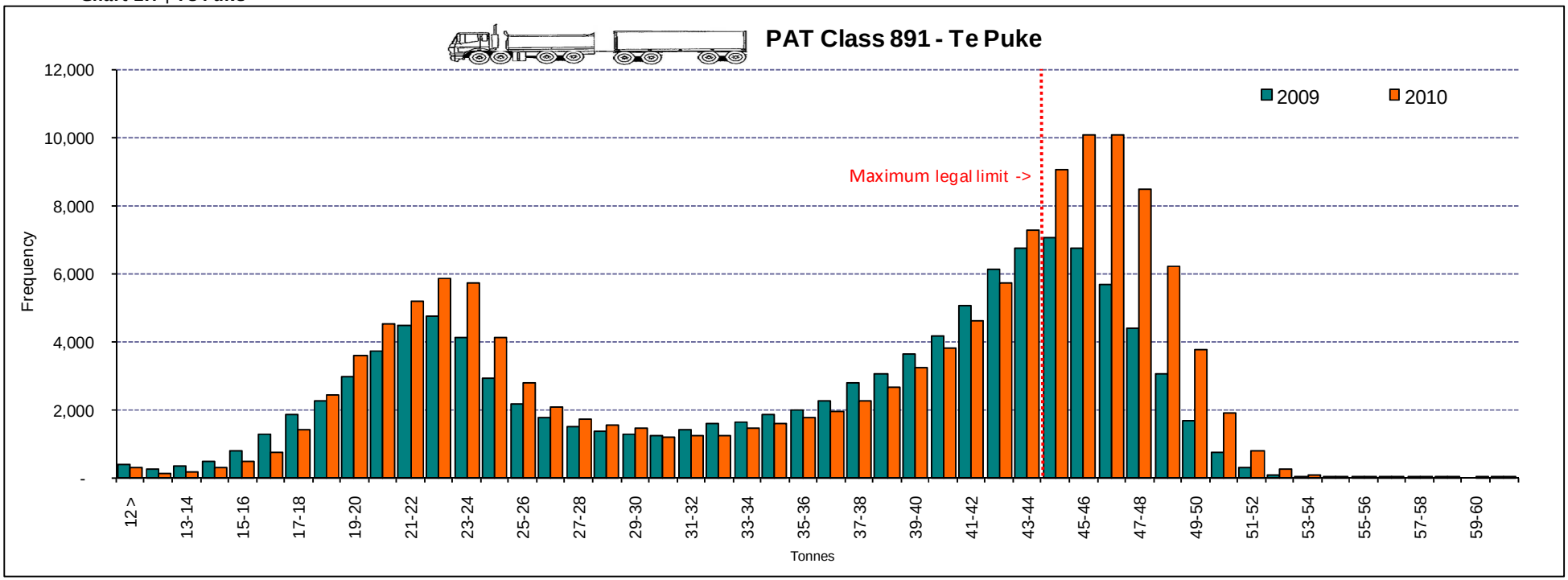


Interpretation: PAT class 891 had the highest number of heavy vehicles of any class at the Drury WiM site. In comparing to 2009 figures, 2010 show decreases from <12 to 46 tonnes. The third highest peak concentrated in the weight 41-45 tonnes in 2009, while in 2010 it went further to 42-46 tonnes. This also shows that in 2010 there were more PAT Class 891 vehicles carrying more than 46 tonnes compared to 2009.

Note: Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

16.0 APPENDIX B – PAT CLASS 891 LOAD FREQUENCY DISTRIBUTION BY WiM SITE CHARTS (Continued)

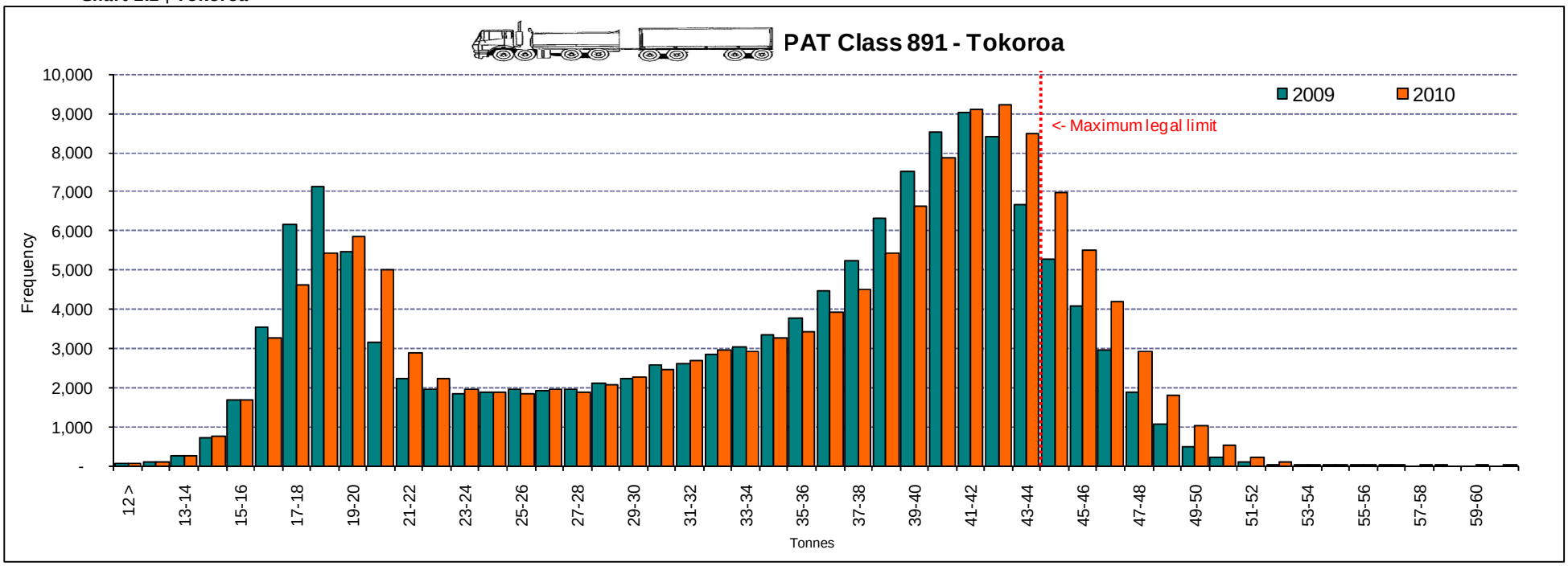
Chart 2.1 | Te Puke



Note: Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

16.0 APPENDIX B – PAT CLASS 891 LOAD FREQUENCY DISTRIBUTION BY WiM SITE CHARTS (Continued)

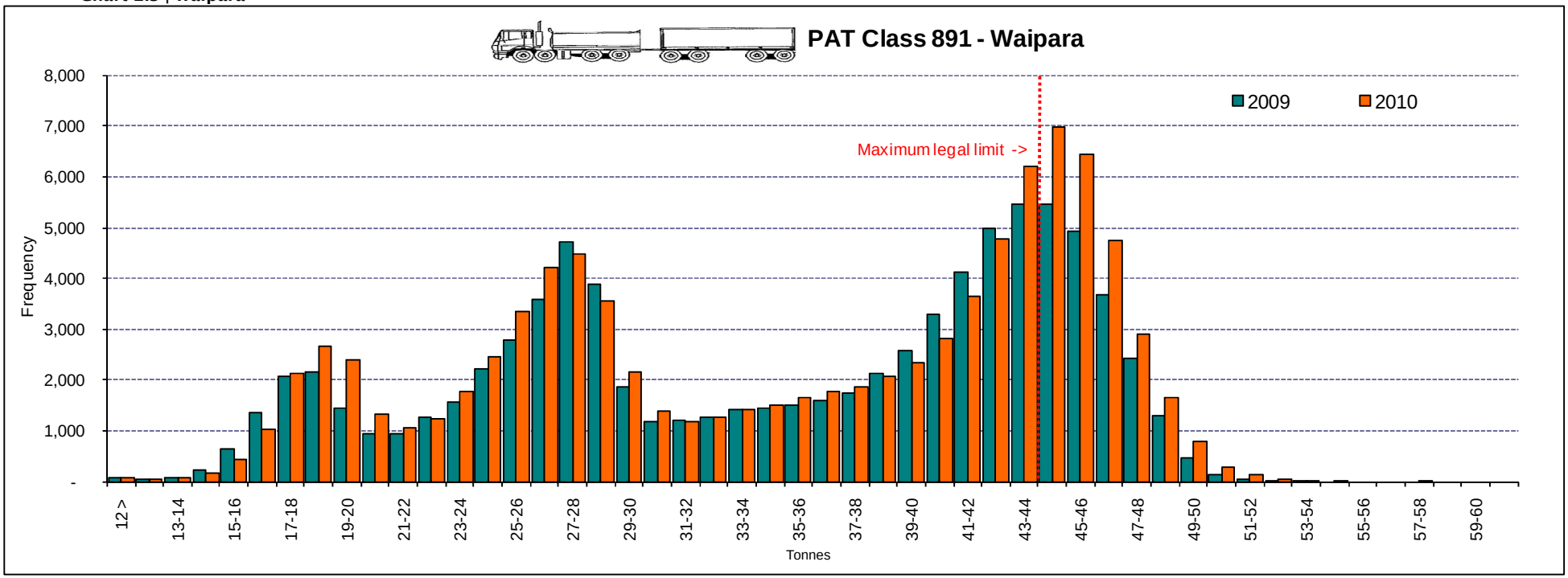
Chart 2.2 | Tokoroa



Note: Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

16.0 APPENDIX B – PAT CLASS 891 LOAD FREQUENCY DISTRIBUTION BY WiM SITE CHARTS (Continued)

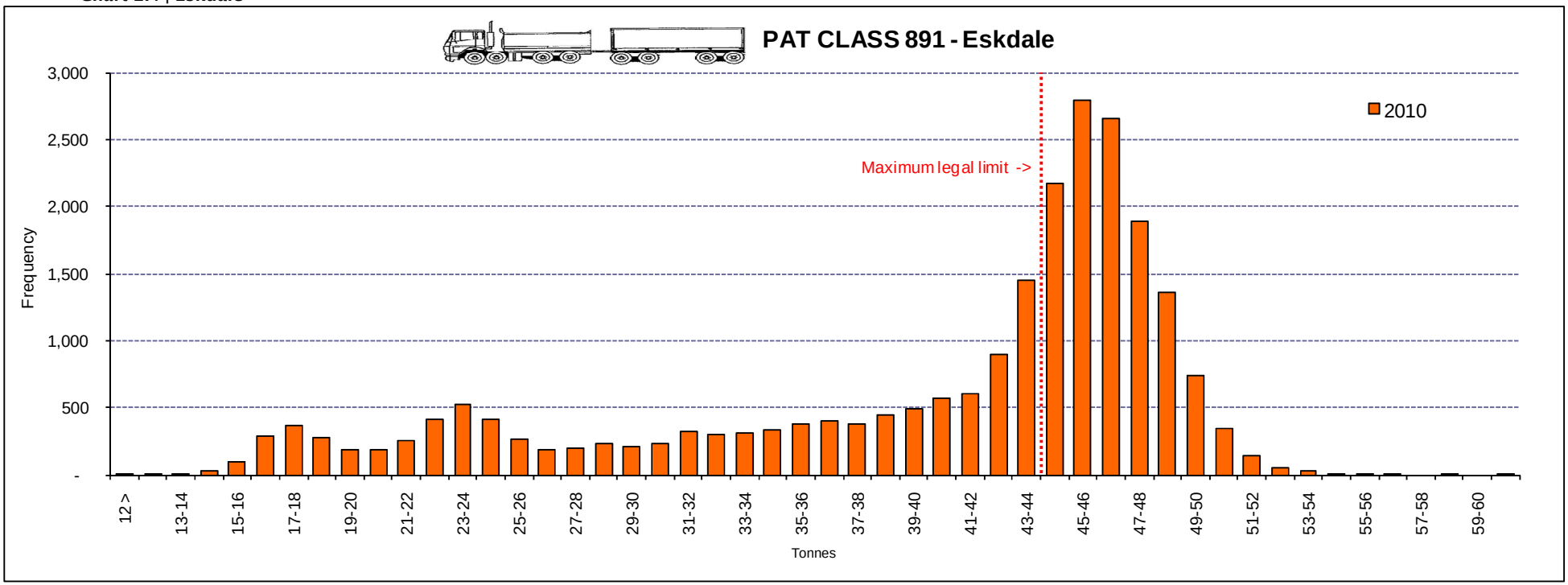
Chart 2.3 | Waipara



Note: Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

16.0 APPENDIX B – PAT CLASS 891 LOAD FREQUENCY DISTRIBUTION BY WiM SITE CHARTS (Continued)

Chart 2.4 | Eskdale



Note: Eskdale WiM site data collection was started in July 2010. So, the quantity of data represents 6 months.
Maximum legal limit except for the small proportion of vehicles which are operating on overweight permits.

17.0 APPENDIX C - VEHICLE FLEET OVERWEIGHT CHARTS

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

Chart 3.0 | Drury

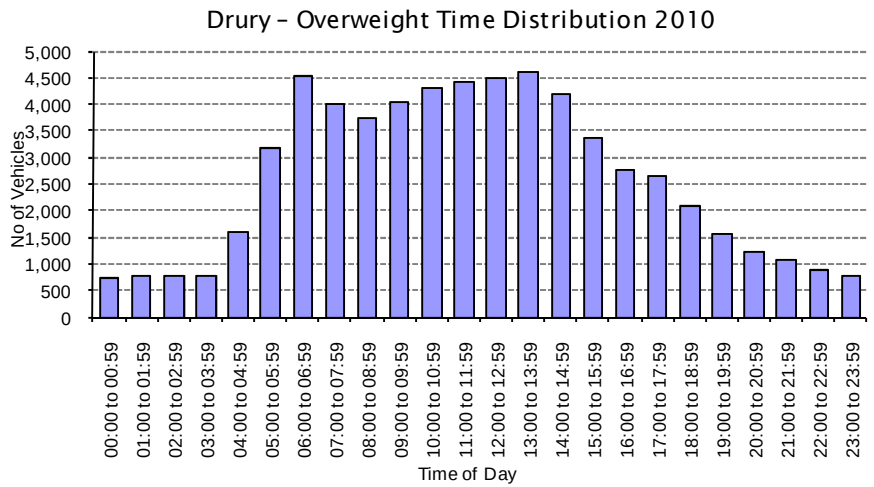


Chart 3.1 | Eskdale

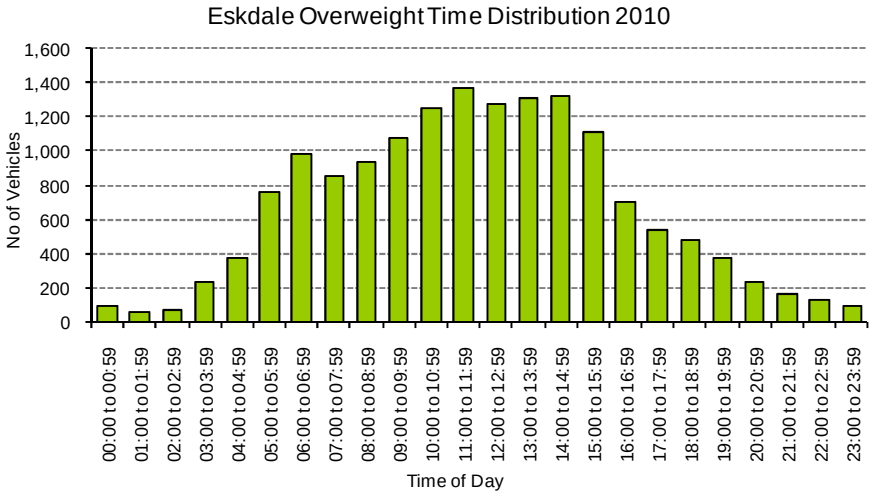


Chart 3.2 | Te Puke

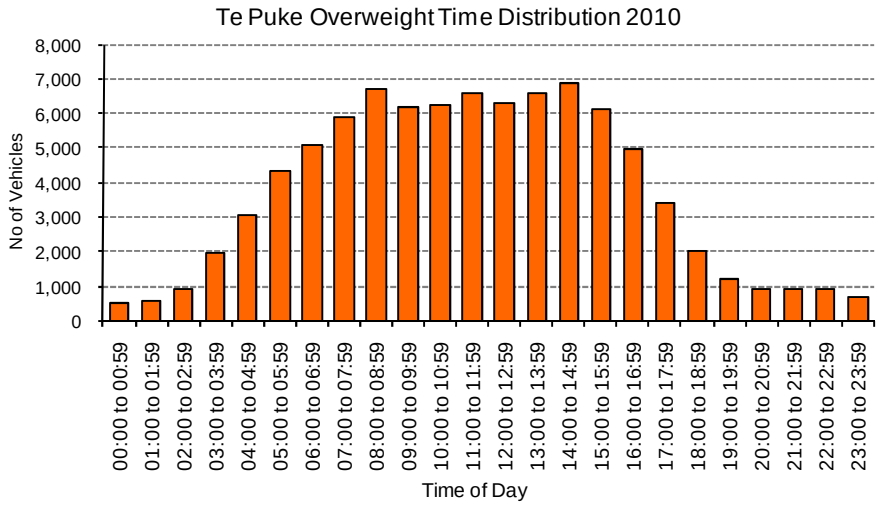
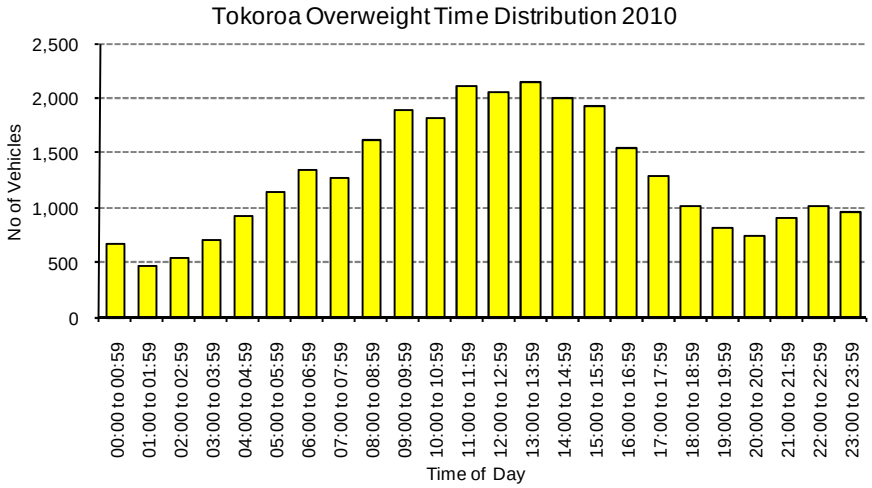
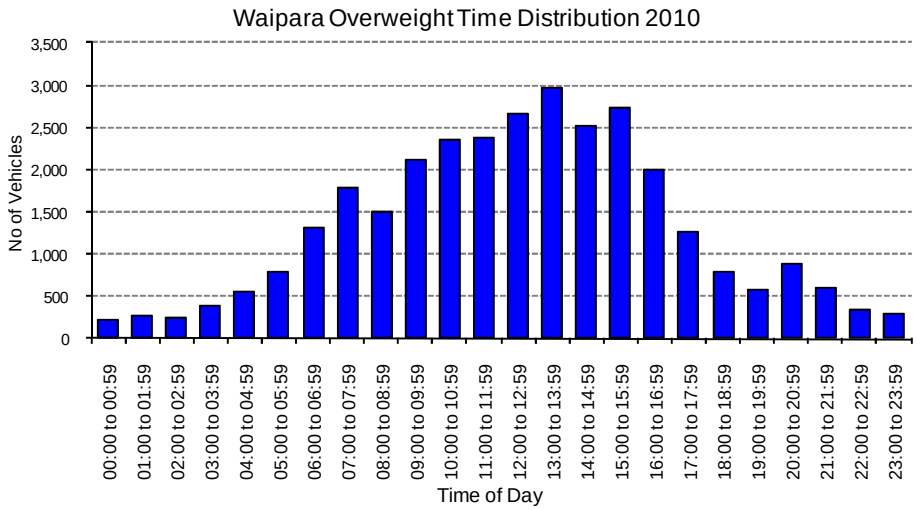


Chart 3.3 | Tokoroa



17.0 APPENDIX C - VEHICLE FLEET OVERWEIGHT CHARTS (Continued)

Chart 3.4 | Waipara



Interpretation: Drury WiM site reported two peaks in frequency/time distribution of overweight vehicles. The peaks occur at approximately between 06:00 - 06:59 and 13:00 - 13:59. The peak at Tokoroa may exist as a result of a long-haul delay from the peak in Drury.

18.0 APPENDIX D – PAT CLASS 891 OVERWEIGHT CHARTS

The charts below show the number of PAT class 891recorded as more than 48 Tonnes across 24 hour period at each site.

Chart 4.0 | Drury

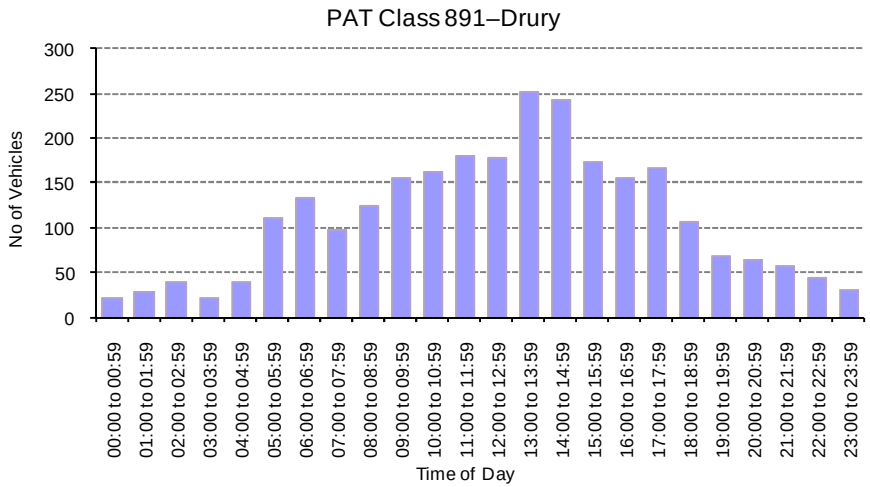


Chart 4.1 | Eskdale

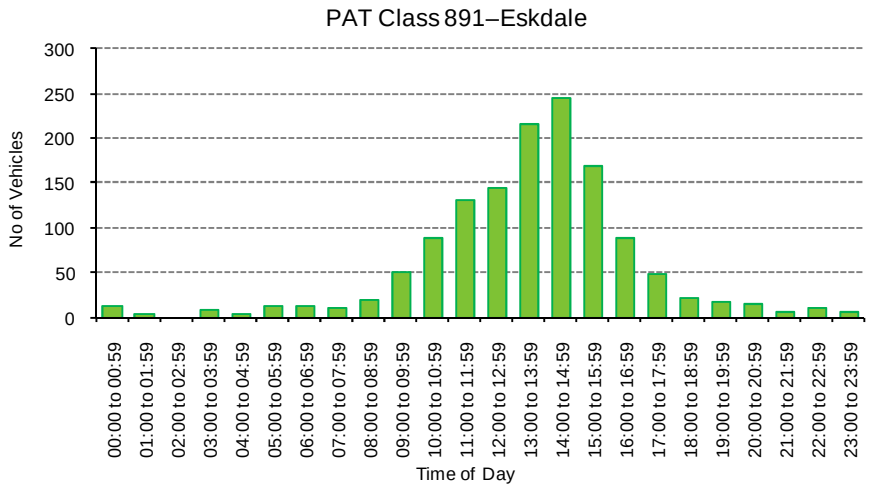


Chart 4.2 | Te Puke

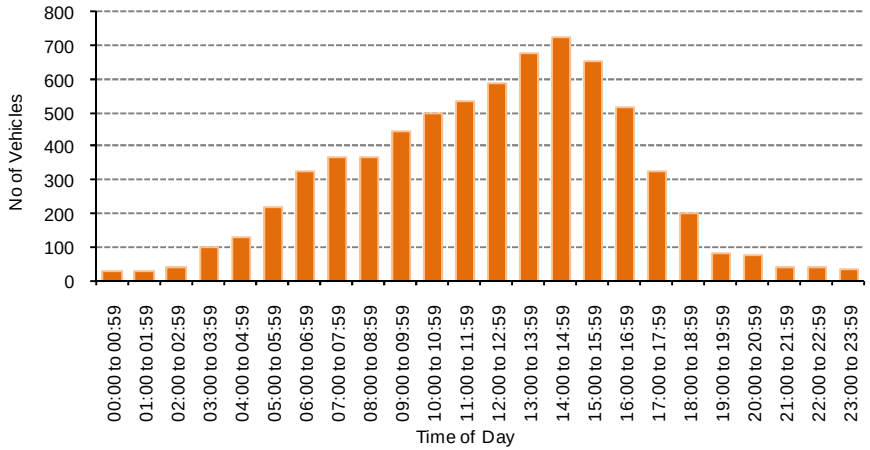
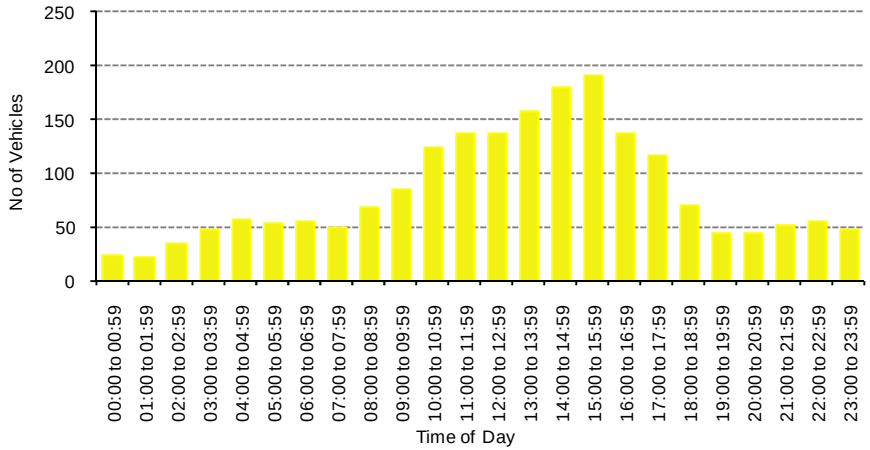
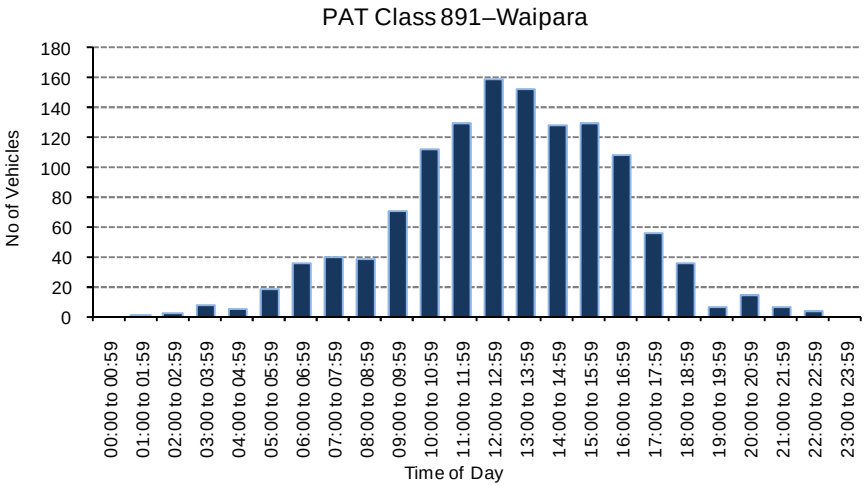


Chart 4.3 | Tokoroa



18.0 APPENDIX D – PAT CLASS 891 OVERWEIGHT CHARTS (Continued)

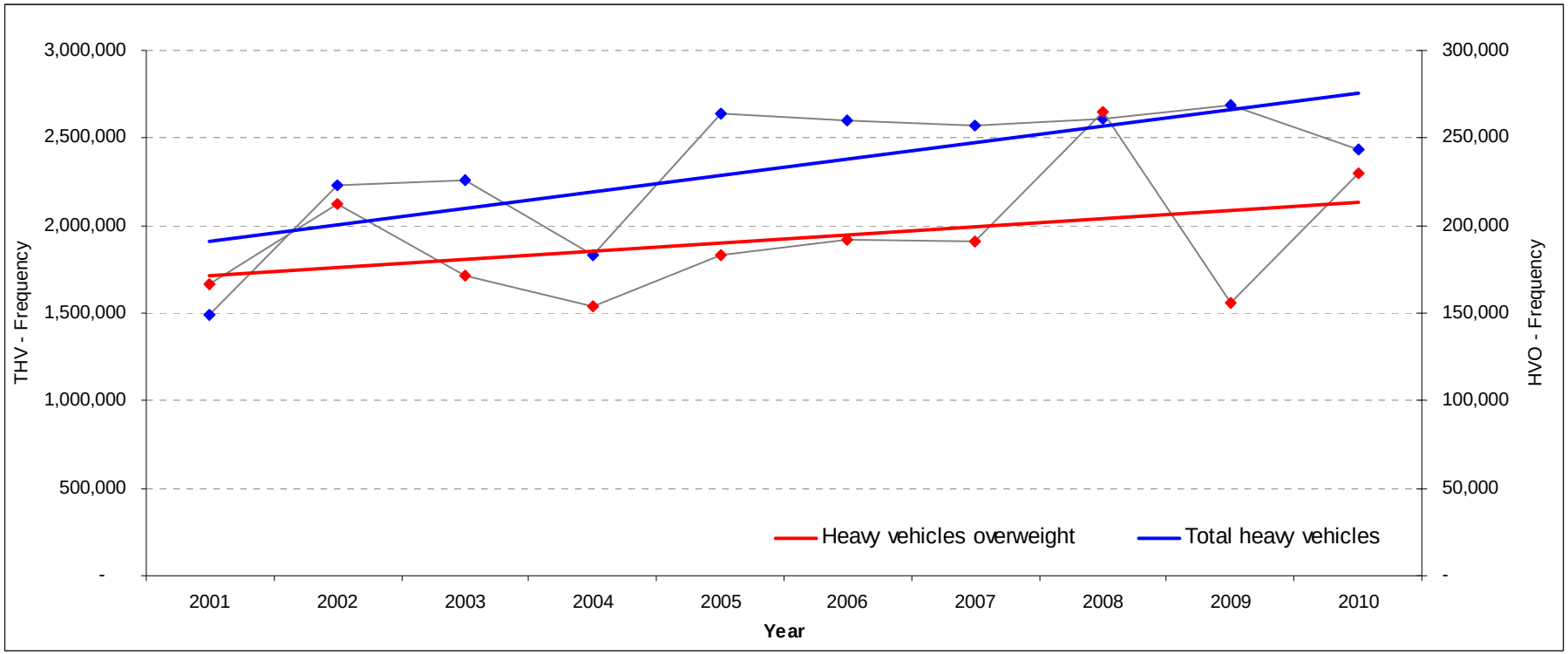
Chart 4.1 | Waipara



Interpretation: Across all WiM sites show that overweight PAT Class 891 recorded greater than 48 Tonnes peaks in the afternoon except for Te Puke that started earlier.

19.0 APPENDIX E - HEAVY VEHICLES LOAD/OVERWEIGHT TRENDS

Chart 5.0 | Heavy Vehicle Load/Overweight Trends



Interpretation: Both total heavy vehicles and overweight vehicles frequencies show a long term increasing trend in the 10-year period. In 2010, the total vehicles frequency decreased from the previous year; while the number of heavy vehicles overweight increased, which was similar in 2006. This scenario is contrary to 2003 and 2009 where the total vehicle frequencies increased from the previous year, while the number of heavy vehicles overweight decreased.

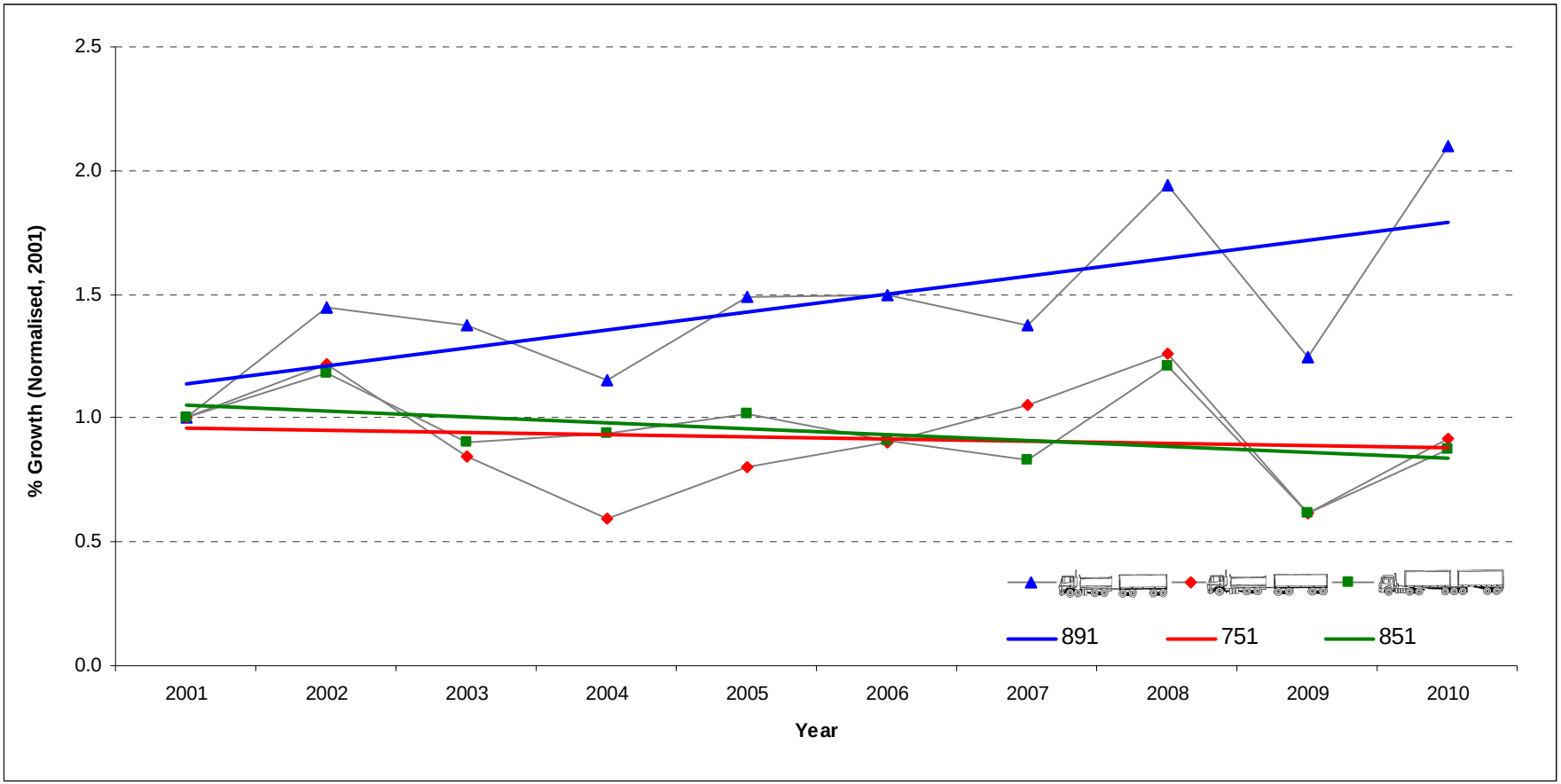
20.0 APPENDIX F - VEHICLE FLEET TRENDS

Chart 6.0 | Growth in Vehicle Fleet Frequencies by PAT Class (2001–2010) at All WiM Sites – Trend Analysis

Interpretation: The three most frequent PAT classes (891, 21, and 31) show an increasing trend in the long-term. However, all have experienced decreases in 2010. PAT class 891 has reported a big decrease from 2009, but in 2010 still represents significant number of heavy vehicles in the fleet.

21.0 APPENDIX G - VEHICLE FLEET OVERWEIGHT TRENDS

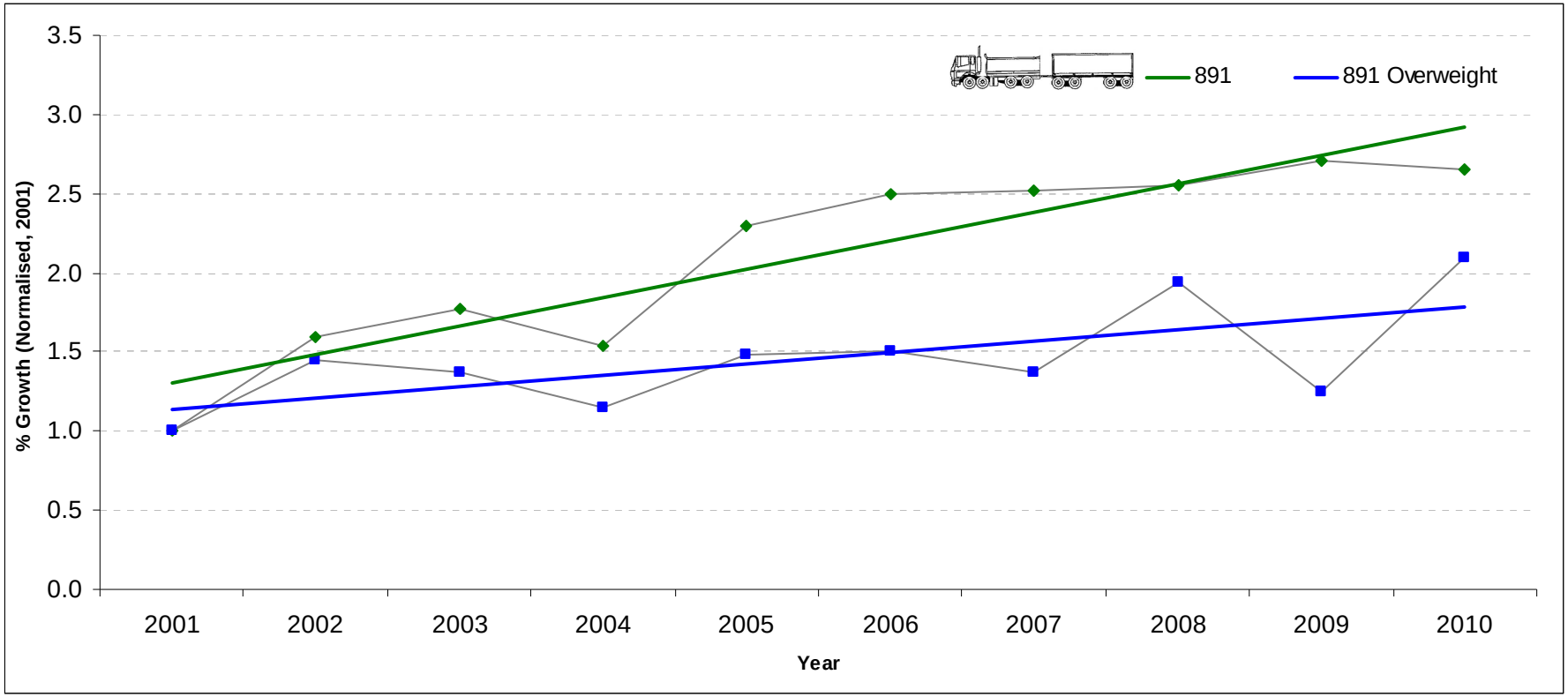
Chart 7.0 | Growth in Vehicles Recorded as Overweight (2001–2010) by PAT Type at All WiM Sites ***(Three most commonly recorded as overweight.)***



Interpretation: PAT class 891 continues to report an increasing overweight trend, whereas both PAT class 751 and 851 report an overweight frequency that indicate possible decreasing trends.

22.0 APPENDIX H - VEHICLE FLEET FREQUENCY vs OVERWEIGHT CHARTS

Chart 8.0 | Vehicle Load Frequency vs. Overweight Frequency (2001–2010) PAT Type 891 at All WiM Sites *(Most commonly recorded as overweight.)*



Interpretation: There exists a possible positive correlation between the frequency of heavy vehicles and the frequency of heavy vehicles overweight. The two plots both indicate a long term increasing trend from 2001 – 2010. However, this PAT class shows a decrease in frequency in 2010 while the number of overweight rebounds from a dip in 2009.

22.0 VEHICLE FLEET FREQUENCY vs OVERWEIGHT CHARTS (Continued)

Chart 8.1 | Vehicle Load Frequency vs. Overweight Frequency (2001–2010) PAT Type 751 at All WiM Sites

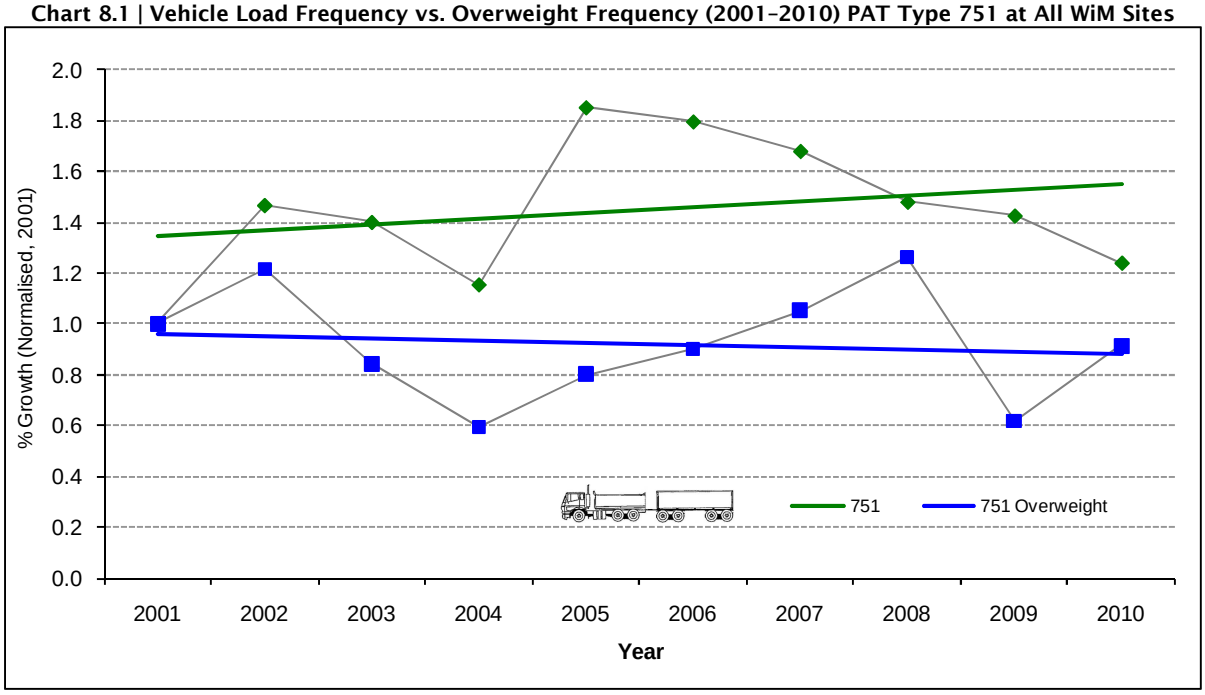
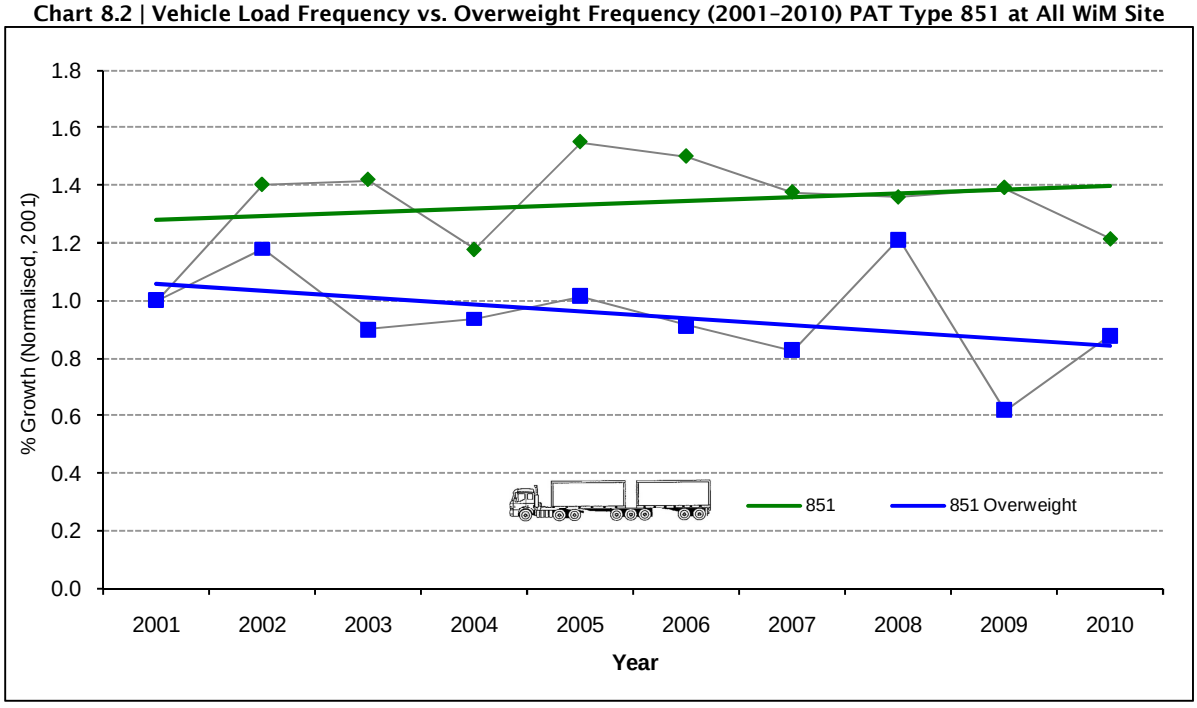



Chart 8.2 | Vehicle Load Frequency vs. Overweight Frequency (2001–2010) PAT Type 851 at All WiM Site