



Annual Weigh-In-Motion (WiM) Report 2011

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Revision Schedule

Rev. No	Date	Description	Prepared by	Reviewed by	Approved by
1		First draft	Bernadette Bañez	Neil Beckett/ Philip Blagdon	
2		Final version	Bernadette Bañez	Neil Beckett/ Philip Blagdon	David Darwin

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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 Weight-in-Motion (WiM) sites. The limitations of the equipment and their installation, congestion effects and various analysis procedures contribute to a level of approximation in the data. These factors should be taken into account when using the data. The NZ Transport Agency and its employees or agents involved in preparation of this information cannot accept liability for its contents or for any consequences arising from its use. People using the contents of the report should apply, and rely upon, their own skill and judgement. The contents should not be used in isolation from other sources of advice and information.
- 2) 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 EXECUTIVE SUMMARY

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

Table 1.0 | Vehicle frequency by vehicle type

Vehicle Type	Total Heavy Vehicles Recorded ⁽¹⁾	% ⁽¹⁾ Total Heavy Vehicles	Overweight Vehicles ⁽¹⁾ (Vehicle Type)	% ⁽²⁾ Overweight Vehicles (Vehicle Type)	% ⁽³⁾
Rigid	1,183,050	39.6	25,450	10.1	2.2
T&T (truck and trailer)	1,023,978	34.3	162,883	64.8	15.9
Artic	505,378	16.9	31,749	12.6	6.3
A&B Train	274,386	9.2	31,349	12.5	11.4
Total	2,986,792	100.0	251,431	100.0	8.4

Note: ¹Number of vehicles recorded during days of operations.

²The proportion of each vehicle type from the overall total. For example, more than 64.8 percent of the overall total of overweight vehicles recorded as T&T vehicles.

³The proportion of number of overweight vehicles over the total heavy vehicles recorded of each vehicle type. For example, approximately 6.3 percent (31,749) of 505,378 Artic type vehicles were overweight.

Vehicle Fleet

- During 2011, rigid and T&T vehicle types had the highest total number of heavy vehicles recorded across five WiM sites with 39.6 percent and 34.3 percent, respectively. (see Table 1.0)
- PAT classes 891, 21 and 31 (see Figure 1 for illustration) reported as having the largest proportion of vehicles, this is true in all WiM sites (combined they account for approximately more than 50 percent of the total heavy vehicle fleet). These three classes combined also had the highest proportion in 2010. (see Table 7.0)
- The annual average daily heavy vehicles, increased by 4.4 percent to 8,708 in 2011 and this is the highest daily average heavy vehicles in 10 years to 2011. (see Table 8.0)

Vehicle Fleet Overweight

- T&T vehicle type had the highest overweight vehicles recorded during 2011 with 64.8 percent of the total overweight vehicles
- PAT class 891 (47.6 percent), 751 (12.9 percent) and 851 (8.3 percent) had the largest proportion of vehicles recorded as being over their specific vehicle type limit (combined approximately 69 percent of the total heavy vehicles recorded as overweight) (see Table 10.0)
- PAT class 891 shows a continuous increasing trend, PAT class 751 has a flat trend while the PAT class 851 illustrate a declining trends. (see Chart 7.0)

Note: Eskdale WiM site in 2010 had six months data only while in 2011 comprised a complete annual data.

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

Table 2.0 | Heavy vehicle type by WiM site (2011)

Vehicle Type	WiM Site					Total
	Drury	Eskdale	Te Puke	Tokoroa	Waipara	
Number of Heavy vehicles						
Rigid	605,048	76,062	228,269	142,147	131,524	1,183,050
T&T	415,137	77,499	191,952	201,910	137,480	1,023,978
Artic	283,825	22,508	75,764	74,989	48,292	505,378
A&B Train	116,230	15,845	28,862	64,085	49,364	274,386
Total	1,420,240	191,914	524,847	483,131	366,660	2,986,792
Number of Overweight vehicles						
Rigid	16,434	1,065	3,470	2,384	2,097	25,450
T&T	59,847	22,112	22,039	27,956	30,929	162,883
Artic	19,793	1,398	4,297	4,142	2,119	31,749
A&B Train	13,364	2,255	3,157	6,754	5,819	31,349
Total	109,438	26,830	32,963	41,236	40,964	251,431
Percentage of overweight vehicles (%)						
Rigid	2.7	1.4	1.5	1.7	1.6	2.2
T&T	14.4	28.5	11.5	13.8	22.5	15.9
Artic	7.0	6.2	5.7	5.5	4.4	6.3
A&B Train	11.5	14.2	10.9	10.5	11.8	11.4
Total	7.7	14.0	6.3	8.5	11.2	8.4

Interpretation:

- During 2011, there were approximately eight overweight vehicles for every 100 heavy vehicles and this is smaller compared to 2010 with nine
- More than 64 percent of overweight vehicles were T&T vehicle type and also revealed that for every 100 vehicles of this type approximately 16 of those were overweight
- The T&T vehicle type (162,883) had the highest number of overweight vehicles across all WiM sites, followed by Artic (31,749)
- Eskdale WiM site had the highest proportion of overweight vehicles and reported that for every 100 heavy vehicles 14 of those were overweight while Te Puke has the least with 6.3 overweight vehicles in every 100 heavy vehicles

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) still represent the PAT class with largest frequencies of heavy vehicles recorded at both >44T and >48T (combined they account for approximately more than 80 percent of the total heavy vehicles recorded for both >44T and >48T).

Time of Day

- Table 3.0 indicates the hours range, which overweight vehicle frequencies exceeded its hourly average on a regular day at each WiM site:

Table 3.0 | Overweight above hourly average distribution by WiM site (start to end)

WiM Site	Start	End
Drury	05:00 – 05:59	17:00 – 17:59
Tokoroa	08:00 – 08:59	16:00 – 16:59
Te Puke	05:00 – 05:59	16:00 – 16:59
Waipara	06:00 – 06:59	16:00 – 16:59
Eskdale	05:00 – 05:59	16:00 – 16:59

- The spikes may represent long-hauls reported across two or more WiM Sites while smaller spikes may represent localise vehicle movements distribution (see Charts 3.0 – 3.5)
- Three WiM sites (Drury, Te Puke, and Eskdale) recorded more than the hourly average as early as five in the morning while Tokoroa started at eight in the morning (see Charts 3.0–3.5)
- Most of WiM sites showed that PAT class 891 with loads more than 48 tonnes had frequencies above the hourly average between 9am to 3pm. (see Charts 4.0–4.5)

3.0 INTRODUCTION

There were five WiM sites in New Zealand collecting axle loading data for use nationally in traffic monitoring during 2011. 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. This data is not included in the 2012 WiM report.

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)
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)

The Hamamanua WiM site on SH35 in the Gisborne region is the latest WiM site to be introduced, data collection started in November 2011. The collected data was not included in this report, but will be in the next 2012 WiM Annual Report.

All data used within this report was collected within the 2011 calendar year and is available to selected users, within the NZTA's State Highway Traffic Monitoring System (TMS). This report is intended to provide an insight into what is available for further, more detailed analysis, to be undertaken by TMS users.

4.0 OTHER DOCUMENTS

The documents below provide 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

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

5.0 TECHNOLOGY

NZTA uses 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 vehicle records, and statistics normally downloaded weekly.

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

6.0 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 E 1318 (or latest revision):

For 95% of confidence:

Gross Vehicle Weight: $\pm 10\%$

Axle group load: $\pm 15\%$

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

6.0 DATA QUALITY REQUIREMENTS (Continued)

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
-

7.0 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. For this class (21) only vehicles with loads weight greater than or equal to 15 tonnes considered 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 2011 there were 131,524 rigid heavy vehicles recorded at the Waipara WiM site. This is the sum of all PAT class (20, 21, 31, 34, 45, 47, 301, and 511) under rigid type at the said WiM site. For the overall total overweight vehicles, add all the overweight vehicles in all WiM sites.

8.0 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.

9.0 WIM SITE MAPS



9.0 WiM SITE MAPS (Continued)



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	Criteria
Bus & MCV	Rigid	20	o--o (short truck or bus)	2	2	2ax, AS1-2/GVW
		21	o----o (truck or bus)	2	2	2ax AS 1 criterion
	T&T	300*	o--o-o (truck towing light trailer)	3	3	3 ax, AS 1,2 criteria
		401*	o--o-oo (truck tow light 2 ax trailer)	4	3	4 ax, AS 1,3 criteria
Bus & HCV1	Rigid	31	o--oo (truck or bus/coach)	3	2	3 axles, 2 groups
		301*	o--oo (tractor without semi-trailer)	3	2	3 axles, 2 groups
		34	oo--o (twin steer truck)	3	2	3 axles, 2 groups
	T&T	30	o-o----o (artic e.g. bread truck)	3	3	3 ax, AS 1,2 criteria
		402*	o--oo---o (truck tow light 1 ax trailer)	4	3	4 ax, AS 1,2,3 criteria
		44	oo--o---o (twin steer tow 1 ax trailer)	4	3	4 ax, AS 1,3 criteria
HCV1	Rigid	45	oo--oo (heavy truck)	4	2	
		47	o--ooo (heavy truck)	4	2	4,5 axles, 2 groups
		511*	oo--ooo (heavy truck)	5	2	
	Artic	41	o--o--oo (artic A112)	4	3	4 ax, AS 1,2,3 criteria
		42	o--oo--o (artic A121)	4	3	4 ax, AS 1,2,3 criteria
	T&T	40	o-o--o--o (truck tow heavy trailer)	4	4	4 axles, 4 groups
HCV2	Artic	50 ⁽¹⁾	o-o-o-o-o (mobile crane)	5	3	5 axles
		53	o--oo--oo	5	3	5 axles
		57*	o-o-----ooo	5	3	
		69	o--oo--ooo	6	3	
		68	oo--oo--oo	6	3	
		747	o--ooo--ooo	7	3	6-8 axles
		791	o--oo--oooo	7	3	3 groups
		713	oo--oo--ooo	7	3	
		826	oo--oo--oooo	8	3	
	847	o--ooo--oooo	8	3		
	A Train	622*	o--o--oo--o-o	6	5	
		74	o--oo--oo--o-o	7	5	(AS 1 criterion)
		85	o--oo--oo--o-oo	8	5	not twin steer
		89	o--oo--ooo--o-o	8	5	(AS 1 criterion)
		810	o--oo--ooo--o-oo	8	5	
	B Train	751 ⁽²⁾	o--oo--oo--oo	7	4	7 axles, not twin steer
		851	o--oo--ooo--oo	8	4	
		811	o--oo--oo--ooo	8	4	
		951	o--oo--ooo--ooo	9	4	
		1032	o--oo--ooo--oooo	10	4	8-11 axles
	T&T	503*	o--oo--oo (truck tow light trailer)	5	3	
		52	o--oo--o--o	5	4	3,4,5 groups
		63	o--oo--o-oo	6	4	
		66	oo--oo--o--o	6	4	6 axles
		62*	o--oo--o-o-o	6	5	4,5 groups
		61	o-o--o-o--oo	6	5	
		751 ⁽²⁾	o--oo--oo--oo	7	4	
		77	oo--oo--o-oo	7	4	
		771*	oo--o--oo--oo	7	4	
		891	oo--oo--oo--oo	8	4	
		915	oo--oo--oo--ooo	9	4	7-11 axles
		914	oo--oo--ooo--oo	9	4	twin steer
		1020	oo--oo--ooo--ooo	10	4	(AS 1 criterion)
1020		oo--ooo--oo--ooo	10	4		
1133	oo--oo--ooo--oooo	11	4			
	x	various (twin steer A train)	7-11	5		
	999	Not classified	any	-	Everything else	

Note: ¹PAT 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.

²The new NZTA 2011 heavy vehicle classification, PAT class 751 has been split in two vehicle type categories, T&T and B Train. But this PAT class was tabulated under T&T vehicle type category.

*New PAT class category.

11.0 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	Description	AADT 2011	Number of heavies per day	% Heavy
1205	1N	DRURY - Telemetry Site 48	41,794	4,190	10.0
421	1N	TOKOROA - Telemetry Site 51	8,503	1,384	16.3
24	2	TE PUKE - Telemetry Site 49	18,767	1,891	10.1
5721	5	ESKDALE - Telemetry Site 101	3,647	596	16.3
518	1S	WAIPARA - Telemetry Site 52	7,502	1,135	15.1

(Source: State Highway Traffic Data Booklet 2006-2011, to be published on April 2012)

12.0 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

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Te Puke		Waipara		Eskdale		Total Volume	%(2)
				Total Volume	%(1)	Total Volume	%(1)	Total Volume	%(1)	Total Volume	%(1)	Total Volume	%(1)		
Rigid	Bus & MCV	20	o--o	73,556	5.2	10,475	2.2	15,018	2.9	19,322	5.3	4,767	2.5	123,138	4.1
		21	o---o	320,439	22.6	68,368	14.2	110,396	21.0	70,583	19.3	29,178	15.2	598,964	20.1
	Bus & HCV1	31	o--oo	135,817	9.6	30,649	6.3	43,723	8.3	20,752	5.7	10,719	5.6	241,660	8.1
		34	oo--o	444	0.0	295	0.1	226	0.0	121	0.0	131	0.1	1,217	0.0
		301	o--oo	2,351	0.2	426	0.1	1,384	0.3	839	0.2	211	0.1	5,211	0.2
	HCV1	45	oo--oo	71,824	5.1	31,855	6.6	57,448	10.9	19,702	5.4	31,025	16.2	211,854	7.1
		47	o--ooo	41	0.0	15	0.0	15	0.0	179	0.0	18	0.0	268	0.0
511		oo--ooo	576	0.0	64	0.0	59	0.0	26	0.0	13	0.0	738	0.0	
T&T	Bus & MCV	300	o-o--o	10,615	0.7	2,792	0.6	2,977	0.6	3,702	1.0	1,161	0.6	21,247	0.7
		401	o-o--oo	8,762	0.6	2,869	0.6	2,771	0.5	3,957	1.1	1,492	0.8	19,851	0.7
	Bus & HCV1	30	o-o-----o	3,438	0.2	777	0.2	360	0.1	775	0.2	256	0.1	5,606	0.2
		44	oo--o--o	20	0.0	38	0.0	9	0.0	10	0.0	10	0.0	87	0.0
	HCV2	402	o--oo--o	3,295	0.2	1,040	0.2	911	0.2	1,096	0.3	342	0.2	6,684	0.2
		52	oo--o-o--o	5,510	0.4	766	0.2	818	0.2	633	0.2	444	0.2	8,171	0.3
		61	o-o--o-o--oo	3	0.0	1	0.0	1	0.0	2	0.0	-	-	7	0.0
		62	o--oo--o-o-o	1,253	0.1	685	0.1	488	0.1	569	0.2	676	0.4	3,671	0.1
		63	oo--oo--o--oo	9,094	0.6	3,588	0.7	5,682	1.1	2,113	0.6	694	0.4	21,171	0.7
		64	oo-o-o-o-o	1	0.0	-	-	-	-	-	-	-	-	1	0.0
		65	oo--o-o--oo	-	-	2	0.0	-	-	4	0.0	-	-	6	0.0
		66	oo--oo--o--o	815	0.1	286	0.1	387	0.1	204	0.1	48	0.0	1,740	0.1
		77	oo--oo--o-o-o	12,060	0.8	5,612	1.2	6,228	1.2	6,431	1.8	3,963	2.1	34,294	1.1
		503	o--oo--oo	273	0.0	90	0.0	212	0.0	408	0.1	48	0.0	1,031	0.0
		751(3)	o-oo--oo--oo	101,289	7.1	26,611	5.5	44,643	8.5	15,274	4.2	10,244	5.3	198,061	6.6
		771	oo--o--oo--oo	2	0.0	31	0.0	11	0.0	24	0.0	2	0.0	70	0.0
		891	oo--oo-oo--oo	251,332	17.7	153,503	31.8	125,574	23.9	99,815	27.2	57,433	29.9	687,657	23.0
914	oo-oo--oo-oo	1,745	0.1	742	0.2	722	0.1	695	0.2	435	0.2	4,339	0.1		
915	oo-oo--oo-ooo	2,855	0.2	2,106	0.4	126	0.0	1,689	0.5	140	0.1	6,916	0.2		
1020	oo-oo--oo-ooo	2,775	0.2	371	0.1	32	0.0	79	0.0	111	0.1	3,368	0.1		
Artic	HCV1	41	o-o--oo	12,668	0.9	3,901	0.8	2,725	0.5	2,940	0.8	1,448	0.8	23,682	0.8
		42	o--oo--o	690	0.0	51	0.0	19	0.0	41	0.0	29	0.0	830	0.0
	HCV2	50	o-o-o-o-o	43	0.0	27	0.0	1	0.0	12	0.0	7	0.0	90	0.0
		53	o-oo--oo	19,043	1.3	3,725	0.8	2,862	0.5	3,137	0.9	1,902	1.0	30,669	1.0
		57	o--o-----ooo	1,202	0.1	199	0.0	170	0.0	201	0.1	154	0.1	1,926	0.1
		68	oo--oo--oo	14,345	1.0	6,762	1.4	1,164	0.2	3,985	1.1	948	0.5	27,204	0.9
		69	o-oo--ooo	124,160	8.7	23,424	4.8	37,844	7.2	14,691	4.0	6,978	3.6	207,097	6.9
		713	oo-oo--ooo	11,925	0.8	2,741	0.6	1,945	0.4	1,443	0.4	819	0.4	18,873	0.6
		747	o--ooo--ooo	275	0.0	60	0.0	38	0.0	54	0.0	2	0.0	429	0.0
		791	o-oo-oooo	38,386	2.7	11,452	2.4	7,136	1.4	10,956	3.0	2,160	1.1	70,090	2.3
826	oo-oo--oooo	59,761	4.2	22,381	4.6	20,299	3.9	10,725	2.9	8,033	4.2	121,199	4.1		
847	o--ooo--oooo	1,327	0.1	266	0.1	1,561	0.3	107	0.0	28	0.0	3,289	0.1		
A&B Train	HCV2	74	o-oo--oo-o--o	7	0.0	9	0.0	-	-	-	-	1	0.0	17	0.0
		622	o--o--oo--o-o	24	0.0	13	0.0	9	0.0	19	0.0	-	-	65	0.0
		811	o--oo--oo--ooo	1,327	0.1	450	0.1	20	0.0	32	0.0	251	0.1	2,080	0.1
		851	o-oo--ooo--oo	85,249	6.0	41,974	8.7	26,981	5.1	36,277	9.9	12,331	6.4	202,812	6.8
		951	o-oo-ooo-ooo	29,622	2.1	21,638	4.5	1,852	0.4	13,029	3.6	3,262	1.7	69,403	2.3
		1032	o-oo-ooo-oooo	1	0.0	1	0.0	-	-	7	0.0	-	-	9	0.0
Total				1,420,240	100.0	483,131	100.0	524,847	100.0	366,660	100.0	191,914	100.0	2,986,792	100.0
Percentage from the total (%) ²				47.6		16.2		17.6		12.3		6.4		100.0	

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

Note: ¹Percentage of each PAT class from the total number of heavy vehicles per WIM site.
²Percentage of each WIM site total from the overall total of heavy vehicles at all WIM sites.
³In 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: At the Tokoroa WIM site, 6.6 percent (31,855) of all heavy vehicles were PAT type 45. The Drury WIM site has recorded 47.6 percent (1,420,240) of the overall total vehicles at all sites.

12.0 VEHICLE FLEET DISTRIBUTION TABLES (Continued)

Table 8.0 | Annual average daily heavy vehicles frequency by vehicle type and by WiM site (2002-2011)

Year	Vehicle Type	WiM Site					Total Average
		Drury	Eskdale	Te Puke	Tokoroa	Waipara	
2002	Rigid	1,388	-	672	482	241	2,701
	T&T	932	-	572	467	244	2,168
	Artic	644	-	183	156	93	1,034
	A&B Train	316	-	110	148	77	634
2002 Total		3,280	-	1,537	1,254	654	6,537
2003	Rigid	1,474	-	651	450	258	2,773
	T&T	966	-	558	466	236	2,191
	Artic	639	-	180	146	98	1,038
	A&B Train	332	-	108	154	82	665
2003 Total		3,411	-	1,498	1,215	674	6,667
2004	Rigid	1,697	-	697	392	280	2,732
	T&T	1,105	-	587	517	245	2,242
	Artic	725	-	205	171	114	1,096
	A&B Train	371	-	111	184	93	714
2004 Total		3,899	-	1,600	1,264	732	6,784
2005	Rigid	1,639	-	630	419	299	2,985
	T&T	1,217	-	584	488	296	2,582
	Artic	708	-	196	160	118	1,186
	A&B Train	343	-	106	175	100	730
2005 Total		3,907	-	1,516	1,243	814	7,483
2006	Rigid	1,713	-	452	429	304	2,970
	T&T	1,214	-	589	525	336	2,691
	Artic	686	-	175	158	107	1,155
	A&B Train	353	-	109	164	113	752
2006 Total		3,966	-	1,325	1,276	860	7,568
2007	Rigid	1,715	-	696	397	298	3,341
	T&T	1,228	-	602	580	334	2,863
	Artic	664	-	201	159	120	1,231
	A&B Train	340	-	113	181	123	783
2007 Total		3,946	-	1,612	1,317	875	8,219
2008	Rigid	1,826	-	694	370	322	3,332
	T&T	1,218	-	586	502	332	2,680
	Artic	751	-	225	165	132	1,321
	A&B Train	356	-	102	156	127	756
2008 Total		4,151	-	1,606	1,194	913	8,090
2009	Rigid	1,627	-	689	368	335	3,026
	T&T	1,122	-	531	501	333	2,495
	Artic	764	-	230	194	129	1,327
	A&B Train	327	-	90	157	121	702
2009 Total		3,840	-	1,540	1,219	918	7,551
2010	Rigid	1,634	205	762	386	350	3,278
	T&T	1,148	216	604	529	357	2,875
	Artic	795	71	260	204	142	1,433
	A&B Train	307	44	102	162	130	759
2010 Total		3,884	537	1,729	1,283	980	8,344
2011	Rigid	1,724	227	758	391	361	3,449
	T&T	1,183	231	638	555	378	2,985
	Artic	809	67	252	206	133	1,473
	A&B Train	331	47	96	176	136	800
2011 Total		4,046	573	1,744	1,327	1,007	8,708

Symbol: - no data

Note: Annual average daily heavy vehicles referring to the average number of heavy vehicles that passed during 24-hour period in a given year in 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. However, total average was computed by dividing the total heavy vehicles over the average accepted days of all WiM sites. So, the total average is not equal to the sum of average daily heavy vehicles across WiM sites

Interpretation:

- In 2011, annual average daily heavy vehicles posted 8,708 and this is a record high of annual daily average heavy vehicles in 10 years up to 2011
- The annual average daily heavy vehicles with Rigid and T&T vehicle types increased by 5.2 and 3.9 percents to 3,449 and 2,985, respectively.

12.0 VEHICLE FLEET DISTRIBUTION TABLES (Continued)

Table 9.0 | Annual average daily heavy vehicles frequency by selected⁽¹⁾PAT class and by WiM site (2006-2011)

Year	Vehicle Type	WiM Site					Total Average
		Drury	Eskdale	Te Puke	Tokoroa	Waipara	
2006	21	709	-	50	100	90	991
	31	424	-	142	85	50	716
	45	202	-	128	80	54	466
	69	480	-	126	107	52	784
	891	588	-	331	361	248	1,538
	Others ⁽²⁾	1,564	-	548	544	365	3,073
2006 Total		3,966	-	1,325	1,276	860	7,568
2007	21	727	-	289	98	93	1,320
	31	420	-	141	86	52	758
	45	209	-	141	84	55	514
	69	447	-	124	102	51	785
	891	621	-	364	432	245	1,700
	Others ⁽²⁾	1,522	-	552	514	378	3,141
2007 Total		3,946	-	1,612	1,317	875	8,219
2008	21	840	-	340	137	134	1,512
	31	397	-	136	76	60	695
	45	205	-	128	75	56	472
	69	415	-	126	78	49	695
	891	690	-	363	364	240	1,671
	Others ⁽²⁾	1,604	-	512	463	374	3,045
2008 Total		4,151	-	1,606	1,194	913	8,090
2009	21	866	-	364	176	189	1,599
	31	370	-	130	79	57	639
	45	201	-	143	81	58	481
	69	340	-	115	65	39	561
	891	651	-	342	375	231	1,605
	Others ⁽²⁾	1,413	-	445	443	344	2,667
2009 Total		3,840	-	1,540	1,219	918	7,551
2010	21	857	83	389	185	193	1,684
	31	374	32	146	84	60	678
	45	198	90	152	85	55	565
	69	349	21	128	67	40	583
	891	686	159	389	403	254	1,922
	Others ⁽²⁾	1,421	153	525	457	378	2,912
2010 Total		3,884	537	1,729	1,283	980	8,344
2011	21	913	87	367	188	194	1,746
	31	387	32	145	84	57	705
	45	205	93	191	88	54	618
	69	354	21	126	64	40	604
	891	716	171	417	422	274	2,005
	Others ⁽²⁾	1,472	169	498	482	388	3,031
2011 Total		4,046	573	1,744	1,327	1,007	8,708

Symbol: - no data

Note: ¹The selection of PAT class was based on the highest frequency recorded in the current year.

²All not stated PAT class were included in 'Others' category.

Annual average daily heavy vehicles referring to the average number of heavy vehicles that passed during 24-hour period in a given year in 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. However, total average was computed by dividing the total heavy vehicles over the average accepted days of all WiM sites. So, the total average is not equal to the sum of average daily heavy vehicles across WiM sites

Interpretation:

- All five PAT classes indentified with highest frequency show increases in annual average daily heavy vehicles from 2011
- The annual average daily heavy vehicle of PAT class 891 with an average of 2,005 during 2011 set a record 10 year high
- PAT classes 21 and 891 annual average daily heavy vehicle increased by 3.7 and 4.0 percent, respectively
- In Drury WiM site, PAT class 21(913) was the most frequent heavy vehicles while PAT class 891 at all other sites.

13.0 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

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Te Puke		Waipara		Eskdale		Total Volume	%(²)
				Total Volume	%(¹)	Total Volume	%(¹)	Total Volume	%(¹)	Total Volume	%(¹)	Total Volume	%(¹)		
Rigid	Bus & MCV	20	0--0	6	0.0	1	0.0	39	0.1	3	0.0	3	0.0	52	0.0
		21	0----0	648	0.6	60	0.1	75	0.2	72	0.2	38	0.1	893	0.4
	Bus & HCV1	31	0--00	4,260	3.9	438	1.1	215	0.7	392	1.0	268	1.0	5,573	2.2
		34	00--0	7	0.0	18	0.0	-	-	2	0.0	4	0.0	31	0.0
	HCV1	45	00--00	11,510	10.5	1,851	4.5	3,141	9.5	1,628	4.0	750	2.8	18,880	7.5
		47	0--000	3	0.0	8	0.0	-	-	-	-	2	0.0	13	0.0
511		00--000	-	-	8	0.0	-	-	-	-	-	-	8	0.0	
T&T	Bus & MCV	300	0--0--0	-	-	2	0.0	-	-	-	-	-	-	2	0.0
		Bus & HCV1	44	00--0---0	-	-	11	0.0	-	-	-	-	-	-	11
	HCV2		52	0--00-0--0	47	0.0	4	0.0	-	-	11	0.0	3	0.0	65
		62	0--00--0-0-0	169	0.2	293	0.7	155	0.5	258	0.6	226	0.8	1,101	0.4
		63	0--00-0--00	922	0.8	123	0.3	139	0.4	209	0.5	30	0.1	1,423	0.6
		66	00--00--0--0	1	0.0	11	0.0	-	-	-	-	-	-	12	0.0
		77	00--00--0-0-0	818	0.7	709	1.7	313	0.9	1,618	3.9	1,219	4.5	4,677	1.9
		751 ⁽³⁾	0-00--00--00	18,005	16.5	3,981	9.7	3,416	10.4	4,105	10.0	3,011	11.2	32,518	12.9
		771	00--0--00--00	-	-	1	0.0	-	-	-	-	-	-	1	0.0
		891	00--00-00--00	38,145	34.9	22,177	53.8	17,843	54.1	23,955	58.5	17,460	65.1	119,580	47.6
		914	00-00--000-00	412	0.4	177	0.4	134	0.4	112	0.3	81	0.3	916	0.4
		915	00-00--00-000	505	0.5	382	0.9	36	0.1	634	1.5	33	0.1	1,590	0.6
1020	00-00-000-000	823	0.8	85	0.2	3	0.0	27	0.1	49	0.2	987	0.4		
Artic	HCV1	41	0--0--00	4	0.0	-	-	4	0.0	-	-	-	-	8	0.0
		42	0--00--0	1	0.0	1	0.0	-	-	-	-	-	-	2	0.0
	HCV2	53	0-00--00	573	0.5	21	0.1	33	0.1	8	0.0	23	0.1	658	0.3
		68	00--00--00	5	0.0	7	0.0	24	0.1	2	0.0	1	0.0	39	0.0
		69	0-00--000	9,005	8.2	896	2.2	2,157	6.5	646	1.6	338	1.3	13,042	5.2
		713	00-00--000	69	0.1	42	0.1	2	0.0	22	0.1	8	0.0	143	0.1
		747	0--000--0000	13	0.0	7	0.0	-	-	3	0.0	-	-	23	0.0
		791	0-00-0000	2,904	2.7	774	1.9	318	1.0	629	1.5	169	0.6	4,794	1.9
		826	00-00--0000	7,174	6.6	2,378	5.8	1,602	4.9	795	1.9	853	3.2	12,802	5.1
847	0--000---0000	45	0.0	16	0.0	157	0.5	14	0.0	6	0.0	238	0.1		
A&B Train	HCV2	74	0-00--00-0--0	-	-	2	0.0	-	-	-	-	-	-	2	0.0
		811	0--00--00--000	974	0.9	220	0.5	11	0.0	17	0.0	112	0.4	1,334	0.5
		851	0-00--000--00	8,901	8.1	3,772	9.1	2,948	8.9	3,938	9.6	1,403	5.2	20,962	8.3
		951	0-00-000-000	3,488	3.2	2,760	6.7	198	0.6	1,864	4.6	740	2.8	9,050	3.6
		1032	0-00-000-0000	1	0.0	-	-	-	-	-	-	-	-	1	0.0
Total				109,438	100.0	41,236	100.0	32,963	100.0	40,964	100.0	26,830	100.0	251,431	100.0
<i>Percentage from the total (%)²</i>				43.5		16.4		13.1		16.3		10.7		100.0	

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

Note: ¹Percentage of each PAT class from the total number of overweight vehicles per WiM site.
²Percentage of overweight vehicle at each WiM site from the overall total of overweight at all WiM sites.
³In 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: Around 35 percent of all overweight vehicles which crossed the Drury WiM site were of PAT class 891. However, 43.5 percent of the overall total overweight vehicles in 2011 passed the same WiM site.

12.0 VEHICLE FLEET OVERWEIGHT TABLES (Continued)

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

Year	Vehicle Type	WiM Site					Total Average
		Drury	Eskdale	Te Puke	Tokoroa	Waipara	
2002	Rigid	25	-	14	2	4	44
	T&T	183	-	154	51	45	424
	Artic	46	-	17	6	3	69
	A&B Train	42	-	27	16	5	87
2002 Total		296	-	213	75	56	623
2003	Rigid	23	-	10	2	5	39
	T&T	124	-	121	59	44	343
	Artic	32	-	15	5	2	53
	A&B Train	34	-	20	16	4	72
2003 Total		214	-	166	82	54	508
2004	Rigid	47	-	12	4	6	62
	T&T	158	-	124	57	45	346
	Artic	62	-	14	8	2	73
	A&B Train	64	-	19	17	4	91
2004 Total		331	-	169	87	57	572
2005	Rigid	33	-	9	3	7	52
	T&T	124	-	72	93	49	339
	Artic	33	-	5	11	3	53
	A&B Train	35	-	12	23	7	77
2005 Total		225	-	99	129	65	521
2006	Rigid	38	-	12	5	6	62
	T&T	134	-	51	128	42	356
	Artic	39	-	6	16	3	66
	A&B Train	33	-	8	26	8	75
2006 Total		244	-	77	174	60	560
2007	Rigid	41	-	10	4	4	65
	T&T	181	-	58	96	36	386
	Artic	50	-	8	17	2	83
	A&B Train	37	-	11	21	5	77
2007 Total		309	-	86	139	47	611
2008	Rigid	62	-	10	3	7	89
	T&T	297	-	73	40	58	493
	Artic	102	-	11	7	4	133
	A&B Train	68	-	14	8	11	107
2008 Total		529	-	108	59	80	821
2009	Rigid	33	-	12	5	5	55
	T&T	78	-	101	40	53	268
	Artic	28	-	26	7	4	64
	A&B Train	19	-	14	7	10	50
2009 Total		158	-	153	59	71	437
2010	Rigid	38	4	18	7	6	70
	T&T	154	90	172	60	63	530
	Artic	37	6	41	9	5	101
	A&B Train	30	7	23	12	13	87
2010 Total		259	107	254	87	87	788
2011	Rigid	47	3	12	7	6	74
	T&T	171	66	73	77	85	475
	Artic	56	4	14	11	6	93
	A&B Train	38	7	10	19	16	91
2011 Total		312	80	110	113	113	733

Symbol: - no data

Note: Annual average daily overweight heavy vehicles referring 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 over the total accepted days for each WiM site. Total average was computed by dividing the overweight heavy vehicles over the average accepted days of all WiM sites. So, the total average is not equal to the sum of average daily overweight heavy vehicles across WiM sites. Accepted days refers to days with recorded data which excludes shutdowns and site maintenance.

Interpretation:

- Although annual average daily heavy vehicles increased in 2011 but the annual average daily overweight vehicles (across WiM sites) decreased by 7.0 percent (55) to 733 daily average
- T&T and Artic vehicle types show decreases by 10.4 percent and 8.6 percent, respectively
- Eskdale and Te Puke WiM sites show decreases in annual average daily overweight to 80 and 110 from 107 and 254 in 2010, respectively.

13.0 VEHICLE FLEET OVERWEIGHT TABLES (Continued)

Table 12.0 | Average annual daily overweight vehicles frequency on selected⁽¹⁾ PAT class and by WiM site

Year	Vehicle Type	WiM Site					Total Average
		Drury	Eskdale	Te Puke	Tokoroa	Waipara	
2006	45	27	-	10	3	5	45
	69	28	-	6	12	2	49
	751	58	-	15	26	8	109
	851	26	-	7	20	7	60
	891	69	-	34	93	29	224
	Others ⁽²⁾	37	-	6	20	9	73
2006 Total		244	-	77	174	60	560
2007	45	30	-	8	3	3	50
	69	32	-	6	9	1	52
	751	88	-	15	18	6	140
	851	29	-	10	15	4	60
	891	85	-	40	74	23	225
	Others ⁽²⁾	45	-	7	18	9	84
2007 Total		309	-	86	139	47	611
2008	45	41	-	9	3	5	62
	69	53	-	8	3	2	70
	751	120	-	15	10	8	163
	851	54	-	13	5	8	85
	891	166	-	56	29	43	308
	Others ⁽²⁾	95	-	8	9	14	134
2008 Total		529	-	108	59	80	821
2009	45	25	-	9	4	4	43
	69	11	-	15	2	1	28
	751	29	-	29	7	8	72
	851	15	-	13	4	7	39
	891	46	-	69	30	36	179
	Others ⁽²⁾	32	-	18	11	15	76
2009 Total		158	-	153	59	71	437
2010	45	29	3	14	5	4	55
	69	16	1	21	2	1	43
	751	58	15	44	9	9	131
	851	22	5	22	8	10	68
	891	91	68	120	47	47	368
	Others ⁽²⁾	43	15	34	16	16	123
2010 Total		259	107	254	87	87	788
2011	45	33	2	10	5	4	55
	69	26	1	7	2	2	38
	751	51	9	11	11	11	95
	851	25	4	10	10	11	61
	891	109	52	59	61	66	349
	Others ⁽²⁾	68	12	11	24	18	135
2011 Total		312	80	110	113	113	733

Symbol: - no data

Note: ¹The selection of PAT class was based on the highest frequency recorded in the current year.

²All not stated PAT class were included in 'Others' category.

Annual average daily overweight heavy vehicles referring to the average number of overweight heavy vehicles that passed during 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 over the total accepted days for each WiM site. However, total average was computed by dividing the overweight heavy vehicles over the average accepted days of all WiM sites. So, the total average is not equal to the sum of average daily overweight heavy vehicles across WiM sites

Interpretation: In 2011, PAT class 891 vehicle type shows a decrease in annual average daily overweight vehicles by 5.3 percent compared previous year.

14.0

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

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Te Puke		Waipara		Eskdale		Total Volume	% ⁽²⁾
				Total Volume	% ⁽¹⁾	Total Volume	% ⁽¹⁾	Total Volume	% ⁽¹⁾	Total Volume	% ⁽¹⁾	Total Volume	% ⁽¹⁾		
Rigid	Bus & HCV1	31	o--oo	-	-	1	0.0	-	-	-	-	-	-	1	0.0
		34	oo--o	-	-	3	0.0	-	-	-	-	1	0.0	4	0.0
	HCV1	45	oo--oo	-	-	8	0.0	-	-	-	-	-	-	8	0.0
		47	o--ooo	-	-	7	0.0	-	-	-	-	-	-	7	0.0
		511	oo--ooo	-	-	8	0.0	-	-	-	-	-	-	8	0.0
T&T	Bus & HCV1	44	oo--o---o	-	-	2	0.0	-	-	-	-	-	-	2	0.0
		52	o--oo-o--o	4	0.0	1	0.0	-	-	-	-	-	-	5	0.0
	HCV2	62	o--oo--o-o-o	110	0.1	239	0.6	132	0.5	196	0.5	163	0.6	840	0.4
		63	o--oo-o--oo	443	0.6	41	0.1	22	0.1	70	0.2	9	0.0	585	0.3
		66	oo--oo--o--o	1	0.0	8	0.0	-	-	-	-	-	-	9	0.0
		77	oo--oo--o-oo	818	1.0	709	1.9	313	1.2	1,618	4.3	1,219	4.8	4,677	2.3
		751	o-oo--oo--oo oo--oo-oo--oo	18,005	22.5	3,981	10.7	3,416	12.7	4,105	10.9	3,011	12.0	32,518	15.7
		891	oo--oo--oo-oo	38,145	47.6	22,177	59.7	17,843	66.2	23,955	63.8	17,460	69.5	119,580	57.8
		914	oo--oo--ooo-oo	412	0.5	177	0.5	134	0.5	112	0.3	81	0.3	916	0.4
		915	oo--oo--oo-ooo	505	0.6	382	1.0	36	0.1	634	1.7	33	0.1	1,590	0.8
1020	oo--oo--ooo-ooo	823	1.0	85	0.2	3	0.0	27	0.1	49	0.2	987	0.5		
Artic	HCV1	42	o--oo--o	-	-	1	0.0	-	-	-	-	-	-	1	0.0
		53	o-oo--oo	2	0.0	3	0.0	8	0.0	-	-	-	-	13	0.0
	HCV2	68	oo--oo--oo	2	0.0	7	0.0	21	0.1	1	0.0	1	0.0	32	0.0
		69	o-oo--ooo	345	0.4	93	0.3	87	0.3	51	0.1	18	0.1	594	0.3
		713	oo--oo--ooo	69	0.1	42	0.1	2	0.0	22	0.1	8	0.0	143	0.1
		747	o--ooo--ooo	5	0.0	-	-	-	-	2	0.0	-	-	7	0.0
		791	o-oo-oooo	403	0.5	142	0.4	26	0.1	125	0.3	29	0.1	725	0.4
		826	oo--oo--oooo o--ooo--ooo	7,174	8.9	2,378	6.4	1,602	5.9	795	2.1	853	3.4	12,802	6.2
847	ooo	45	0.1	16	0.0	157	0.6	14	0.0	6	0.0	238	0.1		
A&B Train	HCV2	811	o--oo--oo--oo ooo	494	0.6	96	0.3	7	0.0	13	0.0	51	0.2	661	0.3
		851	o-oo--ooo--oo oo	8,901	11.1	3,772	10.2	2,948	10.9	3,938	10.5	1,403	5.6	20,962	10.1
		951	o-oo-ooo-ooo o-oo-ooo-ooo	3,488	4.3	2,760	7.4	198	0.7	1,864	5.0	740	2.9	9,050	4.4
		1032	oooo	1	0.0	-	-	-	-	-	-	-	-	1	0.0
Total				80,195	100.0	37,139	100.0	26,955	100.0	37,542	100.0	25,135	100.0	206,966	100.0
Percentage from the total (%) ⁽²⁾				38.7		17.9		13.0		18.1		12.1		100.0	

Symbol: - no data

- Top 5 with highest frequency in each WiM site
- Top 5 with highest frequency across all WiM sites

Note:

- ¹Percentage of each PAT class from the total number of heavy vehicles recorded as >44T per WiM site.
- ²Percentage of each WiM site from the overall total number of heavy vehicles recorded as >44T at all WiM sites.
- ³In 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: At the Tokoroa WiM site, PAT class 851 vehicles reported 3,772 (10.2 percent) with loads >44T. The Te Puke WiM site has 13.0 percent of the total heavy vehicles over 44T of the five WiM sites.

14.0 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

Group	PEM Class	PAT Class	Description	Drury		Tokoroa		Te Puke		Waipara		Eskdale		Total Volume	%
				Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%	Total Volume	%		
Rigid	Bus & HCV1	34	00--0	-	-	-	-	-	-	-	-	1	0.0	1	0.0
		45	00--00	-	-	2	0.0	-	-	-	-	-	-	2	0.0
	HCV1	47	0--000	-	-	4	0.1	-	-	-	-	-	-	4	0.0
		511	00--000	-	-	7	0.1	-	-	-	-	-	-	7	0.0
T&T	HCV2	52	0--00-0--0	1	0.0	1	0.0	-	-	-	-	-	-	2	0.0
		62	0--00--0-0-0	40	0.5	174	3.3	79	8.7	137	3.8	108	4.9	538	2.7
		63	0--00-0--00	23	0.3	7	0.1	2	0.2	5	0.1	1	0.0	38	0.2
		66	00--00--0--0	1	0.0	6	0.1	-	-	-	-	-	-	7	0.0
		77	00--00--0-00	80	1.0	144	2.7	8	0.9	78	2.2	104	4.7	414	2.1
		751	0-00--00--00	1,854	24.3	609	11.5	57	6.3	604	16.7	143	6.5	3,267	16.6
		891	00--00-00--00	3,871	50.7	3,020	57.3	558	61.6	2,125	58.8	1,547	70.0	11,121	56.6
		914	00-00--000-00	92	1.2	43	0.8	16	1.8	21	0.6	11	0.5	183	0.9
		915	00-00--00-000	34	0.4	74	1.4	-	-	119	3.3	8	0.4	235	1.2
		1020	00-00-000-000	57	0.7	24	0.5	-	-	3	0.1	5	0.2	89	0.5
		Artic	HCV1	42	0--00--0	-	-	1	0.0	-	-	-	-	-	-
53	0-00--00			-	-	1	0.0	1	0.1	-	-	-	-	2	0.0
68	00--00--00			1	0.0	7	0.1	16	1.8	-	-	1	0.0	25	0.1
69	0-00--000			34	0.4	48	0.9	5	0.6	14	0.4	5	0.2	106	0.5
713	00-00--000			2	0.0	19	0.4	-	-	6	0.2	4	0.2	31	0.2
747	0--000---000			1	0.0	0	-	-	-	-	-	-	-	1	0.0
791	0-00-0000			20	0.3	14	0.3	2	0.2	22	0.6	3	0.1	61	0.3
826	00-00--0000			248	3.3	154	2.9	18	2.0	26	0.7	47	2.1	493	2.5
847	0--000---0000	3	0.0	3	0.1	-	-	4	0.1	-	-	10	0.1		
A&B Train	HCV2	811	0--00--00--000	33	0.4	17	0.3	-	-	12	0.3	3	0.1	65	0.3
		851	0-00--000--00	754	9.9	354	6.7	125	13.8	226	6.2	94	4.3	1,553	7.9
		951	0-00-000-000	478	6.3	540	10.2	19	2.1	215	5.9	125	5.7	1,377	7.0
		1032	0-00-000-0000	1	0.0	-	-	-	-	-	-	-	-	1	0.0
Total				7,628	100.0	5,273	100.0	906	100.0	3,617	100.0	2,210	100.0	19,634	100.0
Percentage from the total				38.9		26.9		4.6		18.4		11.3		100.0	

Symbol: - no data

 Top 5 with highest frequency in each WiM site

 Top 5 with highest frequency across all WiM sites

Note: ¹Percentage of each PAT class from the total number of heavy vehicles recorded as >48T per WiM site.

²Percentage of each WiM site from the overall total number of heavy vehicles recorded as >48T at all WiM sites.

Interpretation:

- At the Drury WiM site, PAT class 891 vehicle has the highest reported PAT class with loads recorded as >48T with 56.6 percent of the total number of >48T overweight vehicles
- Of the five WiM sites the Te Puke WiM site has the least heavy vehicles frequency, with 4.6 percent of the total heavy vehicles recorded at over 48T. This is opposite from the previous report in 2010 where Te Puke had the highest overweight heavy vehicles with 48T and over loads.

15.0 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 cannot 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	1%	3%	0%	-	-	-
20	18%	22%	1%	0%	0%	-
30	19%	29%	3%	0%	0%	0%
40	13%	16%	9%	0%	1%	1%
50	30%	12%	7%	1%	4%	2%
60	17%	8%	7%	3%	8%	4%
70	1%	6%	7%	18%	14%	8%
80	0%	3%	6%	32%	10%	11%
90	0%	1%	8%	26%	7%	13%
100	0%	0%	10%	16%	6%	8%
110	-	0%	12%	4%	4%	3%
120	-	0%	10%	0%	4%	2%
130	-	0%	8%	0%	4%	2%
140	-	0%	7%	0%	4%	2%
150	-	0%	4%	0%	5%	2%
160	-	0%	1%	0%	6%	3%
170	-	0%	0%	0%	7%	3%
180	-	0%	0%	0%	7%	5%
190	-	-	0%	0%	6%	7%
200	-	-	0%	0%	3%	10%
210	-	-	0%	-	1%	9%
220	-	-	0%	0%	0%	3%
230	-	-	0%	-	0%	1%
240	-	-	0%	-	0%	0%
250	-	-	0%	-	0%	0%
260	-	-	0%	-	0%	0%
270	-	-	-	-	0%	0%

Symbol: - no data

= approximate axle group mass legal limit

15.0 AXLE GROUP DISTRIBUTION TABLES (Continued)

Table 15.1 | Site: 01N00463 (Drury)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	0%	3%	0%	-	-	-
20	17%	24%	1%	0%	0%	-
30	19%	30%	3%	0%	0%	0%
40	11%	16%	9%	0%	2%	0%
50	25%	11%	8%	1%	5%	2%
60	24%	7%	9%	3%	7%	6%
70	4%	5%	8%	15%	8%	9%
80	0%	3%	7%	23%	8%	9%
90	0%	1%	7%	24%	8%	6%
100	0%	0%	8%	21%	7%	6%
110	-	0%	9%	10%	6%	5%
120	-	0%	9%	2%	6%	4%
130	-	0%	7%	0%	6%	4%
140	-	0%	6%	0%	6%	5%
150	-	-	4%	0%	6%	5%
160	-	0%	2%	0%	6%	4%
170	-	0%	1%	-	5%	4%
180	-	-	0%	0%	5%	4%
190	-	-	0%	-	4%	6%
200	-	0%	0%	-	2%	8%
210	-	-	0%	-	1%	7%
220	-	-	0%	-	0%	4%
230	-	-	0%	-	0%	1%
240	-	-	0%	-	0%	0%
250	-	-	0%	-	0%	0%
260	-	-	0%	-	0%	0%
270	-	-	-	-	0%	0%

Table 15.2 | Site: 01N00628 (Tokoroa)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	1%	4%	0%	-	-	-
20	14%	21%	1%	0%	0%	-
30	15%	27%	3%	0%	0%	0%
40	11%	15%	7%	0%	1%	0%
50	27%	13%	7%	0%	3%	0%
60	29%	9%	7%	2%	5%	2%
70	4%	6%	6%	10%	6%	4%
80	0%	4%	7%	24%	6%	5%
90	0%	2%	9%	26%	7%	6%
100	0%	1%	11%	25%	8%	6%
110	-	0%	12%	11%	8%	6%
120	-	0%	10%	1%	9%	6%
130	-	0%	8%	0%	9%	6%
140	-	0%	6%	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%	7%
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%	0%	1%
250	-	-	0%	-	0%	0%
260	-	-	0%	-	0%	0%
270	-	-	0%	-	0%	0%

Symbol: - no data

= approximate axle group mass legal limit

15.0 AXLE GROUP DISTRIBUTION TABLES (Continued)

Table 15.3: Site: 01S00285 (Waipara)

Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	1%	6%	0%	-	-	-
20	29%	35%	2%	0%	0%	-
30	16%	25%	3%	0%	0%	-
40	9%	11%	5%	1%	1%	0%
50	23%	8%	7%	2%	2%	0%
60	21%	6%	8%	2%	3%	0%
70	2%	4%	6%	9%	5%	1%
80	0%	3%	7%	26%	5%	2%
90	0%	1%	9%	28%	6%	5%
100	0%	0%	10%	24%	7%	7%
110	-	0%	12%	8%	7%	7%
120	-	0%	11%	1%	9%	7%
130	-	0%	8%	0%	9%	7%
140	-	0%	6%	0%	10%	8%
150	-	0%	3%	0%	10%	7%
160	-	-	1%	0%	10%	7%
170	-	-	1%	0%	8%	8%
180	-	0%	0%	0%	5%	8%
190	-	0%	0%	0%	3%	8%
200	-	-	0%	0%	1%	7%
210	-	-	0%	-	0%	6%
220	-	-	0%	-	0%	3%
230	-	-	0%	-	0%	1%
240	-	-	0%	-	0%	1%
250	-	-	0%	-	0%	0%
260	-	-	0%	-	0%	0%
270	-	-	-	-	0%	0%

Table 15.4 | Site: 00500259 (Eskdale)

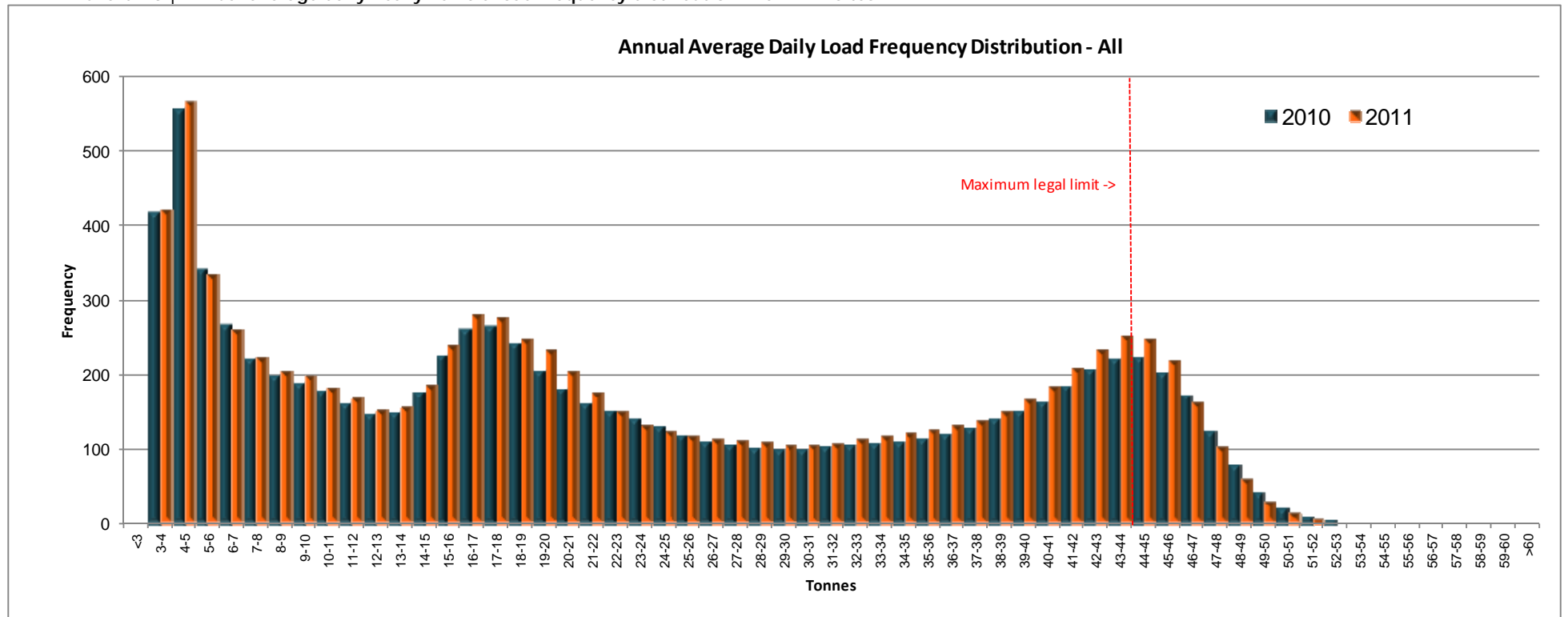
Load (kN)	SAST	SADT	TADT	TSST	TRDT	QADT
10	1%	4%	0%	-	-	-
20	20%	22%	1%	0%	-	-
30	17%	30%	2%	0%	0%	-
40	10%	12%	4%	1%	1%	0%
50	25%	9%	5%	1%	3%	1%
60	24%	7%	5%	3%	6%	3%
70	3%	7%	5%	18%	6%	6%
80	0%	5%	8%	27%	6%	6%
90	0%	2%	11%	26%	7%	5%
100	0%	1%	10%	19%	7%	4%
110	-	0%	13%	5%	8%	4%
120	-	0%	12%	1%	7%	4%
130	-	0%	9%	0%	7%	5%
140	-	0%	7%	0%	7%	6%
150	-	0%	6%	0%	7%	5%
160	-	-	3%	-	8%	5%
170	-	-	1%	-	8%	6%
180	-	-	0%	0%	6%	7%
190	-	-	0%	0%	3%	8%
200	-	-	0%	0%	1%	9%
210	-	-	0%	-	0%	7%
220	-	-	0%	-	0%	4%
230	-	-	0%	-	0%	1%
240	-	-	0%	-	0%	1%
250	-	-	-	-	0%	0%
260	-	-	0%	-	0%	0%
270	-	-	-	-	0%	0%

Symbol: - no data

= approximate axle group mass legal limit

16.0 APPENDIX A – HEAVY VEHICLES LOAD FREQUENCY DISTRIBUTION BY WIM SITE CHARTS

Chart 1.0 | Annual average daily heavy vehicle load frequency distribution in all WiM sites

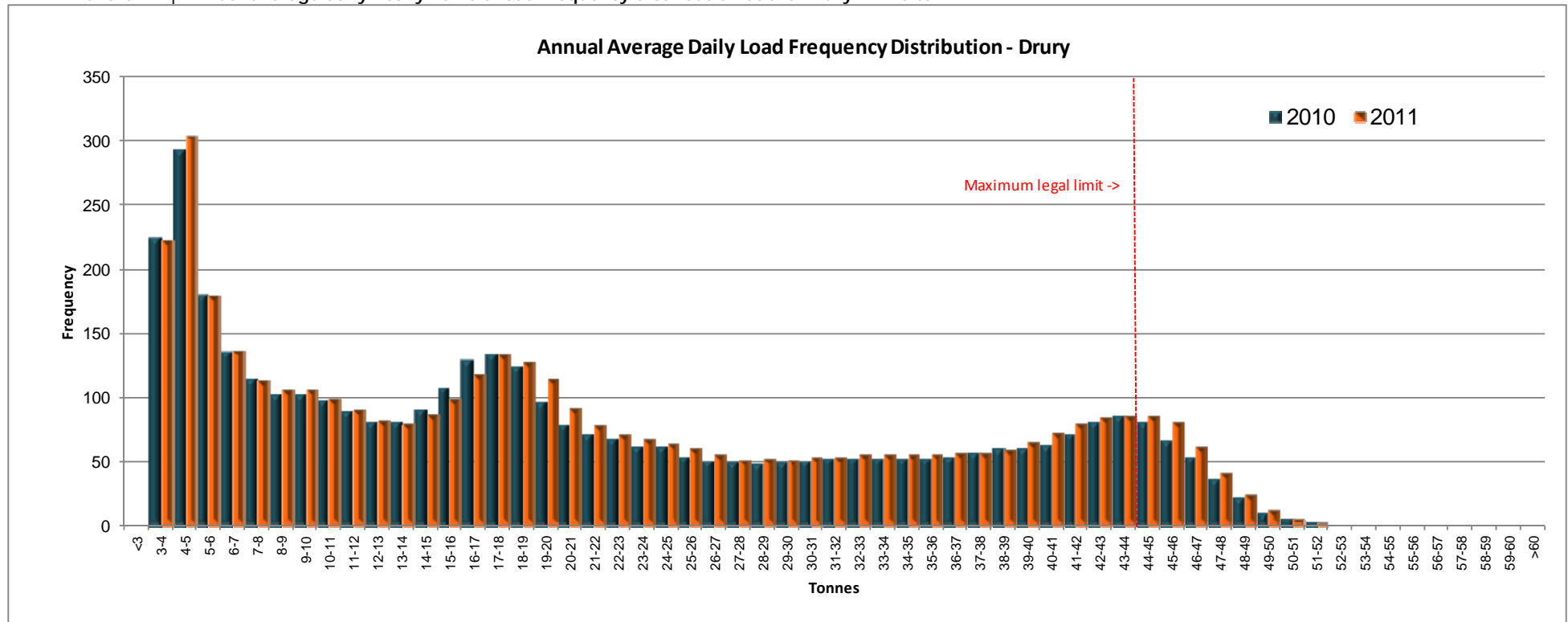


Interpretation: The chart above shows that annual average daily total heavy vehicles in across WiM sites during 2011 have increased compared to 2010.

Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

16.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

Chart 1.1 | Annual average daily heavy vehicle load frequency distribution at the Drury WiM Site

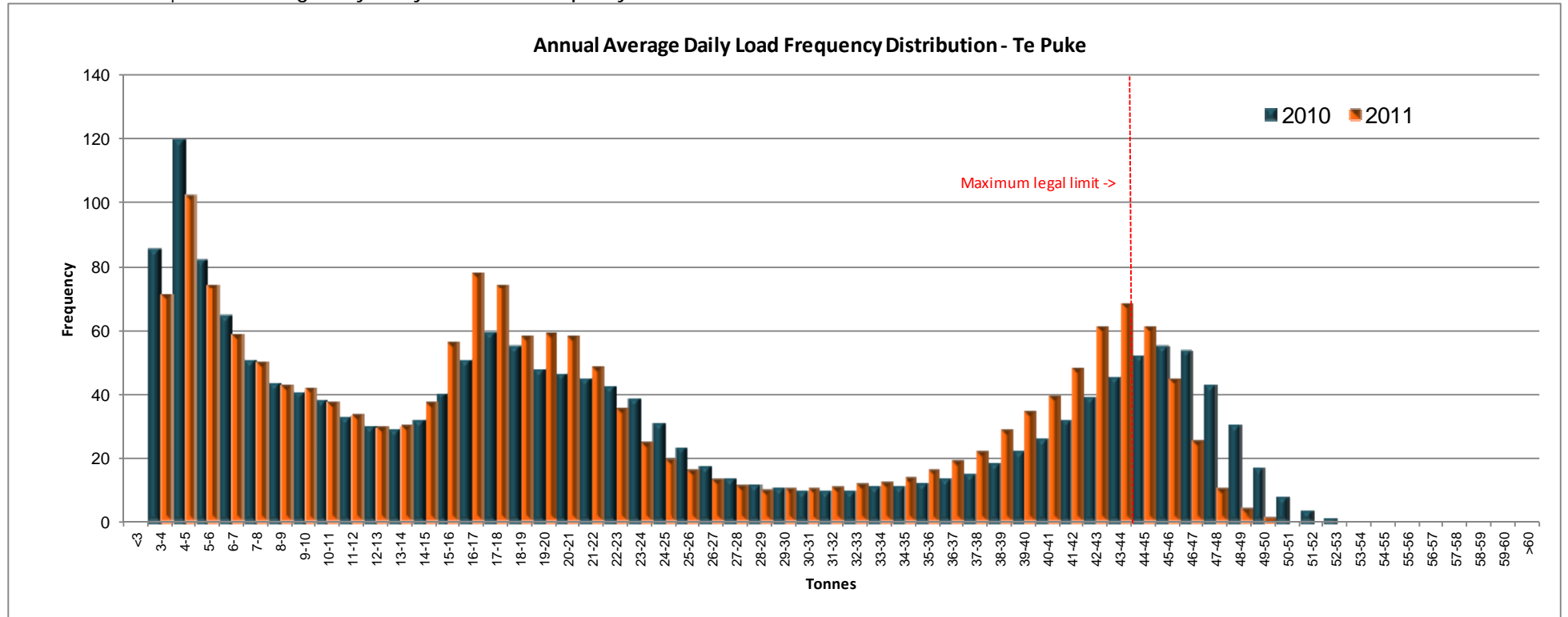


Interpretation: Looking at the above chart, it illustrates that the annual average daily heavy vehicles in some load bands decreased in the previous year but load bands 39-40 to 52-53 increased during 2011.

Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

16.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

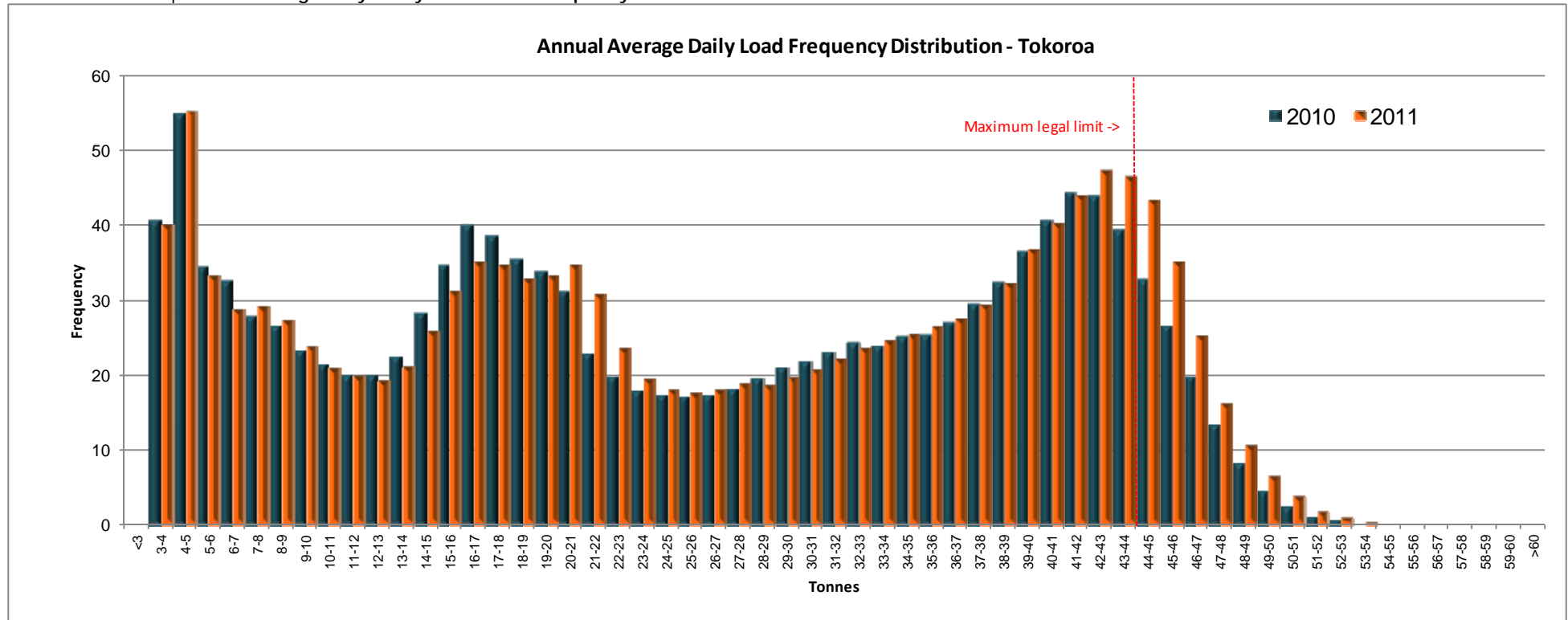
Chart 1.2 | Annual average daily heavy vehicle load frequency distribution at the Te Puke



Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

16.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

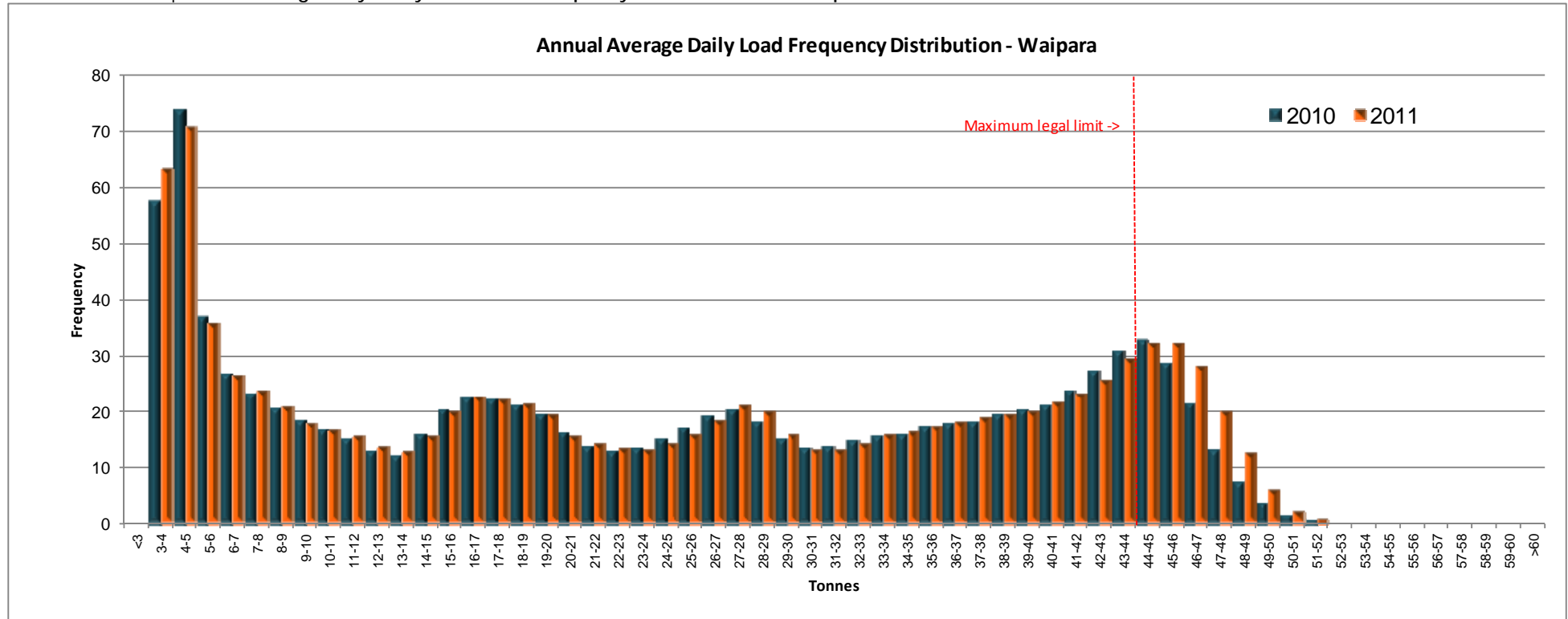
Chart 1.3 | Annual average daily heavy vehicle load frequency distribution at the Tokoroa



Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

16.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

Chart 1.4 | Annual average daily heavy vehicle load frequency distribution at the Waipara

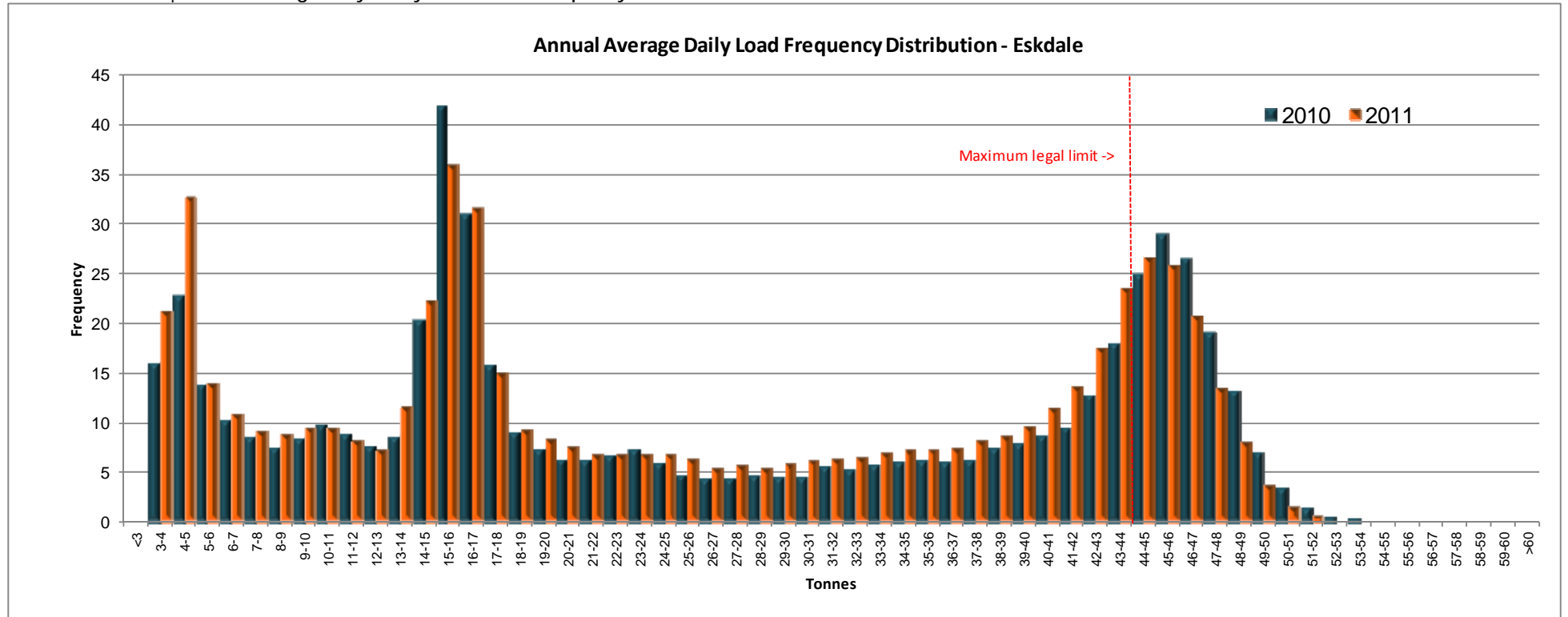


Interpretation: The total heavy vehicles passed Waipara WiM site had increased by 10,073 (2.8 percent) in 2011. The chart above shows that increases found in 3-4 and 45 and above load bands.

Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

16.0 APPENDIX A - VEHICLE FLEET DISTRIBUTION CHARTS (Continued)

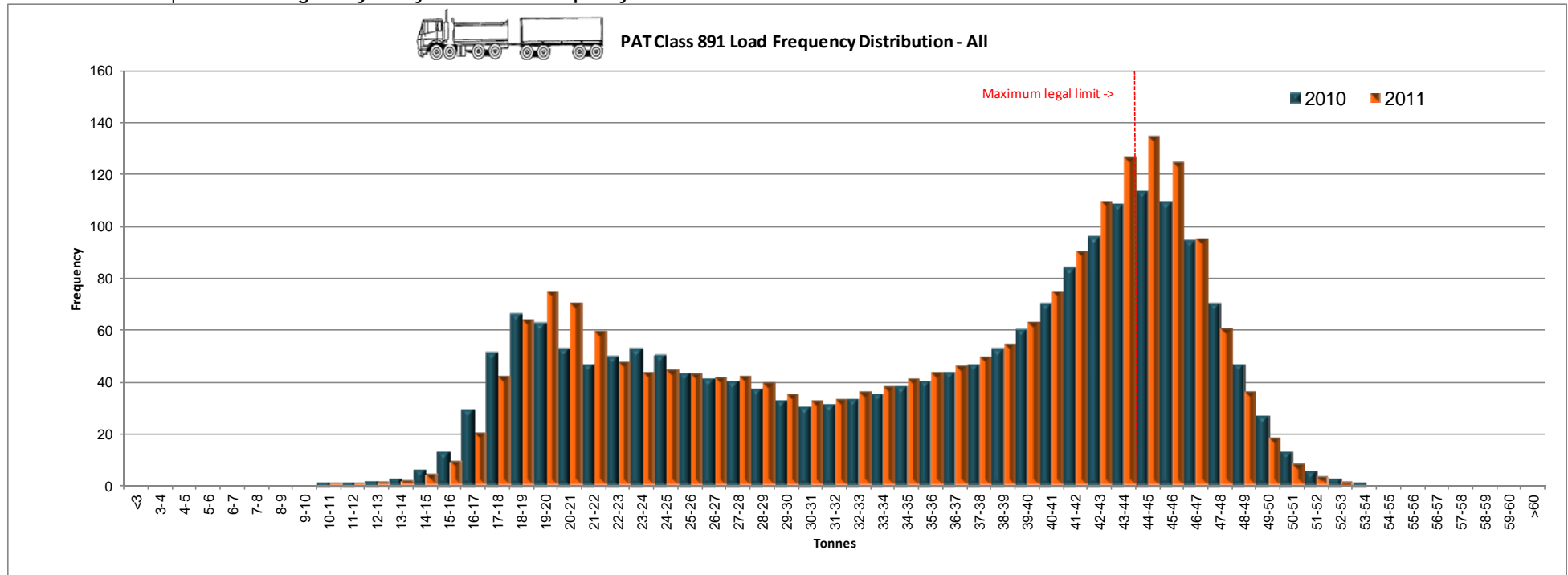
Chart 1.5 | Annual average daily heavy vehicle load frequency distribution at the Eskdale



Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

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

Chart 2.0 | Annual average daily heavy vehicle load frequency distribution of PAT Class 891 in all WiM sites

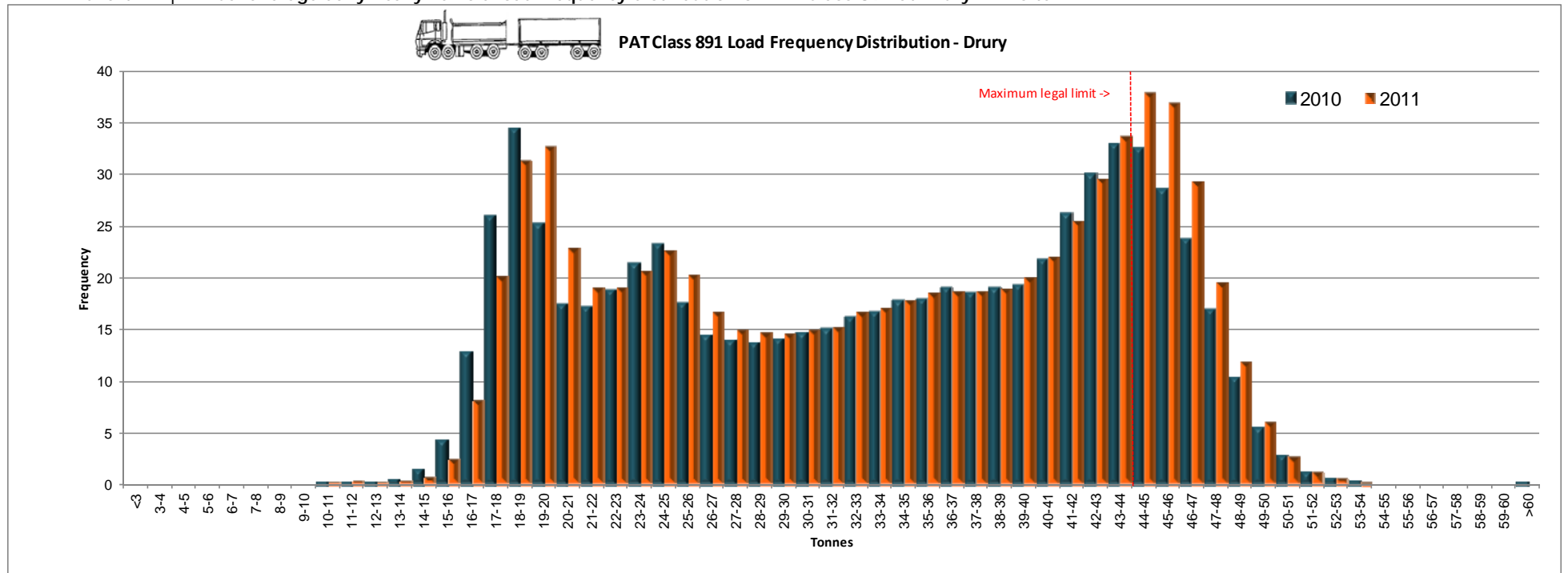


Interpretation: PAT class 891 shows increases between 18-19 to 47-48 load bands except for 23-24 load band.

Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

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

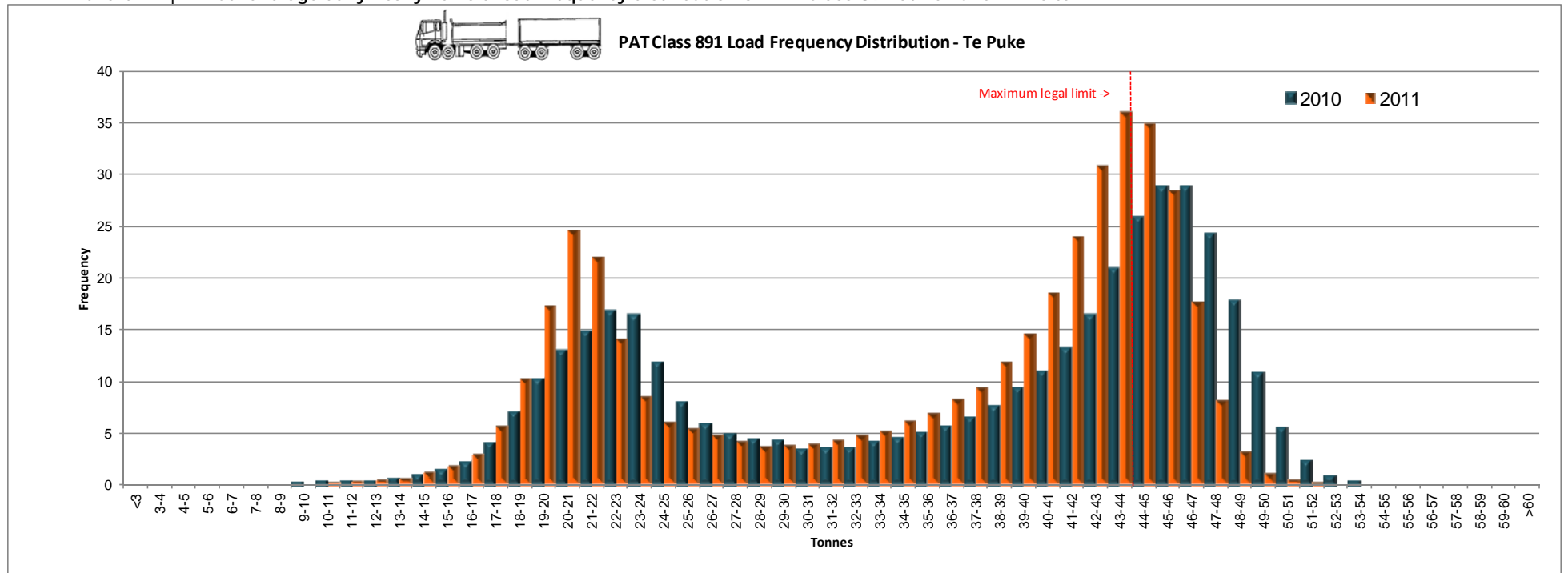
Chart 2.1 | Annual average daily heavy vehicle load frequency distribution of PAT Class 891 at Drury WiM site



Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

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

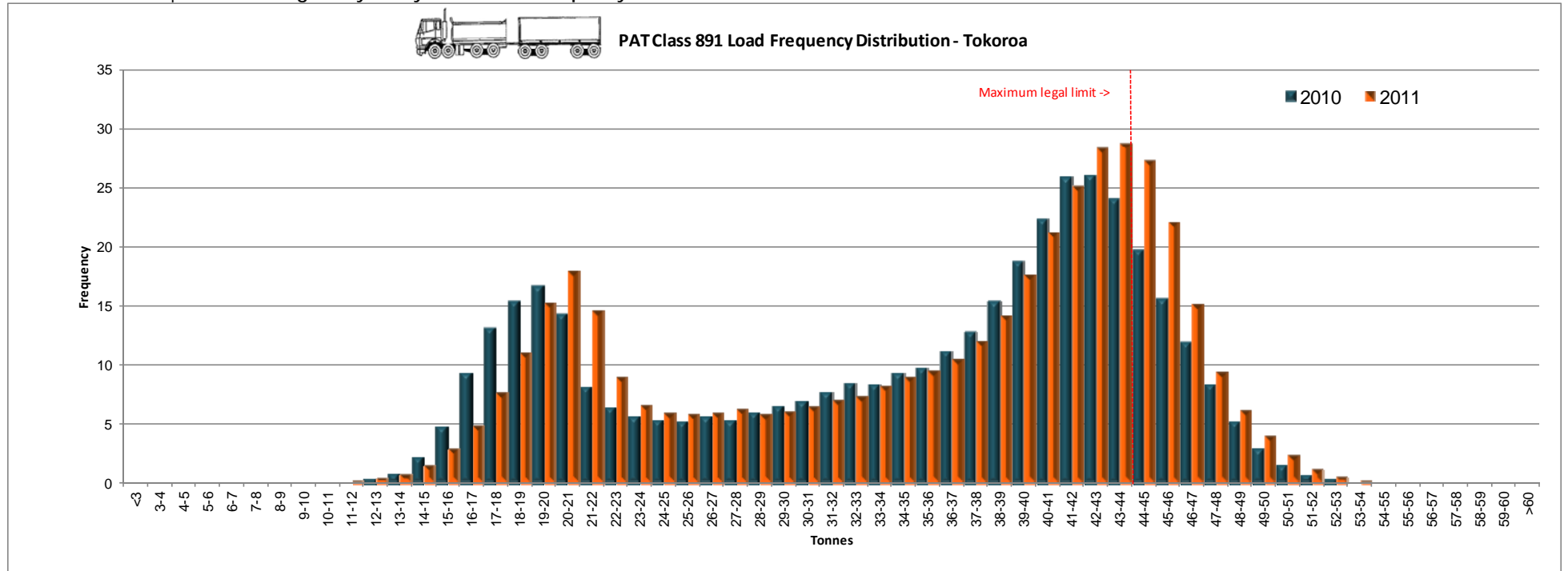
Chart 2.2 | Annual average daily heavy vehicle load frequency distribution of PAT Class 891 at Te Puke WiM site



Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

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

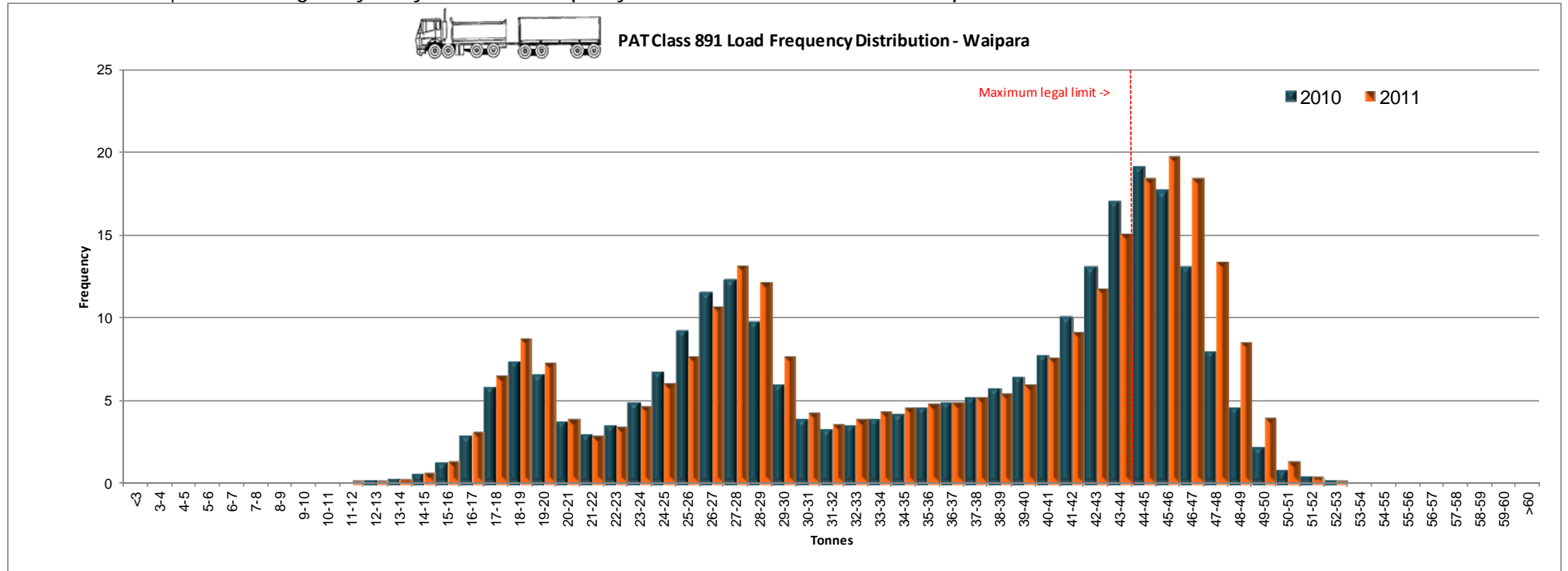
Chart 2.3 | Annual average daily heavy vehicle load frequency distribution of PAT Class 891 at Tokoroa WiM site



Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

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

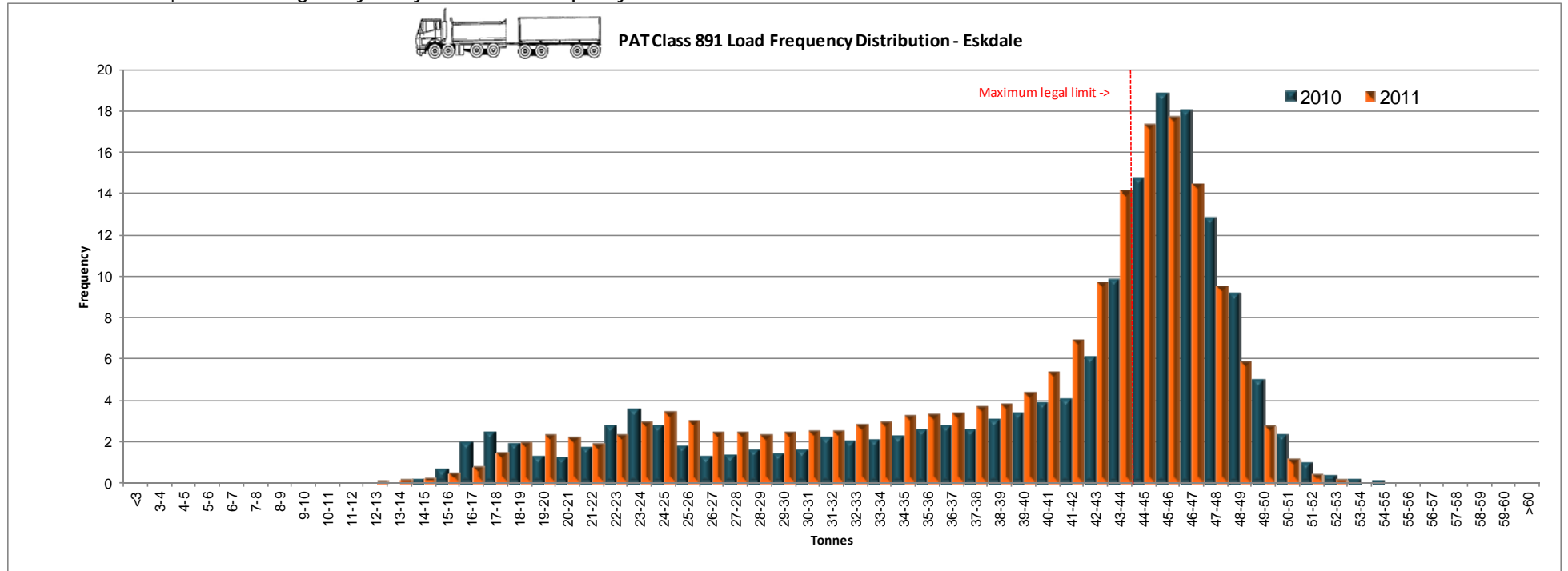
Chart 2.4 | Annual average daily heavy vehicle load frequency distribution of PAT Class 891 at Waipara WiM site



Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

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

Chart 2.5 | Annual average daily heavy vehicle load frequency distribution of PAT Class 891 at Eskdale WiM site



Note: Maximum legal limit (VDAM) without HPMV or on overweight permits.

18.0 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 3.0 | All WiM Sites

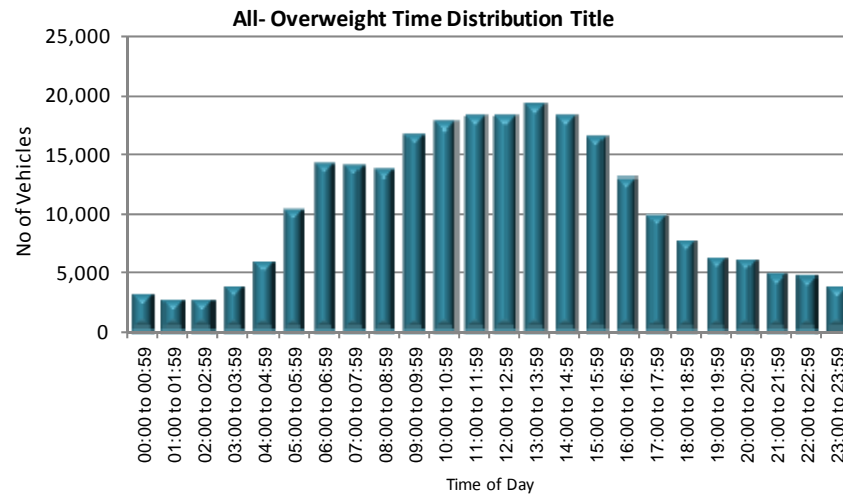


Chart 3.1 | Drury

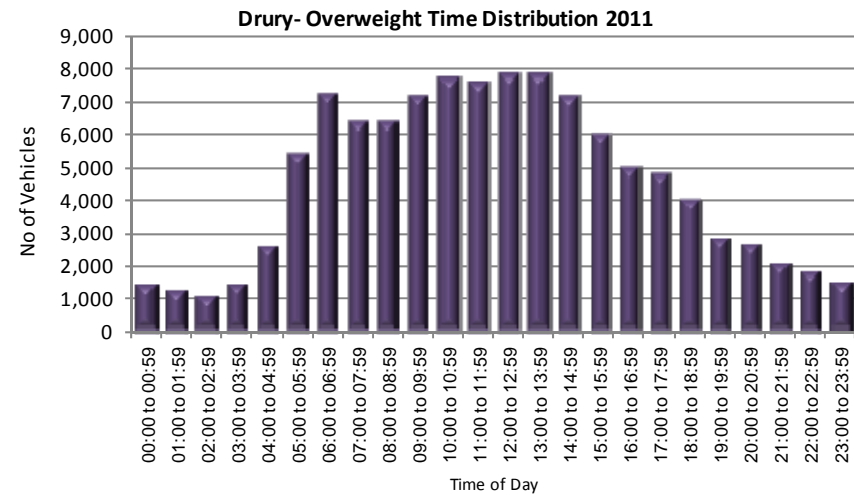


Chart 3.2 | Eskdale

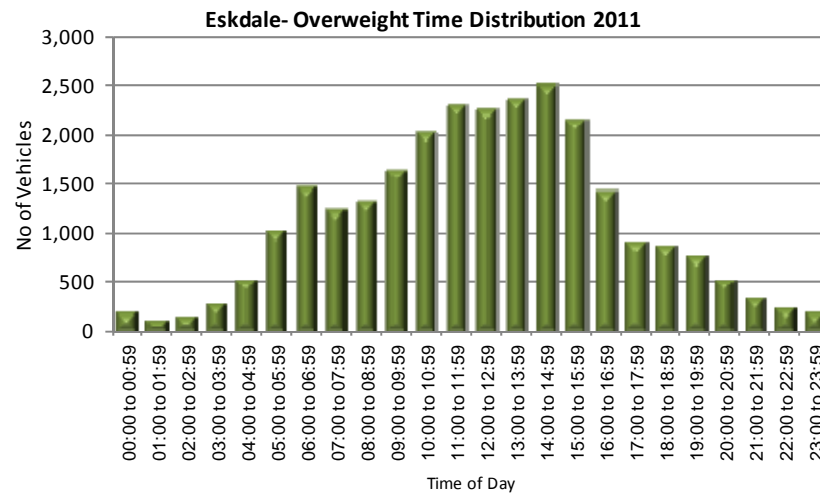
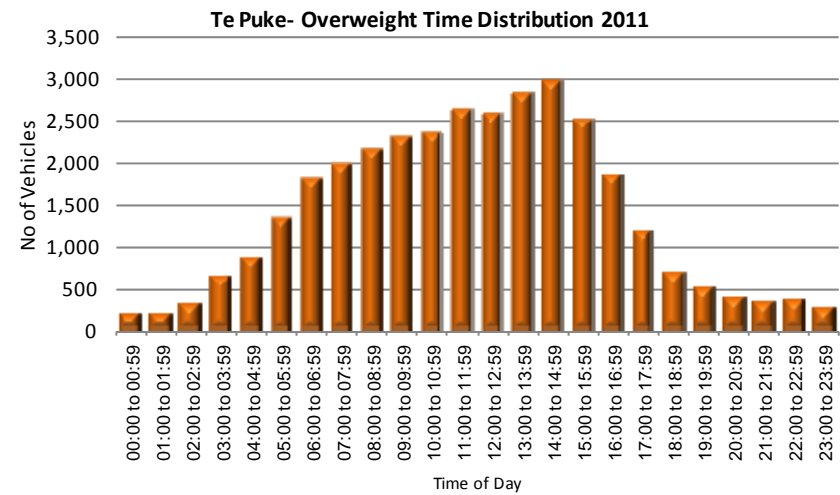


Chart 3.3 | Te Puke



18.0 APPENDIX C - VEHICLE FLEET OVERWEIGHT CHARTS (Continued)

Chart 3.4 | Tokoroa

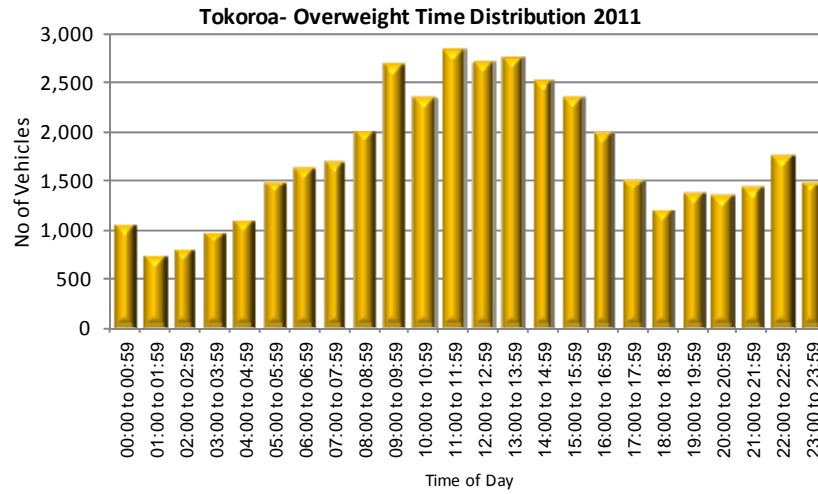
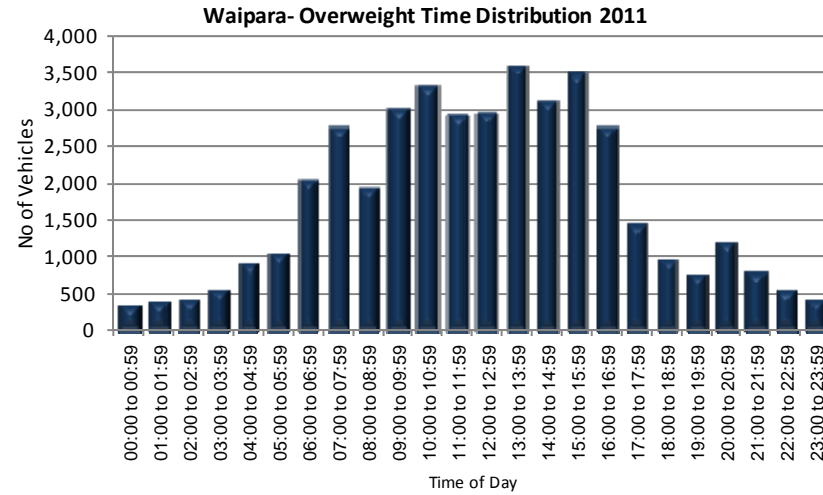


Chart 3.5 | Waipara



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.

19.0 APPENDIX D – PAT CLASS 891 OVERWEIGHT CHARTS

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

Chart 4.0 | All WiM sites

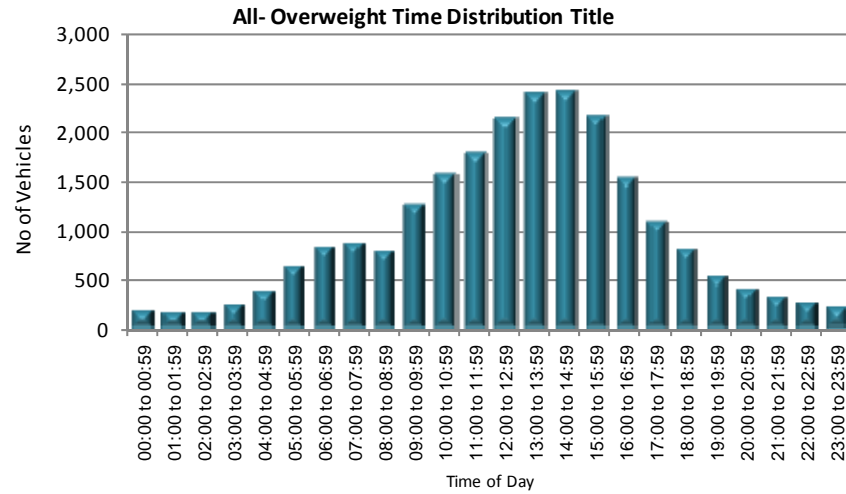


Chart 4.1 | Drury

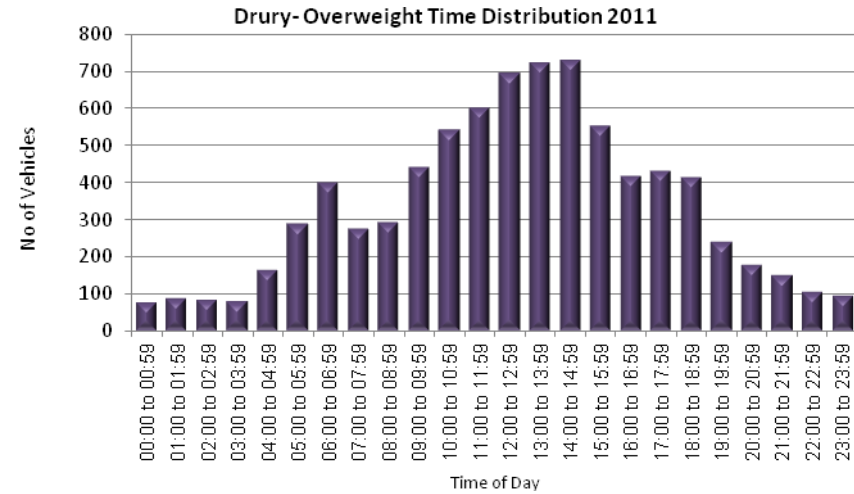


Chart 4.2 | Eskdale

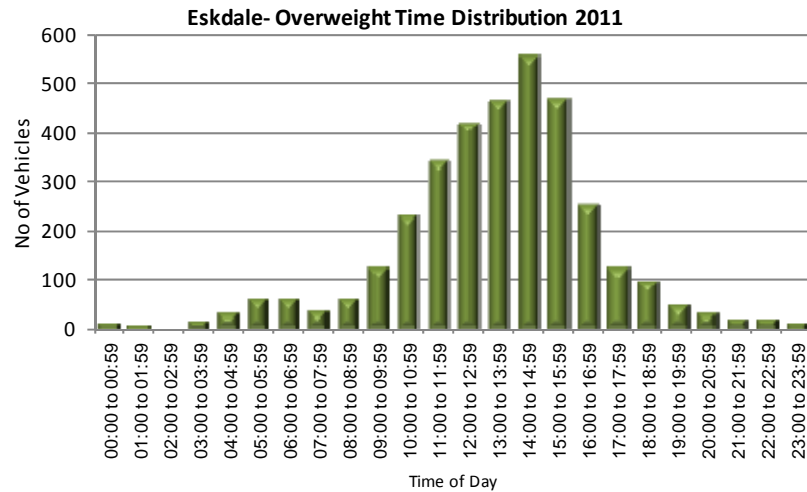
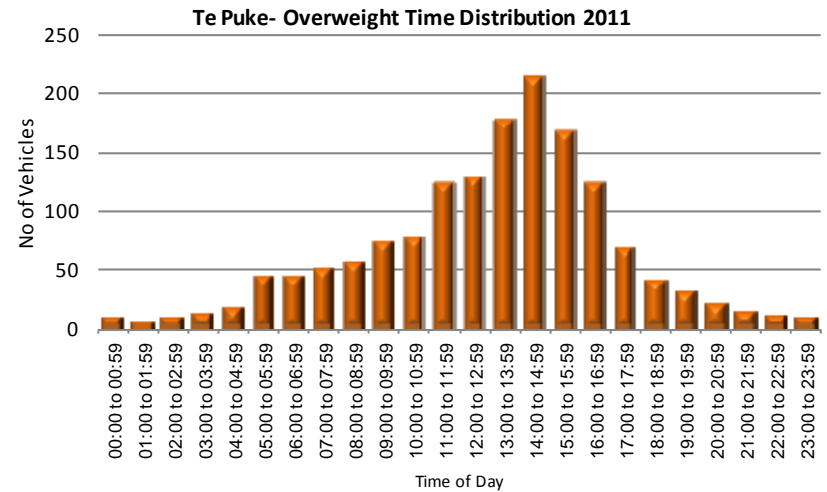


Chart 4.3 | Te Puke



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

Chart 4.4 | Tokoroa

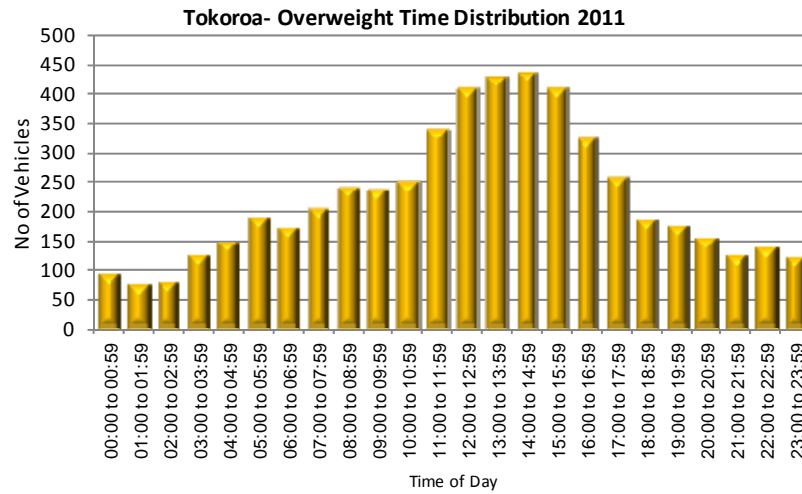
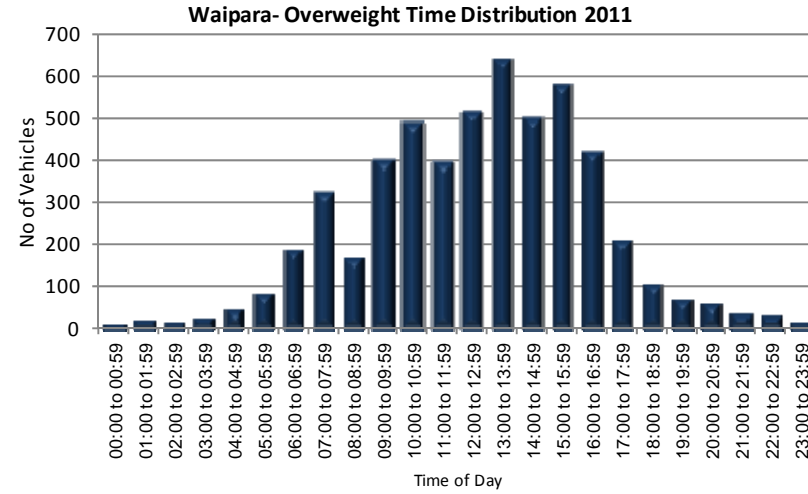
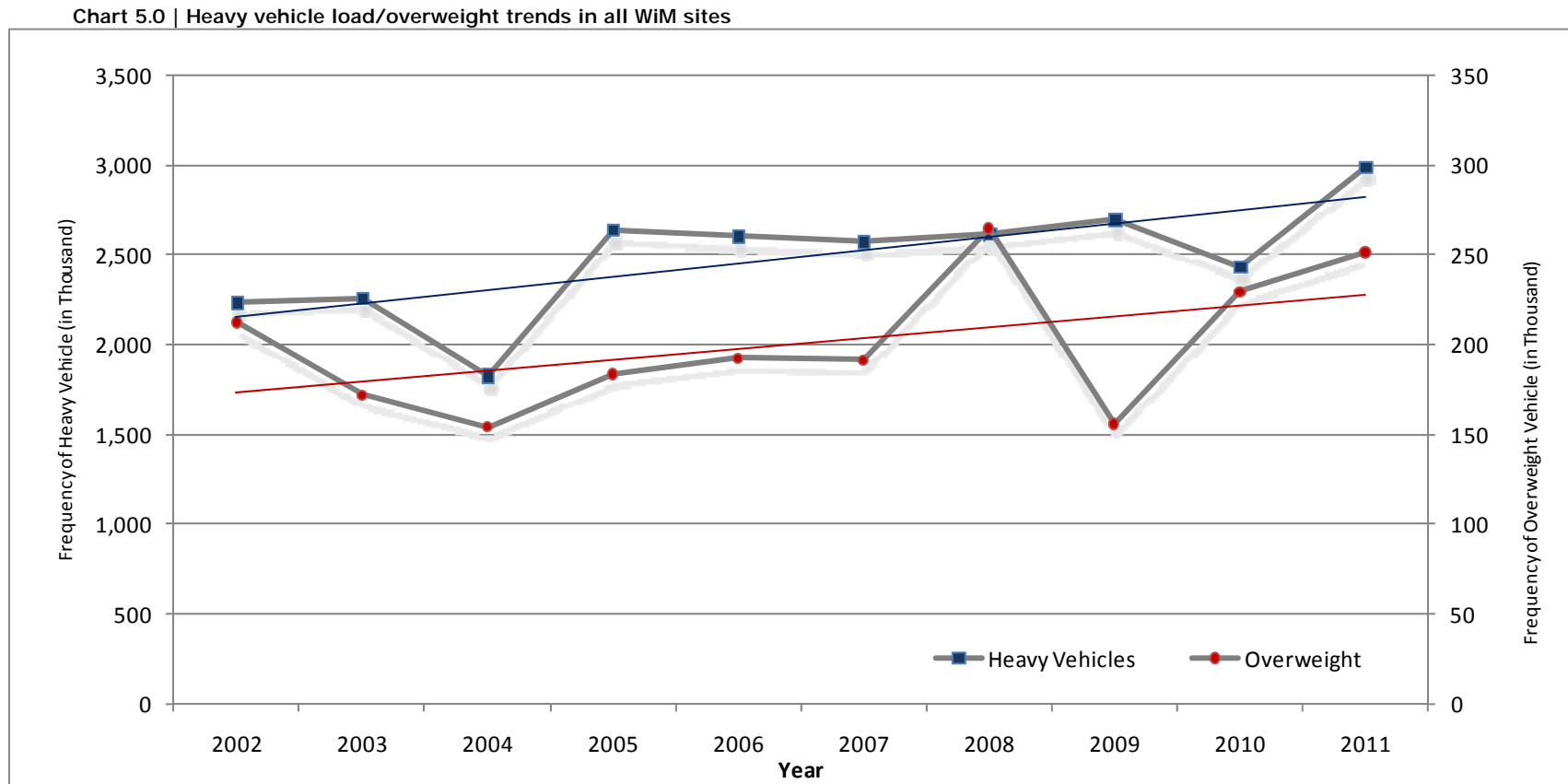


Chart 4.5 | Waipara



Interpretation: Most of WiM sites show that overweight PAT Class 891 recorded greater than 48 Tonnes load peak starts at 12 noon to 3 pm.

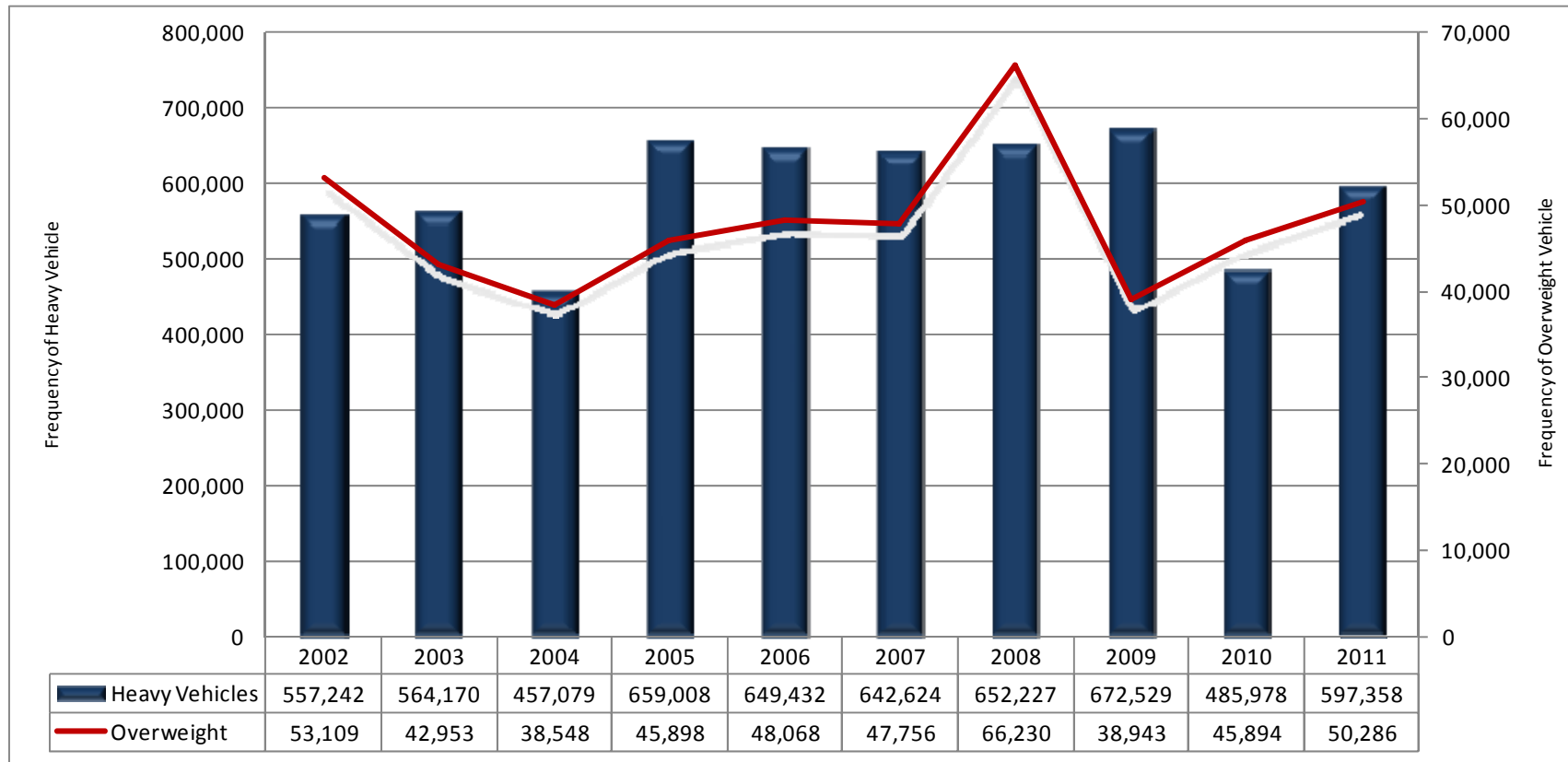
20.0 APPENDIX E - HEAVY VEHICLES LOAD/OVERWEIGHT TRENDS



Interpretation: In 2011, total heavy and overweight vehicles show increases from the previous year. Both also show increasing trends.

20.0 APPENDIX E - HEAVY VEHICLES LOAD/OVERWEIGHT TRENDS (Continued)

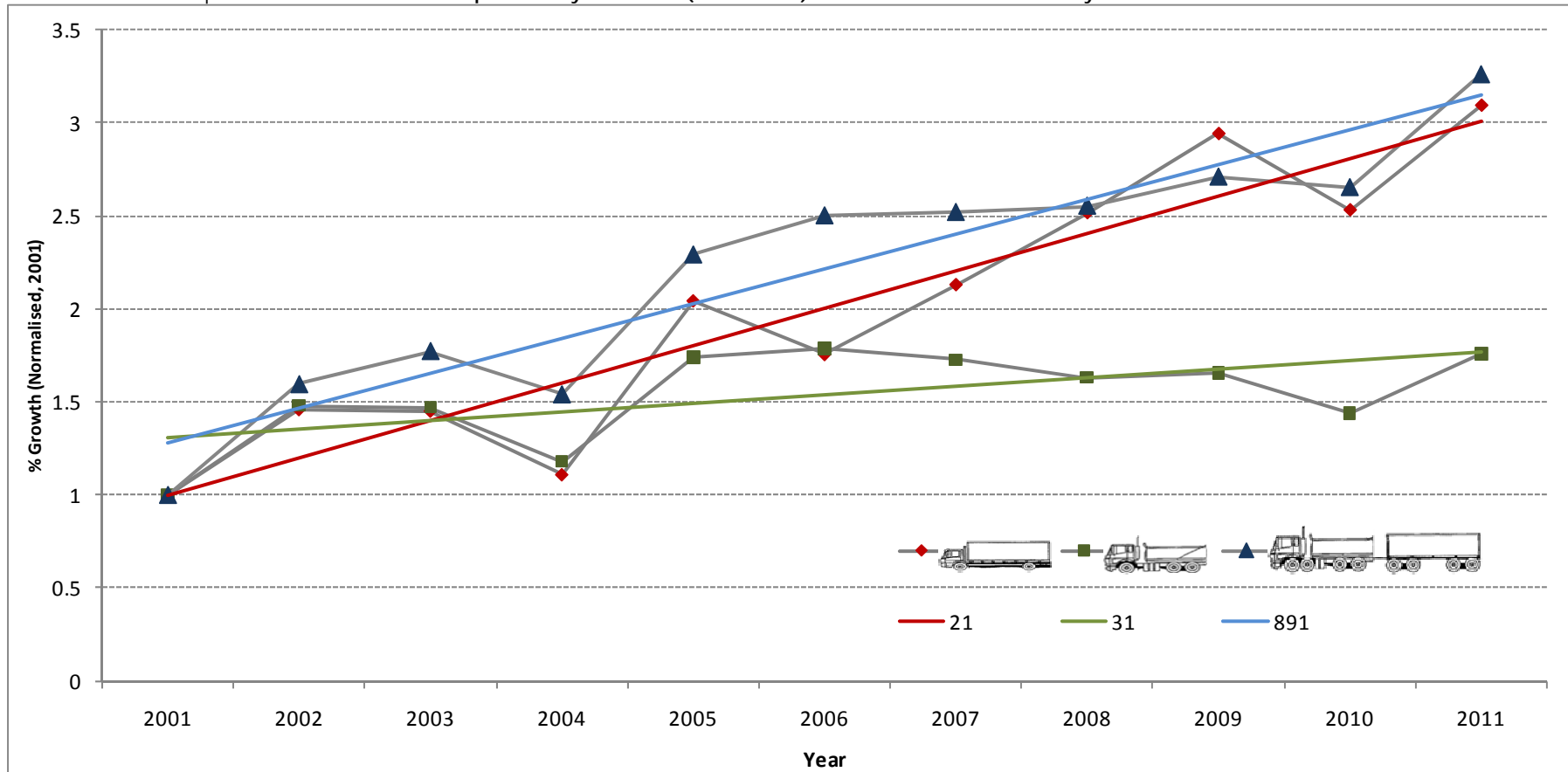
Chart 5.1 | Average heavy vehicle load/overweight in all WiM sites



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

21.0 APPENDIX F - VEHICLE FLEET TRENDS

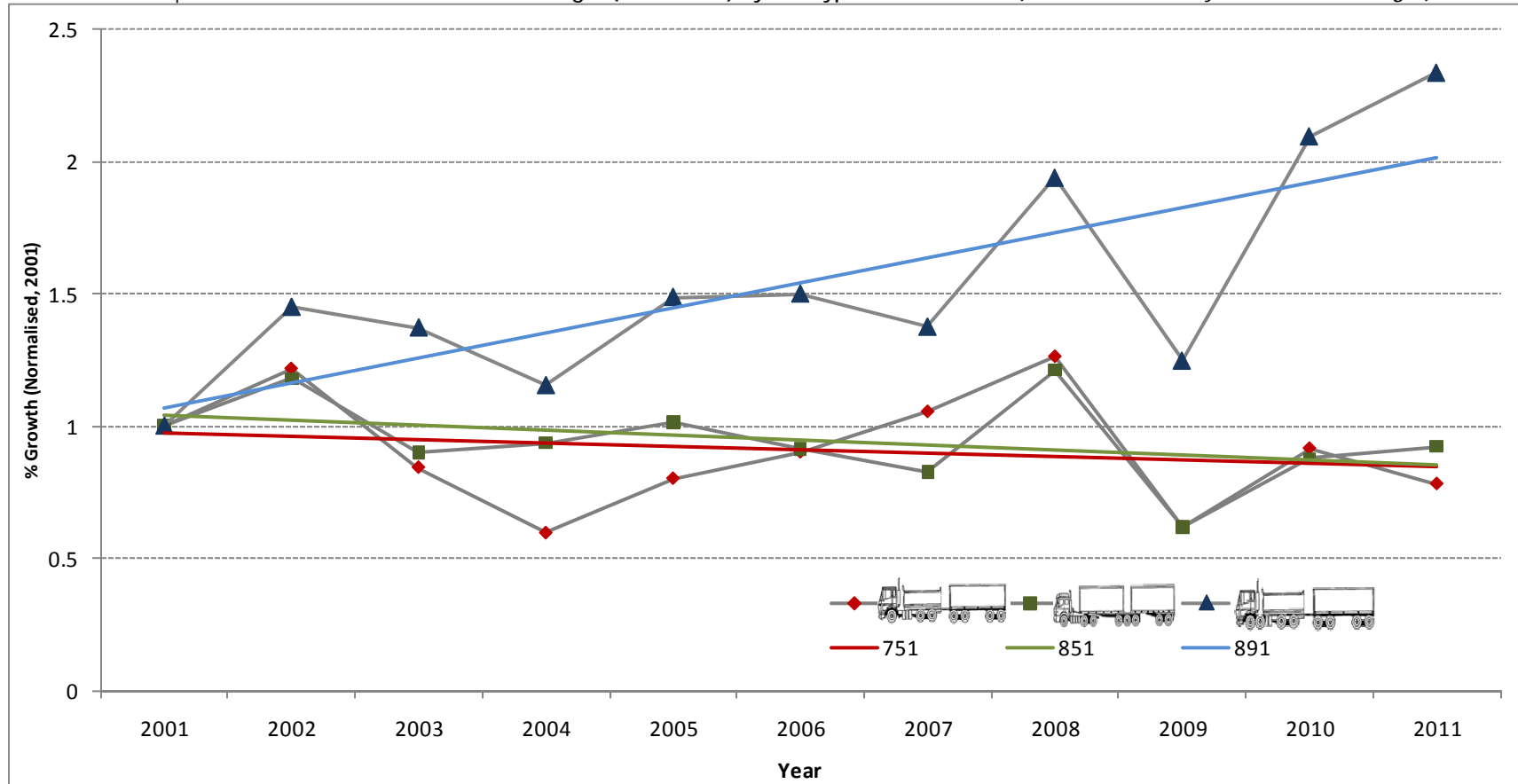
Chart 6.0 | Growth in vehicle fleet frequencies by PAT class (2001-2011) in all WiM sites - Trend analysis



Interpretation: The three most frequent PAT classes (891, 21, and 31) show an increasing trend in the long-term. However, all experienced decreases in 2010 but rebounded in 2011.

22.0 APPENDIX G - VEHICLE FLEET OVERWEIGHT TRENDS

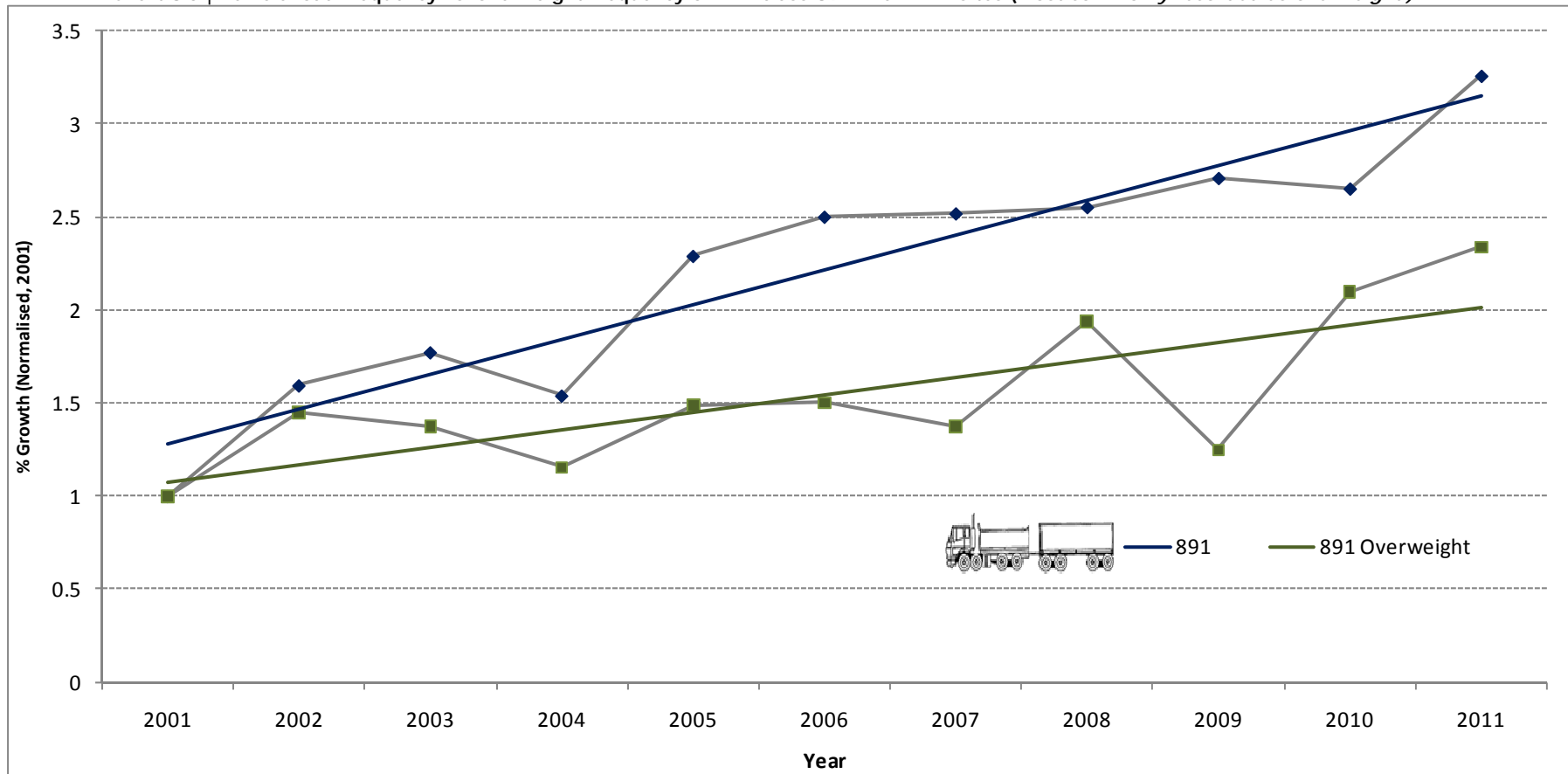
Chart 7.0 | Growth in vehicles recorded as overweight (2001-2011) by PAT type in all WiM sites (Three most commonly recorded as overweight.)



Interpretation: PAT class 891 continues to report an increasing overweight trend; PAT class 751 illustrates a slightly flat trend; while PAT class 851 shows a declining trend.

23.0 APPENDIX H - VEHICLE FLEET FREQUENCY vs OVERWEIGHT CHARTS

Chart 8.0 | Vehicle load frequency vs. overweight frequency of PAT class 891 in 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 – 2011.

22.VEHICLE FLEET FREQUENCY vs OVERWEIGHT CHARTS (Continued)

Chart 8.1 | Vehicle load frequency vs. overweight frequency PAT class 751 in all WiM sites

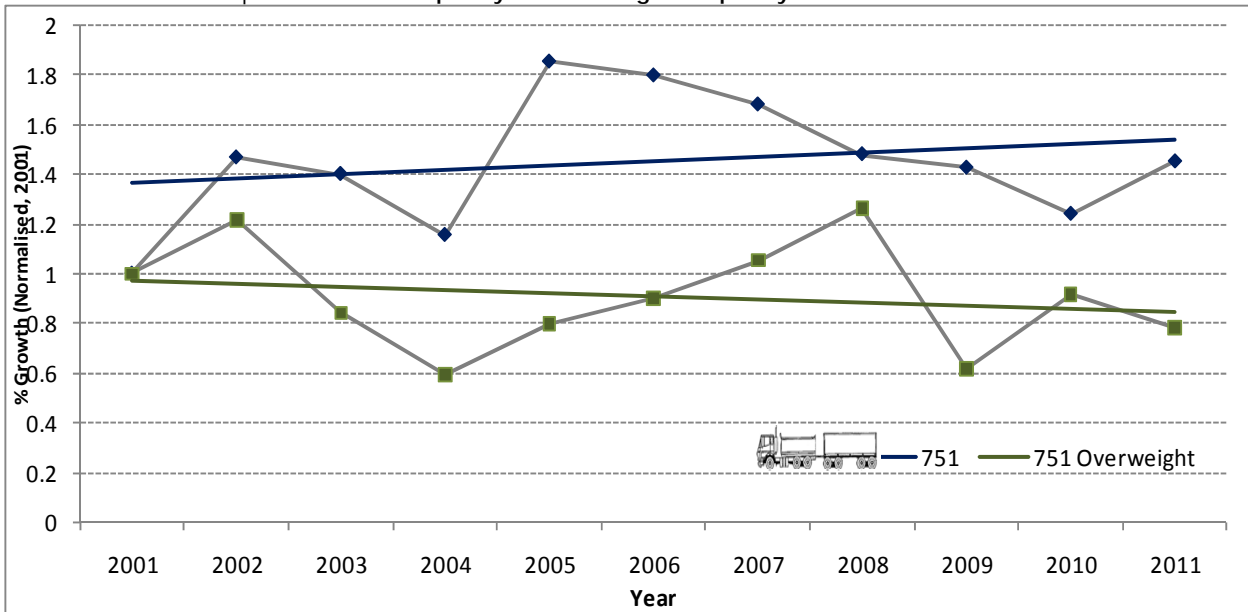


Chart 8.2 | Vehicle load frequency vs. overweight frequency PAT class 851 in all WiM site

