JUNE 2019



# WIM #30
# MN 61, MP 16.3
# TWO HARBORS, MN

## MONTHLY REPORT

*Your Destination...Our Priority*

## WIM Site Location

WIM #30 is located on MN 61 near Two Harbors in Lake county.

## System Operation

WIM #30 was operational for the entire month of June 2019. Volume was computed using all monthly data.

## System Calibration

WIM #30 was most recently calibrated on 2017-01-20. Table 1 summarizes the front axle weights of class 9s by lane [1]. Figure 1 shows the distribution of gross vehicle weights (GVW) in Class 9 vehicles at this site for the last 12 months of operation [2]. Figure 2 depicts the average front axle weight as a percent difference from the first full month following calibration.

## Summary of Volume Statistics

Total Monthly Volume: 311618 | Passenger Vehicles: 294255 | Heavy Commercial Vehicles: 17363

Monthly Average Daily Traffic (MADT): 10387 | Monthly Heavy Commercial Average Daily Traffic (MHCADT): 579

See Table 2 for vehicle class breakdown

## Passenger Vehicles (PVs) and Heavy Commercial Vehicles (HCVs)

**Volume trends.** NB vehicles typically reached highest volume levels on Fridays, with lowest volumes reported on Sundays. SB vehicles typically reached highest volume levels on Sundays, with lowest volumes reported on Tuesdays (see Figure 3 and 4).

## Passenger Vehicles (PVs)

**Volume trends.** On an average 24-hour day (see Figure 5), NB PVs generally reached peak volume levels between 02 PM and 04 PM. Similarly, SB PVs peaked in volume between 12 PM and 04 PM

## Heavy Commercial Vehicles (HCVs)

**Volume trends.** On an average 24-hour day, HCVs traveling NB typically reached peak volume levels between 02 PM and 04 PM, while volume going SB peaked between 12 PM and 04 PM. See Figure 6. Out of all HCVs, the two highest traffic volumes were generated by Class 5's and Class 9's.

## Overweight HCVs

**Volume trends.** Of a total of 17363 HCVs, 2550 of them were overweight [3]. These overweight HCVs contributed to 0.8% of total monthly volume, and 14.9% of total monthly

HCV volume. NB overweight vehicles typically reached highest numbers on Thursdays, with lowest volumes reported on Sundays. SB overweight vehicles tended to reach highest volumes on Tuesdays, with lowest volumes reported on Saturdays. See Figure 3 .
The top two overweight violators by class were the class 9 and class 10 vehicles . Overall, overweight vehicles tended to reach peak volume concentrations during typical business hours, with 63.8% of all overweight vehicles traveling NB this month (see Figure 7 & 8). Figure 9 shows the number of vehicles exceeding 88,000 pounds that crossed the WIM over the last 12 months. The highest number of 88,000+ vehicles within the last 12 months occurred in March.
WIMs are currently used as a screening tool for weight enforcement, and it is estimated that the WIM scales can measure gross vehicle weights (GVW) within 90-95% of static weight scale measurements. Due to the possibility of measurement error, vehicles exceeding 10% of their legal weight limits (or 1.1 times their legal weight limits) are considered overweight in this report [4].
Using normal load limits ,463 NB vehicles exceeded 88,000 pounds (319 vehicles were Class 9's; 101 vehicles were Class 10's). Of vehicles traveling SB,

244 NB vehicles exceeded 88,000 pounds (202 vehicles were Class 10's; 25 vehicles were Class 13's). Refer to Table 3 for the Top 10 highest recorded GVWs from Classes 9 and 10 from June 2019.

**Loaded vs. Unloaded HCVs.** Figure 10 shows the GVW distributions of Class 9s and 10s in June 2019. Data suggests that there were greater numbers of fully_loaded Class 9's than empty Class 9's traveling NB, while there were more fully_loaded Class 9's than empty traveling SB. Data also suggests that there were more fully_loaded Class 10's than empty traveling in the NB direction. In the SB direction, there were more fully_loaded class 10 vehicles.

**Freight Totals.** A total of 127784 tons of freight was recorded to have crossed the WIM. More freight was shipped NB (58.1%) than SB (41.9%). See Table 4 and Figure 11 for more freight information.

## Infrastructure Considerations

**Bridge.** Bridges No. 9341 and No. 9339, which are respectively on the NB and SB side of MN 61, are approximately 1.5 miles north of WIM #30. Bridge No. 9333 (a box culvert) is approximately 1.8 miles south of WIM #30. WIM #30 recorded a total of 311618 vehicles with a combined GVW of 2132876 kips (1 kip = 1,000 pounds = 0.5 tons) in June 2019. See Table 5 and Figures 12-13 for GVW information by vehicle class and lane.

**Pavement Design.** A total of 13796 equivalent single axle loads (ESALs) passed over the pavement at this site. Approximately 60.9% of all ESALs were recorded NB while 39.1% was observed SB. In particular, 50% of all ESALs were generated by the Class 9's (Class 9's were also responsible for generating 13% of total GVW observed this month). See Table 6 and Figures 14-15 for more information on ESALs (Table 6 also provides flexible ESAL factors for each vehicle class using a terminal serviceability of 2.5 and a structural number of 5).

*WIM monthly reports can be found at: http://www.dot.state.mn.us/traffic/data/reports-monthly-wim.html*

MnDOT's vehicle classification scheme and vehicle class groupings for traffic forecasting can be found at: http://www.dot.state.mn.us/traffic/data/data-products.html#weight

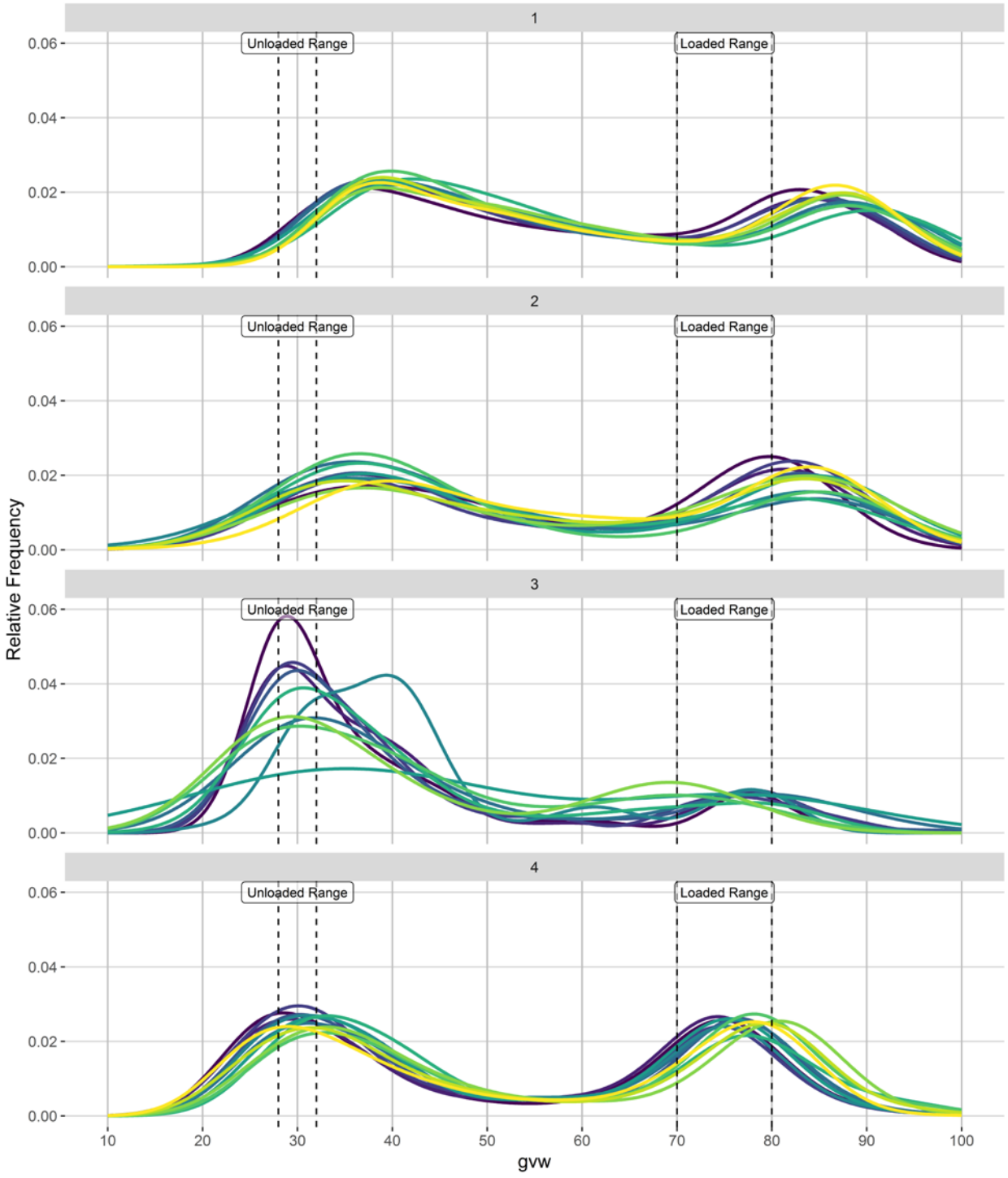
- [1] Front axle weights of Class 9s are monitored on a monthly basis to assure performance between calibrations. The current goal of the WIM scale calibration is to have each individual axle weight stay within a range of ?9% of baseline calibration values

- [2] Previous WIM research indicates that unloaded Class 9s typically weigh 28-32 kips, while loaded Class 9s generally fall in the 70-80 kip range. More recent data from several WIM sites suggests that the unloaded Class 9 range may have moved a little higher over time (due to increased presence of sleeper cabs, etc.), although these ranges are also thought to be site-specific.

- [3] An HCV is considered overweight during normal load limits in this report if they satisfy any of the following 1) exceed a gross vehicle weight (GVW) of 80,000 pounds, 2) exceed any of the legal weight maximums on any axle configurations (legal maximums are: single axle = 20,000 pounds; tandem axles spaced 8' or less = 34,000 pounds; tridem axles spaced 9' or less = 43,000 pounds; quad axles spaced 13' or less = 51,000 pounds). Monthly reports use this standard regardless of the time of year however, the Winter Load Increase (WLI) allows a 10% across the board increase in axle and gross vehicle weights without a permit on US, state routes, and county roads. An HCV is considered overweight during Winter Load Increase(WLI) if they satisfy any of the following 1) exceed a gross vehicle weight (GVW) of 88,000 pounds, 2) exceed any of the legal weight maximums on any axle configurations (legal maximums are: single axle = 22,000 pounds; tandem axles spaced 8' or less = 37,400 pounds; tridem axles spaced 9' or less = 47,300 pounds; quad axles spaced 13' or less = 56,100 pounds). An overweight HCV is only included once in the overweight volume calculations regardless of how many of the aforementioned conditions are violated. For information on MN weight limit dates and statutes: http://www.mrr.dot.state.mn.us/research/seasonal_load_limits/sllindex.asp

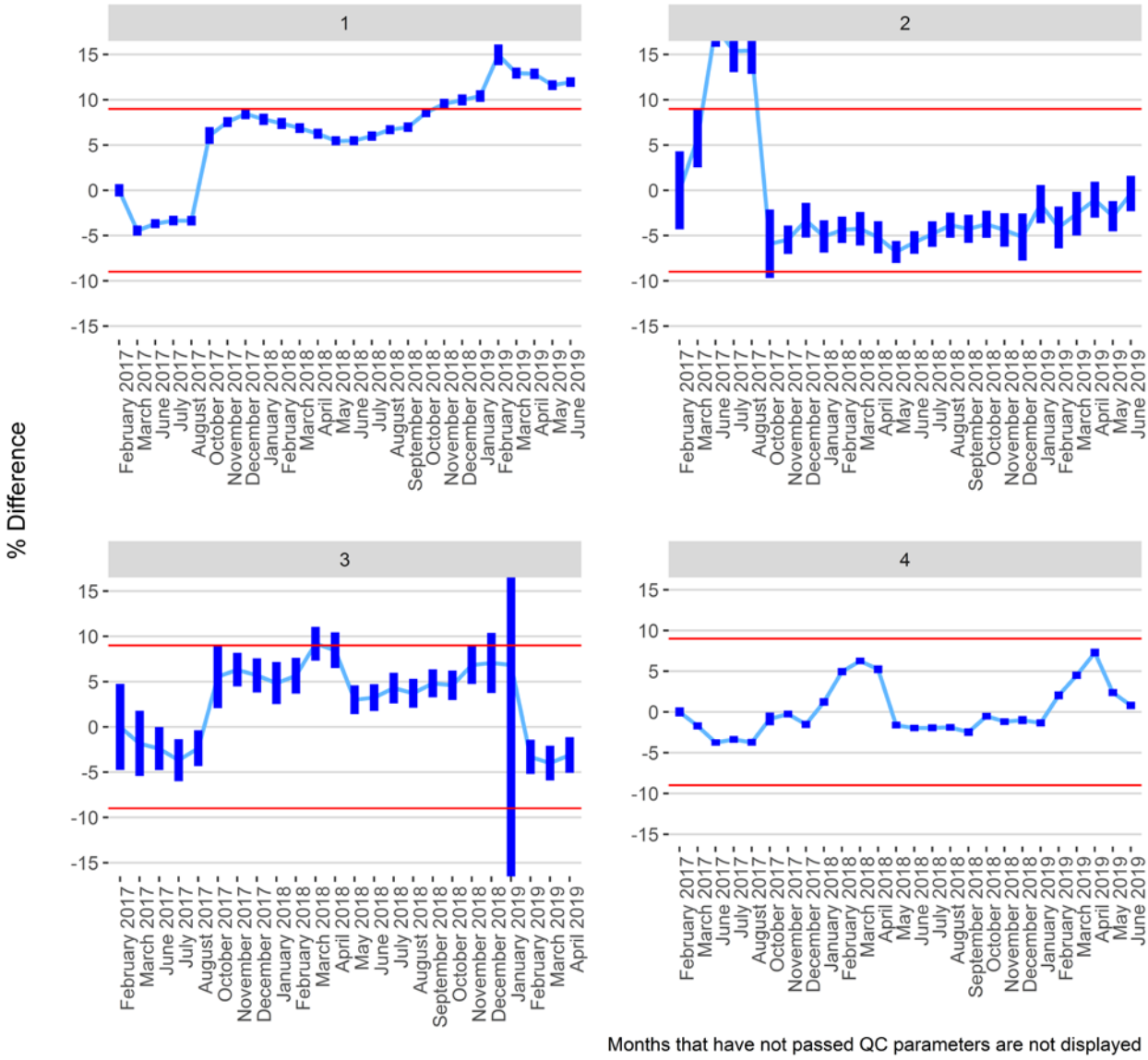
- [4] For example, Class 9s and 10s can legally have gross vehicle weights up to 80,000 lbs (with the exception of permitted loads) during normal load limits. To account for measurement error on the WIM scales, those exceeding 10% of the legal GVW maximum (or 1.1 times the legal GVW) should be screened (e.g., 80,000 lbs + 8,000 lbs = 88,000 lbs). Similarly during WLI vehicles weighing 96,800 lbs should be screened.

Figure 1 - Monthly Class 9 GVW Histogram




Months that have not passed QC parameters are not displayed

Figure 2 - Percent Difference of Front Axle Weight from Last Calibration (+/- 95% CI)




Months that have not passed QC parameters are not displayed

Figure 2 - Average Vehicle Volume vs. Day of the Week

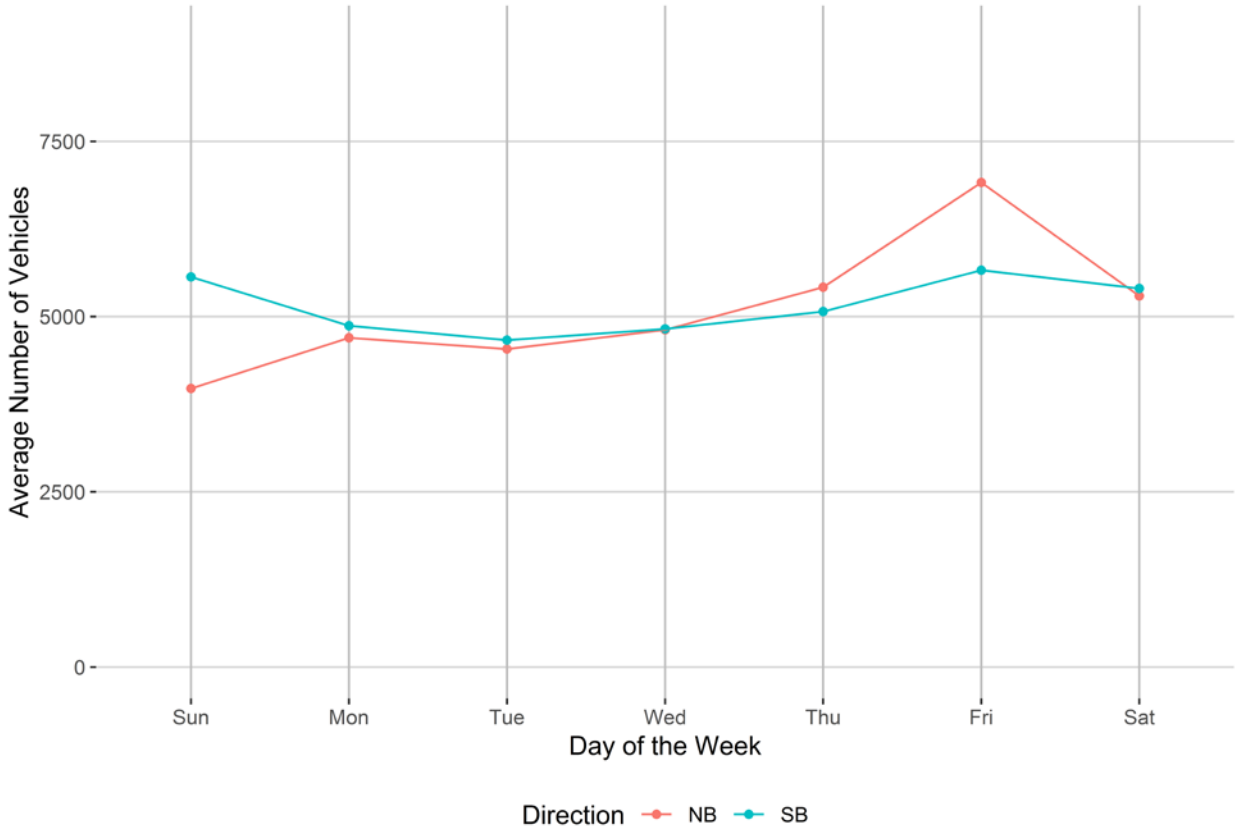



Figure 3 - Average Overweight Vehicle Volume vs. Day of the Week

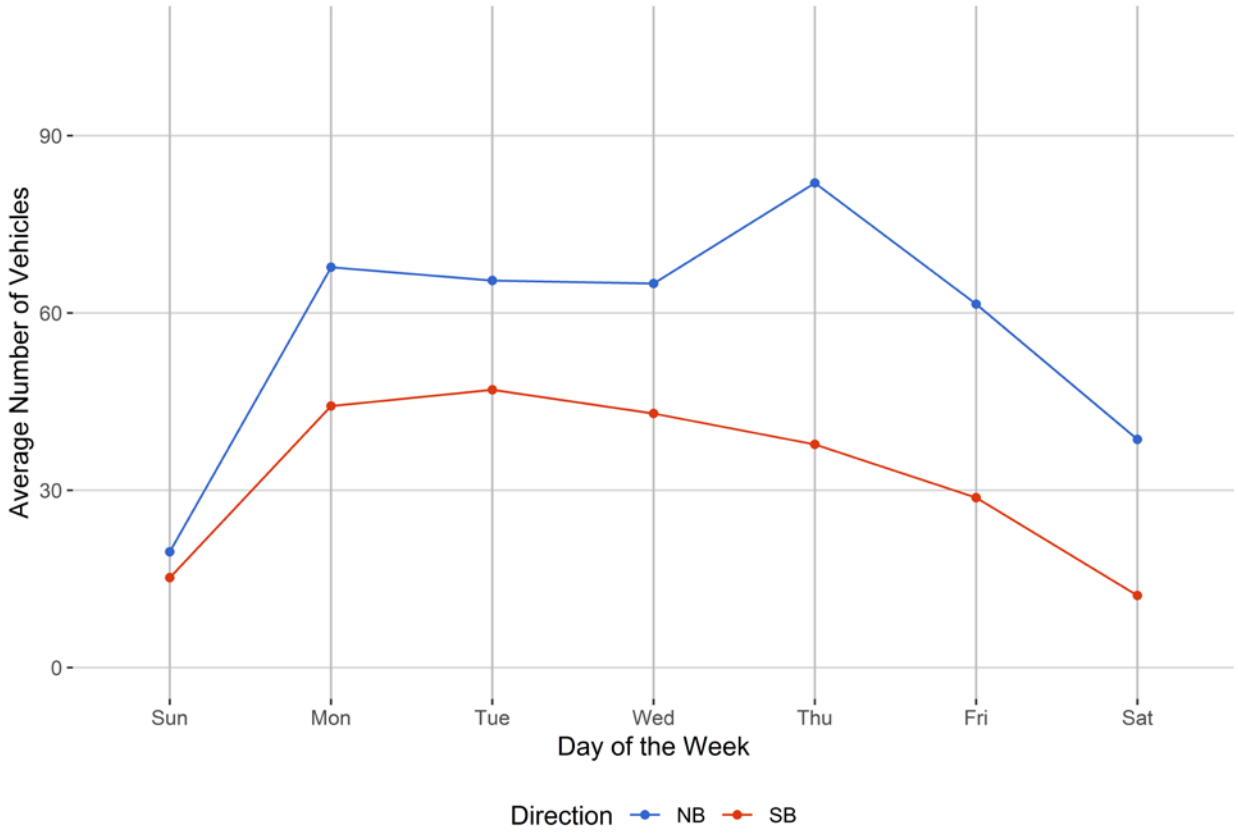


Figure 4 - Passenger Vehicles vs. Hour of the Day

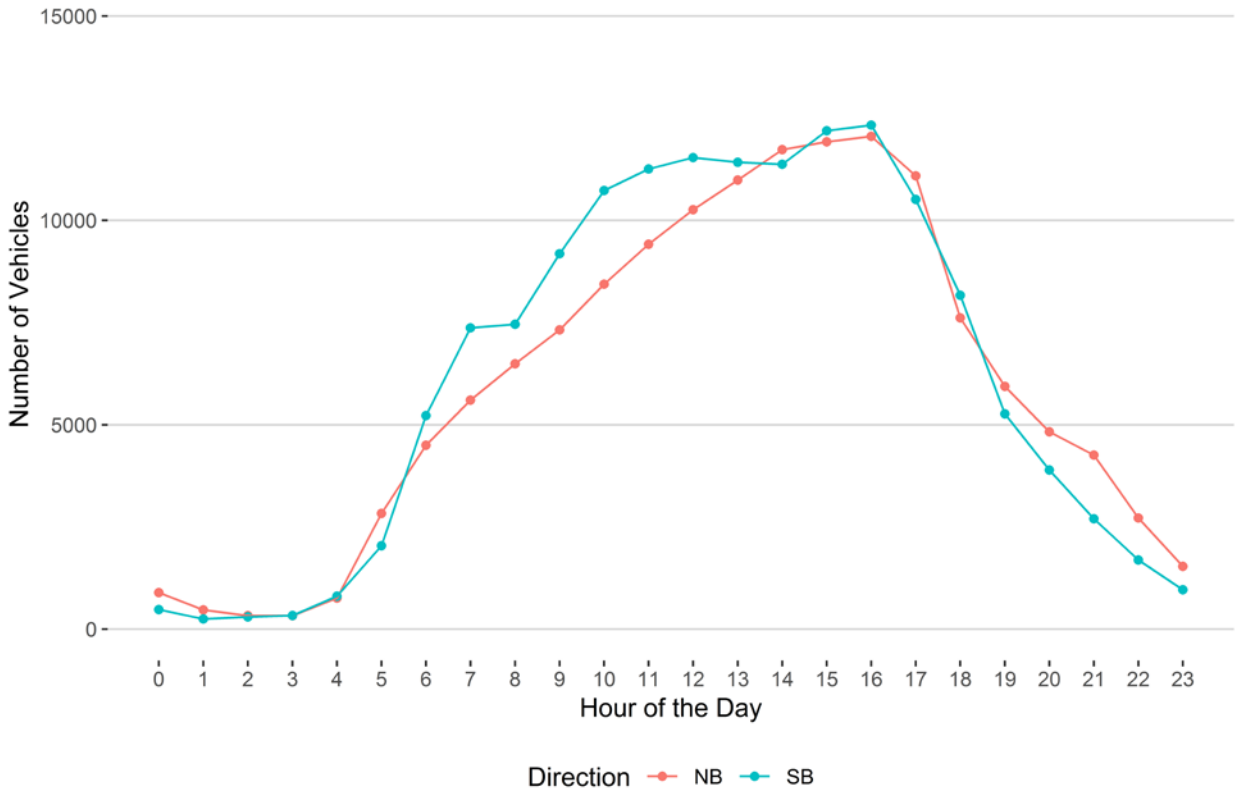



Figure 5 - Heavy Commercial Vehicles vs. Hour of the Day

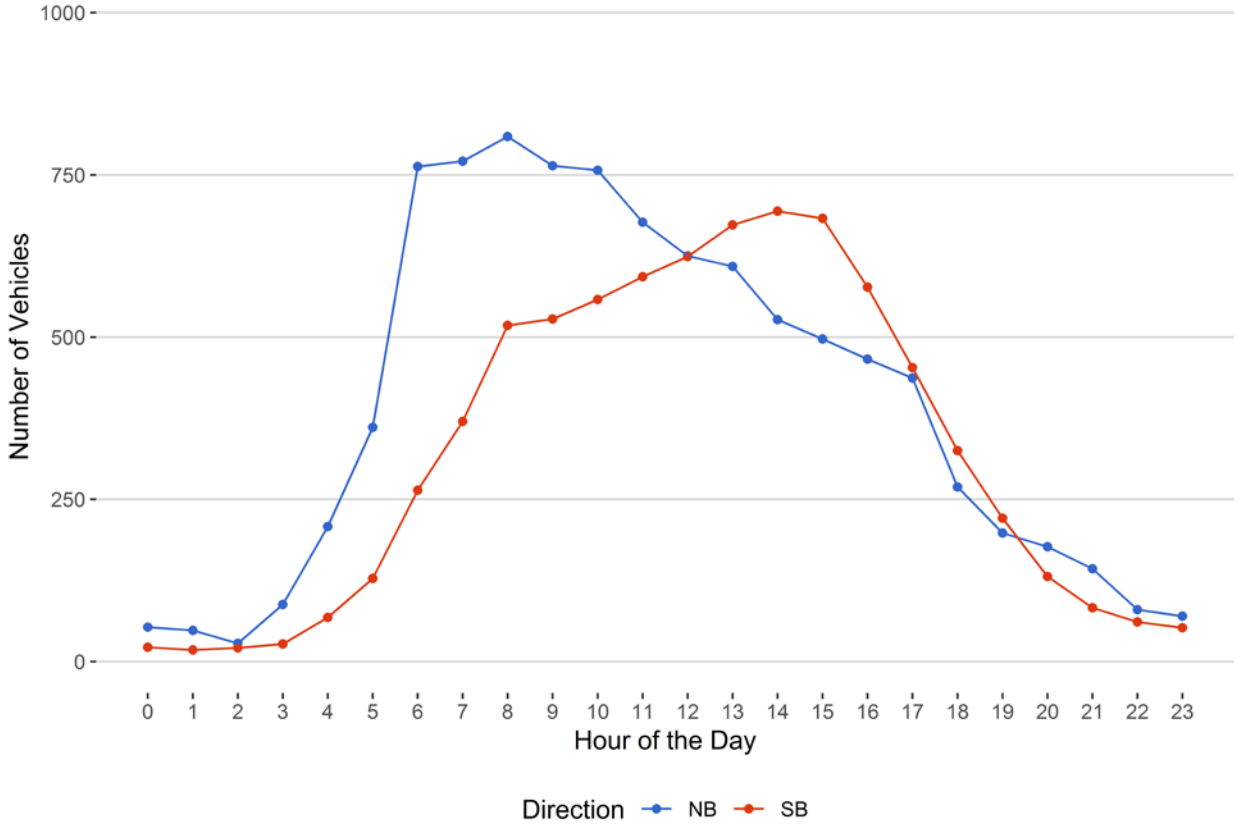


Figure 6 - Overweight Vehicles by Class vs. Hour of the Day

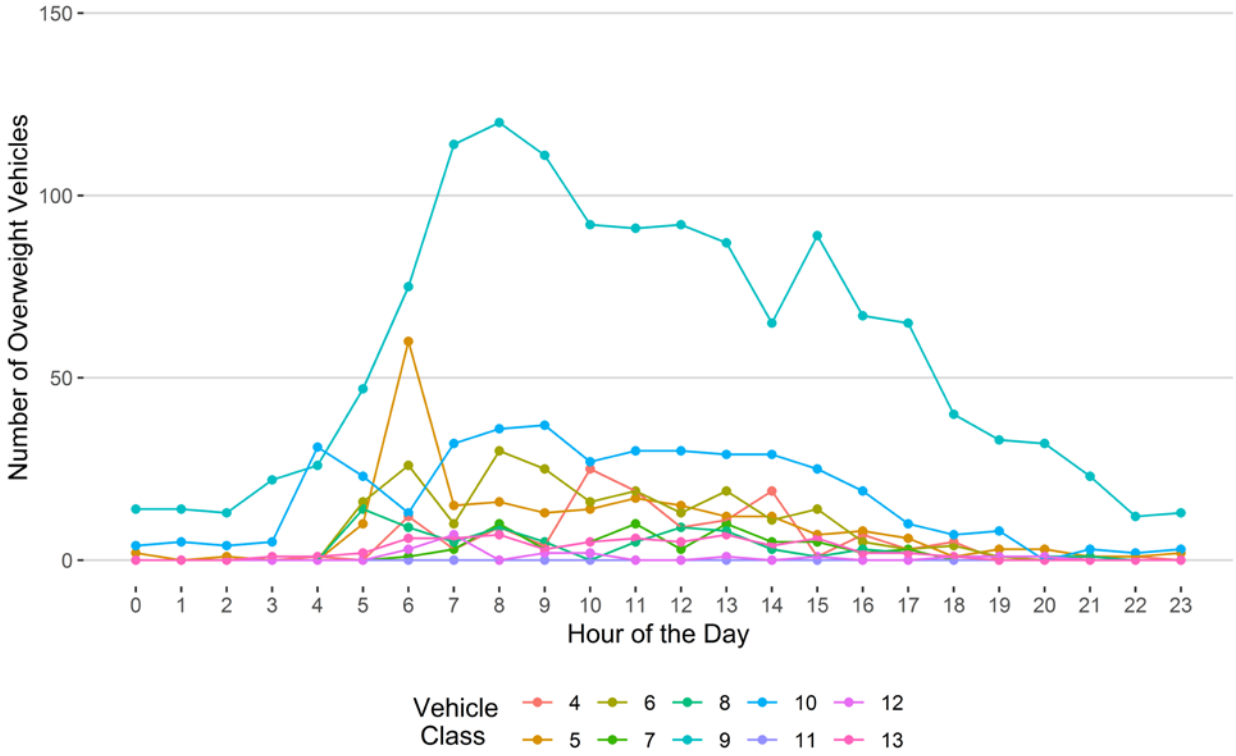


Figure 7 - Overweight Vehicles by Direction
Hour of the Day

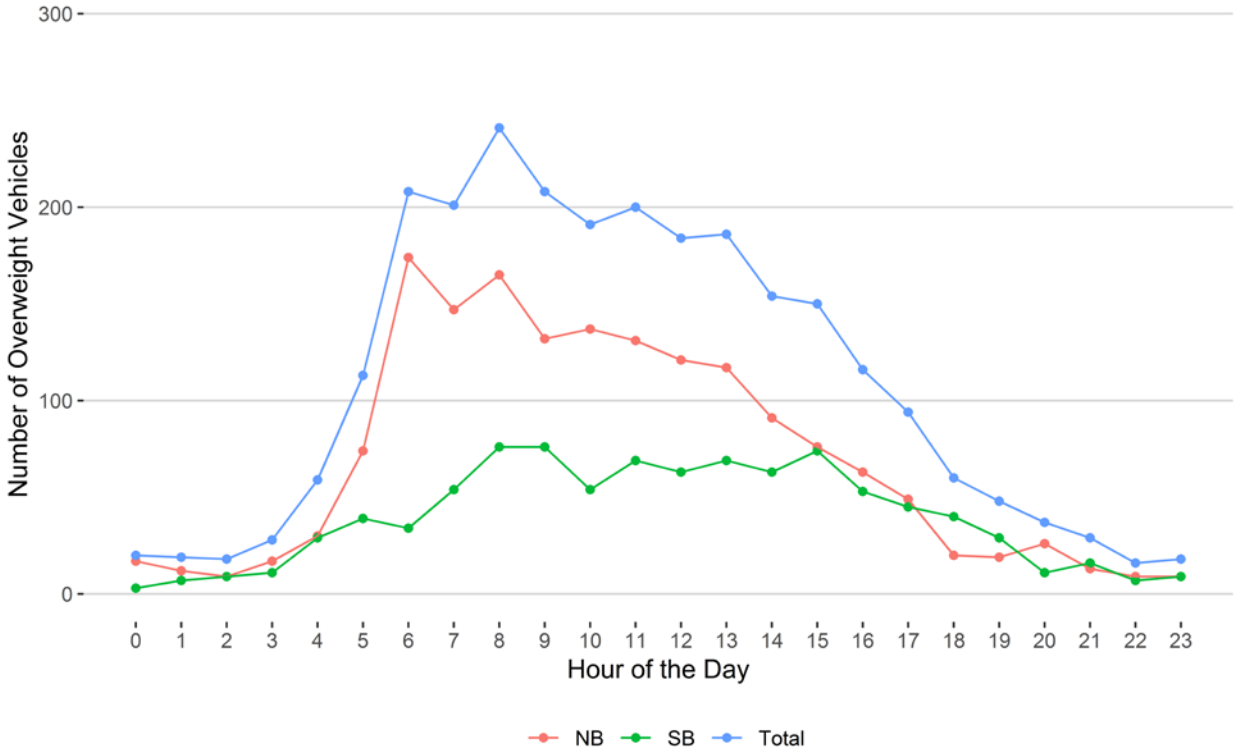
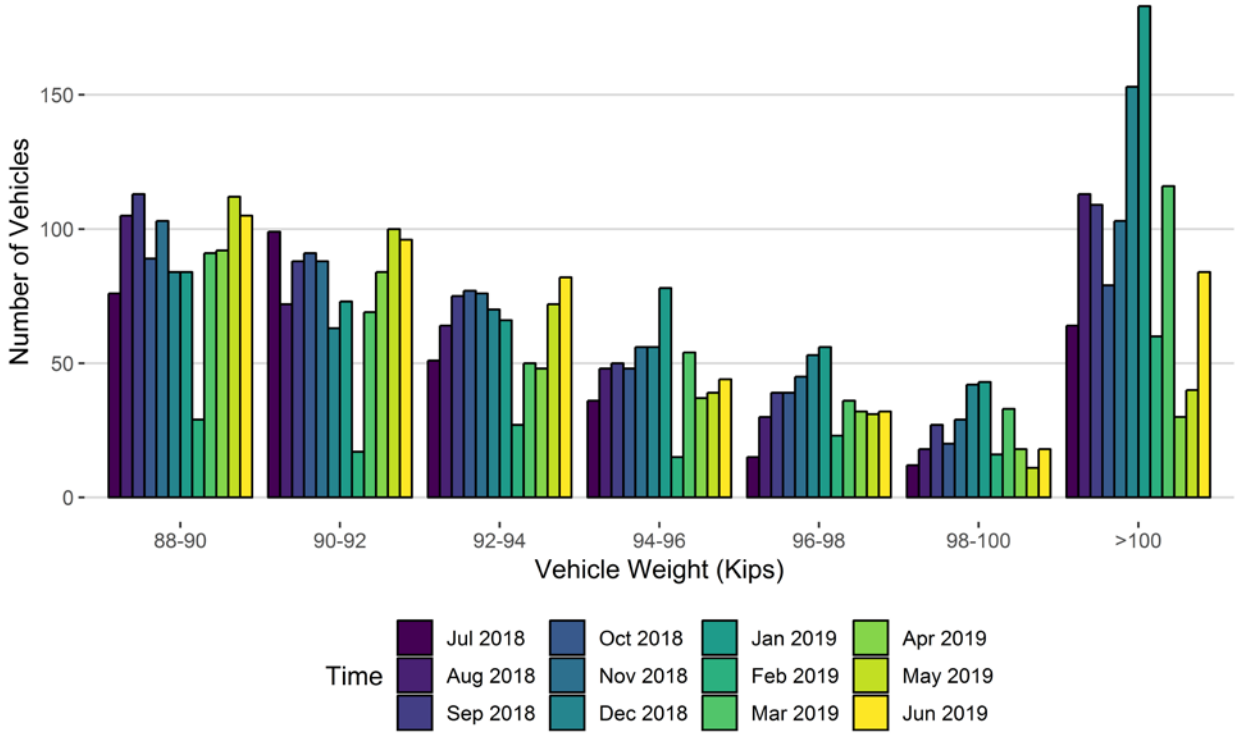
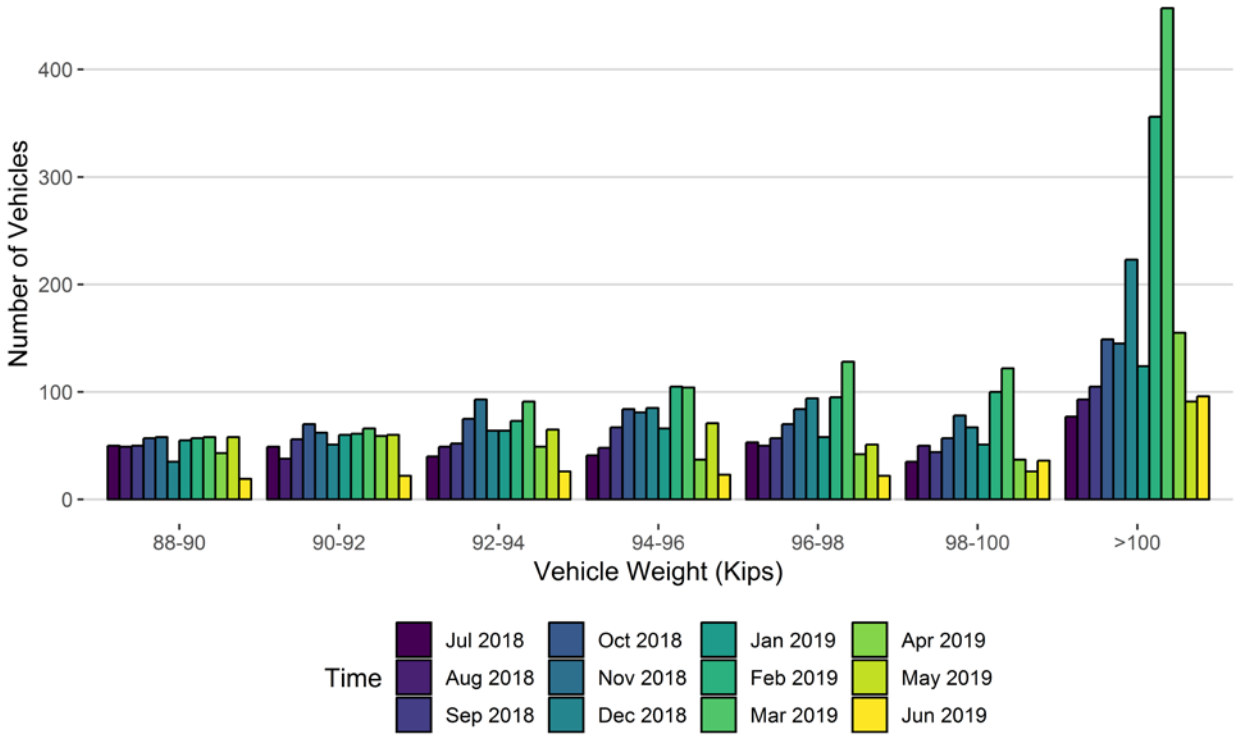


Figure 8 - Histogram of NB Vehicles Over 88,000 Pounds for Current Month




| *Vehicle Weights (Kips)* | *Jul 2018* | *Aug 2018* | *Sep 2018* | *Oct 2018* | *Nov 2018* | *Dec 2018* | *Jan 2019* | *Feb 2019* | *Mar 2019* | *Apr 2019* | *May 2019* | *Jun 2019* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 88-90 | 76 | 105 | 113 | 89 | 103 | 84 | 84 | 29 | 91 | 92 | 112 | 105 |
| 90-92 | 99 | 72 | 88 | 91 | 88 | 63 | 73 | 17 | 69 | 84 | 100 | 96 |
| 92-94 | 51 | 64 | 75 | 77 | 76 | 70 | 66 | 27 | 50 | 48 | 72 | 82 |
| 94-96 | 36 | 48 | 50 | 48 | 56 | 56 | 78 | 15 | 54 | 37 | 39 | 44 |
| 96-98 | 15 | 30 | 39 | 39 | 45 | 53 | 56 | 23 | 36 | 32 | 31 | 32 |
| 98-100 | 12 | 18 | 27 | 20 | 29 | 42 | 43 | 16 | 33 | 18 | 11 | 18 |
| >100 | 64 | 113 | 109 | 79 | 103 | 153 | 183 | 60 | 116 | 30 | 40 | 84 |
| Total | 353 | 450 | 501 | 443 | 500 | 521 | 583 | 187 | 449 | 341 | 405 | 461 |

Figure 8 - Histogram of SB Vehicles Over 88,000 Pounds for Current Month




| *Vehicle Weights (Kips)* | *Jul 2018* | *Aug 2018* | *Sep 2018* | *Oct 2018* | *Nov 2018* | *Dec 2018* | *Jan 2019* | *Feb 2019* | *Mar 2019* | *Apr 2019* | *May 2019* | *Jun 2019* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 88-90 | 50 | 49 | 50 | 57 | 58 | 35 | 55 | 57 | 58 | 43 | 58 | 19 |
| 90-92 | 49 | 38 | 56 | 70 | 62 | 51 | 60 | 61 | 66 | 59 | 60 | 22 |
| 92-94 | 40 | 49 | 52 | 75 | 93 | 64 | 64 | 73 | 91 | 49 | 65 | 26 |
| 94-96 | 41 | 48 | 67 | 84 | 81 | 85 | 66 | 105 | 104 | 37 | 71 | 23 |
| 96-98 | 53 | 50 | 57 | 70 | 84 | 94 | 58 | 95 | 128 | 42 | 51 | 22 |
| 98-100 | 35 | 50 | 44 | 57 | 78 | 67 | 51 | 100 | 122 | 37 | 26 | 36 |
| >100 | 77 | 93 | 105 | 149 | 145 | 223 | 124 | 356 | 457 | 155 | 91 | 96 |
| Total | 345 | 377 | 431 | 562 | 601 | 619 | 478 | 847 | 1026 | 422 | 422 | 244 |

Figure 8 - Class 9's and 10's by Direction vs Gross Vehicle Weight

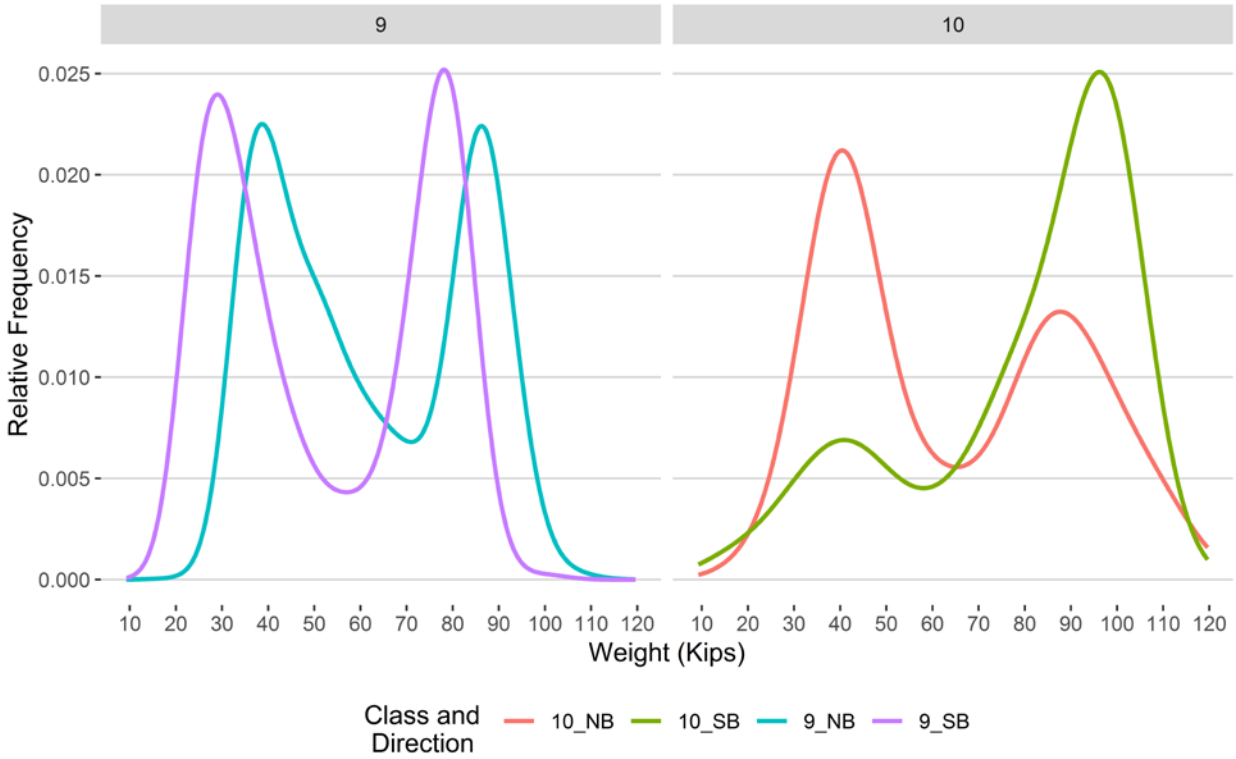



Figure 9 - Freight Percentage by Direction and Class

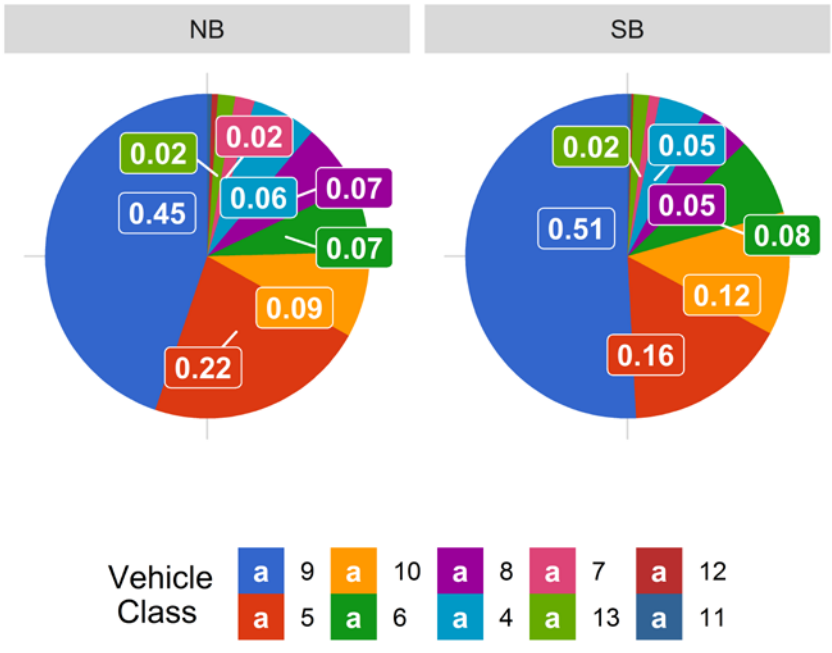


Figure 10 - Total Gross Vehicle Weight Percentage by Class and Lane

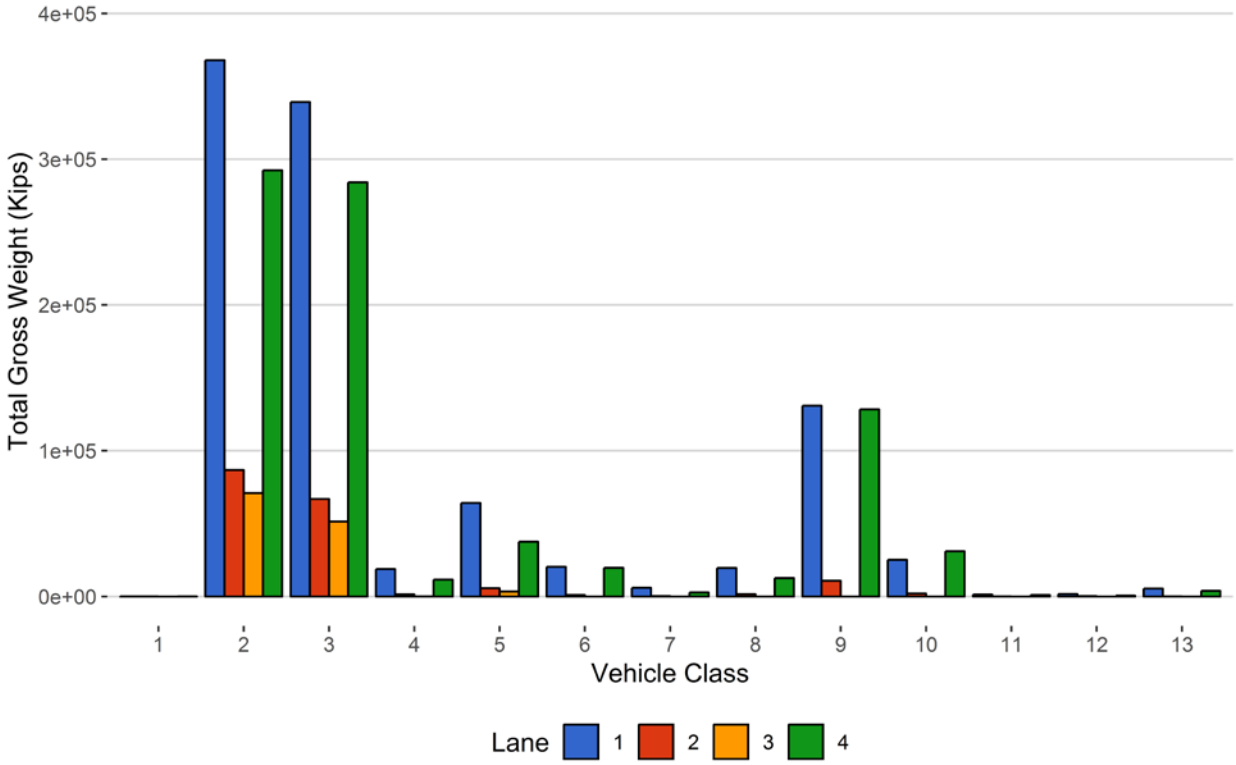
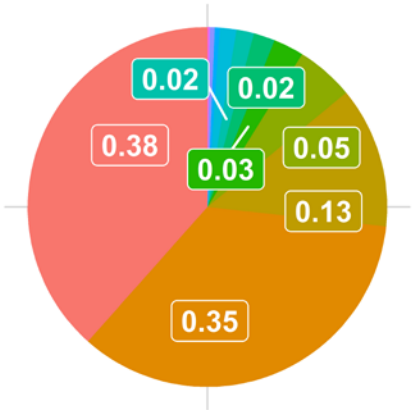



Figure 11 - Total Gross Vehicle Weight b



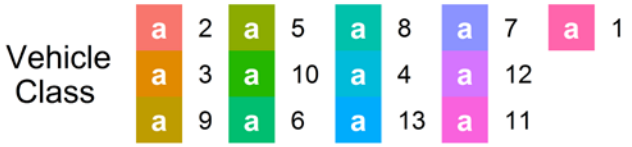



Figure 12 - Total ESALs by Class and Lane

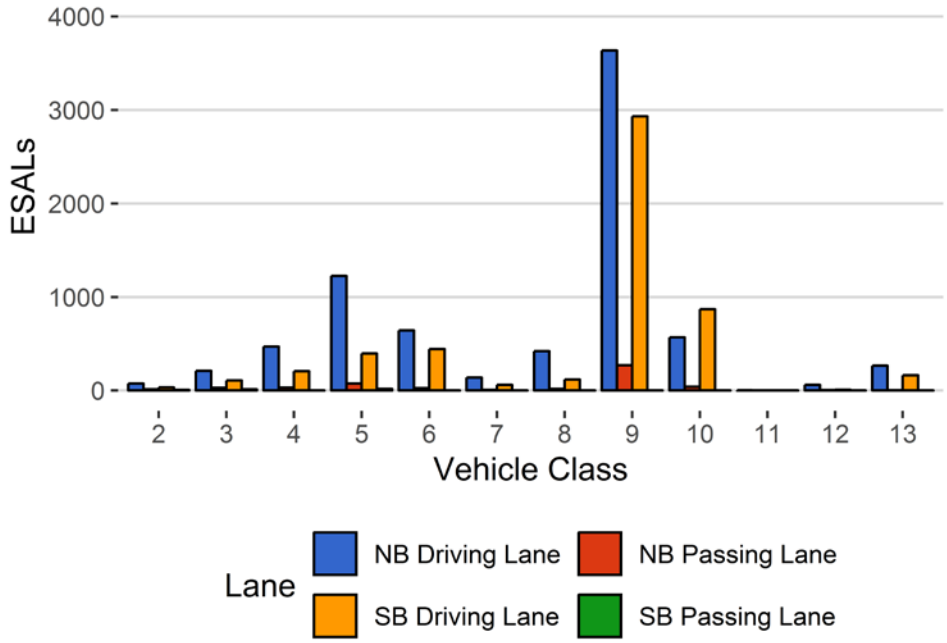
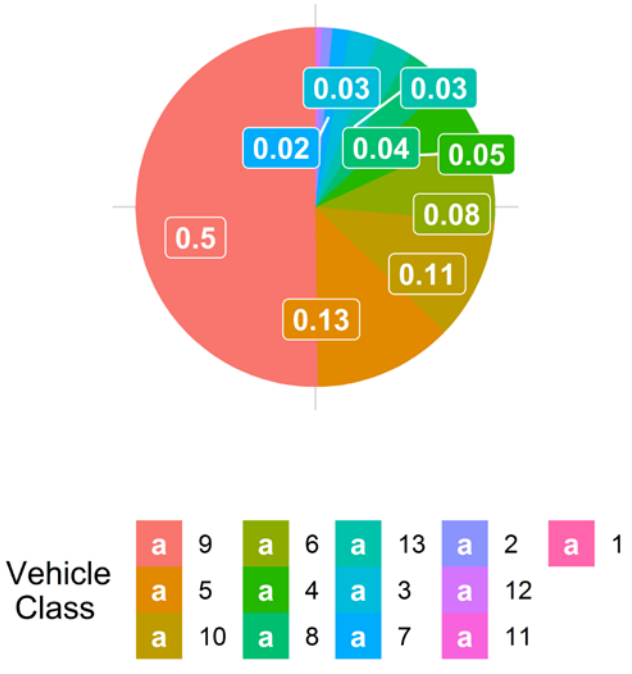



Figure 13 - ESALs by Class



## Table 1 Class 9 Front Axle Weight by Lane

| *Month* | *Lane 1 (Kips)* | *Front Axle +/- 9%* | *Lane 2 (Kips)* | *Front Axle +/- 9%* | *Lane 3 (Kips)* | *Front Axle +/- 9%* | *Lane 4 (kips)* | *Front Axle +/- 9%* |
|---|---|---|---|---|---|---|---|---|
| February 2017 | 11.62 | 0.00 | 12.12 | 0.00 | 10.33 | 0.00 | 11.31 | 0.00 |
| March 2017 | 11.10 | -4.45 | 12.82 | 5.74 | 10.14 | -1.83 | 11.11 | -1.71 |
| June 2017 | 11.19 | -3.68 | 14.31 | 18.03 | 10.08 | -2.40 | 10.88 | -3.75 |
| July 2017 | 11.23 | -3.35 | 13.99 | 15.41 | 9.95 | -3.68 | 10.93 | -3.36 |
| August 2017 | 11.23 | -3.36 | 13.99 | 15.43 | 10.09 | -2.35 | 10.89 | -3.73 |
| October 2017 | 12.32 | 6.06 | 11.40 | -5.91 | 10.91 | 5.55 | 11.21 | -0.85 |
| November 2017 | 12.49 | 7.54 | 11.46 | -5.46 | 10.99 | 6.32 | 11.28 | -0.25 |
| December 2017 | 12.60 | 8.45 | 11.72 | -3.32 | 10.92 | 5.69 | 11.14 | -1.52 |
| January 2018 | 12.53 | 7.84 | 11.50 | -5.10 | 10.83 | 4.84 | 11.45 | 1.24 |
| February 2018 | 12.47 | 7.38 | 11.59 | -4.37 | 10.92 | 5.64 | 11.87 | 4.95 |
| March 2018 | 12.41 | 6.87 | 11.61 | -4.25 | 11.28 | 9.19 | 12.01 | 6.26 |
| April 2018 | 12.34 | 6.25 | 11.49 | -5.19 | 11.21 | 8.47 | 11.90 | 5.24 |
| May 2018 | 12.25 | 5.47 | 11.30 | -6.81 | 10.64 | 3.00 | 11.12 | -1.61 |
| June 2018 | 12.25 | 5.47 | 11.42 | -5.75 | 10.67 | 3.24 | 11.08 | -1.97 |
| July 2018 | 12.31 | 5.98 | 11.54 | -4.83 | 10.78 | 4.29 | 11.09 | -1.94 |
| August 2018 | 12.39 | 6.70 | 11.65 | -3.85 | 10.72 | 3.72 | 11.09 | -1.88 |
| September 2018 | 12.43 | 6.97 | 11.60 | -4.27 | 10.83 | 4.82 | 11.03 | -2.48 |
| October 2018 | 12.61 | 8.58 | 11.67 | -3.76 | 10.81 | 4.59 | 11.25 | -0.51 |
| November 2018 | 12.73 | 9.56 | 11.59 | -4.38 | 11.04 | 6.84 | 11.17 | -1.18 |
| December 2018 | 12.77 | 9.97 | 11.49 | -5.17 | 11.06 | 7.06 | 11.19 | -1.00 |
| January 2019 | 12.83 | 10.40 | 11.94 | -1.52 | 11.04 | 6.85 | 11.16 | -1.34 |
| February 2019 | 13.35 | 14.96 | 11.62 | -4.10 | 9.99 | -3.32 | 11.54 | 2.04 |
| March 2019 | 13.12 | 12.94 | 11.81 | -2.59 | 9.92 | -4.00 | 11.82 | 4.50 |
| April 2019 | 13.11 | 12.87 | 11.99 | -1.04 | 10.01 | -3.11 | 12.13 | 7.29 |
| May 2019 | 12.97 | 11.61 | 11.77 | -2.87 | NA | NA | 11.58 | 2.38 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| June 2019 | 13.01 | 11.96 | 12.08 | -0.36 | NA | NA | 11.40 | 0.80 |

## Table 2 Vehicle Classification Data

| *Vehicle Class* | *Monthly Average Daily Volume* | *Monthly Total Volume* | *Monthly Total Volume Percentage* | *Monthly Total Overweight Vehicles* | *Monthly Total Overweight Percentage* |
|---|---|---|---|---|---|
| 1 | 6 | 169 | 0.1 | 0 | 0 |
| 2 | 6286 | 188574 | 60.5 | 0 | 0 |
| 3 | 3517 | 105512 | 33.9 | 0 | 0 |
| 4 | 38 | 1152 | 0.4 | 130 | 5.1 |
| 5 | 257 | 7724 | 2.5 | 219 | 8.6 |
| 6 | 38 | 1147 | 0.4 | 212 | 8.3 |
| 7 | 5 | 163 | 0.1 | 60 | 2.4 |
| 8 | 46 | 1367 | 0.4 | 77 | 3 |
| 9 | 158 | 4746 | 1.5 | 1357 | 53.2 |
| 10 | 28 | 827 | 0.3 | 412 | 16.2 |
| 11 | 4 | 115 | 0 | 0 | 0 |
| 12 | 1 | 42 | 0 | 19 | 0.7 |
| 13 | 3 | 80 | 0 | 64 | 2.5 |
| **TOTAL** | **10387** | **311618** | **100** | **2550** | **100** |

## Table 3 Top 10 Gross Vehicle Weight, Class 9 and 10

| *Date* | *Day of Week* | *Time* | *Vehicle Class* | *Direction* | *Lane* | *GVW (lbs)* |
|---|---|---|---|---|---|---|
| 2019-06-17 | Monday | 13:41:06 | 10 | NB | 2 | 119.64 |
| 2019-06-11 | Tuesday | 10:00:48 | 10 | NB | 1 | 118.07 |
| 2019-06-19 | Wednesday | 07:30:22 | 10 | NB | 1 | 115.28 |
| 2019-06-11 | Tuesday | 10:00:52 | 10 | NB | 1 | 114.74 |
| 2019-06-05 | Wednesday | 15:44:01 | 10 | NB | 1 | 112.87 |
| 2019-06-09 | Sunday | 12:31:54 | 10 | SB | 3 | 112.42 |
| 2019-06-06 | Thursday | 17:38:02 | 10 | NB | 2 | 111.85 |
| 2019-06-11 | Tuesday | 14:29:08 | 10 | NB | 1 | 111.58 |
| 2019-06-28 | Friday | 03:22:39 | 10 | SB | 4 | 111.5 |
| 2019-06-21 | Friday | 13:54:32 | 10 | SB | 4 | 111.31 |

## Table 4 Freight Summary

| *Vehicle Class* | *Direction* | *Weight of Empty Vehicle (Kips)* | *Total Number of Vehicles* | *Number of Empty Vehicles* | *Percentage of Empty Vehicles* | *Total Weight of Vehicles with Freight (Kips)* | *Total Weight of Empty Vehicles (Kips)* | *Total Weight of Freight (Tons)* |
|---|---|---|---|---|---|---|---|---|
| 4 | NB | 15 | 680 | 40 | 5.9 | 19678 | 548 | 5039 |
| 5 | NB | 8 | 4495 | 55 | 1.2 | 69355 | 400 | 16918 |
| 6 | NB | 19 | 529 | 3 | 0.6 | 21322 | 51 | 5664 |
| 7 | NB | 11.5 | 104 | 0 | 0 | 6222 | 0 | 2513 |
| 8 | NB | 31 | 783 | 483 | 61.7 | 12959 | 8181 | 1829 |
| 9 | NB | 33 | 2275 | 76 | 3.3 | 139280 | 2364 | 33357 |
| 10 | NB | 33.5 | 423 | 24 | 5.7 | 26361 | 674 | 6497 |
| 11 | NB | 36.5 | 61 | 61 | 100 | 0 | 1390 | 0 |
| 12 | NB | 36.5 | 28 | 5 | 17.9 | 1792 | 123 | 476 |
| 13 | NB | 31.5 | 47 | 0 | 0 | 5499 | 0 | 2009 |
| **TOTAL** | **** | **** | **9425** | **747** | **** | **302469** | **** | **74303** |
| Vehicle Class | Direction | Weight of Empty Vehicle (Kips) | Total Number of Vehicles | Number of Empty Vehicles | Percentage of Empty Vehicles | Total Weight of Vehicles with Freight (Kips) | Total Weight of Empty Vehicles (Kips) | Total Weight of Freight (Tons) |
| 4 | SB | 15 | 456 | 109 | 23.9 | 10165 | 1415 | 2480 |
| 5 | SB | 8 | 3119 | 710 | 22.8 | 35965 | 5065 | 8347 |
| 6 | SB | 19 | 602 | 25 | 4.2 | 19246 | 435 | 4142 |
| 7 | SB | 11.5 | 57 | 0 | 0 | 2715 | 0 | 1030 |
| 8 | SB | 31 | 565 | 450 | 79.6 | 4235 | 8352 | 335 |
| 9 | SB | 33 | 2404 | 724 | 30.1 | 108623 | 19655 | 26591 |
| 10 | SB | 33.5 | 392 | 28 | 7.1 | 30296 | 716 | 9051 |
| 11 | SB | 36.5 | 52 | 52 | 100 | 0 | 986 | 0 |
| 12 | SB | 36.5 | 13 | 5 | 38.5 | 464 | 107 | 86 |
| 13 | SB | 31.5 | 32 | 0 | 0 | 3849 | 0 | 1420 |
| **TOTAL** | **** | **** | **7692** | **2103** | **** | **215558** | **** | **53482** |
| **GRAND TOTAL** | **** | **** | **17117** | **2850** | **502** | **518027** | **50461** | **127784** |

## Table 5 Gross Vehicle Weight by Class and Lane

| *Vehicle Class* | *NB Driving Lane* | *NB Passing Lane* | *SB Passing Lane* | *SB Driving Lane* | *Total* | *Percentage* |
|---|---|---|---|---|---|---|
| 1 | 68 | 31 | 9 | 115 | 224 | 0 |
| 2 | 367925 | 86721 | 70868 | 292414 | 817927 | 38.4 |
| 3 | 339160 | 66835 | 51407 | 284150 | 741552 | 34.8 |
| 4 | 18810 | 1416 | 30 | 11550 | 31806 | 1.5 |
| 5 | 64141 | 5615 | 3428 | 37602 | 110786 | 5.2 |
| 6 | 20346 | 1027 | 0 | 19682 | 41055 | 1.9 |
| 7 | 5936 | 286 | 0 | 2715 | 8937 | 0.4 |
| 8 | 19563 | 1576 | 0 | 12587 | 33726 | 1.6 |
| 9 | 130912 | 10732 | 0 | 128277 | 269922 | 12.7 |
| 10 | 25085 | 1950 | 0 | 31012 | 58047 | 2.7 |
| 11 | 1350 | 40 | 0 | 986 | 2375 | 0.1 |
| 12 | 1689 | 226 | 0 | 571 | 2486 | 0.1 |
| 13 | 5413 | 86 | 0 | 3849 | 9348 | 0.4 |
| **TOTAL** | **1000398** | **176541** | **125742** | **825509** | **2128190** | **100** |
| **GVW/LANE** | **47.01** | **8.3** | **5.91** | **38.79** | **100** | **0** |

## Table 6 ESALs by Class and Lane and Flexible ESAL Factors

| *Vehicle Class* | *NB Driving Lane* | *NB Passing Lane* | *SB Passing Lane* | *SB Driving Lane* | *Total* | *Percentage* | *Flexible ESAL Factor* |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.006 |
| 2 | 76 | 14 | 7 | 33 | 130 | 0.95 | 0.0014 |
| 3 | 210 | 29 | 13 | 107 | 359 | 2.64 | 0.007 |
| 4 | 469 | 32 | 2 | 206 | 709 | 5.2 | 1.25 |
| 5 | 1226 | 74 | 18 | 397 | 1715 | 12.59 | 0.45 |
| 6 | 643 | 26 | 0 | 444 | 1113 | 8.17 | 1.97 |
| 7 | 139 | 6 | 0 | 61 | 206 | 1.52 | 2.51 |
| 8 | 421 | 18 | 0 | 119 | 558 | 4.1 | 0.83 |
| 9 | 3636 | 271 | 0 | 2932 | 6839 | 50.22 | 2.93 |
| 10 | 570 | 40 | 0 | 870 | 1479 | 10.86 | 3.61 |
| 11 | 2 | 0 | 0 | 1 | 3 | 0.02 | 0.13 |
| 12 | 62 | 5 | 0 | 9 | 75 | 0.55 | 3.08 |
| 13 | 267 | 2 | 0 | 163 | 432 | 3.17 | 9.56 |
| **TOTAL** | **7720** | **516** | **39** | **5343** | **13618** | **100** | **26** |
| **ESALS/LANE** | **56.7** | **3.8** | **0.3** | **39.2** | **100** | **–** | **–** |

## Table 7 Site Summary: Volume and Vehicle Class

| *Month* | *Total Volume* | *Monthly ADT* | *Monthly HCADT* | *Passenger Vehicles* | *Passenger Vehicles %* | *Heavy Commercial Vehicles* | *Heavy Commercial Vehicles %* | *Heavy Commercial Vehicles in Driving Lane %* | *Heavy Commercial Vehicles in Passing Lane %* |
|---|---|---|---|---|---|---|---|---|---|
| Jul 2018 | 350547 | 11308 | 574 | 332764 | 94.9 | 17782.9 | 5.1 | 90.2 | 9.8 |
| Aug 2018 | 358059 | 11550 | 592 | 339709 | 94.9 | 18350 | 5.1 | 90.6 | 9.4 |
| Sep 2018 | 313915 | 10464 | 604 | 295806 | 94.2 | 18109.5 | 5.8 | 90.9 | 9.1 |
| Oct 2018 | 288734 | 9314 | 557 | 271460 | 94 | 17274.5 | 6 | 91.5 | 8.5 |
| Nov 2018 | 213943 | 7131 | 471 | 199800 | 93.4 | 14142.7 | 6.6 | 92.7 | 7.3 |
| Dec 2018 | 202323 | 6977 | 389 | 190274 | 94 | 12049.2 | 6 | 93.6 | 6.4 |
| Jan 2019 | 203082 | 6551 | 412 | 190300 | 93.7 | 12782.5 | 6.3 | 96.2 | 3.8 |
| Feb 2019 | 184458 | 6588 | 402 | 173210 | 93.9 | 11247.6 | 6.1 | 91 | 9 |
| Mar 2019 | 222183 | 7167 | 470 | 207616 | 93.4 | 14566.8 | 6.6 | 92.9 | 7.1 |
| Apr 2019 | 213284 | 7109 | 424 | 200549 | 94 | 12734.7 | 6 | 93.5 | 6.5 |
| May 2019 | 274445 | 8601 | 515 | 258492 | 94.2 | 15952.7 | 5.8 | 93.9 | 6.1 |
| Jun 2019 | 311618 | 10387 | 579 | 294255 | 94.4 | 17363.2 | 5.6 | 93.6 | 6.4 |
| **TOTAL** | **3136591** | **–** | **–** | **2954235** | **–** | **182356** | **–** | **–** | **–** |
| **AVERAGE** | **261383** | **8596** | **499** | **246186** | **94** | **15196** | **6** | **93** | **7** |

## ESALs

| *Month* | *ESALS NB Passing Lane* | *ESALS NB Driving Lane* | *ESALS SB Driving Lane* | *ESALS SB Passing Lane* | *Total ESALS* | *Driving Lane ESALS %* | *Passing Lane ESALS %* | *Pavement Life Decrease Months* |
|---|---|---|---|---|---|---|---|---|
| Jul 2018 | 6965 | 535 | 336 | 5229 | 13065 | 93 | 7 | 23.1 |
| Aug 2018 | 7274 | 628 | 412 | 5605 | 13919 | 93 | 7 | 29.6 |
| Sep 2018 | 7125 | 574 | 424 | 5493 | 13615 | 93 | 7 | 31.5 |
| Oct 2018 | 7067 | 554 | 340 | 6223 | 14184 | 94 | 6 | 31.9 |
| Nov 2018 | 6376 | 331 | 315 | 5768 | 12790 | 95 | 5 | 48.1 |
| Dec 2018 | 5978 | 281 | 7355 | 5121 | 18736 | 59 | 41 | 85.7 |
| Jan 2019 | 6348 | 398 | 15 | 5011 | 11772 | 96 | 4 | 64.8 |
| Feb 2019 | 2855 | 313 | 24397 | 6316 | 33880 | 27 | 73 | 7.8 |
| Mar 2019 | 6210 | 276 | 7776 | 7820 | 22080 | 64 | 36 | 95.1 |
| Apr 2019 | 5158 | 248 | 118 | 5495 | 11019 | 97 | 3 | 46.4 |
| May 2019 | 6651 | 375 | 39 | 5840 | 12906 | 97 | 3 | 30.5 |
| Jun 2019 | 7881 | 523 | 39 | 5353 | 13796 | 96 | 4 | 30.7 |
| **TOTAL** | **75888** | **5034** | **41565** | **69275** | **191763** | **–** | **–** | **–** |
| **AVERAGE** | **6324** | **420** | **3464** | **5773** | **15980** | **84** | **16** | **44** |

## Gross Vehicle Weight

| *Month* | *GVW NB Passing Lane* | *GVW NB Driving Lane* | *GVW SB Passing Lane* | *GVW SB Driving Lane* | *Total GVW Kips* |
|---|---|---|---|---|---|
| Jul 18 | 989942 | 190861 | 199906 | 891495 | 2272204 |
| Aug 18 | 1029912 | 206482 | 199903 | 915971 | 2352268 |
| Sep 18 | 928245 | 167946 | 179934 | 843547 | 2119672 |
| Oct 18 | 874341 | 151885 | 156271 | 815285 | 1997782 |
| Nov 18 | 703774 | 103950 | 86051 | 644760 | 1538536 |
| Dec 18 | 685139 | 100086 | 67487 | 606959 | 1459670 |
| Jan 19 | 682176 | 85152 | 31467 | 619015 | 1417811 |
| Feb 19 | 523242 | 76780 | 67109 | 602583 | 1269714 |
| Mar 19 | 756964 | 97404 | 91231 | 710157 | 1655755 |
| Apr 19 | 699507 | 92039 | 78224 | 627597 | 1497367 |
| May 19 | 898098 | 146399 | 99456 | 755605 | 1899557 |
| Jun 19 | 1004278 | 176757 | 125798 | 826044 | 2132876 |
| **TOTAL** | **9775619** | **1595742** | **1382836** | **8859016** | **21613214** |
| **AVERAGE** | **814635** | **132978** | **115236** | **738251** | **1801101** |

## Overweight Vehicles

| *Month* | *Total Number of Overweight Vehicles* | *Overweight / Total Volume* | *Overweight / Heavy Commercial Volume* | *Number Over 88,000 lbs* | *Number Over 98,000 lbs* |
|---|---|---|---|---|---|
| Jul 2018 | 2415 | 0.7 | 13.6 | 700 | 189 |
| Aug 2018 | 2476 | 0.7 | 13.5 | 830 | 275 |
| Sep 2018 | 2546 | 0.8 | 14.1 | 934 | 286 |
| Oct 2018 | 2727 | 0.9 | 15.8 | 1007 | 305 |
| Nov 2018 | 2379 | 1.1 | 16.9 | 1102 | 355 |
| Dec 2018 | 2093 | 1 | 16.5 | 1147 | 489 |
| Jan 2019 | 2132 | 1.1 | 16 | 1062 | 401 |
| Feb 2019 | 1870 | 1.1 | 16.9 | 1060 | 553 |
| Mar 2019 | 2748 | 1.3 | 18.9 | 1486 | 736 |
| Apr 2019 | 2116 | 1 | 16.7 | 764 | 241 |
| May 2019 | 2475 | 0.9 | 15.6 | 829 | 170 |
| Jun 2019 | 2598 | 0.8 | 15 | 707 | 234 |
| **TOTAL** | **28575** | **–** | **–** | **11628** | **4234** |
| **AVERAGE** | **2381.2** | **1** | **15.8** | **969** | **352.8** |

## Freight

| *Month* | *NB Freight Tons* | *SB Freight Tons* | *Total Freight* | *NB Freight %* | *SB Freight %* |
|---|---|---|---|---|---|
| Jul 2018 | 72207 | 58420 | 130627 | 55.3 | 44.7 |
| Aug 2018 | 73261 | 62083 | 135345 | 54.1 | 45.9 |
| Sep 2018 | 75479 | 60417 | 135896 | 55.5 | 44.5 |
| Oct 2018 | 71194 | 66929 | 138122 | 51.5 | 48.5 |
| Nov 2018 | 59228 | 61355 | 120584 | 49.1 | 50.9 |
| Dec 2018 | 53907 | 52938 | 106845 | 50.5 | 49.5 |
| Jan 2019 | 57703 | 52459 | 110162 | 52.4 | 47.6 |
| Feb 2019 | 29089 | 60935 | 90023 | 32.3 | 67.7 |
| Mar 2019 | 57188 | 75044 | 132232 | 43.2 | 56.8 |
| Apr 2019 | 49952 | 53049 | 103001 | 48.5 | 51.5 |
| May 2019 | 64933 | 57952 | 122885 | 52.8 | 47.2 |
| Jun 2019 | 74303 | 53482 | 127784 | 58.1 | 41.9 |
| **TOTAL** | **738445** | **715061** | **1453506** | **–** | **–** |
| **AVERAGE** | **61537.1** | **59588.4** | **121125.5** | **50.3** | **49.7** |