5 Analysis Of Variations In Vehicular Activity Patterns

This chapter addresses two types of data concerning traffic on freeways in the South Coast Air Basin. Section 5.1 contains analyses of data from Weigh-in-Motion (WIM) Stations. These data identify differences in the volumes of heavy-duty and non-heavy-duty vehicles by day-of-week. Data for some sites are limited to 24-hour totals while other locations also include both hourly and 24-hour volumes. Section 5.2 contains analyses of hourly data from many inductive-loop counters installed in the freeway networks of Los Angeles and Orange Counties. Although the analyses in Section 5.2 do not differentiate between classes of vehicles, they do provide hourly profiles for total traffic by day-of-week in 11 sub-regions of the two counties. Finally, Section 5.3 compares hourly volumes of freeway traffic to hourly air quality data by day-of-week in 11 sub-regions used in Section 5.2.

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Figure 5.1 South Coast Air Basin all of Los Angeles and Orange Counties and portions of Riverside and San Bernardino Counties – Major air quality stations are triangles and Weigh-in-Motion stations are solid circles.

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5.1 Day-of-Week Patterns of Heavy-Duty and Non-Heavy-Duty Vehicle Activity At Weigh-in-Motion (WIM) Stations Relevant to the South Coast Air Basin During the Summer of 1997

5.1.1 Abstract

In this section, we analyze day-of-week differences in the activity of heavy-duty vehicles (trucks) and non-heavy-duty vehicles. Heavy-duty trucks are particularly important because they produce a disproportionately large fraction of NO_x emissions in the South Coast Air Basin. Therefore, differences in heavy-duty truck activity by day-of-week may be an important contributor to differences in air pollution on weekdays compared to weekends.

Most results are based on daily total counts. Hourly data were only available shortly before completion of this report and time did not allow as thorough an evaluation of these data.

The Weigh-in-Motion (WIM) network, maintained by CALTRANS, counts vehicles and simultaneously identifies their weight classes. Daily vehicle counts (24-hour totals) from WIM stations in and around the South Coast Air Basin demonstrate that the volume of heavy-duty trucks is much lower on weekends compared to weekdays in all locations. The data also show that the daily volume of non-heavy-duty vehicles decreases on weekends at some locations but increases at others.

In the central urbanized area, the volumes of both heavy-duty and non-heavy-duty vehicles are lower on weekends compared to their mid-week volumes. In addition, the decrease in heavy-duty traffic is greater than the decrease in non-heavy-duty traffic.

In the peripheral non-urbanized area, the volume of heavy-duty vehicles on freeways decreases on weekends while the volume of non-heavy-duty vehicles is similar for all days of the week. At these sites, the reduction in heavy-duty traffic is not as great as the reduction at the more centrally located sites.

Hourly data for heavy-duty and non-heavy-duty traffic by day-of-week provide additional detail. The hourly volumes for heavy-duty and non-heavy-duty vehicles are markedly different. The greatest volumes of heavy-duty vehicles tend to occur near mid-day and may be nearly constant between the “rush hour” peaks for the non-heavy-duty vehicles. With rare exceptions, volumes for heavy-duty vehicles on Saturday and especially on Sunday are substantially lower then weekday volumes throughout the daylight hours.

Overall, the WIM data are circumstantially consistent with Hypothesis #1 (NOx reduction), Hypothesis #2 (NOx timing), Hypothesis #3 (Carryover aloft), Hypothesis #4 (Carryover at ground level), Hypothesis #6 (Aerosols and UV radiation), and Hypothesis #7 (Surface O_3 quenching).

The WIM data from peripheral locations in the South Coast Air Basin are consistent with Hypothesis #5 (Increased weekend emissions). However, the WIM data from metropolitan areas of the SoCAB are not consistent with this Hypothesis.

The WIM data do not address non-freeway activity of mobile sources and other emission sources that may increase on weekends.

5.1.2 Methodology

In this section, we discuss the data, locations, and methods used to examine differences in heavy-duty and non-heavy-duty traffic on weekdays versus weekends and to present the results.

5.1.2.1 Data

Data from the WIM network were obtained from two sources. Daily total volumes were provided by Dr. Niemeir at U.C.-Davis. Hourly volumes were obtained through a cooperative project involving staff of the Air Resources Board and the Department of Transportation (CALTRANS).

5.1.2.1.1 Daily total volumes

Data from the network of WIM stations were provided by Dr. Niemeir at U.C.-Davis. These data were collected during the summer of 1997 by CALTRANS and examined by Dr. Niemeir as part of the overall SCOS97-NARSTO field study. The data set contained daily vehicle counts for each of 14 vehicle classes at each WIM site during the summer of 1997. Table 5.1-1 shows the class definitions supplied with the data.

The daily data reveal potentially important differences in the traffic volumes by vehicle class and by day-of-week.

We did not conduct general QA/QC procedures beyond those applied by CALTRANS and/or Dr. Niemeir. However, the daily data at three sites were summarized but not considered in further analyses. The Fontana site (No. 69) was not considered because only southbound traffic was monitored. The Newhall site (No. 6) was not considered because only northbound traffic was monitored and because the data were highly variable and may not be representative. The Murrieta site was not considered because the heavy-duty data are extremely variable and may not be representative; unlike any other site, the Murrieta data varied by more than 100% for observations on the same day of the week.

5.1.2.1.2 Hourly volumes

ARB and CALTRANS engaged in a cooperative effort that yielded hourly traffic counts for all 14 WIM classes at 15 locations relevant to the South Coast Air Basin.

Data were obtained for 1997 and for 2000. Only the data for 1997 are presented here to maintain the most direct comparisons with the daily totals and with the air quality analyses included in this report.

Only those data that satisfied the standard QA/QC procedures at CALTRANS were selected. For most locations, at least eight weeks of valid data were avaliable during the summer of 1997.

5.1.2.2 Locations

Most of the WIM stations are paired so that traffic on both sides of a freeway are counted. Each pair of stations provides counts for east and westbound or north and southbound traffic; for example, station No. 8 and station No. 9 cover southbound and northbound traffic respectively on the Ventura Freeway at milepost 37.8. Table 5.1-2 lists the WIM stations and their locations. For paired stations, the counts were combined to form a single value. For unpaired stations that have no designated direction, the counts already included the traffic in both directions.

The hourly data include two additional locations – Artesia and Glendora – that were not included in the sites providing daily totals. These sites are urban locations in Los Angeles County on SR-91 and I-210 respectively. In addition, hourly data are presented for the Fontana and Murrietta sites.

5.1.2.3 Methods of Analysis and Presentation

Our analysis of the WIM data is straightforward for both the daily and hourly data. Following the advice of ARB and CALTRANS engineers, we summed the counts for classes 8-14 to represent the number of heavy-duty vehicles. Similarly, the sum of the counts for classes 1-7 represents the number of non-heavy-duty vehicles.

For the daily data, we report results both in original units and relative to mid-week levels (Tuesday through Thursday). Complete results are presented for all sites in Table 5.1-3. Two graphs, one in original units and one in relative units are provided for each location.

Analyses for hourly data are presented only in original units.

5.1.3 Results and Discussion

5.1.3.1 General results

5.1.3.1.1 Daily total volumes

Some observations apply to the activity data at <u>all or almost all stations</u> considered for further analysis.

Heavy-duty activity drops dramatically at all sites compared to mid-week levels. On Saturday, heavy-duty activity averaged 45% of mid-week levels, ranging from

31% (Elsinore and Long Beach) to 61% (Indio and Van Nuys). On Sunday, heavy-duty activity averaged 33% of mid-week levels, ranging from 17% (Peralta) to 59% (Indio).

Non-heavy-duty activity decreased less than heavy-duty activity on weekends at all sites and even increased at some sites. On Saturday, non-heavy-duty activity averaged 94% of mid-week levels, ranging from 76% (Montrose) to 148% (Castaic). On Sunday, non-heavy-duty activity averaged 84% of mid-week levels, ranging from 62% (Montrose) to 184% (Indio).

In the basin as a whole, the volumes of both heavy-duty and non-heavy-duty vehicles are lower on weekends compared to their mid-week volumes. However, the decrease in heavy-duty traffic is greater than the decrease in non-heavy-duty traffic. Therefore, the ratio of heavy-duty to non-heavy-duty vehicles is substantially lower on weekends compared to weekdays. The estimated ratios are 1:20 on weekdays, 1:50 on Saturday, and 1:100 on Sunday. These results are in close agreement with the VMT estimates in recent emission inventory models.

Among weekdays, Friday had the highest volume of non-heavy-duty traffic at all sites but one (Montrose). The increase averages 7% across all sites.

Table 5.1-4 shows that activity patterns in the central (more urbanized) areas appear to differ systematically from the activity patterns in the peripheral (less urbanized) areas. The central sites were Long Beach, Ventura Freeway, Van Nuys, Irvine, Peralta, and Montrose, while the peripheral sites were Redlands, Castaic, Elsinore, Indio, and Devore.

5.1.3.1.2 Heavy-duty activity

In aggregate, the heavy-duty activity on weekends decreased more at the central sites compared to the peripheral sites. The total volume for the central sites combined relative to the mid-week volume was 39% on Saturday and 22% on Sunday. The total volume for the peripheral sites combined relative to the mid-week volume was 53% on Saturday and 44% on Sunday.

The day-of-week effects for heavy-duty traffic were not uniform, however, for all sites within the central or within the peripheral category. Relative to mid-week levels, the central sites ranged from 31% to 62% on Saturday and 17% to 38% on Sunday. In comparison, the peripheral sites ranged form 31% to 106% on Saturday and 18% to 97% on Sunday.

5.1.3.1.3 Non-heavy-duty activity

Except at Peralta, the central, more urbanized locations show the activity of non-heavy-duty vehicles decreasing on weekends. The Peralta site is close to Disneyland, which may explain why non-heavy-duty traffic at Peralta was higher on Saturday (104%) compared to mid-week levels.

In aggregate, the non-heavy-duty activity on weekends decreased at the central sites and increased at the peripheral sites. When the central sites are combined, their total volume relative to mid-week levels was 91% on Saturday and 78% on Sunday. When the peripheral sites are combined, their total volume relative to mid-week levels was 102% on Saturday and 100% on Sunday.

Relative to mid-week levels, the central sites (except Peralta) ranged from 76% to 93% on Saturday and from 62% to 79% on Sunday. In comparison, the peripheral sites ranged from 84% to 148% on Saturday and from 73% to 184% on Sunday.

Increases in weekend traffic at peripheral sites may be due to multiple factors. For instance, non-heavy-duty traffic may increase on routes that serve recreational or entertainment facilities, such as lakes, casinos, resorts, and amusement parks. Long-distance travel for recreation or visitation may also cause increases in weekend traffic on major entry and exit routes. How significant such increases are is not clear. The increases tend to be increases in small volumes, whereas, the decreases at central sites tend to be decreases in large volumes.

5.1.3.1.4 Hourly volumes

The diurnal patterns for heany-duty and non-heavy-duty volumes are markedly different. The heavy-duty volumes do not exhibit the morning and evening “rush hour” pattern typical of the non-heavy-duty traffic. Instead, the largest volume of heavy-duty traffic occurs between the morning and evening rush hours and usually reaches a maximum near mid-day.

Figures 5.1.26 through 5.1.55 show for the hourly volumes by day-of-week for heavy-duty and non-heavy-duty (called light duty in the figures) classes at fifteen WIM locations. Five of these figures merit specific comments.

Three figures represent hourly data for heavy-duty vehicles from 2000 rather than 1997. The sites involved are Elsinore (Figure 5.1-33), Fontana (Figure 5.1-35), and Ventura Freeway (Figure 5.1-55). These substitutions were made because the 1997 patterns contained clearly spurious patterns that were inconsistent with the 2000 patterns. The ARB staff reviewed the data carefully and determined that the data in 2000 at these sites was more reliable than the 1997 data.

For two locations – Castaic and Indio – the patterns are distinctive and raise the question of whether the data are reliable. In both cases, the data for 2000 replicate the distinctive patterns and validate the data for 1997.

5.1.4 Conclusions

The WIM data help set the stage on which other datasets can speak to the various hypotheses. From the WIM data alone, we draw several preliminary conclusions.

First, the volume of heavy-duty trucks throughout the South Coast Air Basin is lower on weekends compared to weekdays. Saturday volumes are lower than weekday volumes and Sunday volumes are lower still.

Second, the volume of non-heavy-duty vehicles decreases on weekends in the central, metropolitan areas of the Basin but increases in the peripheral, non-metropolitan areas.

Third, in the basin as a whole, the volumes of both heavy-duty and non-heavy-duty vehicles are lower on weekends compared to their mid-week volumes. However, the decrease in heavy-duty traffic is greater than the decrease in non-heavy-duty traffic. Therefore, the ratio of heavy-duty to non-heavy-duty vehicles is substantially lower on weekends compared to weekdays. The estimated ratios are 1:20 on weekdays, 1:50 on Saturday, and 1:100 on Sunday.

Among weekdays, Friday had the highest volume of non-heavy-duty traffic at all sites but one (Montrose). The increase relative to the mid-week volume averages 7% across all sites.

The WIM data are consistent with Hypothesis #1, Hypothesis #2, and Hypothesis #3a. The data are somewhat inconsistent with Hypothesis #4, because any increase in weekend traffic appears to be limited to peripheral sites rather than metropolitan areas of the South Coast Air Basin. Even so, the WIM data do not address other emission sources that may increase on weekends.

5.1.5 Recommendations

The three recommendations discussed below emerged from our analyses of the daily total volumes. The first two recommendations have been already been followed and the results are partially included in this section.

First, hourly summaries for the WIM data should be acquired and analyzed. The day-of-week differences in several parameters, such as VOC/NOx ratios, would be more clearly understood by using hourly values rather than daily values for the WIM data.

Second, WIM data for extended periods should be acquired and analyzed. In our analyses, only a few days were available in some cases to characterize the volumes of heavy-duty and non-heavy-duty vehicles for a particular day-of-week. Results would be more reliable and convincing if based on data that are more extensive.

ARB and CALTRANS have established an annual program that produces hourly summaries for each of 14 days in each month for every WIM station in California. At this time, all data for 2001 and 2002 have been compiled.

Third, data for activity on surface streets are essential. Such data should identify the classes of vehicles as well as counting the total vehicles. In addition, such data

should be assembled on an hourly basis. Only with such information, can the full picture of on-road activity be accurate and complete.

Table 5.1-1 Standard criteria used to classify vehicles at Weigh-in-Motion Stations*

Class	Vehicle Description	Axles	Weight (kips) min	Weight (kips) max
0	unclassifiable			
1	motorcycle	2	0.10	3.00
2	auto, pickup	2	1.00	7.99
2	auto w/ 1 axle trailer	3	1.00	11.99
2	auto w/ 2 axle trailer	4	1.00	11.99
3	other (limo, van, RV)	2	1.00	7.99
3	other w/ 1 axle trailer	3	1.00	11.99
3	other w/ 2 axle trailer	4	1.00	11.99
3	other w/ 3 axle trailer	5	1.00	11.99
4	bus	2	12.00	N/A
4	bus	3	20.00	N/A
5	2D	2	8.00	N/A
6	3 axle	3	12.00	N/A
7	4 axle	4	12.00	N/A
8	2S1, 21	3	12.00	N/A
8	3S1, 31	4	12.00	N/A
8	2S2	4	12.00	N/A
9	3S2	5	12.00	N/A
10	3S3, 33	6	12.00	N/A
11	2S12	5	12.00	N/A
12	3S12	6	12.00	N/A
13	2S23, 3S22, 3S13	7	12.00	N/A
13	3S23	8	12.00	N/A
13	permit	9	12.00	N/A
14	32	5	12.00	N/A
15	unclassifiable or erro	0		

* Differentiation between classes also depends on spacing between axles. Note: one “kip” equals one thousand pounds.

Table 5.1-2. Weigh-in-Motion stations selected for analysis due to their proximity to the South Coast Air Basin.

Station No.	Name	Nearby A.Q. Monitor	County	Fwy/Mile Post
5	INDIO	(none)	RIV	10-R59.4
6	NEWHALL (NB only)	SANTA CLARITA	LA	5-44.6
8, 9	VENTURA FWY	RESEDA	LA	101-37.8
12, 13	VAN NUYS	RESEDA	LA	405-42.9
15, 16	IRVINE	IRVINE	ORA	5-25.8
37, 38	ELSINORE	LAKE ELSINORE	RIV	15-21.6
39	REDLANDS	REDLANDS	SBD	30-31.7
47, 48	CASTAIC	SANTA CLARITA	LA	5-R56.1
59, 60	LONG BEACH	N. LONG BEACH	LA	710-11.5
61, 62	PERALTA	ANAHEIM	ORA	91-R11.9
63	MURRIETA	(none)	RIV	215-R5.0
67	DEVORE	CRESTLINE	SBD	215-14.8
69	FONTANA (SB only)	FONTANA	SBD	15-6.1
101, 102	MONTROSE	BURBANK	LA	2-7.5

Table 5.1-3 Heavy-Duty and Non-Heavy-Duty Traffic at WIM Stations in and Near the SCAB

WIM Station		Day of	Average Daily Total			Percent of Tue. - Thu. Activity			% of Daily Total	
			Duty Classification			Duty Classification			Duty Classification	
Name	No.	Week	Heavy	Non-Heavy	Total	Heavy	Non-Heavy	Total	Heavy	Non-Heavy
Long Beach	59	1	3866	112800	116666	20%	67%	62%	3.3%	96.7%
	and	2	17785	161715	179500	94%	96%	96%	9.9%	90.1%
	60	3	19126	167965	187091	101%	100%	100%	10.2%	89.8%
		4	18920	166526	185446	100%	99%	99%	10.2%	89.8%
		5	18948	170204	189152	100%	101%	101%	10.0%	90.0%
		6	19180	178343	197524	101%	106%	105%	9.7%	90.3%
		7	5951	138023	143975	31%	82%	77%	4.1%	95.9%
Ventura Fwy	8	1	1266	135200	136466	31%	80%	79%	0.9%	99.1%
	and	2	3303	146207	149510	80%	87%	86%	2.2%	97.8%
	9	3	4181	166272	170453	102%	99%	99%	2.5%	97.5%
		4	4020	168682	172702	98%	100%	100%	2.3%	97.7%
		5	4121	171421	175542	100%	102%	102%	2.3%	97.7%
		6	4235	180659	184893	103%	107%	107%	2.3%	97.7%
		7	2072	151584	153656	50%	90%	89%	1.3%	98.7%
Van Nuys	12	1	1329	169739	171068	37%	80%	79%	0.8%	99.2%
	and	2	3470	215010	218480	98%	102%	102%	1.6%	98.4%
	13	3	3615	215362	218977	102%	102%	102%	1.7%	98.3%
		4	3615	218130	221745	102%	103%	103%	1.6%	98.4%
		5	3407	201561	204967	96%	95%	95%	1.7%	98.3%
		6	3663	227082	230745	103%	107%	107%	1.6%	98.4%
		7	2180	197044	199224	61%	93%	93%	1.1%	98.9%
Irvine	15	1	1457	168785	170242	19%	76%	74%	0.9%	99.1%
	and	2	7484	216631	224115	96%	97%	97%	3.3%	96.7%
	16	3	7804	219885	227688	101%	99%	99%	3.4%	96.6%
		4	7581	222855	230436	98%	100%	100%	3.3%	96.7%
		5	7885	225709	233594	102%	101%	101%	3.4%	96.6%
		6	7700	234174	241874	99%	105%	105%	3.2%	96.8%
		7	3120	198649	201768	40%	89%	88%	1.5%	98.5%

WIM Station		Day of	Average Daily Total			Percent of Tue. - Thu. Activity			% of Daily Total	
			Duty Classification			Duty Classification			Duty Classification	
Name	No.	Week	Heavy	Non-Heavy	Total	Heavy	Non-Heavy	Total	Heavy	Non-Heavy
Fontana	**69**	**1**	**2811**	**58059**	**60870**	**55%**	**115%**	**109%**	**4.6%**	**95.4%**
(southbound only)		**2**	**5817**	**51978**	**57795**	**113%**	**103%**	**104%**	**10.1%**	**89.9%**
		3	**4960**	**49613**	**54573**	**97%**	**98%**	**98%**	**9.1%**	**90.9%**
		4	**4996**	**50403**	**55399**	**97%**	**100%**	**99%**	**9.0%**	**91.0%**
		5	**5427**	**51809**	**57236**	**106%**	**102%**	**103%**	**9.5%**	**90.5%**
		6	**5058**	**57842**	**62900**	**99%**	**114%**	**113%**	**8.0%**	**92.0%**
		7	**2336**	**52000**	**54336**	**46%**	**103%**	**97%**	**4.3%**	**95.7%**
Redlands	**39**	**1**	**298**	**40561**	**40859**	**29%**	**73%**	**72%**	**0.7%**	**99.3%**
		2	**985**	**53828**	**54813**	**97%**	**97%**	**97%**	**1.8%**	**98.2%**
		3	**1079**	**55452**	**56531**	**107%**	**100%**	**100%**	**1.9%**	**98.1%**
		4	**1018**	**54986**	**56004**	**101%**	**99%**	**99%**	**1.8%**	**98.2%**
		5	**940**	**55926**	**56866**	**93%**	**101%**	**101%**	**1.7%**	**98.3%**
		6	**784**	**56243**	**57027**	**77%**	**101%**	**101%**	**1.4%**	**98.6%**
		7	**425**	**46589**	**47014**	**42%**	**84%**	**83%**	**0.9%**	**99.1%**
Newhall	**6**	**1**	**2544**	**11481**	**14025**	**35%**	**106%**	**77%**	**18.1%**	**81.9%**
(northbound only)		**2**	**9577**	**14768**	**24345**	**131%**	**136%**	**134%**	**39.3%**	**60.7%**
		3	**8709**	**13256**	**21965**	**119%**	**122%**	**121%**	**39.7%**	**60.3%**
		4	**7669**	**11431**	**19100**	**105%**	**105%**	**105%**	**40.2%**	**59.8%**
		5	**5570**	**7831**	**13401**	**76%**	**72%**	**74%**	**41.6%**	**58.4%**
		6	**5195**	**9834**	**15029**	**71%**	**91%**	**83%**	**34.6%**	**65.4%**
		7	**3725**	**15313**	**19037**	**51%**	**141%**	**105%**	**19.6%**	**80.4%**
Castaic	**47**	**1**	**5344**	**80105**	**85449**	**38%**	**148%**	**125%**	**6.3%**	**93.7%**
	and	**2**	**13253**	**58645**	**71898**	**93%**	**108%**	**105%**	**18.4%**	**81.6%**
	48	**3**	**14039**	**51803**	**65841**	**99%**	**96%**	**96%**	**21.3%**	**78.7%**
		4	**14191**	**52637**	**66828**	**100%**	**97%**	**98%**	**21.2%**	**78.8%**
		5	**14368**	**57747**	**72115**	**101%**	**107%**	**106%**	**19.9%**	**80.1%**
		6	**13276**	**76931**	**90207**	**93%**	**142%**	**132%**	**14.7%**	**85.3%**
		7	**6804**	**72516**	**79320**	**48%**	**134%**	**116%**	**8.6%**	**91.4%**

WIM Station		Day of	Average Daily Total			Percent of Tue. - Thu. Activity			% of Daily Total	
			Duty Classification			Duty Classification			Duty Classification	
Name	No.	Week	Heavy	Non-Heavy	Total	Heavy	Non-Heavy	Total	Heavy	Non-Heavy
Elsinore	37	1	746	66096	66842	18%	96%	92%	1.1%	98.9%
	and	2	4046	68161	72206	99%	99%	99%	5.6%	94.4%
	38	3	4092	67365	71457	100%	98%	98%	5.7%	94.3%
		4	3994	67074	71069	98%	98%	98%	5.6%	94.4%
		5	4172	71575	75746	102%	104%	104%	5.5%	94.5%
		6	3424	73291	76716	84%	107%	105%	4.5%	95.5%
		7	1276	71106	72382	31%	104%	99%	1.8%	98.2%
Indio	5	1	3571	14688	18259	59%	184%	130%	19.6%	80.4%
		2	5146	9238	14384	85%	116%	102%	35.8%	64.2%
		3	5376	6588	11964	88%	83%	85%	44.9%	55.1%
		4	6372	8212	14584	105%	103%	104%	43.7%	56.3%
		5	6519	9116	15635	107%	114%	111%	41.7%	58.3%
		6	5281	13007	18288	87%	163%	130%	28.9%	71.1%
		7	3728	11767	15496	61%	148%	110%	24.1%	75.9%
Peralta	61	1	1461	192633	194094	17%	94%	91%	0.8%	99.2%
	and	2	8485	198176	206661	99%	97%	97%	4.1%	95.9%
	62	3	8685	201391	210076	102%	99%	99%	4.1%	95.9%
		4	8493	205203	213696	99%	100%	100%	4.0%	96.0%
		5	8444	206398	214842	99%	101%	101%	3.9%	96.1%
		6	8237	214319	222556	96%	105%	105%	3.7%	96.3%
		7	3336	211806	215142	39%	104%	101%	1.6%	98.4%
Montrose	101	1	65	59918	59983	22%	62%	62%	0.1%	99.9%
	and	2	266	94377	94643	91%	98%	98%	0.3%	99.7%
	102	3	303	91628	91930	103%	95%	95%	0.3%	99.7%
		4	277	99961	100238	95%	104%	104%	0.3%	99.7%
		5	299	98040	98339	102%	102%	102%	0.3%	99.7%
		6	323	93865	94188	110%	97%	97%	0.3%	99.7%
		7	135	73833	73967	46%	76%	76%	0.2%	99.8%

WIM Station		Day of	Average Daily Total			Percent of Tue. - Thu. Activity			% of Daily Total	
			Duty Classification			Duty Classification			Duty Classification	
Name	No.	Week	Heavy	Non-Heavy	Total	Heavy	Non-Heavy	Total	Heavy	Non-Heavy
Murrieta	63	1	2158	33860	36018	97%	80%	80%	6.0%	94.0%
		2	2891	38527	41418	130%	91%	93%	7.0%	93.0%
		3	2840	42419	45259	128%	100%	101%	6.3%	93.7%
		4	1965	41677	43643	88%	98%	98%	4.5%	95.5%
		5	1864	43502	45366	84%	102%	101%	4.1%	95.9%
		6	2976	42248	45223	134%	99%	101%	6.6%	93.4%
		7	2361	37116	39477	106%	87%	88%	6.0%	94.0%
Devore	67	1	934	33604	34538	41%	86%	83%	2.7%	97.3%
		2	2111	39101	41212	92%	100%	99%	5.1%	94.9%
		3	2325	38778	41103	101%	99%	99%	5.7%	94.3%
		4	2222	38986	41208	97%	99%	99%	5.4%	94.6%
		5	2331	39987	42318	102%	102%	102%	5.5%	94.5%
		6	2124	43705	45829	93%	111%	110%	4.6%	95.4%
		7	1127	34563	35690	49%	88%	86%	3.2%	96.8%

Table 5.1-4 Summary of heavy-duty and non-heavy-duty traffic at central and peripheral WIM sites

Day of Week	All Sites	Central Sites	Peripheral Sites
Total Volume of Heavy-Duty Trucks			
1	27849	9443	13050
2	84617	40792	28432
3	87131	43712	29750
4	85333	42905	29762
5	84293	43103	30193
6	81455	43337	27865
7	38574	16793	15721
Heavy-Duty Trucks as % of Midweek			
1	32.5%	21.8%	43.6%
2	98.9%	94.3%	95.1%
3	101.8%	101.1%	99.5%
4	99.7%	99.2%	99.5%
5	98.5%	99.7%	101.0%
6	95.2%	100.2%	93.2%
7	45.1%	38.8%	52.6%
Total Volume of Non-Heavy-Duty Vehicles			
1	1177528	839074	268914
2	1366362	1032116	267499
3	1387777	1062503	262406
4	1406764	1081358	263572
5	1410825	1073333	277852
6	1501543	1128442	305425
7	1311908	970939	273657
Non-Heavy-Duty Vehicles as % of Midweek			
1	84.0%	78.2%	100.4%
2	97.5%	96.2%	99.8%
3	99.0%	99.1%	97.9%
4	100.4%	100.8%	98.4%
5	100.6%	100.1%	103.7%
6	107.1%	105.2%	114.0%
7	93.6%	90.5%	102.1%

Figure 5.1-1 Basinwide perspective of the locations of Weigh-in-Motion Stations

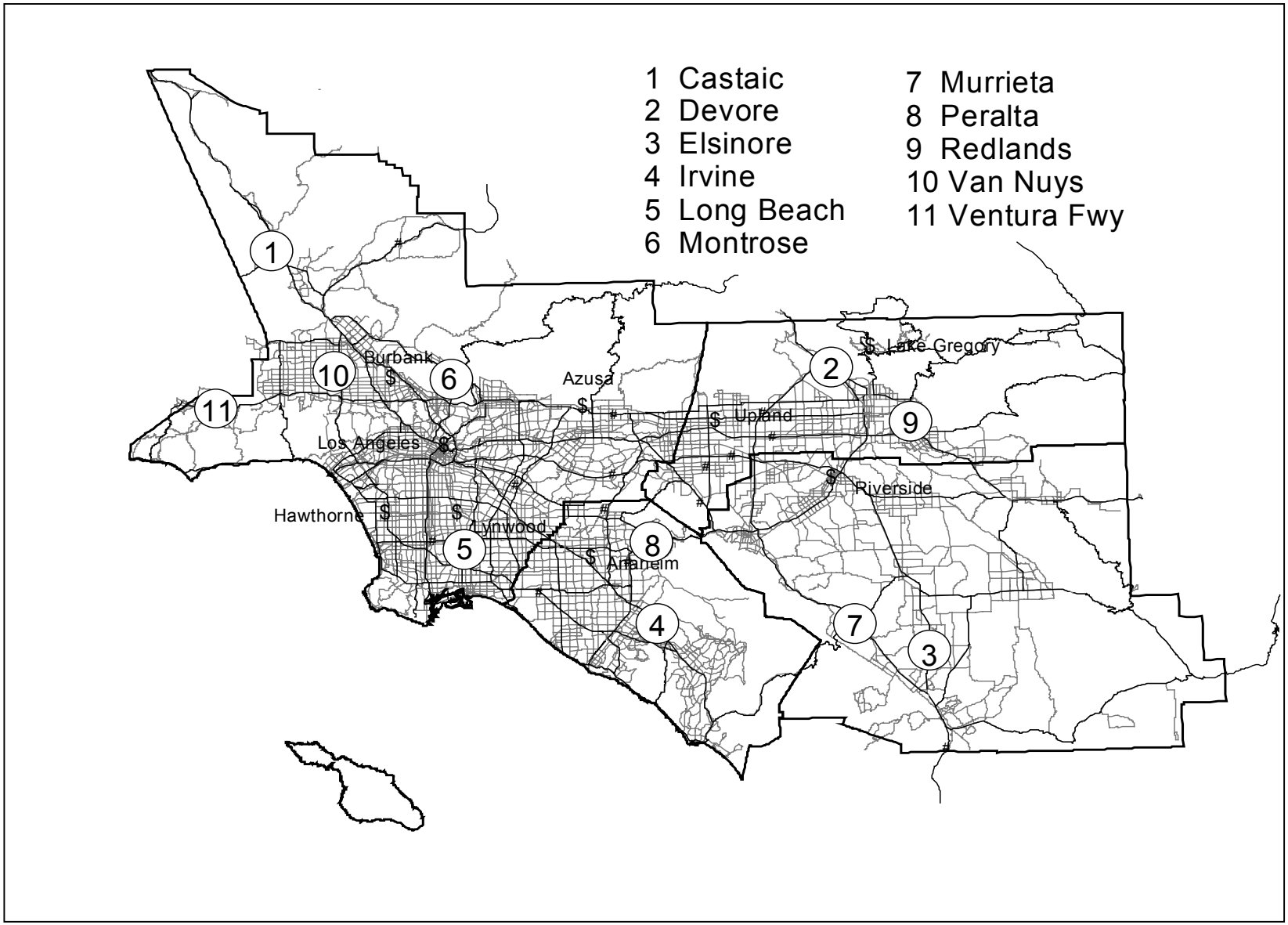

Figure 5.1-2 Indio (WIMS No. 5): Total Volume

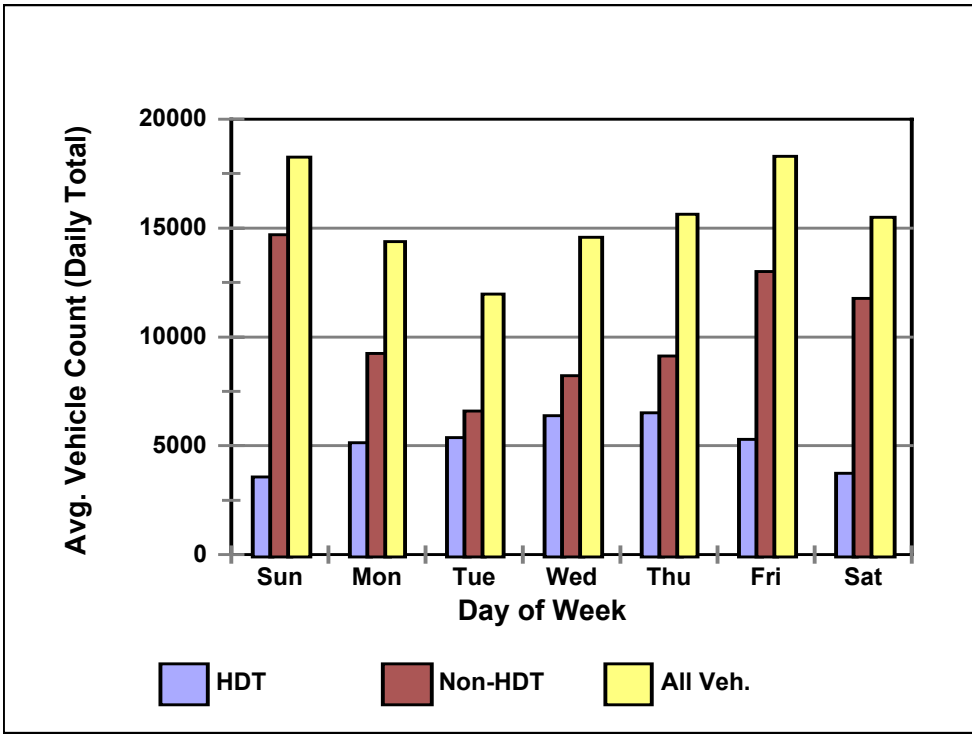

Figure 5.1-3 Indio (WIMS No. 5): Relative Volume

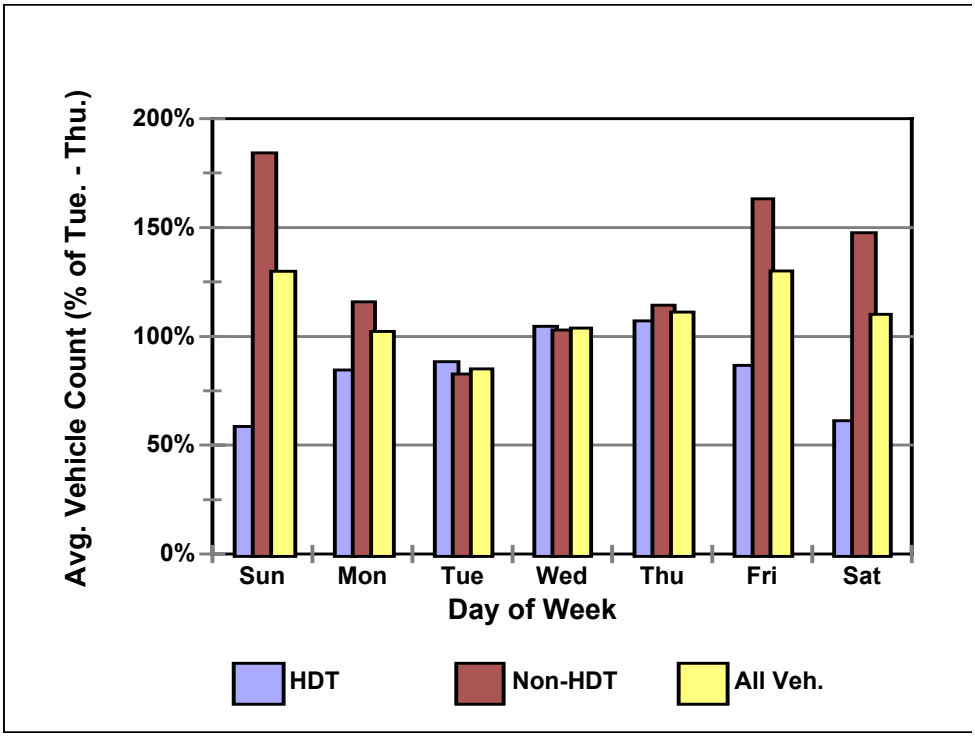

Figure 5.1-4 Ventura Fwy (WIMS Nos. 8/9): Total Volume

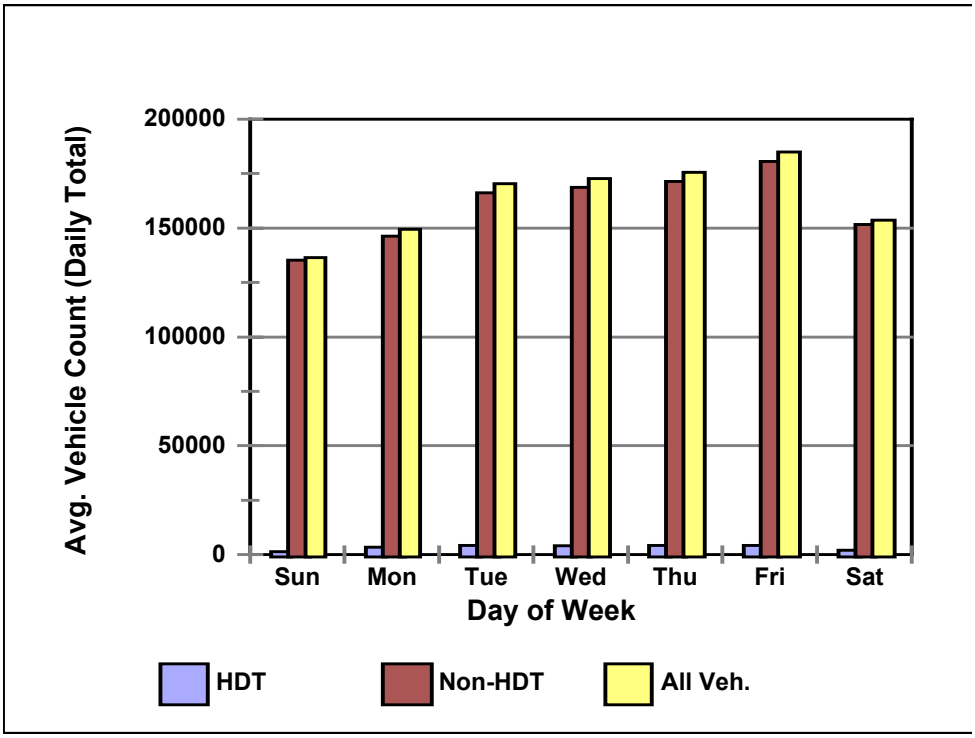

Figure 5.1-5 Ventura Fwy (WIMS Nos. 8/9): Relative Volume

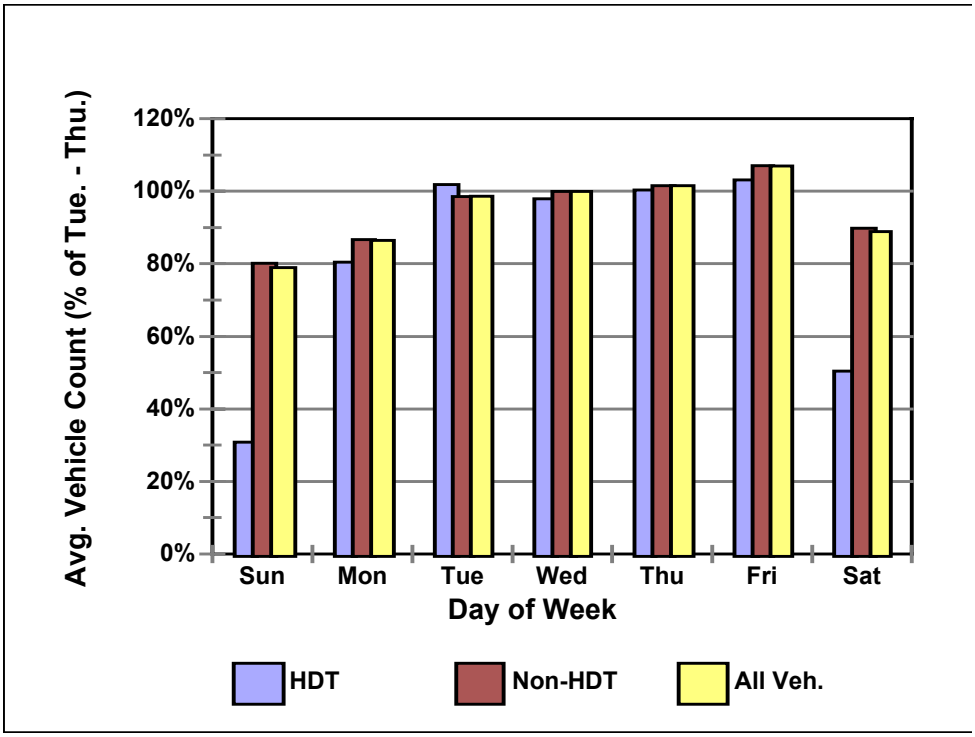

Figure 5.1-6 Van Nuys (WIMS Nos. 12/13): Total Volume

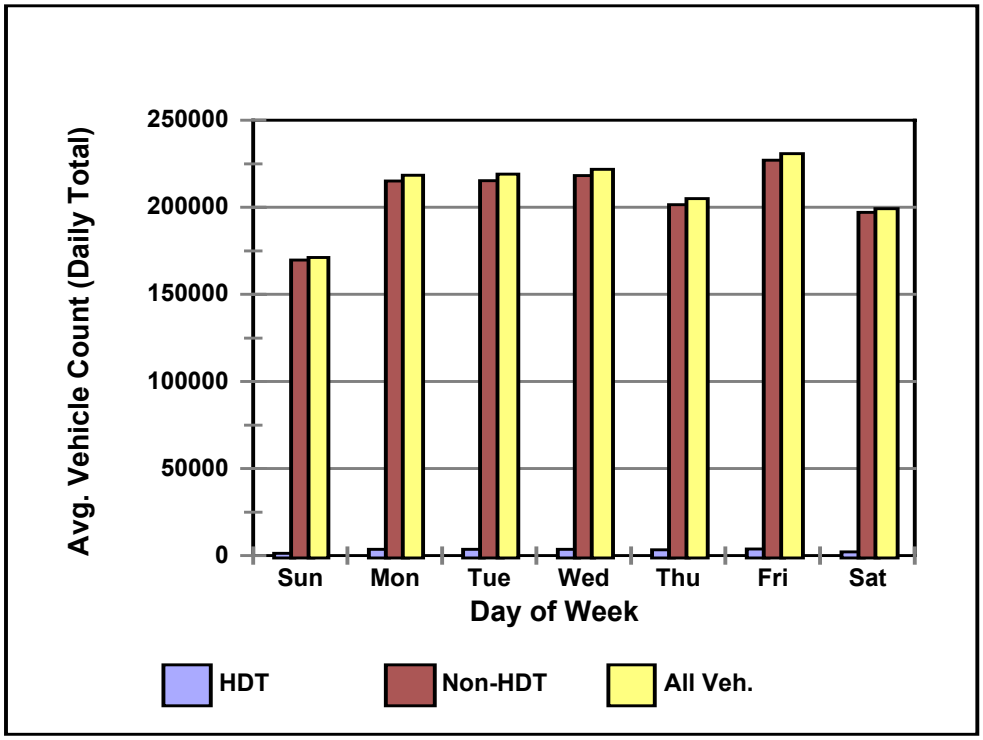

Figure 5.1-7 Van Nuys (WIMS Nos. 12/13): Relative Volume

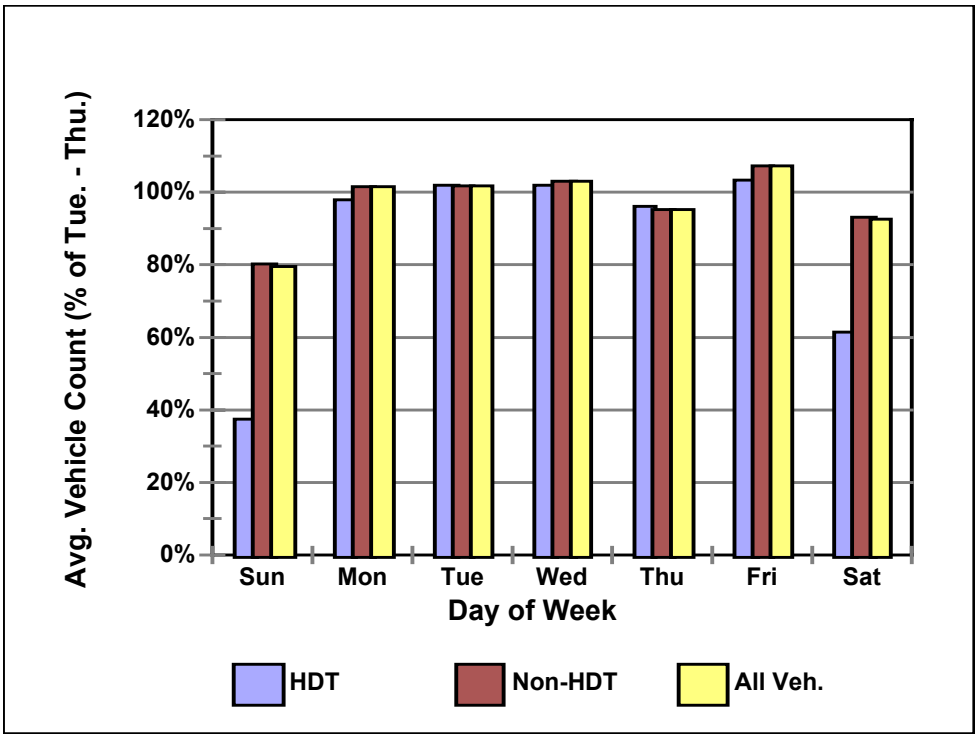

Figure 5.1-8 Irvine (WIMS Nos. 15/16): Total Volume

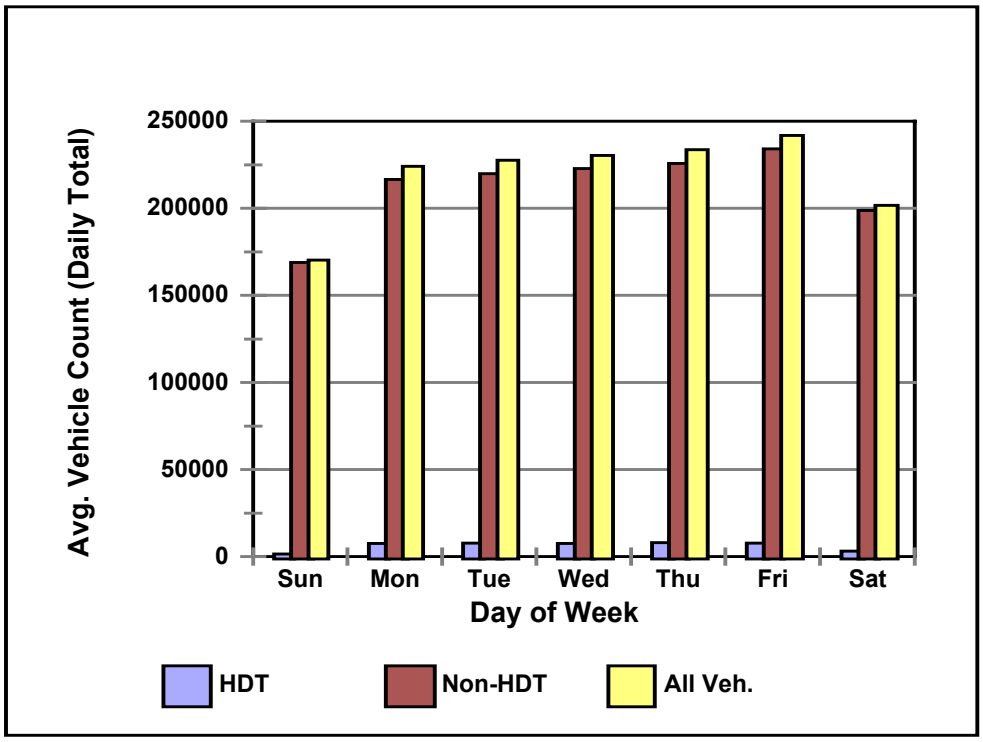

Figure 5.1-9 Irvine (WIMS Nos. 15/16): Relative Volume

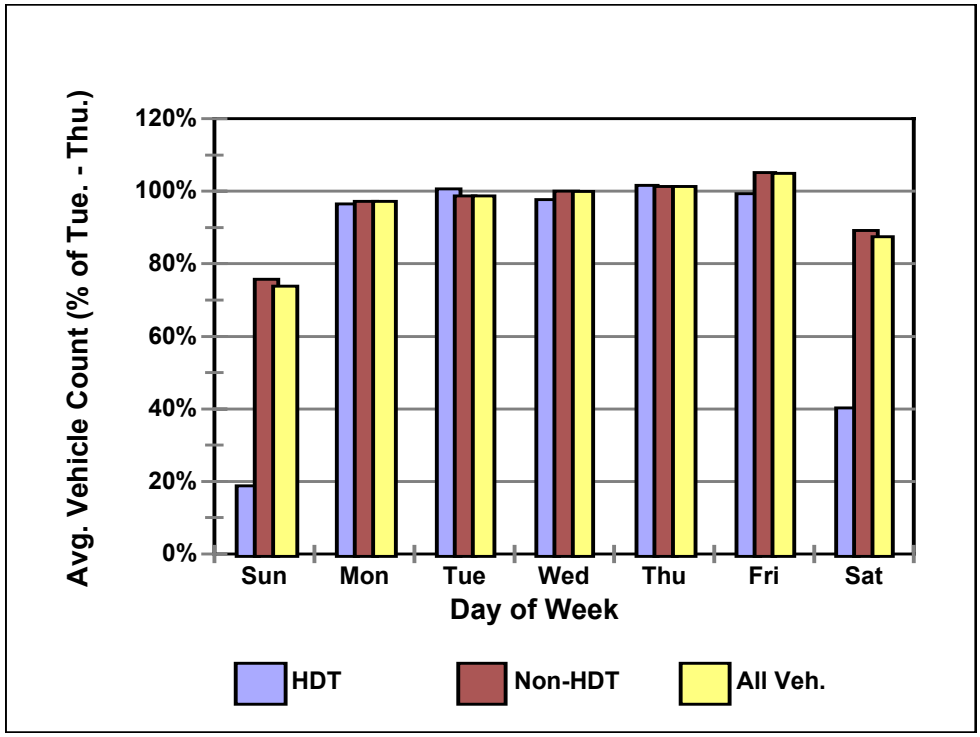

Figure 5.1-10 Elsinore (WIMS Nos. 37/38): Total Volume

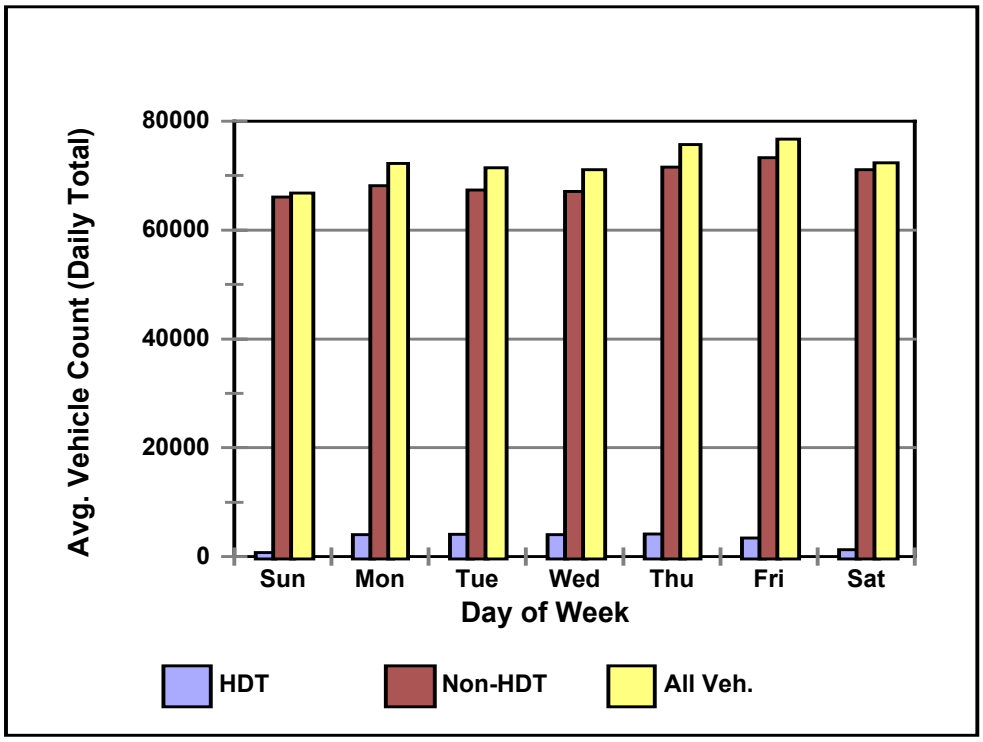

Figure 5.1-11 Elsinore (WIMS Nos. 37/38): Relative Volume

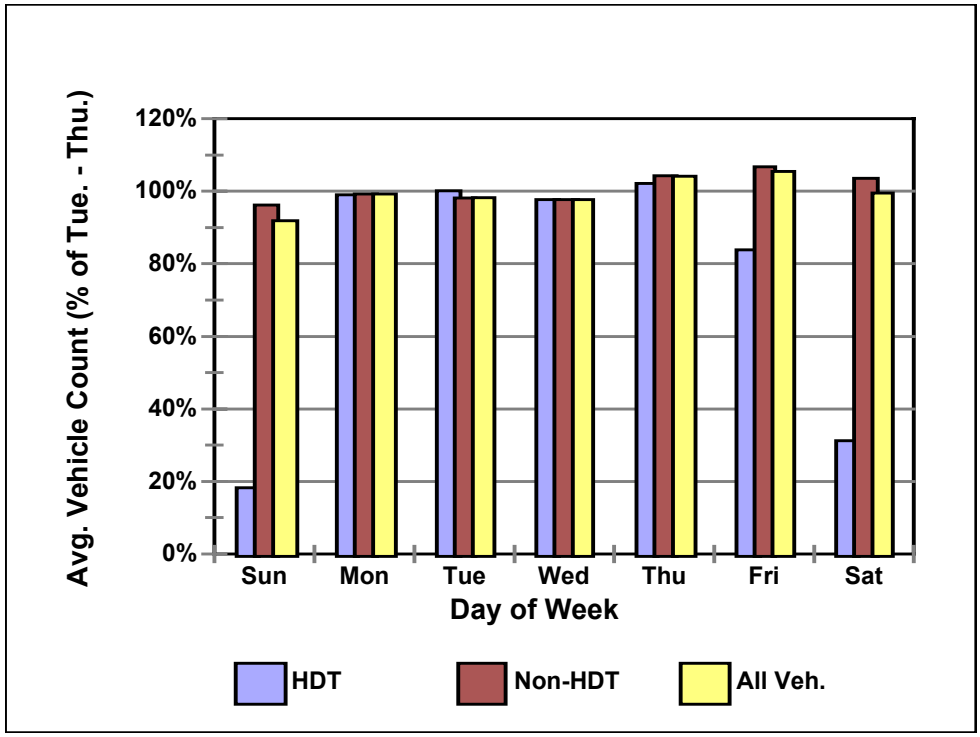

Figure 5.1-12 Redlands (WIMS No. 39): Total Volume

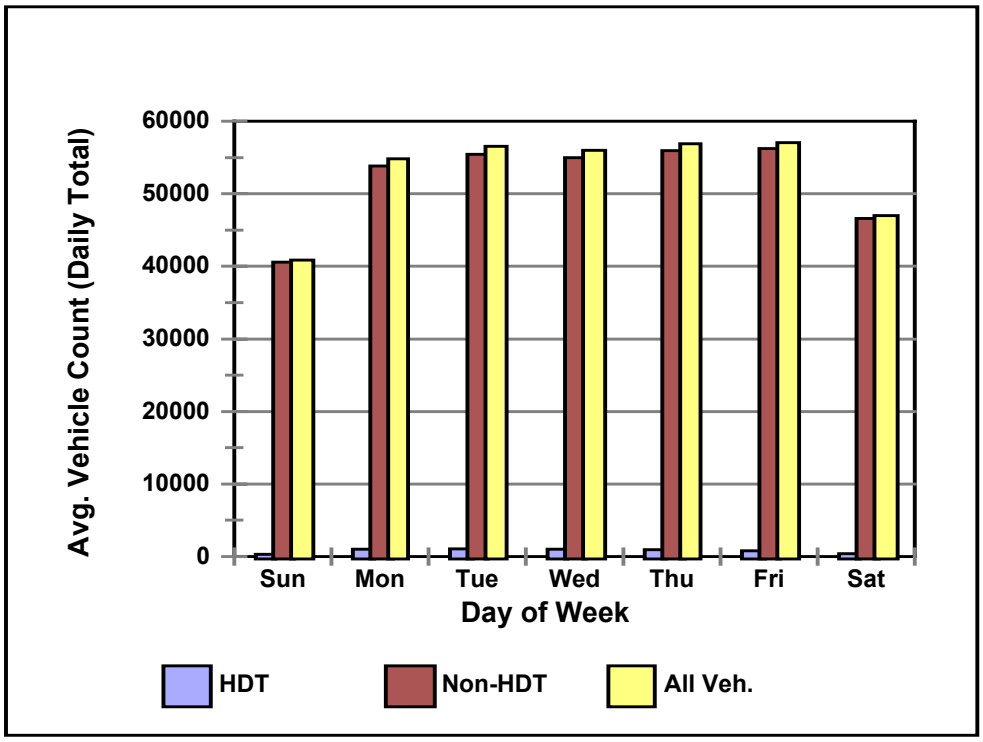

Figure 5.1-13 Redlands (WIMS No. 39): Relative Volume

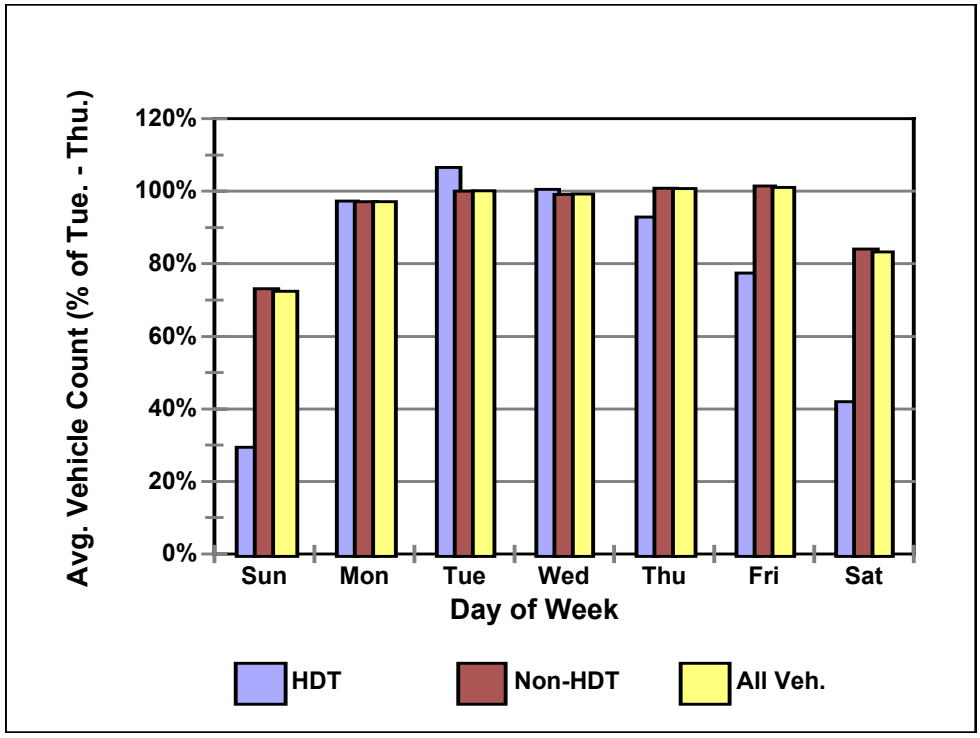

Figure 5.1-14 Castaic (WIMS Nos. 47/48): Total Volume

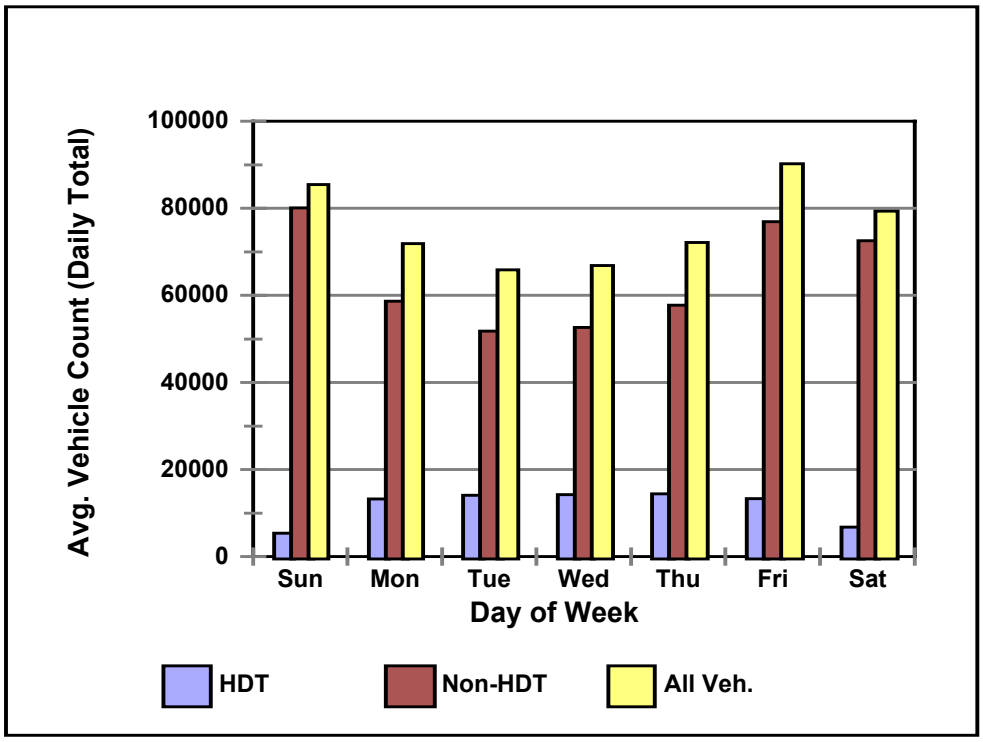

Figure 5.1-15 Castaic (WIMS Nos. 47/48): Relative Volume

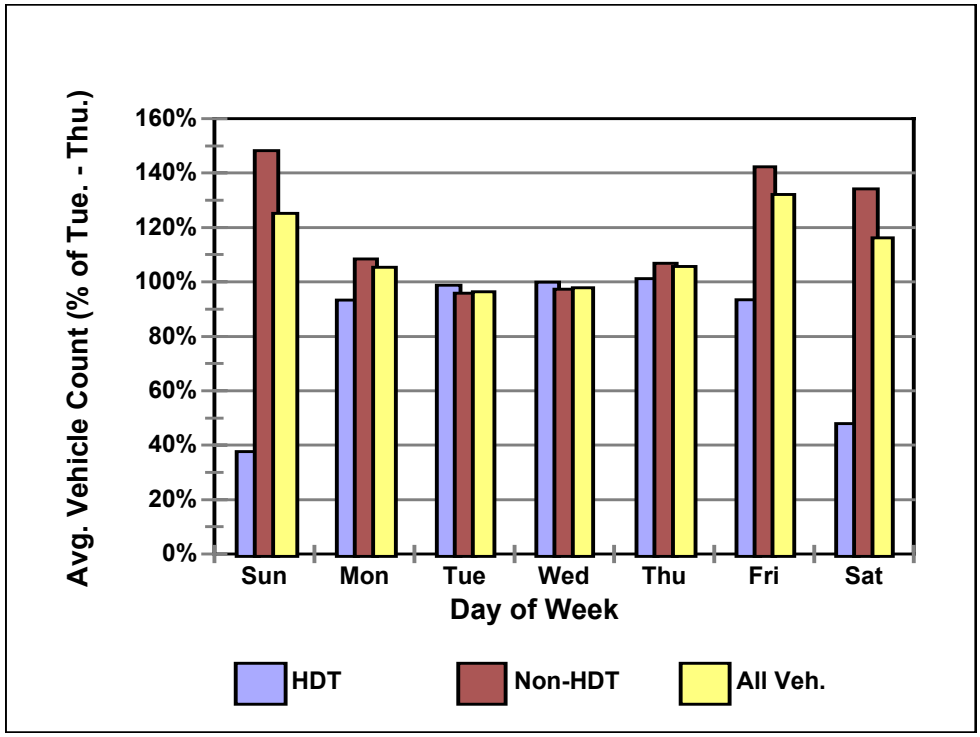

Figure 5.1-16 Long Beach (WIMS Nos. 59/60): Total Volume

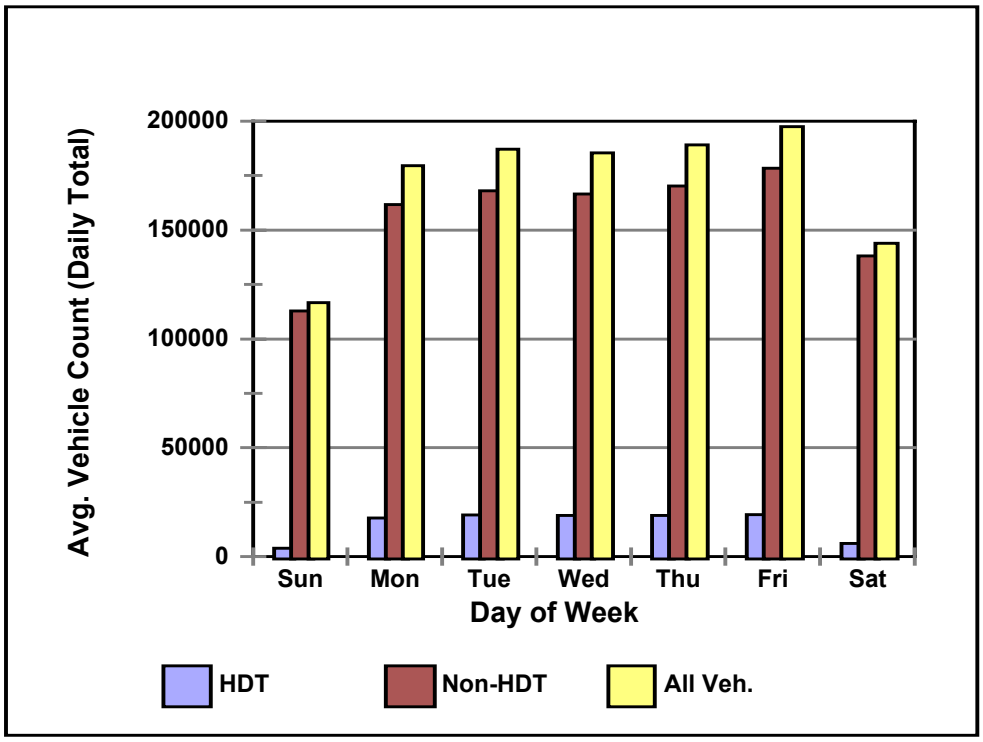

Figure 5.1-17 Long Beach (WIMS Nos. 59/60): Relative Volume

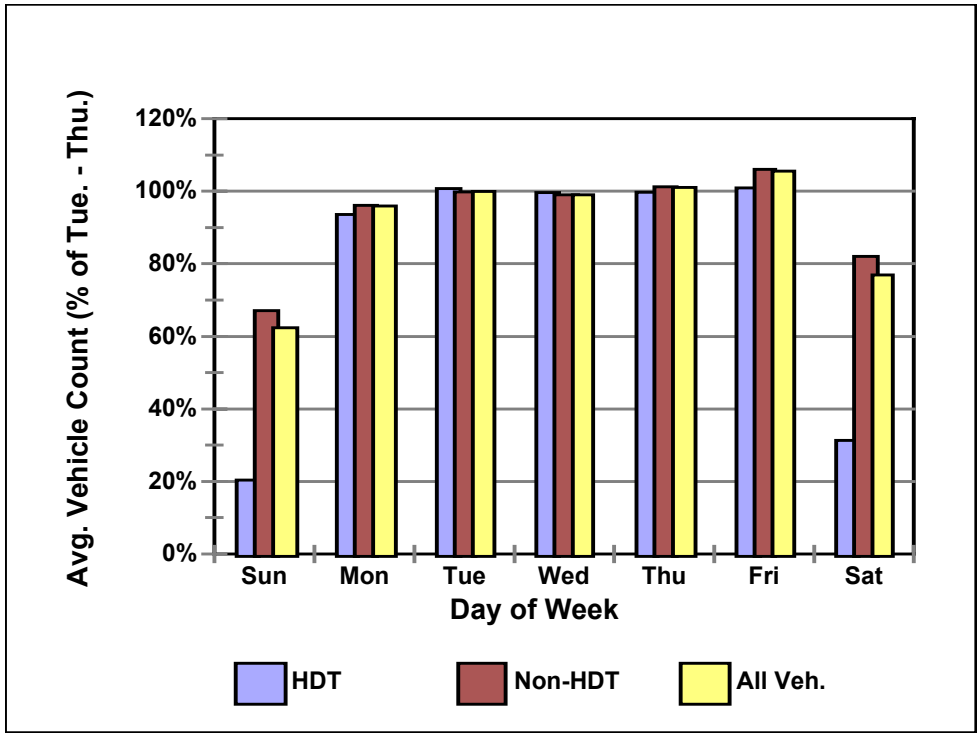

Figure 5.1-18 Peralta (WIMS Nos. 61/62): Total Volume

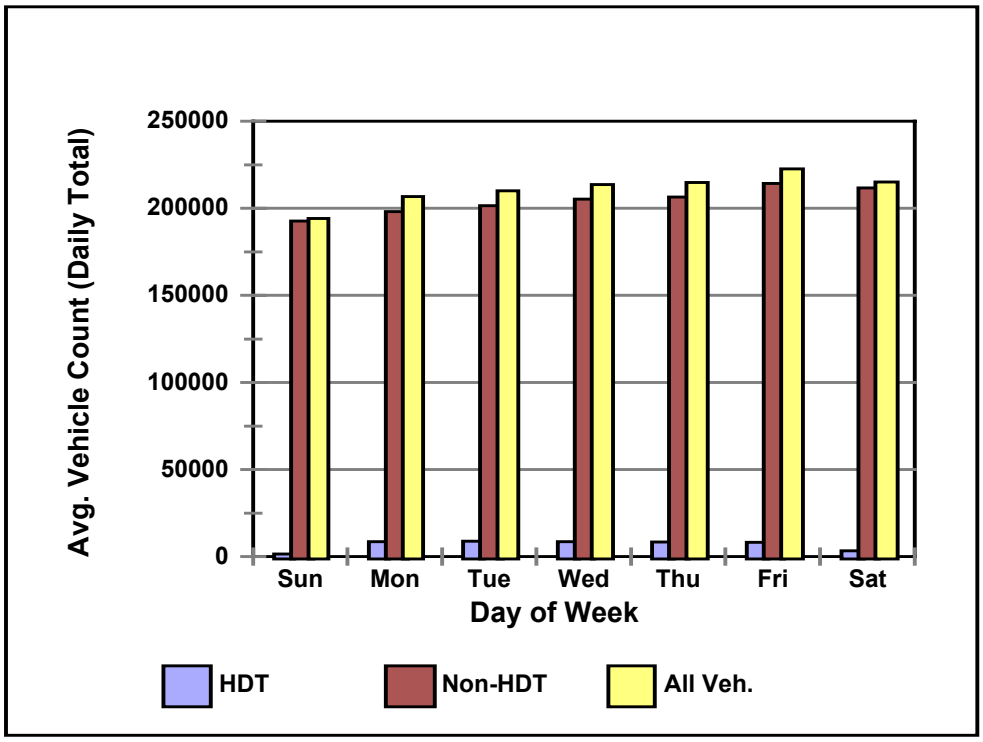

Figure 5.1-19 Peralta (WIMS Nos. 61/62): Relative Volume

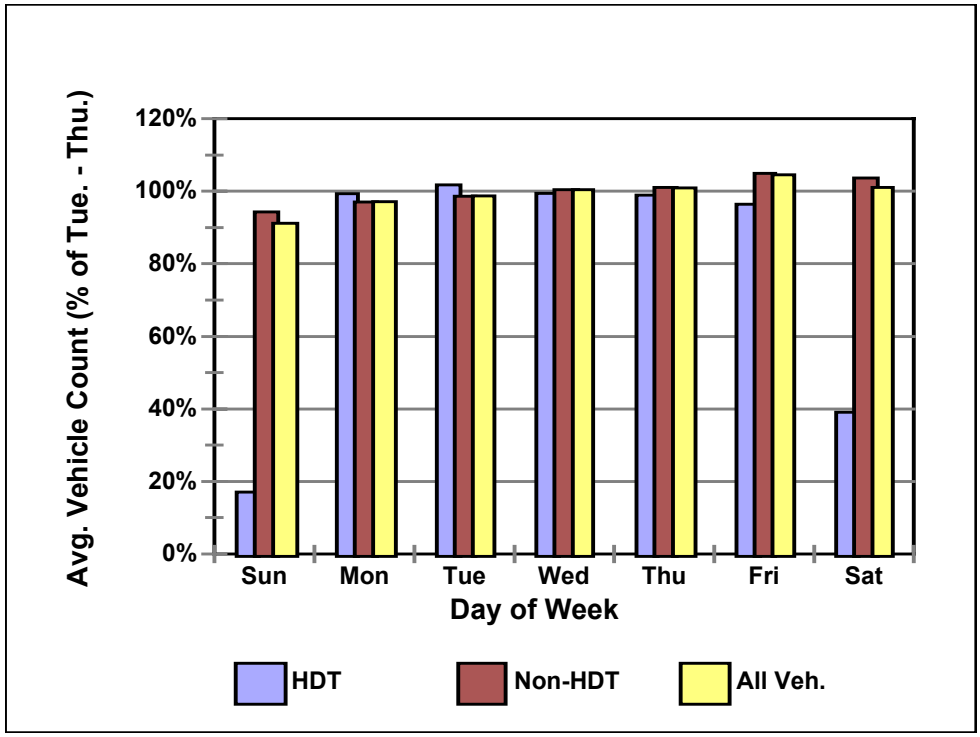

Figure 5.1-20 Murrieta (WIMS No. 63): Total Volume

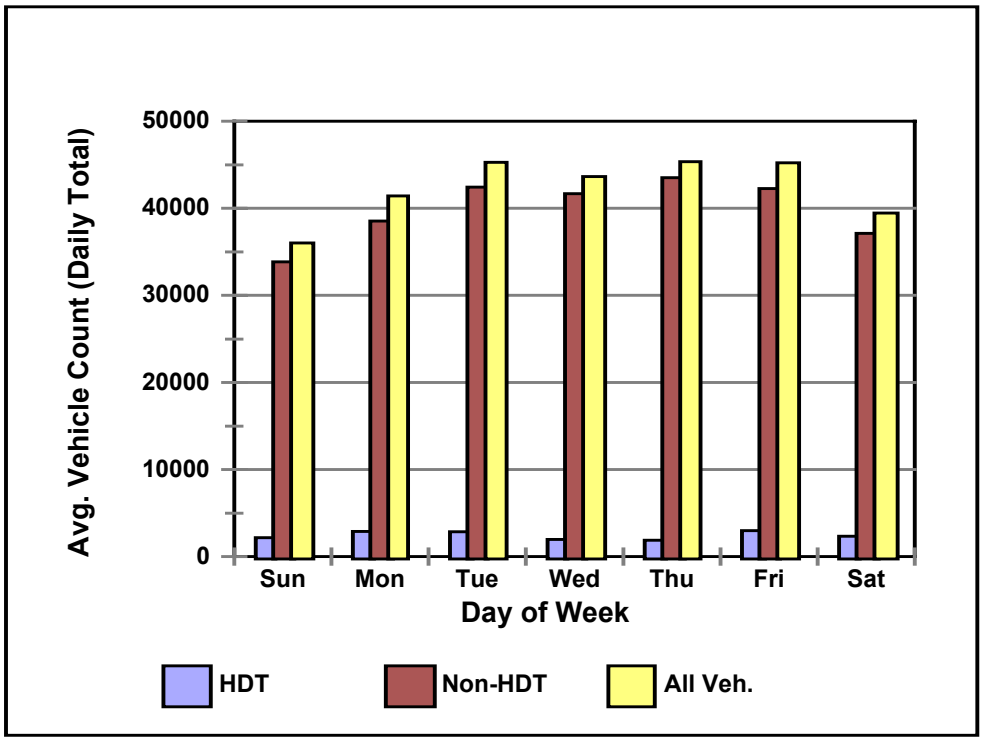

Figure 5.1-21 Murrieta (WIMS No. 63): Relative Volume

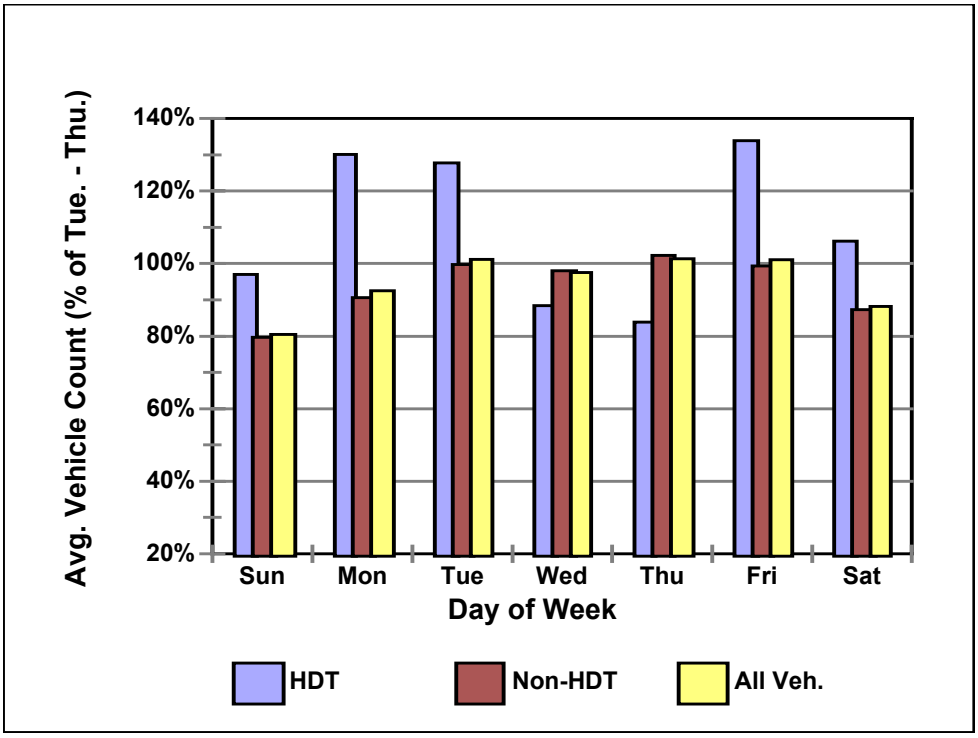

Figure 5.1-22 Devore (WIMS No. 67): Total Volume

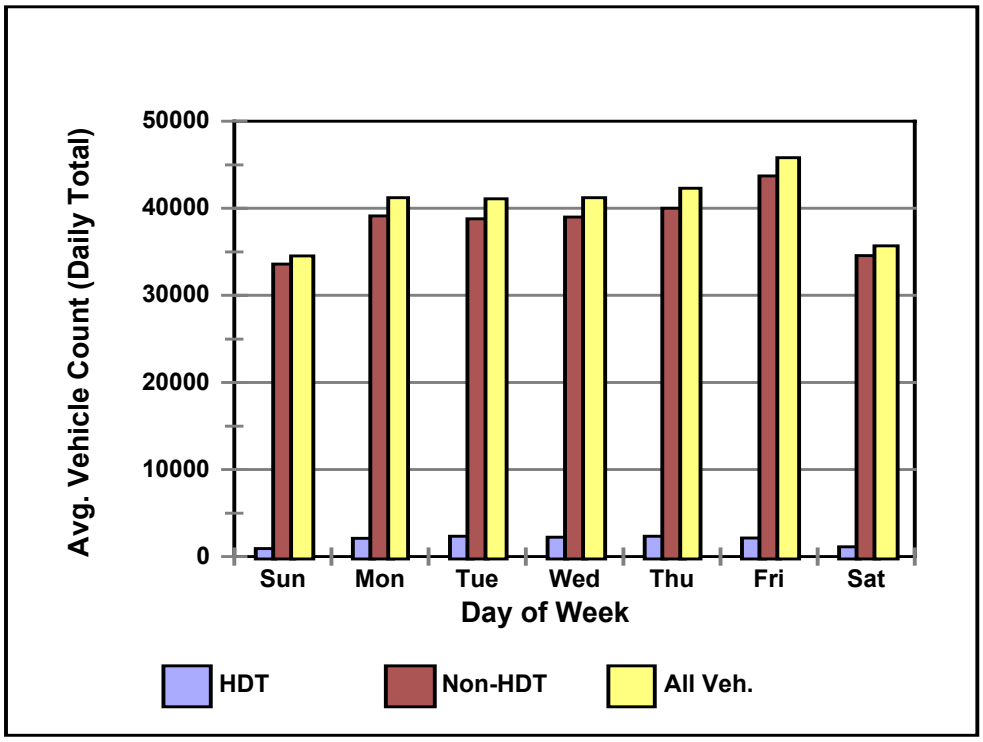

Figure 5.1-23 Devore (WIMS No. 67): Relative Volume

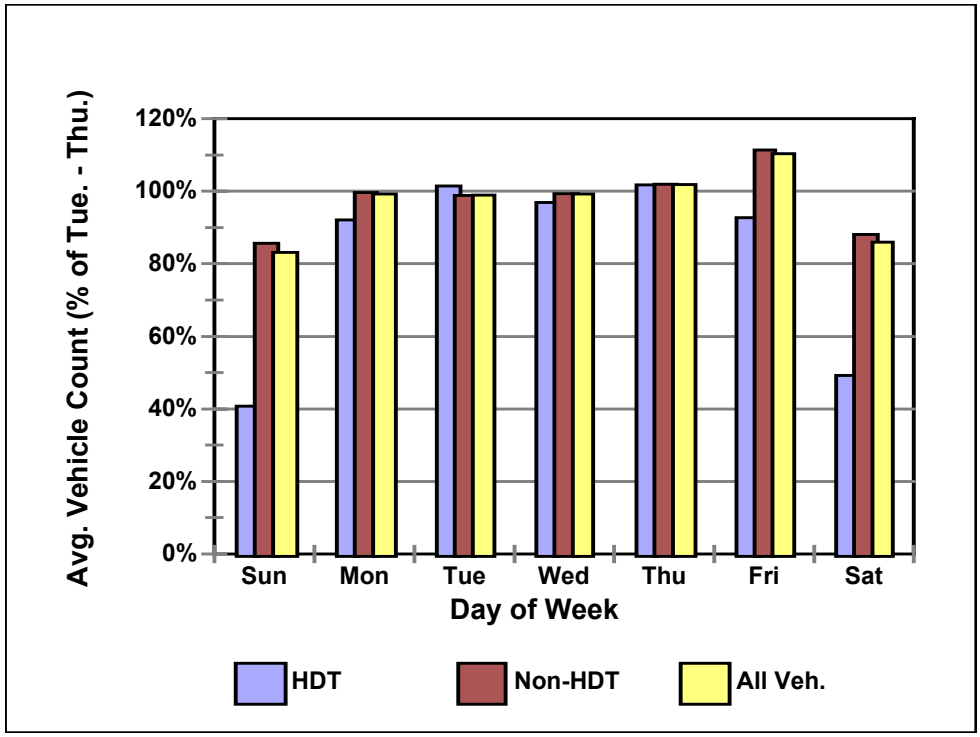

Figure 5.1-24 Montrose (WIMS Nos. 101/102): Total Volume

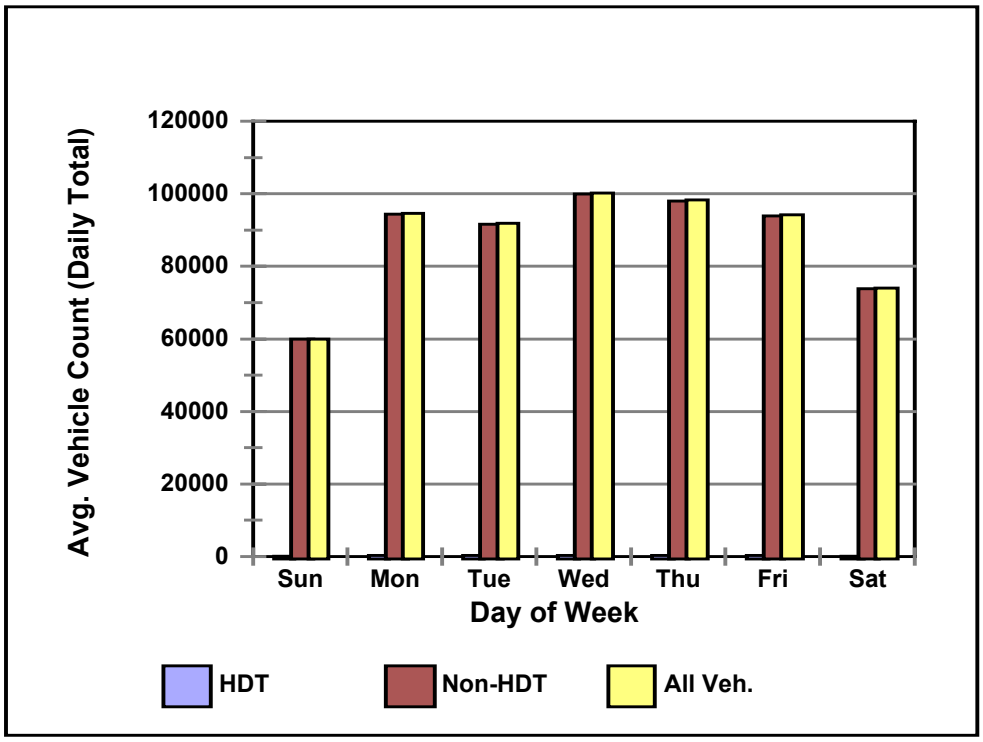

Figure 5.1-25 Montrose (WIMS Nos. 101/102): Relative Volume

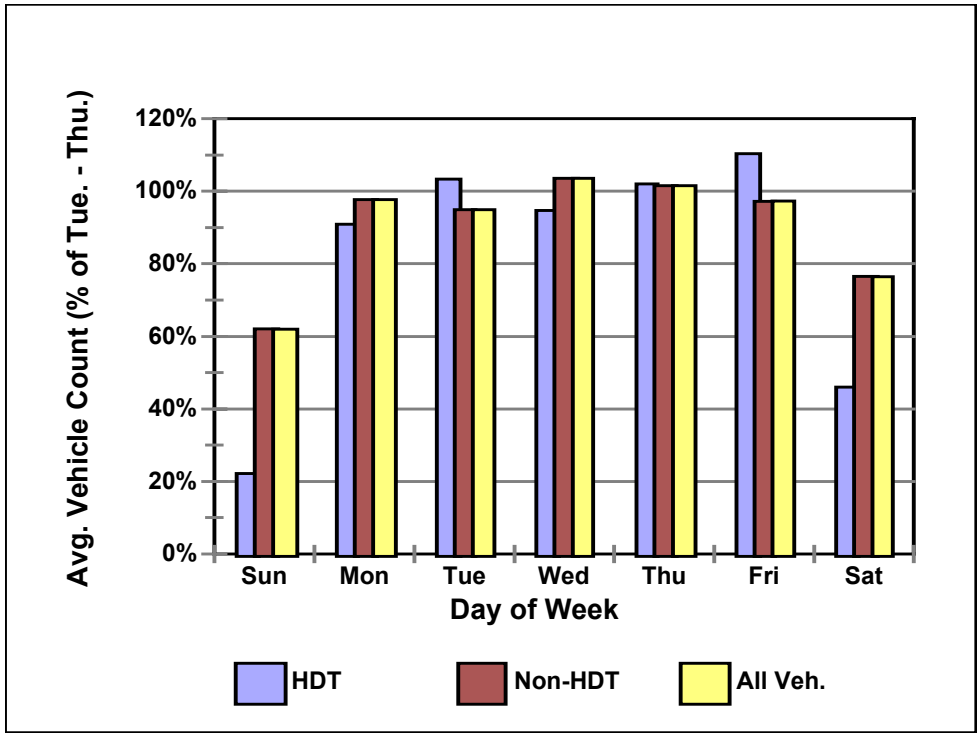

Figure 5.1-26

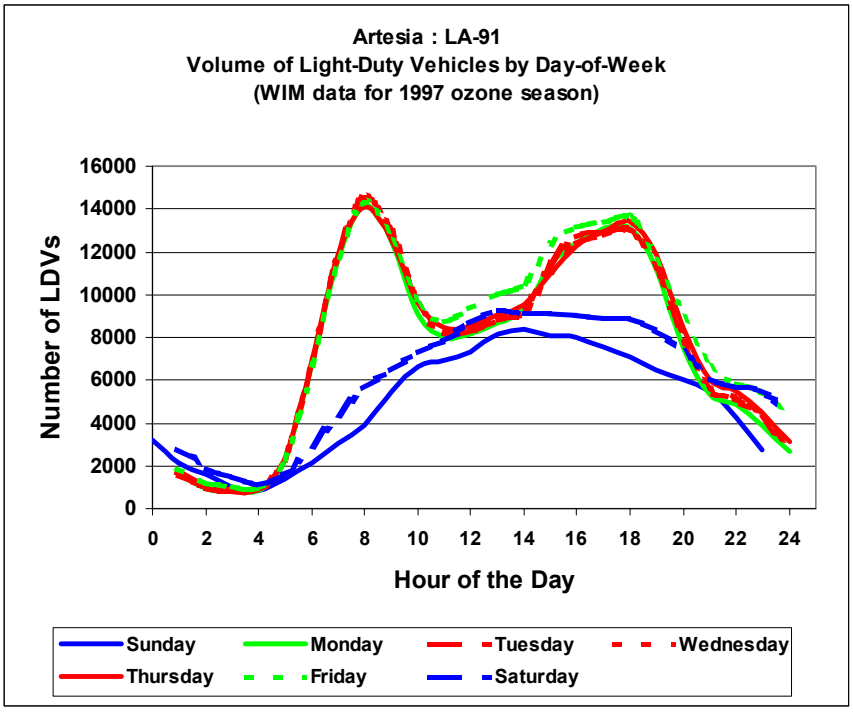

Figure 5.1-27

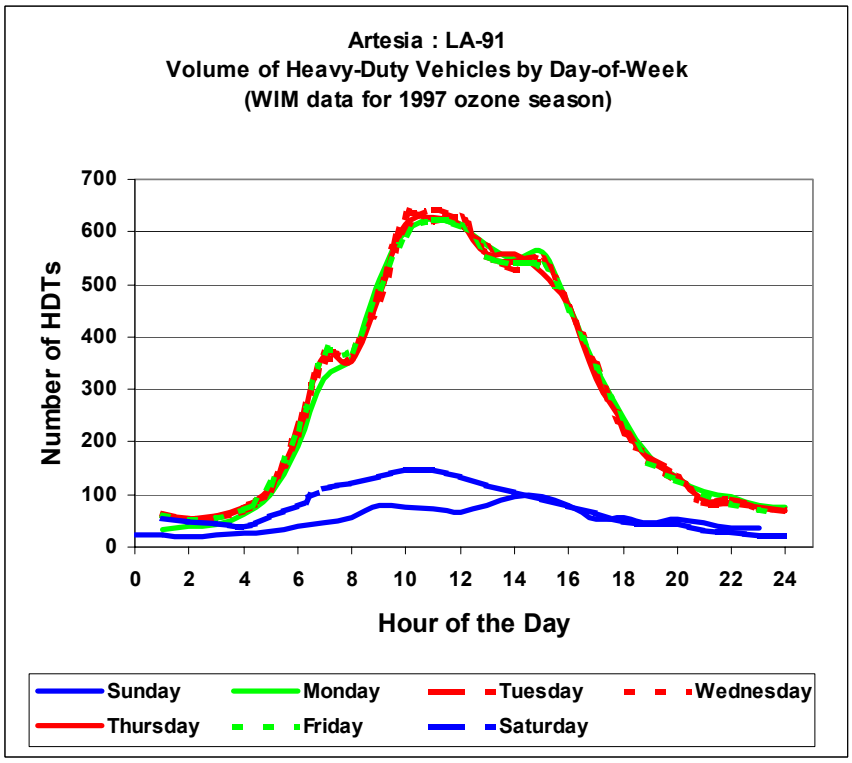

Figure 5.1-28

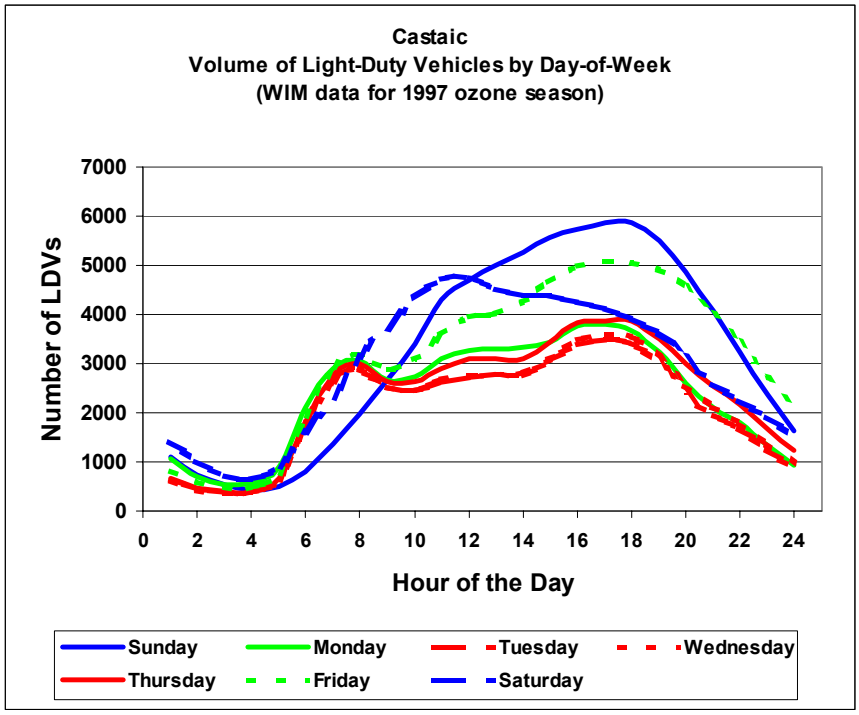

Figure 5.1-29

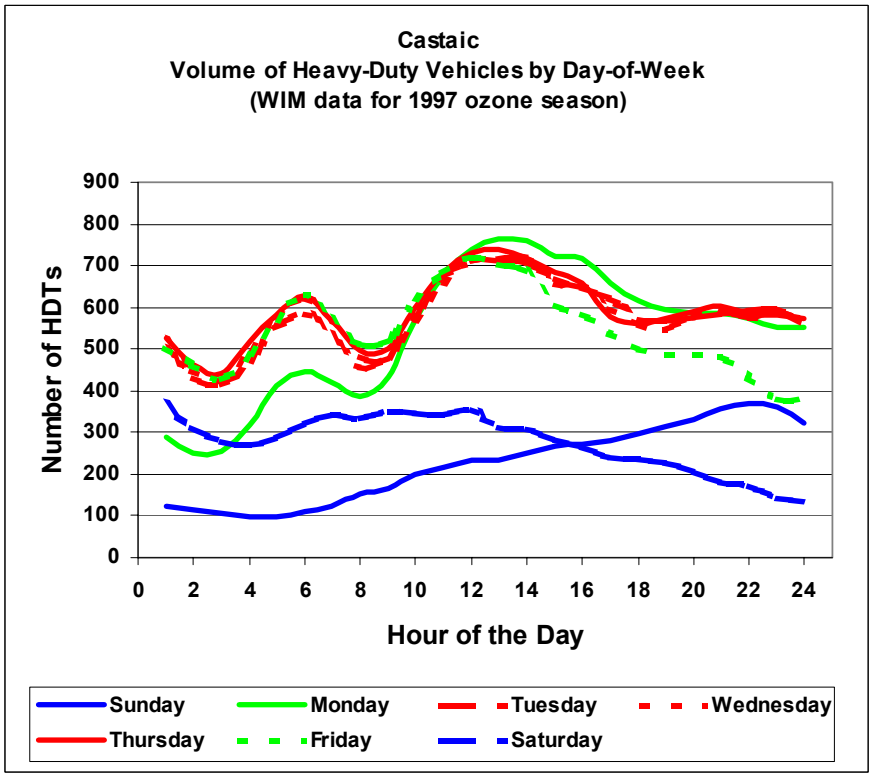

Figure 5.1-30

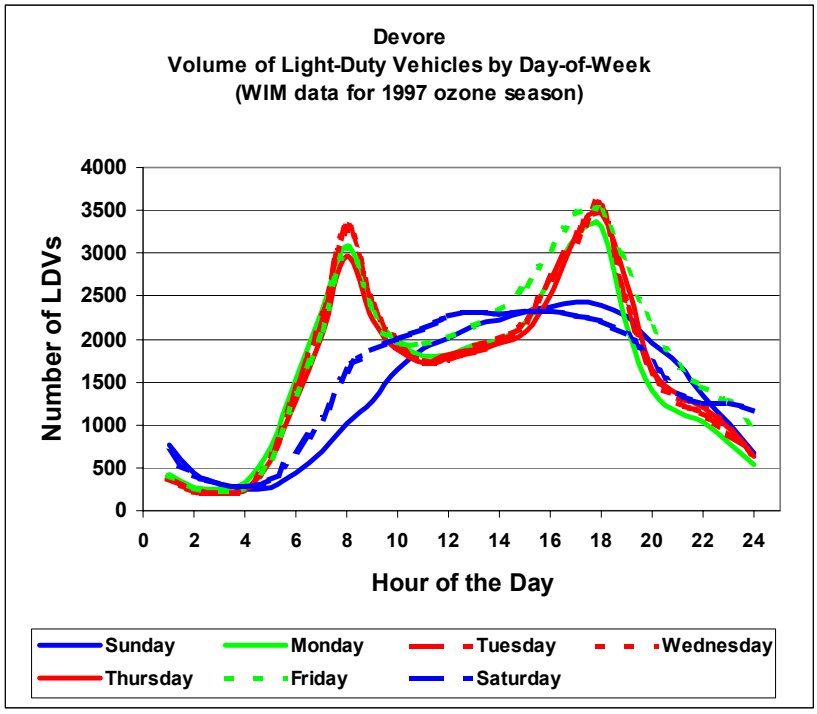

Figure 5.1-31

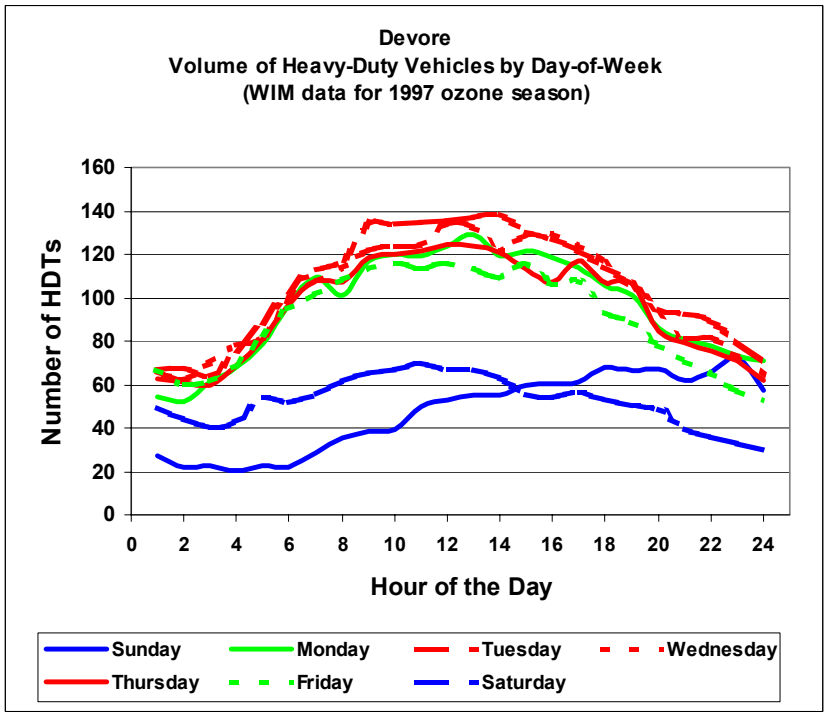

Figure 5.1-32

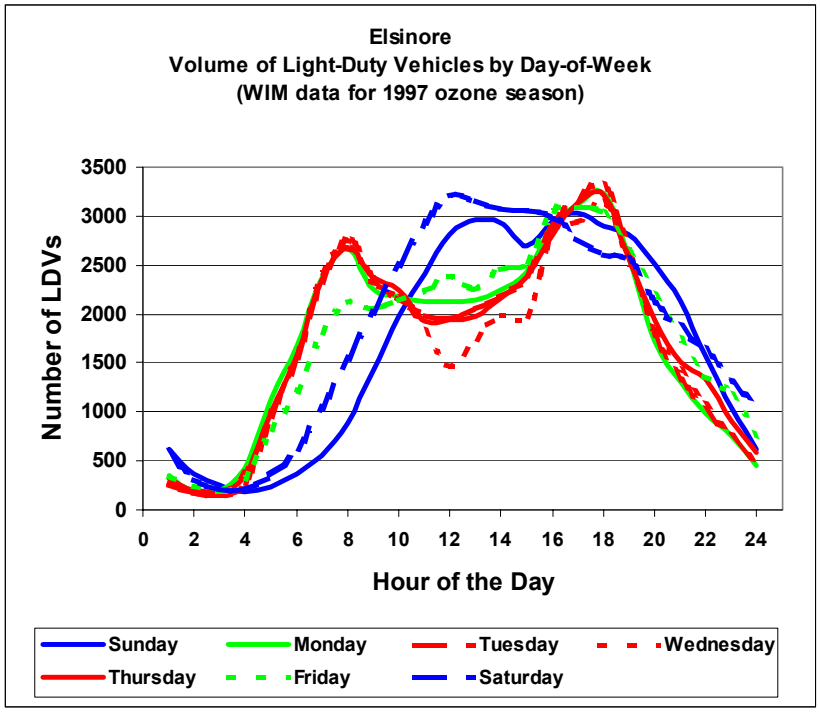

Figure 5.1-33

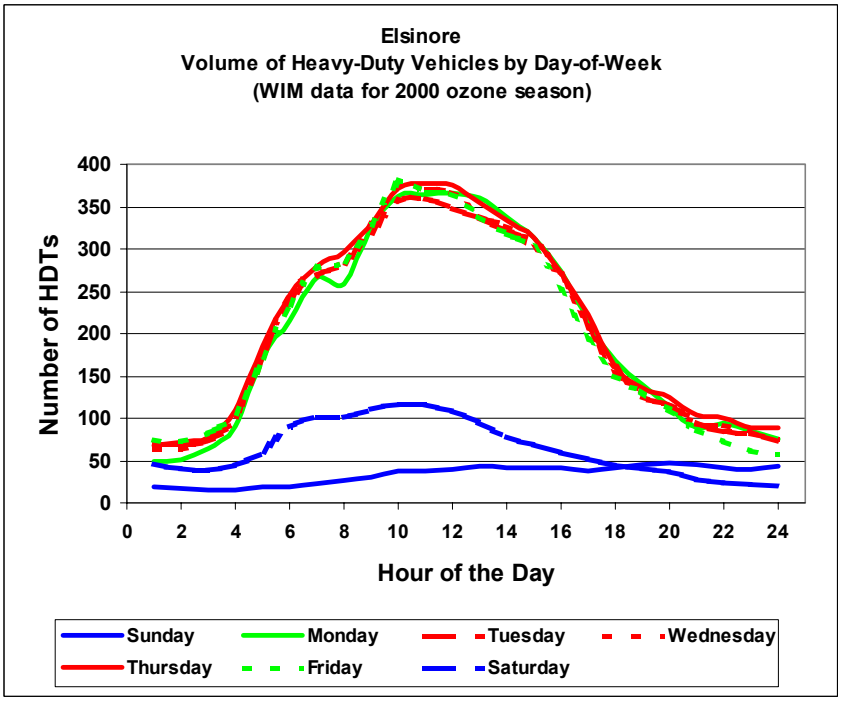

Figure 5.1-34

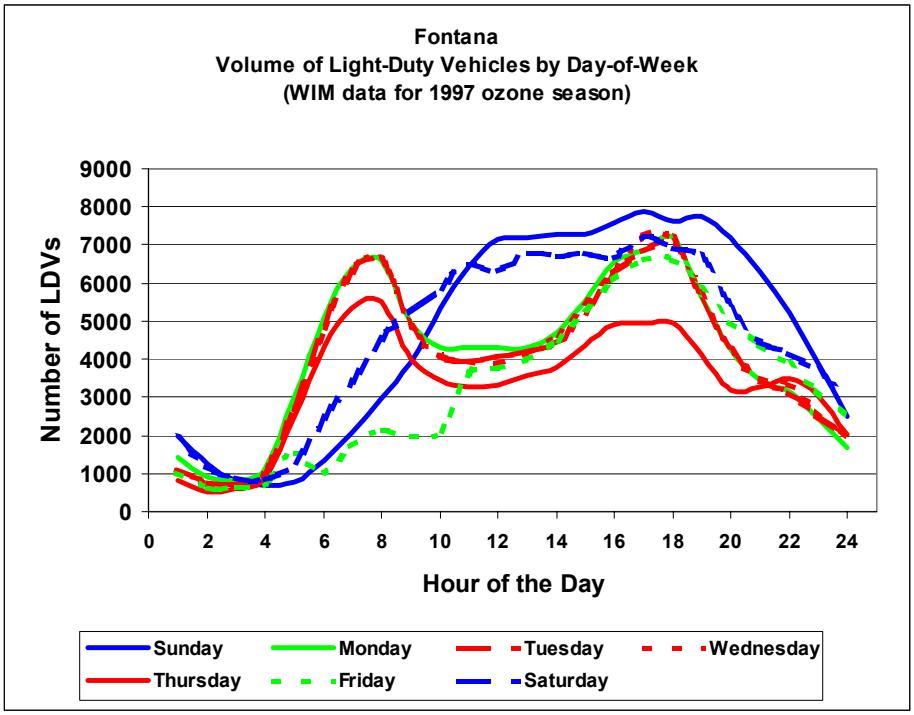

Figure 5.1-35

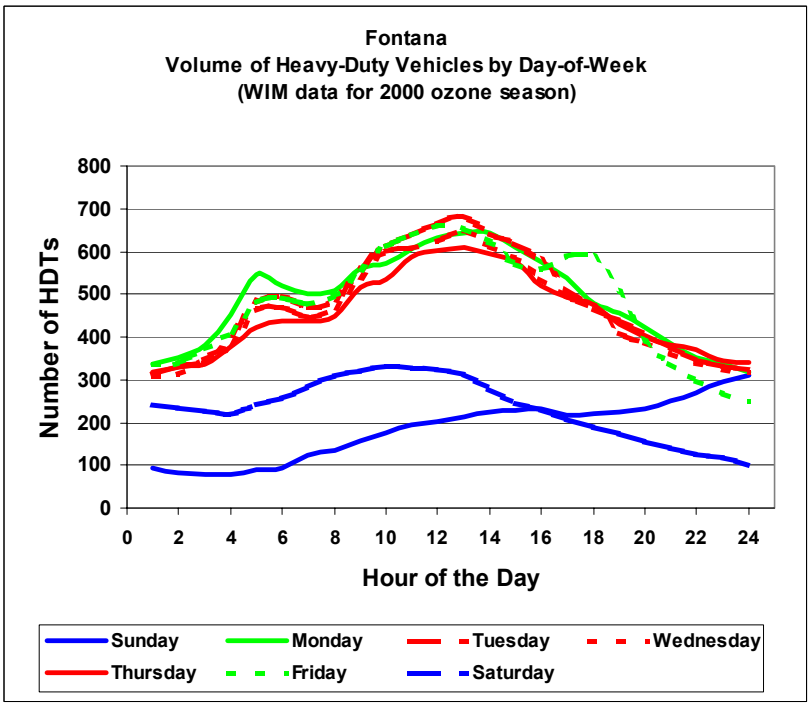

Figure 5.1-36

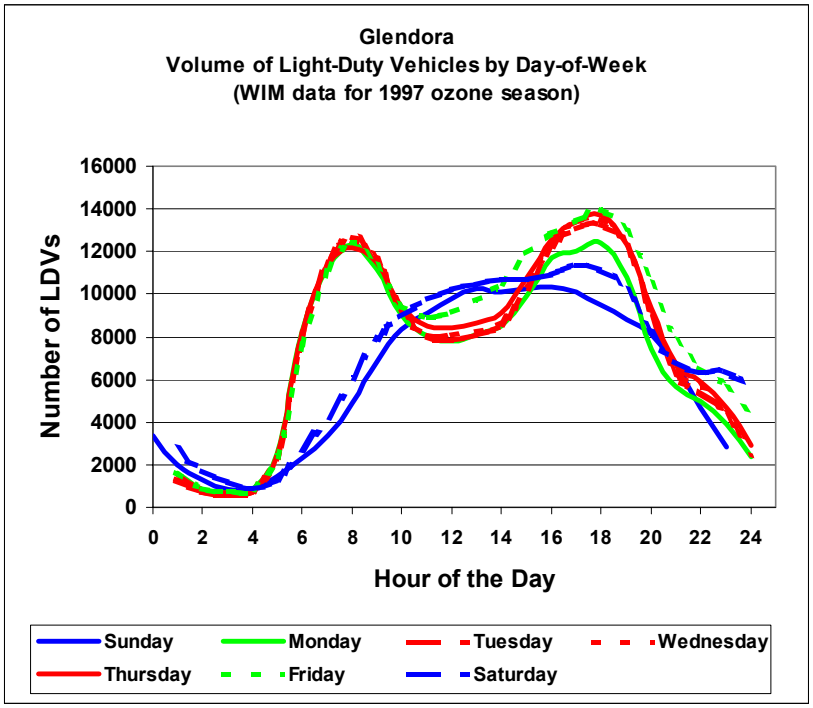

Figure 5.1-37

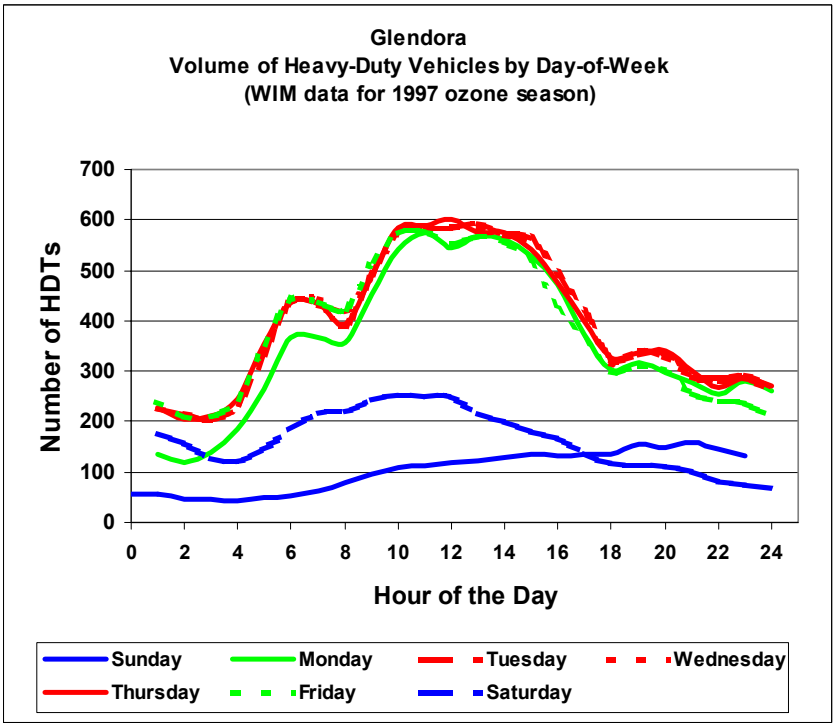

Figure 5.1-38

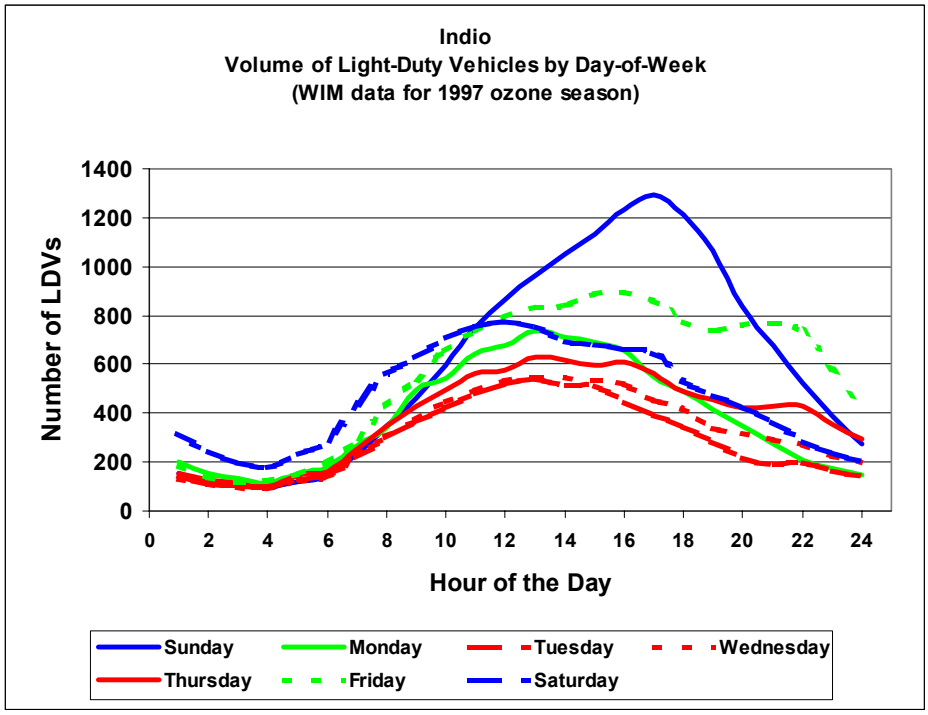

Figure 5.1-39

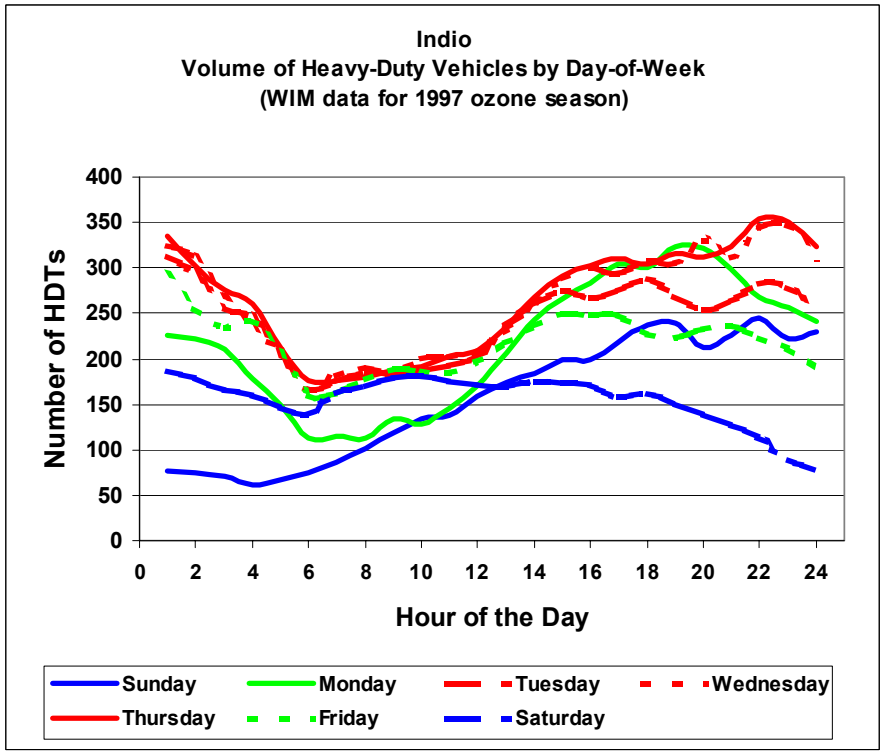

Figure 5.1-40

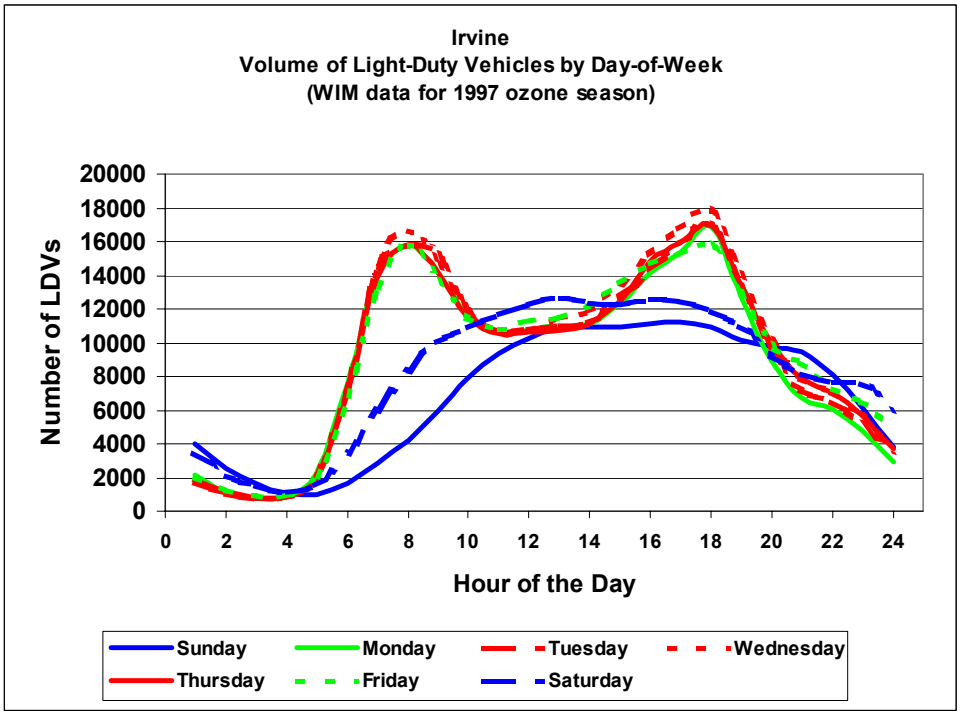

Figure 5.1-41

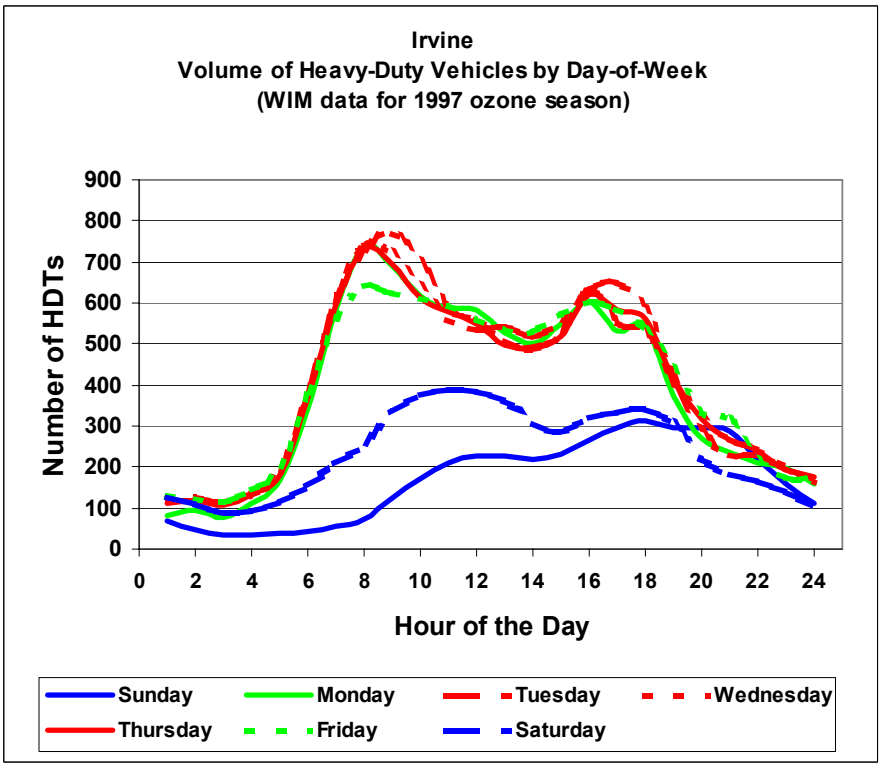

Figure 5.1-42

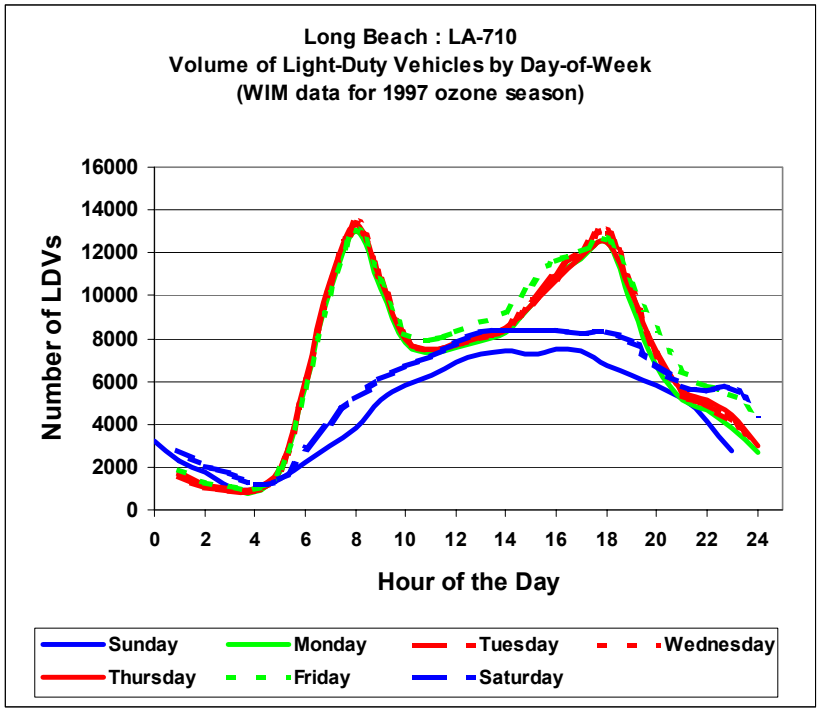

Figure 5.1-43

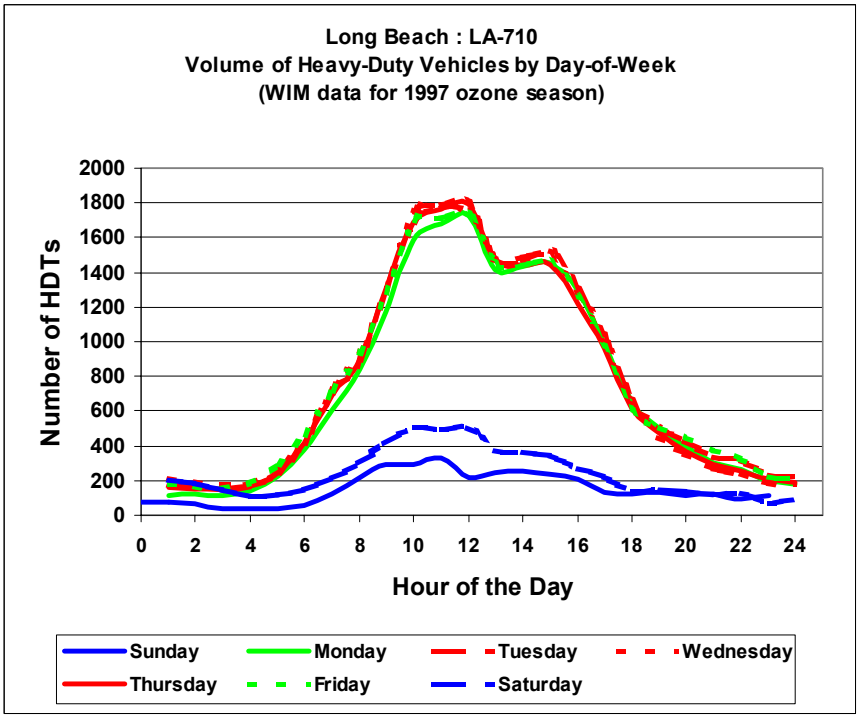

Figure 5.1-44

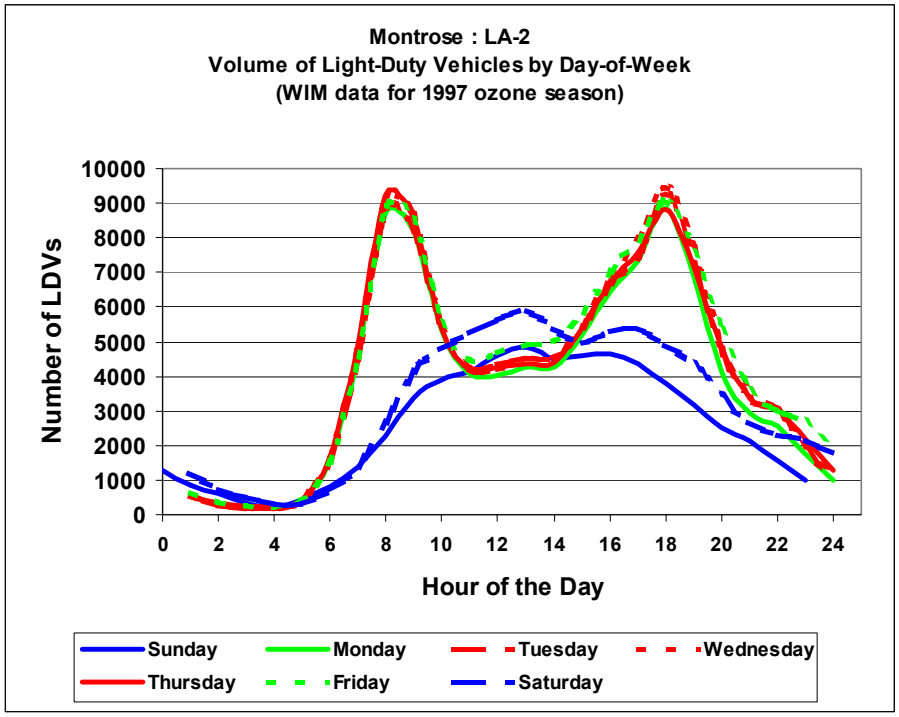

Figure 5.1-45

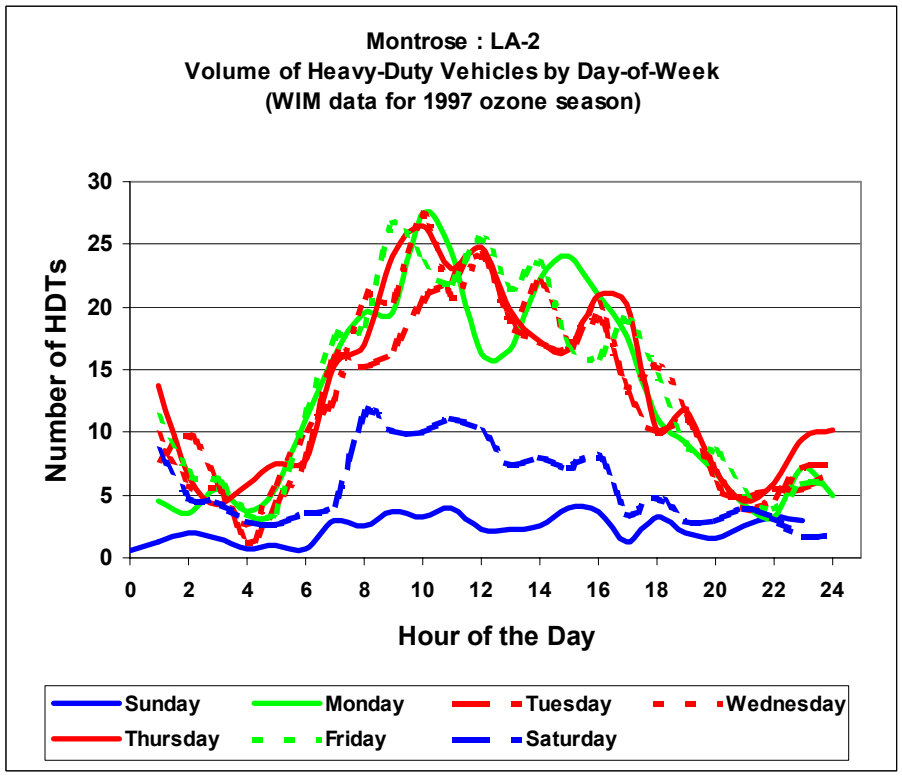

Figure 5.1-46

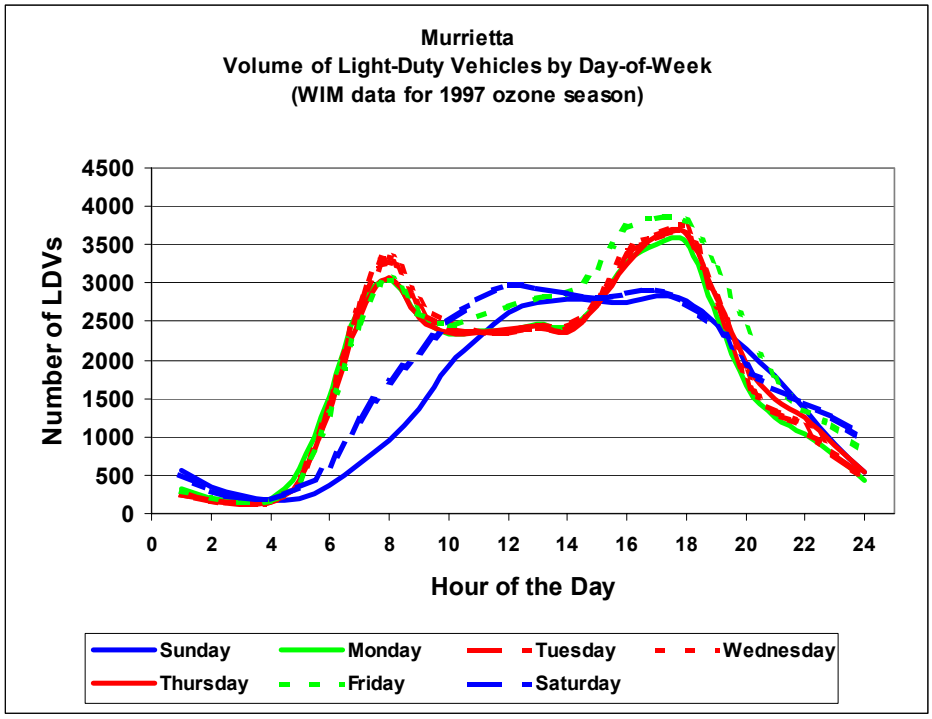

Figure 5.1-47

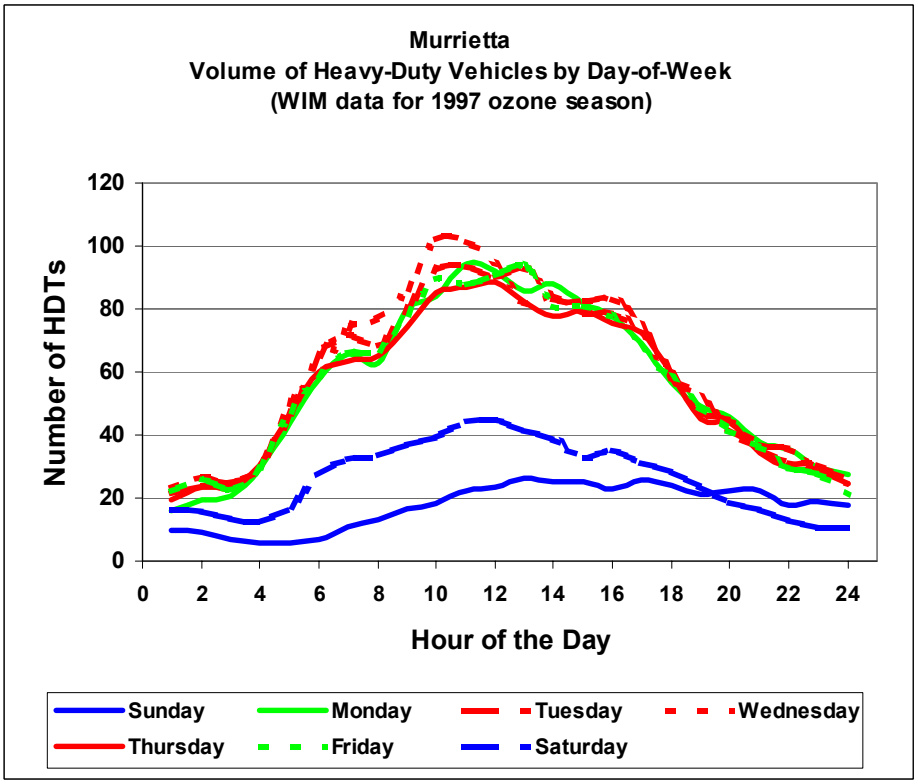

Figure 5.1-48

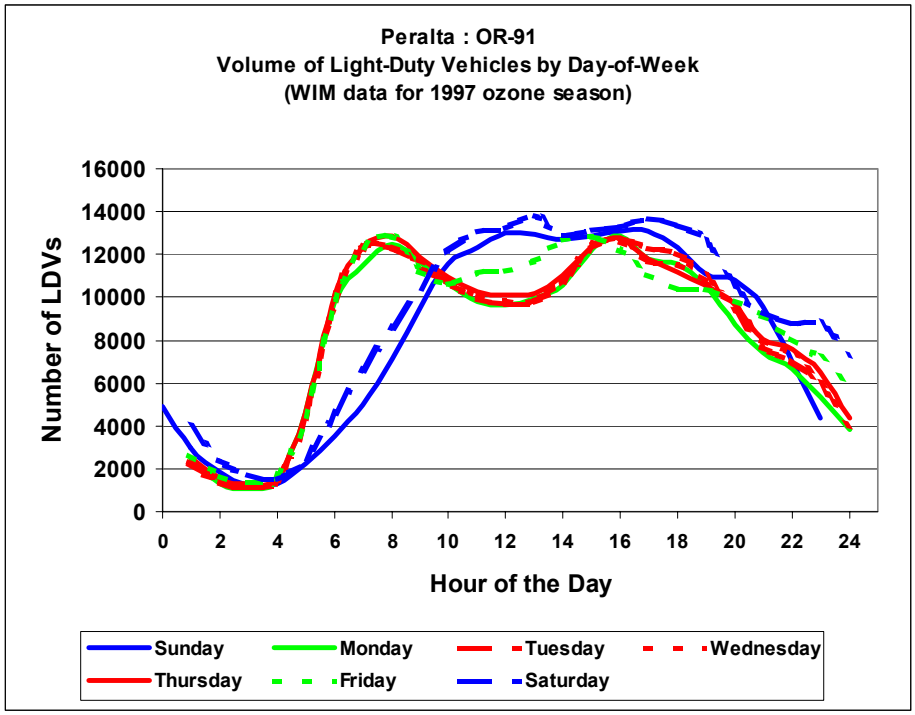

Figure 5.1-49

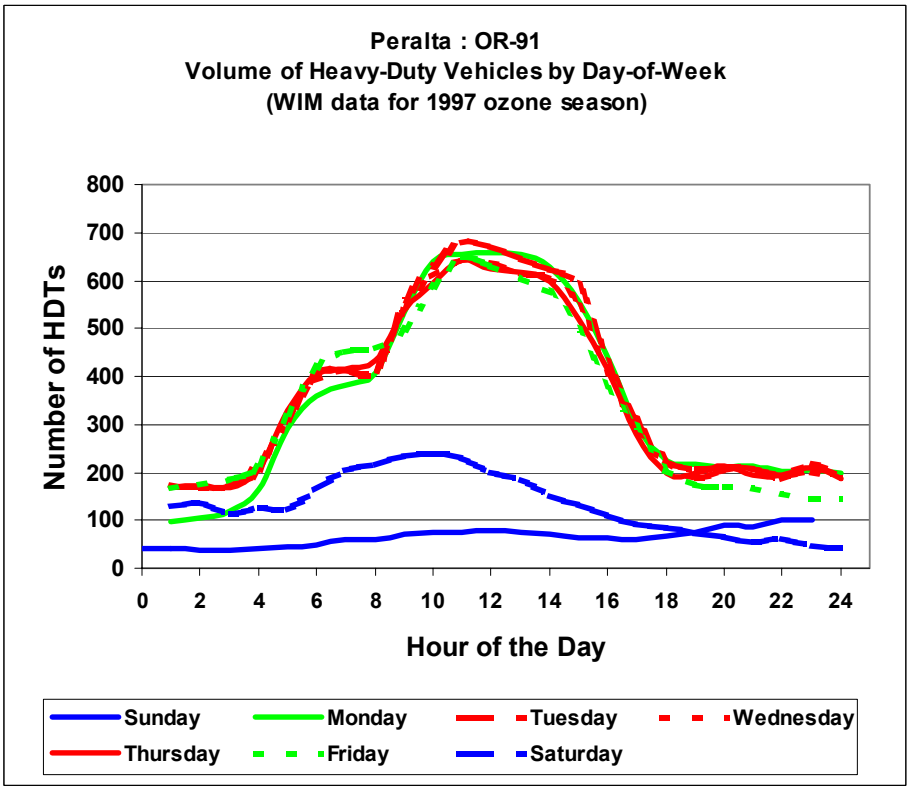

Figure 5.1-50

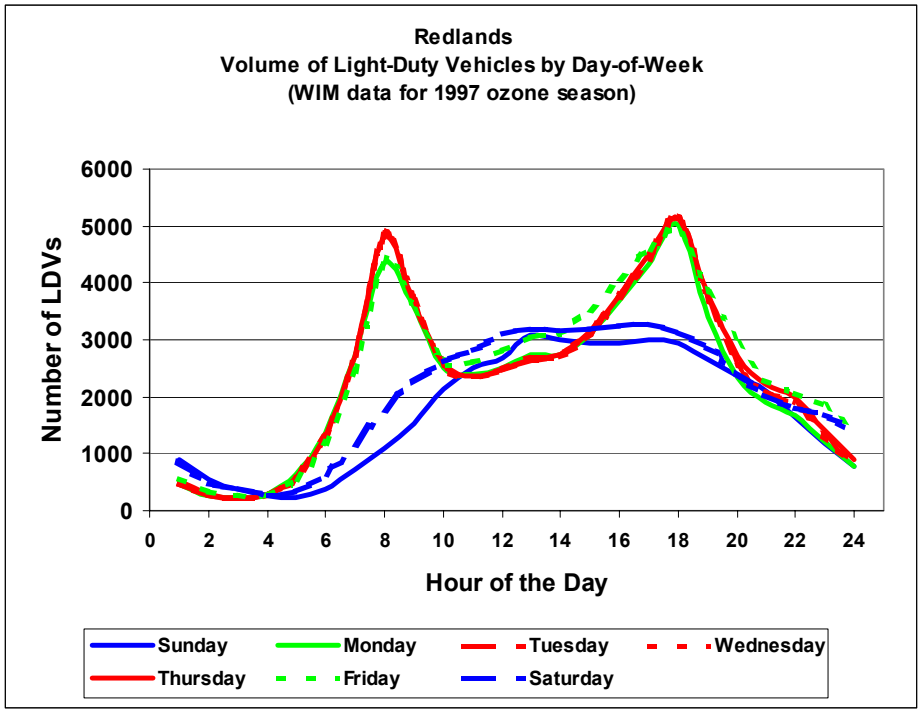

Figure 5.1-51

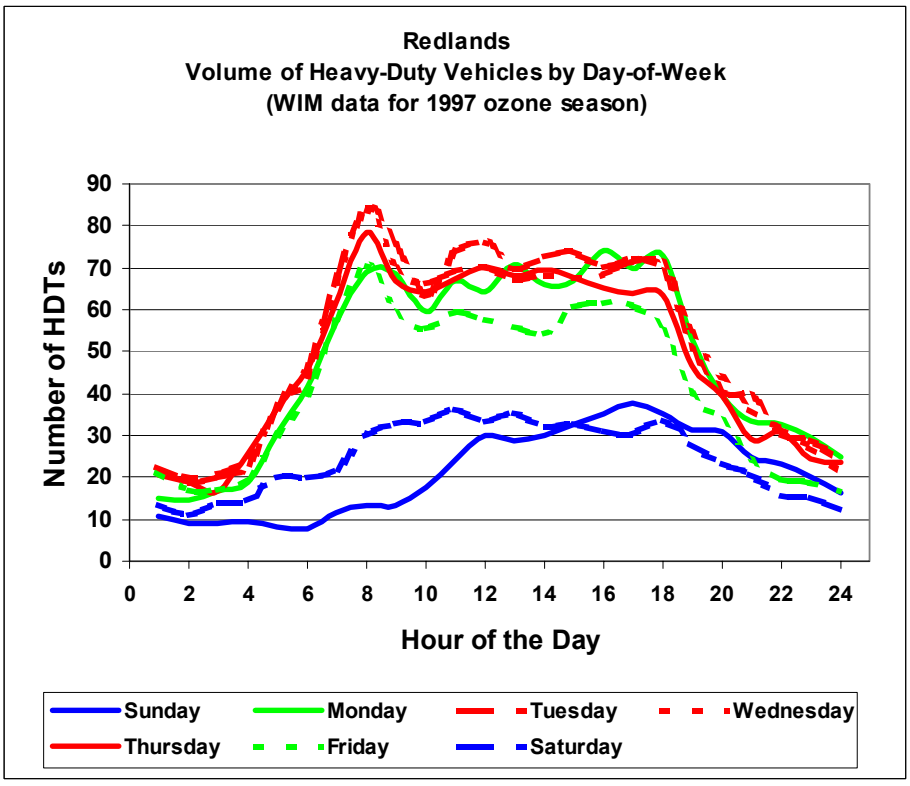

Figure 5.1-52

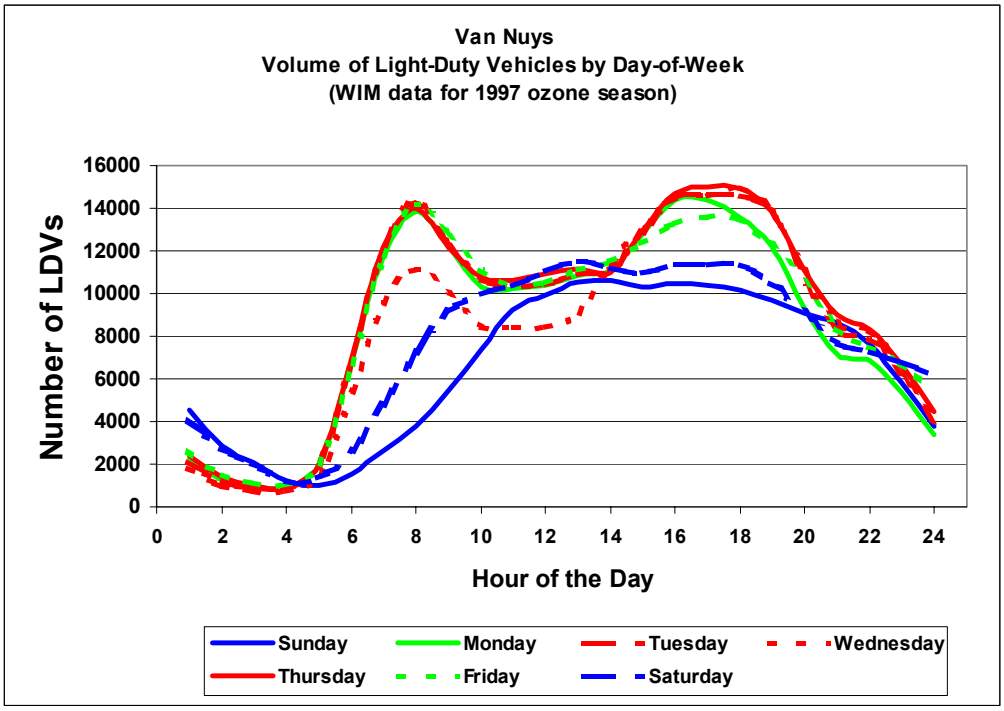

Figure 5.1-53

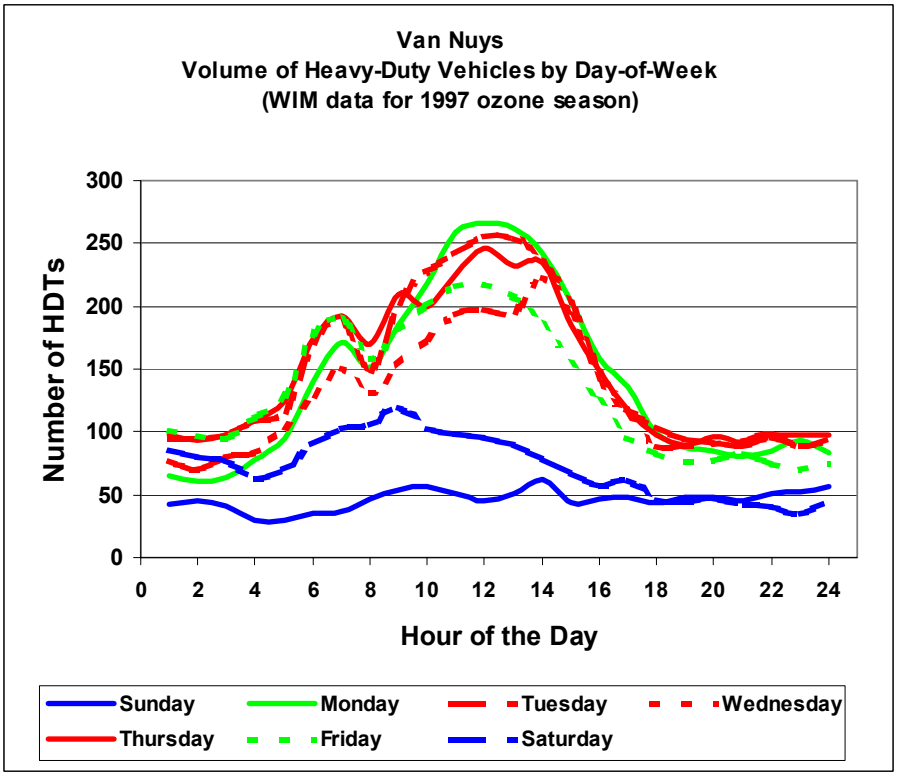

Figure 5.1-54

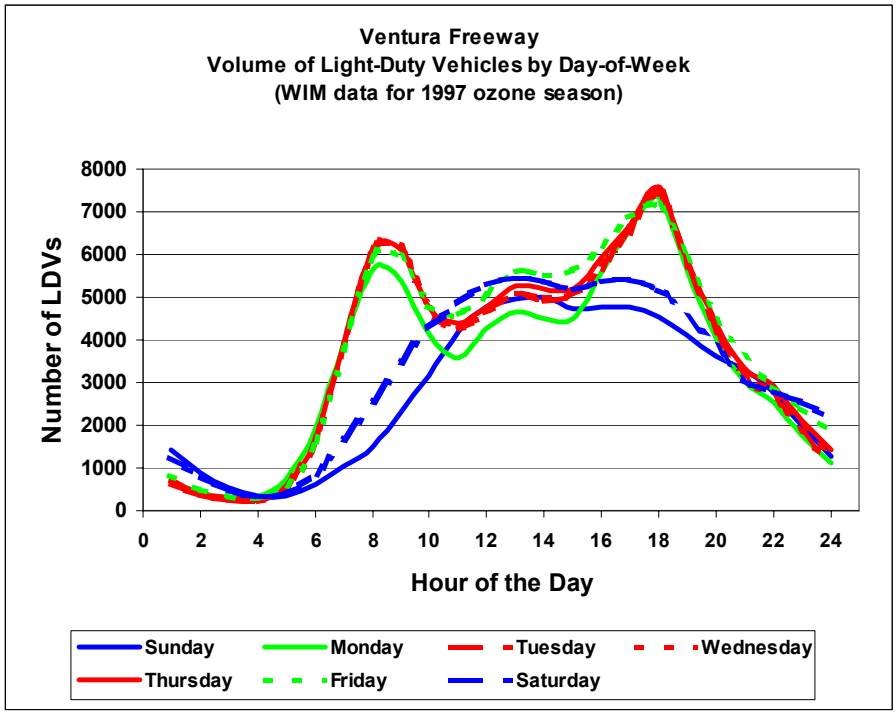

Figure 5.1-55