



**WIM #34
MN 23, MP 122.1
CLARA CITY, MN**

APRIL 2011

**MONTHLY
REPORT**



Your Destination... Our Priority



In order to understand the vehicle classes and groupings the Mn/DOT “Vehicle Classification Scheme” and the “Vehicle Class Groupings for Forecasting” are shown on the WIM Reports home page at

http://www.dot.state.mn.us/traffic/data/html/wim_reports.html

For the month of April 2011, the system was operating normally. The data in this report uses the data that was collected for the month, no extrapolation.

VOLUME

For WIM #34 on MN 23 at mile post 122.1 near Clara City, the volume was 92,886 vehicles for the month of April. The Average Daily Traffic (ADT) and Heavy Commercial Average Daily Traffic (HCADT) for April 2011 was 3,096 and 399, respectively. Of the heavy commercial vehicles, the top two in volume were the Class 9’s and 5’s. Figure 1 shows the average number of vehicles, broken down by direction, versus day of the week. The average numbers of vehicles for both northbound (NB) and southbound (SB) peaked on Fridays and was lowest on Tuesdays for both directions. Figure 2 shows the passenger vehicles (Class 1, 2, and 3), and heavy commercial vehicles (Class 4 to 13) by direction versus hour of day. For April the NB passenger vehicles peaked between 12 noon and 6 pm and the SB passenger vehicles peaked between 12 noon and 7 pm. The passenger vehicles were reviewed for directional volume differences and there about the same number going in either direction. For April the NB heavy commercial vehicles had a peak between 9 am and 5 pm and SB heavy commercial vehicles had a peak between 8 am and 5 pm. There were more heavy commercial vehicles going SB.

VEHICLE CLASSIFICATION

The traffic volume consisted of 80,920 passenger vehicles (87.1%) and 11,966 heavy commercial vehicles (12.9%). Table 1 summarizes vehicle class volumes and percentages; and overweight vehicles and the percentages as compared to total overweight vehicles.

OVERWEIGHT VEHICLES

The normal maximum allowable weight for a single axle is 20,000 pounds; tandem axles, spaced 8’ or less, can be up to 34,000 pounds; tridem axles, spaced 9’ or less, can be up to 43,000 pounds; quad axles, spaced 13’ or less, can be up to 51,000 pounds; and the maximum GVW is 80,000 pounds.

The total volume and total heavy commercial volume for April 2011 was 92,886 and 11,966, respectively. The total number of vehicles that were overweight was 2,314 or 2.5% of the total traffic or 19.3% of the heavy commercial vehicles. Figure 1 shows the average number of overweight vehicles, broken down by direction, versus day of the week. The average numbers of overweight vehicles for the NB direction peaked on Thursdays and peaked on Wednesdays for SB. For both directions the average number of overweight vehicles was lowest on weekends. The top two overweight violators by class were the Class 9’s and the Class 10’s. Overweight vehicles by class versus hour of the day are shown in Figure 3. The Class 9 overweight vehicles peaked between 9

am and 4 pm. The overweight vehicles were also reviewed to determine if there is a NB and SB difference. Figure 4 shows the total, NB, and SB overweight vehicles versus hour of the day. Figure 4 shows that for April 2011, 37% more overweight vehicles were going in the SB direction.

Figure 5 shows the gross vehicle weight for Class 9's and 10's in both the NB and SB direction. From Figure 5, it is apparent that the Class 9's had more full vehicles than empty vehicles in the SB direction and more empty than full in the NB direction. The Class 10's had more empty than full vehicles in the SB direction and more full than empty in the NB direction.

For weight enforcement the WIMs are a screening tool. Currently, piezo-quartz WIM systems are considered to be accurate within 5% to 10% on Gross Vehicle Weight (GVW). During normal load limits and with an accuracy of about 10% anything over a GVW of 88,000 pounds is overweight. For the most efficient use of personnel and equipment, these are the vehicles that should be weighed on static scales and reviewed for permits. In the NB direction during the normal load limits there were 123 vehicles over 88,000 pounds, 21 were Class 9's and 23 were Class 10's. In the SB direction during the normal load limits there were 171 vehicles over 88,000 pounds, 100 were Class 9's and 54 were Class 10's. Table 2 summarizes the Top 10 Gross Vehicle Weight for Class 9 and Class 10 vehicles for the month of April 2011.

SPEED

The speed limit on MN 23 at the WIM site is 60 mph. For April 2011 for both lanes, WIM #34 recorded an average speed of 61 mph, the median speed was 61 mph, and the 85th percentile speed was 64 mph. Table 3 summarizes the vehicle data for the Top 20 speeders that crossed WIM #34 in the month of April. The speed of the Top 20 ranged from 83 mph up to 94 mph. Figure 6 shows the average speed of passenger vehicles and heavy commercial vehicles in both the NB and SB direction. Depending on the hour of the day there is only a 1 to 2 mph difference between the average slowest vehicles and the average fastest vehicles. Figure 7 shows the average speed versus the day of the week. For April 2011 the average speeds generally varied between 60 mph and 64 mph. Figure 8 shows the average speed by lane. As expected, there is not much difference based on direction.

BRIDGE

Bridge No. 12012 is approximately 3.8 miles north of WIM #34, and Bridge No. 12004 is 3.1 miles south of WIM #34. For the month of April 2011, WIM #34 saw 92,886 vehicles and recorded a total weight of 820,000 kips (1 kip = 1,000 pounds). Figure 9 summarizes the total gross vehicle weight (GVW) by direction and class and Figure 10 summarizes the percentages each class contributes to the total GVW. Table 4 provides details on the class breakdowns versus direction for GVW.

MATERIALS

For April 2011 a total of 7,903 ESALs passed over the pavement at WIM #34. Approximately 55.8% of the ESALs were NB and 44.2% were SB. Figure 11 graphically depicts the total ESALs by class and direction. Figure 12 summarizes the percentages that each vehicle class contributes to the total ESALs. It is interesting to note that the Class 9's provide 73.0% of the ESALs while they are only 36.8% of the total gross vehicle weight. Table 5 provides details on the class breakdowns versus direction for ESALs. Table 5 also provides the flexible ESAL factors for each vehicle class using a terminal serviceability of 2.5 and a structural number of 5.

Reviewing the ESALs in the 2 lanes for April 2011, the largest number of ESALs is in Lane 1, the NB driving lane. Therefore, the design lane would be the NB driving lane and the growth factor for this section of of MN 23 in Chippewa County is 1.4%.

In April, for the NB driving lane, there were 430 Class 9 trucks and 170 Class 10 trucks over 80,000 pounds. These 600 vehicles generated 1,570 ESALs. If all of these trucks weighed just 80,000 pounds they would have generated 1,369 ESALs, 202 ESALs lower. If you take the April NB driving lane ESALs of 4,411 and multiply it by 12 to get an annual ESAL number, apply a growth factor of 1.4% for 20 years (1.28) and then multiply it by 20 to get a 20-year BESAL you get 1,355,000. If you go through the same process but start with a monthly value of 4,209, i.e. subtracting out all of the overweight Class 9 and 10 vehicles, you come up with 1,293,000 20-year BESALs. If you take the difference between the 20-year BESAL and divide that by 4,411, the BESALs with the overweight Class 9's and 10's you get 14.05, or the overweight Class 9's and 10's cause the pavement to reach its 20-year design life 14 months early.

This is a quick, back of the napkin calculation, this only looks at Class 9's and 10's, not the other 8 heavy commercial classes. As part of a technical implementation research project we are looking at developing a report function that will perform this calculation for all heavy commercial classes. Because the heavy commercial haulers are looking to move that tonnage of freight we will add additional legal-weight trucks so that the total tonnage being shipped stays the same.

FREIGHT

For WIM #34 for April 2011, it was calculated that approximately 121,000 tons of freight crossed the sensors. More freight was shipped SB (67,000 tons) versus NB (54,000 tons). Table 6 summarizes the number of vehicles by class and the number of empty vehicles. Table 6 and Figure 13 summarize the freight shipment by class, direction, and tonnage.

CALIBRATION

WIM #34 was calibrated on January 27, 2011. As part of the on-going monitoring to assure the performance between calibrations, gross vehicle weights and front axle weights of Class 2's, 3's, and 9's are being monitored on a monthly basis. Table 7 summarizes the gross vehicle weight of the Class 2's and 3's by lane. Currently, all Class 2's and 3's are included in this data. In the future, the goal would be to only monitor the Class 2's and 3's that are not pulling trailers. Table 8 summarizes the front axle weight

of the Class 2's, 3's, and 9's by lane. The current goal of the calibration is to first have the GVW for each class and each lane stay within a range of $\pm 5\%$ and then secondly to have each individual axle stay within a range of $\pm 9\%$. As you can see in Table 7, the GVW was within the range of $\pm 5\%$ for both Classes in Lane 1 only. In Table 8 the front axle weight stayed within $\pm 9\%$ for all Classes in both Lanes except Class 9 in Lane 2.

Past WIM research indicates that an unloaded Class 9 should weigh 28 to 32 kips. Data from the MnROAD site indicates that this unloaded range may have moved a little higher. The range for loaded Class 9's is generally in the 70 to 80 kip range but varies more by site and season. Figures 14 and 15 shows histograms of the monthly GVW of Class 9's over the last 11 months for Lanes 1 and 2. Figure 16 is a graph of the unloaded and loaded peaks by lane versus date. There are enough Class 9's in Lanes 1 and 2 that a weekly histogram can be developed. So far WIM #34 is generally working fine and is staying in the calibration range. Over time, Lane 2 is staying closer to the calibration range.

SUMMARY

For April 2011 the average volumes peaked on Fridays in both directions. The overweight vehicles for NB direction peaked on Thursdays and peaked on Wednesdays for SB. There were 37% more overweight vehicles going SB as compared to NB. The overweight vehicles peaked from 9 am to 4 pm. For April 2011, for the Class 9's, 24.3% of them were overweight and for the Class 10's, 41.1% of them were overweight. There were no significant differences in speed based on vehicle class, lane, or hour of the day. The GVW was higher in the NB direction 438,000 kips versus 381,000 kips SB. This agrees with the ESALs, but not the freight data. The NB ESALs were higher 4,411 versus 3,492 SB. The tonnage of freight was higher in the SB direction 67,000 versus 54,000 NB. For April, the overweight Class 9's and 10's were shortening the 20-year BESAL design life by 14 months. Table 9 provides a monthly summary of some of the key data for the site during 2010.

Attach: Table 1 – Vehicle Classification Data
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- Figure 16 – Unloaded and Loaded Peaks by Lane vs. Date

To request information from this document in an alternative electronic format, call 651-366-4718 or 1-800-657-3774 (Greater Minnesota); 711 or 1-800-627-3529 (Minnesota Relay). You may also send an e-mail to ADArequestt.dot@state.mn.us.

(Please request at least one week in advance).

TABLE 1 - VEHICLE CLASSIFICATION DATA
WIM #34 - CLARA CITY
April 2011

VEHICLE CLASS	MONTHLY AVERAGE DAILY VOLUME	MONTHLY TOTAL VOLUME	MONTHLY TOTAL VOLUME PERCENTAGE	MONTHLY TOTAL OVERWEIGHT VEHICLES	MONTHLY TOTAL OVERWEIGHT PERCENTAGE
C1	0	0	0.0%	0	0.0%
C2	1,745	52,361	56.4%	0	0.0%
C3	952	28,559	30.7%	0	0.0%
C4	10	302	0.3%	32	1.4%
C5	83	2,484	2.7%	40	1.7%
C6	19	582	0.6%	76	3.3%
C7	1	27	0.0%	11	0.5%
C8	20	587	0.6%	19	0.8%
C9	234	7,024	7.6%	1,709	73.9%
C10	22	669	0.7%	275	11.9%
C11	2	49	0.1%	0	0.0%
C12	4	117	0.1%	45	1.9%
C13	4	125	0.1%	107	4.6%
TOTAL =	3,096	92,886	100.0%	2,314	100.0%

TABLE 2 - TOP 10 GROSS VEHICLE WEIGHT, CLASS 9 AND CLASS 10
WIM #34 - CLARA CITY
April 2011

DATE	DAY OF WEEK	TIME	VEHICLE CLASS	DIRECTION	LANE	GVW (lbs)
4/28/11	Thursday	13:02:42	10	Northbound	1	114,000
4/10/11	Sunday	14:37:57	9	Southbound	2	113,000
4/4/11	Monday	13:26:24	10	Southbound	2	109,000
4/30/11	Saturday	14:43:50	10	Southbound	2	109,000
4/14/11	Thursday	2:26:08	9	Southbound	2	108,000
4/11/11	Monday	17:04:14	10	Northbound	1	107,000
4/7/11	Thursday	12:23:58	10	Northbound	1	105,000
4/12/11	Tuesday	12:46:49	10	Southbound	2	104,000
4/26/11	Tuesday	13:43:00	10	Southbound	2	104,000
4/8/11	Friday	13:14:16	10	Northbound	1	103,000

TABLE 3 - TOP 20 SPEEDERS
WIM #34 - CLARA CITY
April 2011

DATE	DAY OF WEEK	TIME	VEHICLE CLASS	DIRECTION	LANE	SPEED (mph)
4/20/11	Wednesday	1:55:33	2	Northbound	1	94
4/30/11	Saturday	18:30:16	2	Northbound	1	94
4/6/11	Wednesday	14:47:49	2	Northbound	1	92
4/26/11	Tuesday	10:28:14	3	Northbound	1	92
4/19/11	Tuesday	23:00:16	3	Southbound	2	89
4/10/11	Sunday	19:19:44	2	Southbound	2	88
4/25/11	Monday	7:14:52	3	Northbound	1	87
4/1/11	Friday	22:39:35	2	Northbound	1	86
4/2/11	Saturday	11:38:00	2	Northbound	1	86
4/5/11	Tuesday	8:57:56	3	Northbound	1	86
4/17/11	Sunday	23:51:55	3	Northbound	1	86
4/24/11	Sunday	14:36:16	2	Northbound	1	86
4/19/11	Tuesday	0:21:57	2	Southbound	2	85
4/22/11	Friday	3:04:56	2	Southbound	2	85
4/22/11	Friday	7:08:38	3	Northbound	1	85
4/25/11	Monday	5:34:36	3	Northbound	1	85
4/28/11	Thursday	5:26:49	3	Northbound	1	85
4/30/11	Saturday	23:58:13	2	Northbound	1	84
4/6/11	Wednesday	6:09:32	2	Southbound	2	83
4/6/11	Wednesday	15:59:36	3	Southbound	2	83

TABLE 4 - GROSS VEHICLE WEIGHT BY CLASS AND DIRECTION
WIM #34 - CLARA CITY
April 2011

VEHICLE CLASS	NB DRIVING LANE (Kips)	SB DRIVING LANE (Kips)	TOTAL (Kips)	PERCENTAGE
C1	21	25	46	0.0%
C2	101,266	104,924	206,190	25.2%
C3	90,628	87,556	178,184	21.7%
C4	3,135	1,300	4,435	0.5%
C5	22,228	26,760	48,988	6.0%
C6	9,418	6,593	16,011	2.0%
C7	913	57	970	0.1%
C8	11,594	9,128	20,723	2.5%
C9	170,570	131,074	301,645	36.8%
C10	24,437	11,317	35,754	4.4%
C11	1,103	1,116	2,218	0.3%
C12	1,308	1,286	2,594	0.3%
C13	1,560	289	1,849	0.2%
TOTAL =	438,181	381,425	819,606	100.0%
GVW/LANE =	53.5%	46.5%		

**TABLE 5 - ESALs BY CLASS AND DIRECTION AND FLEXIBLE ESAL FACTORS
WIM #34 - CLARA CITY
April 2011**

VEHICLE CLASS	NB DRIVING LANE	SB DRIVING LANE	TOTAL	PERCENTAGE	FLEXIBLE ESAL FACTOR
C1	0	0	0	0.0%	0.0004
C2	20	25	45	0.6%	0.0006
C3	40	43	83	1.1%	0.0021
C4	73	44	117	1.5%	0.69
C5	271	311	583	7.4%	0.24
C6	209	115	324	4.1%	0.45
C7	18	2	20	0.3%	1.15
C8	108	144	252	3.2%	0.28
C9	3,176	2,597	5,772	73.0%	0.75
C10	430	163	593	7.5%	0.79
C11	14	25	39	0.5%	0.36
C12	16	17	33	0.4%	0.39
C13	36	5	41	0.5%	4.60
TOTAL =	4,411	3,492	7,903	100.0%	
ESALS/LANE =	55.8%	44.2%			

**TABLE 6 - FREIGHT SUMMARY
WIM #34 - CLARA CITY
April 2011**

NORTHBOUND

VEHICLE CLASS	WEIGHT OF EMPTY VEHICLE (Kips)	TOTAL NUMBER OF VEHICLES	NUMBER OF EMPTY VEHICLES	PERCENTAGE OF EMPTY VEHICLES	TOTAL WEIGHT OF FREIGHT & VEHICLES (Kips)	WEIGHT OF EMPTY VEHICLES (Kips)	TOTAL WEIGHT OF FREIGHT (Tons)
C4	15.0	176	18	10.2%	5,145	224	1,276
C5	8.0	1,121	57	5.1%	18,940	420	5,004
C6	19.0	292	24	8.2%	9,602	413	2,049
C7	11.5	24	0	0.0%	1,287	0	506
C8	31.0	275	130	47.3%	8,491	3,196	400
C9	33.0	3,254	643	19.8%	171,588	19,485	32,970
C10	33.5	380	22	5.8%	26,140	650	6,749
C11	36.5	26	4	15.4%	1,183	116	132
C12	36.5	88	2	2.3%	6,339	45	1,578
C13	31.5	102	0	0.0%	9,561	0	3,174
TOTAL =		5,738	900	15.7%	258,276	--	53,836

SOUTHBOUND

VEHICLE CLASS	WEIGHT OF EMPTY VEHICLE (Kips)	TOTAL NUMBER OF VEHICLES	NUMBER OF EMPTY VEHICLES	PERCENTAGE OF EMPTY VEHICLES	TOTAL WEIGHT OF FREIGHT & VEHICLES (Kips)	WEIGHT OF EMPTY VEHICLES (Kips)	TOTAL WEIGHT OF FREIGHT (Tons)
C4	15.0	131	22	16.8%	3,954	287	1,016
C5	8.0	1,350	33	2.4%	22,401	244	5,811
C6	19.0	290	17	5.9%	9,174	302	1,843
C7	11.5	3	0	0.0%	170	0	68
C8	31.0	299	68	22.7%	11,177	1,384	1,316
C9	33.0	3,767	344	9.1%	226,853	10,471	51,712
C10	33.5	294	28	9.5%	16,998	818	3,635
C11	36.5	24	0	0.0%	1,347	0	236
C12	36.5	31	0	0.0%	2,213	0	541
C13	31.5	23	0	0.0%	2,011	0	643
TOTAL =		6,212	512	8.2%	296,298	--	66,818

GRAND TOTAL = 11,950 1,412 11.8% 554,574 -- 120,654

TABLE 7 - GROSS VEHICLE WEIGHT BY CLASS AND LANE
WIM #34 - CLARA CITY
April 2011

MONTH	VEHICLE CLASS	LANE 1 (Kips)	GVW ± 5%	LANE 2 (Kips)	GVW ± 5%	
May 10	C2	4.27	2.89%	4.32	9.64%	
Jun 10		4.37	5.30%	4.36	10.66%	
Jul 10		4.45	7.23%	4.48	13.71%	
Aug 10		4.40	6.02%	4.44	12.69%	
Sep 10		4.32	4.10%	4.30	9.14%	
Oct 10		3.97	--	4.10	--	
Nov 10		3.99	0.50%	4.01	-2.20%	
Dec 10		3.95	-0.50%	3.85	-6.10%	
Jan 11		3.88	-2.27%	3.76	-8.29%	
Feb 11		4.14	--	4.30	--	
Mar 11		4.12	-0.48%	4.41	2.56%	
Apr 11		4.09	-1.21%	4.52	5.12%	
May 10		C3	6.81	8.27%	6.38	5.11%
Jun 10			7.06	12.24%	7.03	15.82%
Jul 10	7.14		13.51%	7.21	18.78%	
Aug 10	7.23		14.94%	7.32	20.59%	
Sep 10	6.97		10.81%	7.02	15.65%	
Oct 10	6.15		--	6.60	--	
Nov 10	6.27		1.95%	6.36	-3.64%	
Dec 10	6.04		-1.79%	5.47	-17.12%	
Jan 11	5.89		-4.23%	5.42	-17.88%	
Feb 11	6.31		--	6.47	--	
Mar 11	6.36		0.79%	6.17	-4.64%	
Apr 11	6.42		1.74%	6.95	7.42%	

TABLE 8 - FRONT AXLE WEIGHT BY CLASS AND LANE
WIM #34 - CLARA CITY
April 2011

MONTH	VEHICLE CLASS	LANE 1 (Kips)	FRONT AXLE ± 9%	LANE 2 (Kips)	FRONT AXLE ± 9%	
May 10	C2	2.51	2.45%	2.51	9.61%	
Jun 10		2.56	4.49%	2.53	10.48%	
Jul 10		2.59	5.71%	2.58	12.66%	
Aug 10		2.57	4.90%	2.57	12.23%	
Sep 10		2.54	3.67%	2.50	9.17%	
Oct 10		2.34	--	2.39	--	
Nov 10		2.35	0.43%	2.34	-2.09%	
Dec 10		2.31	-1.28%	2.22	-7.11%	
Jan 11		2.28	-2.56%	2.18	-8.79%	
Feb 11		2.45	--	2.50	--	
Mar 11		2.44	-0.41%	2.57	2.80%	
Apr 11		2.41	-1.63%	2.63	5.20%	
May 10		C3	3.47	3.89%	3.23	1.89%
Jun 10			3.55	6.29%	3.50	10.41%
Jul 10	3.58		7.19%	3.57	12.62%	
Aug 10	3.59		7.49%	3.60	13.56%	
Sep 10	3.55		6.29%	3.50	10.41%	
Oct 10	3.25		--	3.33	--	
Nov 10	3.27		0.62%	3.27	-1.80%	
Dec 10	3.18		-2.15%	2.81	-15.62%	
Jan 11	3.13		-3.69%	2.81	-15.62%	
Feb 11	3.36		--	3.37	--	
Mar 11	3.36		0.00%	3.20	-5.04%	
Apr 11	3.35		-0.30%	3.58	6.23%	
May 10	C9		12.04	5.71%	12.34	9.88%
Jun 10			12.19	7.02%	12.22	8.82%
Jul 10		12.18	6.94%	12.49	11.22%	
Aug 10		12.26	7.64%	12.50	11.31%	
Sep 10		12.11	6.32%	12.20	8.64%	
Oct 10		11.05	--	11.62	--	
Nov 10		10.91	-1.27%	11.38	-2.07%	
Dec 10		10.62	-3.89%	10.63	-8.52%	
Jan 11		10.58	-4.25%	10.25	-11.79%	
Feb 11		11.23	--	11.90	--	
Mar 11		11.27	0.36%	12.24	2.86%	
Apr 11		11.54	4.43%	12.76	9.81%	

**TABLE 9 - SITE SUMMARY
WIM #34 - CLARA CITY
April 2011**

VEHICLE VOLUME & CLASS	MONTH	TOTAL VOLUME	MONTHLY ADT	MONTHLY HCADT	PASSENGER VEHICLES #	PASSENGER VEHICLES %	HEAVY COMMERCIAL VEHICLES #	HEAVY COMMERCIAL VEHICLES %
	May 10	109,291	3,499	495	95,102	87.0%	14,189	13.0%
	Jun 10	102,816	3,426	470	88,349	85.9%	14,467	14.1%
	Jul 10	108,406	3,475	424	95,266	87.9%	13,140	12.1%
	Aug 10	108,908	3,549	448	95,155	87.4%	13,753	12.6%
	Sep 10	102,988	3,428	473	88,518	85.9%	14,470	14.1%
	Oct 10	107,401	3,457	536	91,377	85.1%	16,024	14.9%
	Nov 10	91,835	3,148	466	77,995	84.9%	13,840	15.1%
	Dec 10	85,757	2,832	279	77,116	89.9%	8,641	10.1%
	Jan 11	78,885	2,545	282	70,132	88.9%	8,754	11.1%
	Feb 11	74,121	2,647	352	64,259	86.7%	9,862	13.3%
	Mar 11	90,768	2,928	330	80,551	88.7%	10,217	11.3%
	Apr 11	92,886	3,096	399	80,920	87.1%	11,966	12.9%
TOTAL =	1,154,062	--	--	1,004,740	--	149,323	--	
AVERAGE =	96,172	3,169	413	83,728	87.1%	12,444	12.9%	

ESALS	MONTH	ESALS NB DRIVING LANE	ESALS SB DRIVING LANE	TOTAL ESALS	PAVEMENT LIFE DECREASE MONTHS *	SYSTEM OPERATION Days	SYSTEM OPERATION %
	May 10	9,677	6,435	16,112	35.71	31	100.0%
	Jun 10	7,374	7,222	14,596	37.86	30	100.0%
	Jul 10	6,335	8,502	14,837	37.80	31	100.0%
	Aug 10	6,681	8,402	15,082	33.28	31	100.0%
	Sep 10	7,311	8,669	15,980	32.29	30	100.0%
	Oct 10	6,579	8,098	14,677	22.82	31	100.0%
	Nov 10	4,953	6,618	11,571	19.62	30	100.0%
	Dec 10	3,389	2,238	5,627	1.45	31	100.0%
	Jan 11	3,189	1,596	4,784	0.93	30	96.8%
	Feb 11	3,952	3,687	7,639	4.85	28	100.0%
	Mar 11	4,757	2,814	7,571	12.52	31	100.0%
	Apr 11	4,411	3,492	7,903	14.05	30	100.0%
TOTAL =	68,607	67,773	136,380	--	364	--	
AVERAGE =	5,717	5,648	11,365	21.1	--	99.7%	

* Based on WLI of 88,000 lbs in effect until March 8, 2010 and then again starting December 13, 2010 and ending on February 19, 2011.

**TABLE 9 - SITE SUMMARY (contd.)
WIM #34 - CLARA CITY
April 2011**

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MONTH	GVW NB DRIVING LANE	GVW SB DRIVING LANE	TOTAL GVW KIPS
May 10	660,713	446,078	1,106,791
Jun 10	550,912	502,495	1,053,407
Jul 10	530,831	577,743	1,108,574
Aug 10	548,024	593,356	1,141,380
Sep 10	557,336	589,312	1,146,648
Oct 10	566,537	599,591	1,166,129
Nov 10	479,079	514,401	993,480
Dec 10	378,439	243,106	621,545
Jan 11	338,356	222,696	561,052
Feb 11	362,451	321,889	684,340
Mar 11	431,935	267,907	699,841
Apr 11	438,181	381,425	819,606

TOTAL =	5,842,794	5,260,000	11,102,795
AVERAGE =	486,900	438,333	925,233

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MONTH	TOTAL NUMBER OF OVERWEIGHT VEHICLES *	OVERWEIGHT/ TOTAL VOLUME %	OVERWEIGHT/ HEAVY COMMERCIAL VOLUME %	NUMBER OVER 88,000 LBS	NUMBER OVER 98,000 LBS
May 10	4,672	4.3%	32.9%	962	70
Jun 10	4,031	3.9%	27.9%	879	63
Jul 10	3,286	3.0%	25.0%	899	63
Aug 10	3,285	3.0%	23.9%	772	84
Sep 10	3,759	3.6%	26.0%	737	79
Oct 10	2,941	2.7%	18.4%	322	77
Nov 10	2,300	2.5%	16.6%	298	85
Dec 10	574	0.7%	6.6%	59	16
Jan 11	432	0.5%	4.9%	68	16
Feb 11	1,694	2.3%	17.2%	340	45
Mar 11	1,916	2.1%	18.8%	212	30
Apr 11	2,314	2.5%	19.3%	294	50

TOTAL =	31,204	--	--	5,842	678
AVERAGE =	2,600	2.7%	20.9%	487	57

* Based on WLI of 88,000 lbs in effect until March 8, 2010 and then again starting December 13, 2010 and ending on February 19, 2011.

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MONTH	AVERAGE SPEED (mph)	MEDIAN SPEED (mph)	85th PERCENTILE SPEED (mph)
May 10	61	61	64
Jun 10	61	61	64
Jul 10	61	61	64
Aug 10	61	61	64
Sep 10	61	61	64
Oct 10	61	61	64
Nov 10	61	61	64
Dec 10	59	60	63
Jan 11	60	60	63
Feb 11	60	60	63
Mar 11	59	60	63
Apr 11	61	61	64

TOTAL =	--	--	--
AVERAGE =	61	61	64

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MONTH	NB FREIGHT TONS	SB FREIGHT TONS	TOTAL FREIGHT TONS	NB FREIGHT %	SB FREIGHT %
May 10	93,548	48,494	142,042	65.9%	34.1%
Jun 10	72,566	90,600	163,166	44.5%	55.5%
Jul 10	60,852	80,360	141,212	43.1%	56.9%
Aug 10	67,692	79,223	146,915	46.1%	53.9%
Sep 10	75,627	82,464	158,091	47.8%	52.2%
Oct 10	75,727	85,604	161,331	46.9%	53.1%
Nov 10	61,994	71,356	133,350	46.5%	53.5%
Dec 10	21,269	19,234	40,503	52.5%	47.5%
Jan 11	35,892	30,057	65,948	54.4%	45.6%
Feb 11	41,075	58,291	99,366	41.3%	58.7%
Mar 11	50,882	51,593	102,475	49.7%	50.3%
Apr 11	53,836	66,818	120,654	44.6%	55.4%

TOTAL =	710,959	764,094	1,475,053	--	--
AVERAGE =	59,247	63,674	122,921	48.2%	51.8%

Figure 1 - Average Volume and Average Overweight Volume vs. Day of the Week

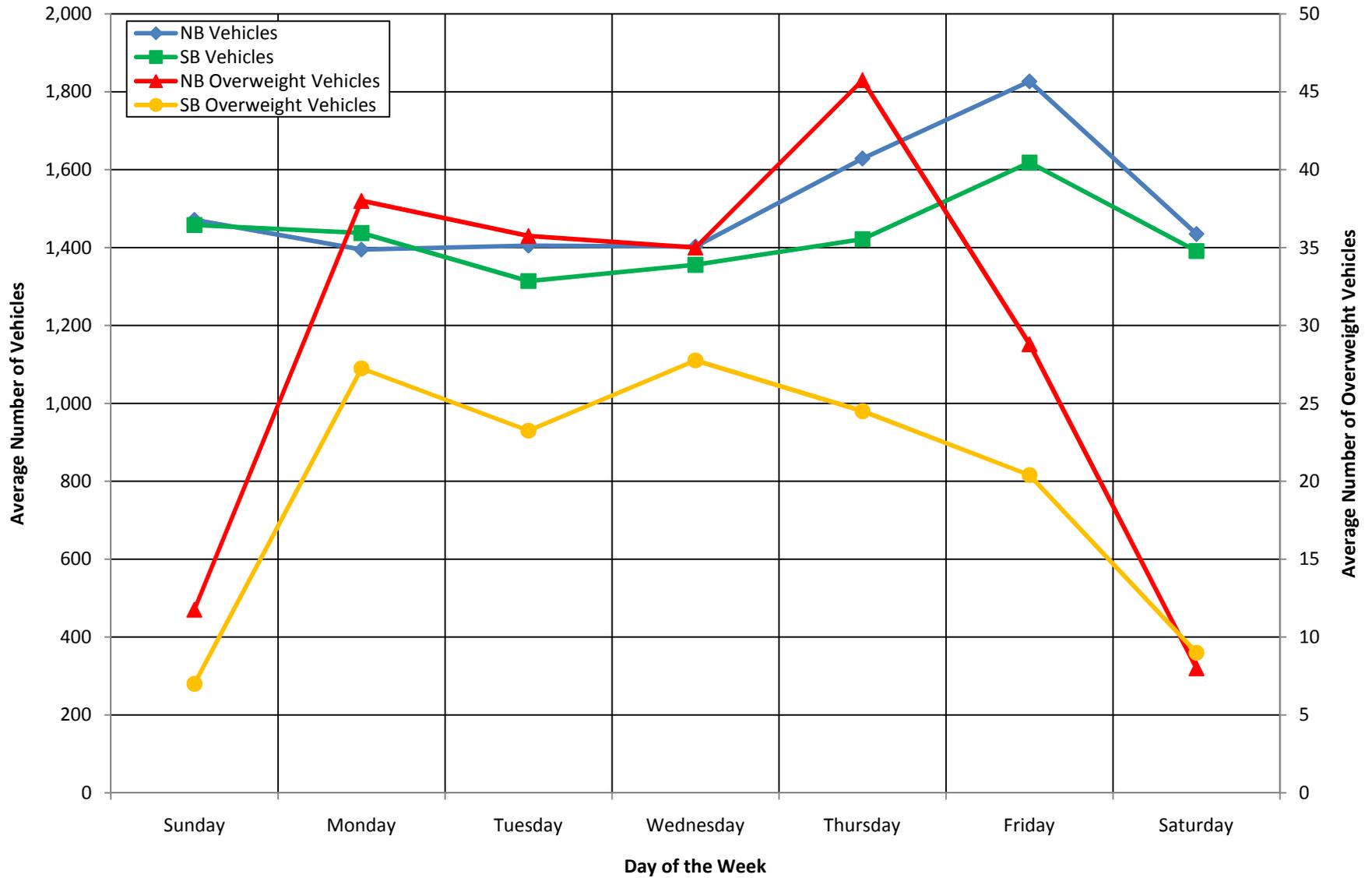


Figure 2 - Passenger and Heavy Commercial Vehicles vs. Hour of the Day

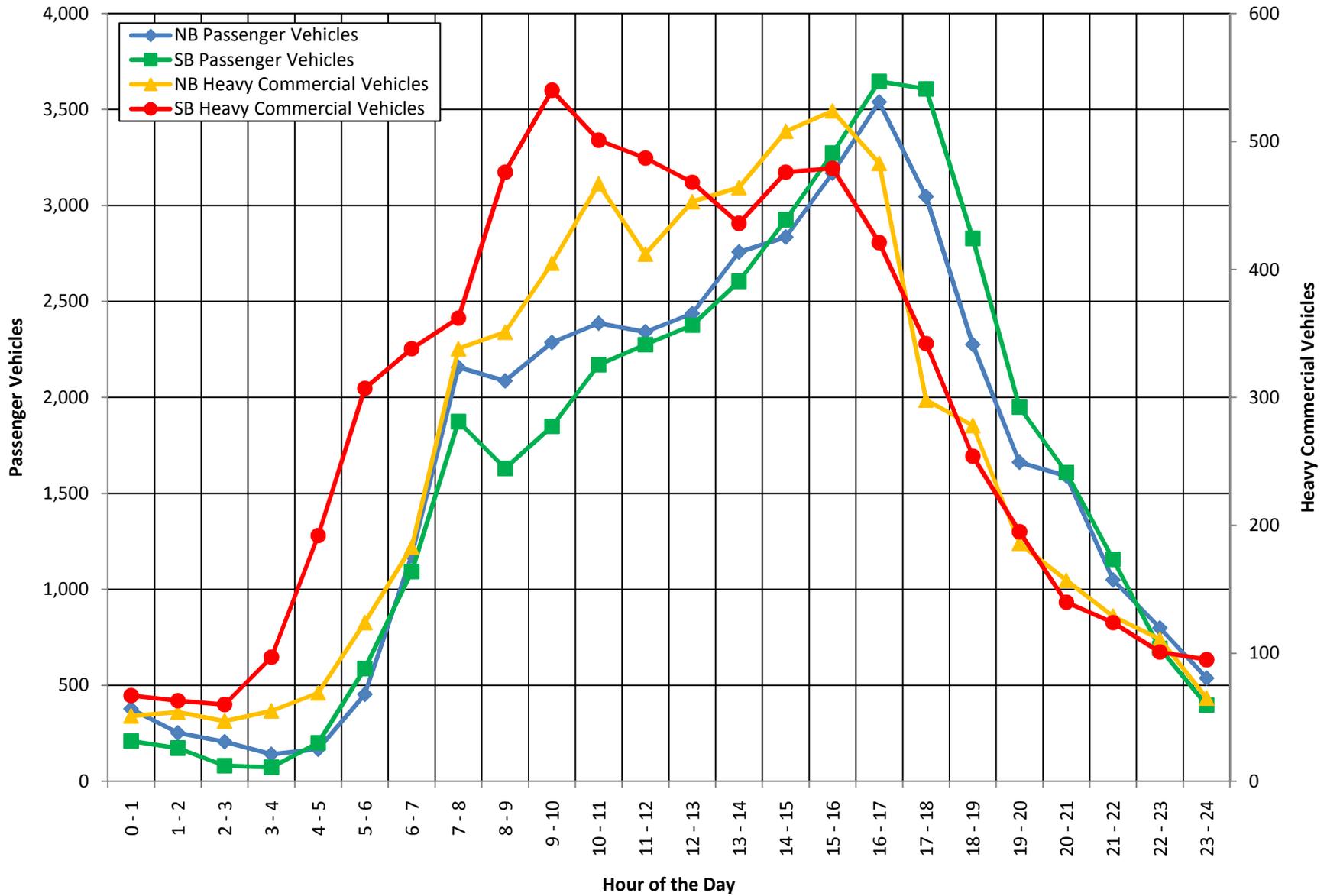


Figure 3 - Overweight Vehicles by Class vs. Hour of the Day

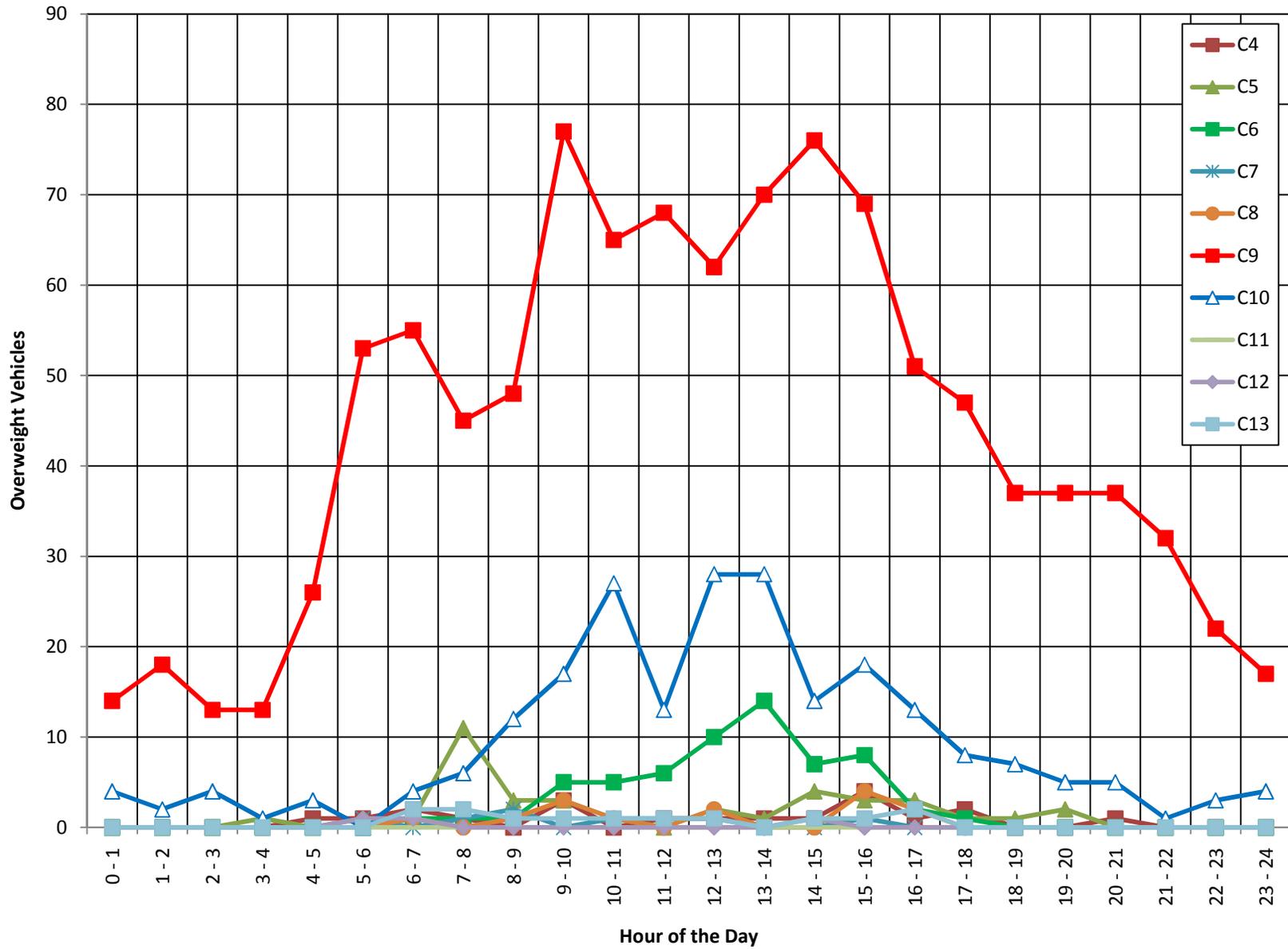


Figure 4 - Overweight Vehicles by Direction vs. Hour of the Day

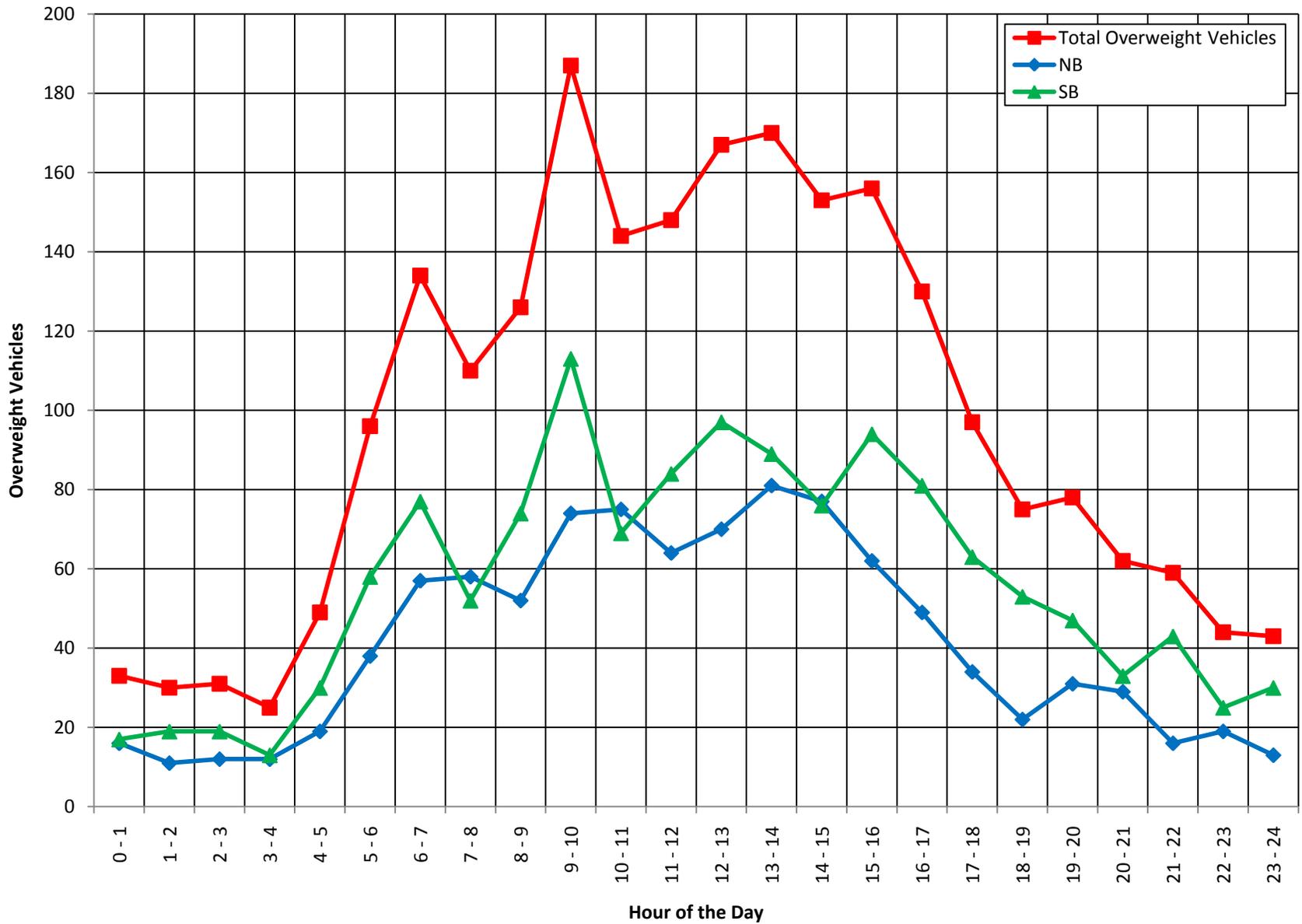


Figure 5 - Class 9's and 10's by Direction vs. Gross Vehicle Weight

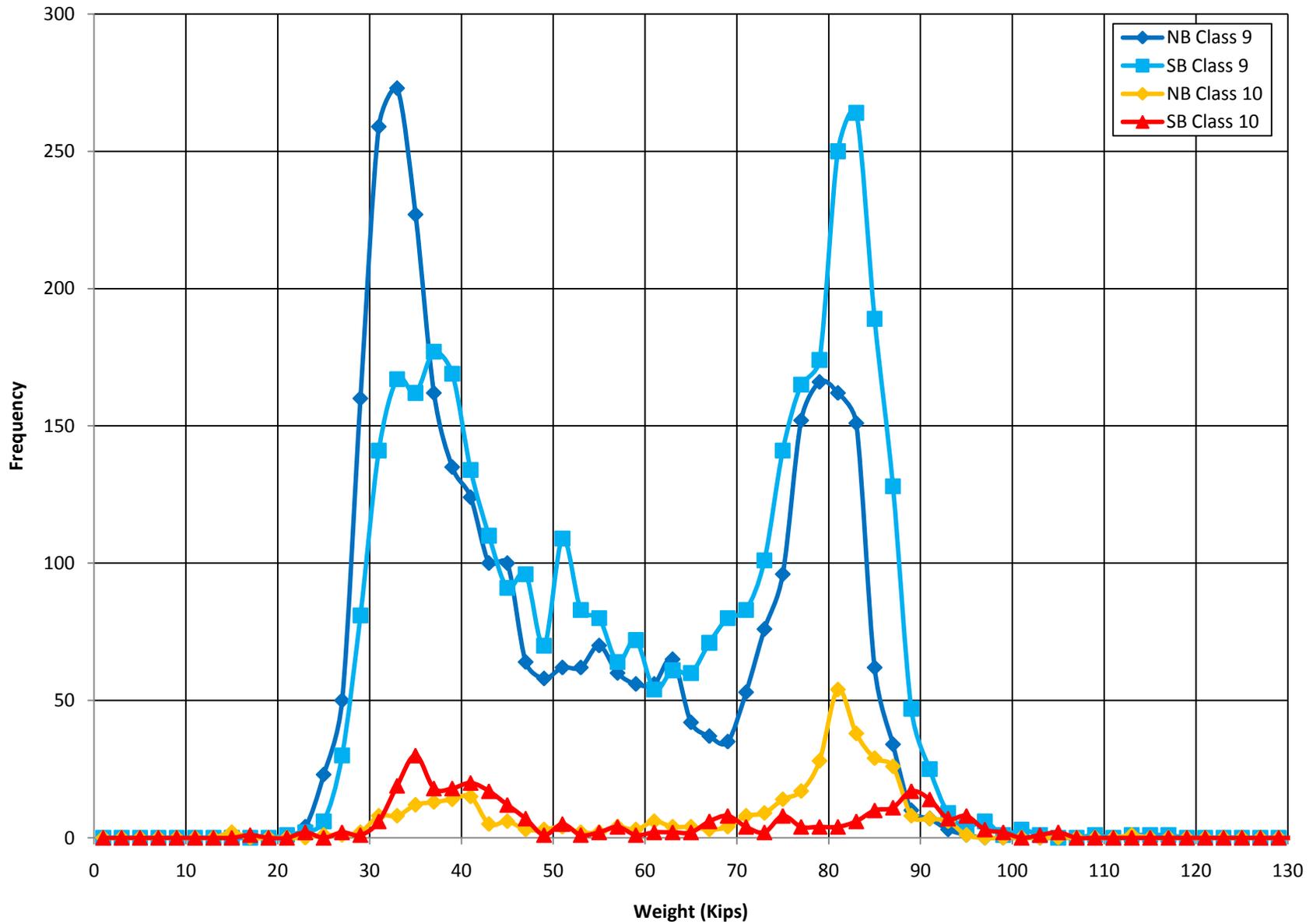


Figure 6 - Average Speed by Lane and Vehicle Type vs. Hour of the Day

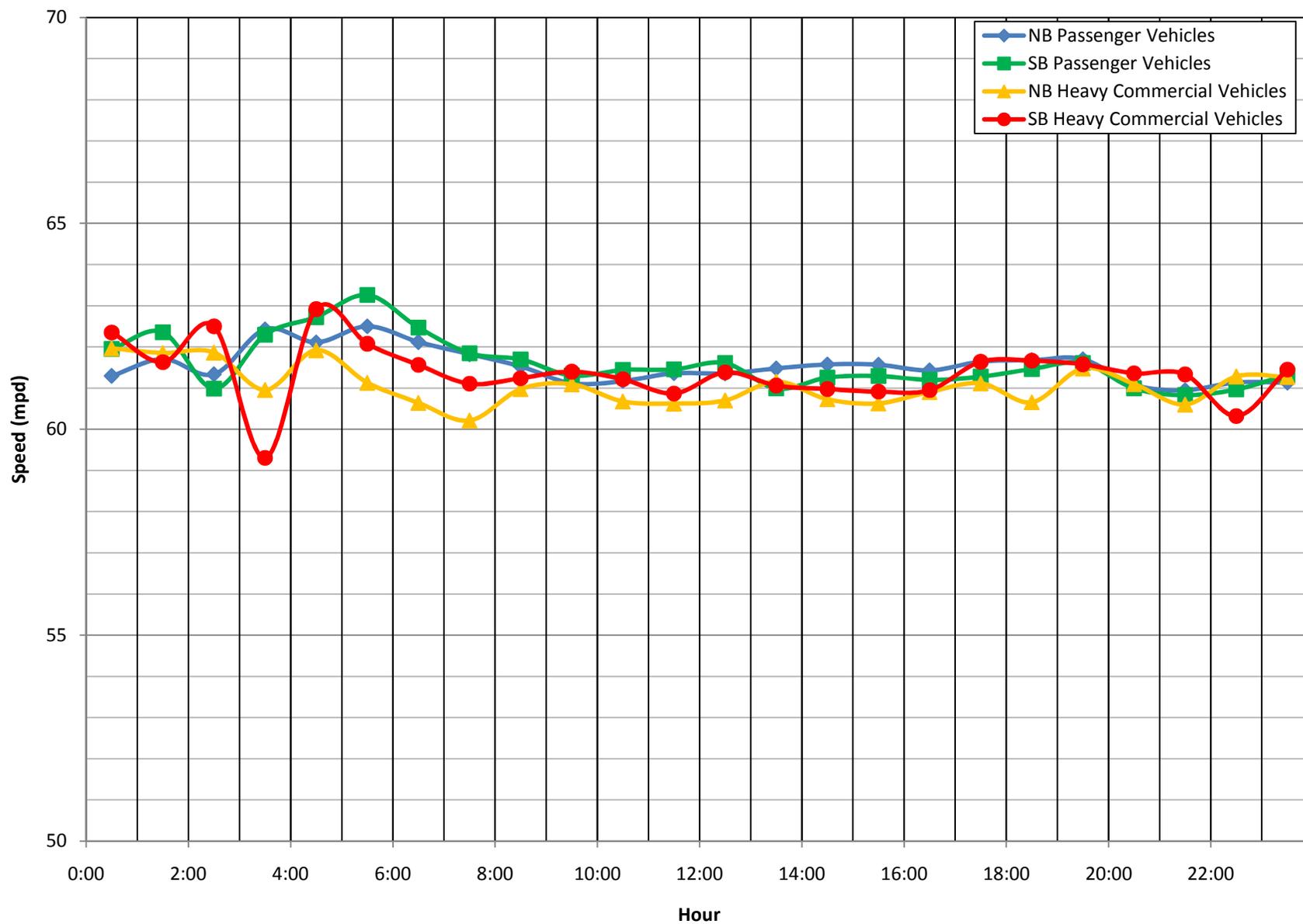


Figure 7 - Average Speed vs. Day of the Week

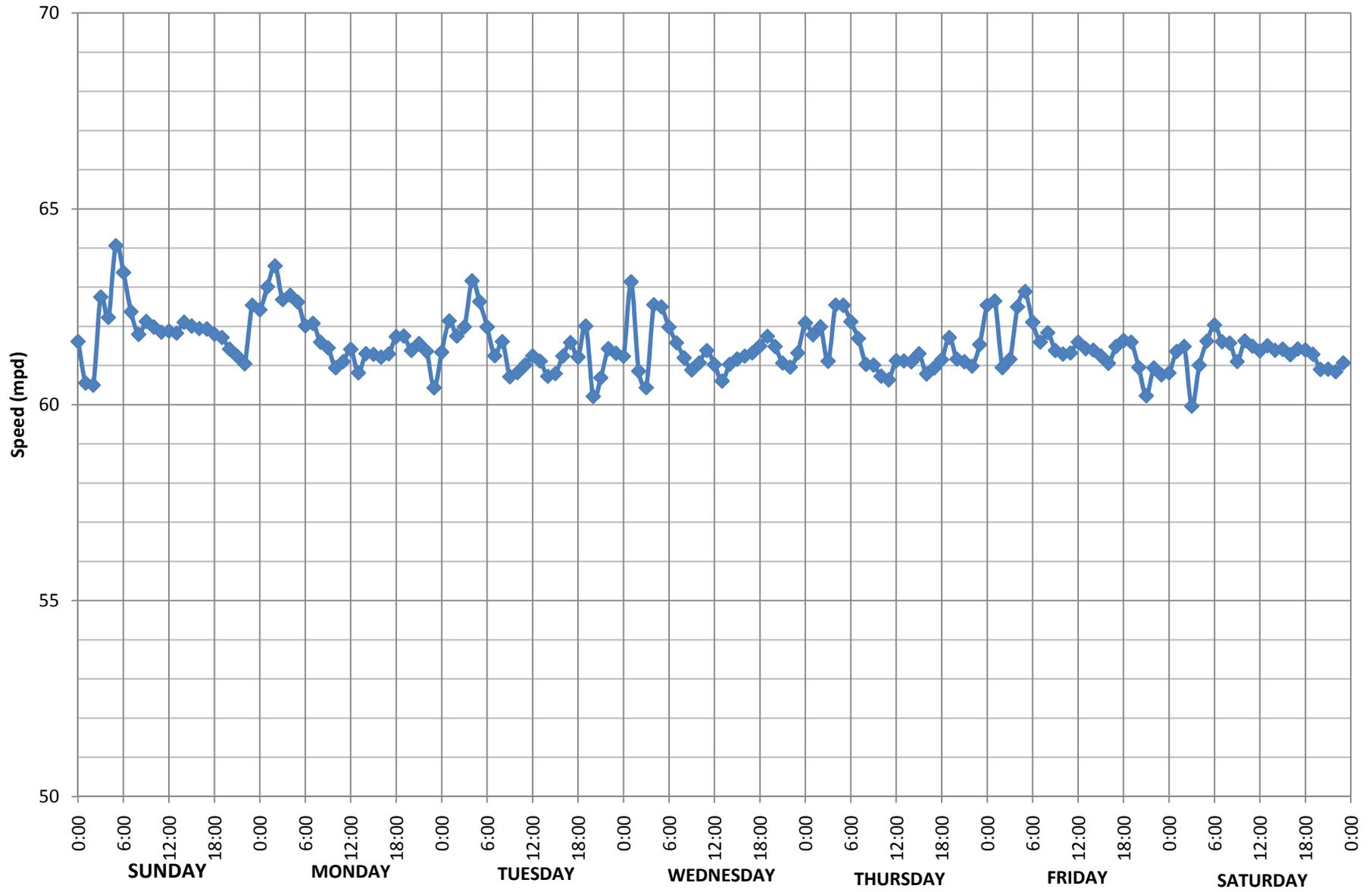


Figure 8 - Average Speed by Lane and Direction vs. Hour of the Day

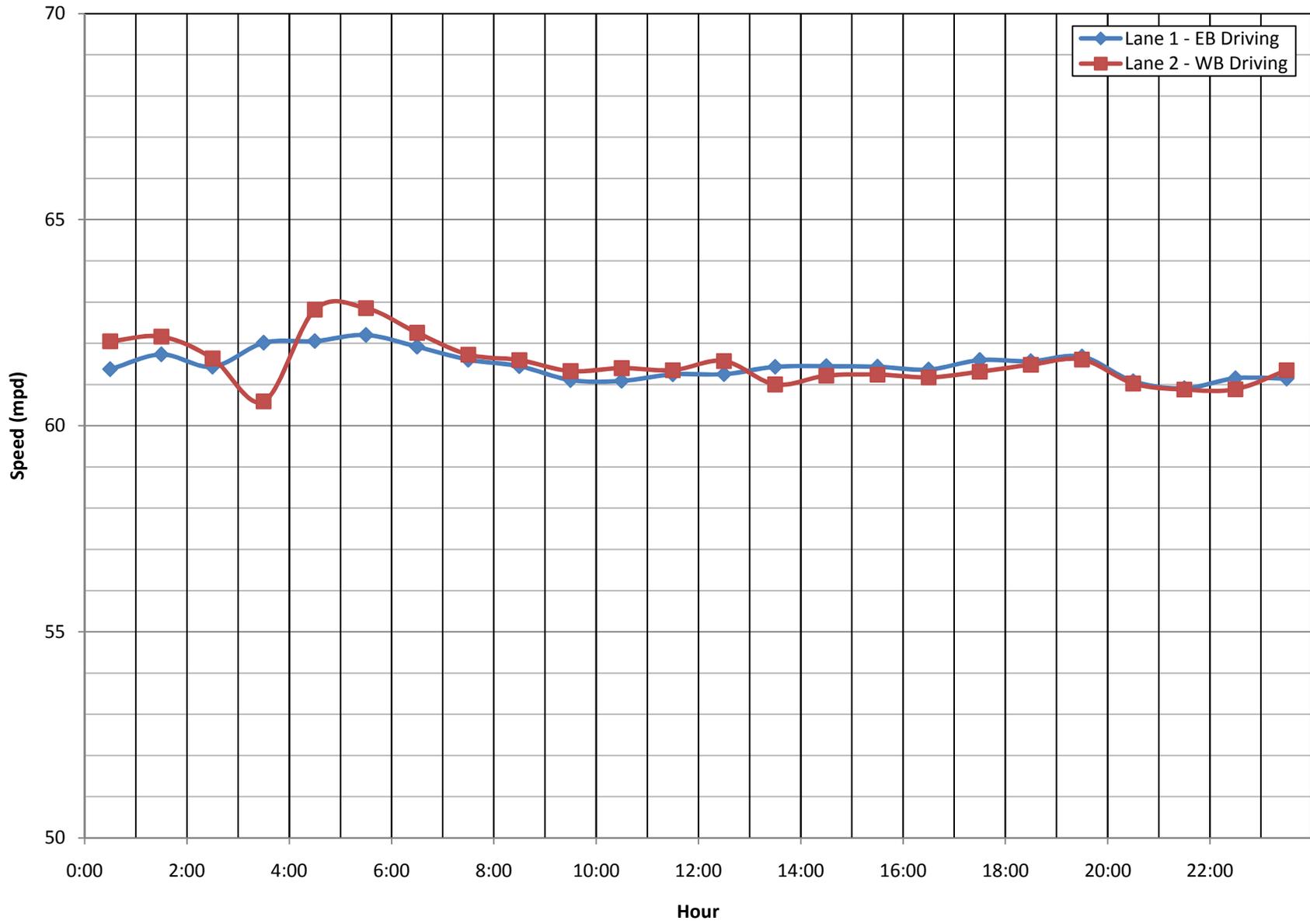


Figure 9 - Total Gross Vehicle Weight by Class and Direction

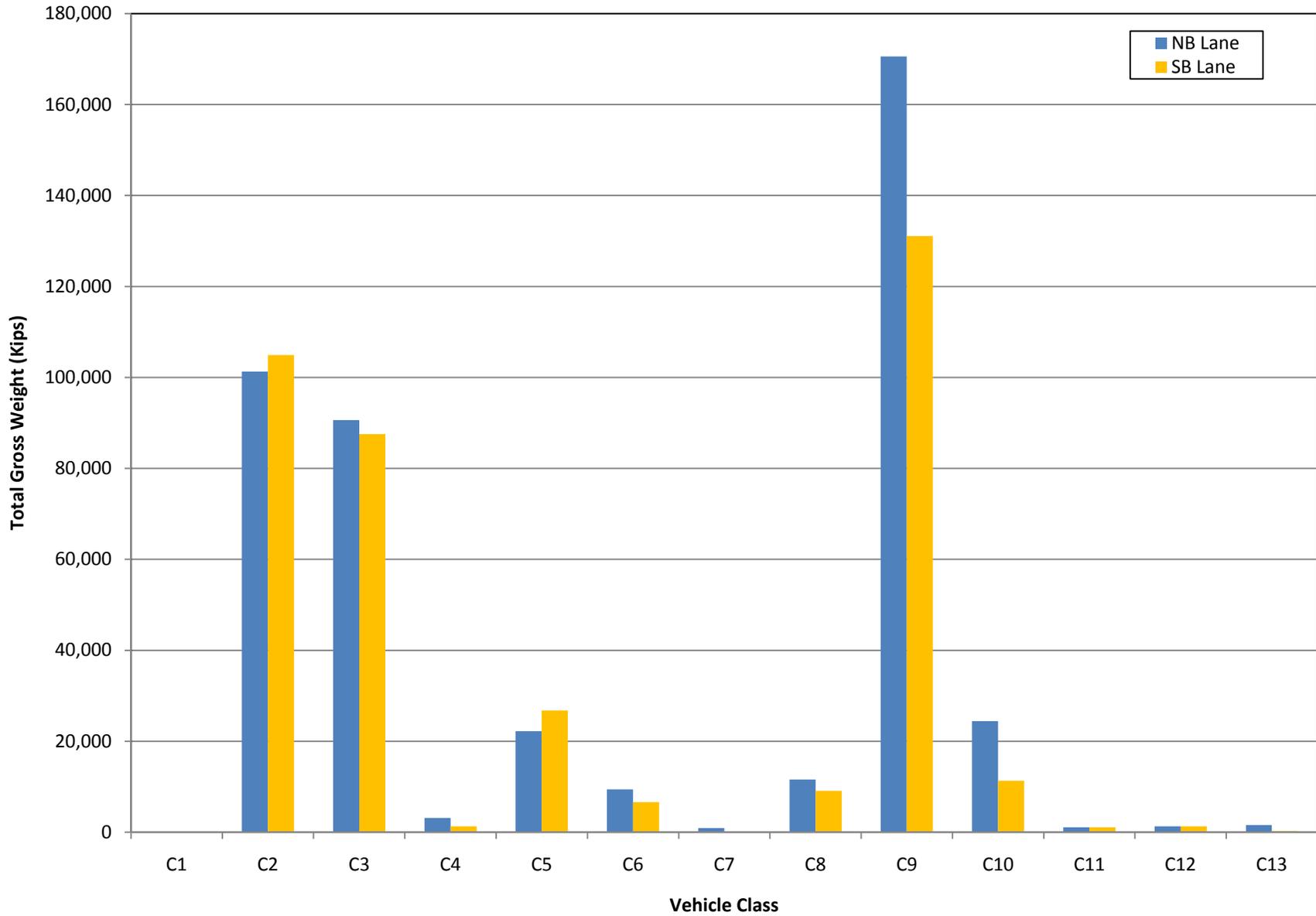


Figure 10 - Total Gross Vehicle Weight by Class

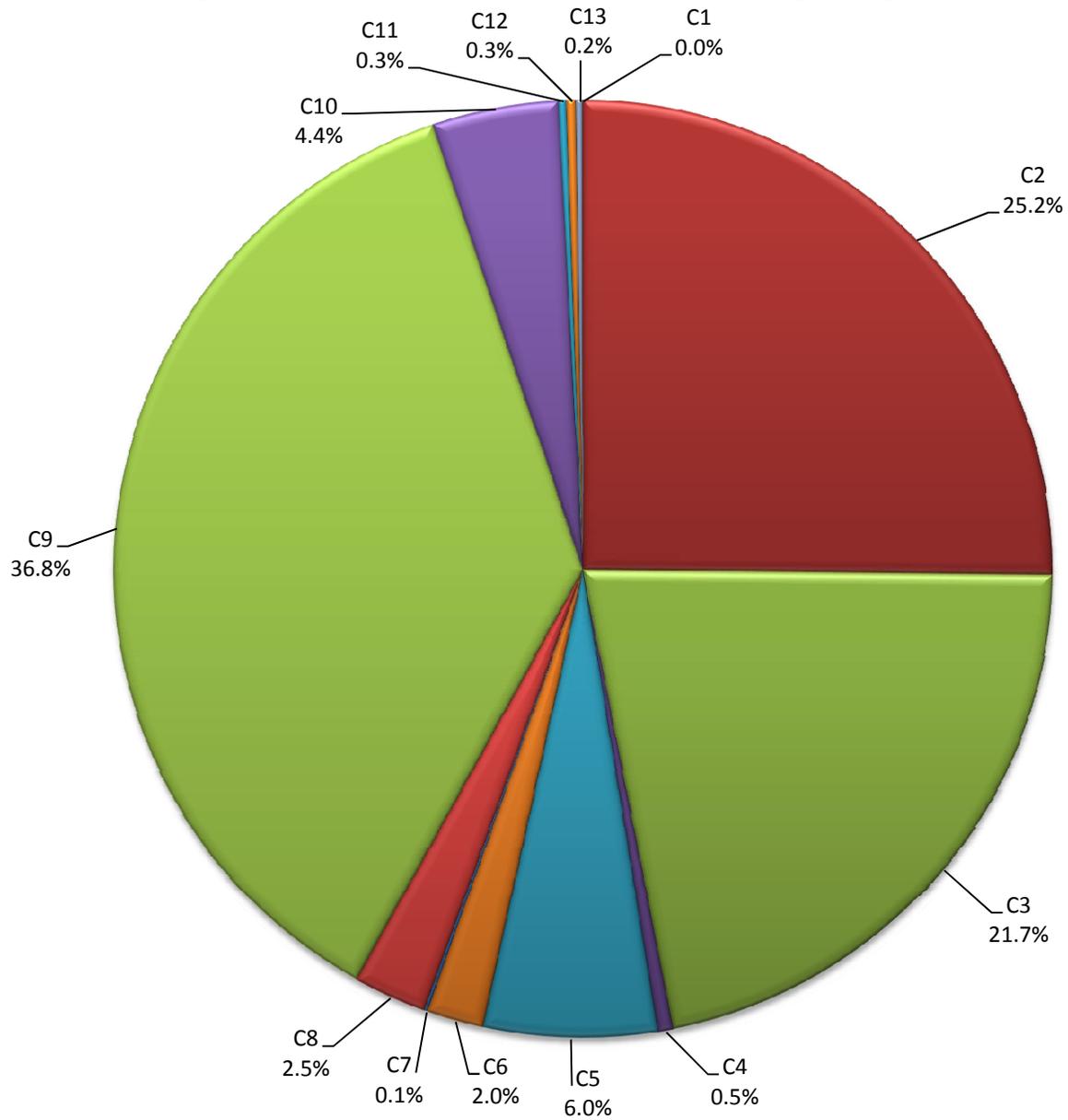


Figure 11 - Total ESALs by Class and Direction

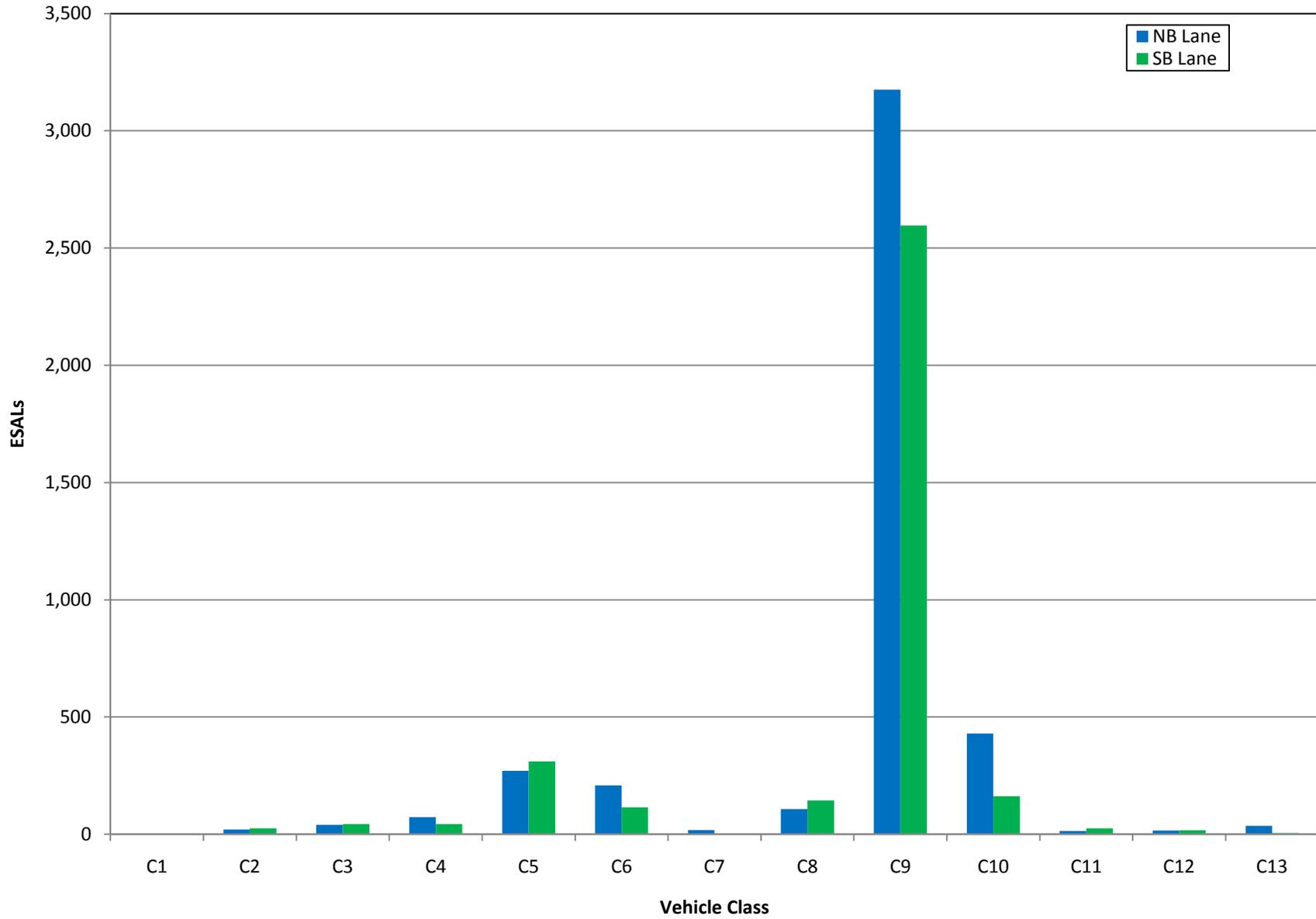


Figure 12 - ESALs by Class

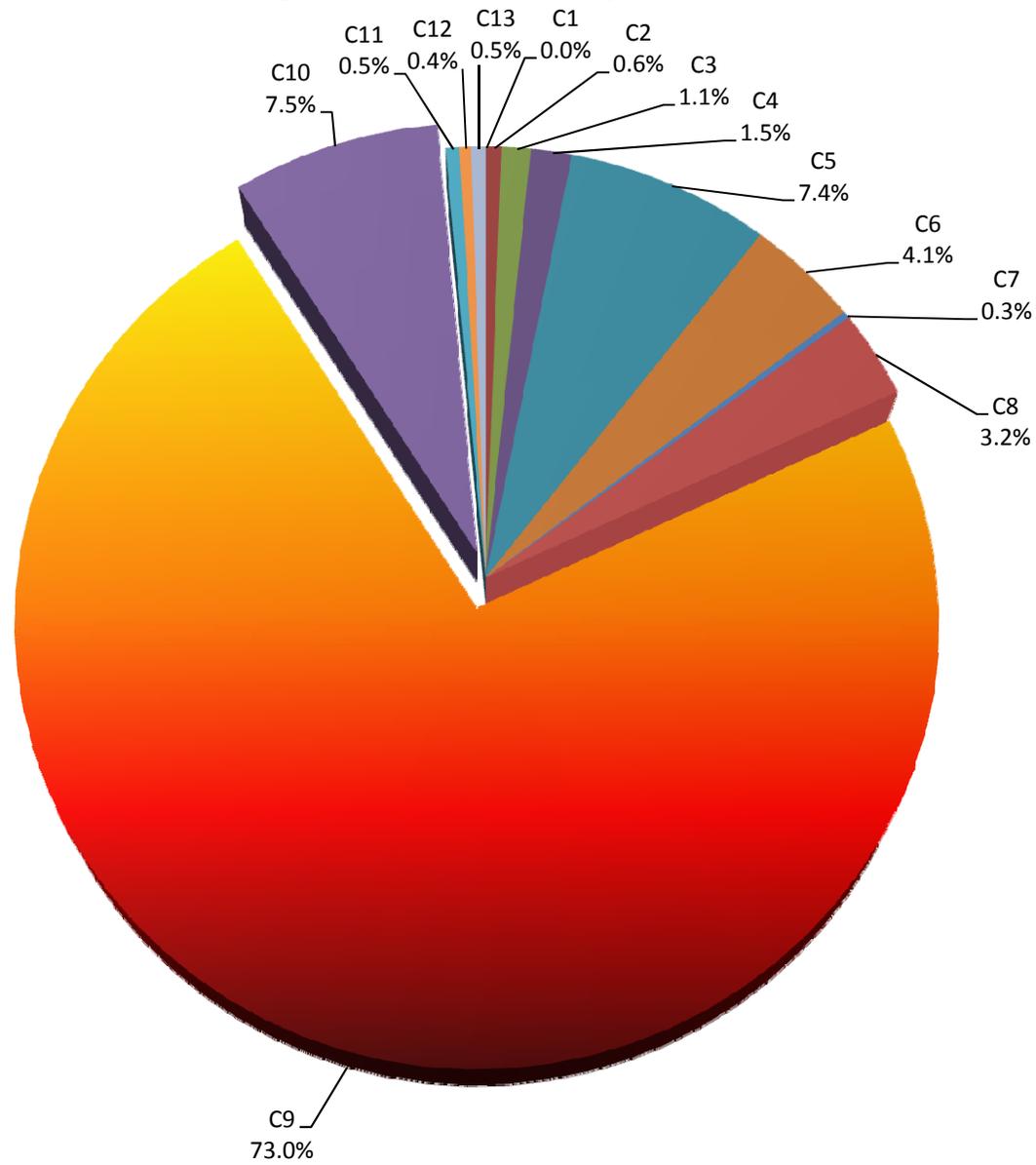
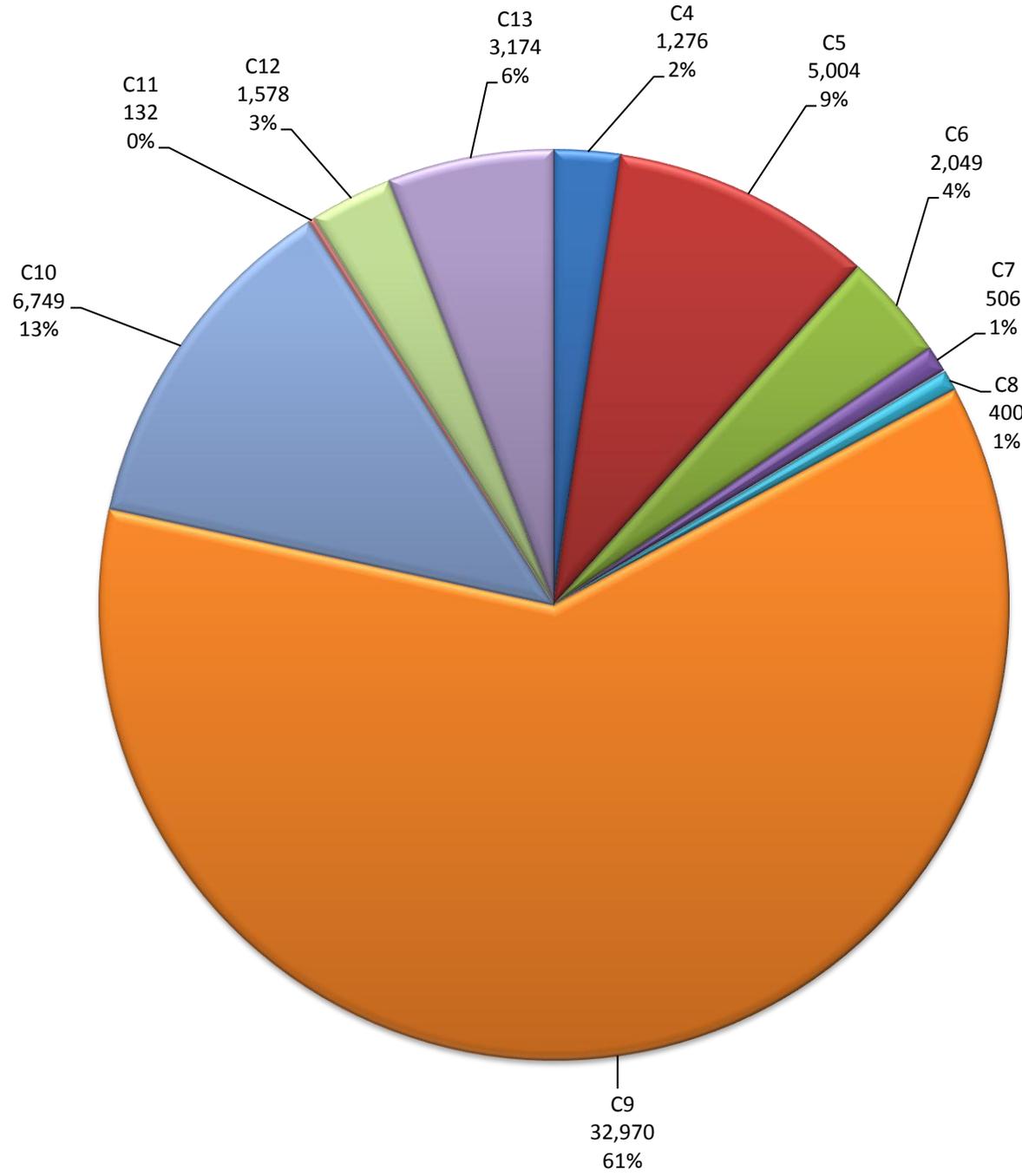


Figure 13 - Freight Tonnage and Percentage by Direction and Class

Northbound Freight



Southbound Freight

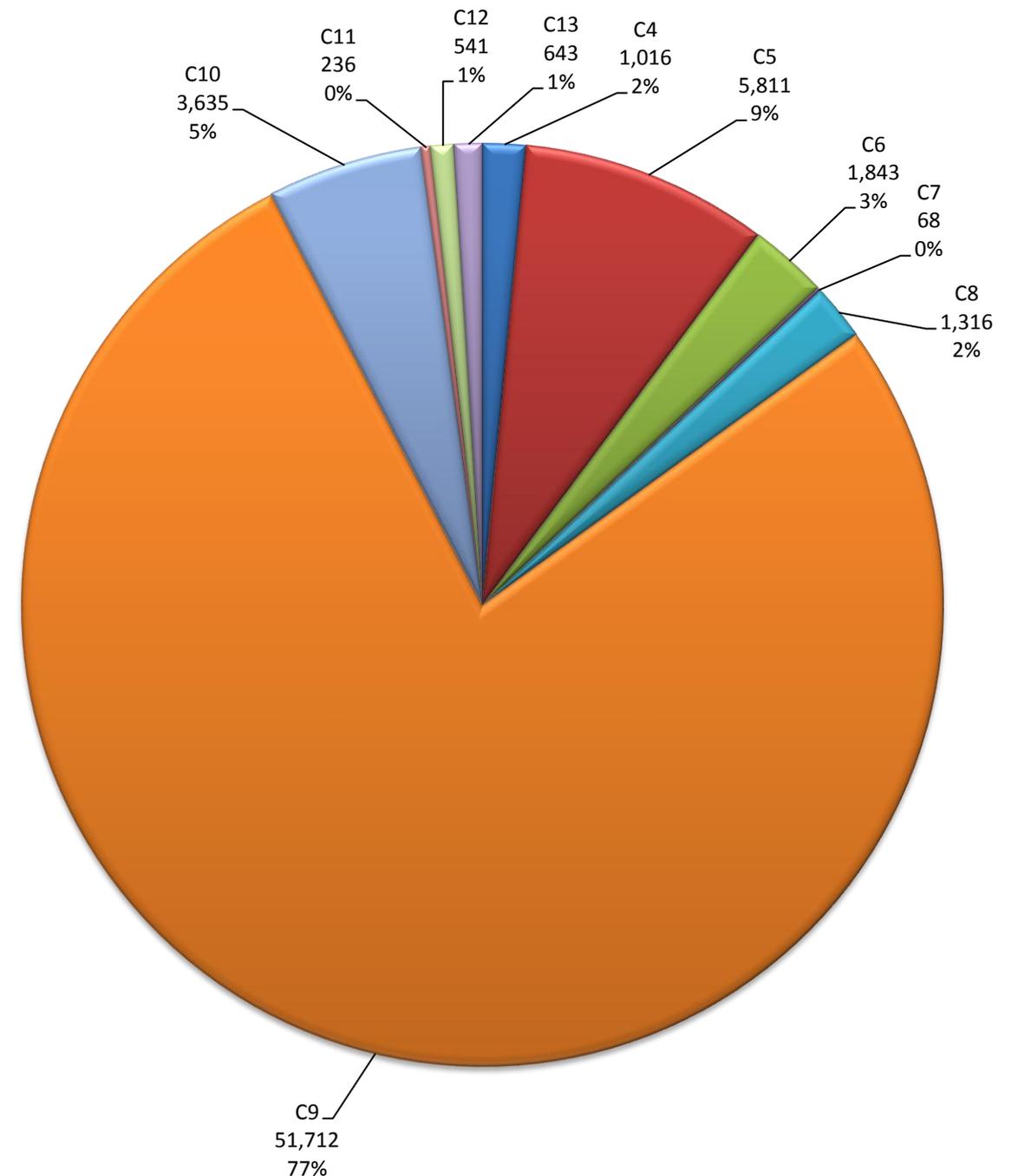


Figure 14 - Monthly Class 9 GVW Histogram - Lane 1 (NB)

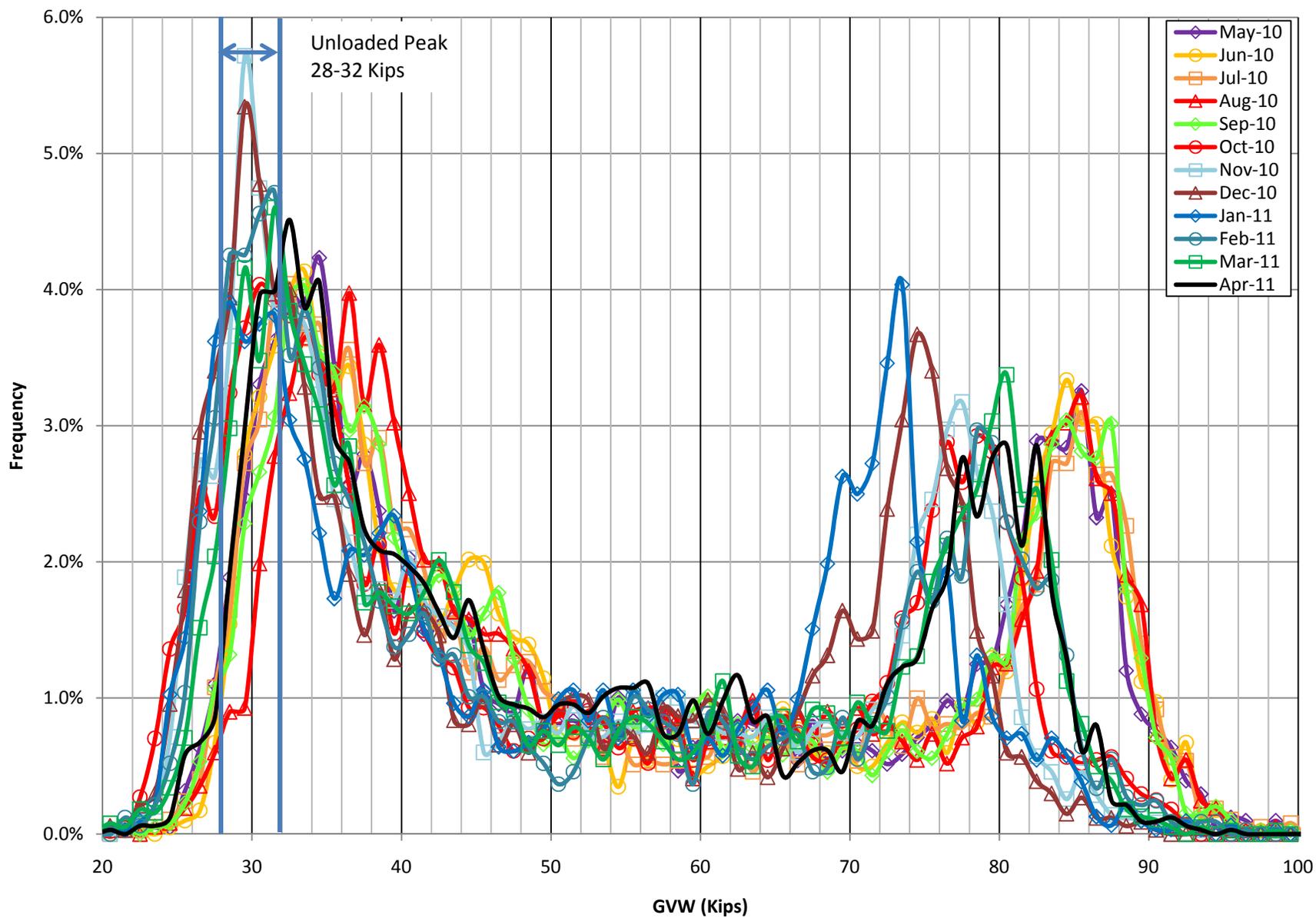


Figure 15 - Monthly Class 9 GVW Histogram - Lane 2 (SB)

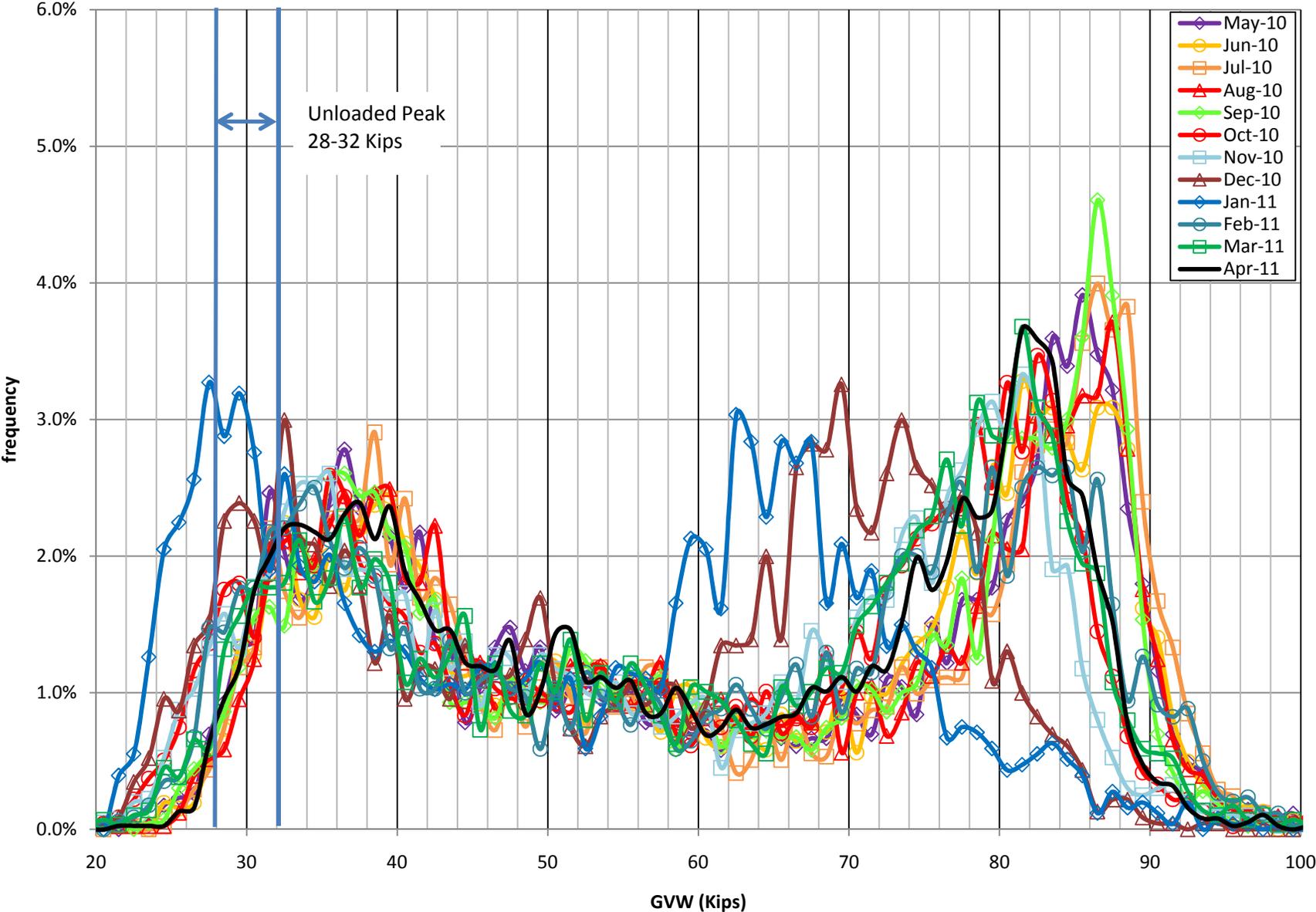


Figure 16 - Unloaded and Loaded Peaks by Lane vs. Date

