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LARGE TRUCK MONITORING PROGRAM

WIM Station Annual Report for 2008

Prepared for:

NEW JERSEY DEPARTMENT OF TRANSPORTATION
Bureau of Freight Services

Prepared by:

NEW JERSEY INSTITUTE OF TECHNOLOGY
Department of Civil and Environmental Engineering

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Introduction

The New Jersey Department of Transportation (NJDOT), in collaboration with sister transportation agencies, initiated a five year truck monitoring program in 2007 to evaluate the impacts of new 102" Large Truck Network regulations (N.J.A.C. 16:32) proposed by the state in November 2006 and effective on January 22, 2008. The truck monitoring program encompasses the statewide collection of truck volume, origin-destination (O-D) patterns, crash statistics, subsequent analysis of data, and the production of quarterly and yearly reports.

The newly adopted large truck regulations stipulate that double-trailer truck combinations and 102" width trucks must use the National Network when traveling within New Jersey, unless making a pickup or delivery or seeking food, fuel, service or lodging within two miles of the National Network. The regulations also require that any travel off the National Network onto a New Jersey Access Network roadway be by the shortest distance or most direct route.

The National Network consists of the interstate routes, the New Jersey Turnpike, the Atlantic City Expressway, and sections of NJ 42 (between I-295 and the Atlantic City Expressway), NJ 81 (between US 1&9 and the New Jersey Turnpike), US 130/NJ 322 (between I-295 and the Commodore Barry Bridge), and NJ 440 (between the New Jersey Turnpike and the Outerbridge Crossing). The New Jersey Access Network consists of most other state and 500-series county routes with exceptions.

The previous rules regarding large truck routing in New Jersey were governed by emergency regulations put in place in February 2006 as a result of a court order striking down the legality of earlier legislation. The 2006 rules stated that double-trailer truck combinations were restricted to the Double Trailer Truck Network which was identical to the current National Network. 102" trucks, on the other hand, were permitted to "travel freely for all purposes" on the 102-Inch Truck Network which consisted of the extents of both the National Network and the current New Jersey Access Network.

This report summarizes Weigh-in-Motion (WIM) data for 23 key automated recording stations (34 directional stations) as well as several toll facilities throughout New Jersey. These locations were selected due to their high truck volume and/or anticipated changes in truck activity as a result of the implementation of the new regulations. **Figure A** shows the location of the key WIM Stations. The focus of the report is on documenting and identifying changes and trends in the large truck activity in New Jersey since the adoption of the new regulations shortly after the start of 2008. A particular focus of these analyses is trends as they relate to the quarter ending December 31, 2008.

Figure A: Key WIM Stations

Data Sources and Methods

Weigh-in-Motion (WIM) Stations

Weigh-in-Motion (WIM) stations sense axle loadings passing over the roadway sensors. Using a combination of the weight per axle and the axle spacing, vehicles can be identified as one class of the 13-class FHWA vehicle classification system, plus an unknown class. The records of individual vehicles can then be summarized into the total number of vehicles in each vehicle class for each hour of every day, per direction, per lane. This hourly vehicle classification data is then summarized into files, one file per WIM station per month. The data analyzed in this report was extracted from these processed hourly vehicle classification files, or CLA files.

During the creation of the CLA files from raw WIM data by NJDOT staff, some data are removed due to observed anomalies in the volumes, hardware malfunction, badly formatted records, or other problems that may compromise the data integrity. These preliminarily cleaned CLA files were then delivered to NJIT and were further scrubbed to remove more problematic data, including any missing (or extra) data records for hours and lanes. When the CLA data for a station was discovered to not have exactly one record per hour of the day (usually missing hours), the entire day of data was discarded for that station and direction of travel. Similarly, if the CLA files were missing records for any of the lanes at each station, or had lane data for lanes that do not exist (e.g. data for lane 3 at a station where only 2 lanes exist), the entire day was removed for that station and direction of travel. When either partial day or partial lane data was removed, the other days within that month were kept to maximize the amount of data to be summarized and analyzed.

In addition to removing suspect data, all weekends and eight state holidays were removed from the data summaries that are included in this report. The specific holidays removed include New Year's Day, Dr. Martin Luther King's Birthday (observed), President's Day (observed), Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day. If a state holiday fell on a weekend, the weekday on which the holiday was observed was removed. In addition to state holidays, the Friday after Thanksgiving, Christmas Eve, the day after Christmas, and New Year's Eve were also removed from this summary report as these days exhibited unusually low overall volume at all locations and would skew the results.

These cleaned weekday-only CLA files were then summarized on a monthly, quarterly, and annual basis, through the calculation of the volume totals per hour and per day, daily average volume per station per direction, and the standard deviation of that directional daily volume. The minimum and maximum daily volume during the period was also noted. The hourly distribution

of vehicle class groups was also determined by the total volume per vehicle grouping (aggregations of vehicle classes) during the reporting period.

In this report, unless otherwise noted large trucks are categorized as FHWA vehicle classes 8 through 13. These classes are defined in Appendix A. In all cases, vehicles classified as 'unknown' in the CLA files (e.g. errors such as those caused by vehicle changing lanes while crossing the sensor or those vehicles not fitting the FHWA classification scheme such as special heavy construction equipment, cranes, etc.) were not included in the volume totals or analyses. While these unclassified vehicles make up about 1% of all WIM Station observations statewide in 2008, in few cases this value is a significant share (>5%) of the total volume and may influence results. These rare instances are noted.

Estimating Unavailable Data

It was determined that due to the significant amount of unavailable WIM volume data; the research team would use forecasting methodologies to estimate the large truck weekday average daily traffic (ADT) for months when gaps occurred. For truck traffic data, which exhibits both a trend and a seasonal element, it was important to select a suitable forecasting algorithm. Two algorithms were considered:

1. Holt's Algorithm – Using a user-defined set of historical observations (typically six or 12 months), computes the forecast by using exponential smoothing recursions of the trend at the subject location.
2. The Holt-Winters Seasonal Algorithm – Expands on the Holt's Algorithm where the trend and seasonal variation of the historical observations is available. A minimum of two years of historical data is required to establish the seasonality of each month at the subject location.

On a station by station basis, the applied forecasting methodology was determined based on:

- the availability of historical WIM data,
- The average mean squared error.

For some locations, such as newly-deployed WIM Stations, there was insufficient historical data available to apply the Holt-Winters Seasonal Algorithm. For those locations, Holt's Algorithm was applied to estimate the large truck ADT. In all other cases, both methods were applied for all months of 2008. The method that yielded the smallest mean squared error for months when the large truck ADT was known was chosen as the preferred forecasting tool for estimating the gaps in the data series.

Holt's Algorithm was used to fill the holes in the historical monthly ADT data series (2005-2007) in order to produce the complete set of data required for the Holt-Winters Seasonal Algorithm.

Large Truck Volume Profiles

There were several key general findings from the WIM data analyzed:

- As one would expect, large truck volume is heaviest on the Interstate routes which are designed and intended for interstate through trucks and intrastate movements.
- Looking at the annual profiles, volumes declined sharply during the 4th quarter of 2008 on both National Network and New Jersey Access Network roadways. This contributed to a decline in year over year volume from 2007 to 2008 for nearly every location.
- Generally, daily variability tended to be highest during the 1st and 4th quarters of the year when inclement weather is possible.
- The daily large truck profiles exhibit four patterns referred to by the following numbers in this report:
    1. Heavy truck volume relatively evenly spaced throughout the day so that the maximum hourly volume, generally during the early morning, is less than double the minimum hourly volume, often during the early evening. This is typical of eastbound and northbound National Network routes in the northern portion of the state.
    2. Heavy truck volume with a normal, but low curve peaking during the midday. Midday peak hourly volume exhibiting a two- to six-fold increase over the overnight minimum. This is typical of all other National Network routes and heavily used New Jersey Access Network routes.
    3. Moderate to low truck volume with a normal, but more peaked curve during the midday. Midday peak hour volume typically six to nine times greater than overnight low volume. These locations generally exhibit a local/urban truck use pattern.
    4. Low truck volume with a normal, but highly peaked curve during the midday. Midday peak hour volume more than nine times greater than the overnight lull. These locations are in urban areas with limited through-trips.

The following series of figures depict the large truck activity and volume trends at 23 select WIM Stations, two toll plaza locations, and three toll road mainline locations during 2008. For this report, large trucks are defined as FHWA classes 8 through 13 unless otherwise noted.

Interstate 78 Toll Bridge Plaza: I-78, MP 0.0

The Delaware River Joint Toll Bridge Commission (DRJTBC) Interstate 78 Toll Bridge plaza is located on westbound I-78 west of the Interstate 78 Toll Bridge on the Pennsylvania side of the Delaware River. Since no vehicles can access I-78 between the bridge and the toll plaza, the volume at this location represents the volume at milepost 0.0, mid-span of the bridge. At this location I-78 is a six-lane limited access Urban Interstate and is included in the National Network. **Figure 1-78_DRJTBC** shows the location and surrounding features. Monthly data at this location comes from DRJTBC and was not stratified by hour or day.

Figure 1-78_DRJTBC: Aerial View of Location at I-78, MP 0.0

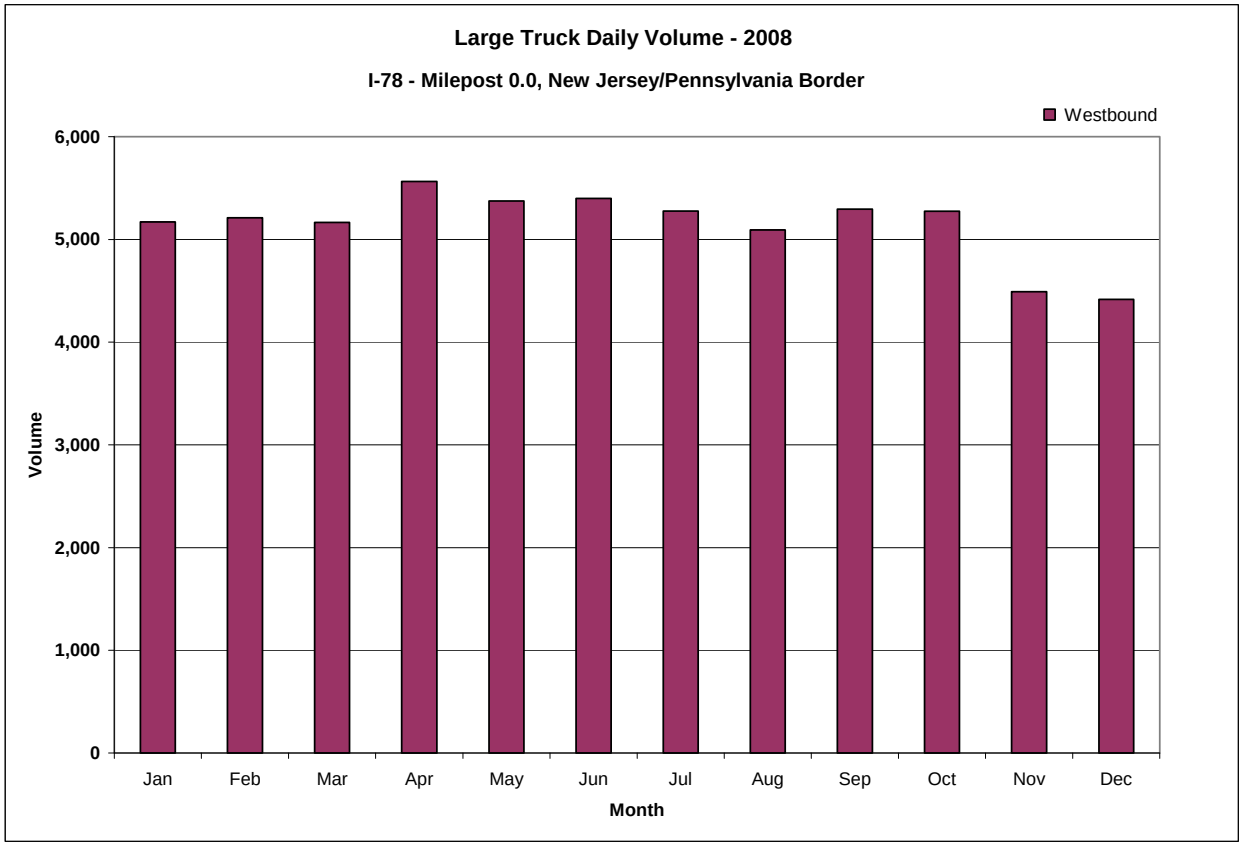

Figure 2-78_DRJTBC: Annual Profile of Large Truck Volume at I-78, MP 0.0
Notes: Large Trucks defined as trucks with five or more axles. Holidays and weekend are included.

As shown in **Figure 2-78_DRJTBC,** large truck weekday average daily volume (ADT) ranged from 4,500 to nearly 5,500 per day during 2008 at westbound I-78 at the toll barrier for the Delaware River crossing. Daily large truck volume exceeded 5,000 between January and October 2008 with a peak of 5,500 in April 2008. A steep drop off in volume is shown during November and December 2008 due in large part to the inclusion of holidays in the data set.

WIM Station 78E: I-78, MP 5.02

WIM Station 78E is located at milepost 5.02 of eastbound Interstate 78 in Greenwich, Warren County east of Interchange 3 (Route 22/122/173). At this location I-78 is a six-lane limited access Urban Interstate and is included in the National Network. **Figure 1-78E** shows the location and surrounding features. This location is paired with westbound WIM Station 78F at milepost 7.9. WIM data collection commenced in July 2007 and data was available for all of 2008 except May.

Figure 1-78E: Aerial View of WIM Station at I-78, MP 5.02

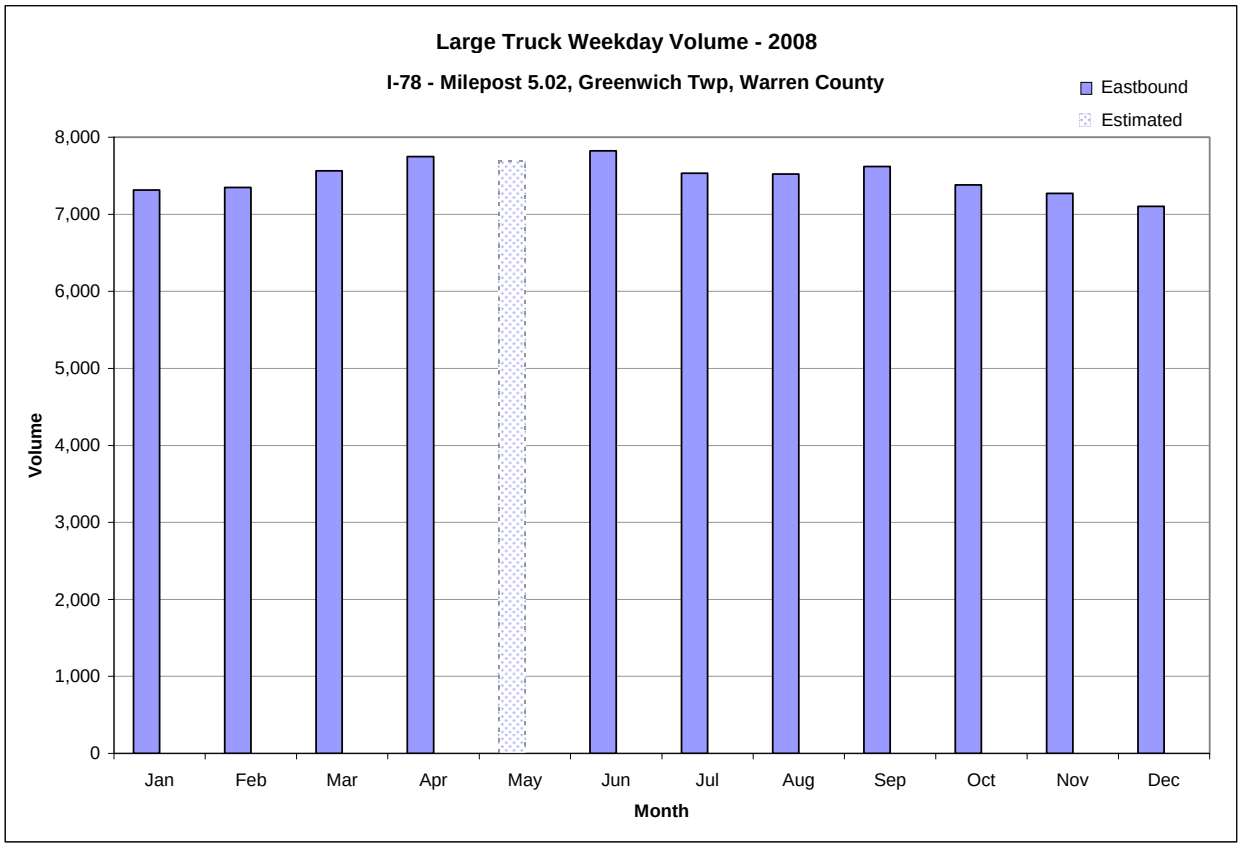

Figure 2-78E: Annual Profile of Large Truck Volume at I-78, MP 5.02
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-78E,** large truck weekday average daily volume (ADT) ranged from 7,000 to nearly 8,000 per weekday during 2008 at eastbound I-78, milepost 5.02. Large truck volume steady rose from January to June 2008 to 7,800 before dropping to an annual low of just more than 7,000 in December 2008.

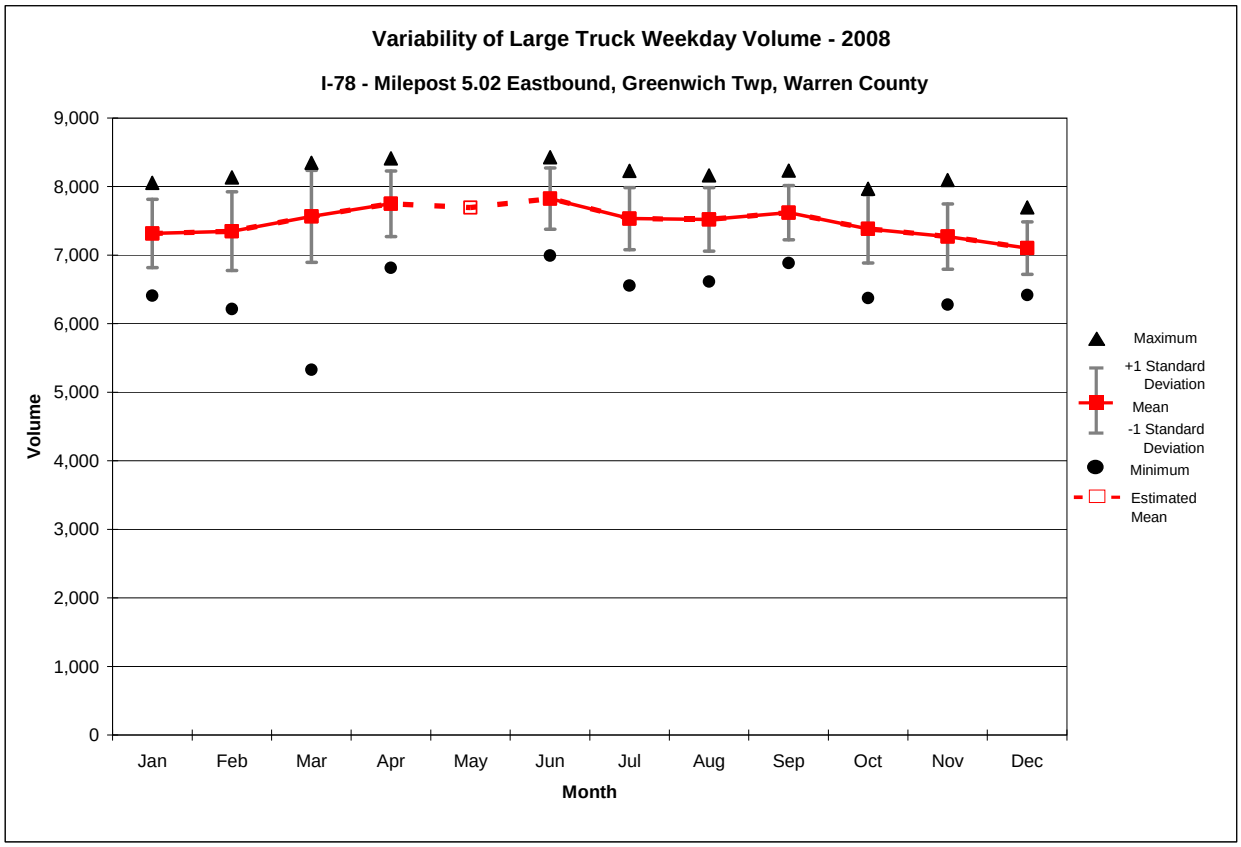

Figure 3A-78E: Variability of Large Truck Volume at Eastbound I-78, MP 5.02
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at eastbound I-78 milepost 5.02 is shown in **Figure 3A-78E.** A relatively large amount of variability occurred in March 2008 due primarily to the low volume for the year on March 21, 2008 (5,328). Minimal variability during December 2008 was due to limited data availability. Some 8,430 trucks traveled over this WIM station on June 19, 2008.

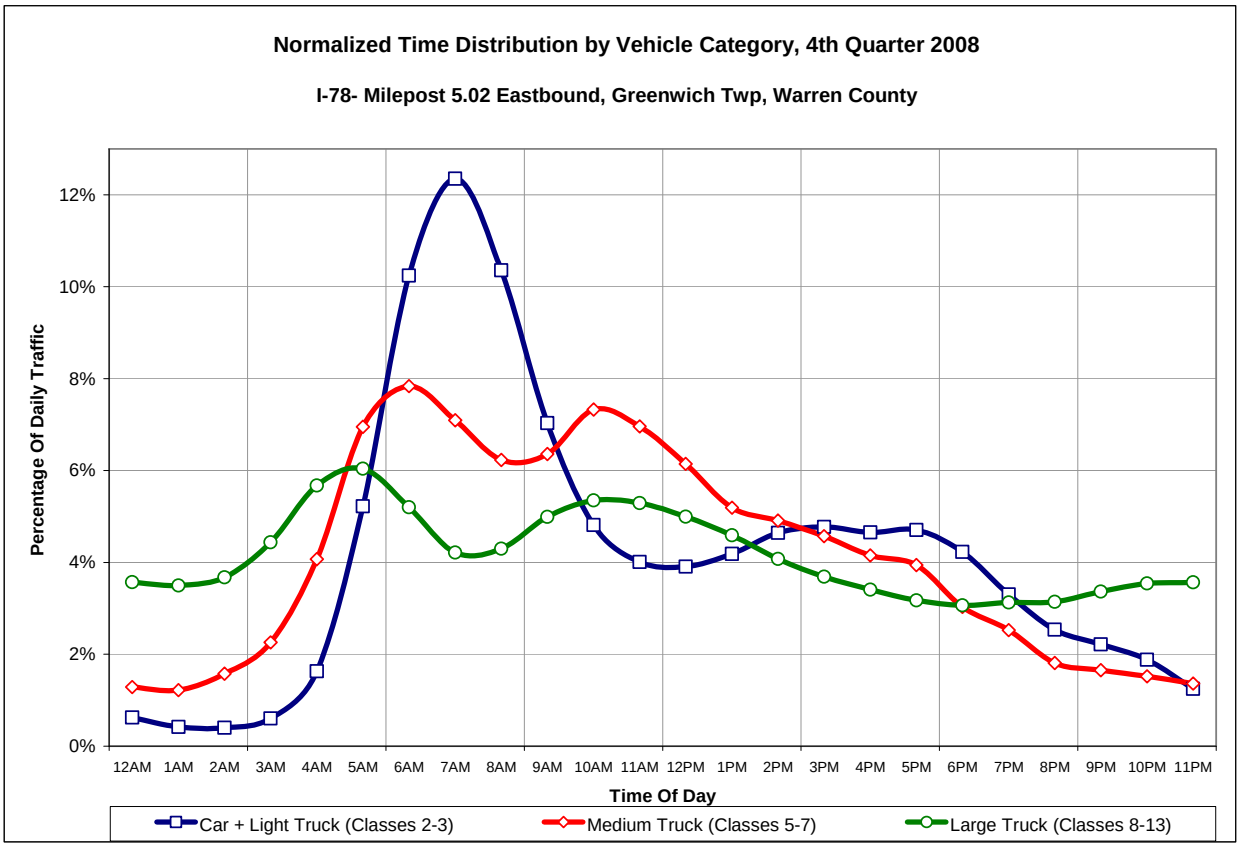

Figure 4A-78E: Daily Profile of Volume at Eastbound I-78, MP 5.02

Figure 4A-78E shows the relative daily profile of traffic by vehicular category in the eastbound direction at I-78 milepost 5.02 during the 4th quarter of 2008. The large truck volume was relatively constant throughout the day but did peak slightly during the early morning. The peaking profile is typical of Profile 1 (discussed earlier). As with other locations on eastbound I-78 this pattern is likely due to long distance trucks attempting to reach the core consumer market and trucking/intermodal terminals in New Jersey and New York before the morning gate opening and/or peak congestion. Auto volume was sharply peaked in the morning between 7:00 and 8:00 a.m. with over 12% of daily auto volume in that hour. This suggests a strong commuter pattern from employment locations to the east.

WIM Station 78F: I-78, MP 7.9

WIM Station 78F (a.k.a. 78W) is located at milepost 7.9 of westbound Interstate 78 in Bethlehem, Hunterdon County east of Interchange 7 (NJ 173). At this location I-78 is a six-lane limited access Rural Interstate and is included in the National Network. **Figure 1-78F** shows the location and surrounding features. This location is paired with eastbound WIM Station 78E at milepost 5.02. WIM data collection commenced in July 2007 at this location and data was available for all of 2008 except March and May.

Figure 1-78F: Aerial View of WIM Station at I-78, MP 7.9

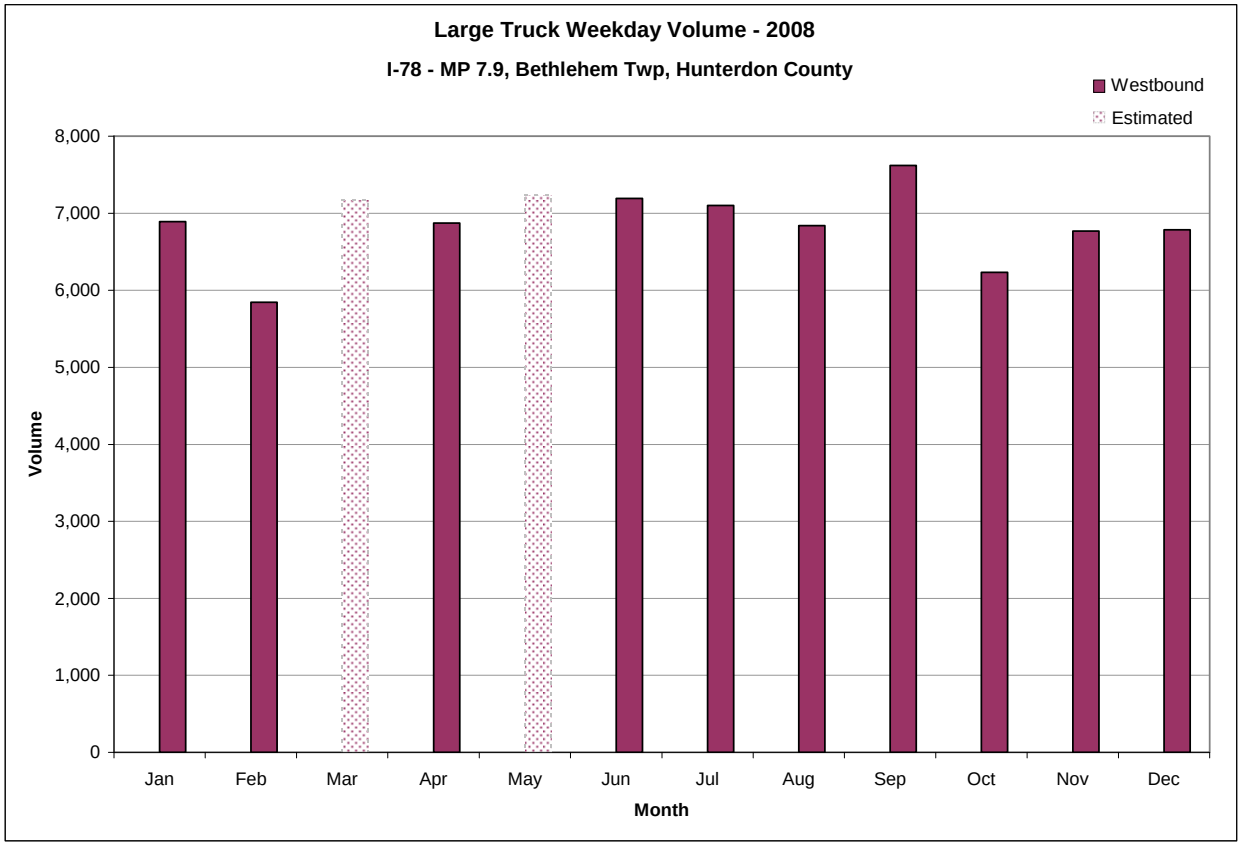

Figure 2-78F: Annual Profile of Large Truck Volume at I-78, MP 7.9
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-78F,** large truck volume ranged from a low of fewer than 6,000 per weekday in February 2008 (when 3,000 total vehicles per weekday (7%) were not classified) to a high of approximately 7,600 in September 2008 at westbound I-78, milepost 7.9. In contrast to many other locations throughout the state, large truck volume was on an increasing trend during the 4th quarter of 2008.

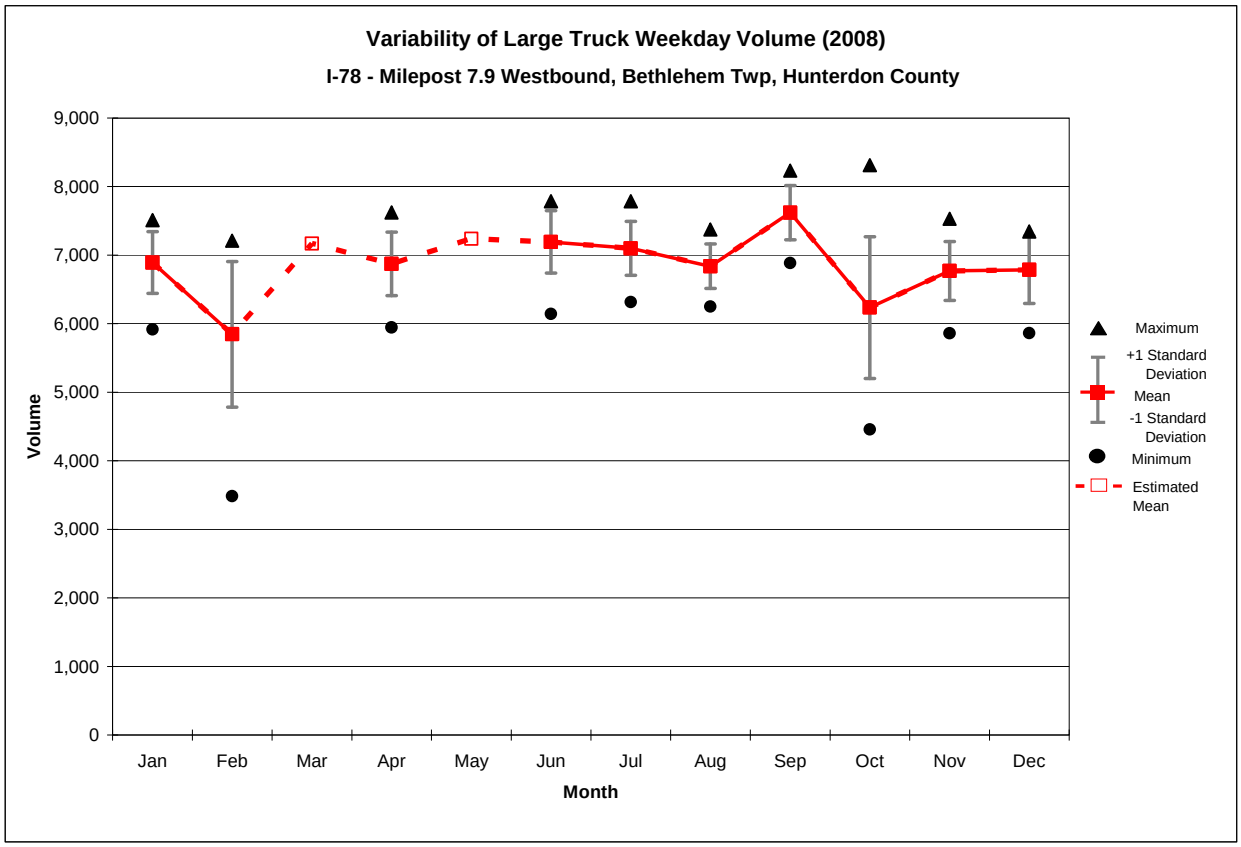

Figure 3B-78F: Variability of Large Truck Volume at Westbound I-78, MP 7.9
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3B-78F shows the range of weekday large truck volume at westbound I-78 milepost 7.9. High variability months were February and October, 2008 when the standard deviation was more than 1,000 vehicles. On October 10th, fewer than 4,500 large trucks were counted at this location. This low volume was followed later in that month with an unusually high volume day on October 30, 2008 when over 8,300 large trucks traveled over the WIM counters. Overall, October was a below average volume month immediately succeeding the highest volume month of September. The annual minimum occurred on February 25, 2008 when 3,490 trucks were counted.

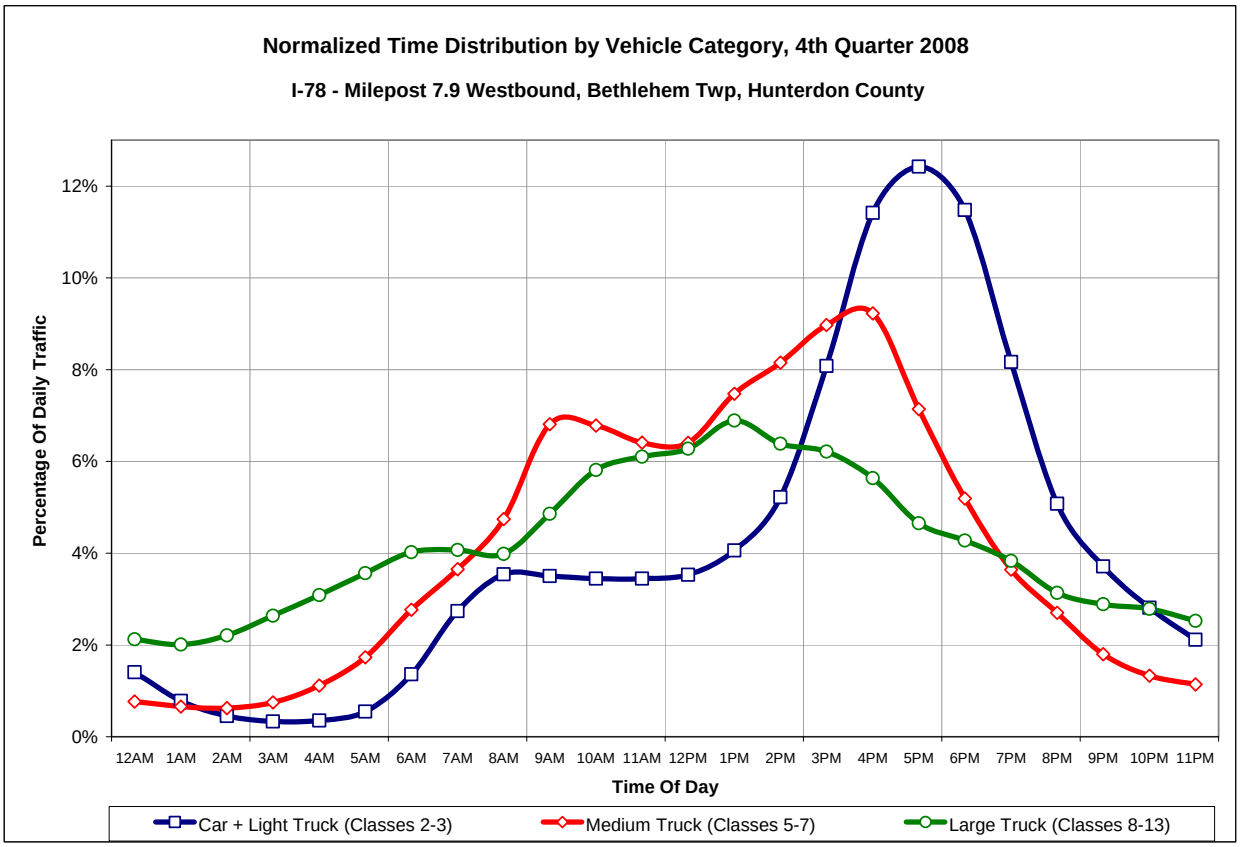

Figure 4B-78F: Daily Profile of Volume at Westbound I-78, MP 7.9

Figure 4B-78F shows the relative daily profile of traffic by vehicular category in the westbound direction at I-78 milepost 7.9 during the 4th quarter of 2008. The large truck volume pattern exhibits Profile 2 and peaked between 1:00 and 2:00 p.m. Medium trucks peaked relatively late in the day between 3:00 and 5:00 p.m. Auto volume followed a strong directional commuter pattern with a pronounced peak during the 4:00 to 7:00 p.m. period with over one-third of the daily total during this three hour stretch.

WIM Station 78D: I-78, MP 25.7

WIM Station 78D is located at milepost 25.7 of Interstate 78 in Readington, Hunterdon County between Interchanges 24 (CR 523 Oldwick Road) and 26 (CR 665 Rattlesnake/Bridge Road). At this location I-78 is a six-lane limited access Rural Interstate and is included in the National Network. **Figure 1-78D** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years however two months of data was unavailable for 2008.

Figure 1-78D: Aerial View of WIM Station at I-78, MP 25.7

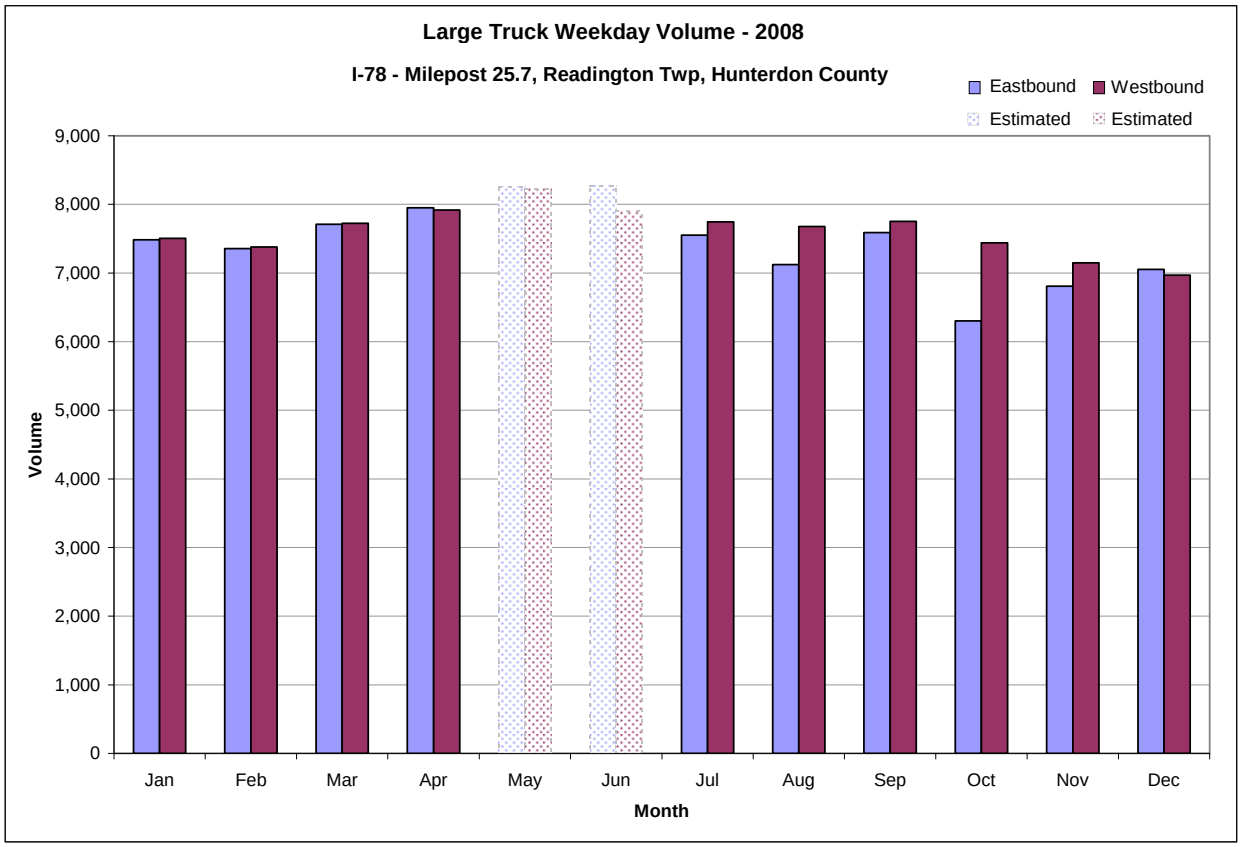

Figure 2-78D: Annual Profile of Large Truck Volume at I-78, MP 25.7
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-78D,** large truck weekday ADT at I-78, milepost 25.7 exhibited an upward trend during the first half of 2008. In April 2008 nearly 8,000 large trucks were counted per weekday in both directions. This was the highest volume of large trucks recorded at any New Jersey WIM station in 2008. The lowest volume in both directions at this station was during the 4th quarter of 2008. Westbound traffic exceeded eastbound traffic in all but one month where comparable data was available. The largest discrepancy between directions occurred in October 208 when 18% more large trucks traveled westbound at this location.

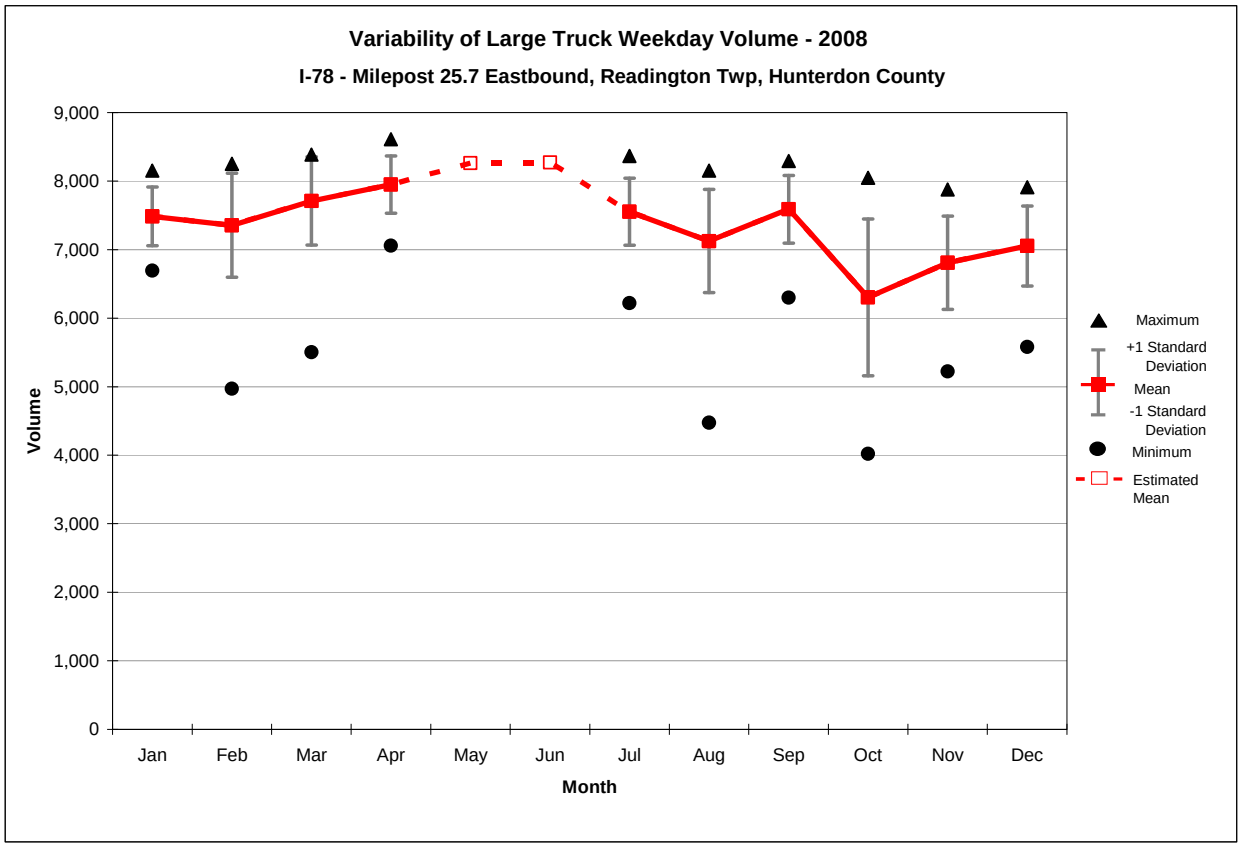

Figure 3A-78D: Variability of Large Truck Volume at Eastbound I-78, MP 25.7
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3A-78D depicts the range of weekday large truck volume at eastbound I-78 milepost 25.7. Variability was high during the 4th quarter 2008 months, particularly October when the standard deviation was 1,145 trucks. Little variability occurred in January and April 2008 when the standard deviation registered at little over 400. April 2008 was also the month of the highest weekday large truck volume when 8,610 traveled I-78 on the 23rd. This was the highest single day of large truck volume recorded at a WIM Station in 2008. Just over 4,000 trucks crossed this same location on October 31, 2008.

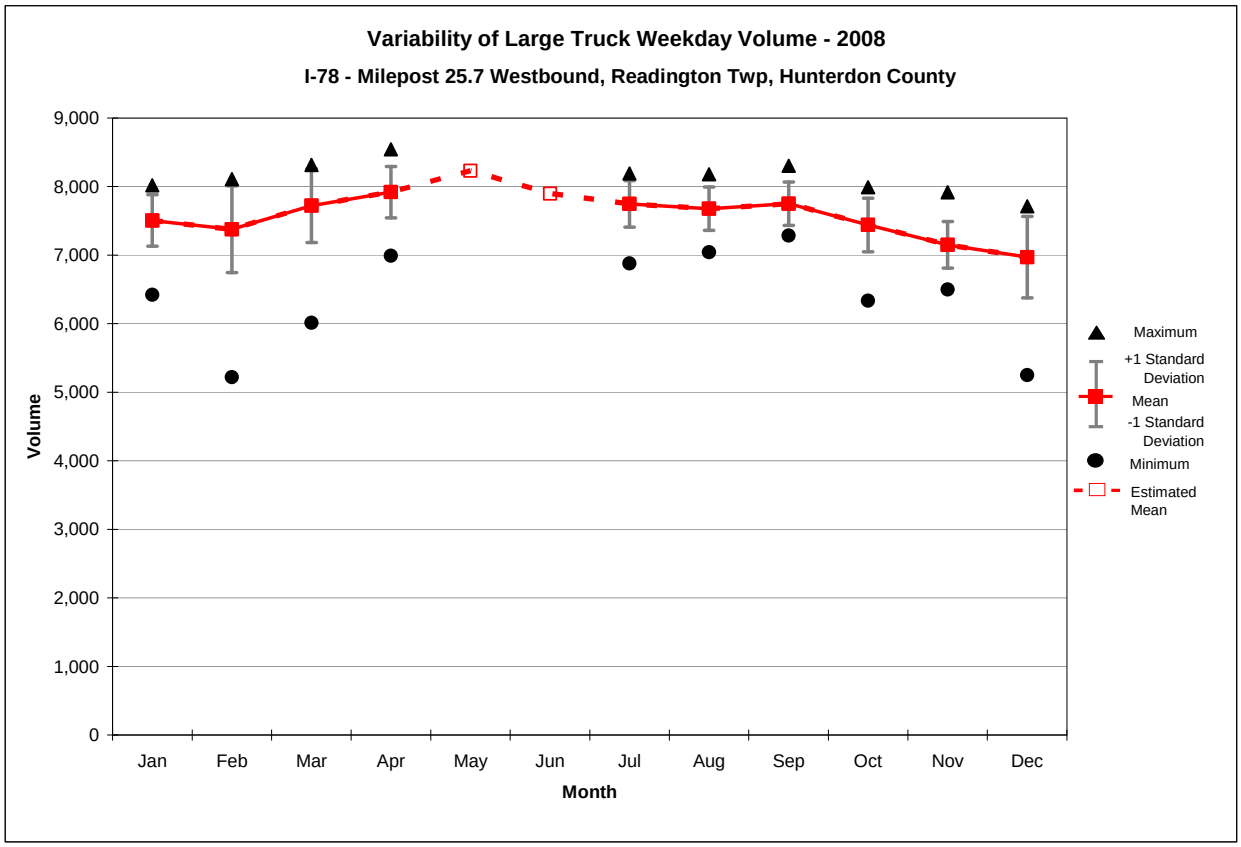

Figure 3B-78D: Variability of Large Truck Volume at Westbound I-78, MP 25.7
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3B-78D shows the range of weekday large truck volume at westbound I-78 milepost 25.7. While the overall variability was much less westbound compared to eastbound at this station, the greatest variability transpired in February and December 2008. Low volume was recorded on February 25th likely due to the aftermath of a snow event and December 29th was a low volume day. Little variability occurred during August and September 2008 when the standard deviation was just over 300 and the monthly minimums were higher than the December 2008 mean. The maximum recorded volume of 8,543 large trucks occurred on April 30, 2008 from the data that was available.

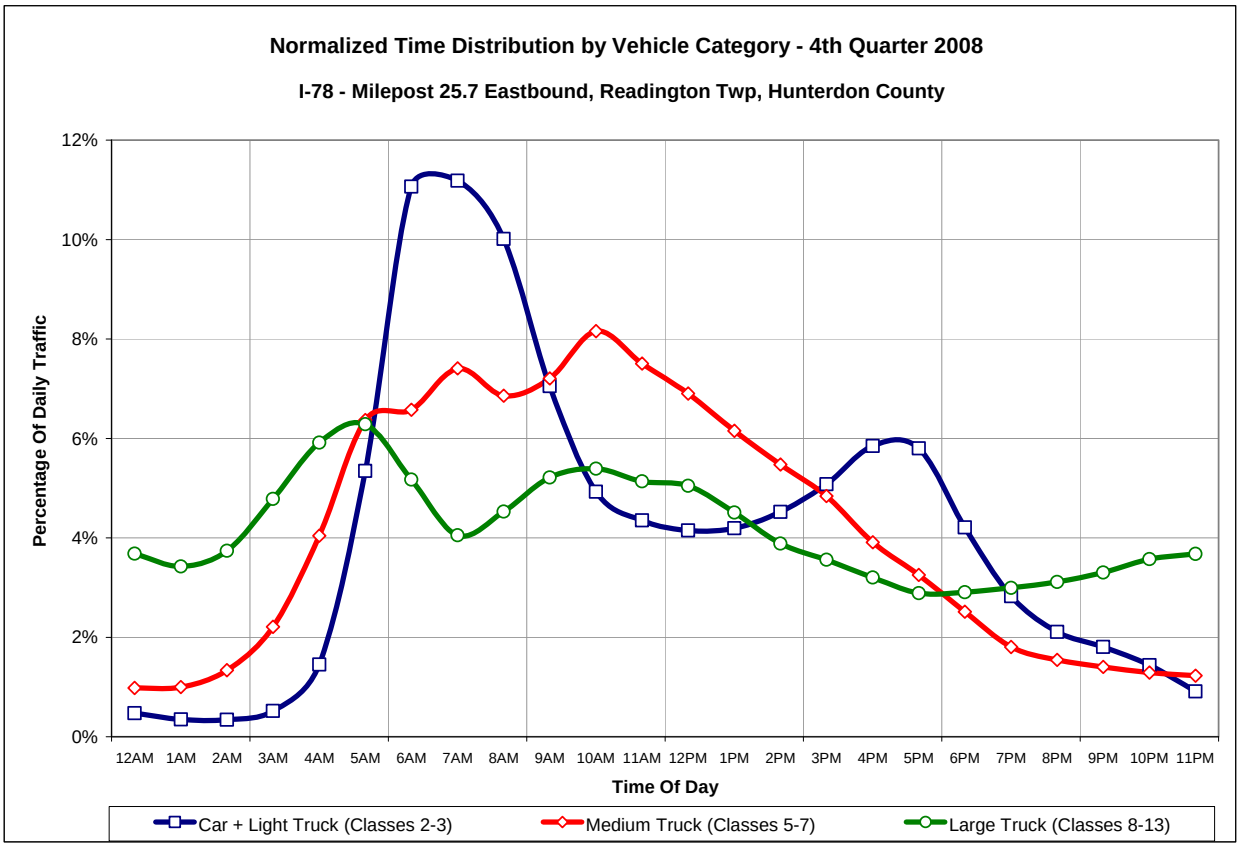

Figure 4A-78D: Daily Profile of Volume at Eastbound I-78, MP 25.7

Figure 4A-78D shows the relative daily profile of traffic by vehicular category in the eastbound direction at I-78 milepost 25.7 during the 4th quarter of 2008. The large truck Profile 1 is typical of a heavily traveled through-trip route with relatively steady volume throughout the 24-hour weekday. Large truck volume peaked early, between 4:00 and 6:00 a.m., when over 12% of all large truck traffic occurred. This early peak is likely due to long distance truckers trying to reach the core consumer market and truck terminals in New Jersey and New York before the morning gate opening and/or peak congestion. Overnight large truck volume was demonstrably higher at this location than most others throughout the state. Car trips peaked during the 6:00 to 8:00 a.m. period when nearly 22% of auto volume occurred.

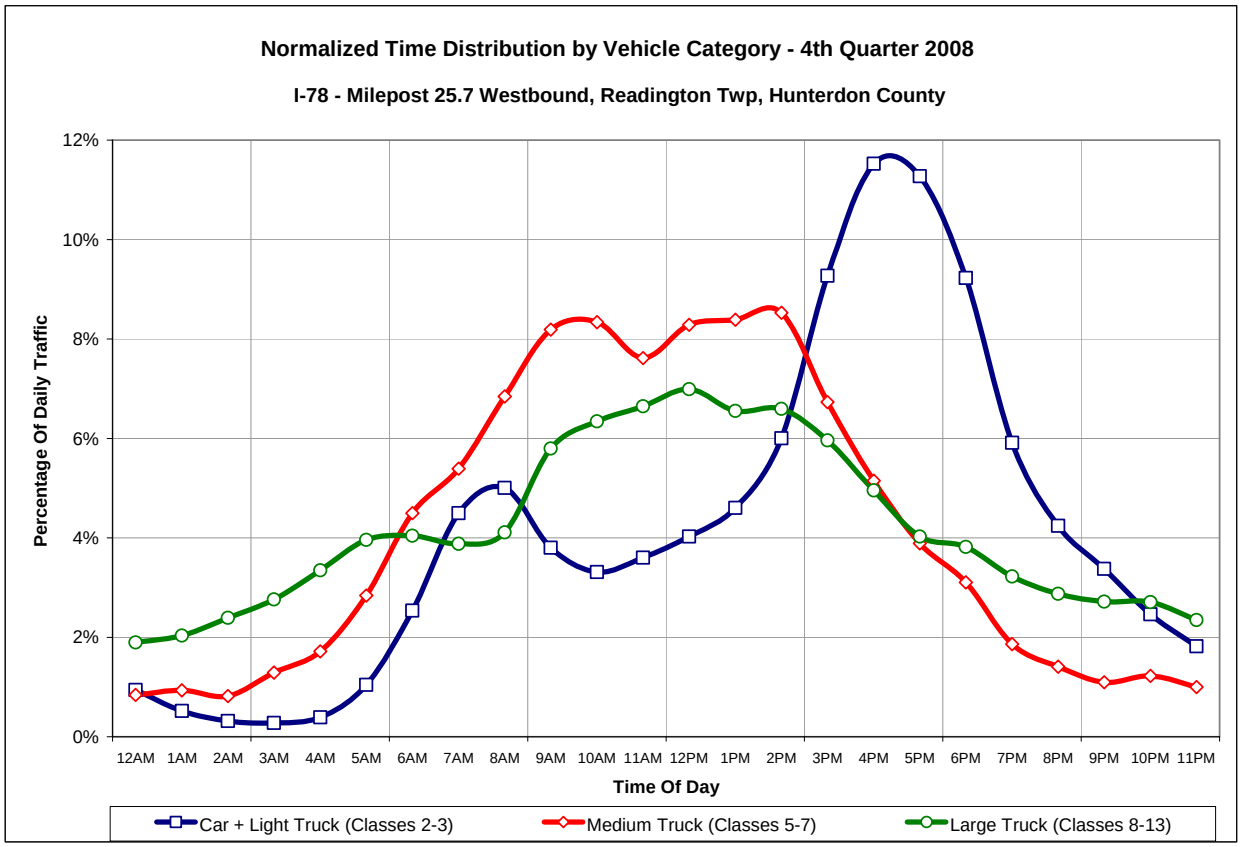

Figure 4B-78D: Daily Profile of Volume at Westbound I-78, MP 25.7

Figure 4B-78D shows the relative daily profile of traffic by vehicular category in the westbound direction at I-78 milepost 25.7 during the 4th quarter of 2008. The heavy large truck volume shows a mild peak during midday typical of Profile 2. Auto volume followed a strong commuter pattern with over 22% of daily auto volume between 4:00 and 6:00 p.m.

WIM Station 78B: I-78, MP 34.5

WIM Station 78B is located at milepost 34.5 of westbound Interstate 78 in Bernards Township, Somerset County near the ramps of Interchange 33 (CR 525 Martinsville/Liberty Corner Road). At this location I-78 is a six-lane limited access Urban Interstate and is included in the National Network. **Figure 1-78B** shows the location and surrounding features. WIM data has been continuously recorded at this location since late 2006 however some data was unavailable for 2008.

Figure 1-78B: Aerial View of WIM Station at I-78, MP 34.5

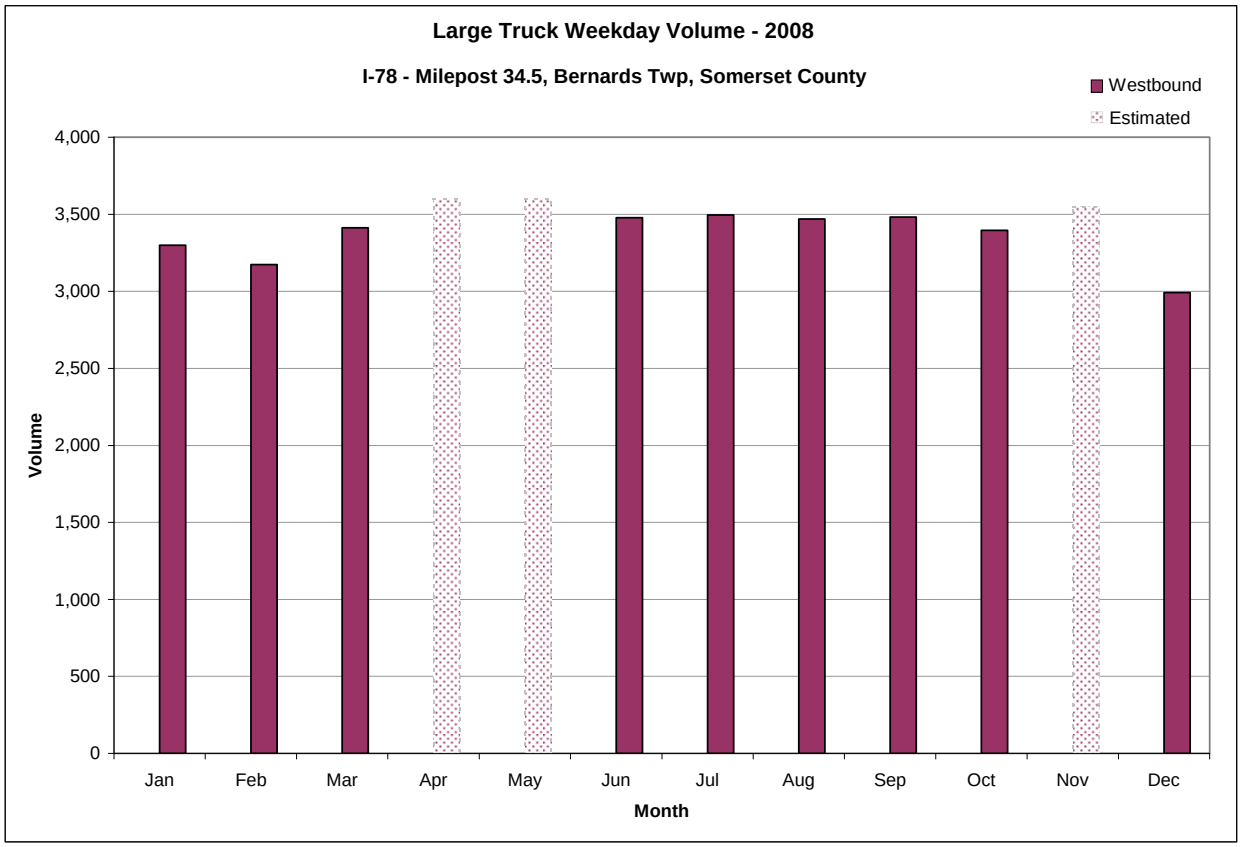

Figure 2-78B: Annual Profile of Large Truck Volume at I-78, MP 34.5
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-78B,** large truck weekday ADT did not show much range during most of 2008. The peak recorded daily average of approximately 3,500 occurred during much of the mid-portion of the year. An annual low of 3,000 occurred during the month of December 2008.

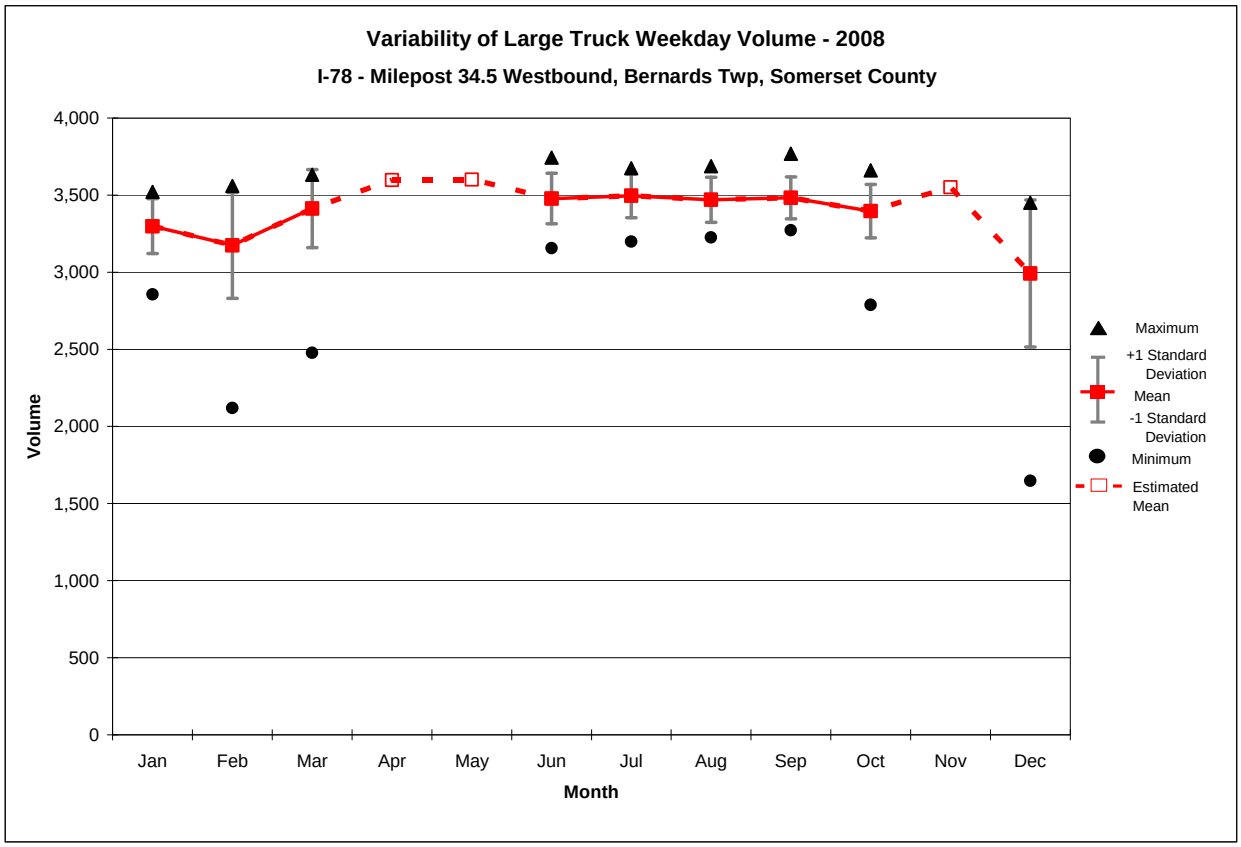

Figure 3B-78B: Variability of Large Truck Volume at Westbound I-78, MP 34.5
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at westbound I-78 milepost 34.5 is shown in **Figure 3B-78B**. The greatest variability occurred in December 2008 due in large part to the very low volume on December 22nd when less than half the annual mean traveled over this counting station. The February 22, 2008 snowstorm is indicated as the unusually low minimum in that month. Given the limited data, the maximum weekday volume of some 3,800 large trucks occurred on September 9, 2008.

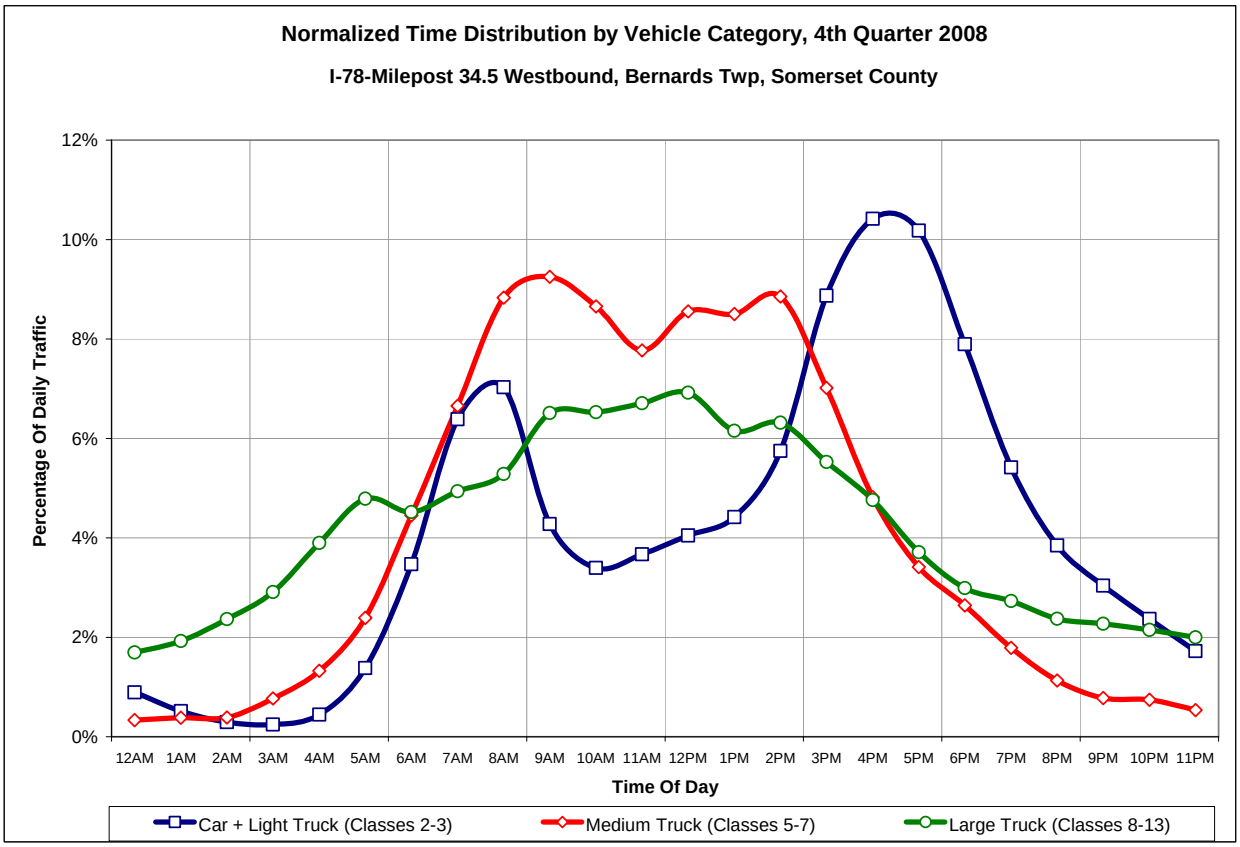

Figure 4B-78B: Daily Profile of Volume at Westbound I-78, MP 34.5

Figure 4B-78B shows the relative daily profile of traffic by vehicular category in the westbound direction at I-78 milepost 34.5 during the 4th quarter of 2008. The large truck volume displayed daily Profile 2 with a peak between 9:00 a.m. and 1:00 p.m. An early peak for medium trucks between 8:00 and 10:00 a.m. was followed by relatively high volume until 3:00 p.m. Personal vehicles peaked during the 4:00 to 6:00 p.m. period with nearly 20% of daily auto volume.

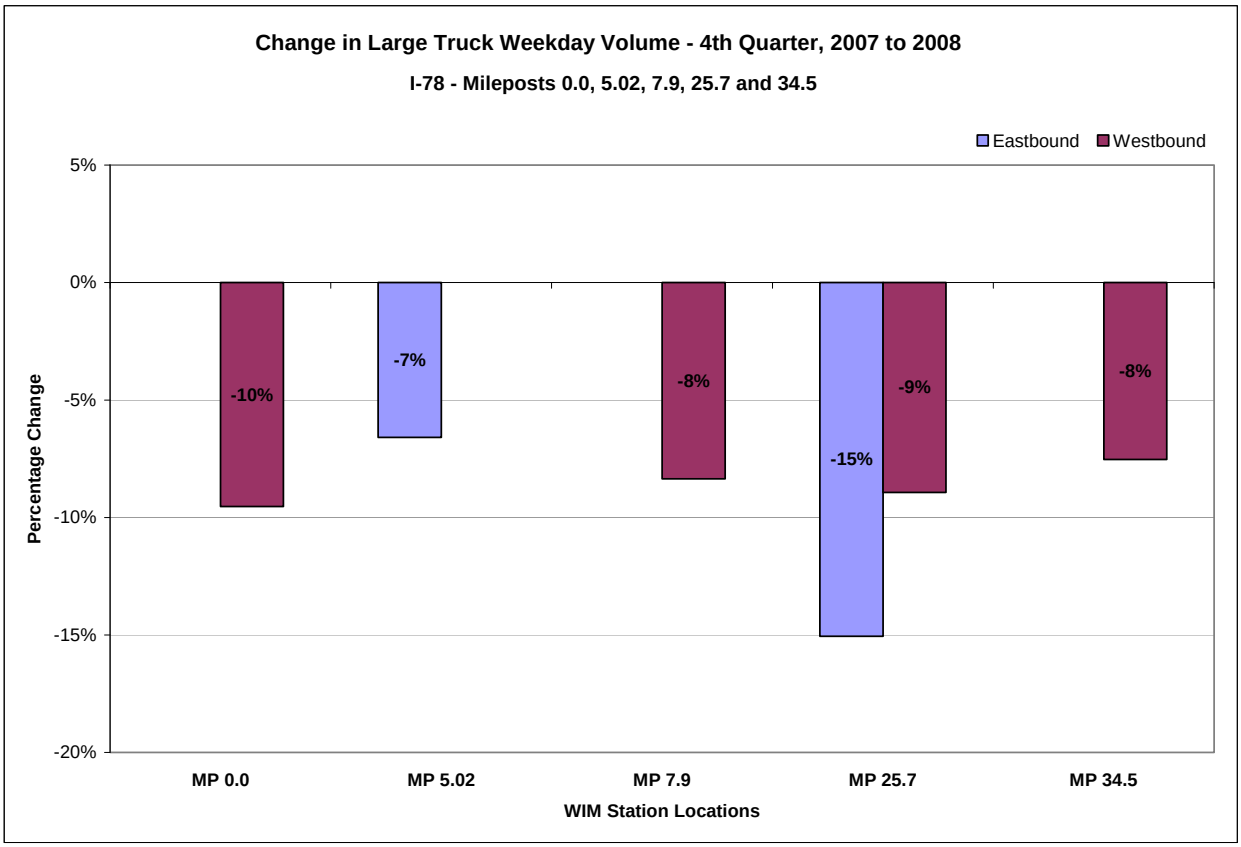

Figure 5-I78: Change in Large Truck Volume on I-78 – 4th Quarter 2007 to 2008

Notes: Some chart features are missing due to insufficient/unavailable data.
For Milepost 0.0 only, large trucks are defined as trucks with five or more axles; holidays and weekends are included.

As shown in **Figure 5-I78**, large truck volume on I-78 declined at all WIM Station locations where data was available in both directions of travel between the 4th quarter of 2007 and 2008. The steep 15% reduction in eastbound large trucks at milepost 25.7 was the most substantial along the route. This reduction was greater than the reduction in the westbound direction.

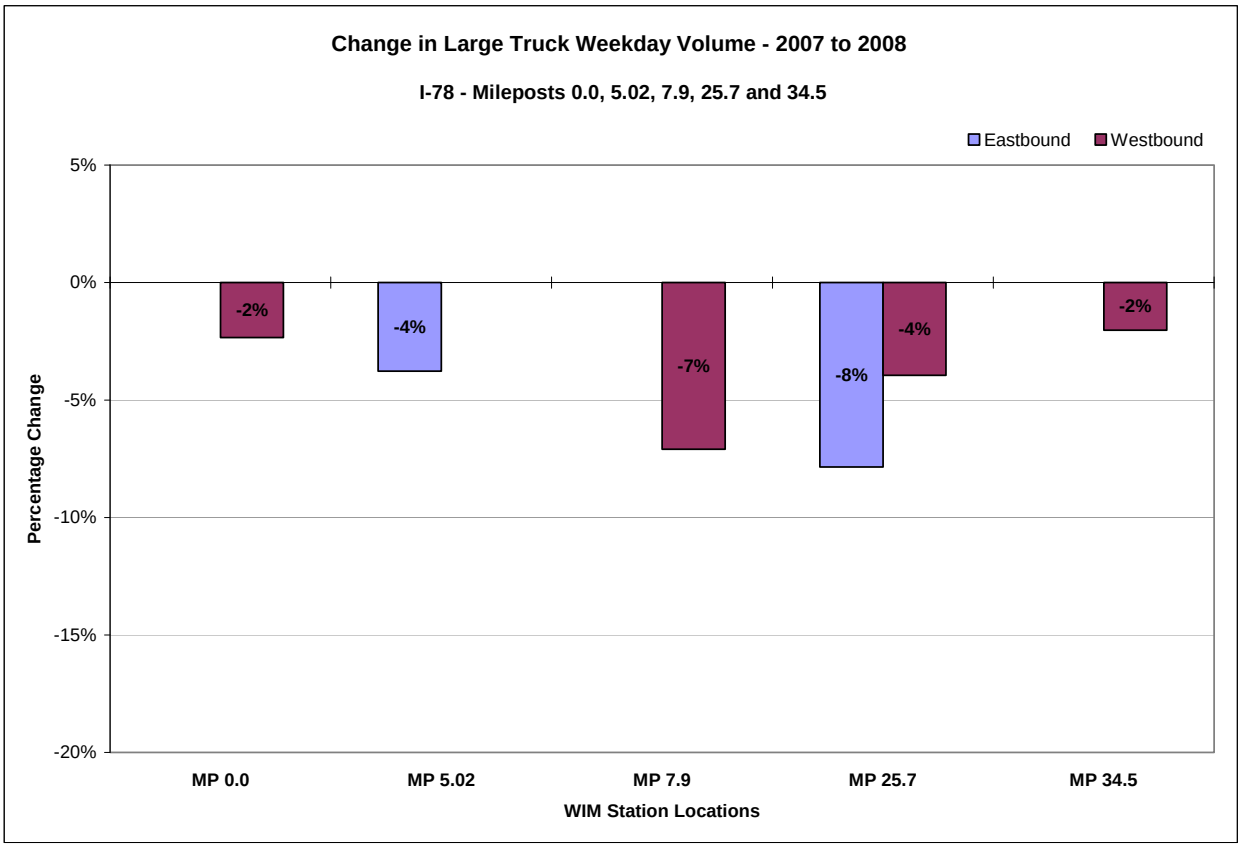

Figure 6-I78: Change in Large Truck Volume on I-78 – 2007 to 2008

Notes: Some chart features are missing due to insufficient/unavailable data.
For Milepost 0.0 only, large trucks are defined as trucks with five or more axles; holidays and weekends are included.

Figure 6-I78 shows the change in weekday volume for large trucks on I-78 between 2007 and 2008. Though not as pronounced as during the 4th quarter, volumes were down at all reporting stations. Volume declines at eastbound milepost 25.7 and westbound milepost 7.9 were greatest. Westbound milepost 7.9 declines were comparable to the declines during the 4th quarter at that location. This contrasts with all other locations where the year to year declines were more severe during the last three months of the year. WIM Stations at mileposts 5.02 and 7.9 were only operational during the July to December period in 2007.

Delaware Water Gap Toll Bridge Plaza: I-80, MP 0.0

The Delaware Water Gap Toll Bridge plaza, operated by the DRJTBC, is located on westbound I-80 west of the Delaware Water Gap Toll Bridge on the Pennsylvania side of the Delaware River. Since no vehicles can access I-80 between the bridge and the toll plaza, the volume at this location represents the volume at milepost 0.0, mid-span of the bridge. At this location I-80 is a four-lane limited access Rural Interstate and is included in the National Network. **Figure I-80_DWG** shows the location and surrounding features. Monthly data at this location comes from DRJTBC and was not stratified by hour or day.

Figure 1-80_DWG: Aerial View of Location at I-80, MP 0.0

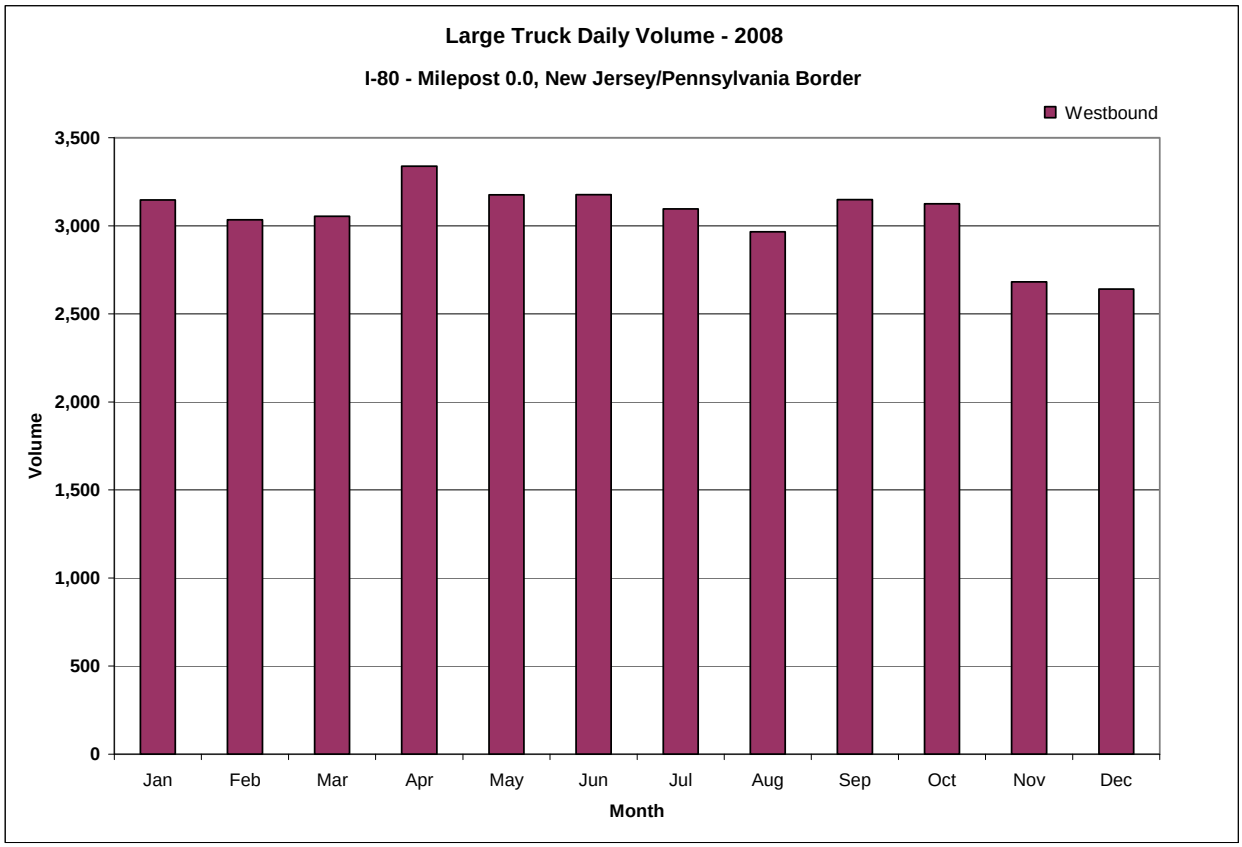

Figure 2-80_DWG: Annual Profile of Large Truck Volume at I-80, MP 0.0
Notes: Large Trucks defined as trucks with five or more axles. Holidays and weekend are included.

Figure 2-80_DWG shows the large truck average daily volume (ADT) during 2008 at westbound I-80, milepost 0.0. Large truck volume generally exceeded 3,000 through the year and peaked in April 2008 at over 3,300. The last two months of 2008 saw a dramatic decline due in large part to holidays being part of the DRJTBC data set.

WIM Station 80A: I-80, MP 8.3

WIM Station 80A is located at milepost 8.3 of Interstate 80 in Knowlton, Warren County between interchanges 4 (US 46/NJ 94) and 12 (CR 521 Hope-Blairstown Road). At this location I-80 is a seven-lane (four eastbound, three westbound) limited access Rural Interstate and is included in the National Network. **Figure 1-80A** shows the location and surrounding features. WIM data has been continuously recorded at this location since October 2007 and a complete set of data is available for 2008.

Figure 1-80A: Aerial View of WIM Station at I-80, MP 8.3

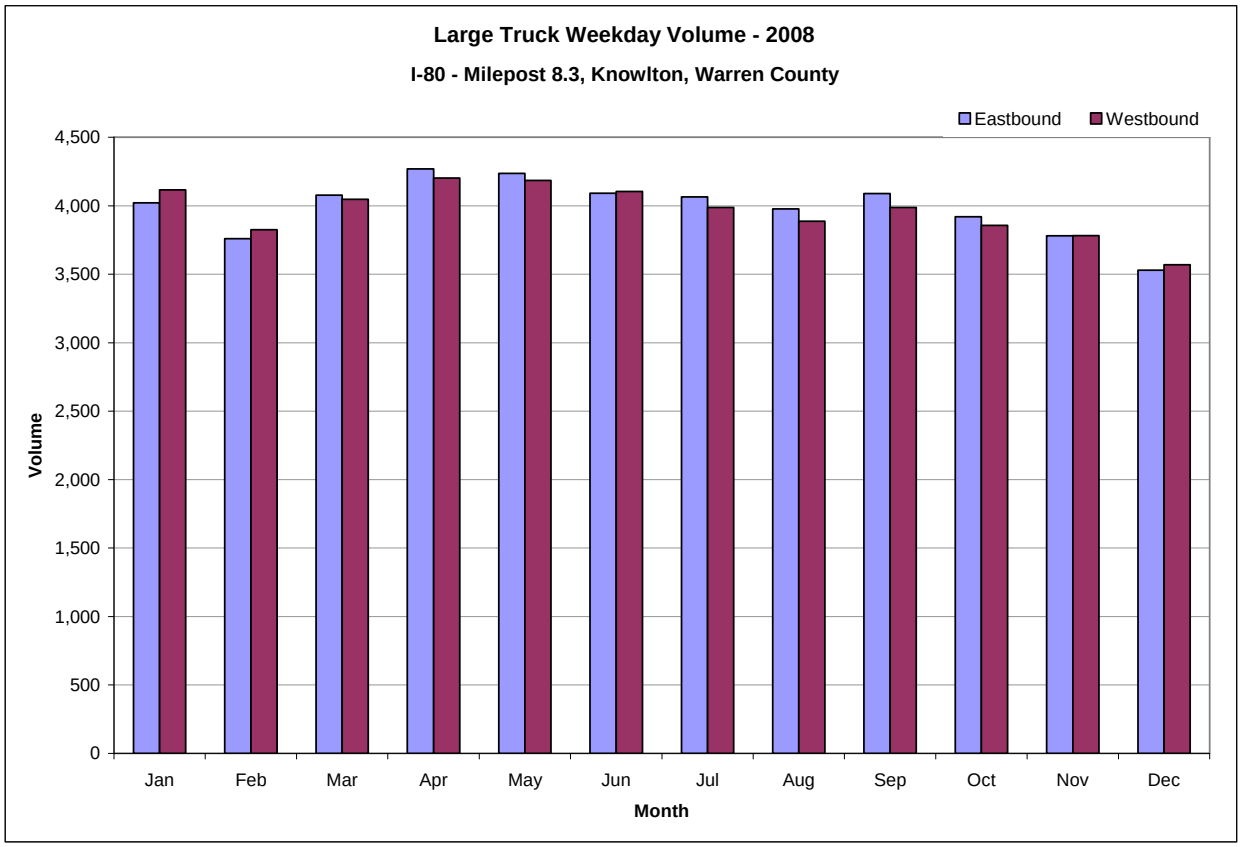

Figure 2-80A: Annual Profile of Large Truck Volume at I-80, MP 8.3

As shown in **Figure 2-80A,** large truck volume at I-80, milepost 8.3 peaked in April 2008 and declined for the remainder of the year. The lowest monthly ADT in both directions of travel occurred during December 2008; weekday volume then was 88% of the annual flow.

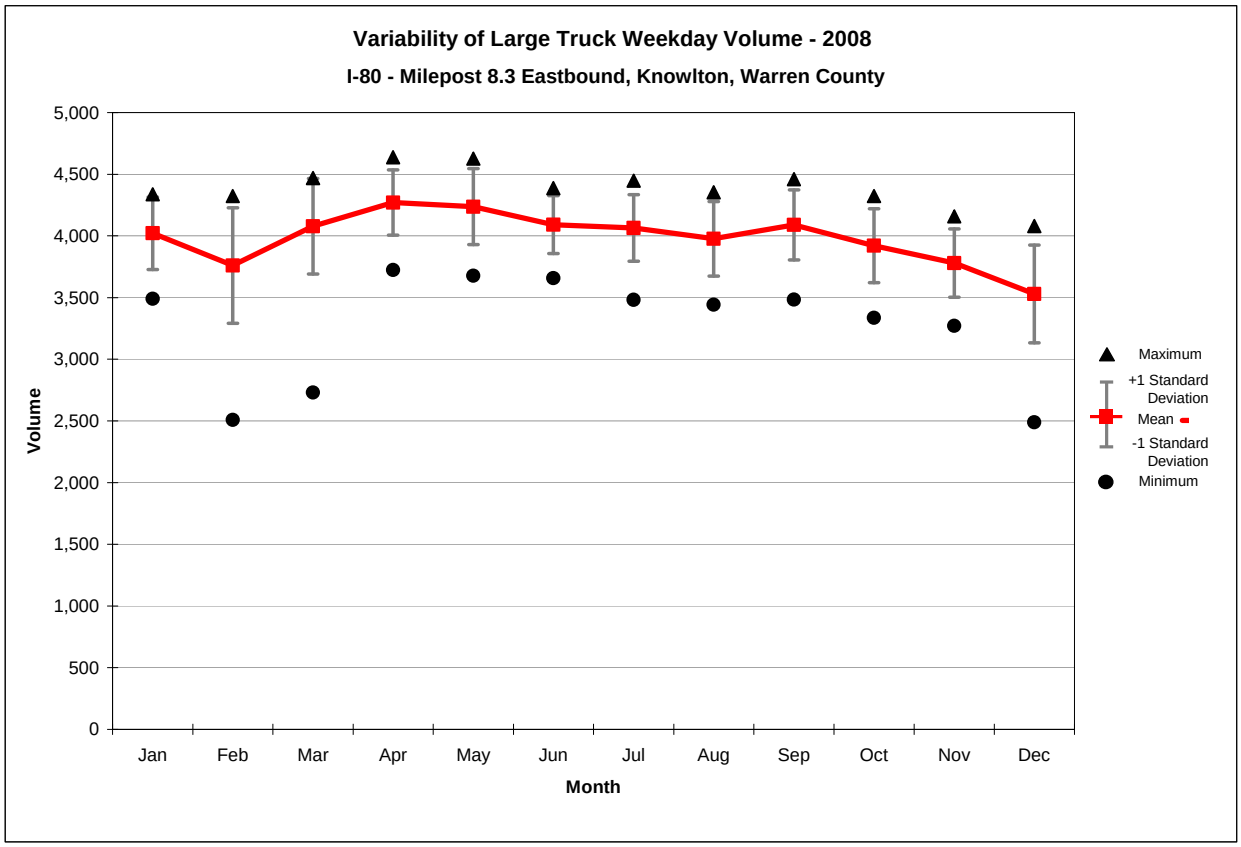

Figure 3A-80A: Variability of Large Truck Volume at Eastbound I-80, MP 8.3

The range of weekday large truck volume at eastbound I-80 milepost 8.3 is shown in **Figure 3B-80A**. High variability occurred in February, March and December 2008 likely due to weather events. The maximum volume of 4,637 trucks was observed on April 17, 2008 during the month of highest average large truck volume.

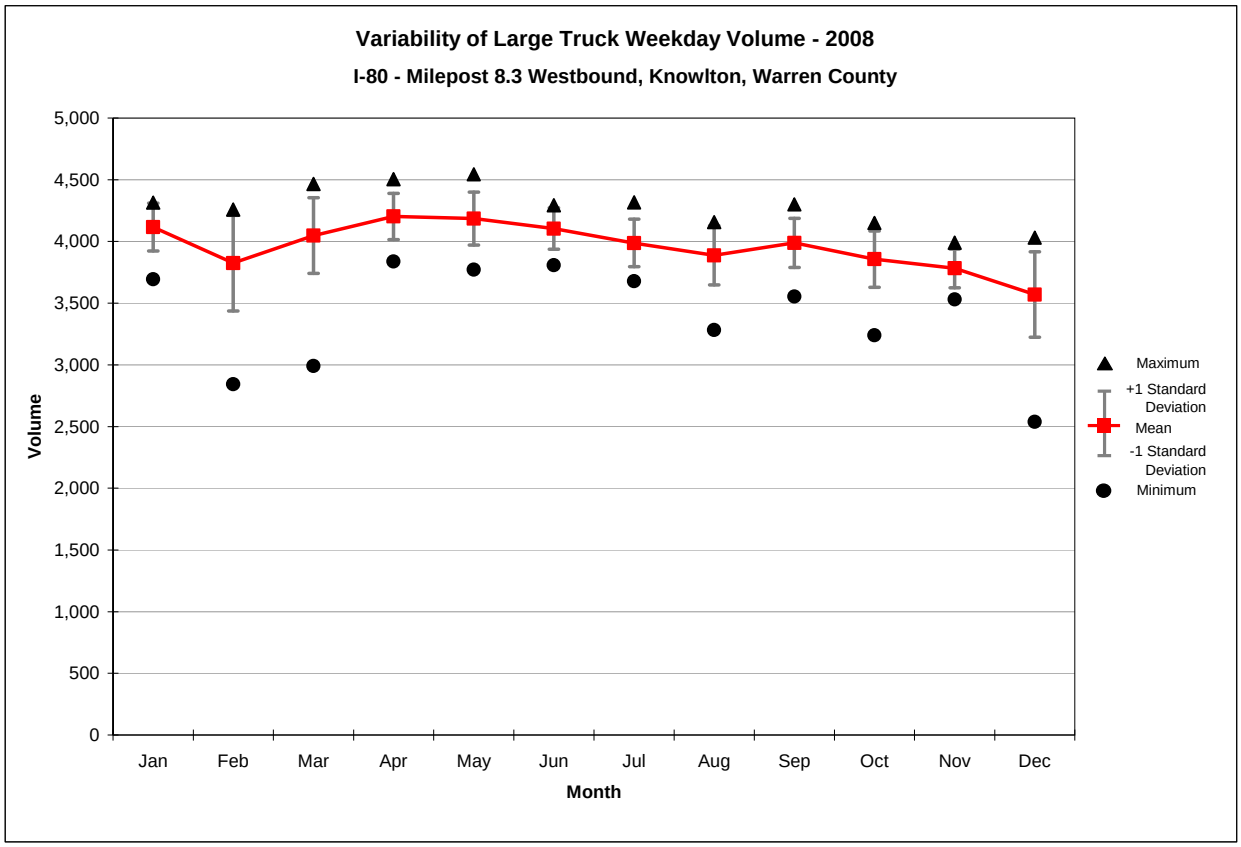

Figure 3B-80A: Variability of Large Truck Volume at Westbound I-80, MP 8.3

Figure 3B-80A illustrates the range of weekday large truck volume at westbound I-80 milepost 8.3. As in the eastbound direction, lowest volumes on February 22, March 21 and December 19 were likely due to severe weather events. November 2008 was a low variability month for large truck volume. The maximum volume of 4,543 trucks occurred on May 21, 2008. The variability of large truck traffic at the WIM Station was much less in the westbound direction than eastbound.

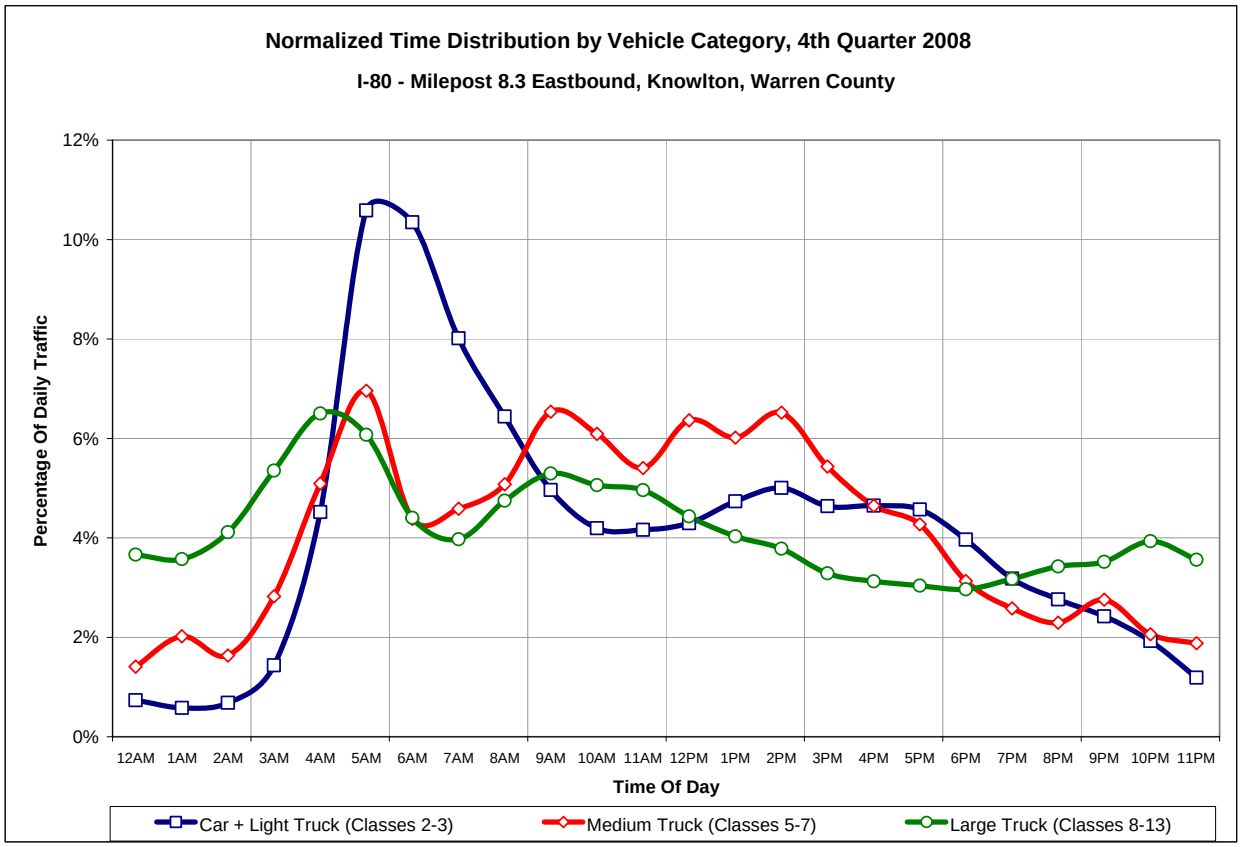

Figure 4A-80A: Daily Profile of Volume at Eastbound I-80, MP 8.3

Figure 4A-80A shows the relative daily profile of traffic by vehicular category in the eastbound direction at I-80 milepost 8.3 during the 4th quarter of 2008. The large truck pattern is characteristic of Profile 1 and peaked between 4:00 and 6:00 a.m. The early peak is likely due to long haul trucks reaching New Jersey in time to meet the terminal gate openings in the state's urban core coupled with a heavy through trip movement. Large truck volume reached its lowest point between 6:00 and 7:00 p.m. before rising again leading into the overnight hours. Auto volume peaked early at this location where the highest hour was between 5:00 and 6:00 a.m. when more than 10% of daily total occurred.

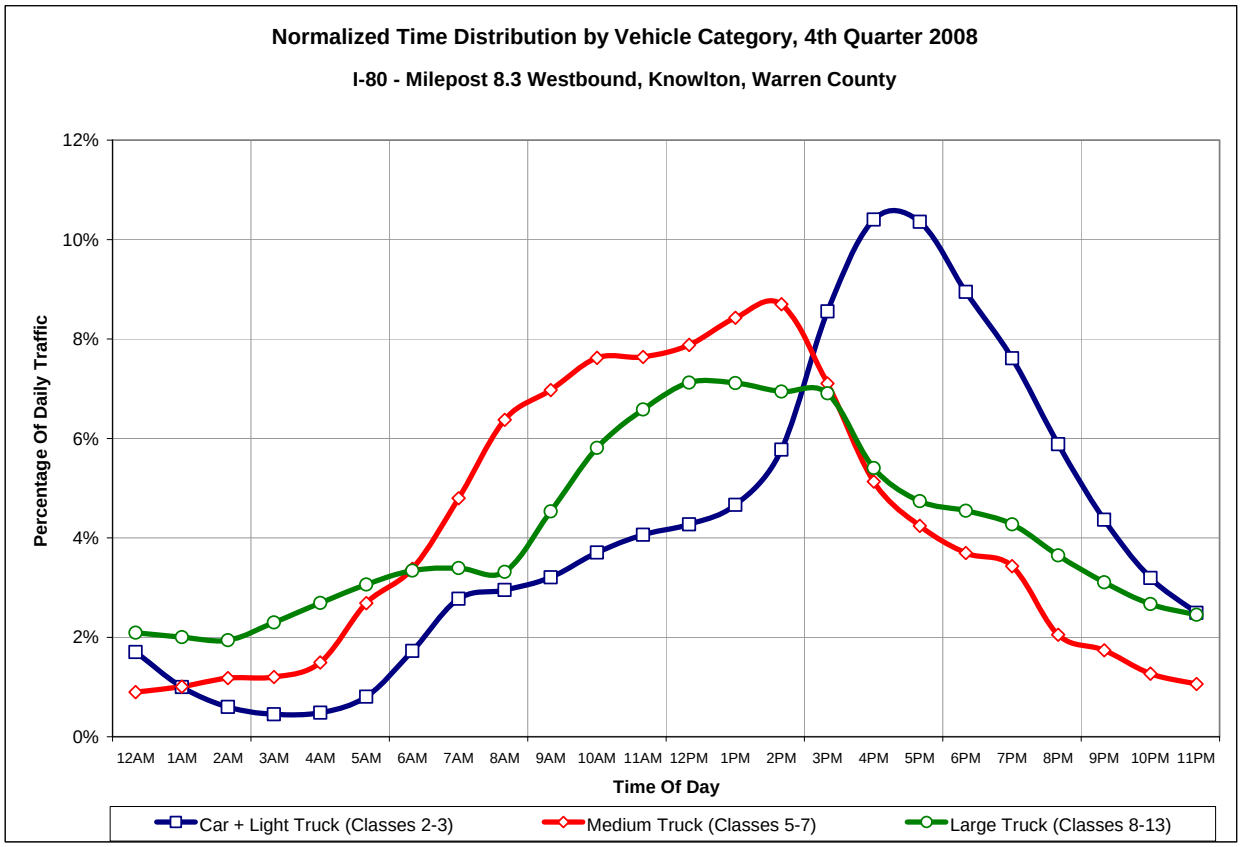

Figure 4B-80A: Daily Profile of Volume at Westbound I-80, MP 8.3

Figure 4B-80A shows the relative daily profile of traffic by vehicular category in the westbound direction at I-80 milepost 8.3 during the 4th quarter of 2008. The large truck hourly volume matches Profile 2 and peaked between 12:00 and 4:00 p.m. Medium trucks followed a more peaked profile with maximum volume reached between 2:00 and 3:00 p.m. Auto volume followed a commuter pattern with a peak during the 4:00 to 6:00 p.m. period.

WIM Station 80B: I-80, MP 32.4

WIM Station 80B is located at milepost 32.4 of Interstate 80 in Roxbury, Morris County between interchanges 30 (CR 615 Howard Boulevard) and 34 (NJ 15). At this location I-80 is a six-lane limited access Urban Interstate and is included in the National Network. **Figure 1-80B** shows the location and surrounding features. WIM data has been continuously recorded at this location since August 2007 however limited data is available for 2008 prior to September 2008.

Figure 1-80B: Aerial View of WIM Station at I-80, MP 32.4

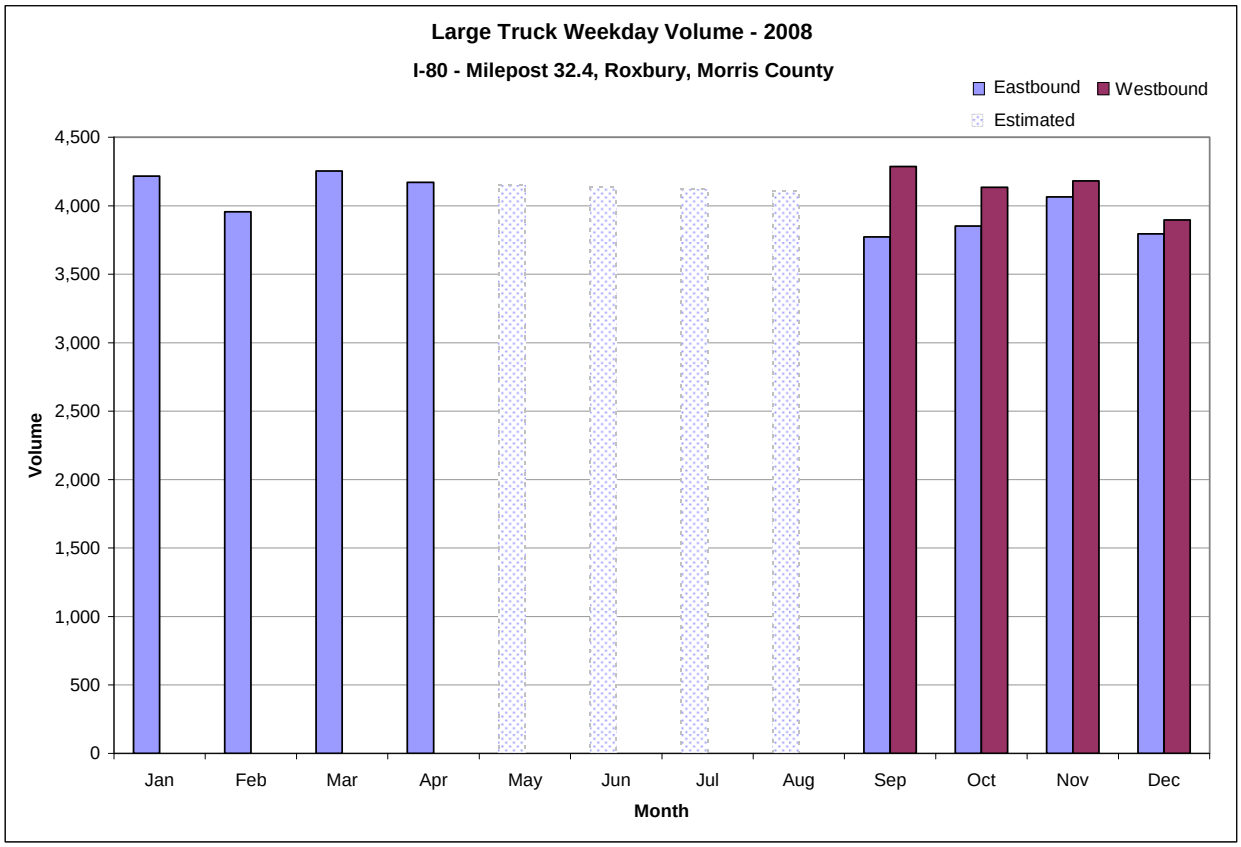

Figure 2-80B: Annual Profile of Large Truck Volume at I-80, MP 32.4
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-80B,** large truck volume at I-80, milepost 32.4 declined during the last four months of 2008. Westbound weekday volume exceeded eastbound by 6% for the months when comparable data was available. Six percent of eastbound vehicles were not classified during September 2008 which may be a factor in the lower volume that month.

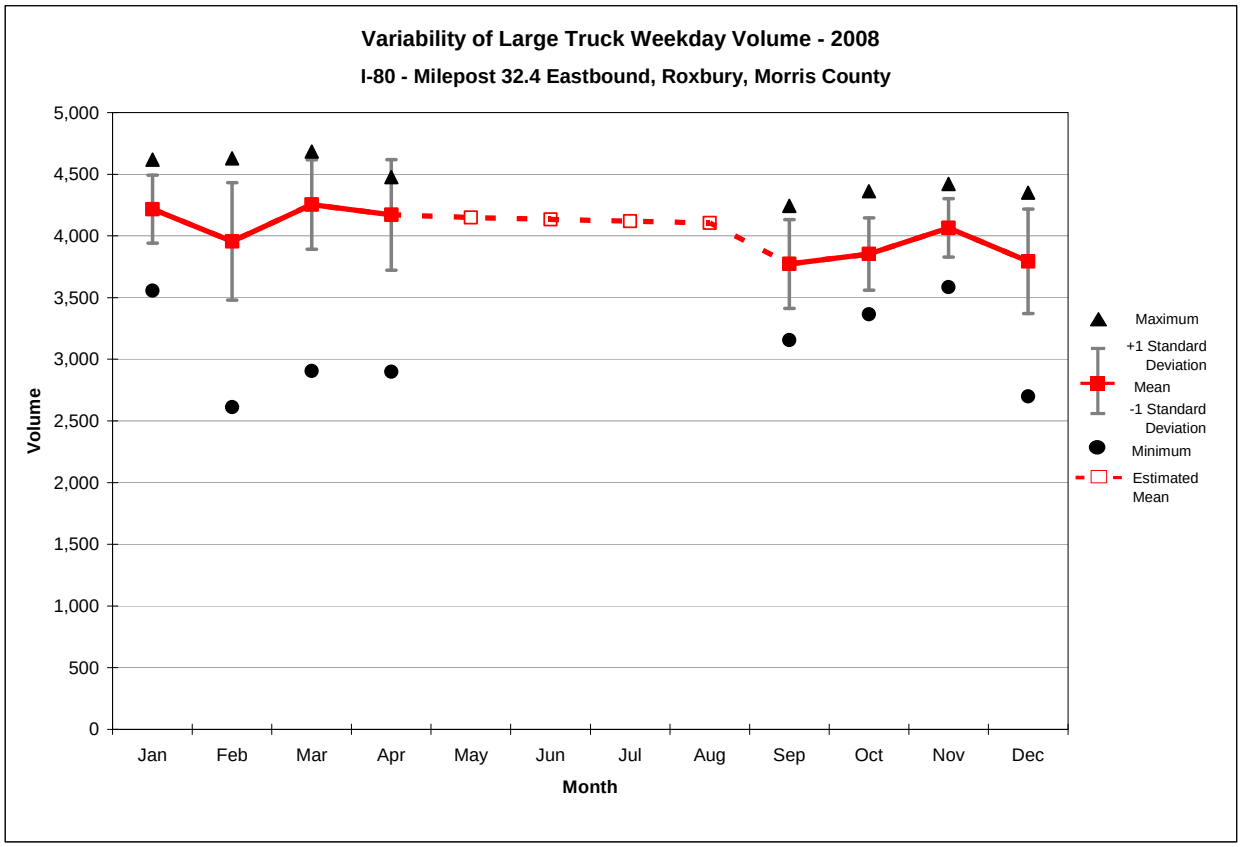

Figure 3A-80B: Variability of Large Truck Volume at Eastbound I-80, MP 32.4
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3B-80B represents the range of weekday large truck volume at eastbound I-80 milepost 32.4. Like other locations, the February 22nd and December 19th snow events marked the low volume points during the year and led to high variability during their respective months of 2008. From available data, the maximum volume of 4,684 occurred on March 26, 2008. Some 4,630 trucks were counted on February 21, 2008, the day immediately preceding a major snow event.

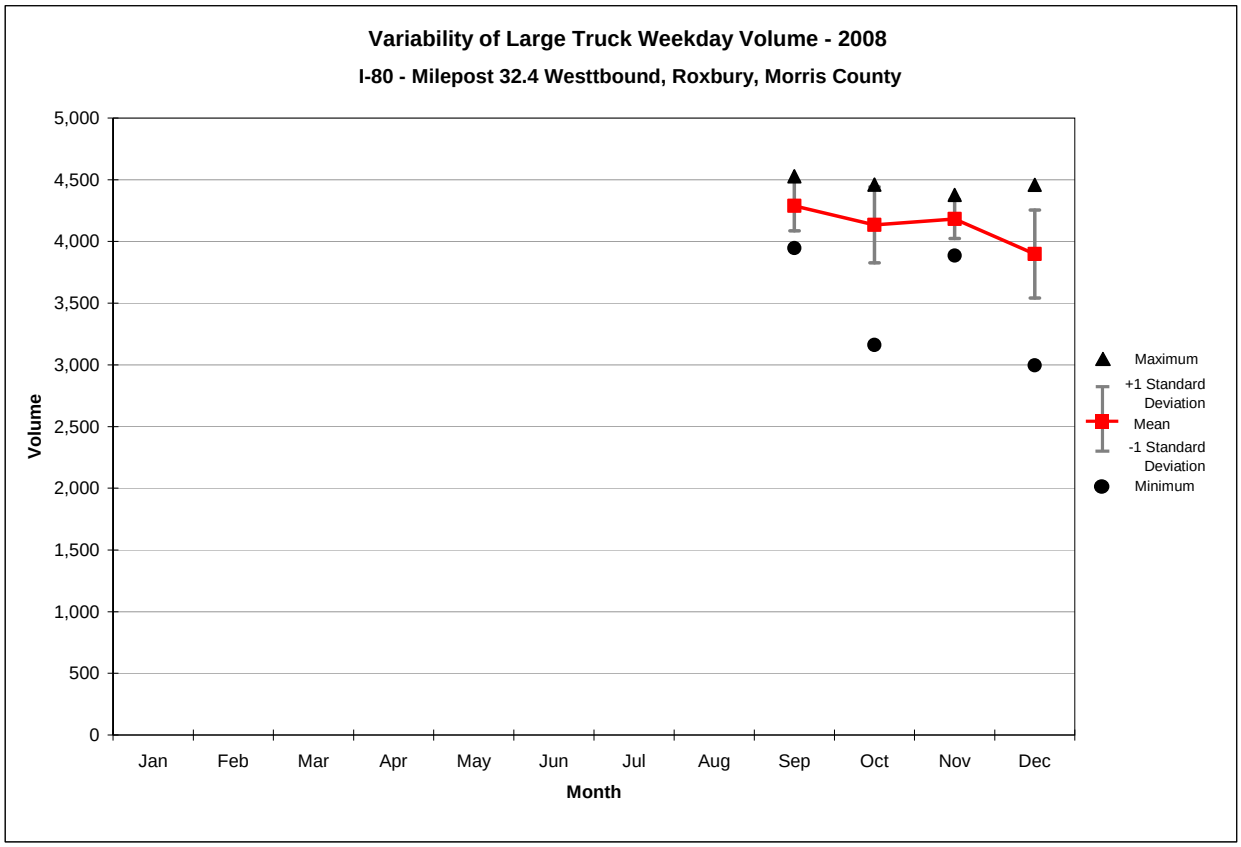

Figure 3B-80B: Variability of Large Truck Volume at Westbound I-80, MP 32.4
Note: Some chart features are missing due to insufficient/unavailable data.

The range of weekday large truck volume at westbound I-80 milepost 32.4 is shown in **Figure 3B-80B**. While this information is based on limited data observations the variability was relatively high in October and December 2008. September volume was more predictable and included the highest daily weekday total of 4,527 on the 16th of the month.

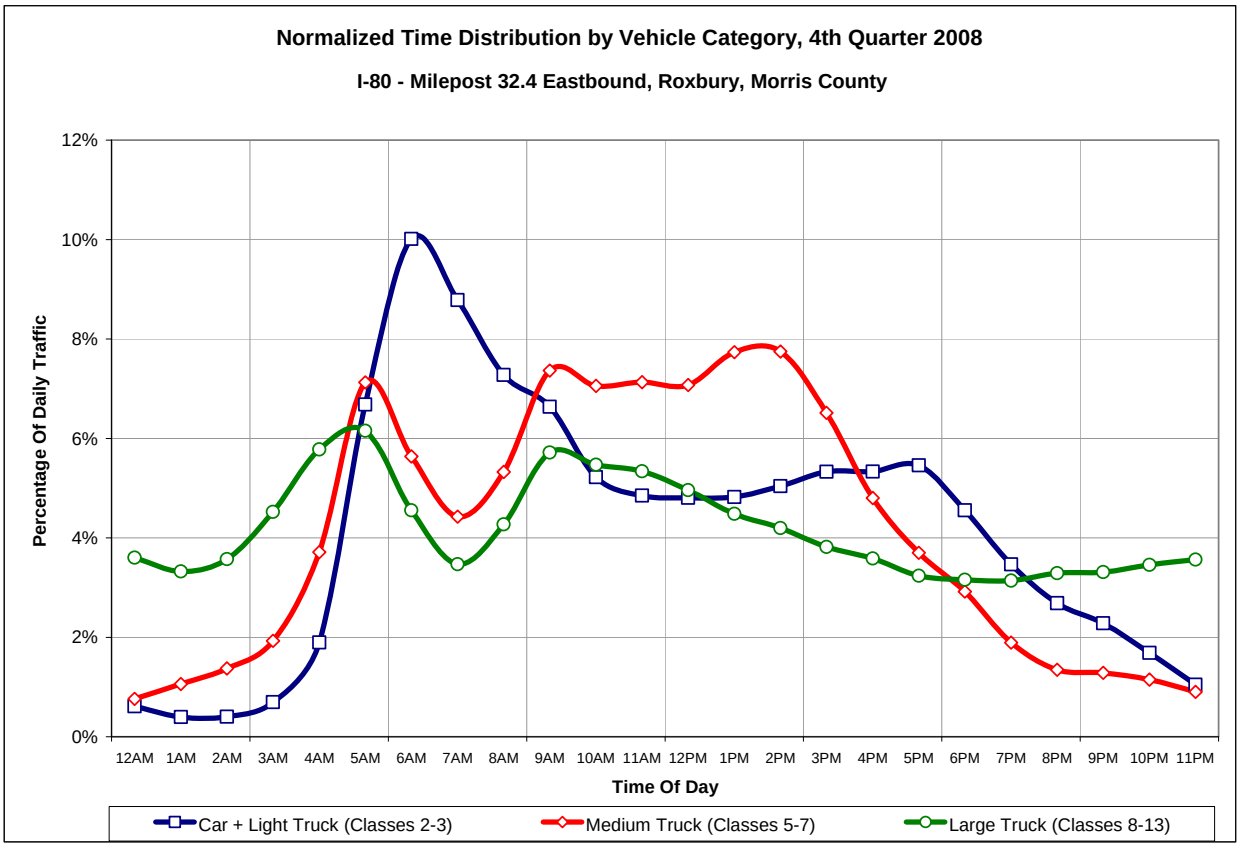

Figure 4A-80B: Daily Profile of Volume at Eastbound I-80, MP 32.4

Figure 4A-80B shows the relative daily profile of traffic by vehicular category in the eastbound direction at I-80 milepost 32.4 during the 4th quarter of 2008. The large truck travel pattern matches Profile 1 with volume peaking between 4:00 and 6:00 a.m. A relatively deep trough in both large and medium truck volume reached its nadir between 7:00 and 8:00 a.m. which roughly corresponds to the car and light truck morning commuter peak followed by a resumption of large truck flow. Similar to the location at I-80 milepost 8.3, the large truck daily minimum occurred in the early evening hours and overnight volume was marginally higher.

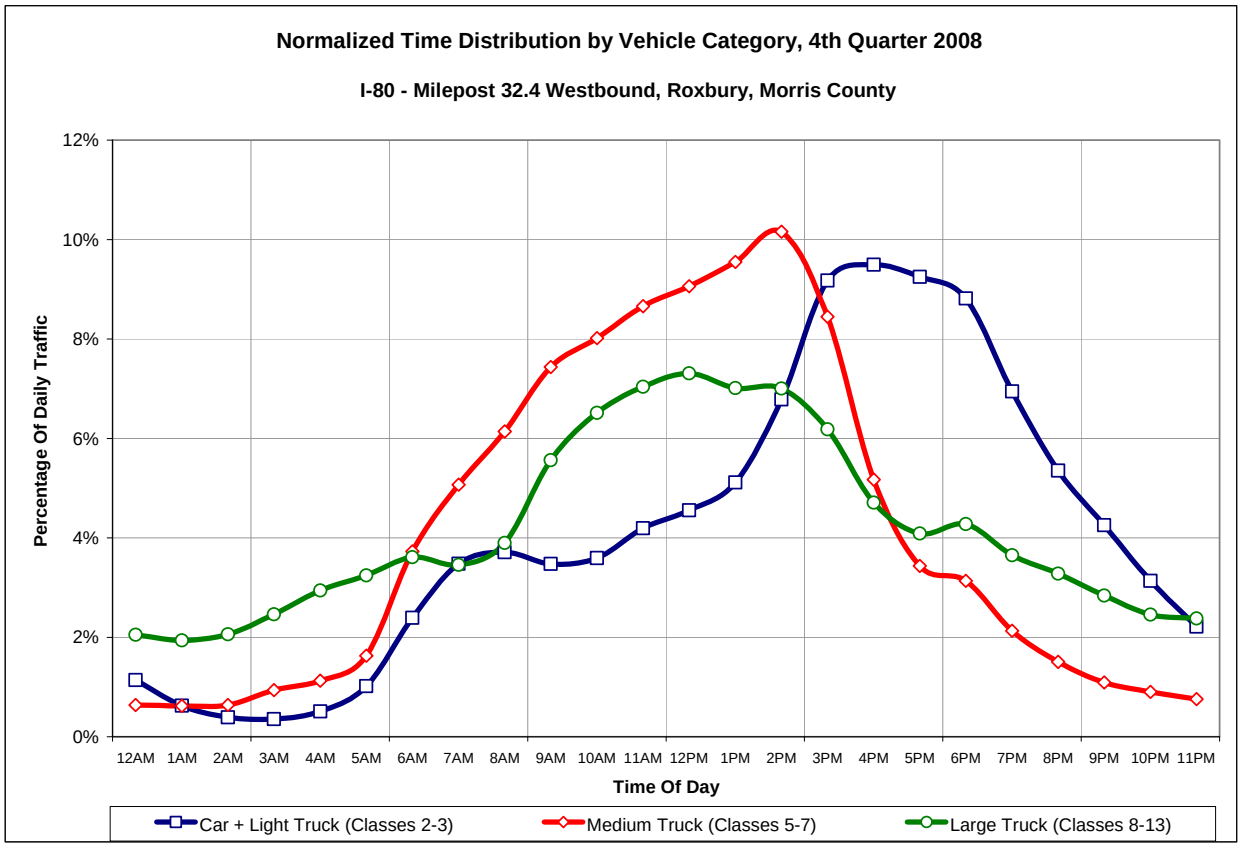

Figure 4B-80B: Daily Profile of Volume at Westbound I-80, MP 32.4

Figure 4B-80B shows the relative daily profile of traffic by vehicular category in the westbound direction at I-80 milepost 32.4 during the 4th quarter of 2008. The large truck volume followed a moderate bell curve peaking at midday and reaching a low at 1:00 a.m. typical of Profile 2. Medium trucks followed a more peaked profile with maximum volume between 2:00 and 3:00 p.m. The westbound auto volume was the counterpart to the directional nature of eastbound commuter pattern with a late afternoon peak.

WIM Station 80C: I-80, MP 38.1

WIM Station 80C is located at milepost 38.1 of Interstate 80 in Denville, Morris County between interchanges 37 (CR 513 Green Pond Road/Hibernia Avenue) and 38 (US 46). At this location I-80 is an eight-lane limited access Urban Interstate and is included in the National Network. **Figure 1-80C** shows the location and surrounding features. WIM data has been recorded at this location since October 2007 however limited data is available for 2008 prior to November 2008.

Figure 1-80C: Aerial View of WIM Station at I-80, MP 38.1

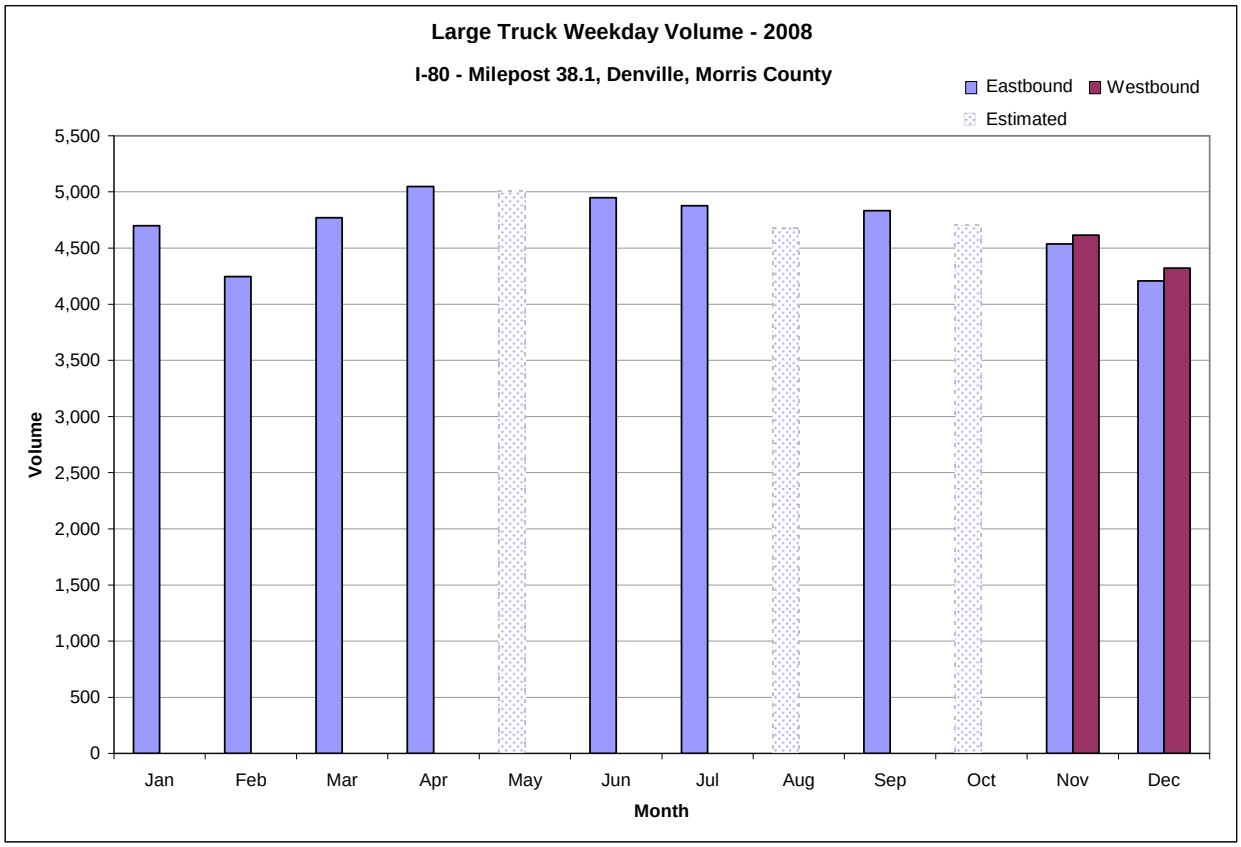

Figure 2-80C: Annual Profile of Large Truck Volume at I-80, MP 38.1
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-80C,** large truck volume at eastbound I-80, milepost 38.1 declined by over 800 (17%) per weekday between April and December 2008. A westbound pattern could not be determined due to a lack of data.

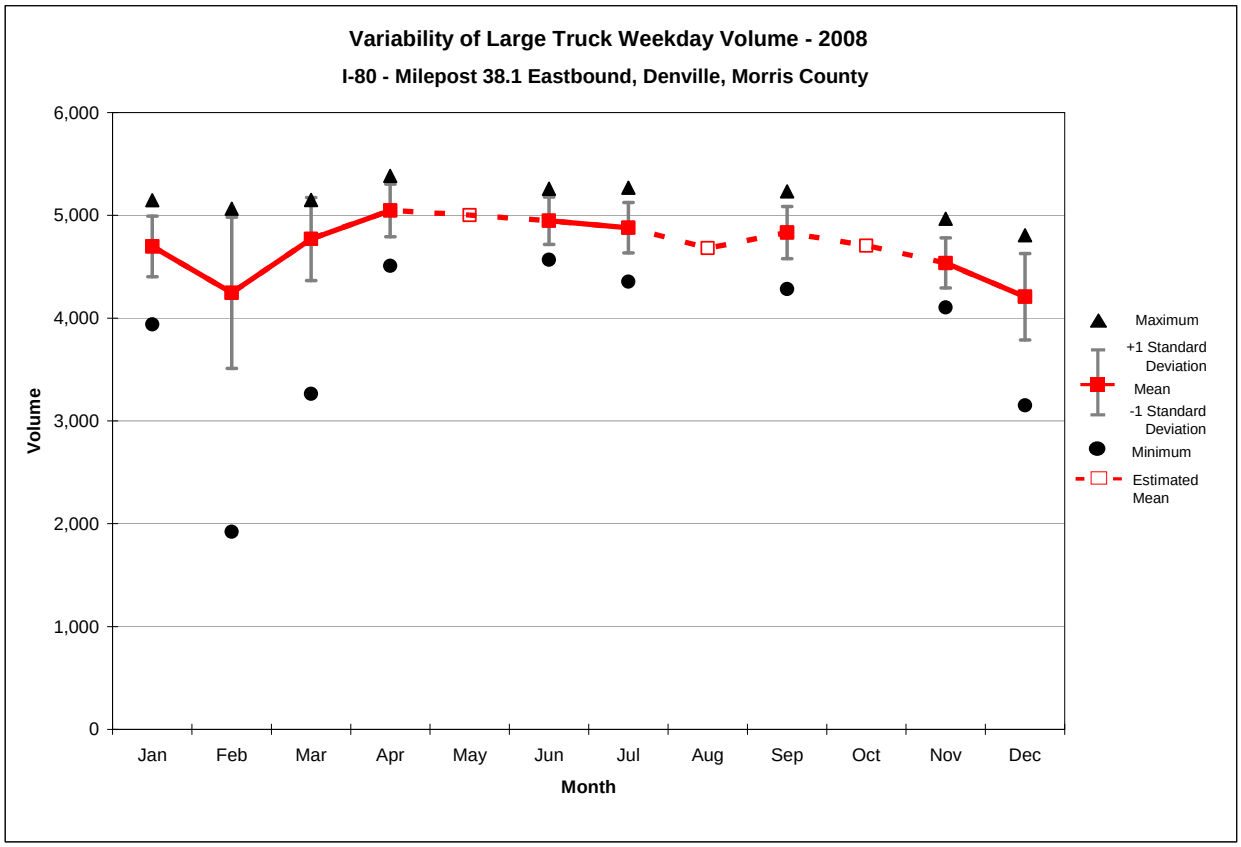

Figure 3A-80C: Variability of Large Truck Volume at Eastbound I-80, MP 38.1
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3A-80C illustrates the monthly range of weekday large truck volume at eastbound I-80 milepost 38.1. Amongst the months with available data, February 2008 exhibited the high variability due to exceptionally low volume on February 22nd when just 1,920 large trucks traversed the WIM Station - much less than half the annual average. April 24, 2008 saw 5,384 large trucks the most for any day with available data.

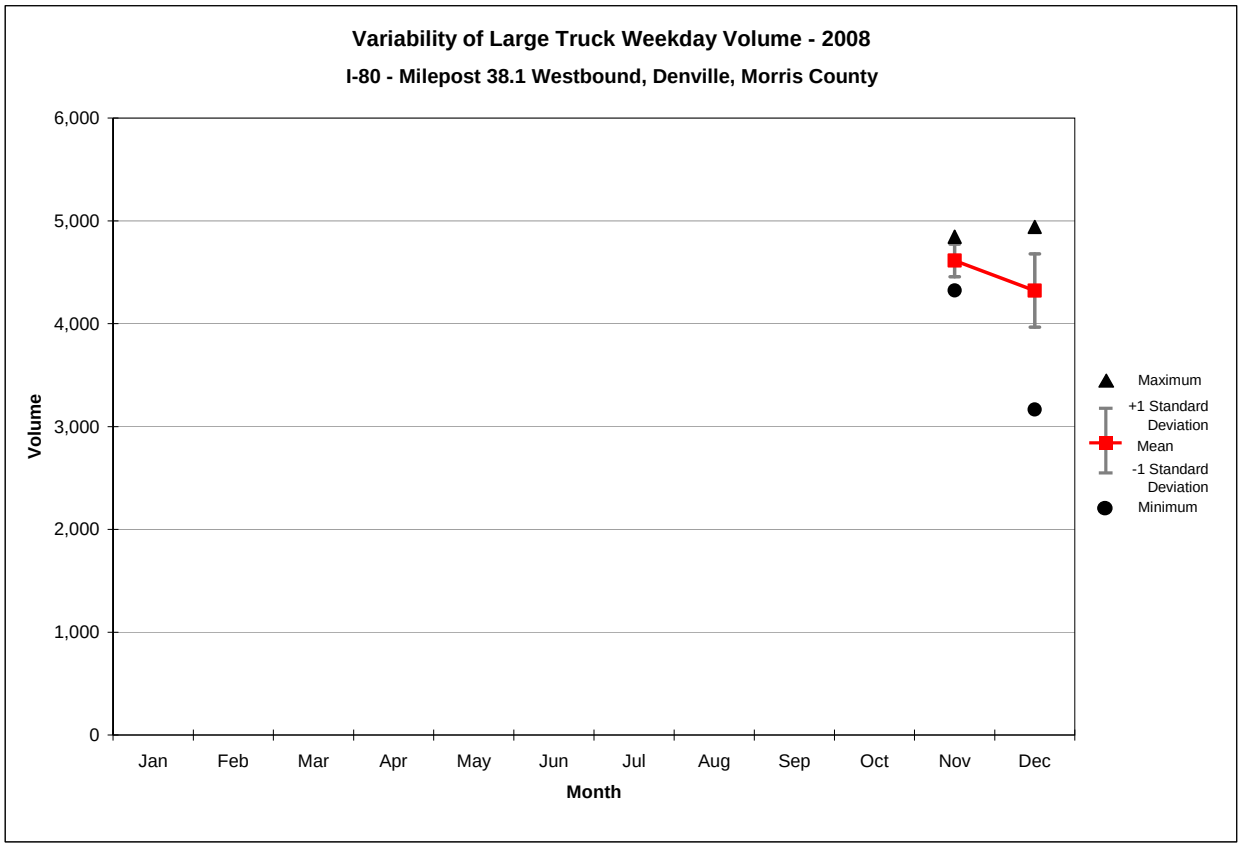

Figure 3B-80C: Variability of Large Truck Volume at Westbound I-80, MP 38.1
Note: Some chart features are missing due to insufficient/unavailable data.

The range of weekday large truck volume at westbound I-80 milepost 38.1 is shown in **Figure 3B-80C**. In the two months of available data, the maximum volume of 4,942 trucks occurred on December 4, 2008 and a minimum volume of 3,165 trucks occurred on December 19, 2008. Much lower variability was seen in November 2008.

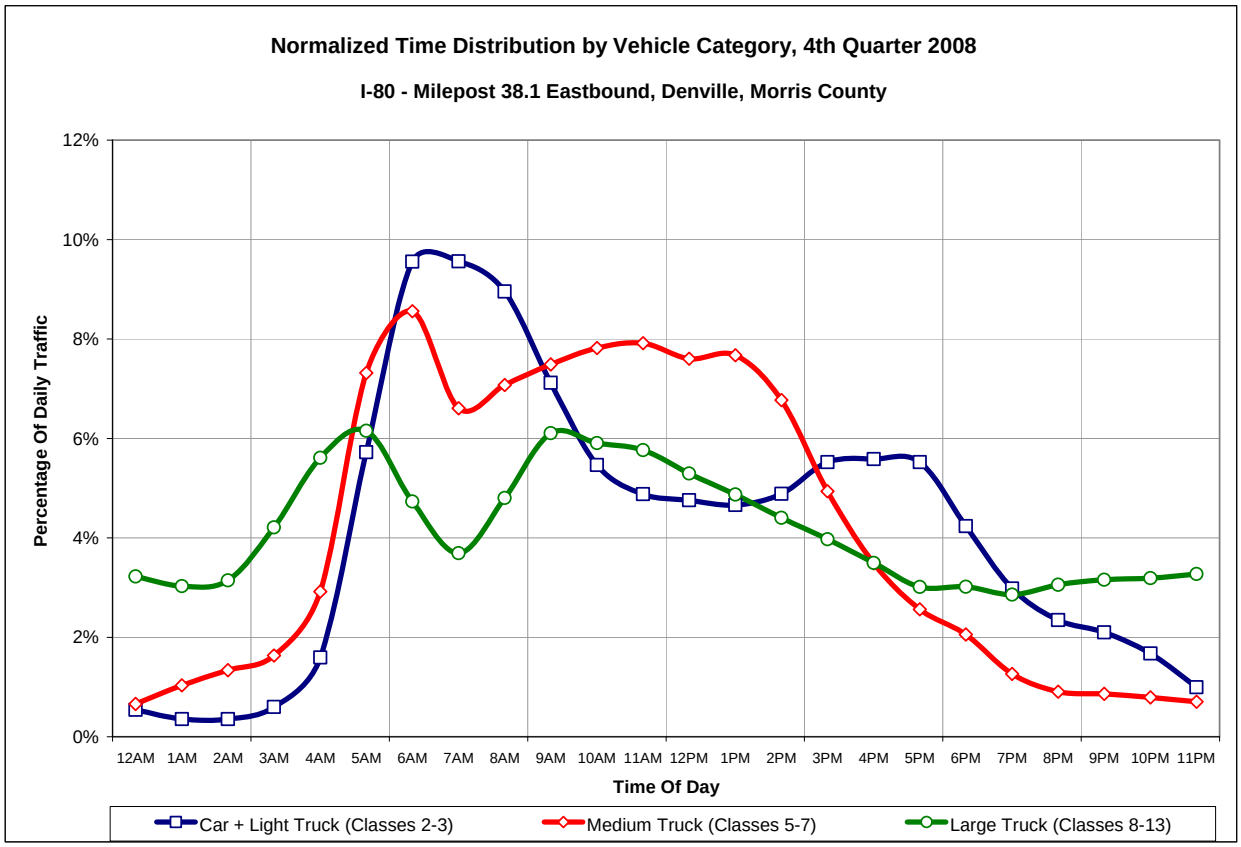

Figure 4A-80C: Daily Profile of Volume at Eastbound I-80, MP 38.1

Figure 4A-80C shows the relative daily profile of traffic by vehicular category in the eastbound direction at I-80 milepost 38.1 during the 4th quarter of 2008. While the pattern is that of Profile 1, the large truck volume had two small morning peaks: one between 4:00 and 6:00 a.m. and another from 9:00 a.m. to 12:00 p.m. The mid morning period between these peaks was sharply lower and corresponded to the car and light truck daily peak travel period. As with other Profile 1 locations on eastbound I-78 and I-80, the large truck presence overnight on weekdays is considerable.

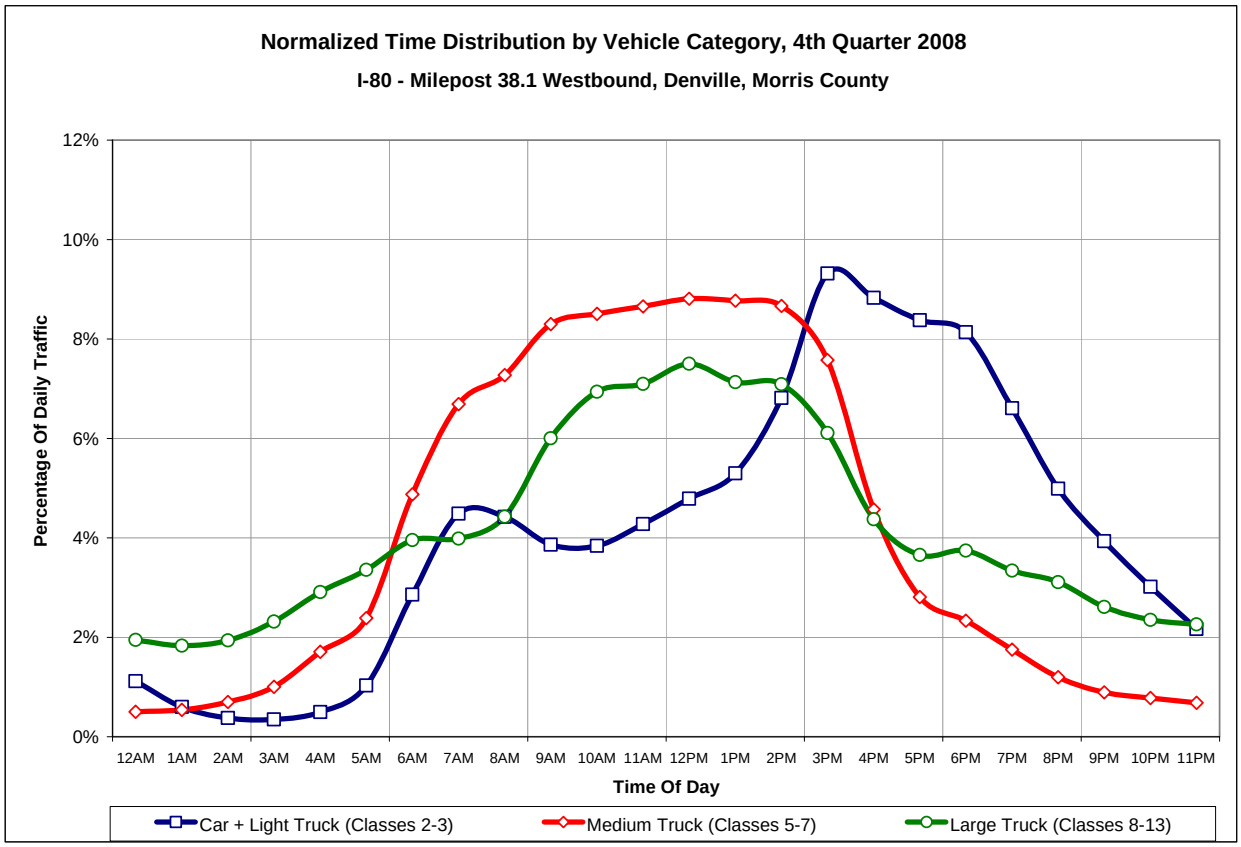

Figure 4B-80C: Daily Profile of Volume at Westbound I-80, MP 38.1

Figure 4B-80C shows the relative daily profile of traffic by vehicular category in the westbound direction at I-80 milepost 38.1 during the 4th quarter of 2008. The large truck pattern is that of Profile 2 roadways and the volume peaked from 10:00 a.m. and 3:00 p.m. Medium trucks followed a similar pattern while personal vehicles peaked between 3:00 and 4:00 p.m. in a classic commuter route profile.

WIM Station 80D: I-80, MP 66.2

WIM Station 80D (a.k.a. SHW) is located at milepost 66.2 of westbound Interstate 80 in South Hackensack, Bergen County between interchanges 66 (Kennedy Street) and 65 (Wesley Street). At this location I-80 is a ten-lane (six local, four express) limited access Urban Interstate and is included in the National Network. **Figure 1-80D** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years however limited data is available for 2008. A companion WIM Station for the eastbound direction ceased operation in 2006.

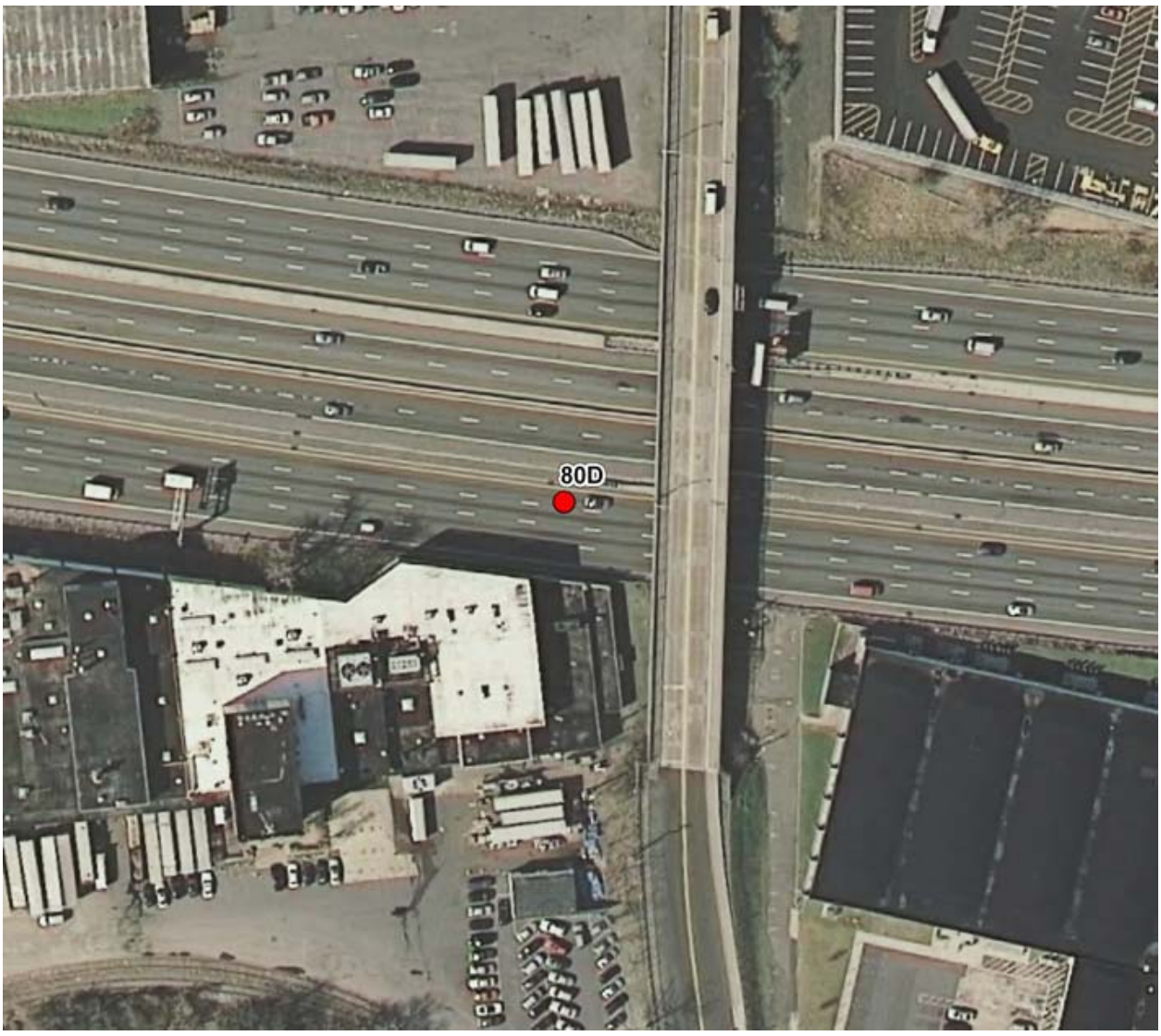

Figure 1-80D: Aerial View of WIM Station at I-80, MP 66.2

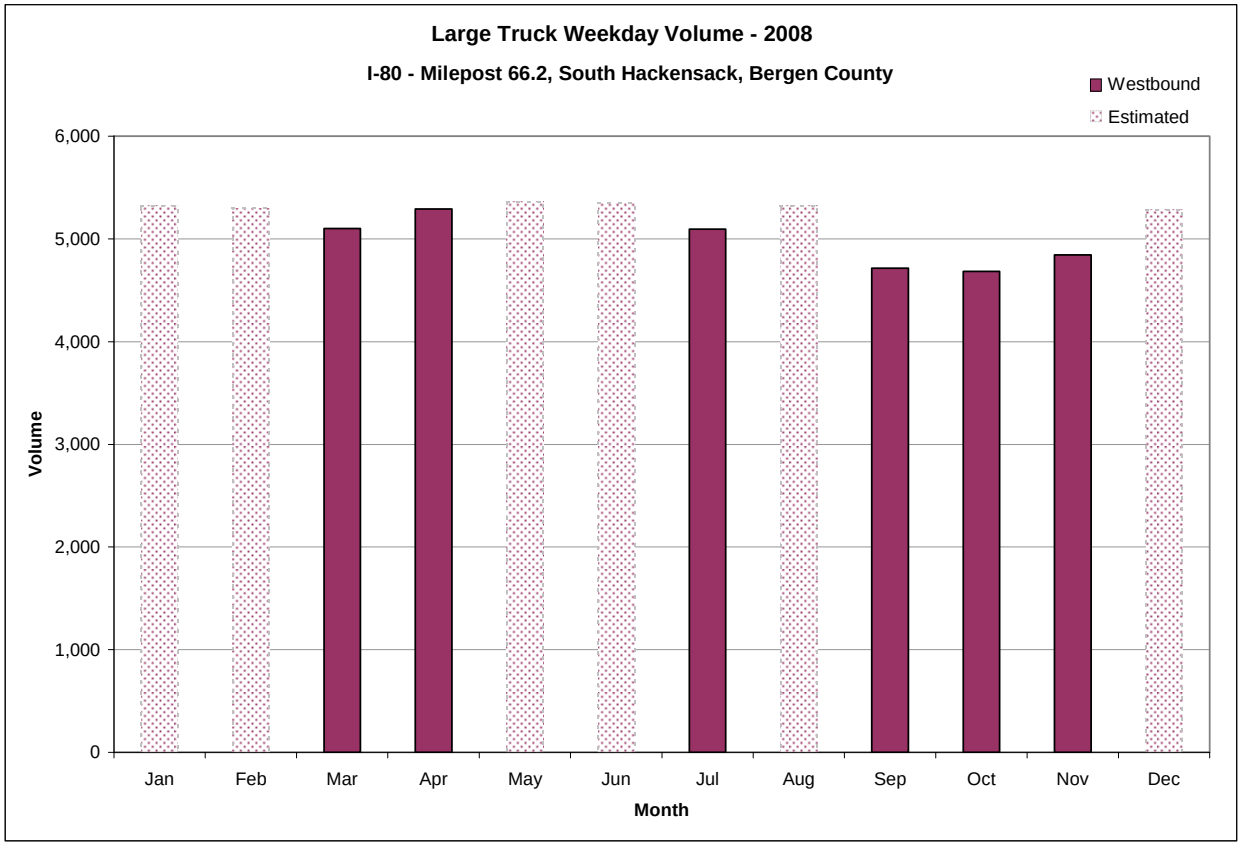

Figure 2-80D: Annual Profile of Large Truck Volume at I-80, MP 66.2
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-80D,** large truck weekday ADT at westbound I-80, milepost 66.2 declined from highs in the early part of the year to lows during later months. Based on limited data observations during the spring 2008, a 12% decline in large trucks occurred between April and October 2008.

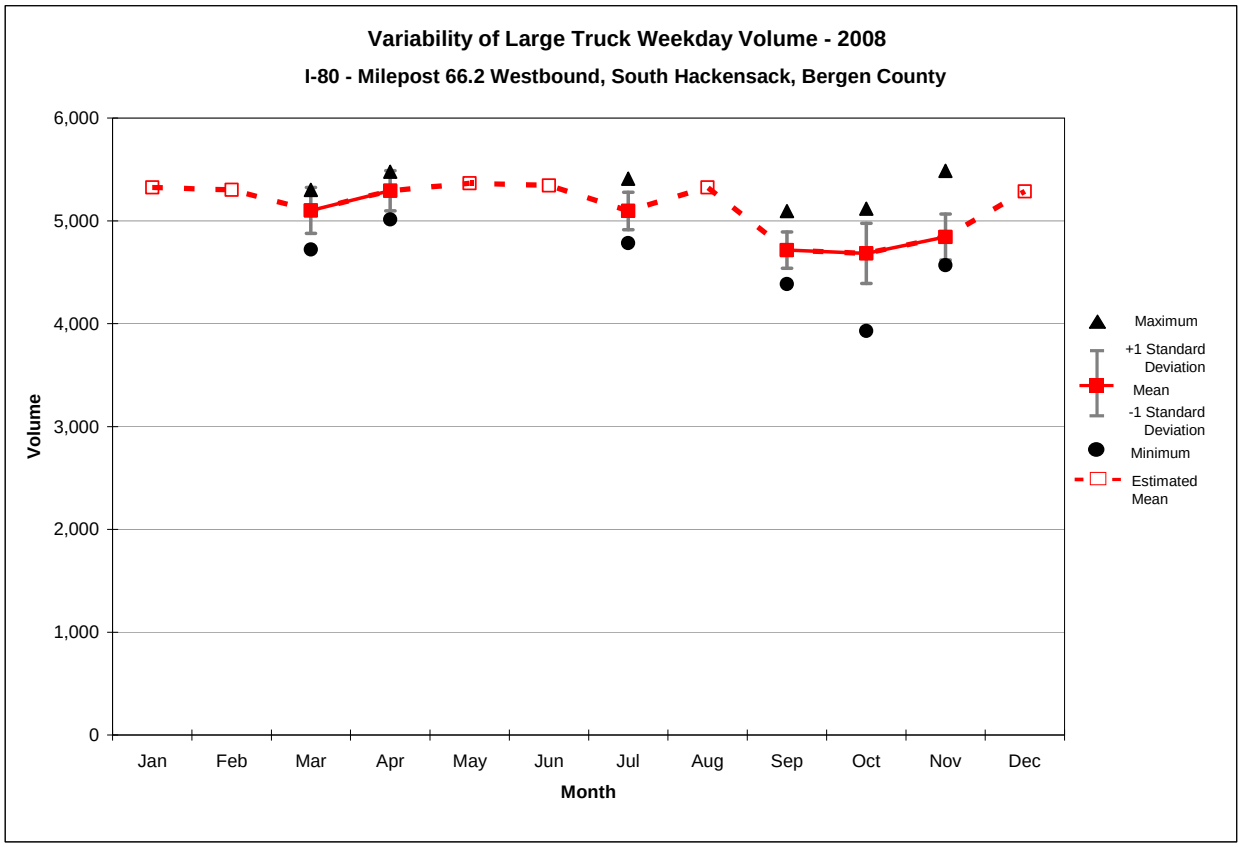

Figure 3B-80D: Variability of Large Truck Volume at Westbound I-80, MP 66.2
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at westbound I-80 milepost 66.2 is shown in **Figure 3B-80D**. Approximately 5,500 large trucks were observed on November 25, 2008 while 3,930 were counted on October 13, 2008. Limited data observations in March and April 2008 lead to statistically insignificant measures of variability.

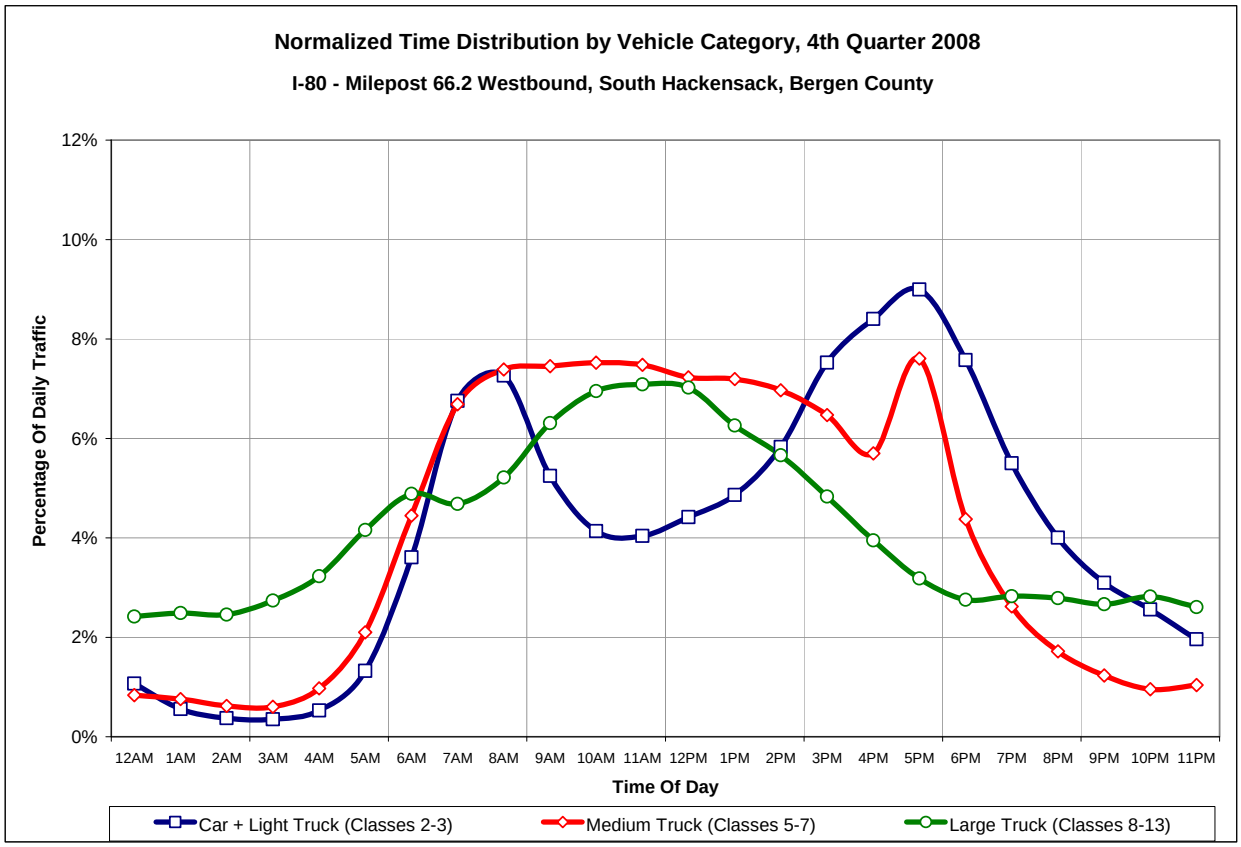

Figure 4B-80D: Daily Profile of Volume at Westbound I-80, MP 66.2

Figure 4B-80D shows the relative daily profile of traffic by vehicular category in the westbound direction at I-80 milepost 66.2 during the 4th quarter of 2008. Unlike other eastbound Interstate locations in northern New Jersey, this heavily urban location demonstrates a Profile 2 pattern with a more significant ratio between the later (midday) peak and the overnight low. However, overnight large truck volume remained considerable typical of Profile 1. Medium trucks exhibited a sharp peak for a single hour of 5:00 to 6:00 p.m. and autos showed both a moderate morning and late afternoon peak.

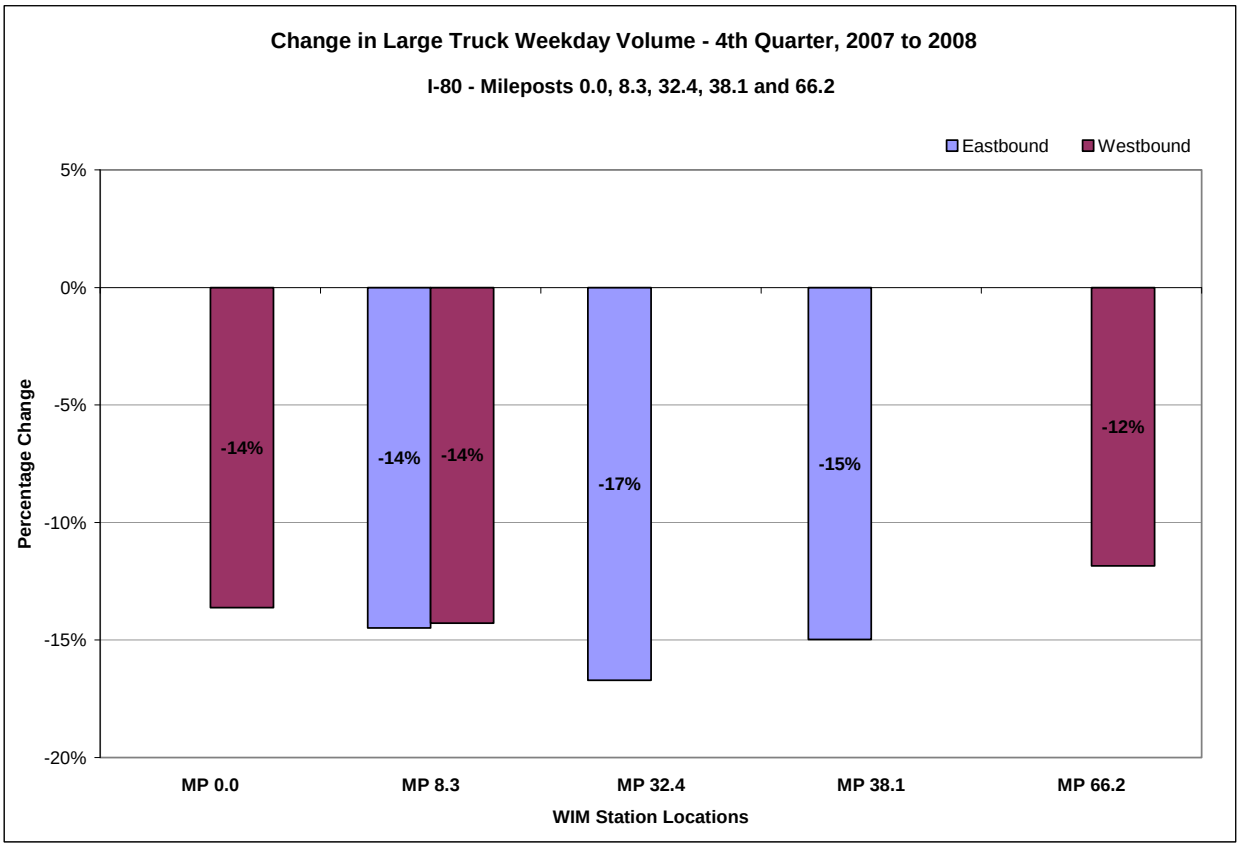

Figure 5-I80: Change in Large Truck Volume on I-80 – 4th Quarter 2007 to 2008

Notes: Some chart features are missing due to insufficient/unavailable data.
For Milepost 0.0 only, large trucks are defined as trucks with five or more axles; holidays and weekends are included.

As shown in **Figure 5-I80**, large truck volume on I-80 declined sharply in both directions of travel at all station locations where data was available between the 4th quarter of 2007 and 2008. While some individual monthly data was unavailable, a month to month comparison between 2007 and 2008 also revealed similarly large reductions at each location. The relative declines on I-80 were greater than those experienced on the parallel I-78 during the same period.

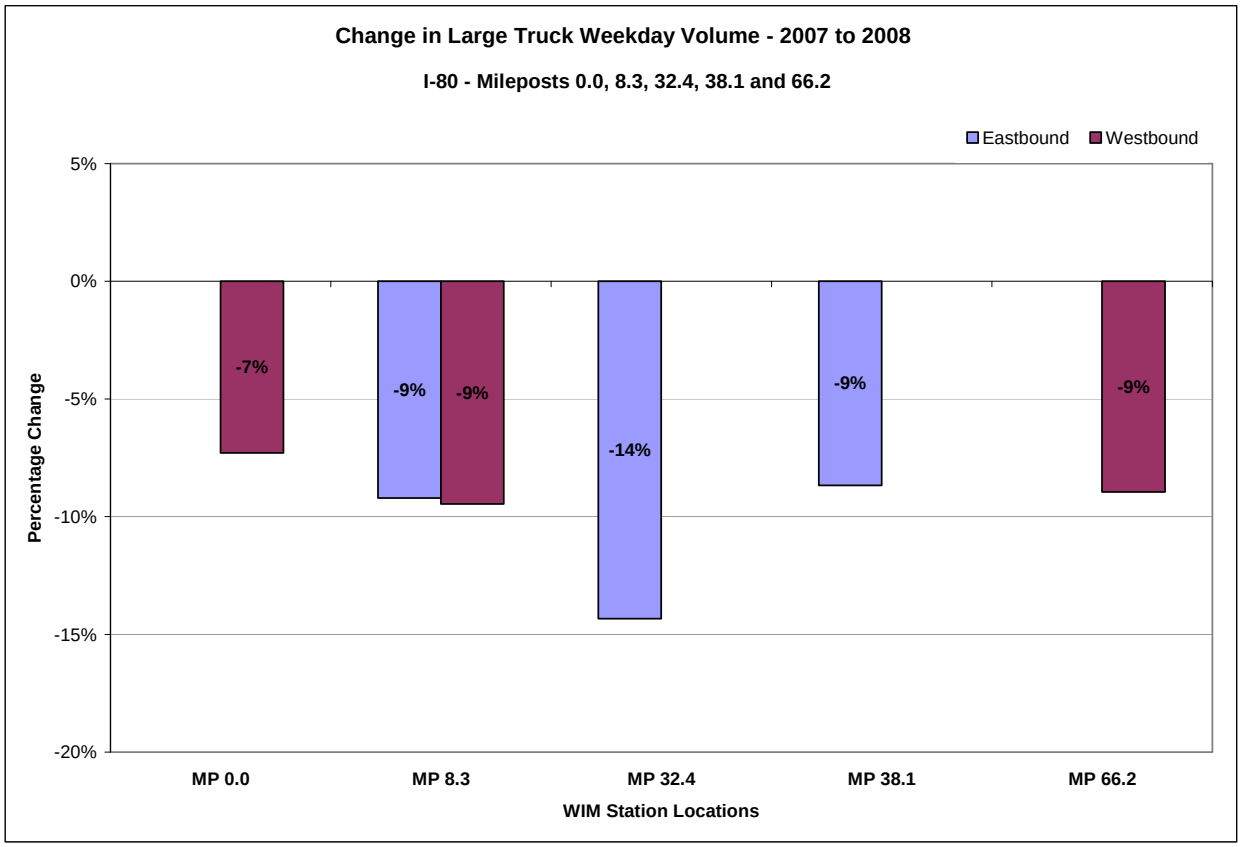

Figure 6-I80: Change in Large Truck Volume on I-80 –2007 to 2008

Notes: Some chart features are missing due to insufficient/unavailable data.

For Milepost 0.0 only, large trucks are defined as trucks with five or more axles; holidays and weekends are included.

As shown in **Figure 6-I80**, large truck volume decreased markedly on I-80 for all station locations between 2007 and 2008. Greatest volume loss was at eastbound milepost 32.4 where the large decline nearly matched the year over year change for the 4th quarter as seen in Figure 5-I80. Only mileposts 0.0 and 66.2 had a full set of available data for 2007. Each of the other stations only began operating between August and October of 2007 so year over year comparisons were based on the latter portion of 2007 only.

WIM Station 195B: I-195, MP 4.0

WIM Station 195B (a.k.a. 19B) is located at milepost 4.0 of Interstate 195 in Hamilton, Mercer County between interchanges 3 (Yardville-Hamilton Square Road) and 5 (US 130). At this location I-195 is a four-lane limited access Urban Interstate and is included in the National Network. **Figure 1-195B** shows the location and surrounding features. WIM data has been continuously recorded at this location since late 2006 however only eight months of data were available for 2008.

Figure 1-195B: Aerial View of WIM Station at I-195, MP 4.0

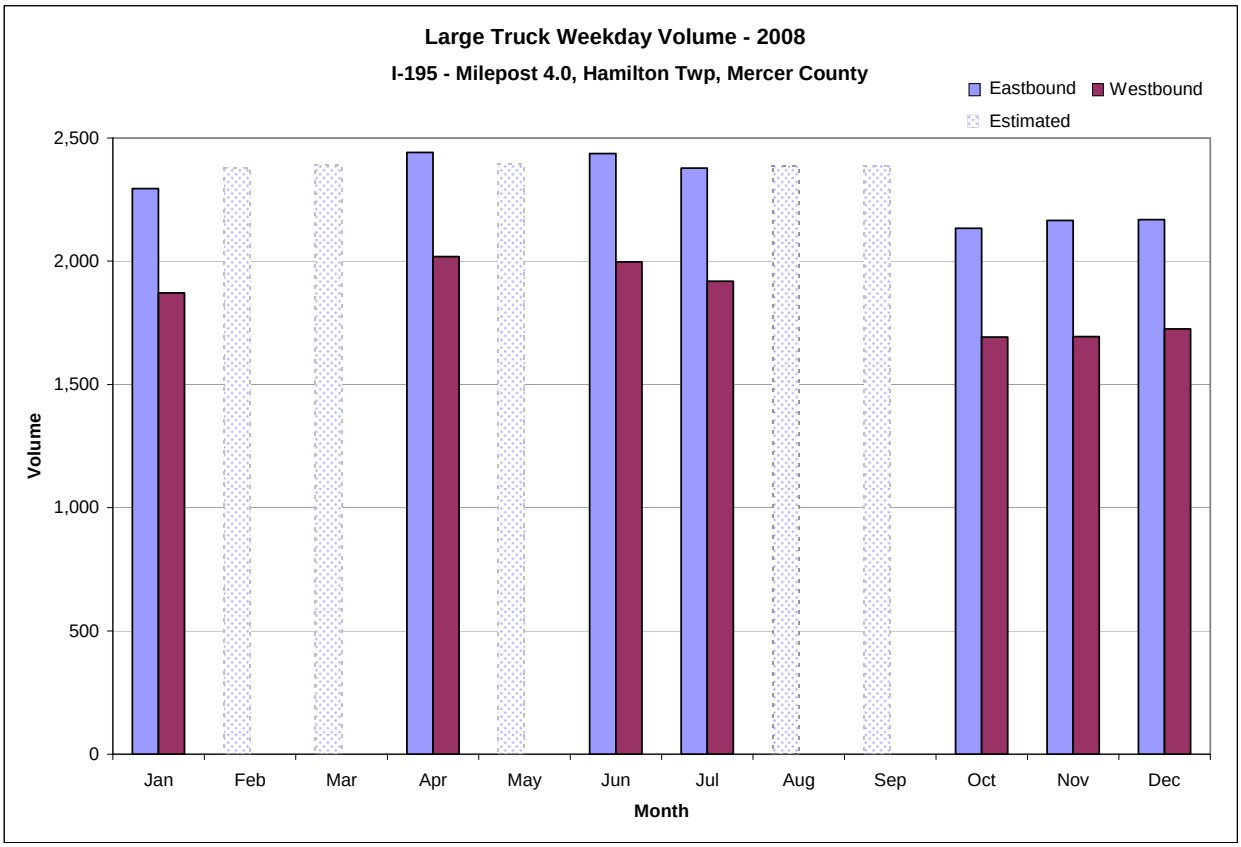

Figure 2-195B: Annual Profile of Large Truck Volume at I-195, MP 4.0
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-195B,** large truck volume at I-195, milepost 4.0 peaked mid-year and declined during the 4th quarter 2008 in both directions of travel. Eastbound large truck volume consistently exceeded westbound travel at this location by 24%, or over 440 per weekday.

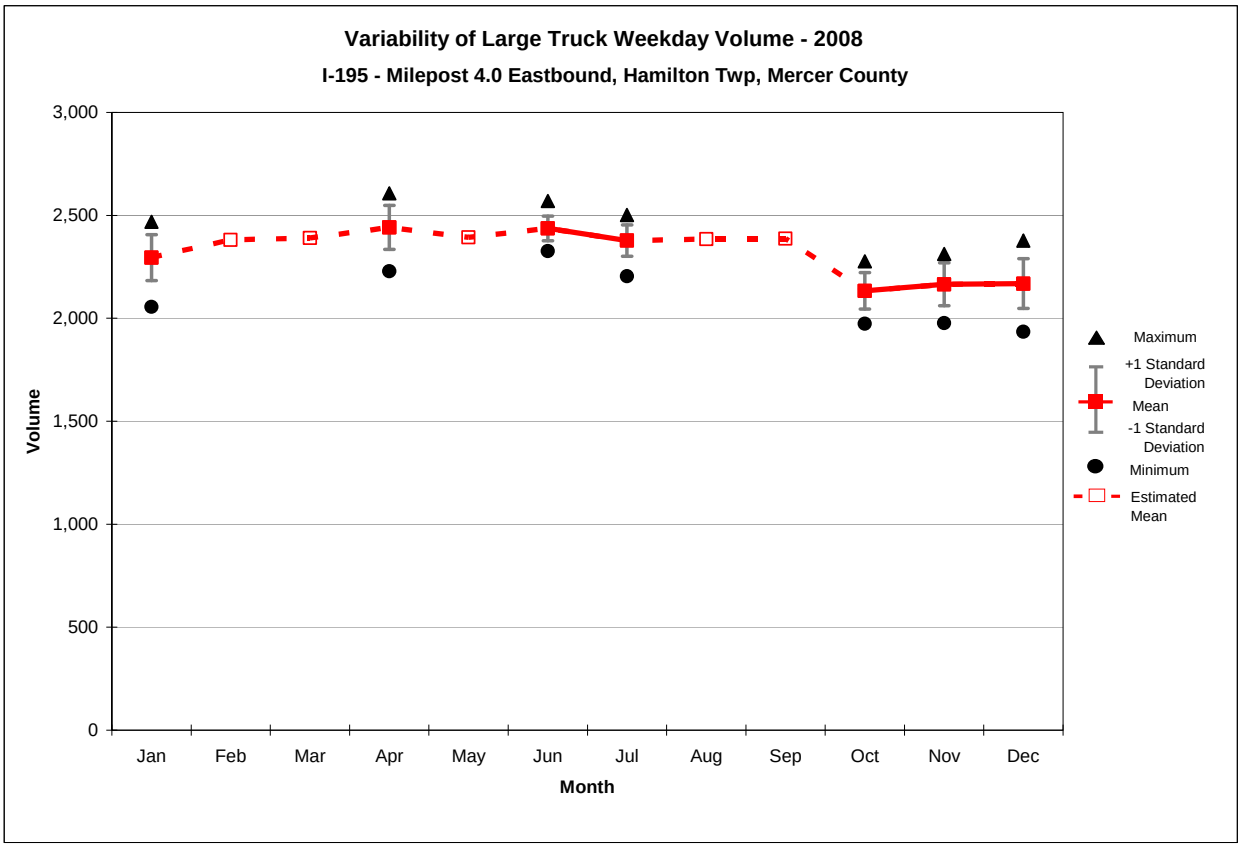

Figure 3A-195B: Variability of Large Truck Volume at Eastbound I-195, MP 4.0
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3A-195B shows the range of weekday large truck volume at eastbound I-195 milepost 4.0. Little variability is seen for the months with available data. The overall maximum was some 2,600 large trucks on April 4, 2008 and the minimum of 1,935 trucks occurred on December 19, 2008.

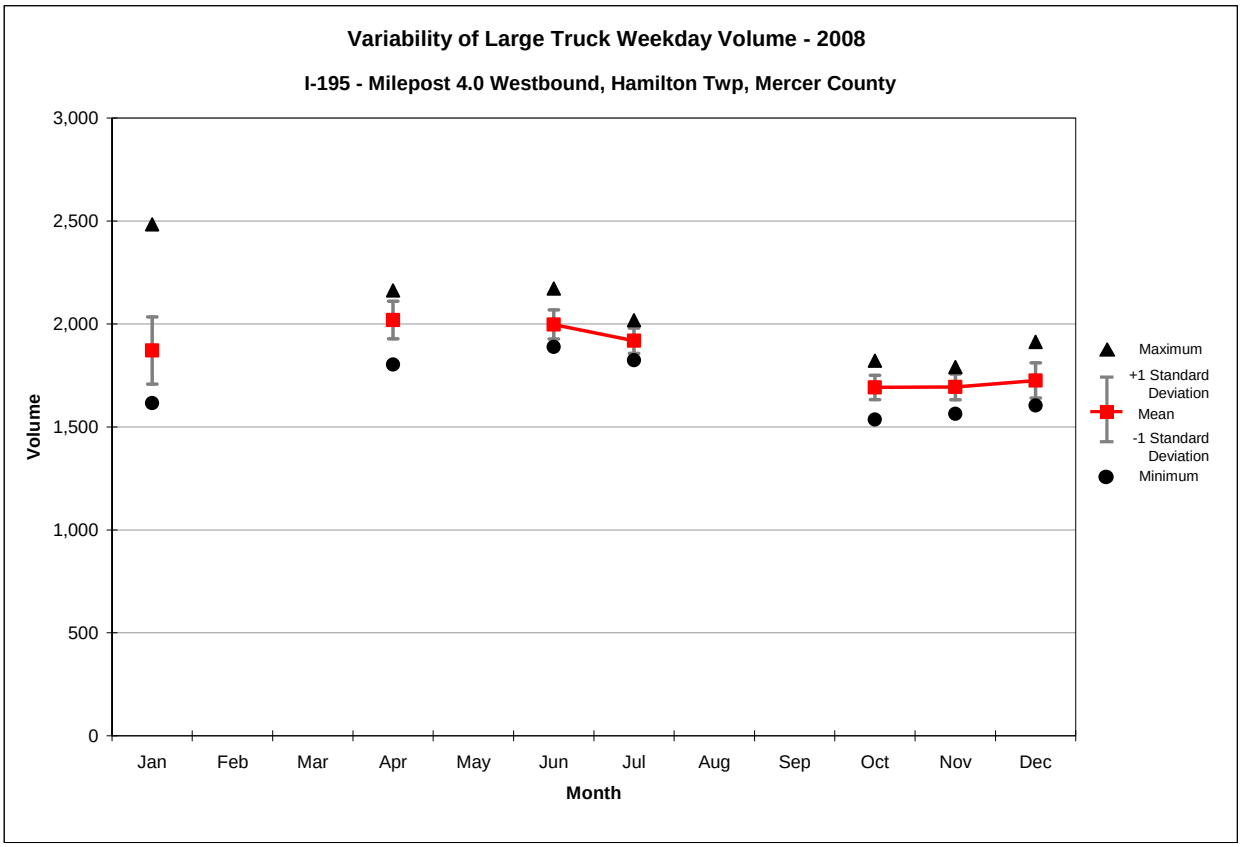

Figure 3B-195B: Variability of Large Truck Volume at Westbound I-195, MP 4.0
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at westbound I-195 milepost 4.0 is shown in **Figure 3B-195B**. While most months exhibited very low variability, January 2008 was a unexpectedly high variability month. An outlier of nearly 2,500 large trucks, 10% higher than the annual average, occurred on January 8, 2008 during an otherwise low volume month at this location. This monthly maximum was more in line with maximums in the eastbound direction at this location. Just 1,536 trucks crossed the same highway location on October 13, 2008.

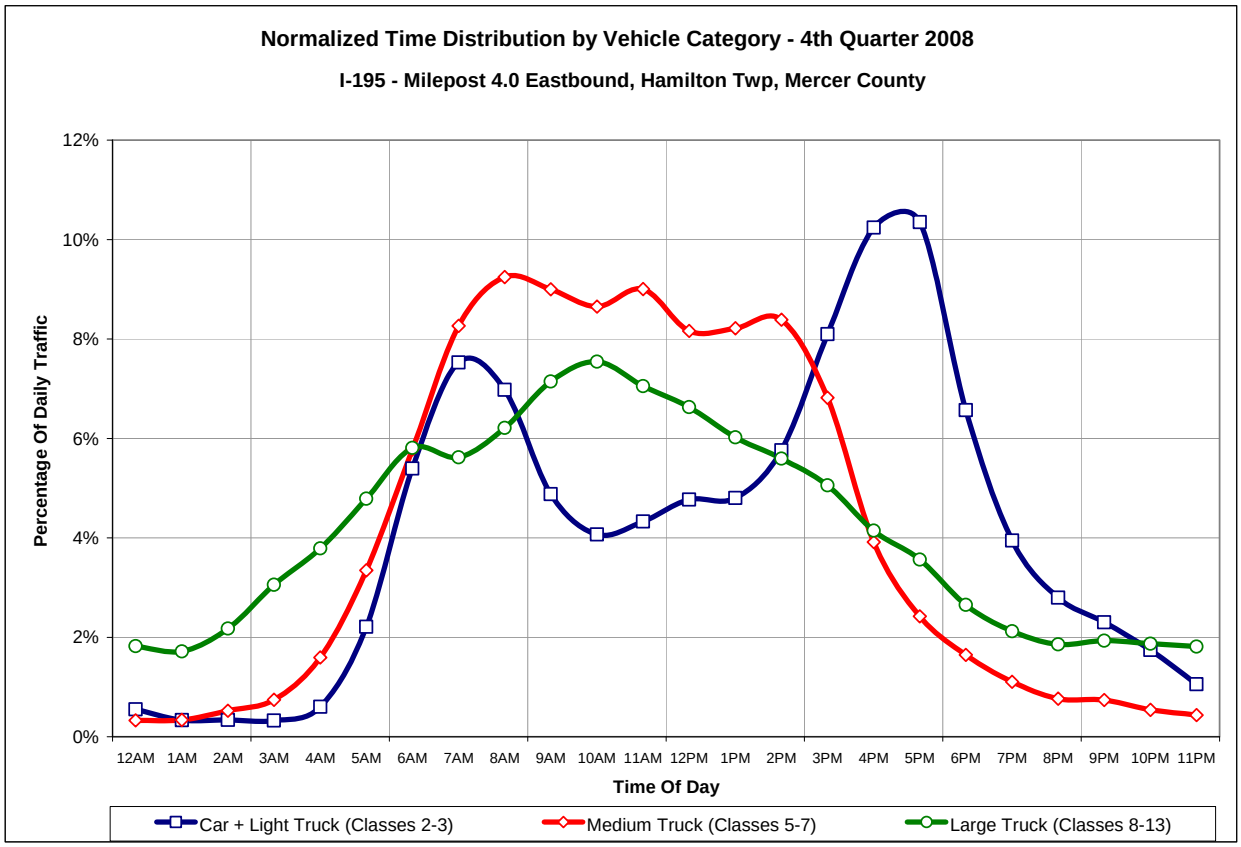

Figure 4A-195B: Daily Profile of Volume at Eastbound I-195, MP 4.0

Figure 4A-195B shows the relative daily profile of traffic by vehicular category in the eastbound direction at I-195 milepost 4.0 during the 4th quarter of 2008. Large truck volume exhibited a Profile 2 pattern with heavy volume and a moderate difference between the midday and overnight extremes. The peak fell between 10:00 a.m. and 11:00 a.m. Medium trucks followed a stronger midday peak profile while personal vehicles were prevalent during the commuter peaks, particularly in the afternoon exiting from the Trenton area.

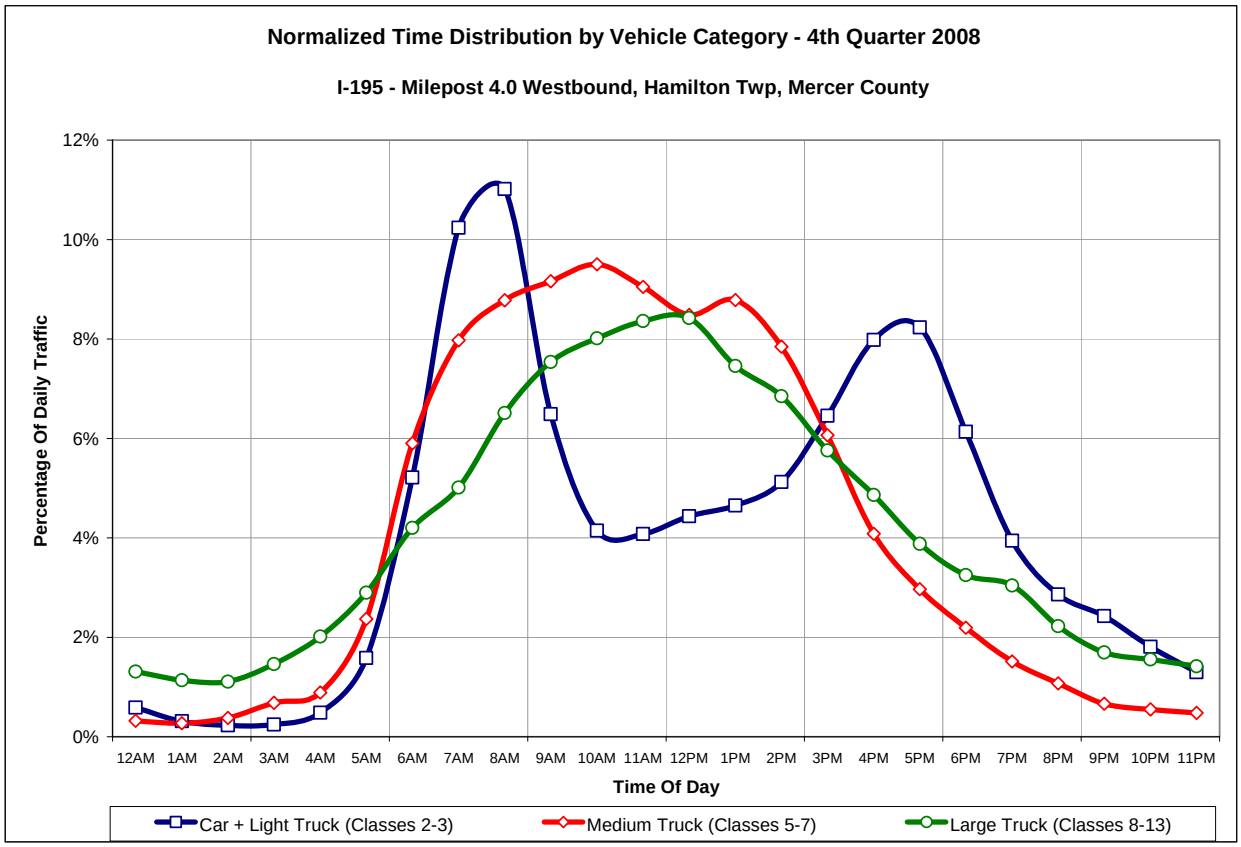

Figure 4B-195B: Daily Profile of Volume at Westbound I-195, MP 4.0

Figure 4B-195B shows the relative daily profile of traffic by vehicular category in the westbound direction at I-195 milepost 4.0 during the 4th quarter of 2008. The lower overall volume and greater disparity in hourly maximum and minimum compared to the eastbound direction would classify this location as a Profile 3. Here a somewhat later peak for large trucks occurred between 12:00 and 1:00 p.m. Auto volume was a mirror image of the eastbound with a heavy flow toward Trenton during the 7:00 to 9:00 a.m. period and a weaker peak during the afternoon.

WIM Station 195: I-195, MP 10.2

WIM Station 195 is located at milepost 10.2 of Interstate 195 in Upper Freehold, Monmouth County between interchanges 8 (CR 524/539 Old York Road) and 11 (CR 43 Imlaystown-Hightstown Road). At this location I-195 is a four-lane limited access Rural Interstate and is included in the National Network. **Figure 1-195** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years however limited data were available for 2008.

Figure 1-195: Aerial View of WIM Station at I-195, MP 10.2

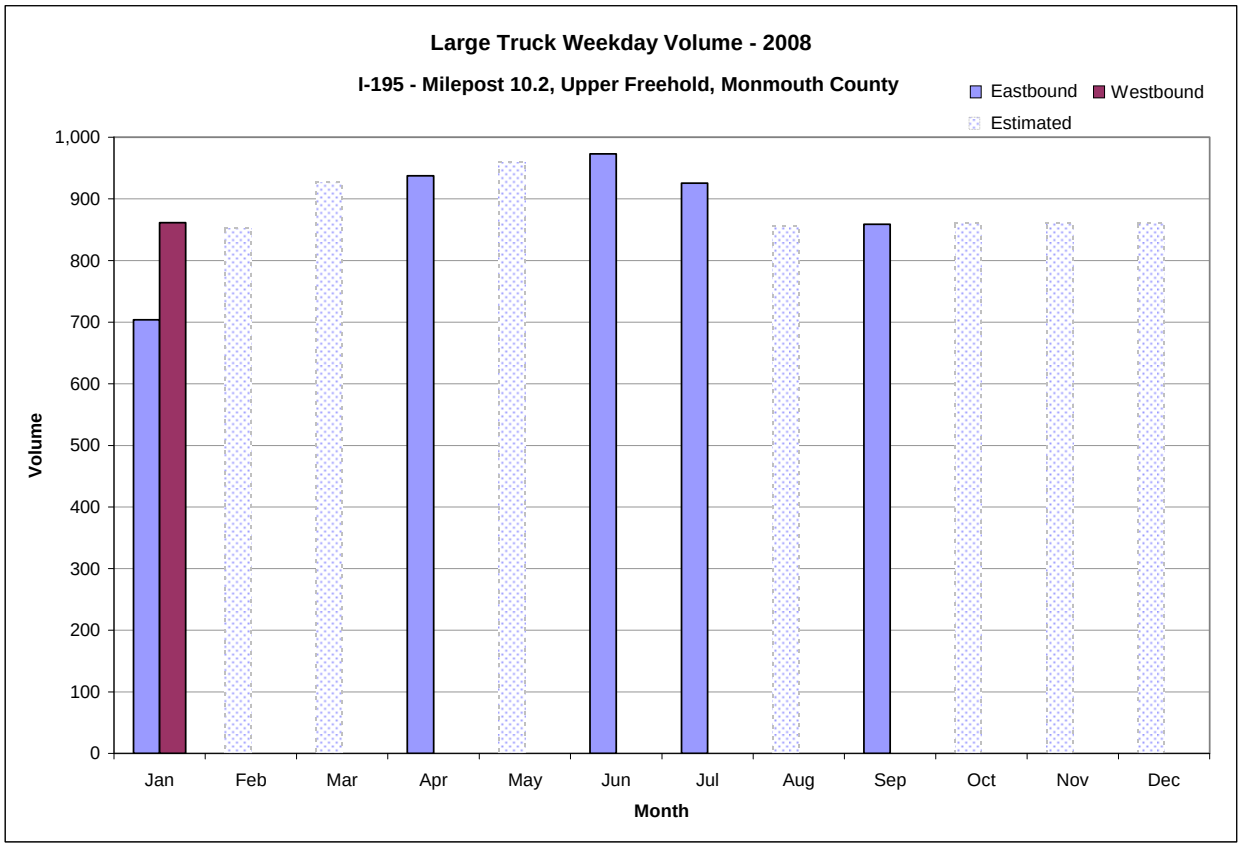

Figure 2-195: Annual Profile of Large Truck Volume at I-195, MP 10.2
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-195,** limited data was available for large truck volume at I-195, milepost 10.2. For the months with data, a peak was reached in June 2008 in the eastbound direction when nearly 1,000 daily vehicles traversed the station location. More than 5% of vehicles were not classified in the eastbound direction in January 2008 at this station which may be a contributing factor in the comparative low large truck weekday volume.

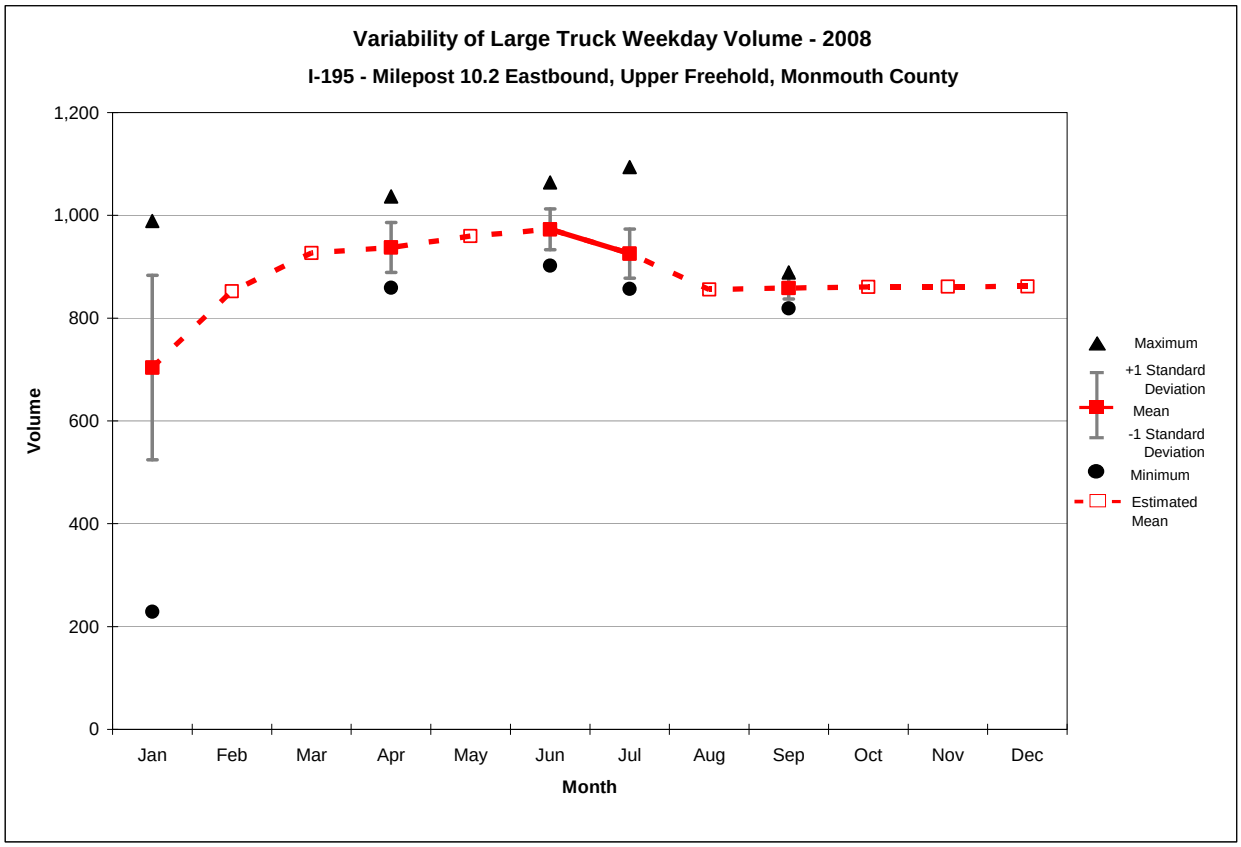

Figure 3A-195: Variability of Large Truck Volume at Eastbound I-195, MP 10.2
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3A-195 indicates the range of weekday large truck volume at eastbound I-195 milepost 10.2. Large truck volume in January 2008 was wildly inconsistent with a standard deviation of 180, an extremely low mark of just 229 trucks on January 3, 2008 followed by nearly 1,000 vehicles one week later. A high value of 1,094 was reached on July 2, 2008. September 2008 volumes demonstrated very little variation with a standard deviation of just 21 trucks.

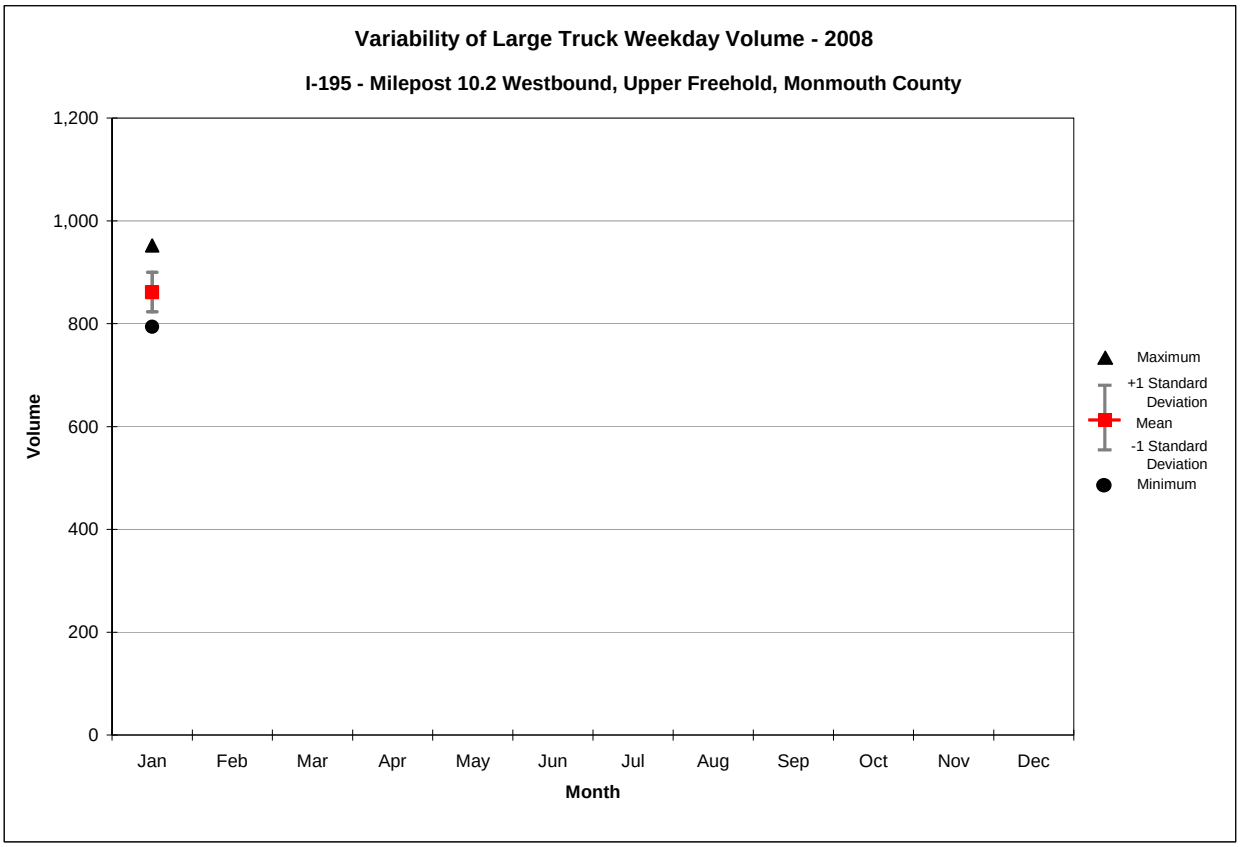

Figure 3B-195: Variability of Large Truck Volume at Westbound I-195, MP 10.2
Note: Some chart features are missing due to insufficient/unavailable data.

The range of weekday large truck volume at westbound I-195 milepost 10.2 is shown in **Figure 3B-195**. With the information available from limited data observation, January 2008 had a maximum volume of 952 trucks on 10th and minimum volume 794 on 22nd.

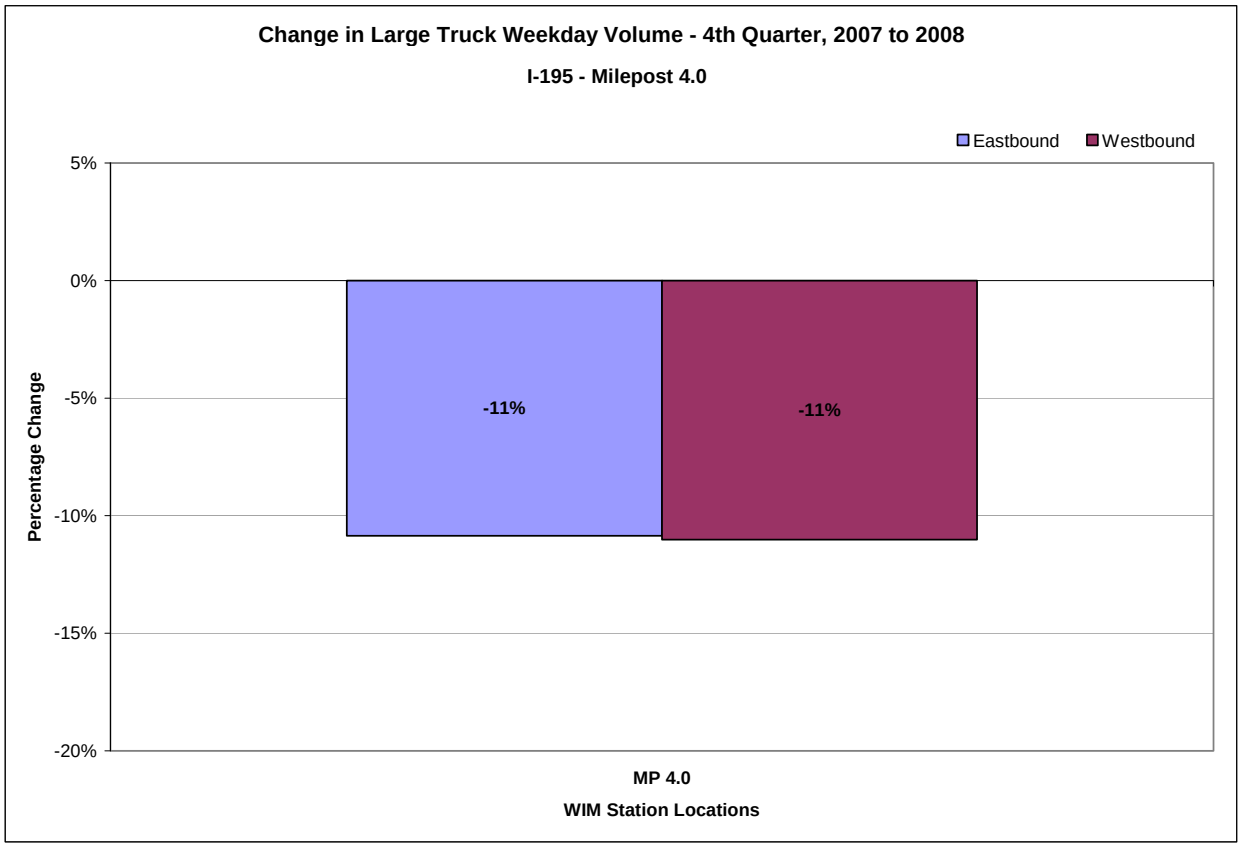

Figure 5-I195: Change in Large Truck Volume on I-195 – 4th Quarter 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

Based on a full data set comparison, large truck volume at I-195, milepost 4.0 uniformly declined between the 4th quarter of 2007 and 2008 in both directions of travel as shown in **Figure 5-I195**.

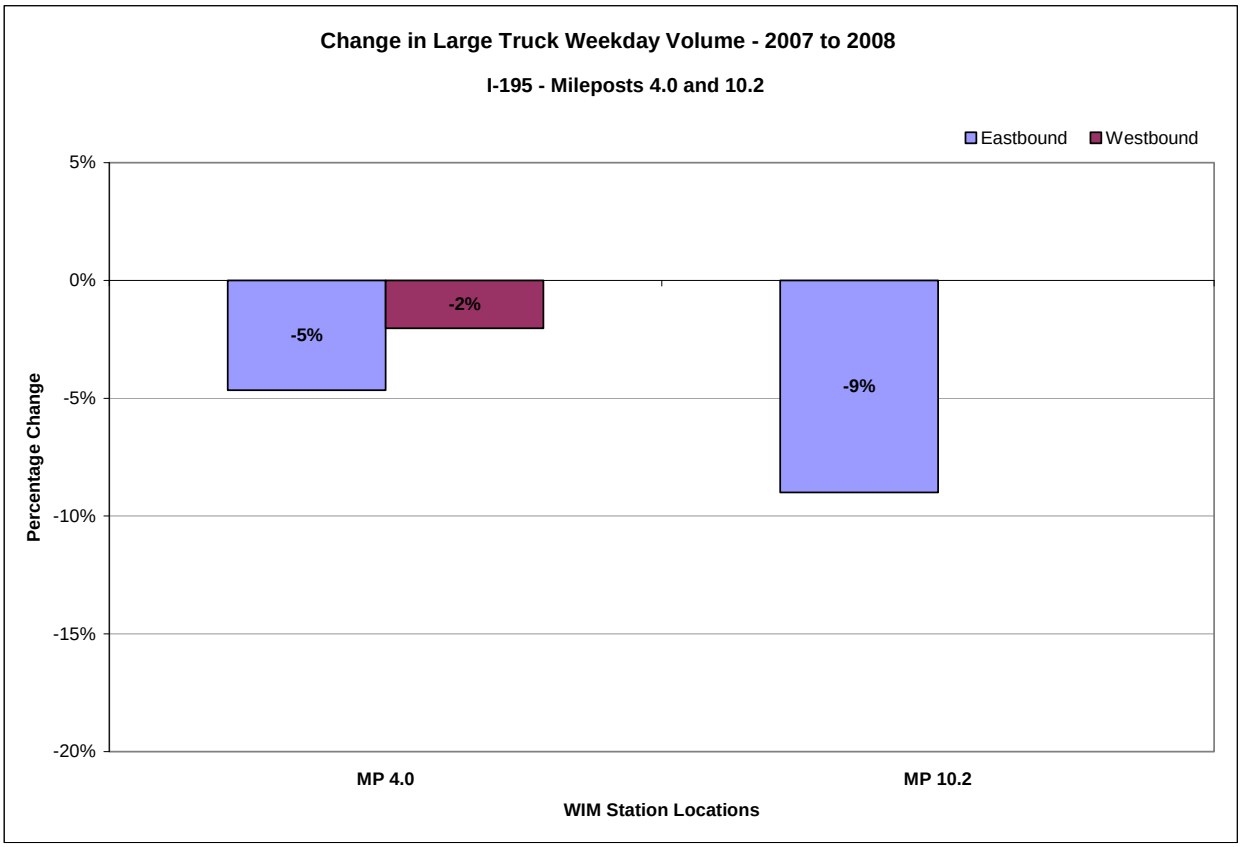

Figure 6-I195: Change in Large Truck Volume on I-195 – 2007 to 2008

Figure 6-I195 shows the change in large truck weekday volume on I-195. Overall declines at milepost 4.0 were mild compared to other interstate locations throughout the state. Milepost 10.2 on the other hand demonstrated much larger declines based on limited data throughout 2008.

WIM Station 287A: I-287, MP 31.7

WIM Station 287A (a.k.a. A87) is located at milepost 31.7 of northbound Interstate 287 in Harding, Morris County between interchanges 30 (North Maple Avenue) and 33 (Harter Road). At this location I-287 is a six-lane limited access Urban Interstate and is included in the National Network. **Figure 1-287A** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years however limited data were available for 2008.

Figure 1-287A: Aerial View of WIM Station at I-287, MP 31.7

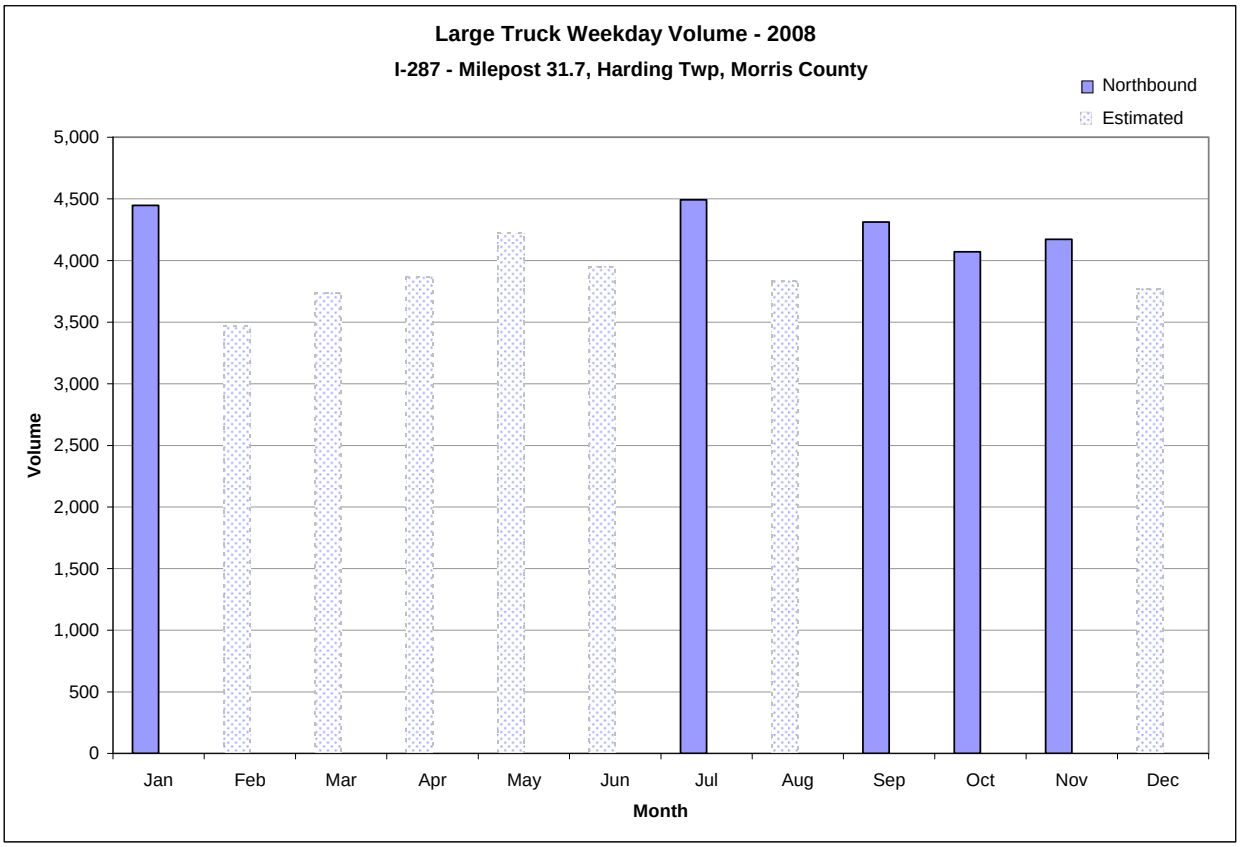

Figure 2-287A: Annual Profile of Large Truck Volume at I-287, MP 31.7
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-287A,** large truck volume at northbound I-287, milepost 31.7 exceeded 4,000 per weekday however was nearly 10% lower during the 4th quarter of 2008 than in July 2008.

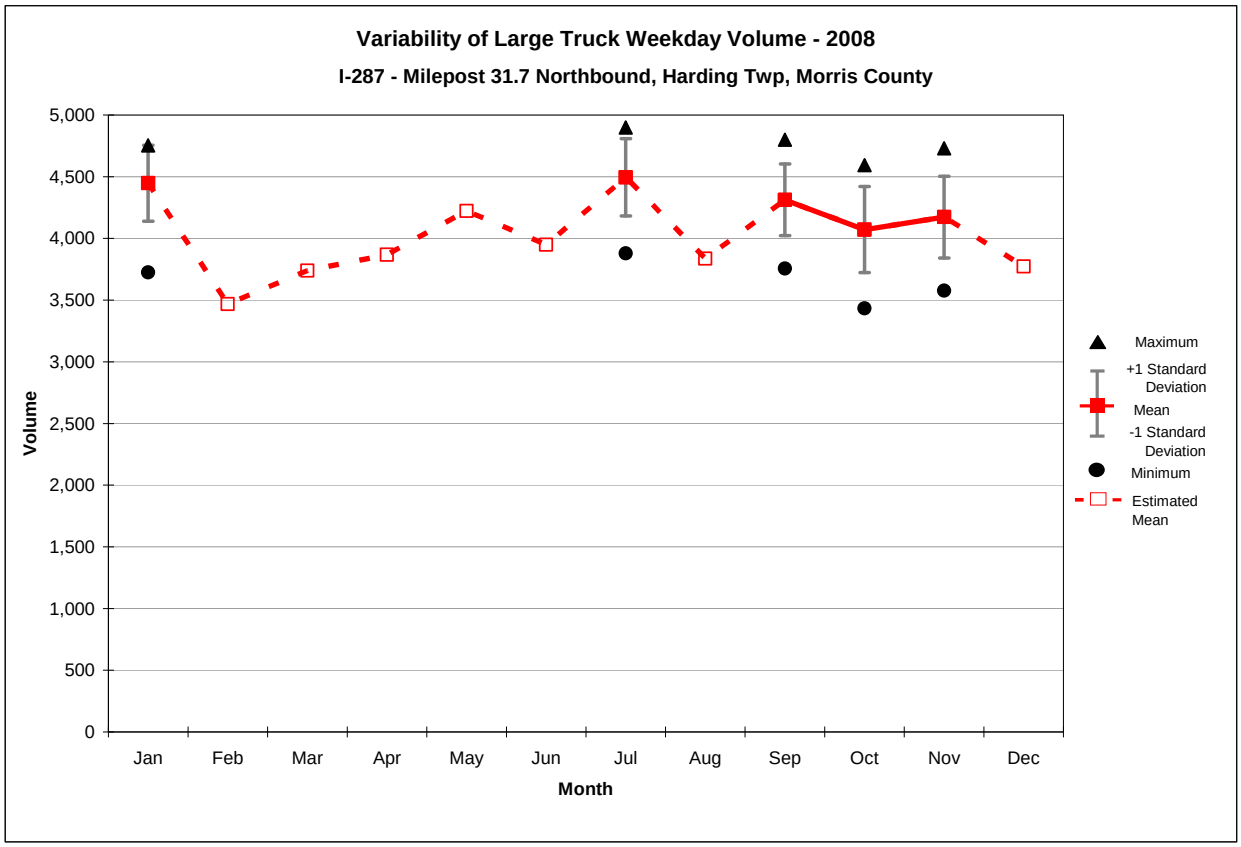

Figure 3A-287A: Variability of Large Truck Volume at Northbound I-287, MP 31.7
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3A-287A displays the range of weekday large truck volume at northbound I-287 milepost 31.7. Data observations were limited at this location however volumes ranged by approximately 1,000 large trucks during each month where observations were available. Consecutive days in September 2008 saw such a swing in volume when 4,800 trucks on the 4th were followed by 3,750 on the 5th. July 2, 2008 was the date of peak observation of 4,900 large trucks at this location while 3,430 were counted on October 10, 2008.

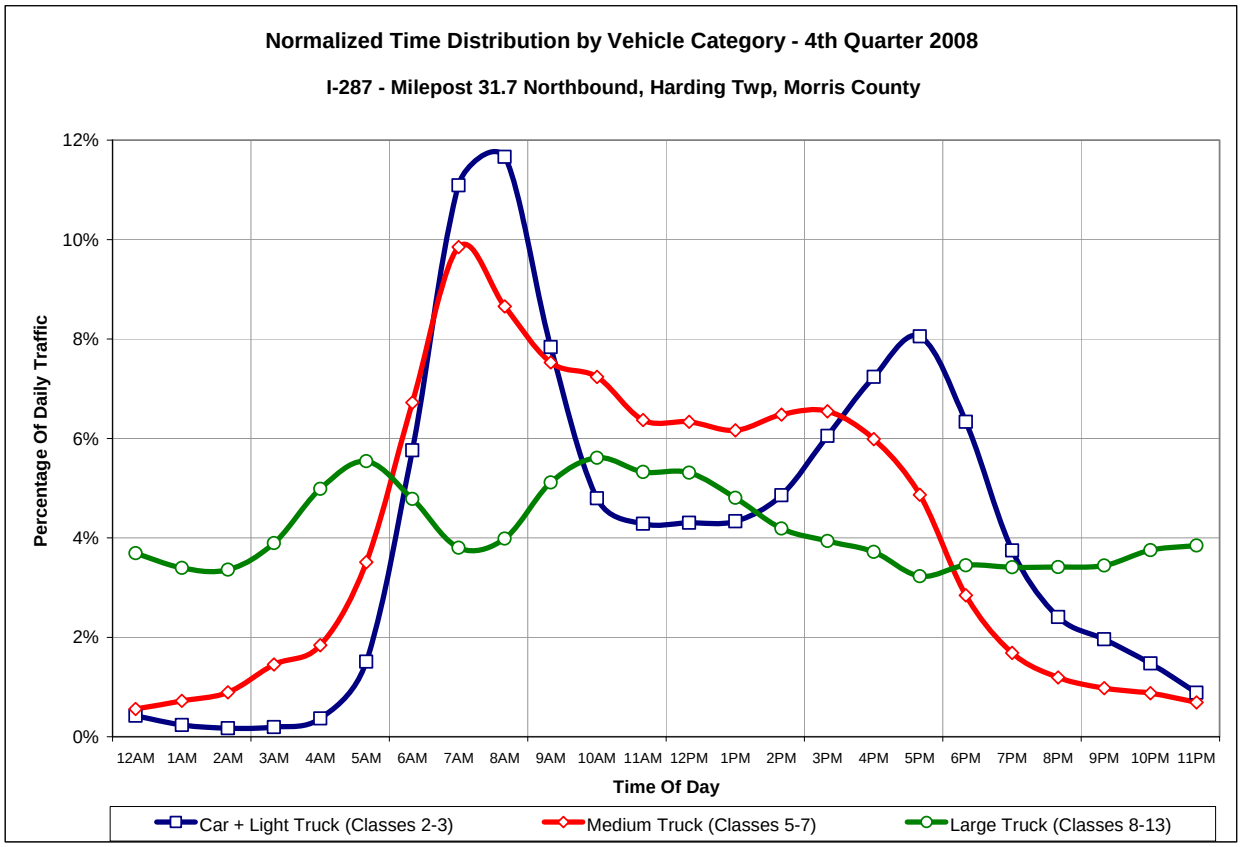

Figure 4A-287A: Daily Profile of Volume at Northbound I-287, MP 31.7

Figure 4A-287A shows the relative daily profile of traffic by vehicular category in the northbound direction at I-287 milepost 31.7 during the 4th quarter of 2008. This location typifies the Profile 1 pattern with minimal variation between the larrge truck morning peaks (one at 5:00 to 6:00 a.m. and another at 10:00 to 11:00 a.m.) and the afternoon low. Overnight large truck volumes were characteristically high for the Profile 1 Interstate routes leading toward the New York/northern New Jersey urban core.

WIM Station 287: I-287, MP 61.7

WIM Station 287 is located at milepost 61.7 of Interstate 287 in Franklin Lakes, Bergen County between interchanges 59 (NJ 208) and 66 (NJ 17). At this location I-287 is a four-lane limited access Urban Interstate and is included in the National Network. I-287 through this section is the only National Network facility connecting New Jersey with upstate New York. **Figure 1-287** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years however only eight months of data were available for 2008.

Figure 1-287: Aerial View of WIM Station at I-287, MP 61.7

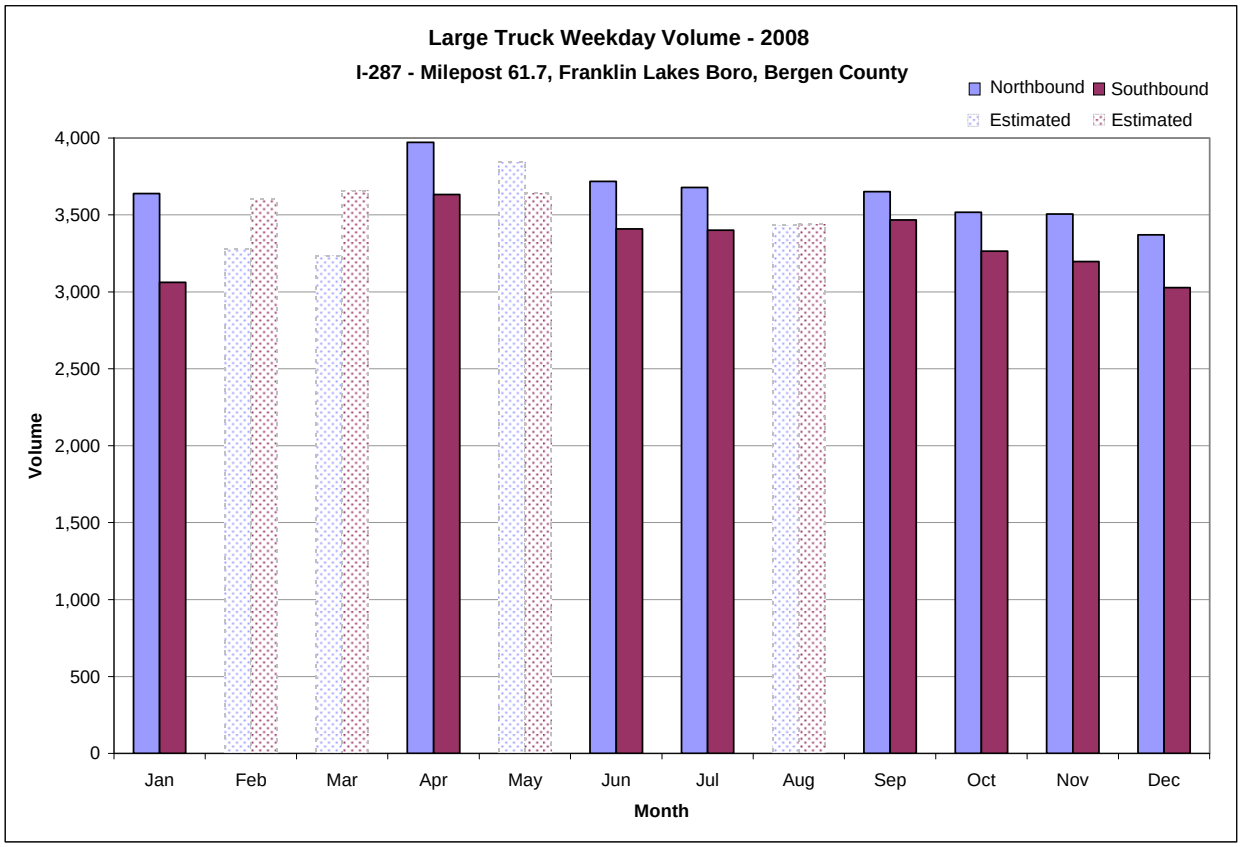

Figure 2-287: Annual Profile of Large Truck Volume at I-287, MP 61.7
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-287,** large truck weekday ADT at I-287, milepost 61.7 was imbalanced between northbound and southbound travel for each month data was available in 2008. Overall, northbound weekday volume exceeded southbound by 10%. This trend began in July of the previous year. Prior to July 2007, the opposite pattern occurred in each month of 2007 to an even greater extent (11% to 15% greater volume in the southbound direction). Both directions experienced a steady drop in large truck volume during the 4th quarter 2008. December 2008 volume was a 16% reduction from April 2008.

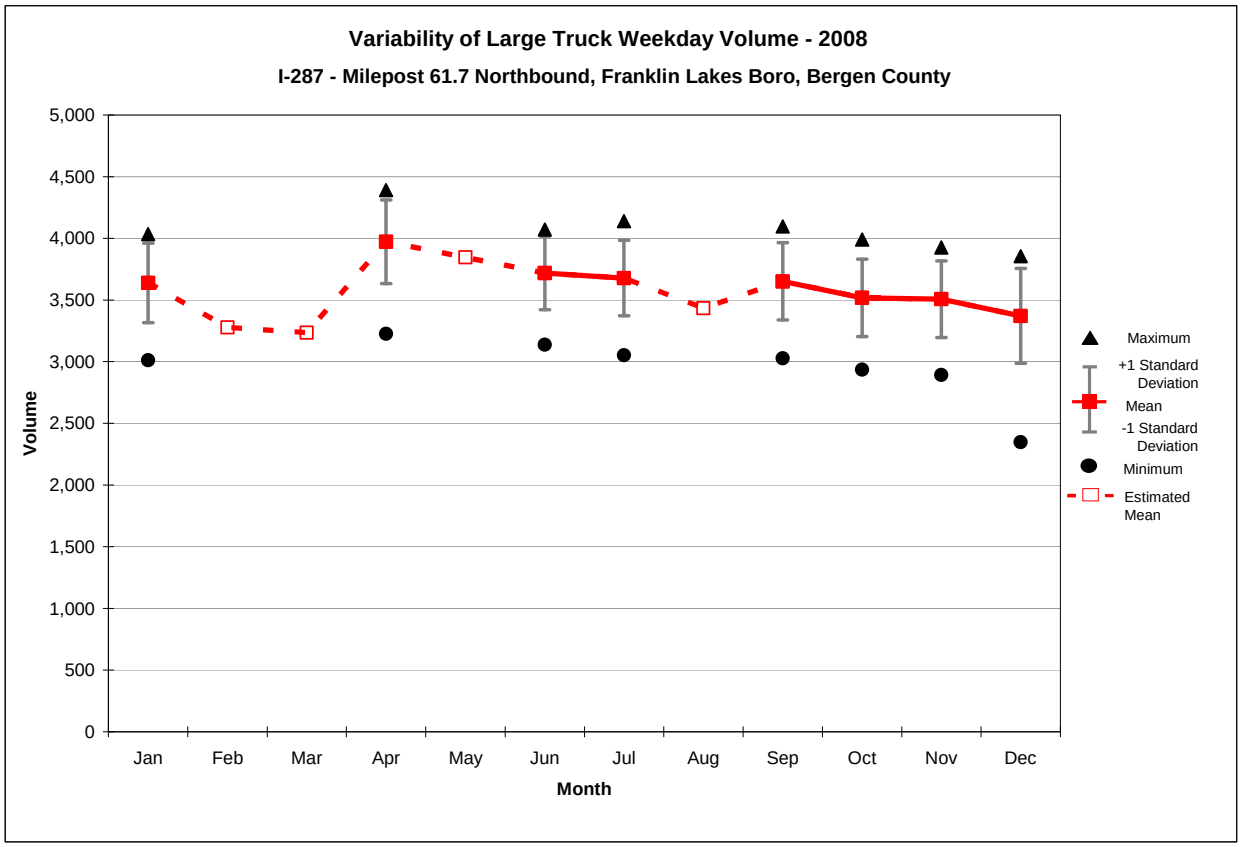

Figure 3A-287: Variability of Large Truck Volume at Northbound I-287, MP 61.7
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at northbound I-287 milepost 61.7 is shown in **Figure 3A-287**. April and December 2008 exhibited highest variability at this location. An extreme low volume of 2,350 occurred on December 19th. From the data available, the 2008 peak was 4,390 trucks on April 30, 2008.

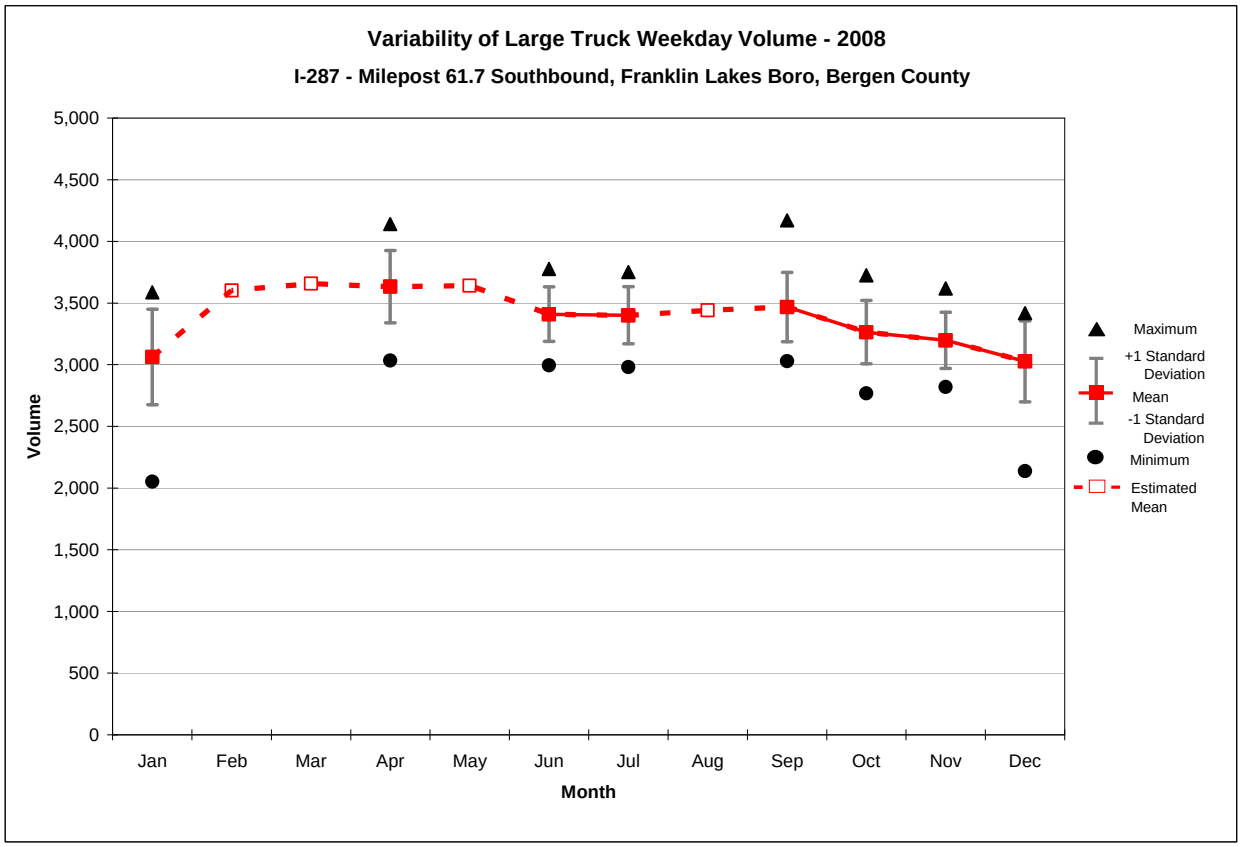

Figure 3B-287: Variability of Large Truck Volume at Southbound I-287, MP 61.7
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3B-287 displays the range of weekday large truck volume at southbound I-287 milepost 61.7. Here, January and December 2008 were variable due to unusually low volumes on January 14th (2,053) and December 19th (2,140). September 23, 2008 was the atypical maximum single day for large truck traffic from available data at this location when 4,170 trucks were observed.

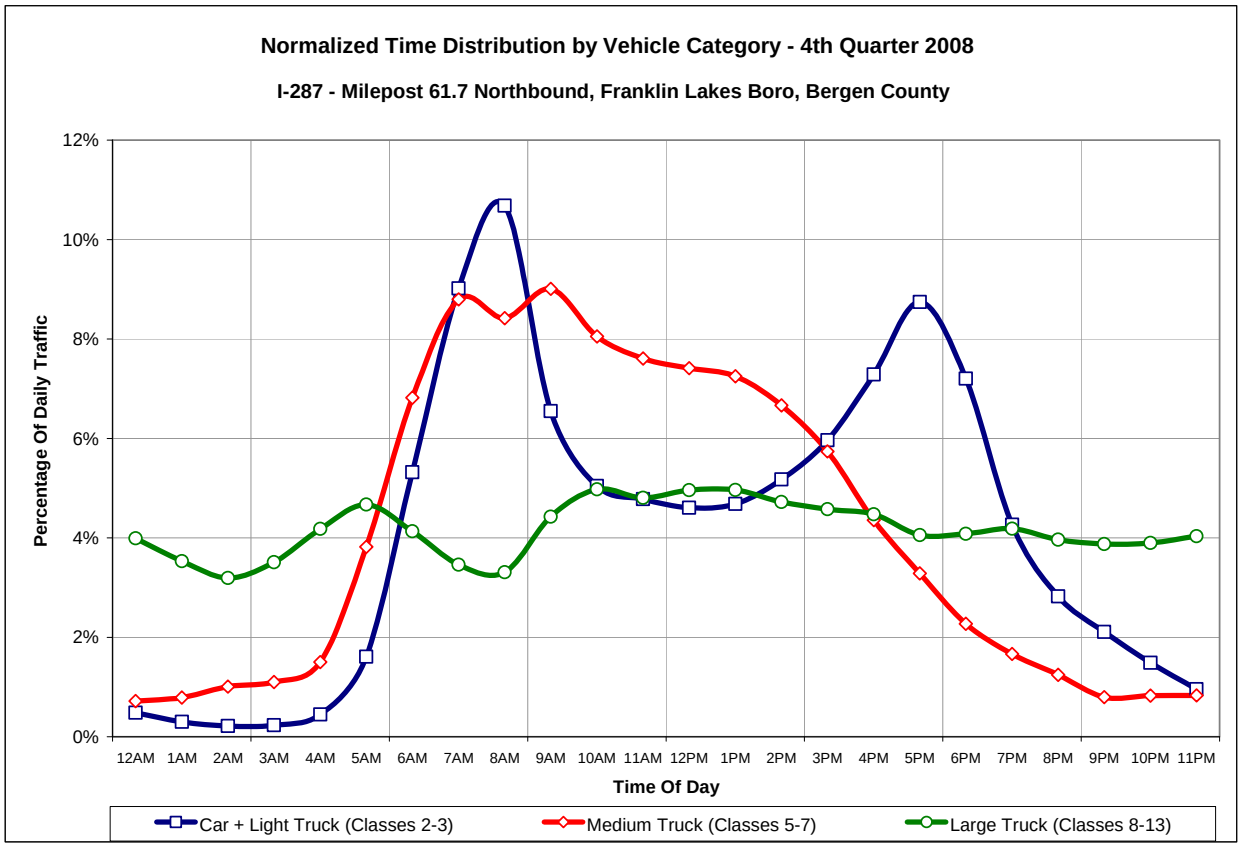

Figure 4A-287: Daily Profile of Volume at Northbound 1-287, MP 61.7

Figure 4A-287 shows the relative daily profile of traffic by vehicular category in the northbound direction at I-287 milepost 61.7 during the 4th quarter of 2008. Here the classic Profile 1 large truck daily profile is exhibited. This location, more than any other analyzed in this report, exhibited the flattest profile of large truck traffic. On an hour by hour basis, the relative percentage ranged from 3.2% for the hour beginning at 2:00 a.m. to 5.0% for the hour starting at 10:00 a.m. The relative percentage of overnight trucks was higher here than at any other analyzed location. Auto trips exhibited two strong commuter peaks.

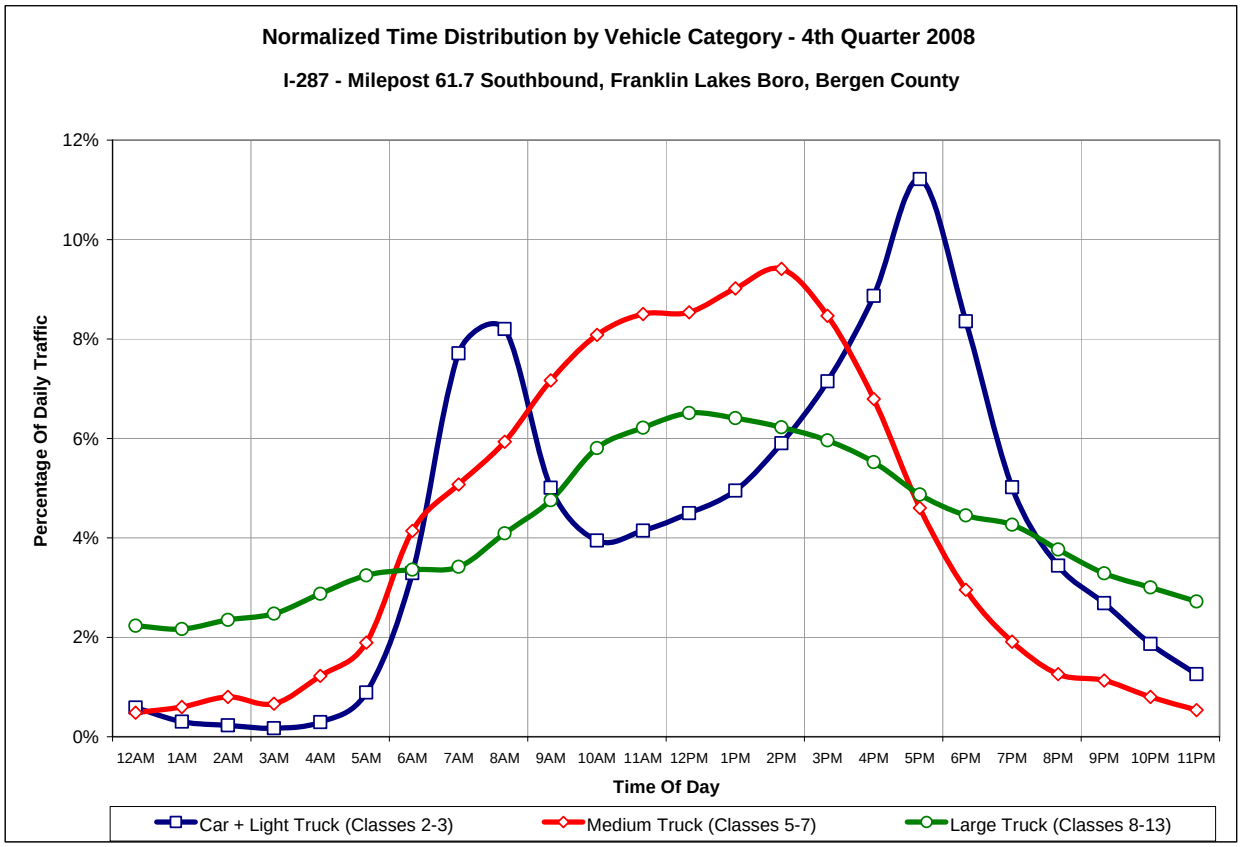

Figure 4B-287: Daily Profile of Volume at Southbound 1-287, MP 61.7

Unlike the northbound direction, **Figure 4B-287** shows a typical Profile 2 bell curve pattern in the relative distribution of large truck traffic in the southbound direction at I-287 milepost 61.7 during the 4th quarter of 2008. On the other hand, the profile for autos was an inverse of the northbound.

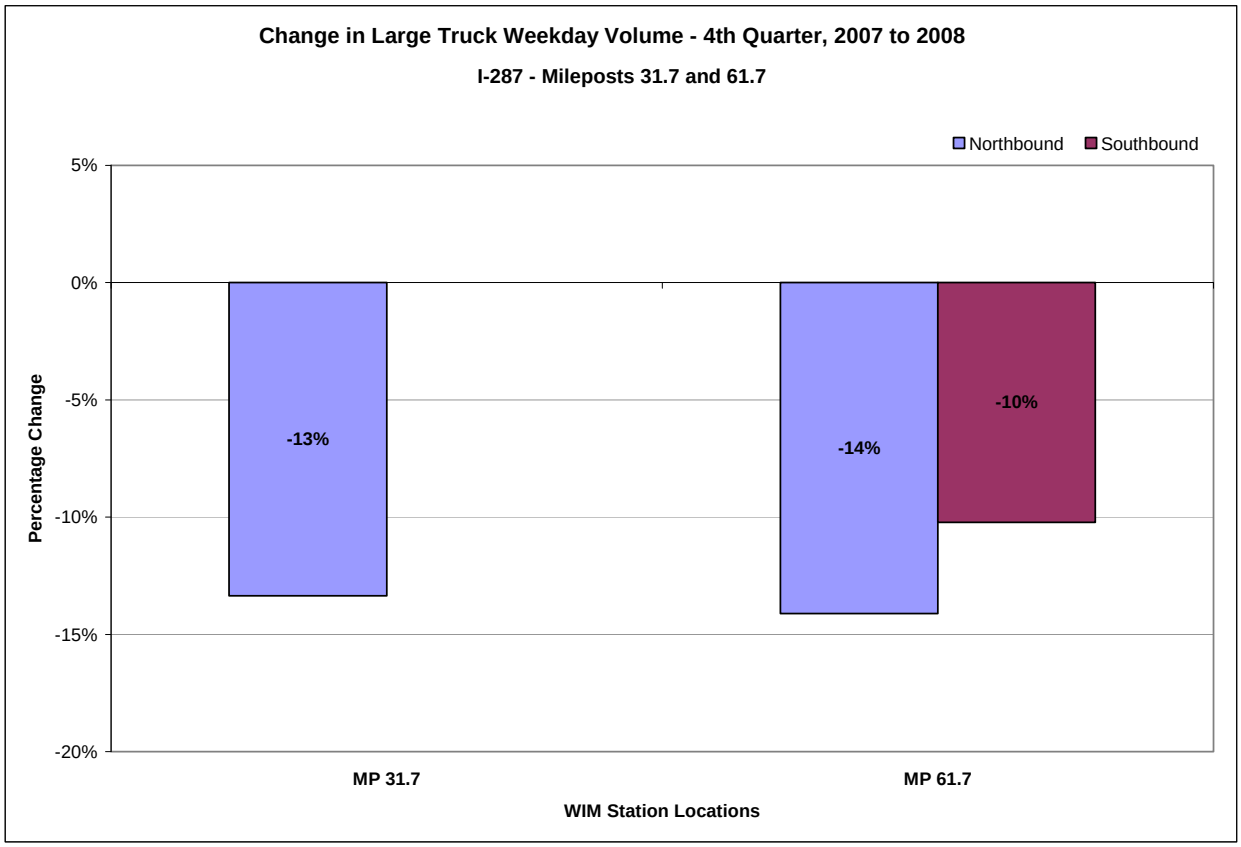

Figure 5-I287: Change in Large Truck Volume on I-287 – 4th Quarter 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

As shown in **Figure 5-I287**, large truck volume on I-287 declined at both WIM Station locations between the 4th quarter of 2007 and 2008. Somewhat greater declines were seen in the two northbound reporting stations compared to the single southbound location at milepost 61.7.

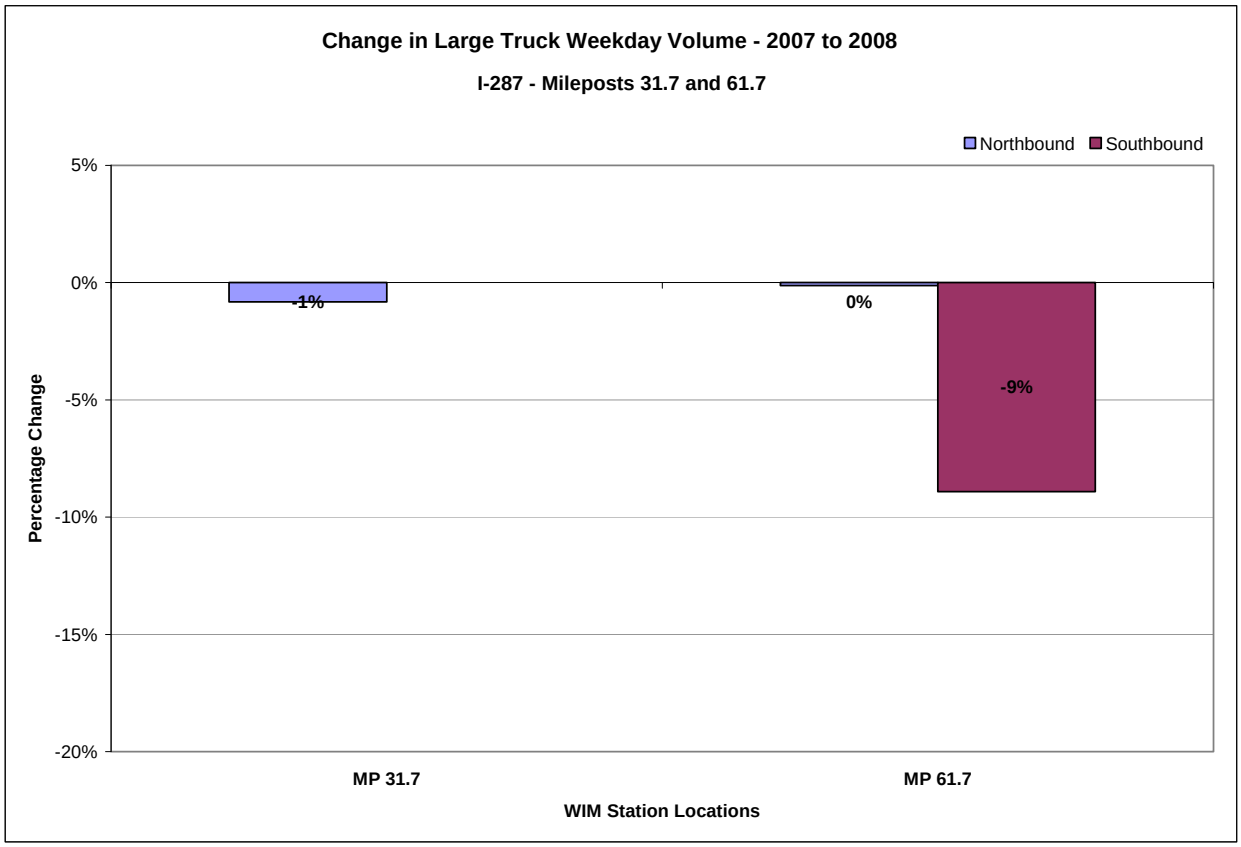

Figure 6-I287: Change in Large Truck Volume on I-287 – 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

Figure 6-I287 shows the year to year large truck volume change on I-287 between 2007 and 2008. Unlike all other interstate locations analyzed in this report, northbound traffic on I-287 was nearly flat between the two years. A curious, yet significant, swing in the directionality of large truck traffic at milepost 61.7 in July 2007 from a stronger southbound flow to a stronger northbound flow may have muted volume declines year over year in the northbound direction that was not evident when focusing on the 4th quarter change alone. This same shift in directional flow may be the cause of the significant decline in the southbound direction at this location.

WIM Station 295L: I-295, MP 15.2

WIM Station 295L (a.k.a. I2L) is located at milepost 15.2 of Interstate 295 in Logan, Gloucester County between interchanges 14 (CR 684 Repaupo Road) and 15 (Tomlin Station Road). At this location I-295 is a six-lane limited access Urban Interstate and is included in the National Network. **Figure 1-295L** shows the location and surrounding features. WIM data has been recorded at this location since January 2008 however limited data were available for 2008.

Figure 1-295L: Aerial View of WIM Station at I-295, MP 15.2

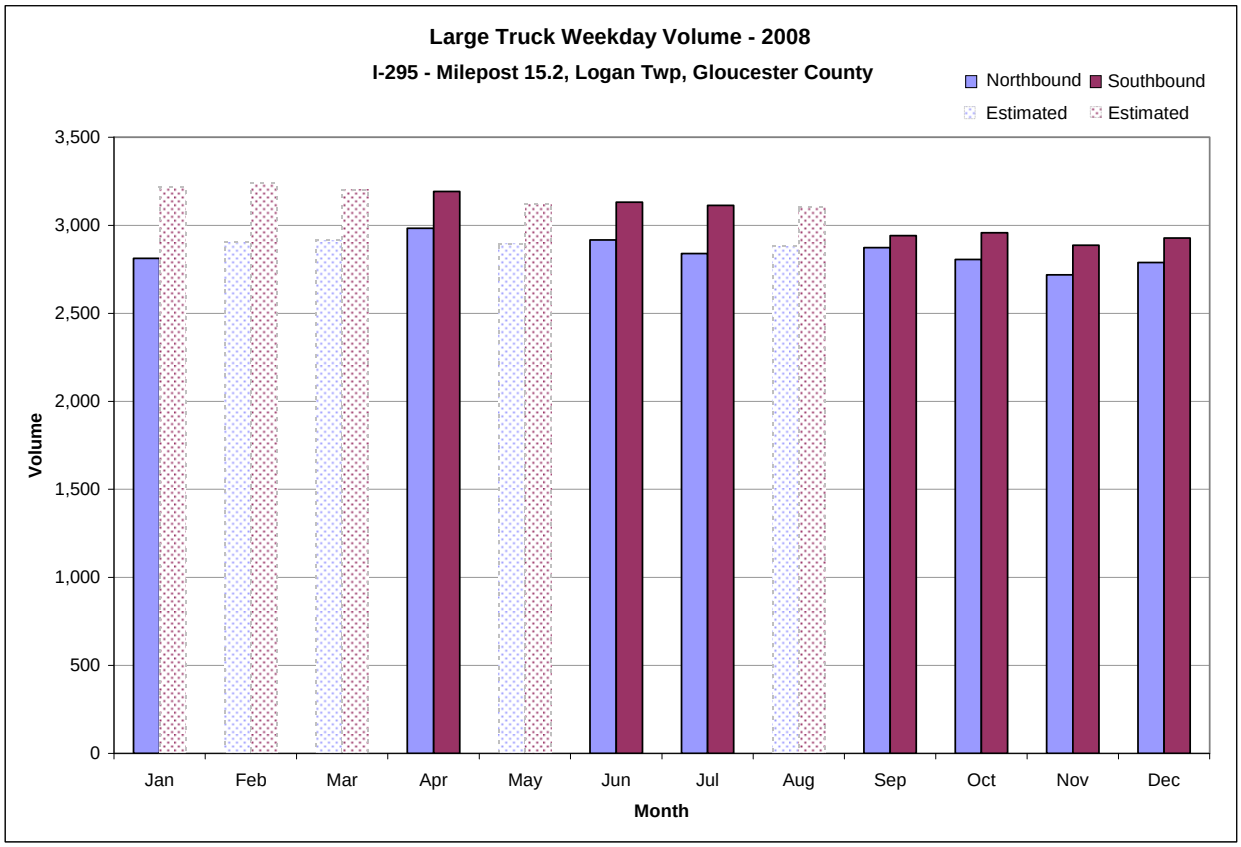

Figure 2-295L: Annual Profile of Large Truck Volume at I-295, MP 15.2
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-295L,** large truck weekday volume at I-295, milepost 15.2 declined from April through the remainder of 2008. In contrast with the pattern seen at WIM Station 130 on the parallel US 130, southbound travel exceeded northbound for all months where data was available by 160 weekday trucks, or 5% of the daily total.

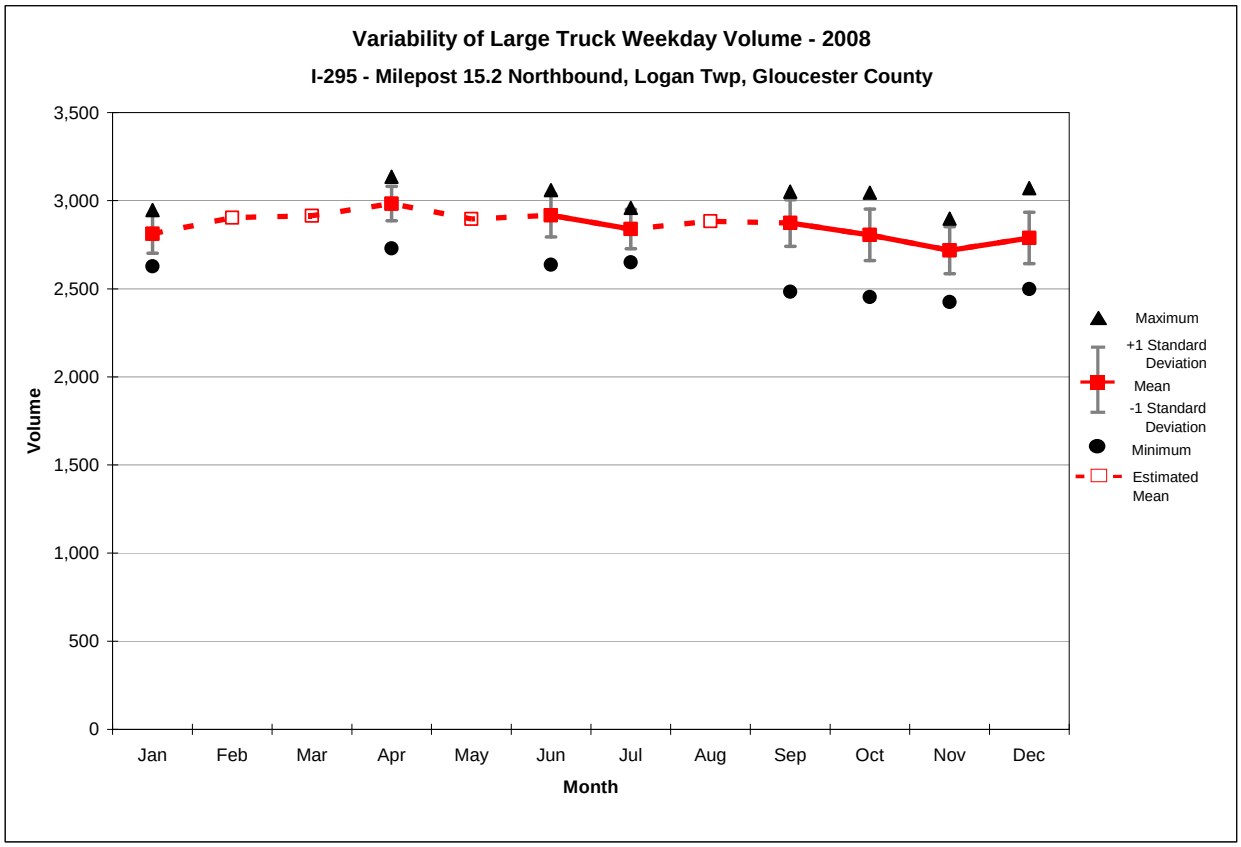

Figure 3A-295L: Variability of Large Truck Volume at Northbound I-295, MP 15.2
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3A-295L is the display of ranges of weekday large truck volume at northbound I-295 milepost 15.2 by month. While large portions of 2008 had no available data, the months with data generally showed little variation. The 3,136 large trucks on April 30, 2008 were the maximum recorded – a volume close to the daily mean in the opposing direction. An atypical high volume day in December 2008 can be seen at this location on the 18th of the month when over 3,000 large trucks were counted.

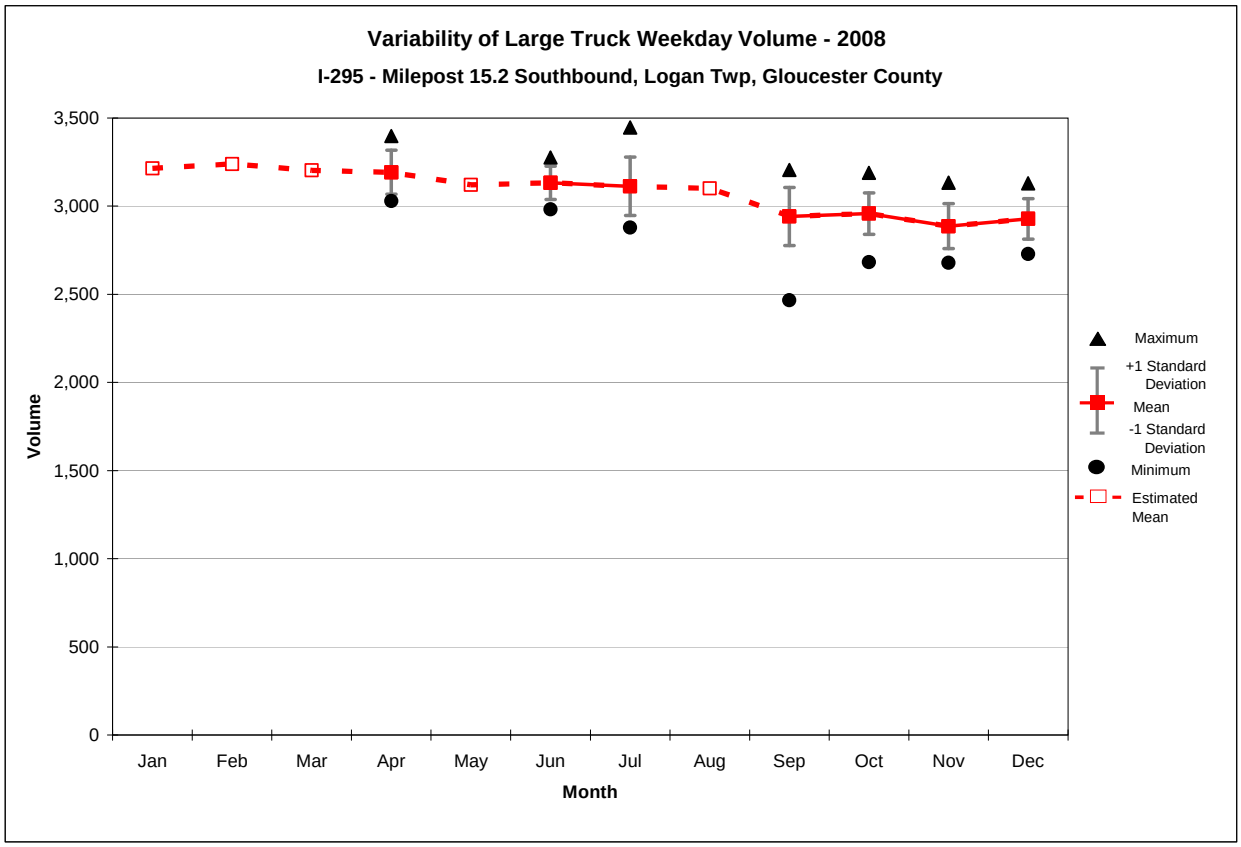

Figure 3B-295L: Variability of Large Truck Volume at Southbound I-295, MP 15.2
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at southbound I-295 milepost 15.2 is shown in **Figure 3B-295L**. The ranges are similarly tight as compared to the northbound direction. Here, 3.446 trucks crossed the WIM Station loop detectors on July 1, 2008 while only 2,466 were counted on September 11, 2008.

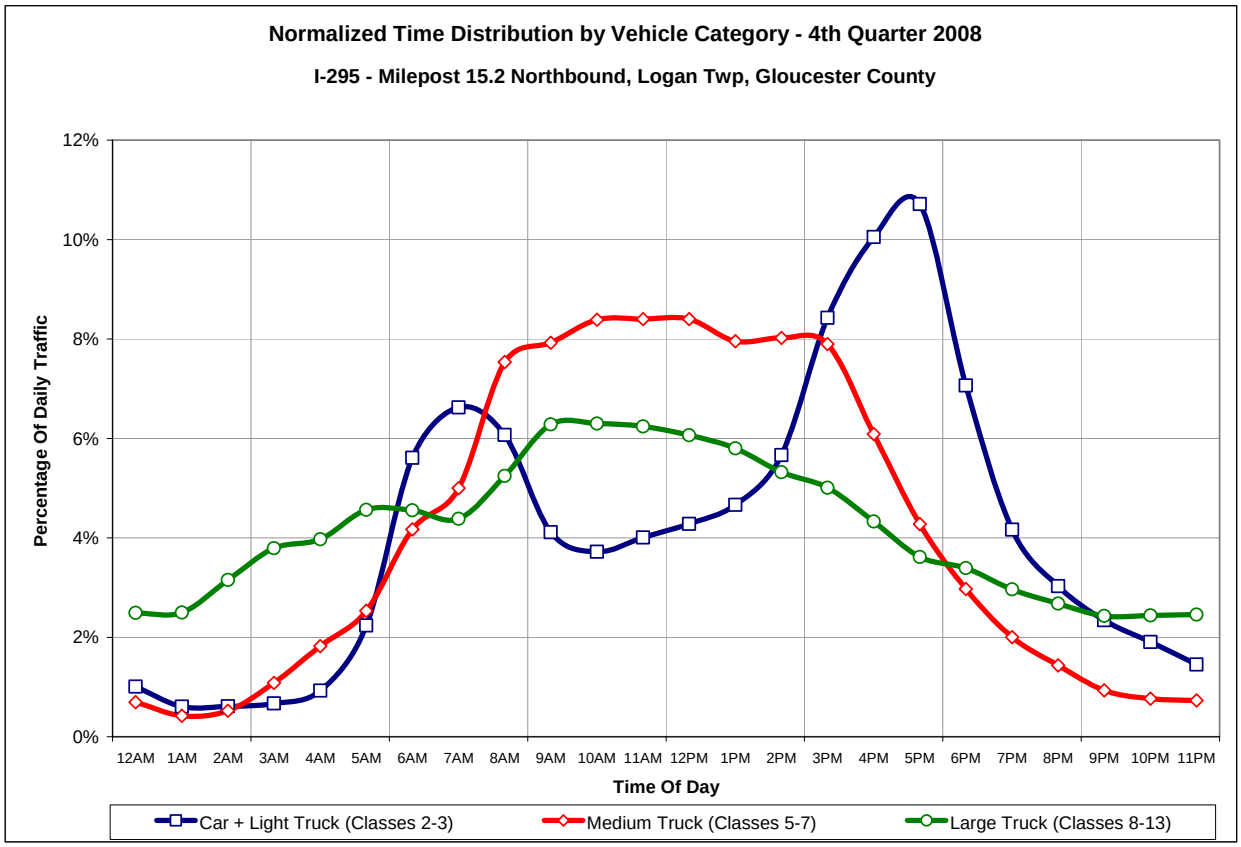

Figure 4A-295L: Daily Profile of Volume at Northbound I-295, MP 15.2

Figure 4A-295L shows the relative daily profile of traffic by vehicular category in the northbound direction at I-295 milepost 15.2 during the 4th quarter of 2008. As typical of most Profile 2 locations, large truck volume peaked during the late morning. Medium trucks followed a more peaked profile during the same time period. Auto volume followed a commuter route pattern with sharp peak during the 4:00 to 6:00 p.m. period with over 20% of daily auto volume.

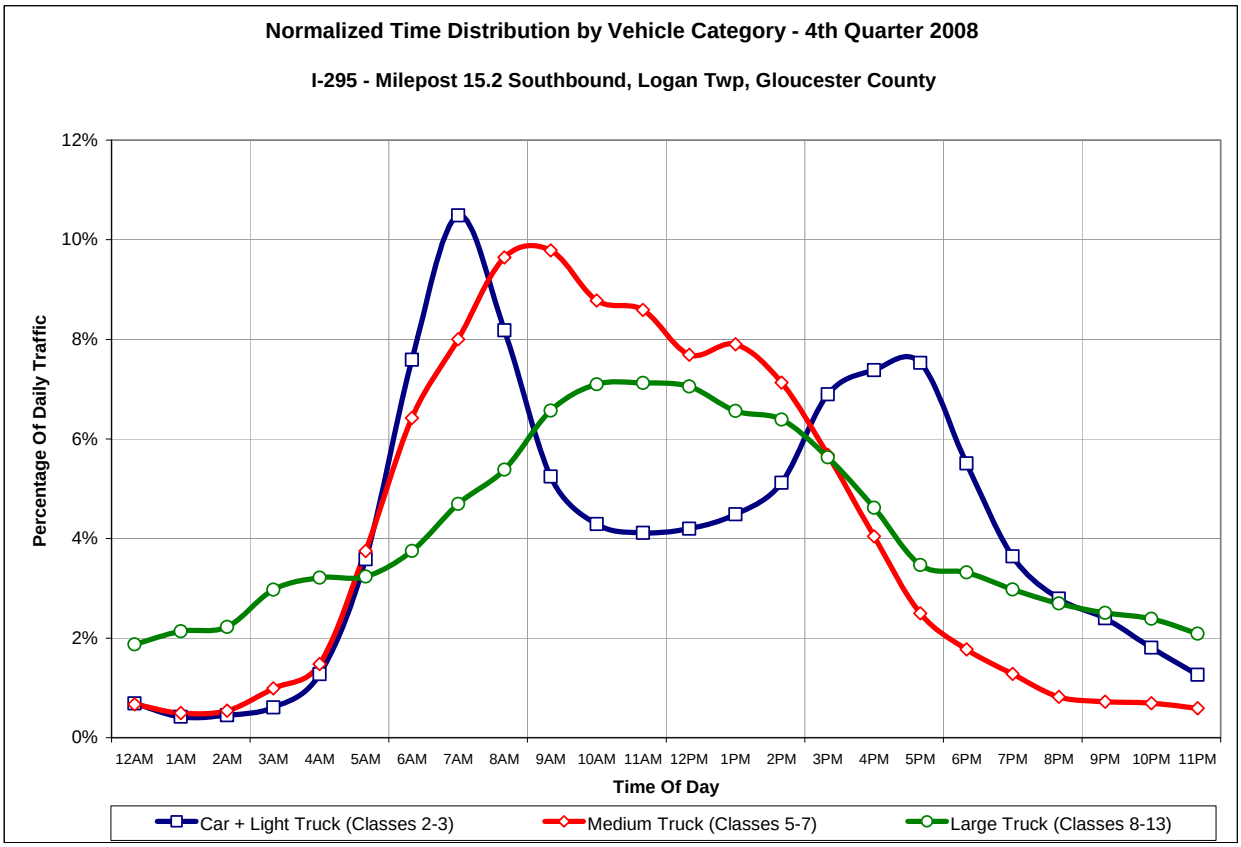

Figure 4B-295L: Daily Profile of Volume at Southbound I-295, MP 15.2

Figure 4B-295L shows the relative daily profile of traffic by vehicular category in the southbound direction at I-295 milepost 15.2 during the 4th quarter of 2008. The Profile 2 pattern of large truck volume peaked during midday as it did in the northbound direction. Medium truck volume peaked in the mid-morning and autos and light trucks were most prevalent between 7:00 to 8:00 a.m.

WIM Station 295C: I-295, MP 35.7

WIM Station 295C (a.k.a. I2C) is located at milepost 35.7 of Interstate 295 in Cherry Hill, Camden County between interchanges 34 (NJ 70) and 36 (NJ 73). At this location I-295 is a six-lane limited access Urban Interstate and is included in the National Network. **Figure 1-295C** shows the location and surrounding features. WIM data has been continuously recorded at this location since 2005 however there were periods of data unavailability throughout 2008.

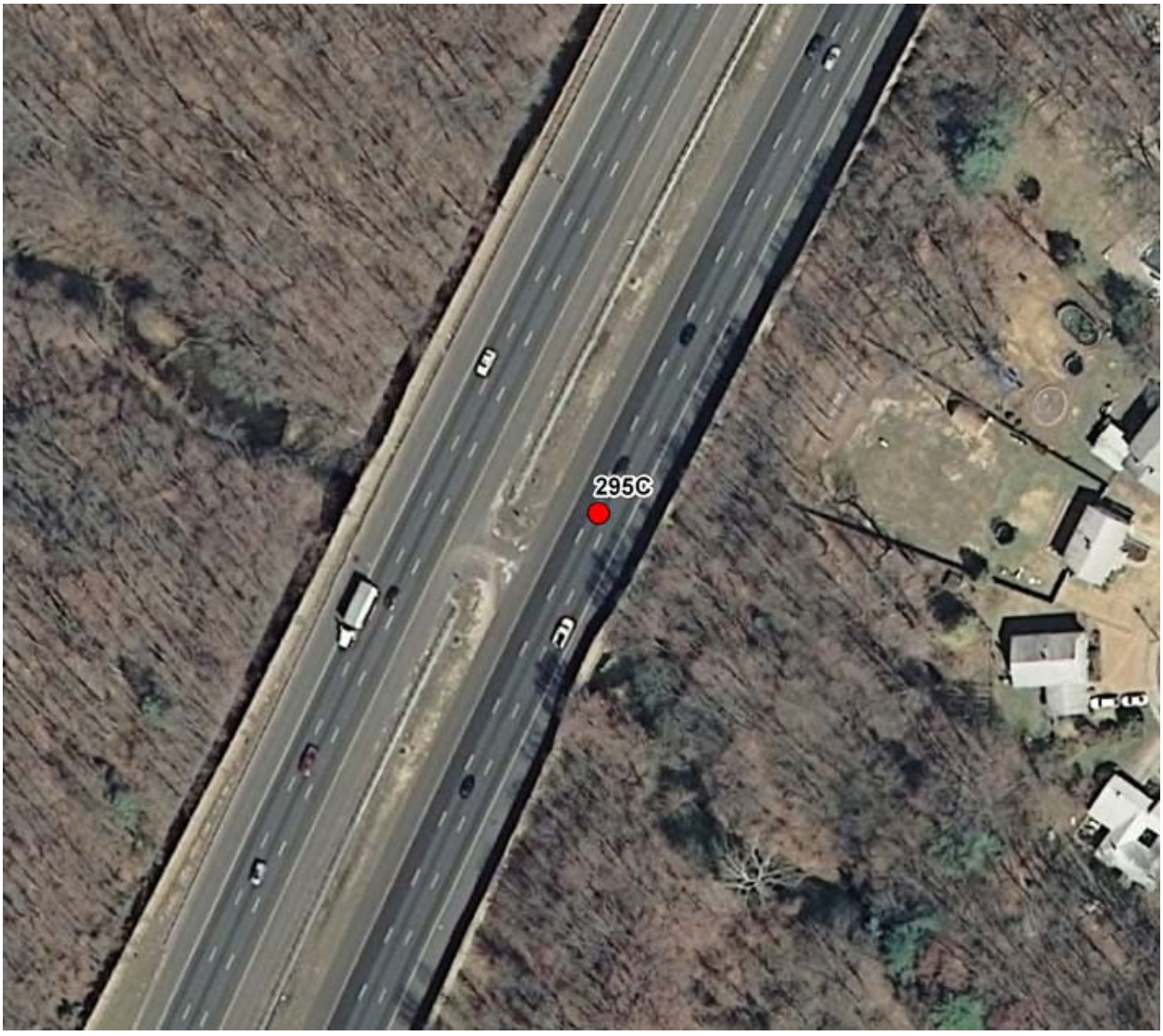

Figure 1-295C: Aerial View of WIM Station at I-295, MP 35.7

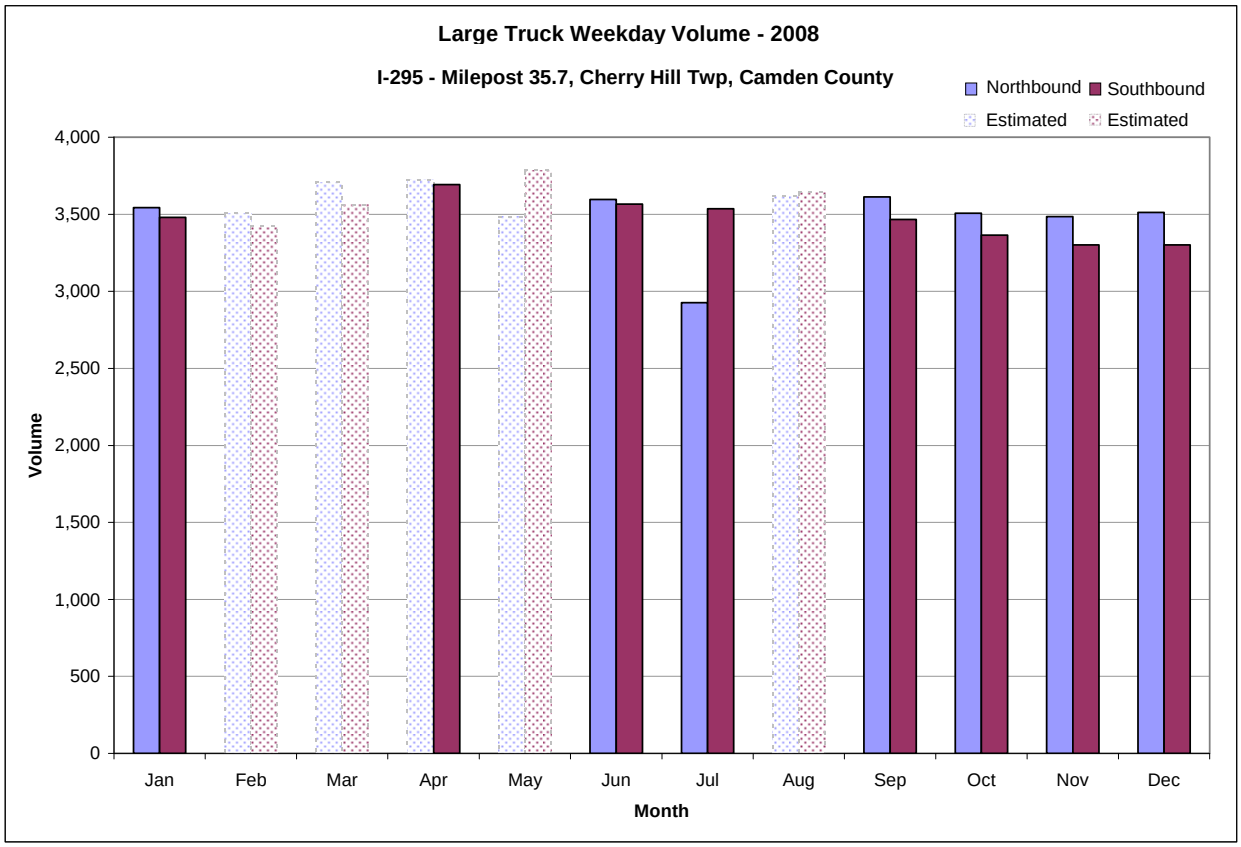

Figure 2-295C: Annual Profile of Large Truck Volume at I-295, MP 35.7
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-295C,** large truck weekday volume at I-295, milepost 15.2 declined from April through December 2008. In contrast with WIM data from 20 miles south on I-295, northbound volume marginally exceeded southbound in six of seven months where comparable data is available in 2008 at a daily rate of 100 large trucks. An unexpected drop in volume in July 2008 in the northbound direction corresponds to a comparable jump in the percentage of unclassified vehicles for that period.

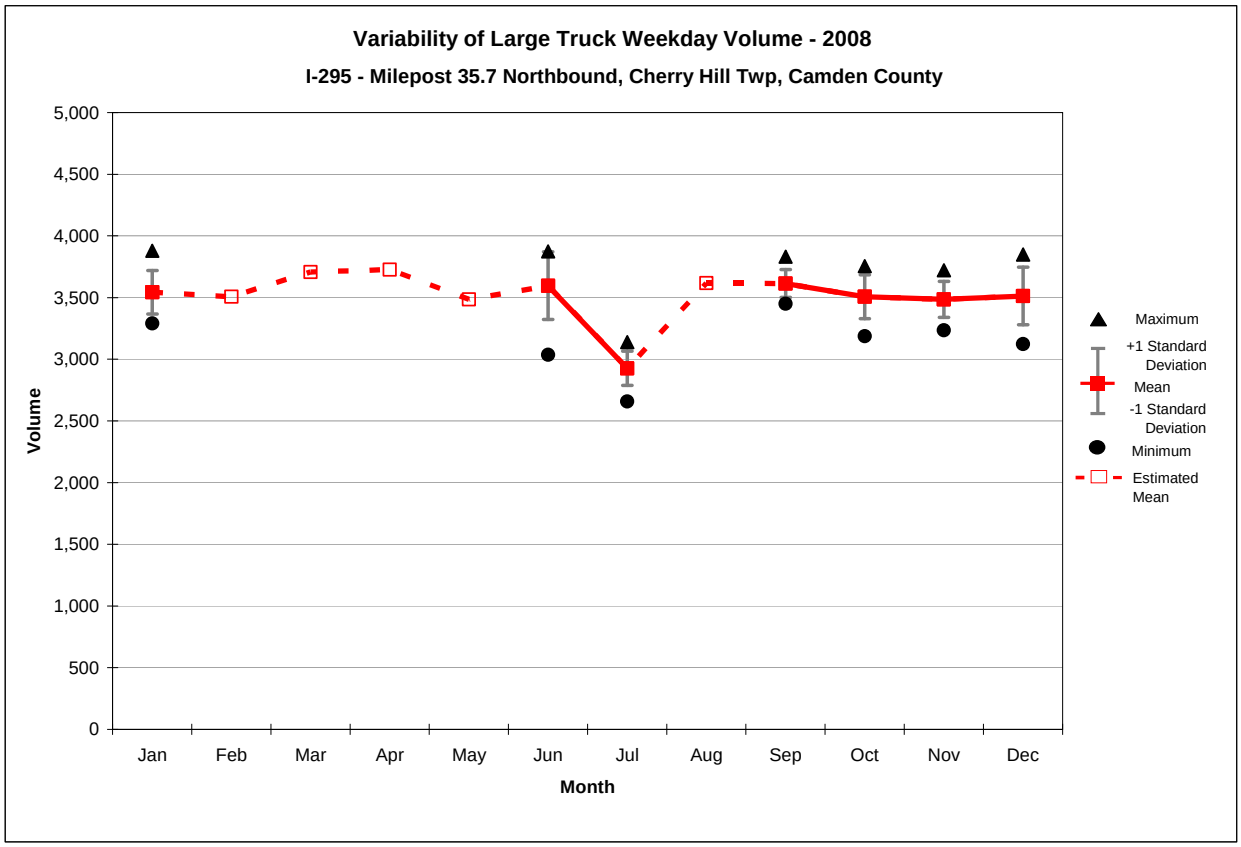

Figure 3A-295C: Variability of Large Truck Volume at Northbound I-295, MP 35.7
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3A-295C details the range of weekday large truck volume at northbound I-295 milepost 35.7. July 2008 variability was quite low as were the counted volume of classified trucks. The maximum during the month did not reach the mean volume of any other month with available data and the July 2008 mean was lower than any daily observation during the year outside of that month. A spike in unclassified vehicles during the month is likely to blame for the data aberration. During the course of the year, the maximum volume of 3,880 trucks occurred on January 9, 2008.

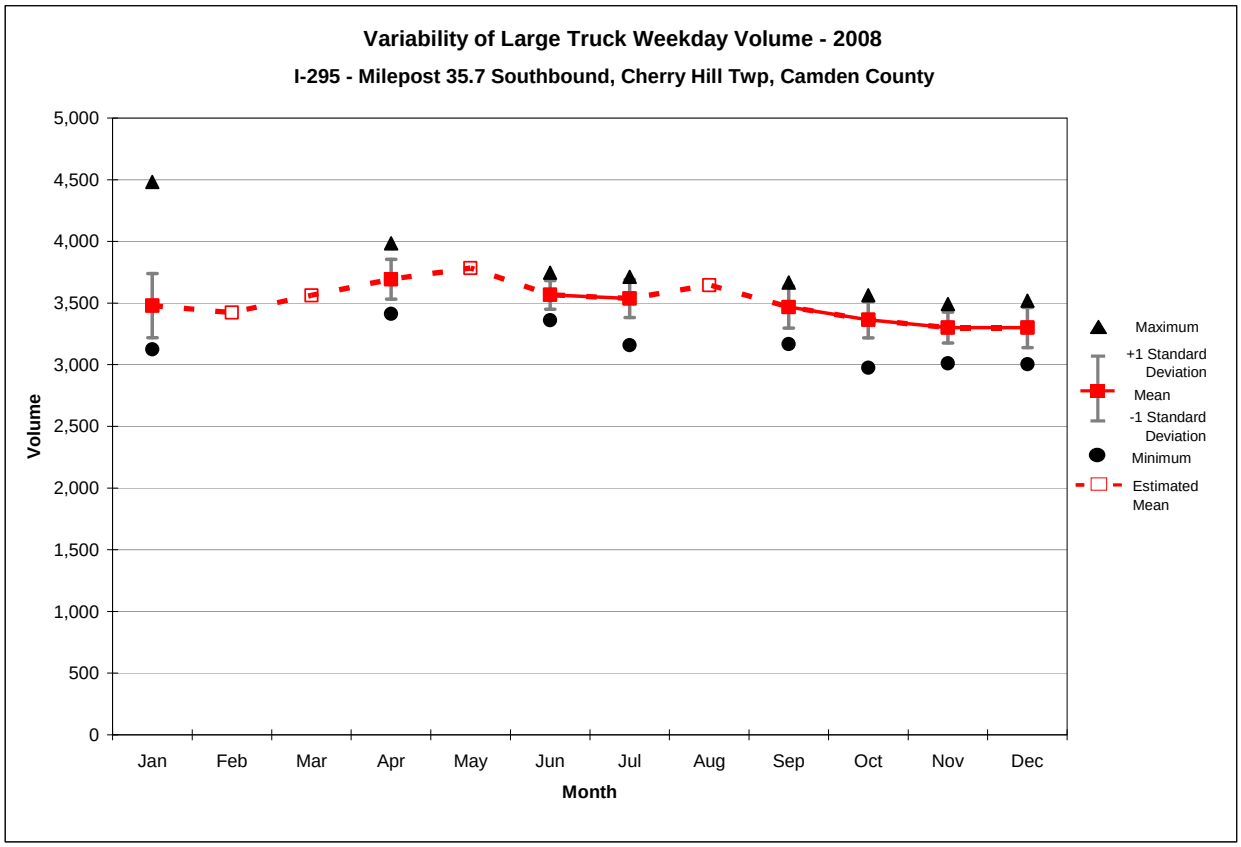

Figure 3B-295C: Variability of Large Truck Volume at Southbound I-295, MP 35.7
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at southbound I-295 milepost 35.7 is shown in **Figure 3B-295C**. The highest volume at this location, far outside the standard deviation, occurred one day prior to the maximum northbound volume. On January 8, 2008, 4,480 large trucks traversed this WIM Station – a higher volume than observed in any other month by 500 large trucks. Low variability was seen throughout the rest of the year.

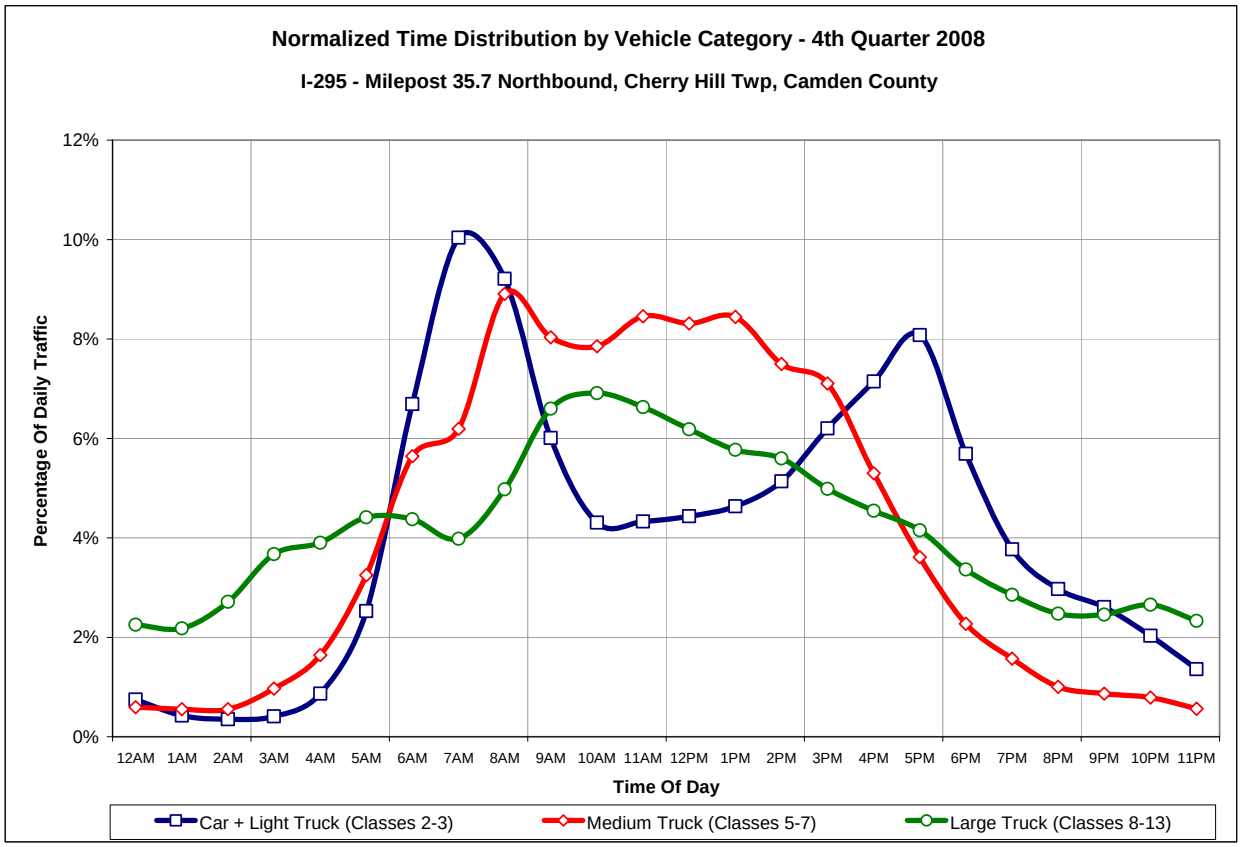

Figure 4A-295C: Daily Profile of Volume at Northbound I-295, MP 35.7

Figure 4A-295C shows the relative daily profile of traffic by vehicular category in the northbound direction at I-295 milepost 35.7 during the 4th quarter of 2008. The large truck volume peaked between 9:00 a.m. and 12:00 p.m. and demonstrates a Profile 2 pattern. Auto volume followed a typical commuter route pattern with highest peak during the 7.00 to 8.00 a.m. period and a lesser peak during the 5:00 to 6:00 p.m. period.

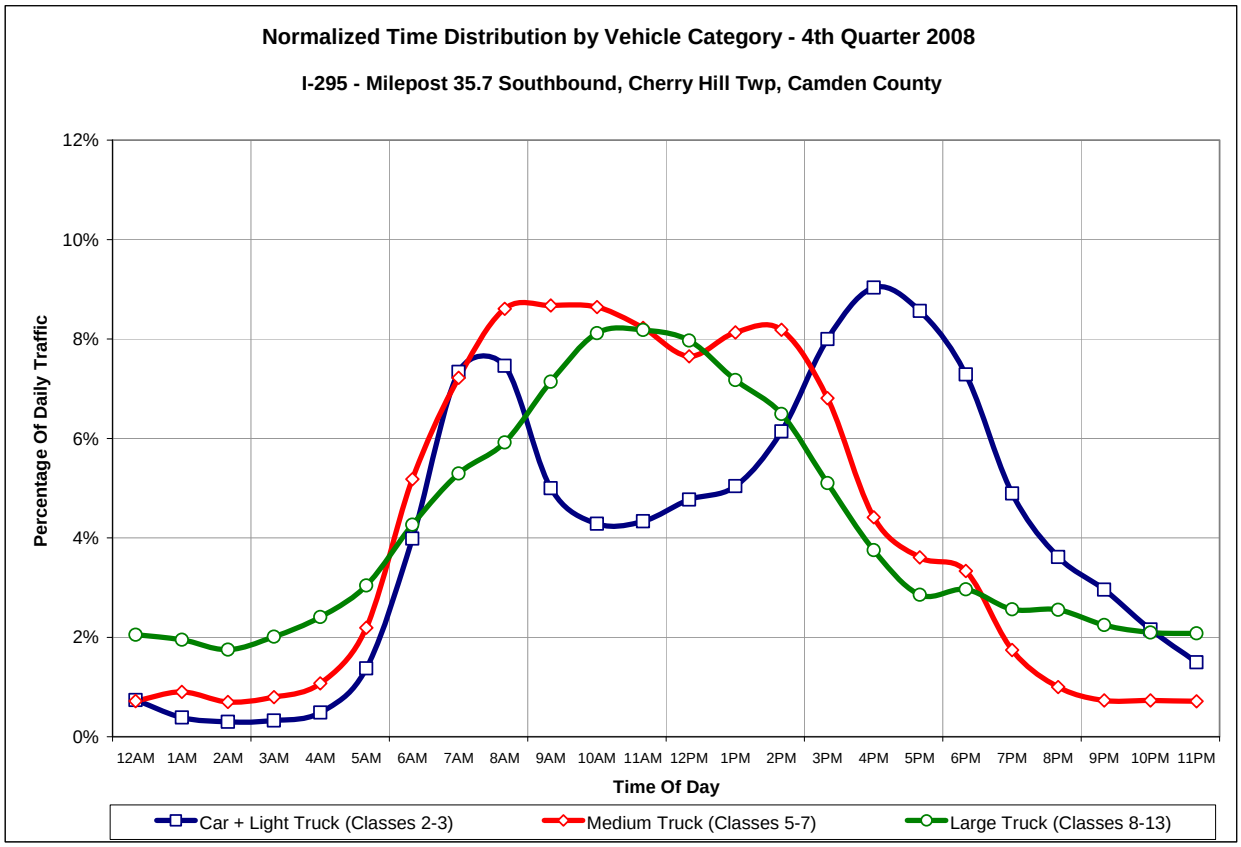

Figure 4B-295C: Daily Profile of Volume at Southbound I-295, MP 35.7

Figure 4B-295C shows the relative daily profile of traffic by vehicular category in the southbound direction at I-295 milepost 35.7 during the 4th quarter of 2008. Although exhibiting a higher kurtosis than the northbound direction with over 24% of all large truck traffic between 10:00 a.m. and 1:00 p.m., the pattern is still characteristic of Profile 2. Medium trucks followed a midday peak while cars and light trucks were observed during both standard commuter peak periods.

WIM Station 295: I-295, MP 39.6

WIM Station 295 is located at milepost 39.6 of Interstate 295 in Mt. Laurel, Burlington County between interchanges 36 (NJ 73) and 40 (NJ 38). At this location I-295 is a six-lane limited access Urban Interstate and is included in the National Network. **Figure 1-295** shows the location and surrounding features. WIM data has been continuously recorded at this location since 2005 however there were only eight months of data available in 2008.

Figure 1-295: Aerial View of WIM Station at I-295, MP 39.6

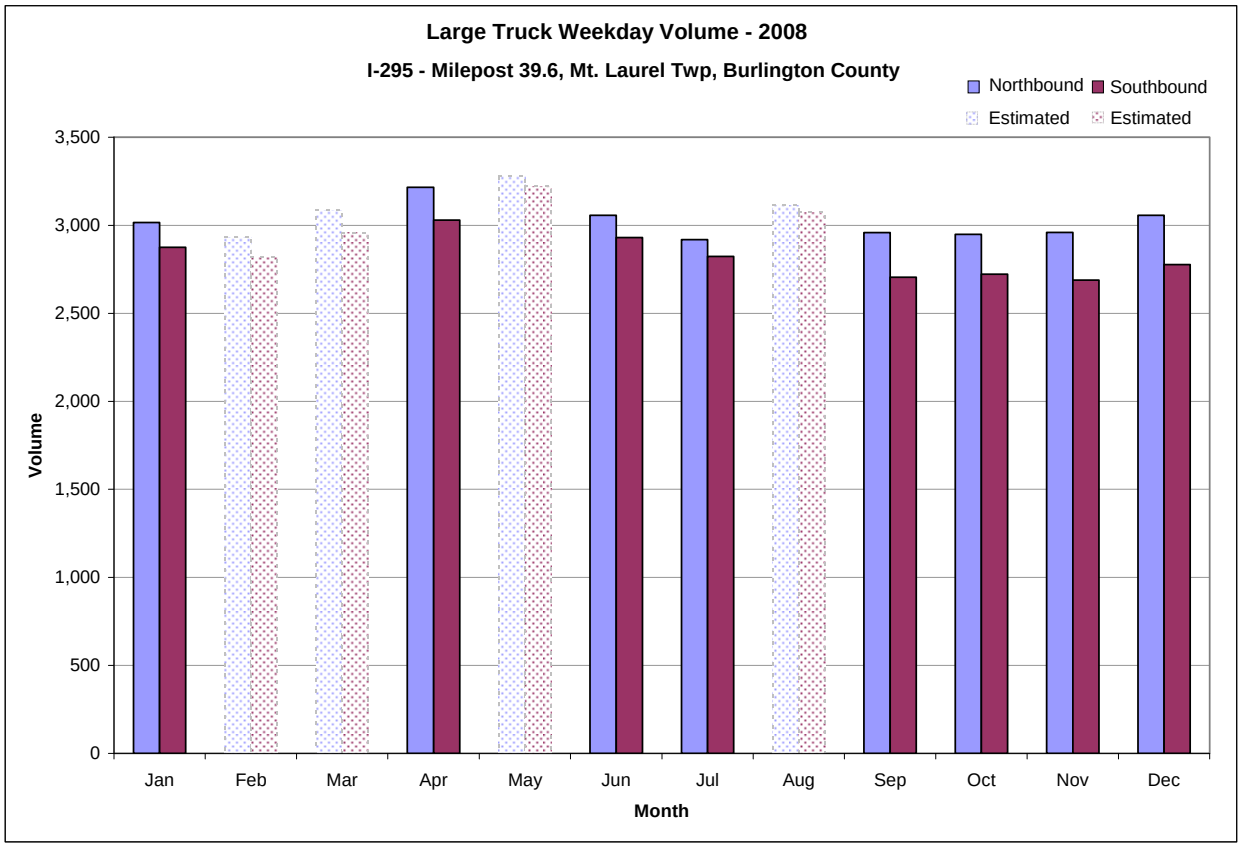

Figure 2-295: Annual Profile of Large Truck Volume at I-295, MP 39.6
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-295,** large truck weekday volume at I-295, milepost 39.6 declined from April through December 2008. Northbound volume exceeded southbound volume by an average of 196 large trucks per weekday, or 7%.

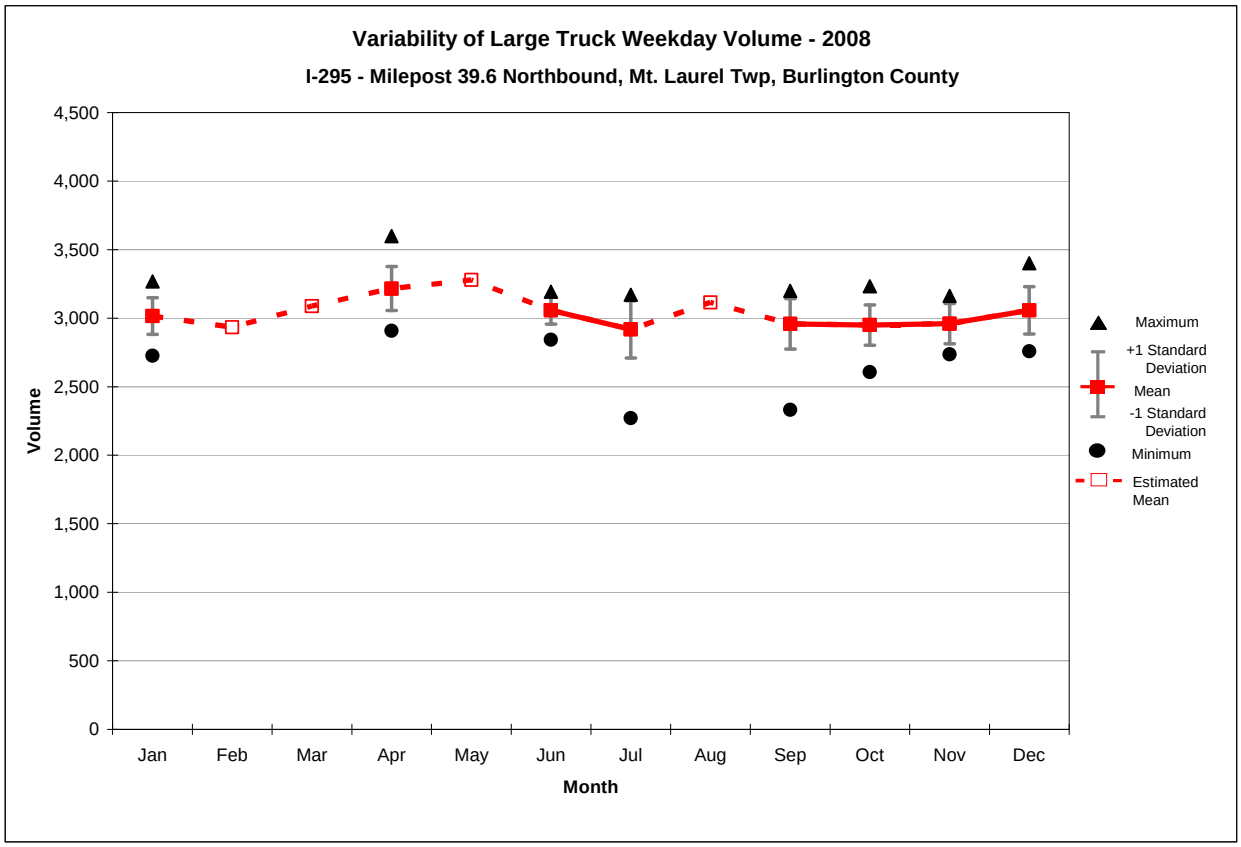

Figure 3A-295: Variability of Large Truck Volume at Northbound I-295, MP 39.6
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at northbound I-295 milepost 39.6 is shown in **Figure 3A-295**. As with other locations on I-295, low variability characterized most monthly data sets. Some 3,600 large trucks were counted at this location on April 23, 2008 while just 2,270 were counted on July 30, 2008.

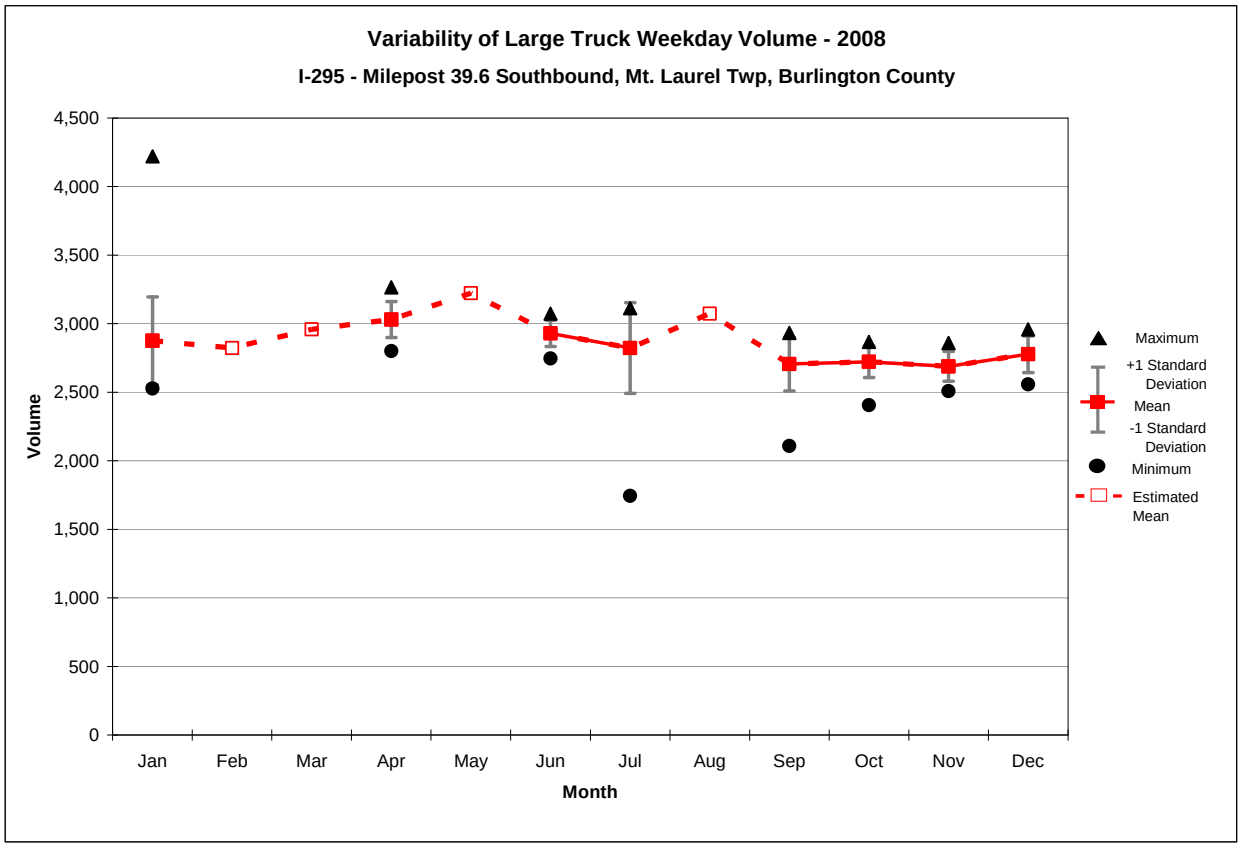

Figure 3B-295: Variability of Large Truck Volume at Southbound I-295, MP 39.6
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3B-295 depicts the range of weekday large truck volume at southbound I-295 milepost 39.6. January and July marked high variability marks due to atypical count occurrences. January 8, 2008 was a true aberration as 4,220 large trucks were observed at this location – far exceeding the typical one day total by some 50%. This is the same day that the maximum volume occurred at I-295 milepost 35.7. Just as in the northbound direction, a low point was reached on July 30, 2008 when an extreme of just 1,745, or 62% of the annual mean, were counted.

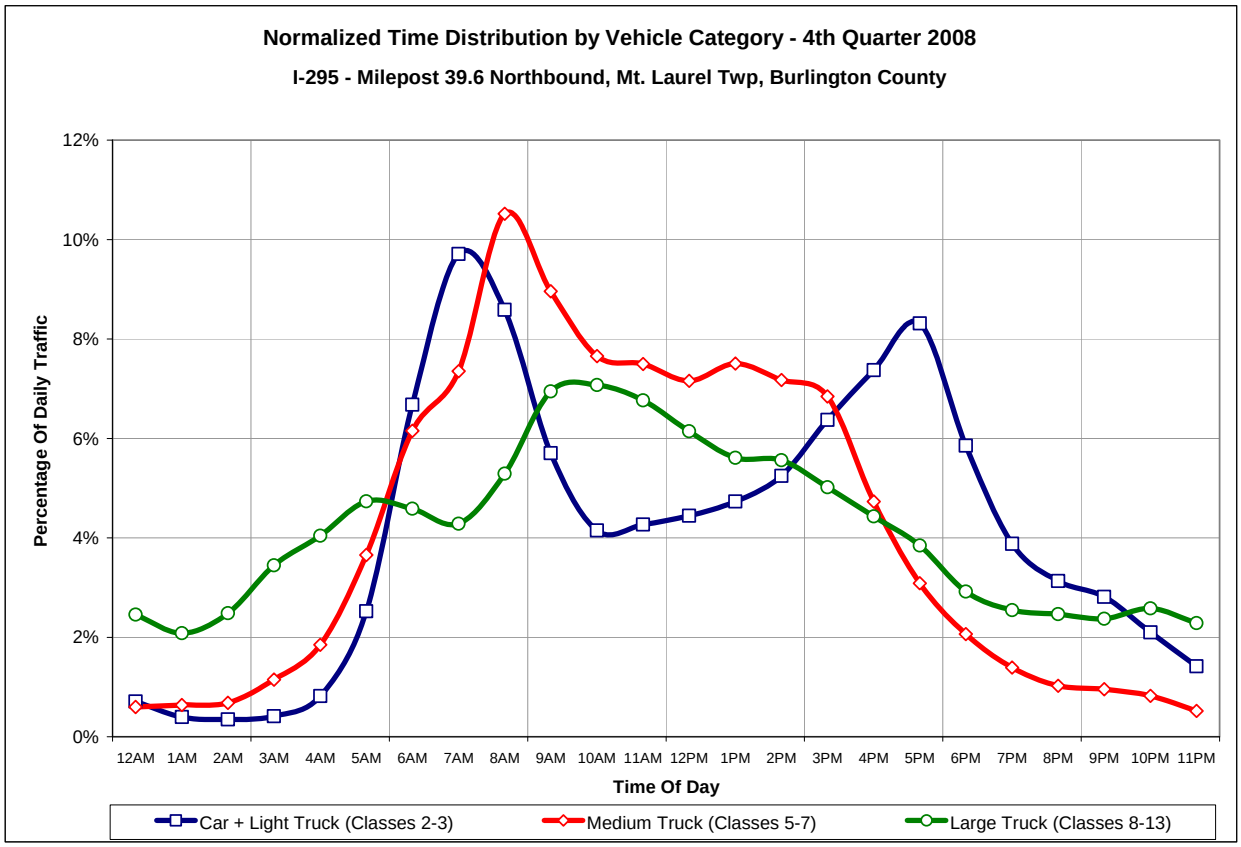

Figure 4A-295: Daily Profile of Volume at Northbound I-295, MP 39.6

Figure 4A-295 shows the relative daily profile of traffic by vehicular category in the northbound direction at I-295 milepost 39.6 during the 4th quarter of 2008. The large truck volume is typical of Profile 2 and peaked between 9:00 a.m. and 12:00 p.m. Medium trucks peaked sharply for the hour beginning at 8:00 a.m. Autos peaked during the typical commuter time periods.

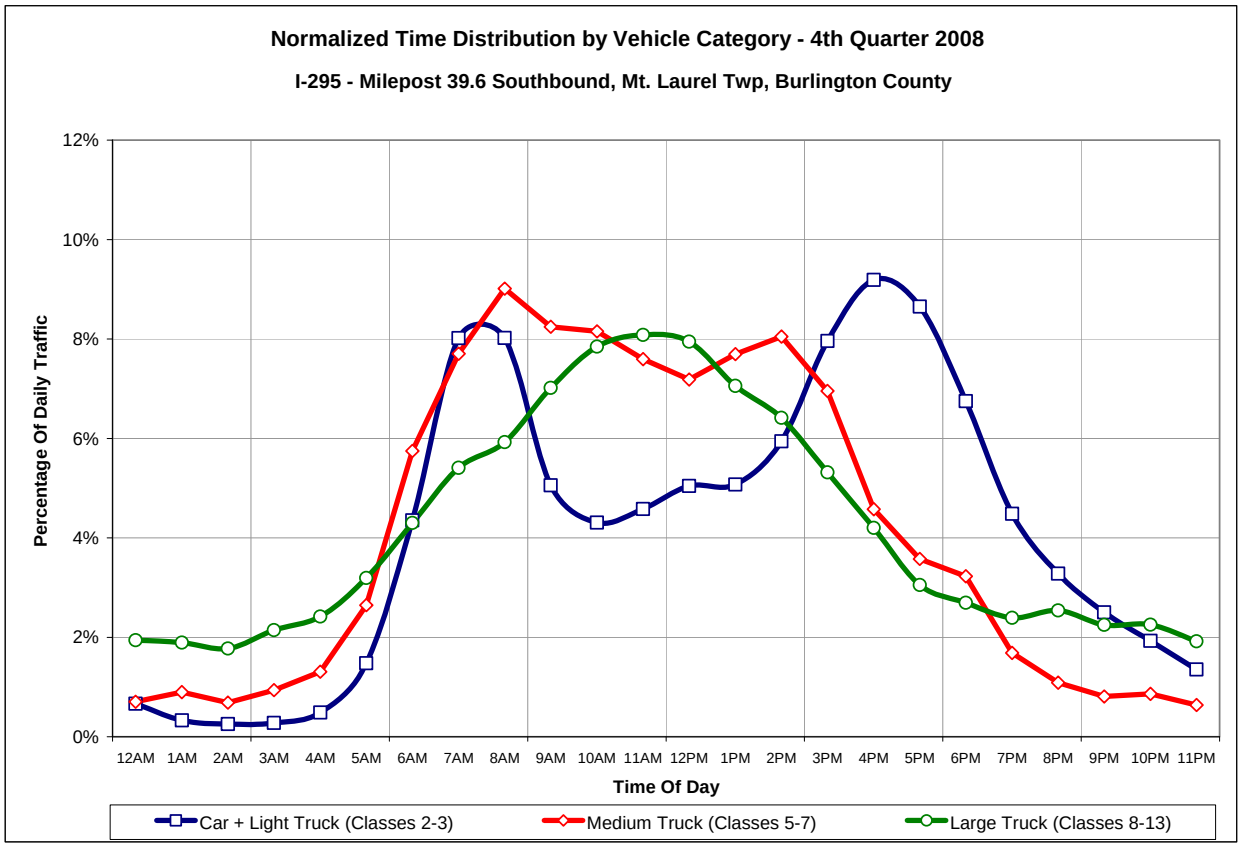

Figure 4B-295: Daily Profile of Volume at Southbound I-295, MP 39.6

Figure 4B-295 shows the relative daily profile of traffic by vehicular category in the southbound direction at I-295 milepost 39.6 during the 4th quarter of 2008. The large truck volume peaked somewhat later and more intensely in this direction of travel compared to northbound but would also be categorized as Profile 2. Autos and light trucks peaked during the mid morning and late afternoon.

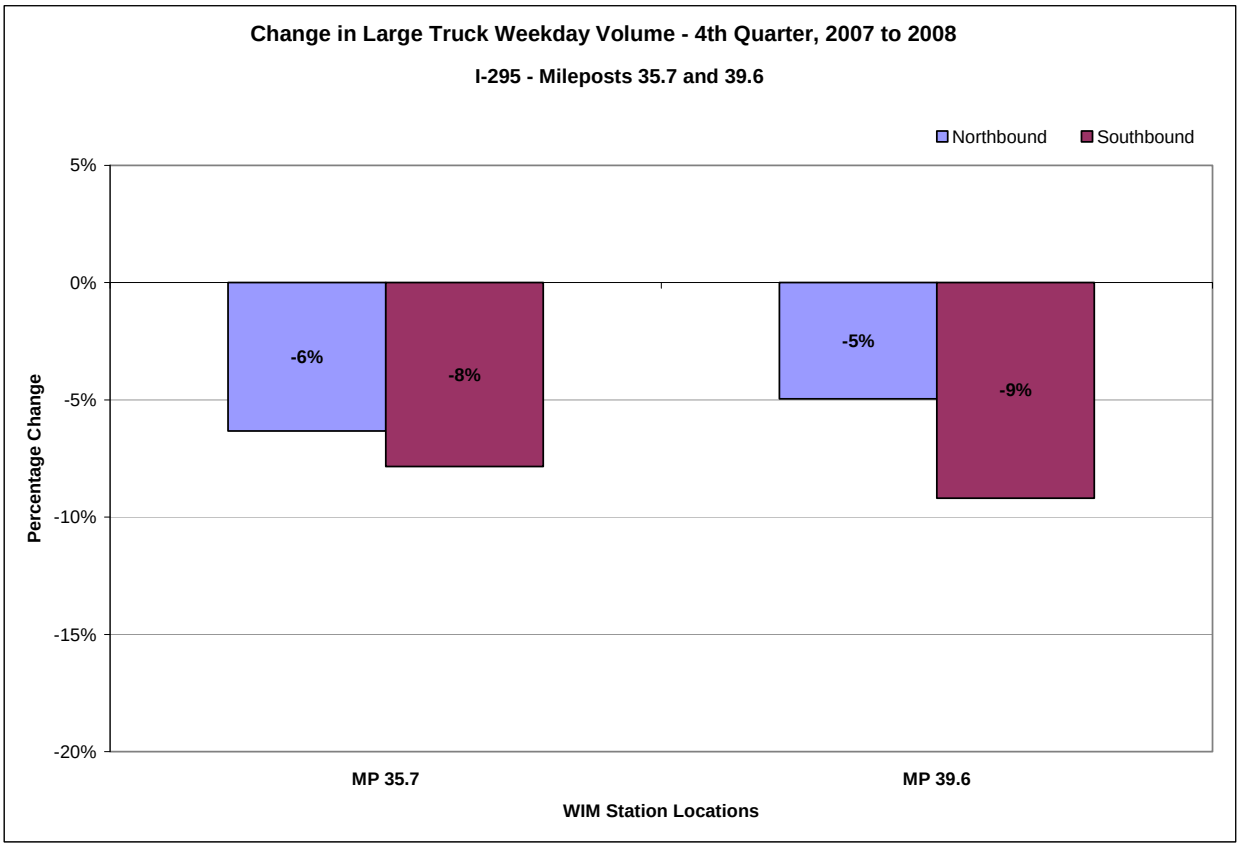

Figure 5-I1295: Change in Large Truck Volume on I-295 – 4th Quarter 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

As shown in **Figure 5-I295**, large truck volume on I-295 declined moderately at both WIM Station locations where data was available between the 4th quarter of 2007 and 2008. The decline was greater in the southbound direction which may have contributed to the uniformly lower weekday totals in that direction.

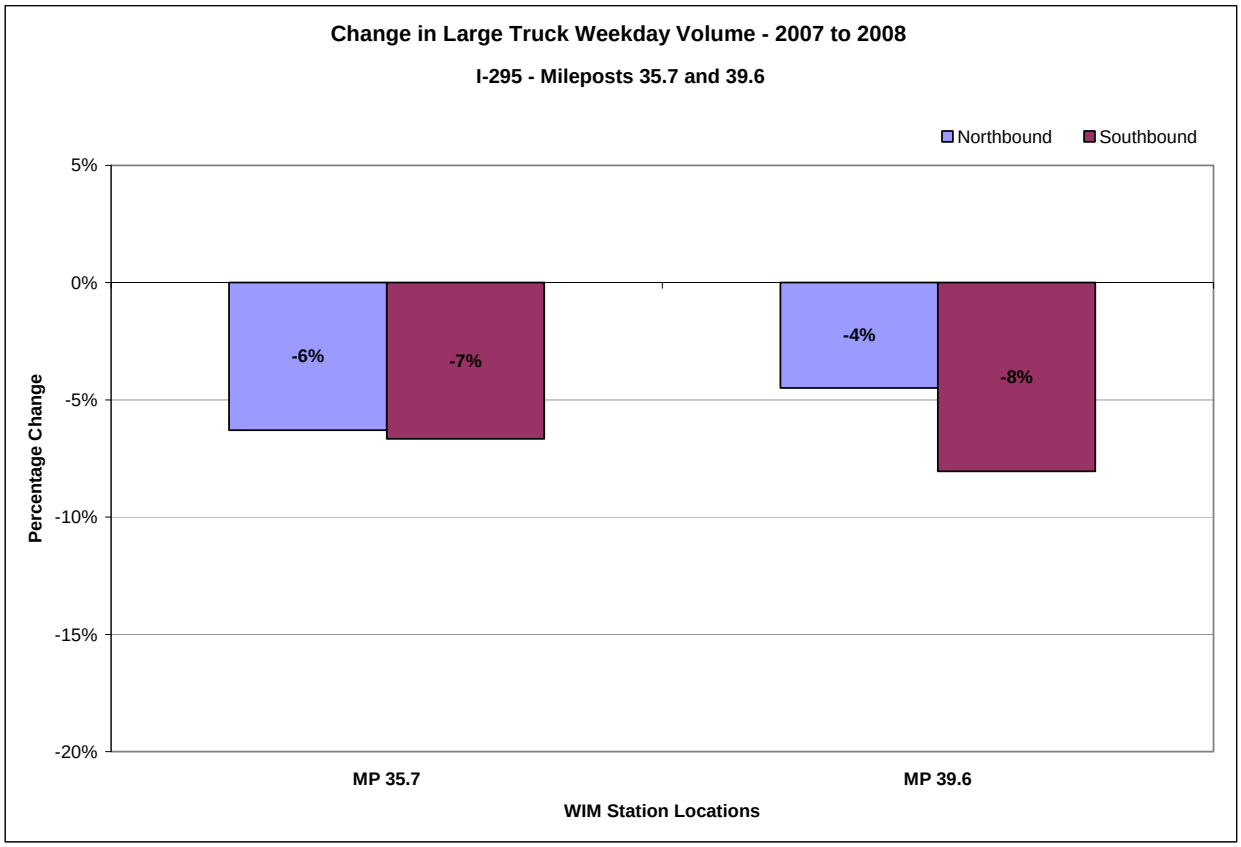

Figure 6-I1295: Change in Large Truck Volume on I-295 – 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

Figure 6-I295 shows the year to year change in large truck volume on I-295 between 2007 and 2008. Moderate declines were experienced at both milepost 35.7 and 39.6 in north- and southbound directions.

New Jersey Turnpike, Between Interchanges 1 and 2

The section between Interchanges 1 (toll plaza at southern terminus) and 2 (US 322) of the New Jersey Turnpike (NJ 700) is located between mileposts 2.4 and 13.0 and includes Carneys Point, Oldmans, and Pilesgrove, Salem County and Woolwich, Gloucester County. Through this section, the New Jersey Turnpike is classified as a four-lane limited access Rural Principal Arterial and is included in the National Network. **Figure 1-700_1-2** shows the configuration of a typical stretch of the New Jersey Turnpike between Interchanges 1 and 2. Monthly data at this location comes from the New Jersey Turnpike Authority (NJTA) and was not stratified by hour or day.

Figure 1-700_1-2: Aerial View of the New Jersey Turnpike Between Interchanges 1 and 2

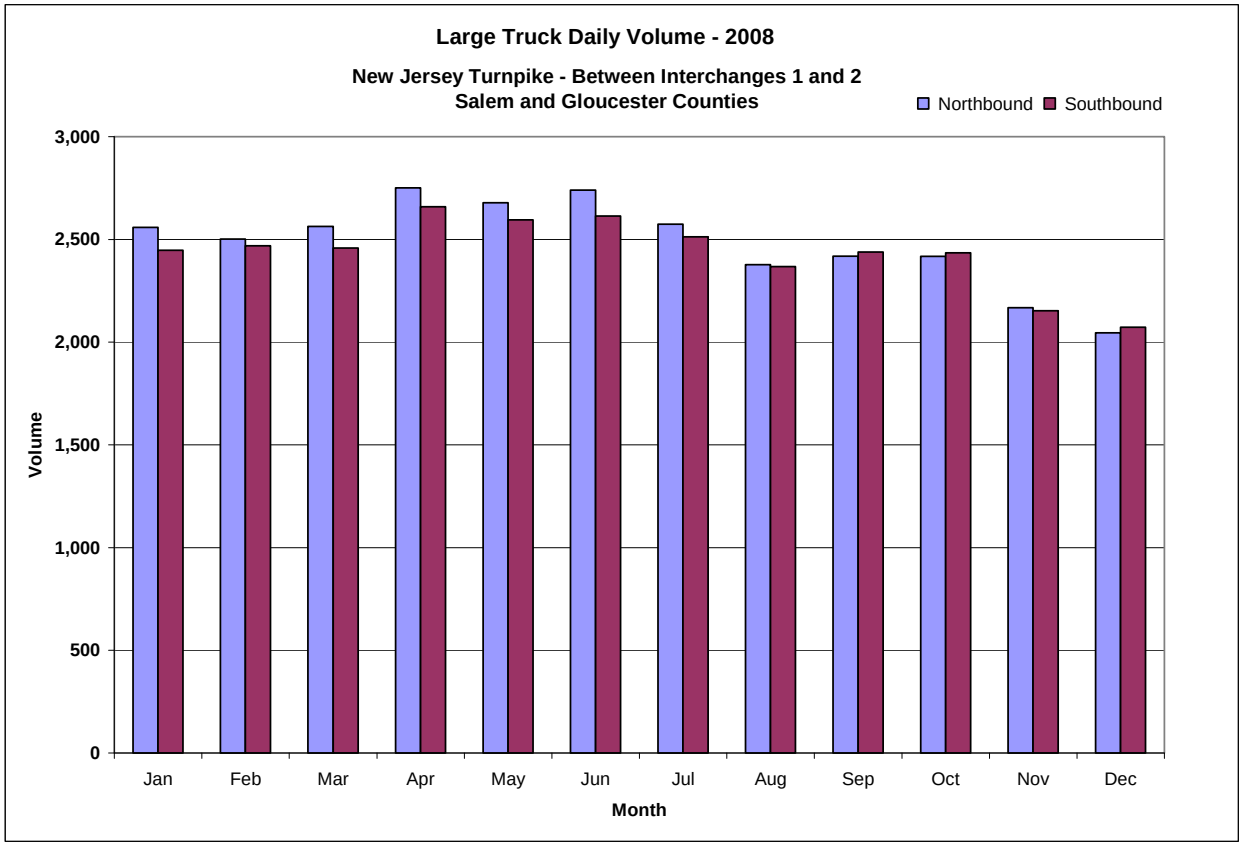

Figure 2-700_1-2: Annual Profile of Large Truck Volume on the New Jersey Turnpike Between Interchanges 1 and 2

Notes: Large Trucks defined as trucks with five or more axles. Holidays and weekend are included.

As shown in **Figure 2-700_1-2**, the daily large truck volume on the New Jersey Turnpike between Interchanges 1and 2 was slightly larger in the northbound direction for the first half of 2008 and roughly comparable for the latter half of the year. This trend is in contrast to the consistent southbound inclination observed at the two more northern analysis locations on the New Jersey Turnpike. The large truck volume was largest during the 2nd quarter of 2008 and declined through the remainder of the year. A significant reduction in the ADT is shown in November and December 2008 due to very low volume holidays during those months being part of the data set.

New Jersey Turnpike, Between Interchanges 7A and 8

The section between Interchanges 7A (I-195) and 8 (NJ 33) of the New Jersey Turnpike (Interstate 95) is located between mileposts 15.15 and 22.21 (I-95 mileposting) and traverses Robbinsville and East Windsor, Mercer County. Through this section, the New Jersey Turnpike/I-95 is a six-lane limited access Interstate with alternating Rural and Urban designations and is included in the National Network. **Figure 1-95_7A-8** shows the configuration of a typical stretch of the New Jersey Turnpike/I-95 between Interchanges 7A and 8. Monthly data at this location comes from the NJTA and was not stratified by hour or day.

Figure 1-95_7A-8: Aerial View of the New Jersey Turnpike Between Interchanges 7A and 8

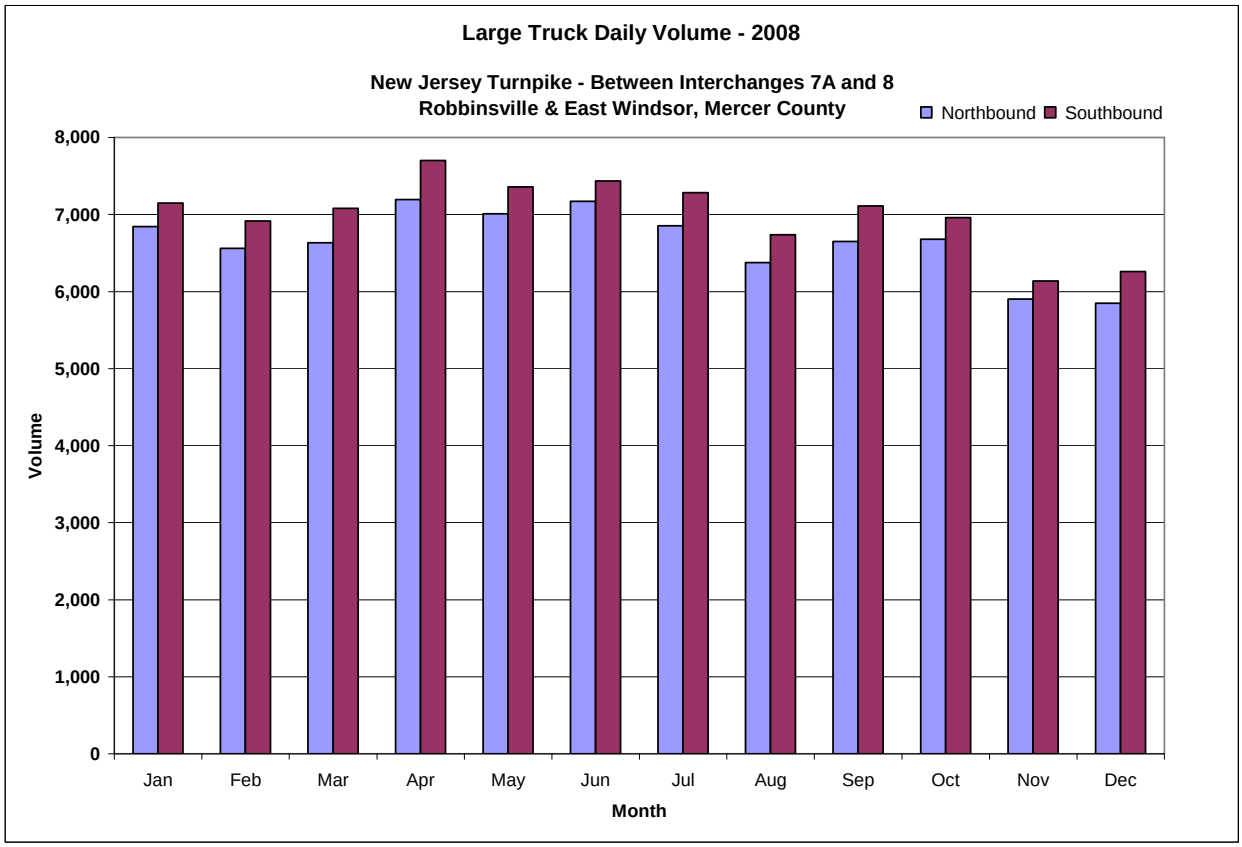

Figure 2-95_7A-8: Annual Profile of Large Truck Volume on the New Jersey Turnpike Between Interchanges 7A and 8

Notes: Large Trucks defined as trucks with five or more axles. Holidays and weekend are included.

As shown in **Figure 2-95_7A-8,** it was observed that the daily large truck volume on the New Jersey Turnpike between Interchanges 7A and 8 in the southbound direction was consistently 4% to 7% higher than the northbound direction throughout 2008. As also seen between Interchanges 1 and 2, the large truck volume was largest in the months of April, May and June when the average exceeded 7,000 in both directions. Since holidays were included in the data set, November and December show a deflated ADT.

New Jersey Turnpike, Between Interchanges 13 and 13A

The New Jersey Turnpike (Interstate 95) between Interchanges 13 (I-278) and 13A (NJ 81) is located between mileposts 54.01 and 56.16 (I-95 mileposting) in Elizabeth, Union County. Through this section, the New Jersey Turnpike/I-95 is a 14-lane dual carriageway (six auto-exclusive, eight off-peak unrestricted) limited access Urban Interstate and is included in the National Network. **Figure 1-95_13-13A** shows the configuration of a typical stretch of the New Jersey Turnpike/I-95 between Interchanges 13 and 13A. Monthly data at this location comes from the NJTA and was not stratified by hour or day.

Figure 1-95_7A-8: Aerial View of the New Jersey Turnpike Between Interchanges 13 and 13A

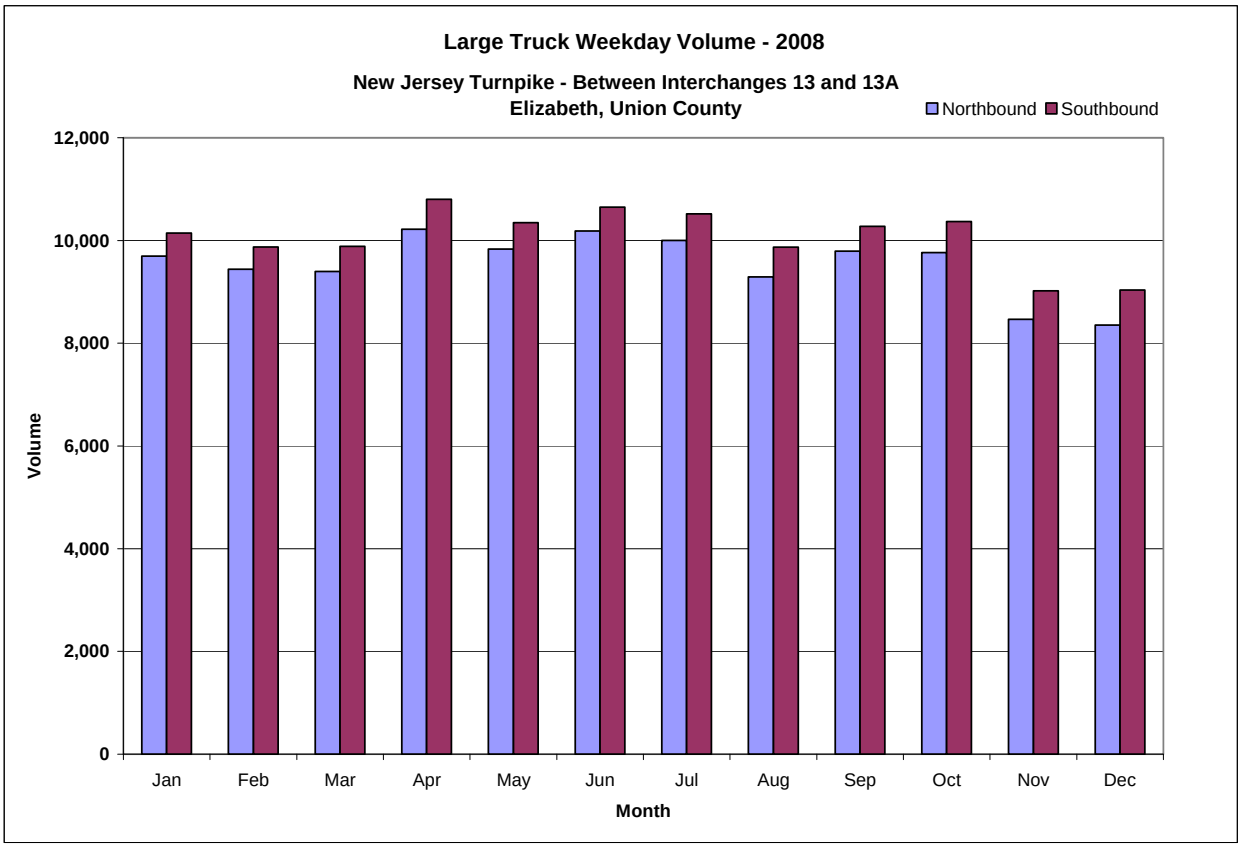

Figure 2-95_13-13A: Annual Profile of Large Truck Volume on the New Jersey Turnpike Between Interchanges 13 and 13A

Notes: Large Trucks defined as trucks with five or more axles. Holidays and weekend are included.

As shown in **Figure 2-95_13-13A**, the daily large truck volume between Interchanges 13 and 13A of the New Jersey Turnpike was approximately 10,000 per direction through most of 2008. The heavier large truck volume in the southbound direction, as was seen with the New Jersey Turnpike section to the south that was discussed earlier, is slightly more pronounced at this section where the volume was 5% to 8% greater than northbound in each month. Consistent at all three New Jersey Turnpike analysis locations, the highest volumes were seen between April and July 2008. A maximum ADT of 10,804 was observed southbound during April 2008 which substantially exceeds the highest WIM station count on I-78. As with other toll agency data, weekend and holiday data skew the results and may explain the lower ADT in November (Thanksgiving plus five weekends), December (Christmas), March and August (five-weekend months) in 2008.

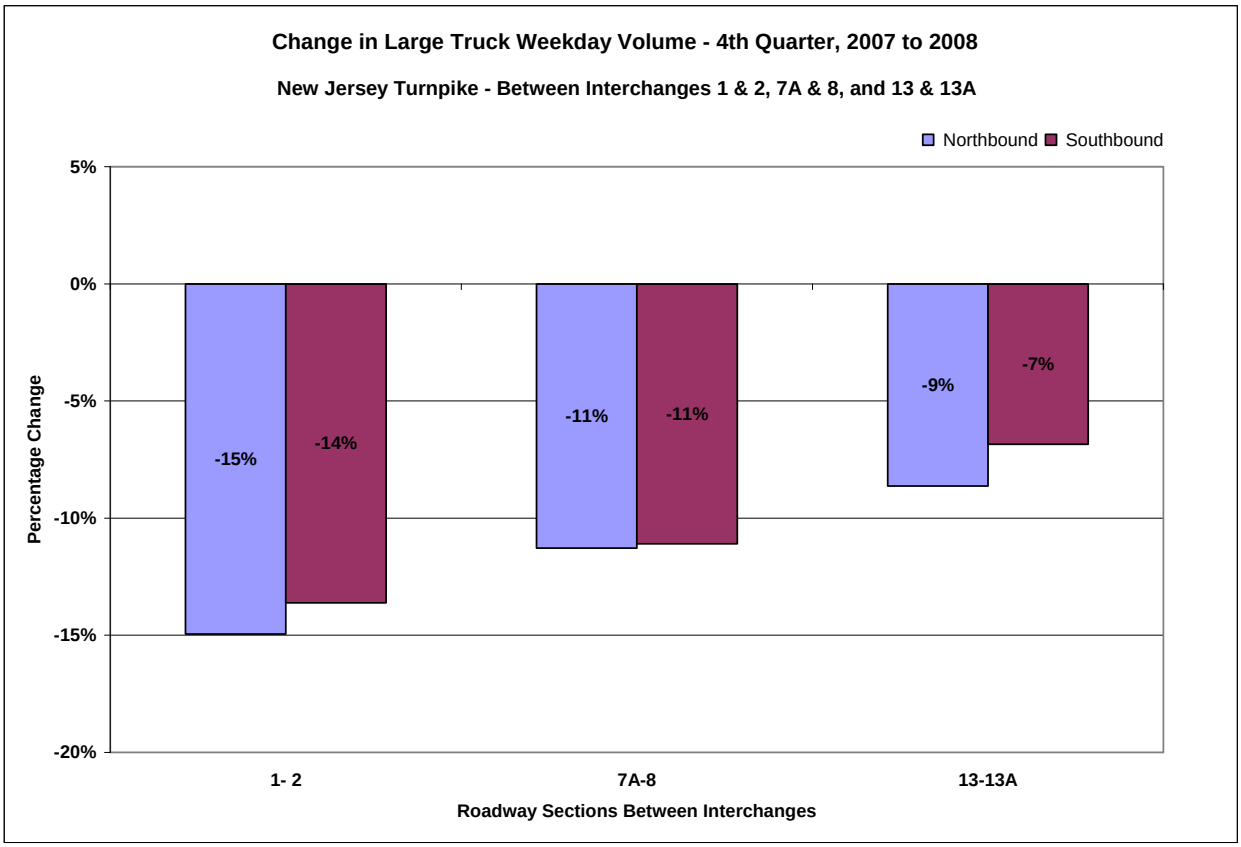

Figure 5-NJTP: Change in Large Truck Volume on the New Jersey Turnpike – 4th Quarter 2007 to 2008

As shown in **Figure 5-NJTP**, large truck volume on the New Jersey Turnpike declined measurably at the three analyzed roadway sections between the 4th quarter of 2007 and 2008. The decline was largest in the southern portion of the toll road between Interchanges 1 and 2 and less severe as travel moved north. Northbound declines were slightly larger than southbound at the three sections exacerbating the directional imbalance at the two northern sections. The absolute losses were greatest in both directions in central New Jersey and northbound in Union County where roughly 800 large trucks were removed from the highway.

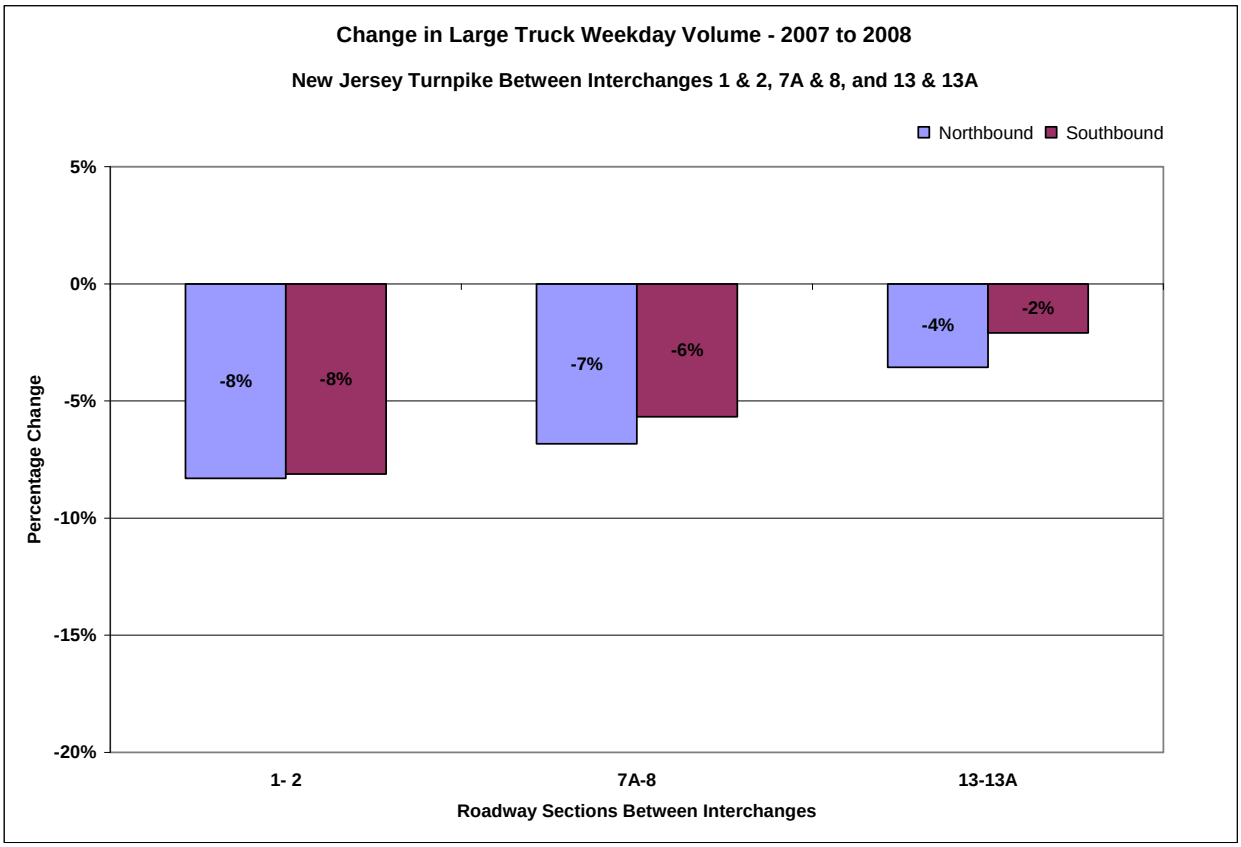

Figure 6-NJTP: Change in Large Truck Volume on the New Jersey Turnpike – 2007 to 2008

As shown in **Figure 6-NJTP**, large truck volume on the New Jersey Turnpike declined at all three analyzed roadway link segments between 2007 and 2008. As was seen in the 4th quarter comparison, the decline was largest in the most southerly section and smallest in the northern New Jersey section from a percent change perspective. The northbound large truck loss was greater than the southbound in each location contributing to the southbound large truck volume advantage at the two northern sections. The greatest absolute losses were observed at the section between Interchanges 7A and 8.

WIM Station 001: US 1, MP 12.9

WIM Station 001 is located at milepost 12.9 of US Route 1 in Plainsboro, Middlesex County at the interchange with Forrestal Road. At this location US 1 is a six-lane limited access divided Urban Principal Arterial and is included in the New Jersey Access Network. **Figure 1-001** shows the location and surrounding features. WIM data has been continuously recorded at this location for three years however limited data was available for 2008.

Figure 1-001: Aerial View of WIM Station at US 1, MP 12.9

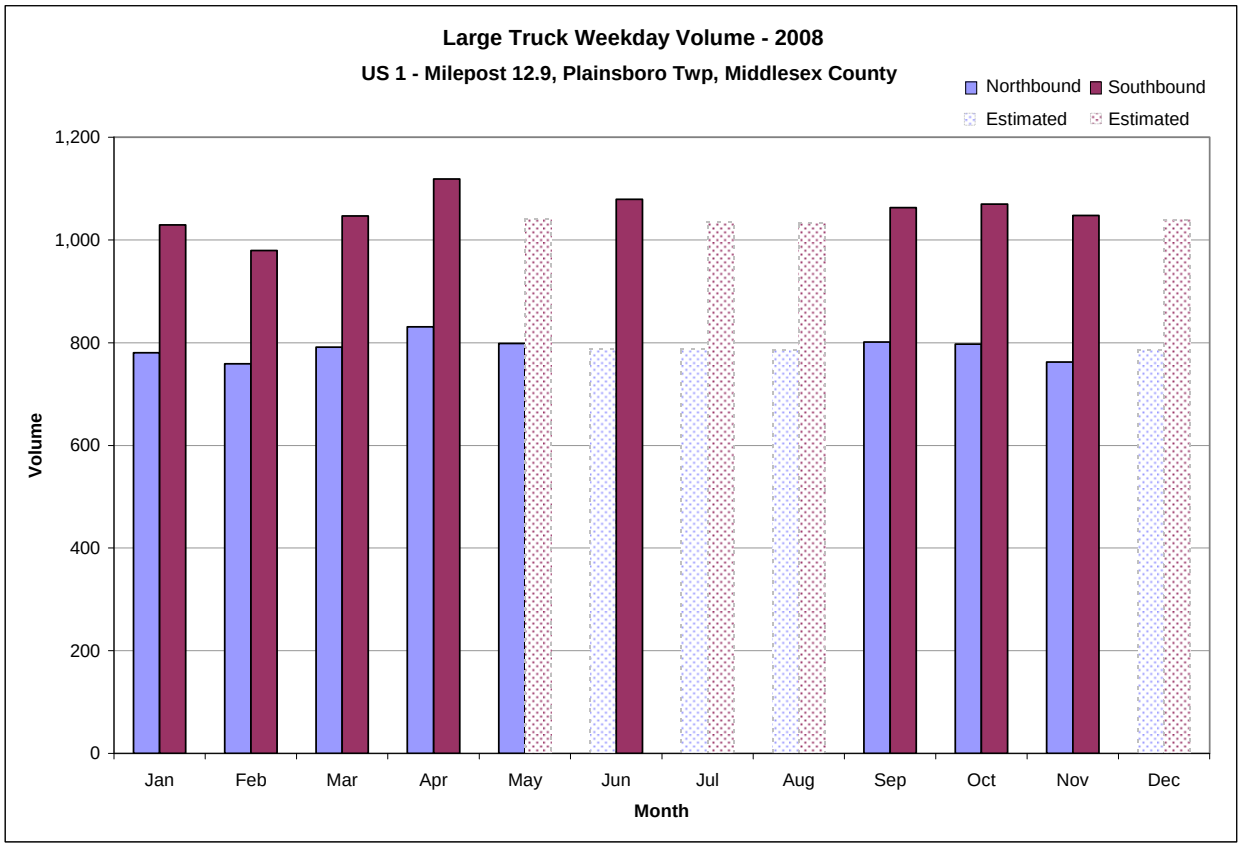

Figure 2-001: Annual Profile of Large Truck Volume at US 1, MP 12.9
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-001,** large truck volume was just less than 800 in the northbound direction and 1,050 in the southbound direction per weekday during 2008 at US 1, milepost 12.9. This 33% higher southbound volume discrepancy was displayed during all months of comparable data throughout 2008.

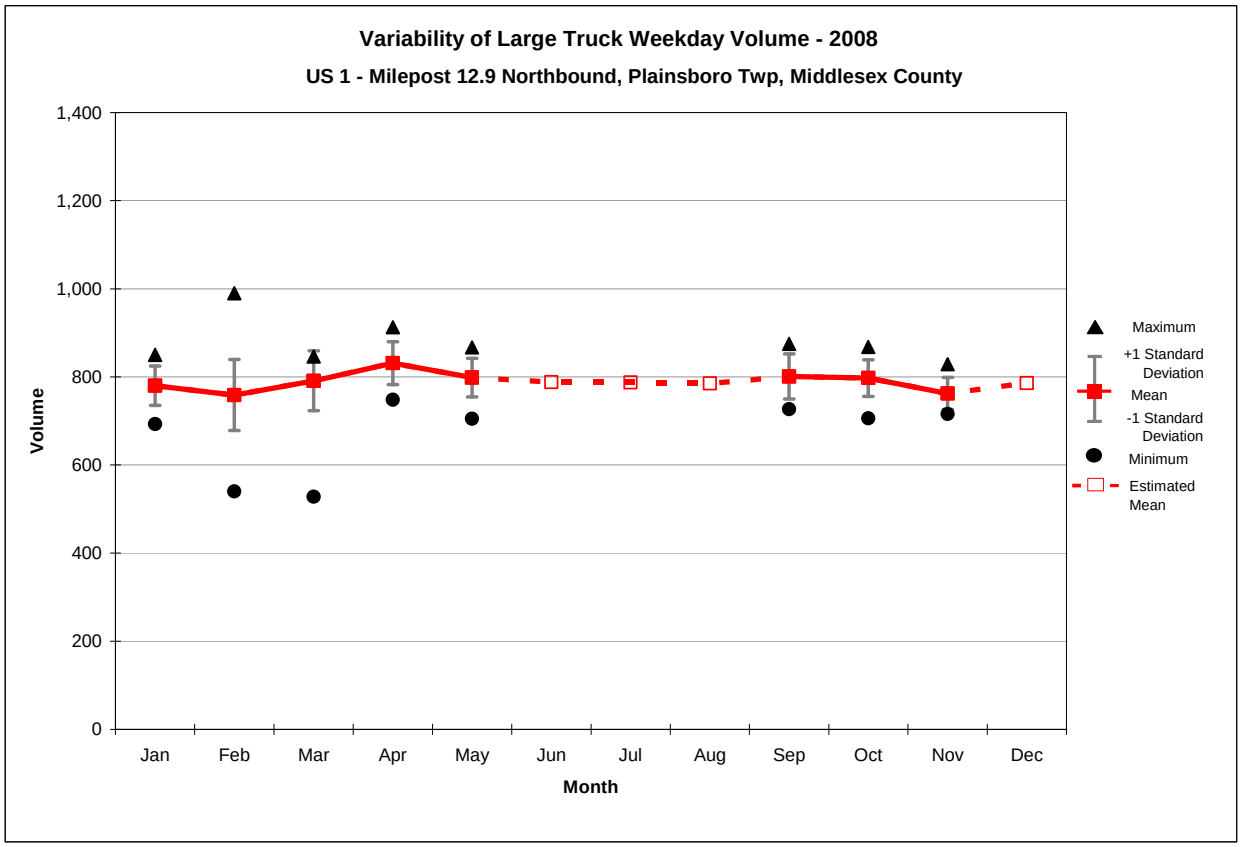

Figure 3A-001: Variability of Large Truck Volume at Northbound US 1, MP 12.9
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at northbound US 1 milepost 12.9 is shown in **Figure 3A-001**. The greatest variability was experienced in February 2008. February 13, 2008 marked the peak large truck travel day when 990 trucks were counted here which was followed by an atypically low volume of 540 one week later on February 22, 2008, the date of a substantial snowfall. Of the data available, the overall minimum volume of just 521 occurred on March 21, 2008.

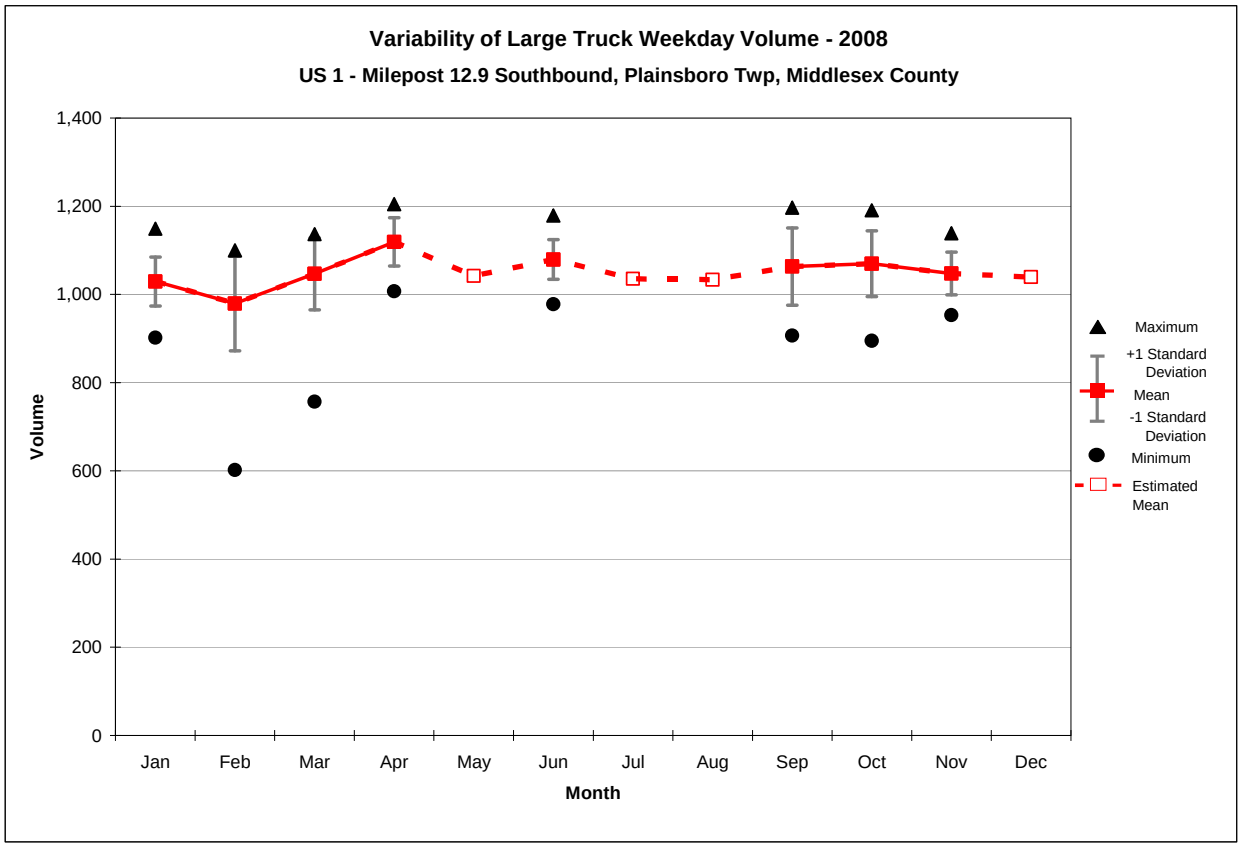

Figure 3B-001: Variability of Large Truck Volume at Southbound US 1, MP 12.9
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at southbound US 1 milepost 12.9 is shown in **Figure 3B-001**. The greatest variability was experienced in February 2008 with a standard deviation of 107, and the least variability in June and November 2008 when the standard deviation was less than half that of February. From the available data, the highest weekday volume of 1,205 trucks occurred on April 8, 2008 and the minimum volume of 600 trucks occurred on February 22, 2008, the date of a heavy snowfall.

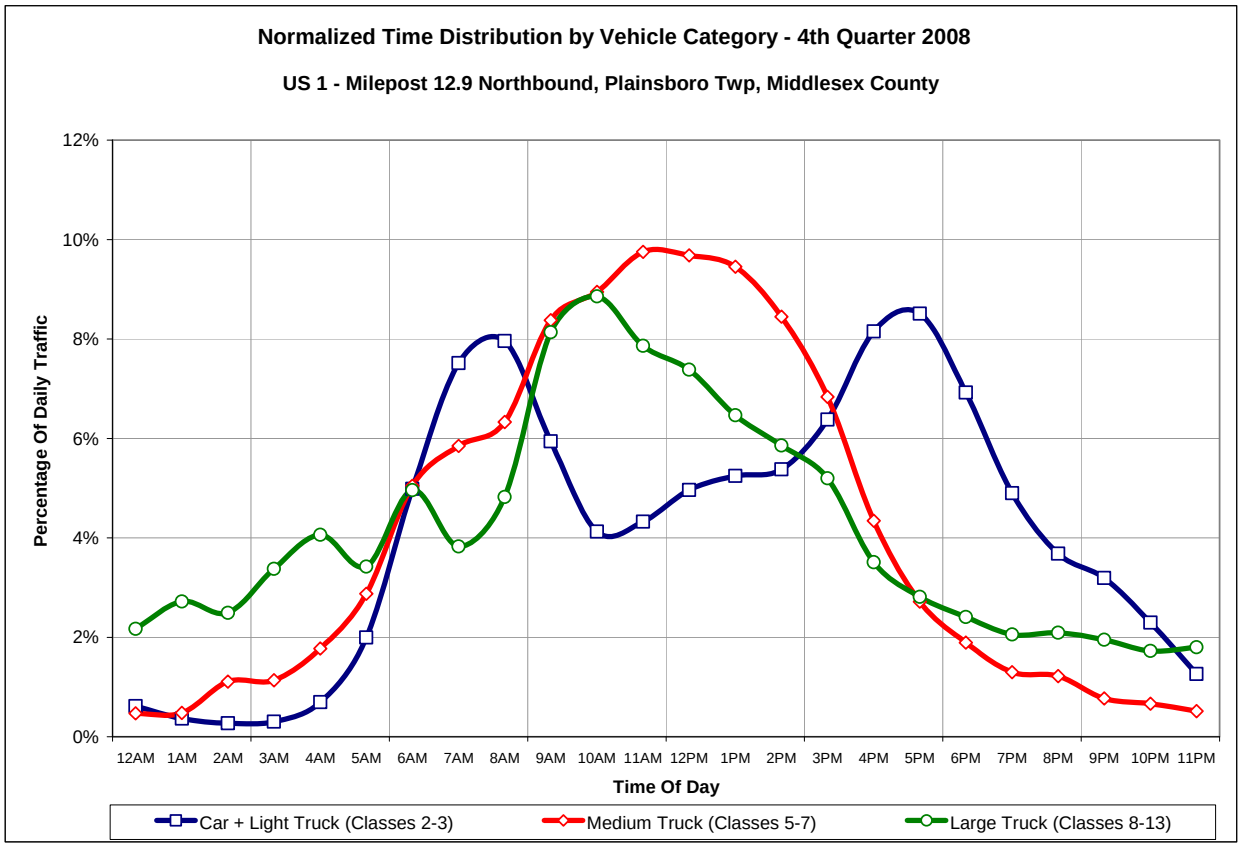

Figure 4A-001: Daily Profile of Volume at Northbound US 1, MP 12.9

Figure 4A-001 shows the relative daily profile of traffic by vehicular category in the northbound direction at US 1 milepost 12.9 during the 4th quarter of 2008. The large truck volume follows Profile 2 and peaked between 9:00 and 11:00 a.m. when nearly 17% of all large truck traffic occurred. Medium trucks followed a more peaked profile with maximum volume between 11:00 a.m. and 1:00 p.m. when over 19% of the daily medium truck traffic occurred. Auto volume followed a bi-directional commuter route pattern with peaks during both the 7:00 to 9:00 a.m. period with over 15% of daily auto volume and the 4:00 to 6:00 p.m. period with over 16% of daily auto volume.

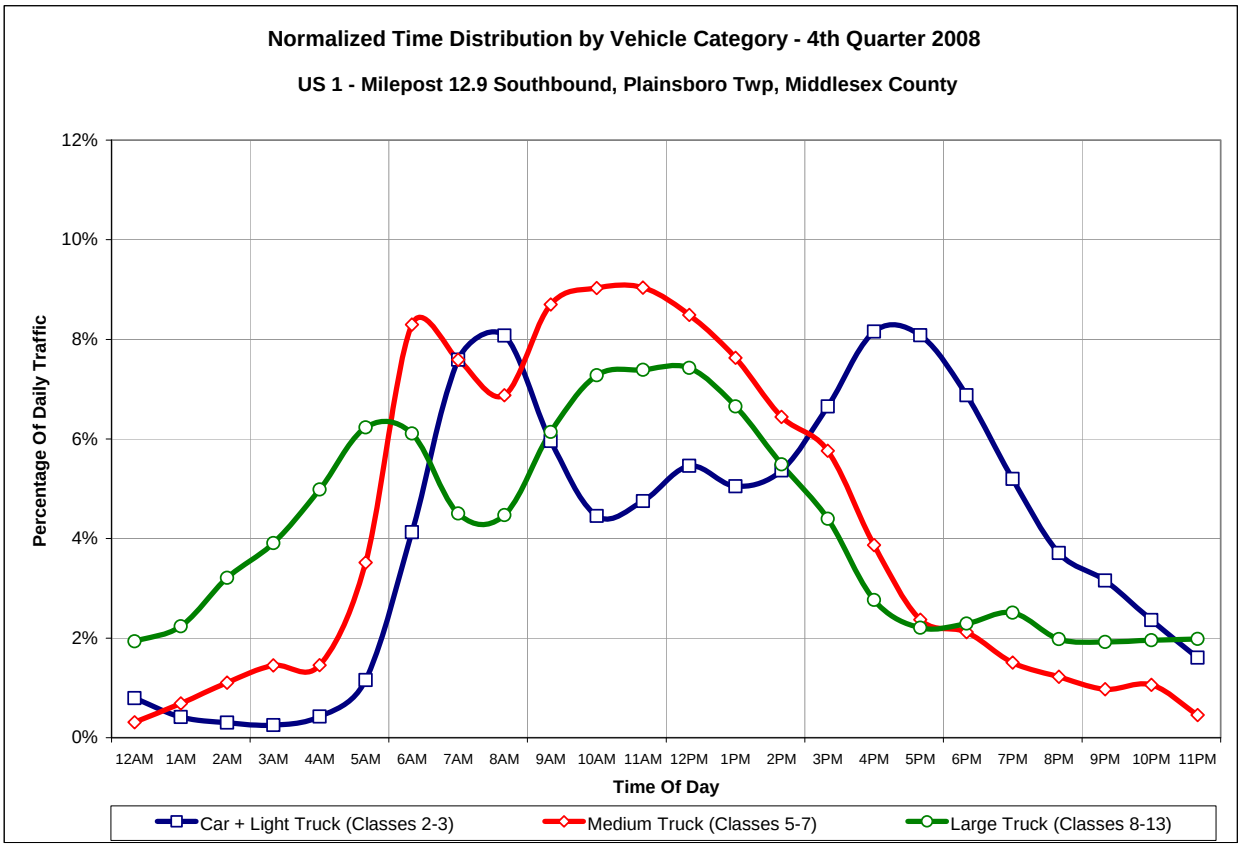

Figure 4B-001: Daily Profile of Volume at Southbound US 1, MP 12.9

Figure 4B-001 shows the relative daily profile of traffic by vehicular category in the southbound direction at US 1 milepost 12.9 during the 4th quarter of 2008. The large truck volume indicates Profile 2 and peaked between 10:00 a.m. and 1:00 p.m. when 22% of all large truck traffic occurred. Medium trucks followed a more peaked profile with maximum volume between 9:00 a.m. and 12:00 p.m. when nearly 27% of the daily medium truck traffic occurred. A medium truck spike also occurred between 6:00 and 7:00 a.m. As with the northbound direction at this location, a bi-directional commuter route pattern manifested itself with peaks during the 7:00 to 9:00 a.m. period and the 4:00 to 6:00 p.m. period with approximately 16% of daily auto volume occurring at each peak.

WIM Station 01A: US 1, MP 18.0

WIM Station 01A is located at milepost 18.0 of northbound US Route 1 in South Brunswick, Middlesex County between the interchanges with New Road and Major Road. At this location US 1 is a four-lane partial access divided Urban Principal Arterial and is included in the New Jersey Access Network. **Figure 1-01A** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years however limited data was available for 2008.

Figure 1-01A: Aerial View of WIM Station at US 1, MP 18.0

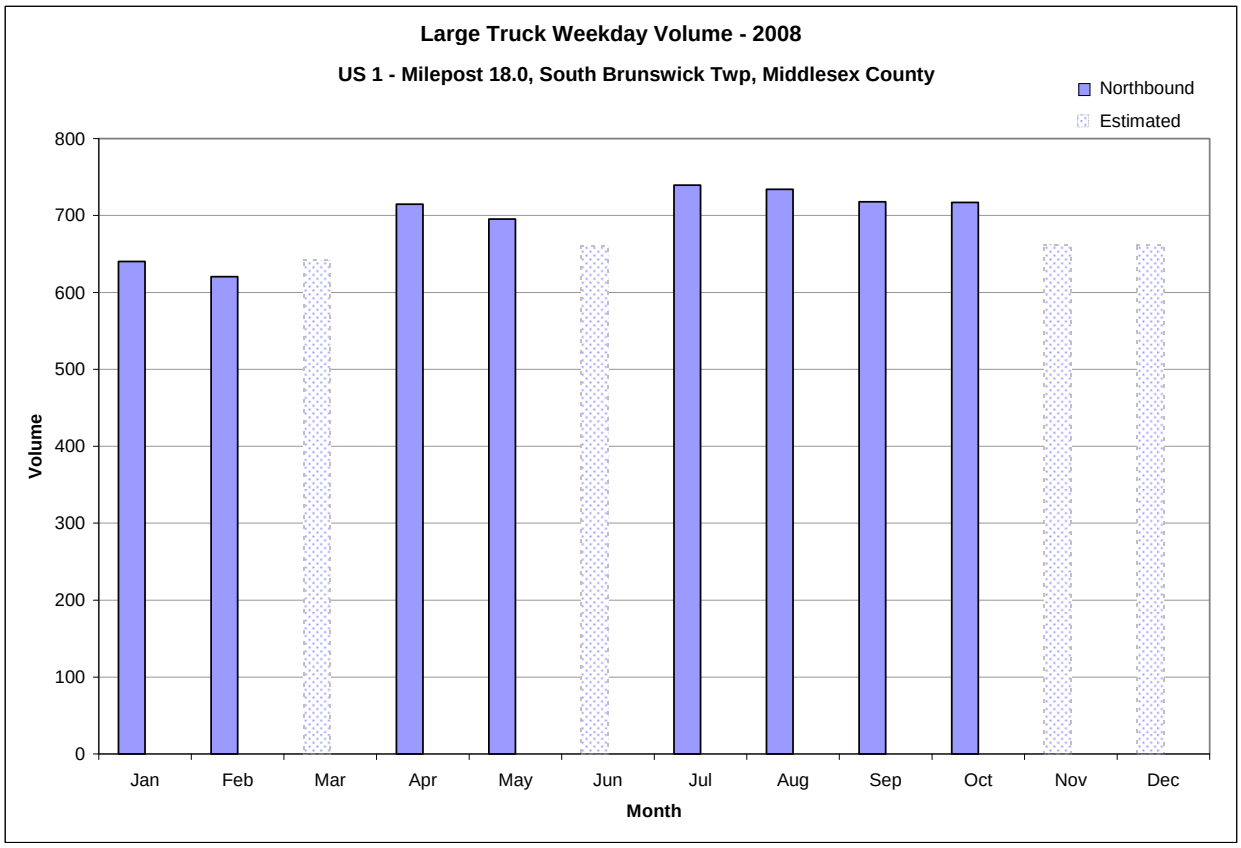

Figure 2-01A: Annual Profile of Large Truck Volume at US 1, MP 18.0
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-01A,** large truck volume ranged from approximately 600 to 750 per weekday during 2008 at northbound US 1 milepost 18.0. Volume was marginally lower during the 1st quarter and higher in the latter half of the year.

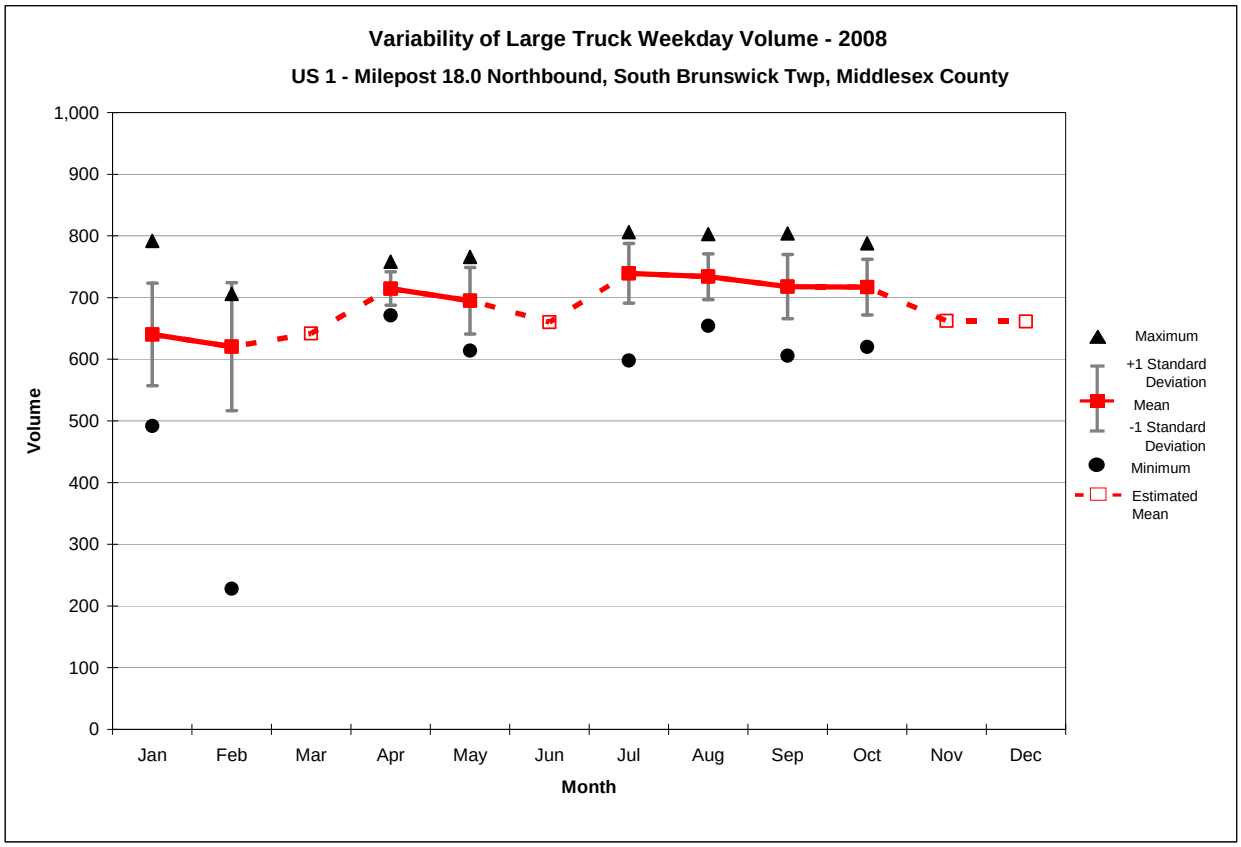

Figure 3A-01A: Variability of Large Truck Volume at Northbound US 1, MP 18.0
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at northbound US 1 milepost 18.0 is shown in **Figure 3A-01A**. From the given months, the greatest variability was experienced in February 2008 and the least variability for the limited data points of April 2008. The data shows that the minimum weekday volume of 228 trucks occurred on February 22, 2008, the date of a heavy snowfall.

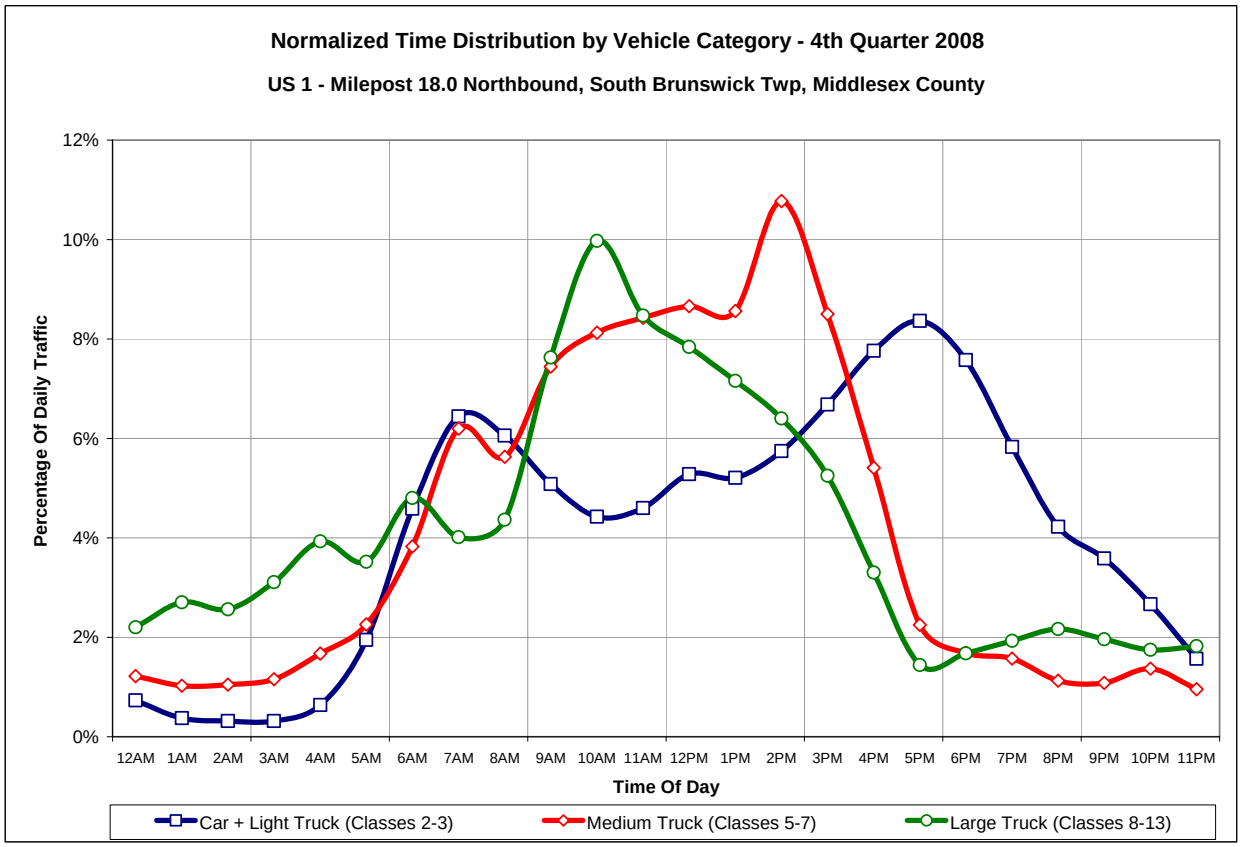

Figure 4A-01A: Daily Profile of Volume at Northbound US 1, MP 18.0

Figure 4A-01A shows the relative daily profile of traffic by vehicular category in the northbound direction at US 1 milepost 18.0 during the 4th quarter of 2008. The pattern suggests Profile 3 due solely to a spike in large truck traffic that occurred between 10:00 a.m. and 11:00 a.m. when 10% of all large truck traffic occurred. Medium trucks followed a similar peaked profile however the spike occurred between 2:00 and 3:00 p.m. Auto volume followed a commuter route pattern with elevated traffic during the 7:00 to 9:00 a.m. period with over 12% of daily auto volume and a higher peak during the 4:00 to 6:00 p.m. period with 16% of daily auto volume.

WIM Station 01C: US 1&9, MP 48.1

WIM Station 01C is located at milepost 48.1 of southbound US Route 1&9 in Newark, Essex County immediately south of I-78. At this location US 1&9 is an eight-lane (four local, four express) partially access controlled Urban Freeway/Expressway and is included in the New Jersey Access Network. **Figure 1-01C** shows the location and surrounding features. WIM data has been rarely available at this location over the past four years and limited data was available for 2008.

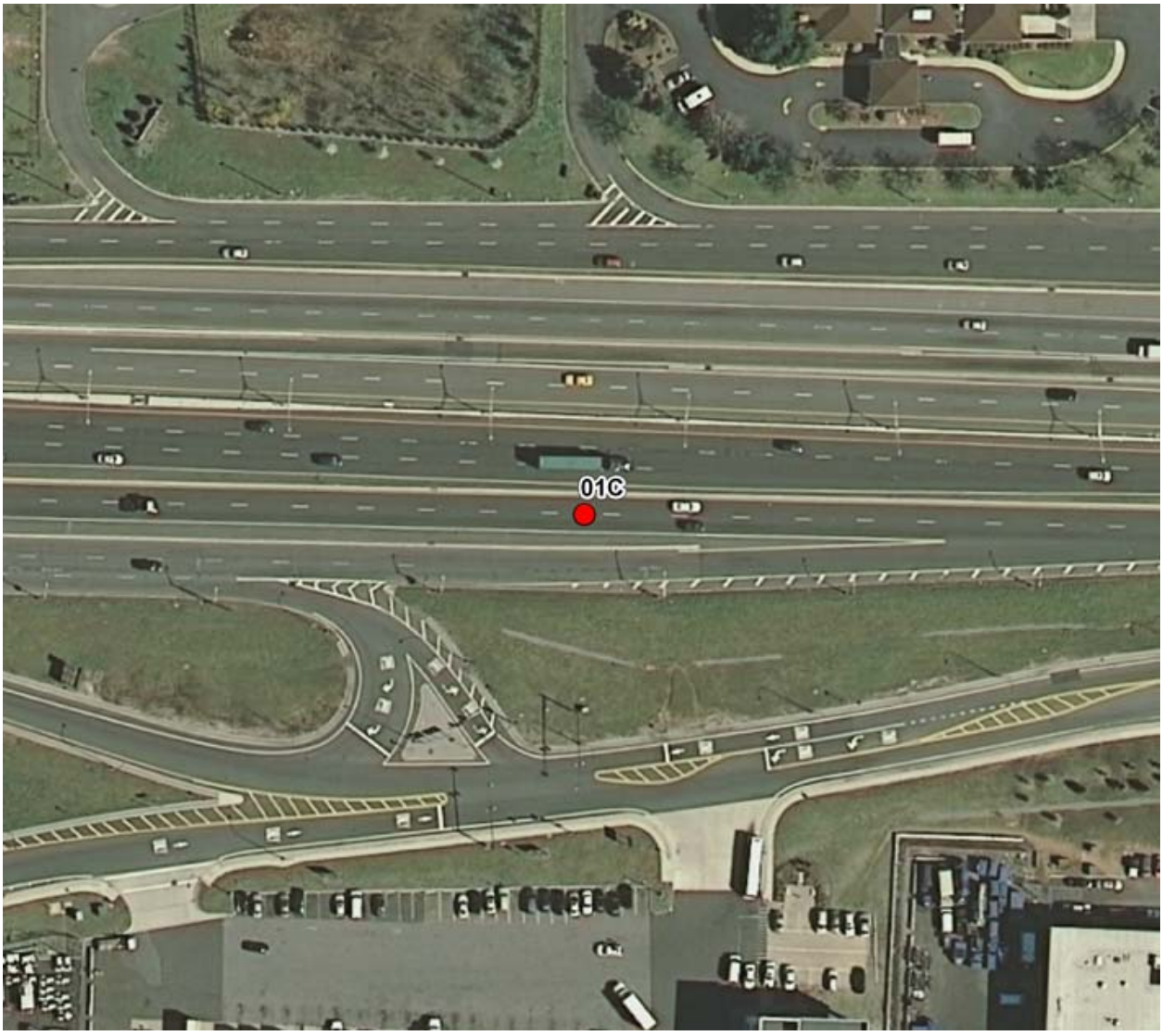

Figure 1-01C: Aerial View of WIM Station at US 1&9, MP 48.1

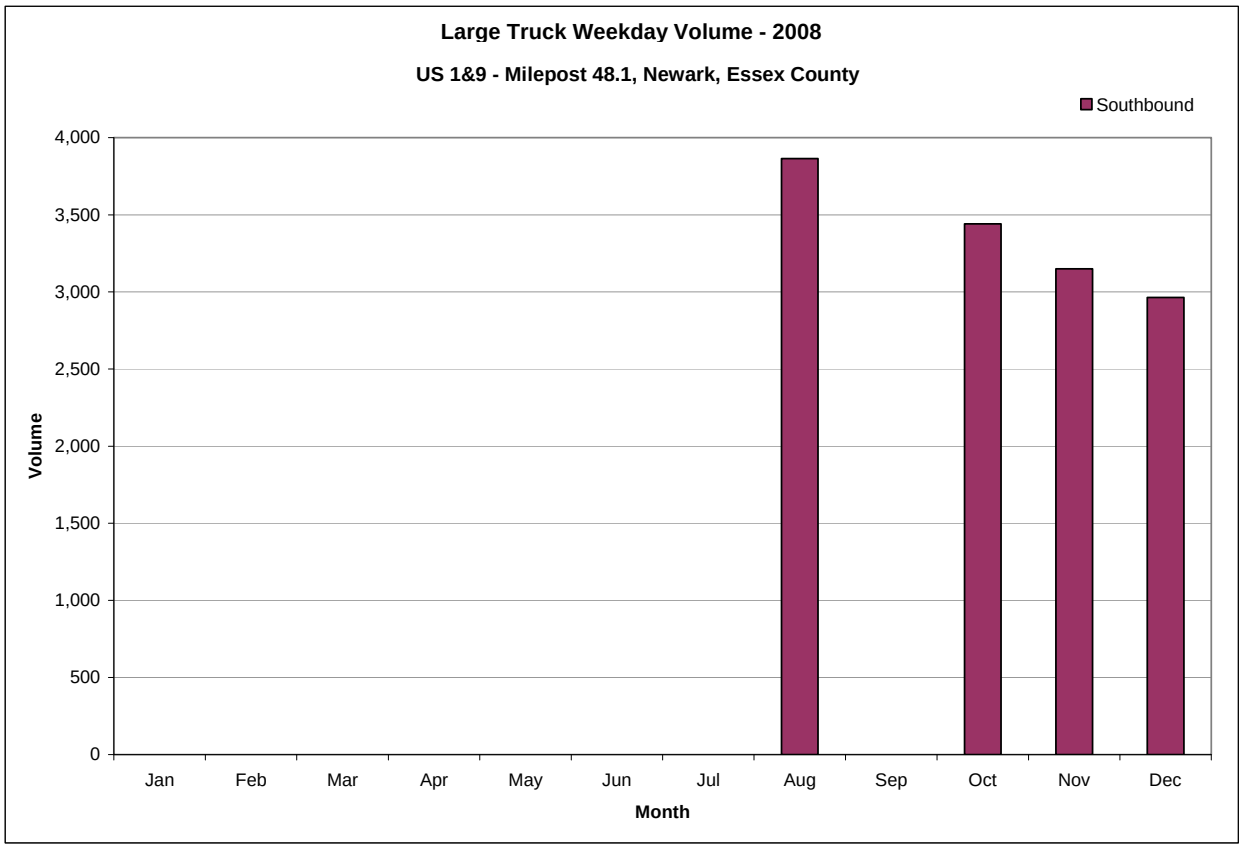

Figure 2-01C: Annual Profile of Large Truck Volume at US 1&9, MP 48.1
Note: Some chart features are missing due to insufficient/unavailable data.

As shown in **Figure 2-01C,** large truck volume was nearly 4,000 per weekday at US 1&9 milepost 48.1 in August 2008 and fewer than 3,000 in December 2008 – a decline of 23%. This is despite the lack of classification of over 9% of vehicles during August 2008 at this location.

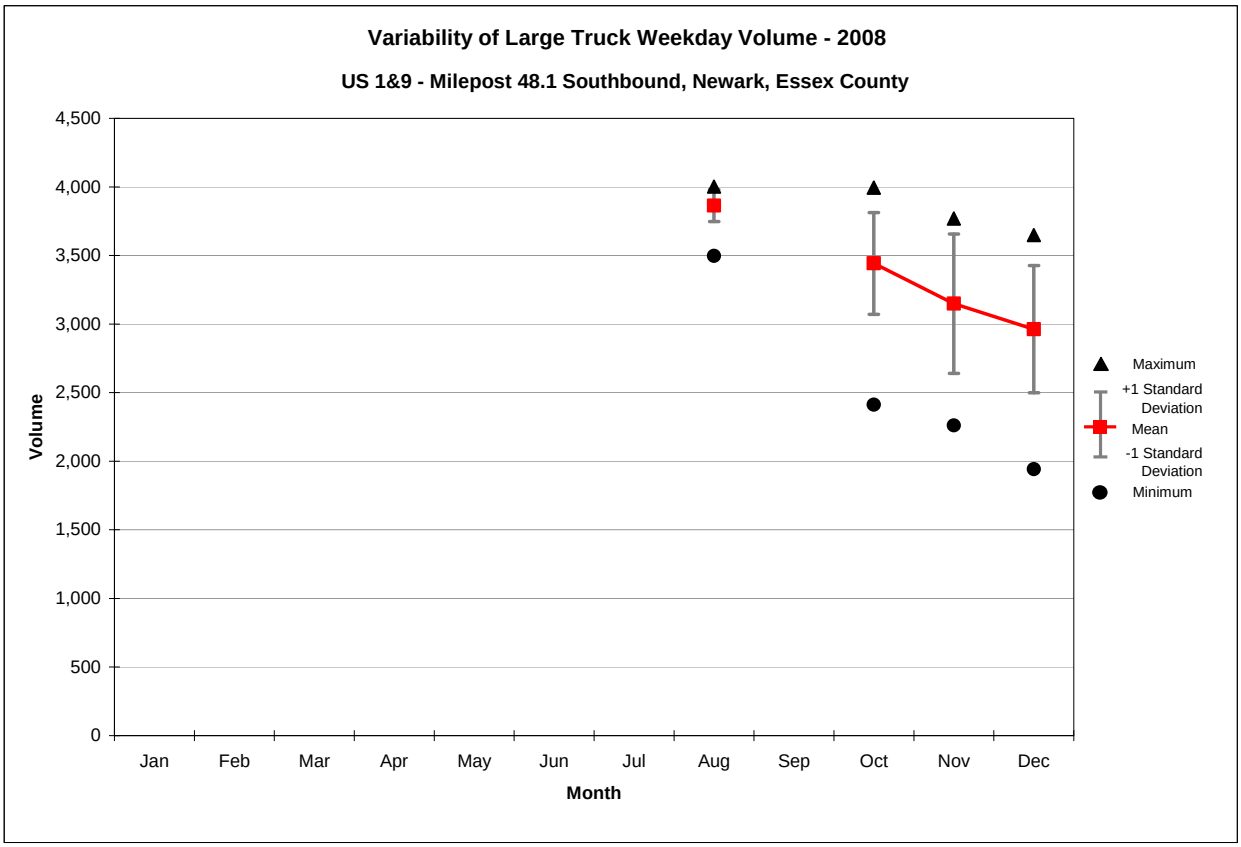

Figure 3B-01C: Variability of Large Truck Volume at Southbound US 1&9, MP 48.1
Note: Some chart features are missing due to insufficient/unavailable data.

The range of weekday large truck volume at southbound US 1&9 milepost 48.1 is shown in **Figure 3B-01C**. While this information is based on limited data observations, substantial variability occurred in all three months of the 4th quarter of 2008. November 2008 registered a standard deviation of over 500 vehicles. The August 2008 minimum recorded large truck volume exceeded the mean volume during the last three months of the year. A low of 1,940 was counted on December 22, 2008 and a high of 4,000 on August 26, 2008.

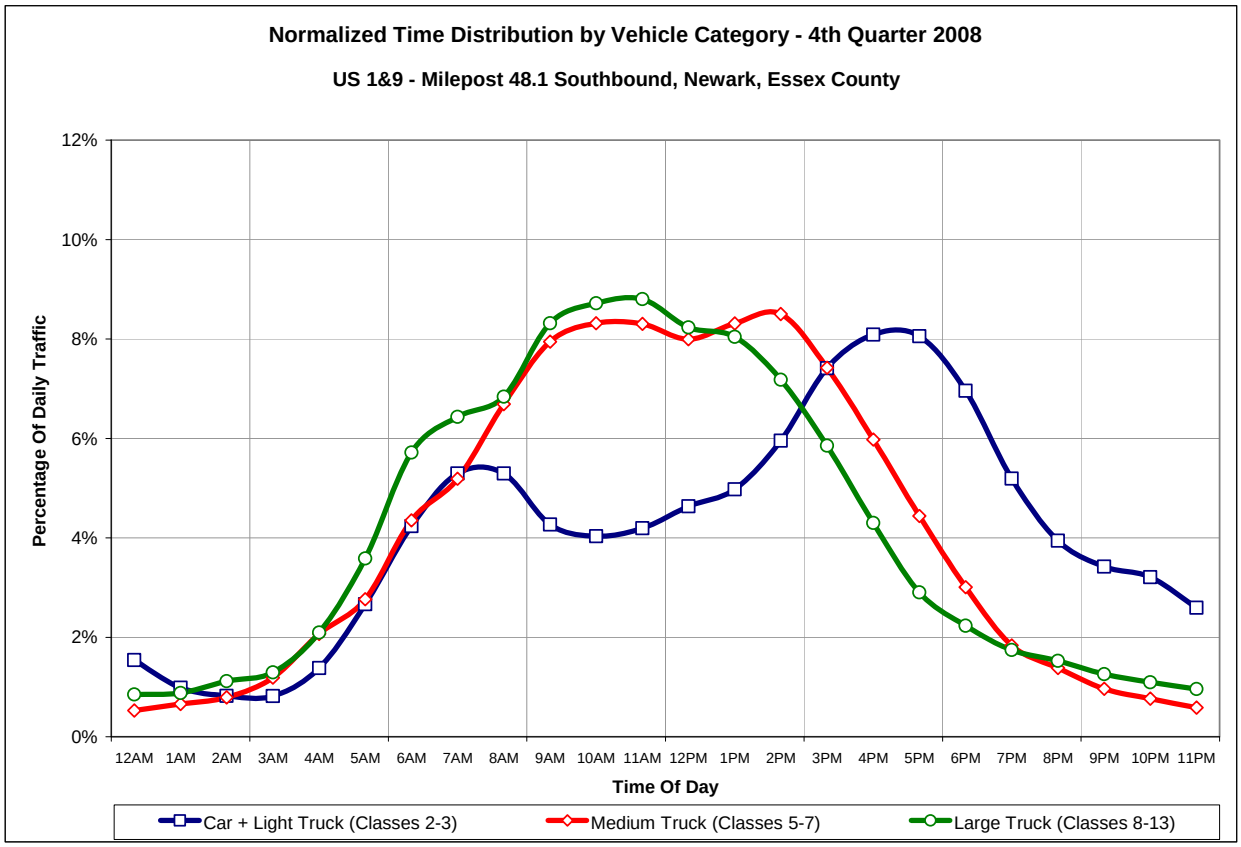

Figure 4B-01C: Daily Profile of Volume at Southbound US 1&9, MP 48.1

Figure 4B-01C shows the relative daily profile of traffic by vehicular category in the southbound direction at US 1&9 milepost 48.1 during the 4th quarter of 2008. The daily profile does not neatly fit any of the four profile types as volumes are heavy and the peak period does not feature a sharp kurtosis (Profile 2), yet the five-hour midday peak is more than ten times the overnight low (Profile 4). The juxtaposition of the Seaport/Airport/Rail Terminal Complex and urban travel flows in this area make for a complex truck pattern. Unlike most arterial locations which showed a stronger peak for medium trucks, at this location they followed an extended peak similar to the large trucks. Auto volume followed a weak commuter route pattern with a slight peak during the 3:00 to 5:00 p.m. period.

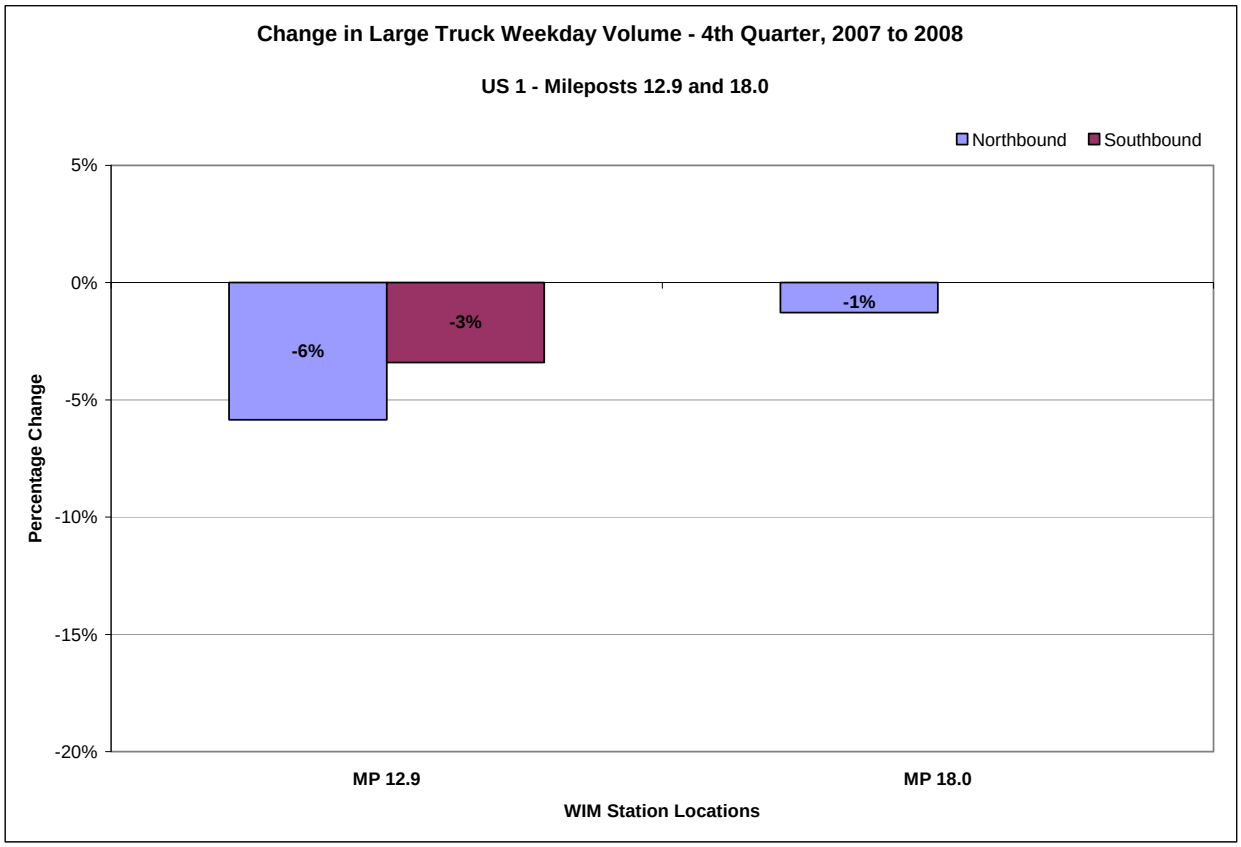

Figure 5-US1: Change in Large Truck Volume on US 1 – 4th Quarter 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

As shown in **Figure 5-US1**, large truck volume on US 1 declined moderately between the 4th quarter of 2007 and 2008 in both directions at milepost 12.9. These comparisons are based on partial data sets and a month to month comparison between November 2007 and 2008 reveals more substantial reductions of 13% and 9% in the north and southbound directions respectively. The volume decreased slightly northbound at milepost 18.0 year to year however only October data was available in 2008 – a month when volume was down 2% from the previous year. As seen in previous figures, this downward trend was not evident on US 1 throughout 2008 when volume was generally flat. US 1 provides a non-tolled alternative to the New Jersey Turnpike at these locations which may have dampened the large truck volume decrease during the economic recession in 2008.

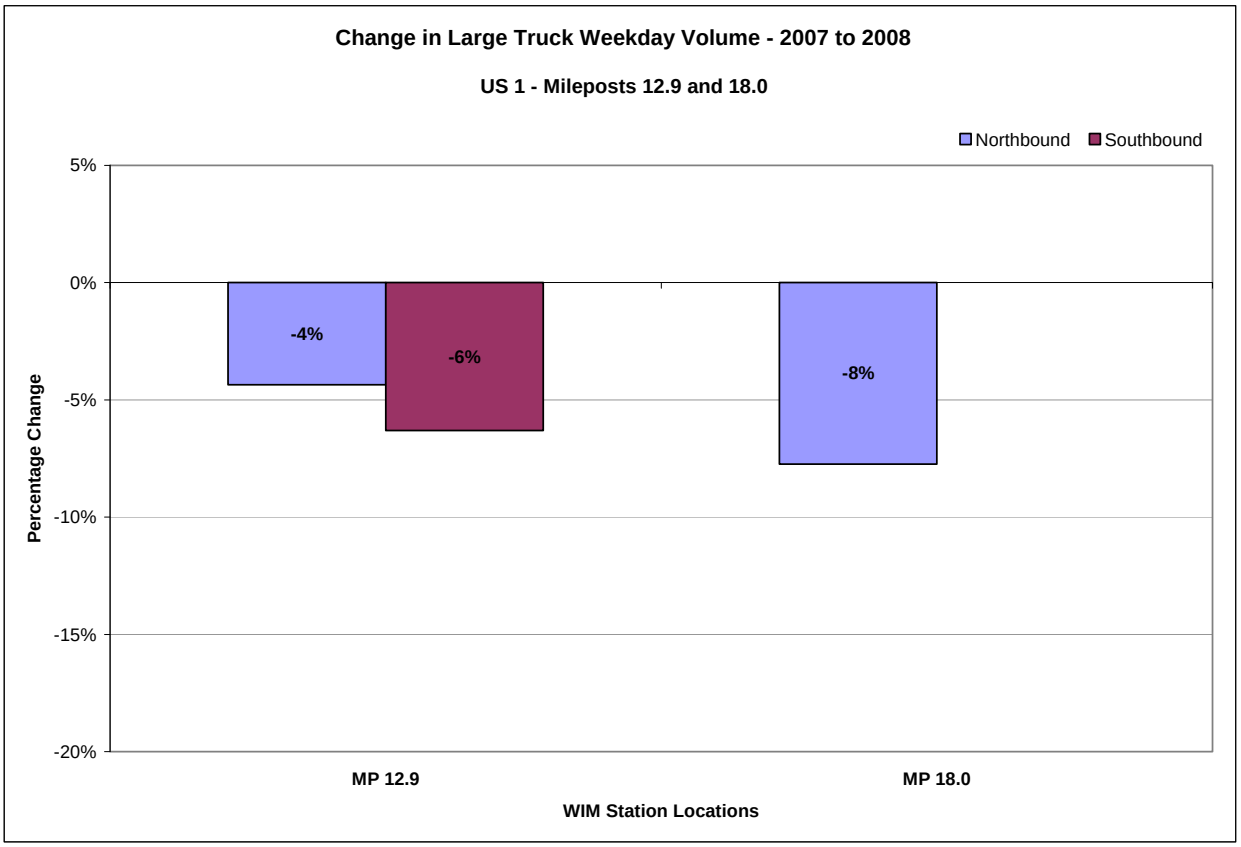

Figure 6-US1: Change in Large Truck Volume on US 1 – 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

Figure 6-US1 depicts the year to year change in large truck average weekday volume on US 1. Unlike most analyzed locations, the declines at milepost 12.9 and 18.0 during the full year were actually larger than the 4th quarter drops. As discussed previously, the 2008 profile for these locations is generally flat indicating the volume decline did not accelerate during the 4th quarter as it did at other locations.

WIM Station 130: US 130, MP 3.4

WIM Station 130 is located at milepost 3.4 of US Route 130 in Penns Grove, Salem County. At this location US 130 is a two-lane Urban Minor Arterial and is included in the New Jersey Access Network. **Figure 1-130** shows the location and surrounding features. WIM data has been continuously recorded at this location since mid-2007 however not a complete data set was available for 2008.

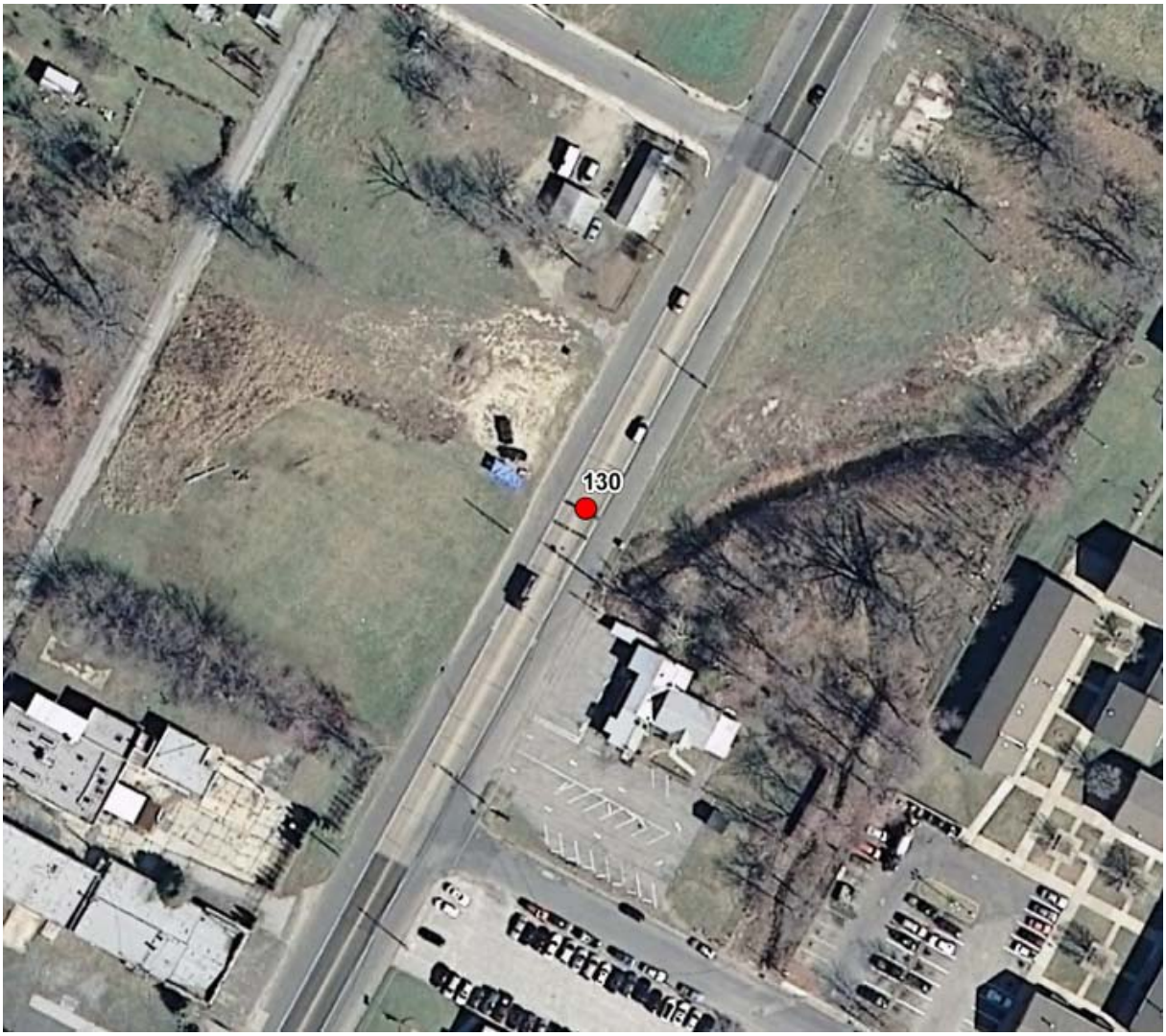

Figure 1-130: Aerial View of WIM Station at US 130, MP 3.4

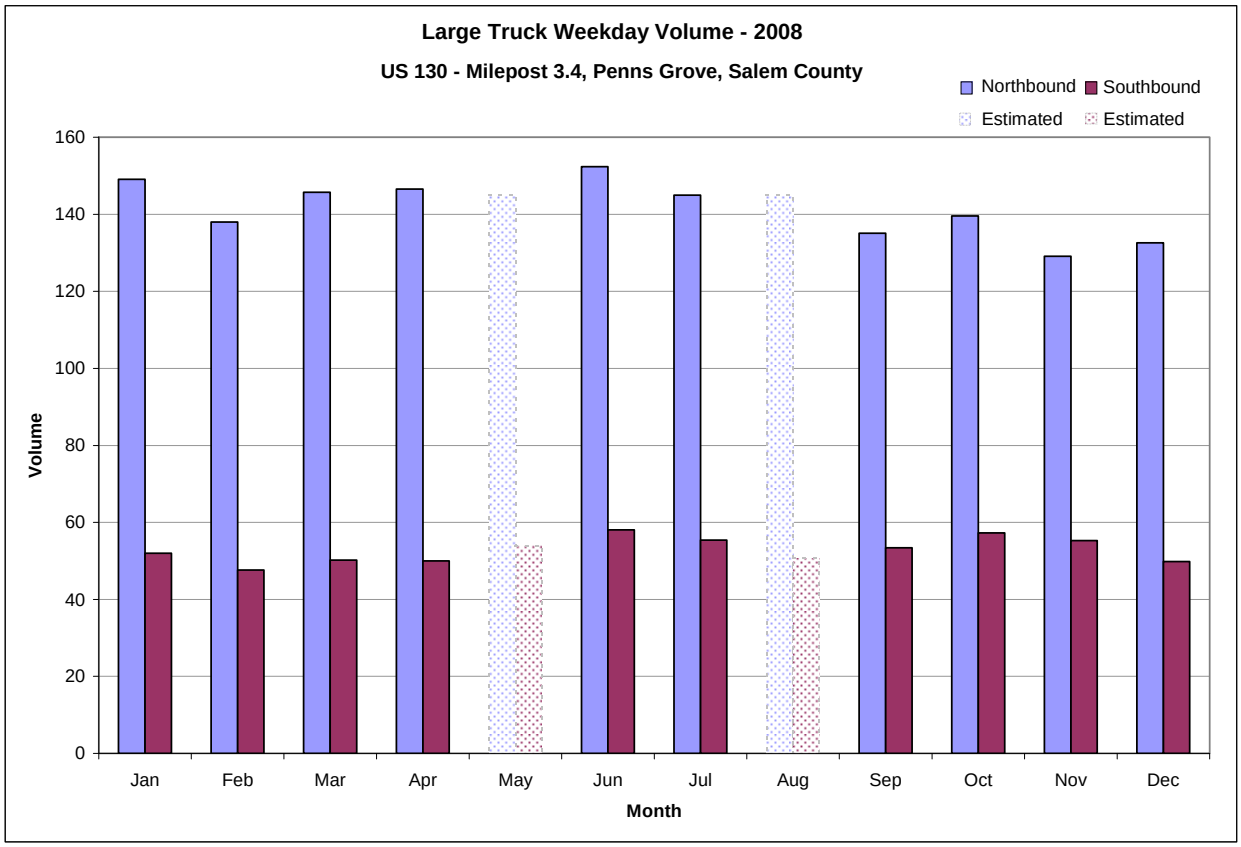

Figure 2-130: Annual Profile of Large Truck Volume at US 130, MP 3.4
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-130,** large truck volume was dramatically higher in the northbound direction compared to southbound per weekday during 2008 at US 130 milepost 3.4. Although overall volume was relatively low the imbalance is consistent throughout the year by a factor of 2.5:1. A corresponding elevated southbound large truck volume relative to northbound was evident on the parallel I-295 during the period. Volume peaked in June 2008 in both directions of travel at US 130, milepost 3.4.

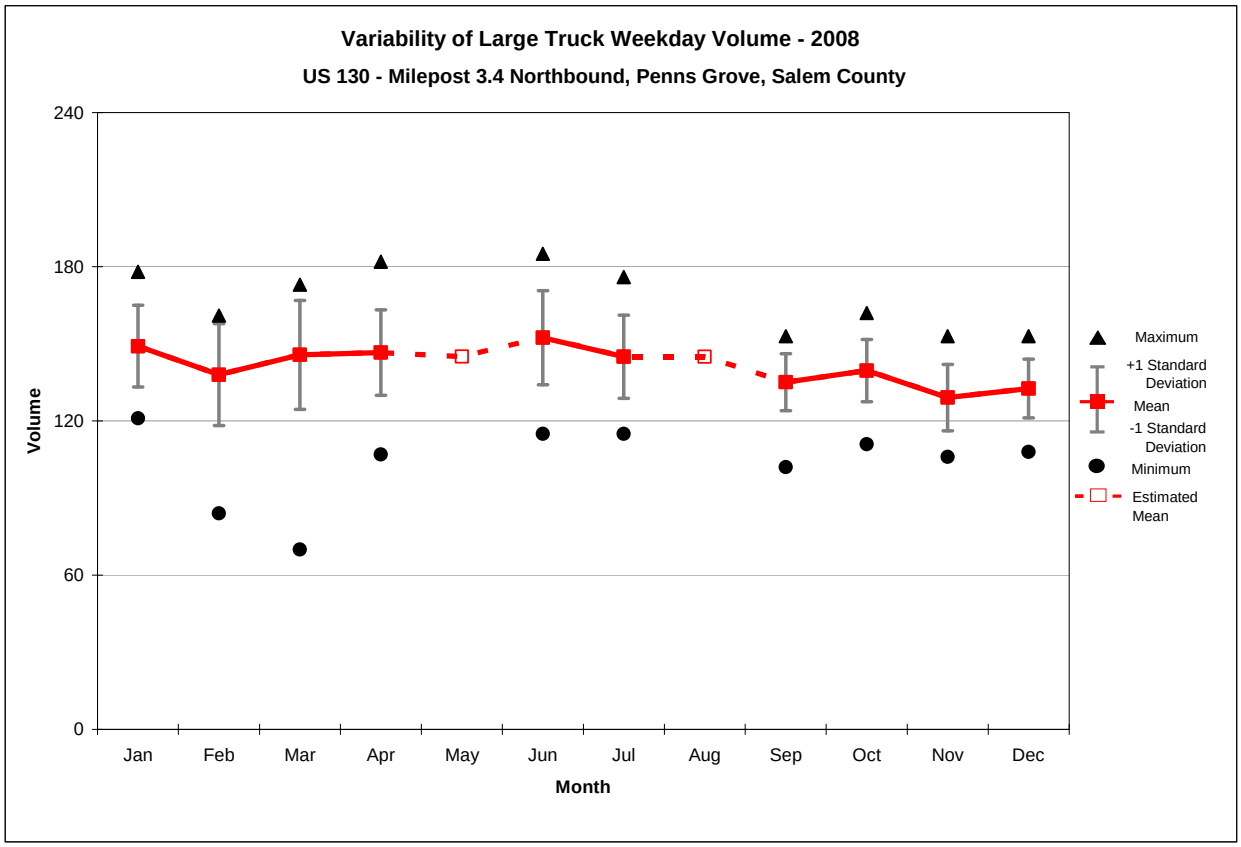

Figure 3A-130: Variability of Large Truck Volume at Northbound US 130, MP 3.4
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3A-130 shows the range of weekday large truck volume at northbound US 130 milepost 3.4. The greatest variability was experienced in March and June 2008 when the annual low and high marks were established. From the data included in this analysis, 185 trucks on June 6, 2008 marked the annual maximum and the 70 trucks on March 21, 2008, the day of an inclement weather event, was the low.

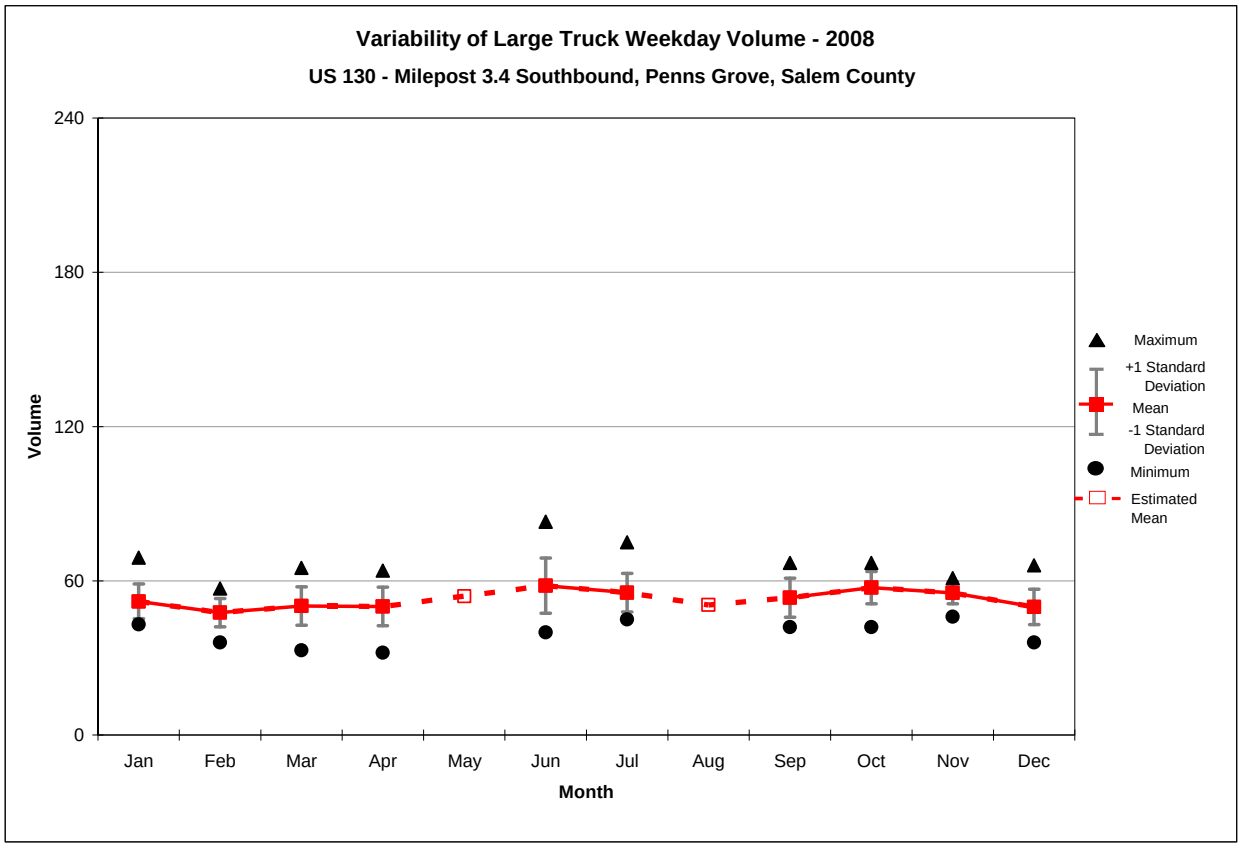

Figure 3B-130: Variability of Large Truck Volume at Southbound US 130, MP 3.4
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3B-130 depicts the range of weekday large truck volume at southbound US 130 milepost 3.4. Much less variability in large truck volume occurred in the southbound direction than in the northbound direction as shown in Figure 3A-130. The variability in November 2008 yielded a range of 15 trucks and standard deviation of just four. The greatest variability was experienced in June 2008. From the available data, the large truck volume of 83 occurred on June 16, 2008 and the minimum volume of 32 trucks occurred on April 28, 2008.

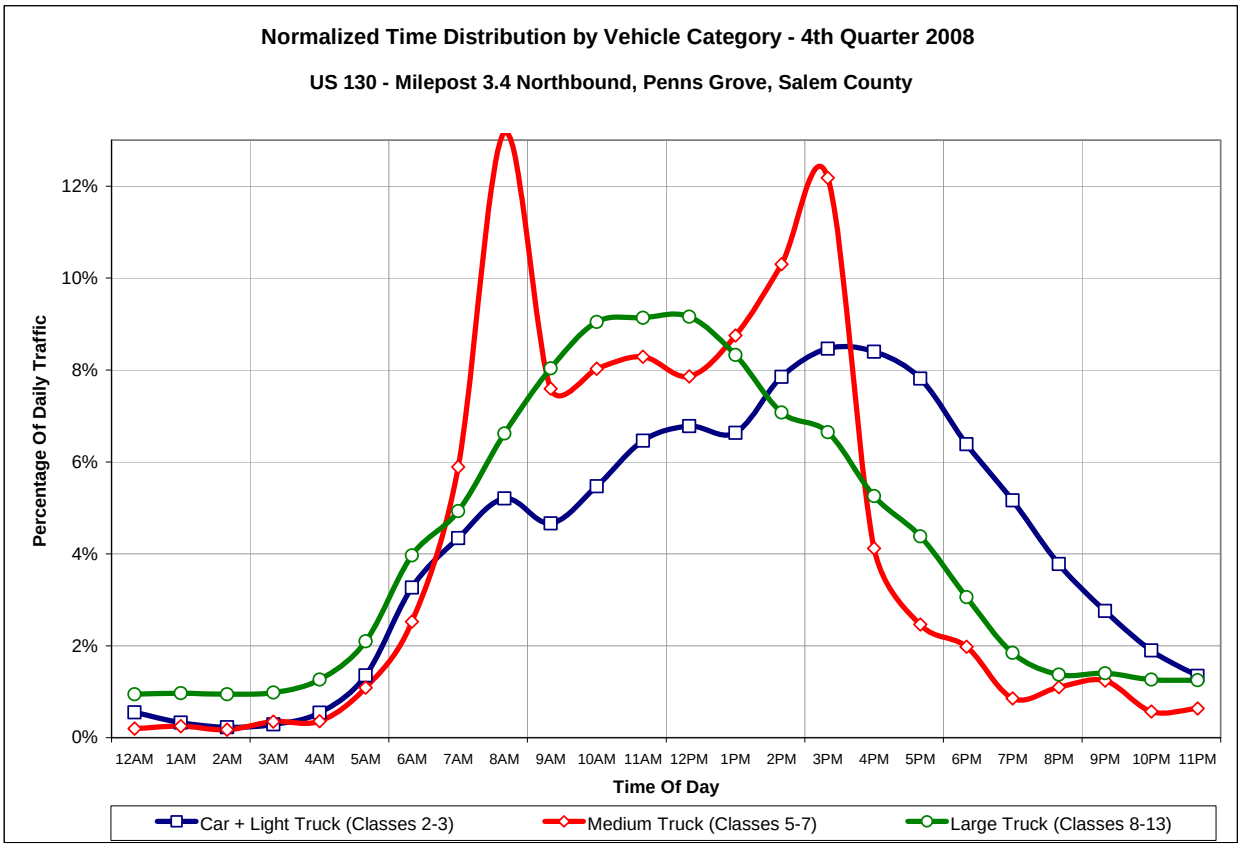

Figure 4A-130: Daily Profile of Volume at Northbound US 130, MP 3.4

Figure 4A-130 shows the relative daily profile of traffic by vehicular category in the northbound direction at US 130 MP 3.4 during the 4th quarter of 2008. Large truck volume depicts Profile 4 with a peak between 10:00 a.m. and 1:00 p.m. when over 27% of all large truck traffic occurred. Overnight large truck relative daily share was low compared to other locations. Medium trucks followed a pronounced profile with a sharp rise during 8:00 to 9:00 a.m. when greater than 13% of the daily total occurred, followed another one hour spike at 3:00 to 4:00 p.m. A nearby industrial facility is likely the cause of this pattern. Auto volume grew throughout the day to a peak at 3:00 to 5:00 p.m. period with over 16% of daily auto volume – this same afternoon peak pattern was evident in the southbound direction.

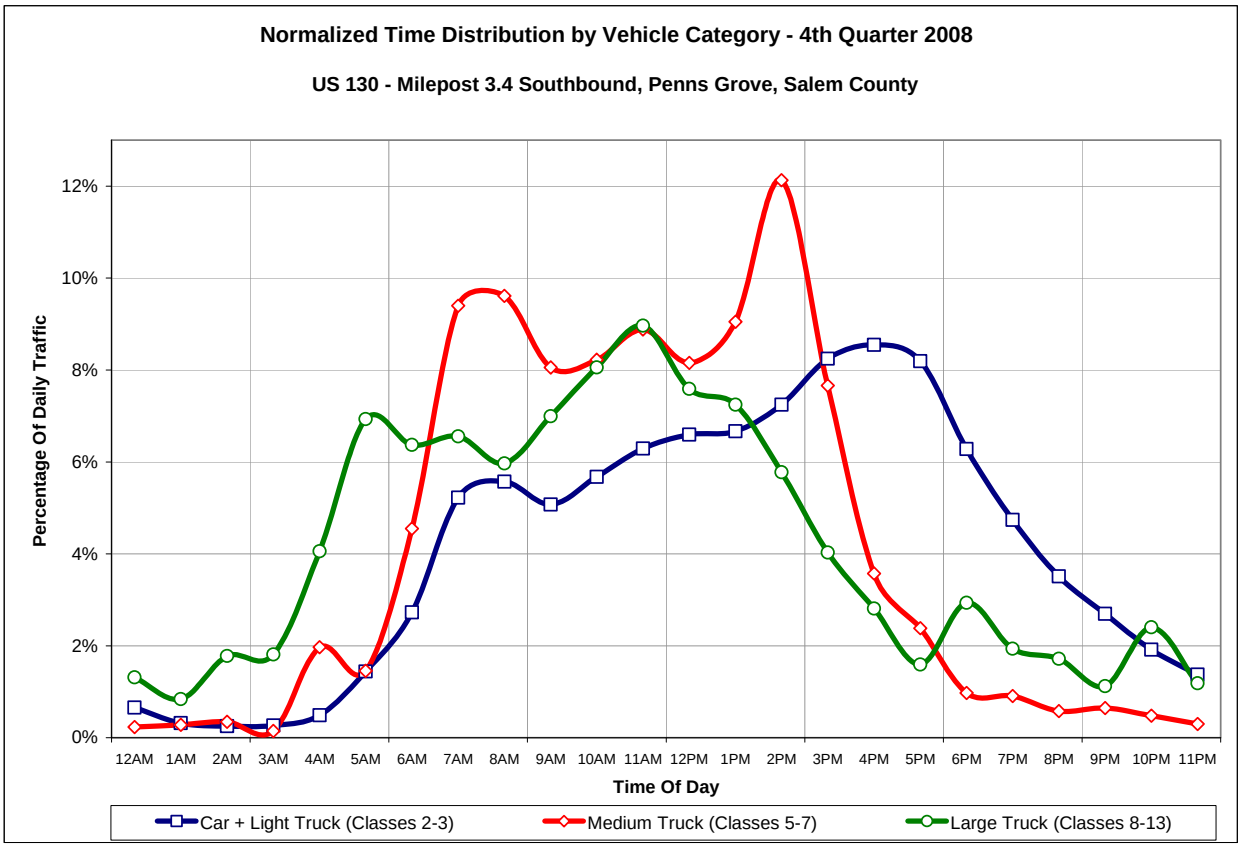

Figure 4B-130: Daily Profile of Volume at Southbound US 130, MP 3.4

Figure 4B-130 shows the relative daily profile of traffic by vehicular category in the southbound direction at US 130 MP 3.4 during the 4th quarter of 2008. The large truck volume exhibits a Profile 4 pattern with low volume and a peak with 9% of daily volume between 11:00 a.m. and 12:00 p.m. Medium trucks were heavy between 2:00 to 3:00 p.m. with nearly 12% of medium truck daily volume. At this unique location, in a pattern similar to the northbound direction auto volume increased throughout the day to a 3:00 to 6:00 p.m. peak.

WIM Station 130A: US 130, MP 70.6

WIM Station 130A (a.k.a. 13A) is located at milepost 70.6 of southbound US Route 130 in Cranbury, Middlesex County. At this location US 130 is a four-lane divided Urban Principal Arterial and is included in the New Jersey Access Network. **Figure 1-130A** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years however very limited data was available for 2008.

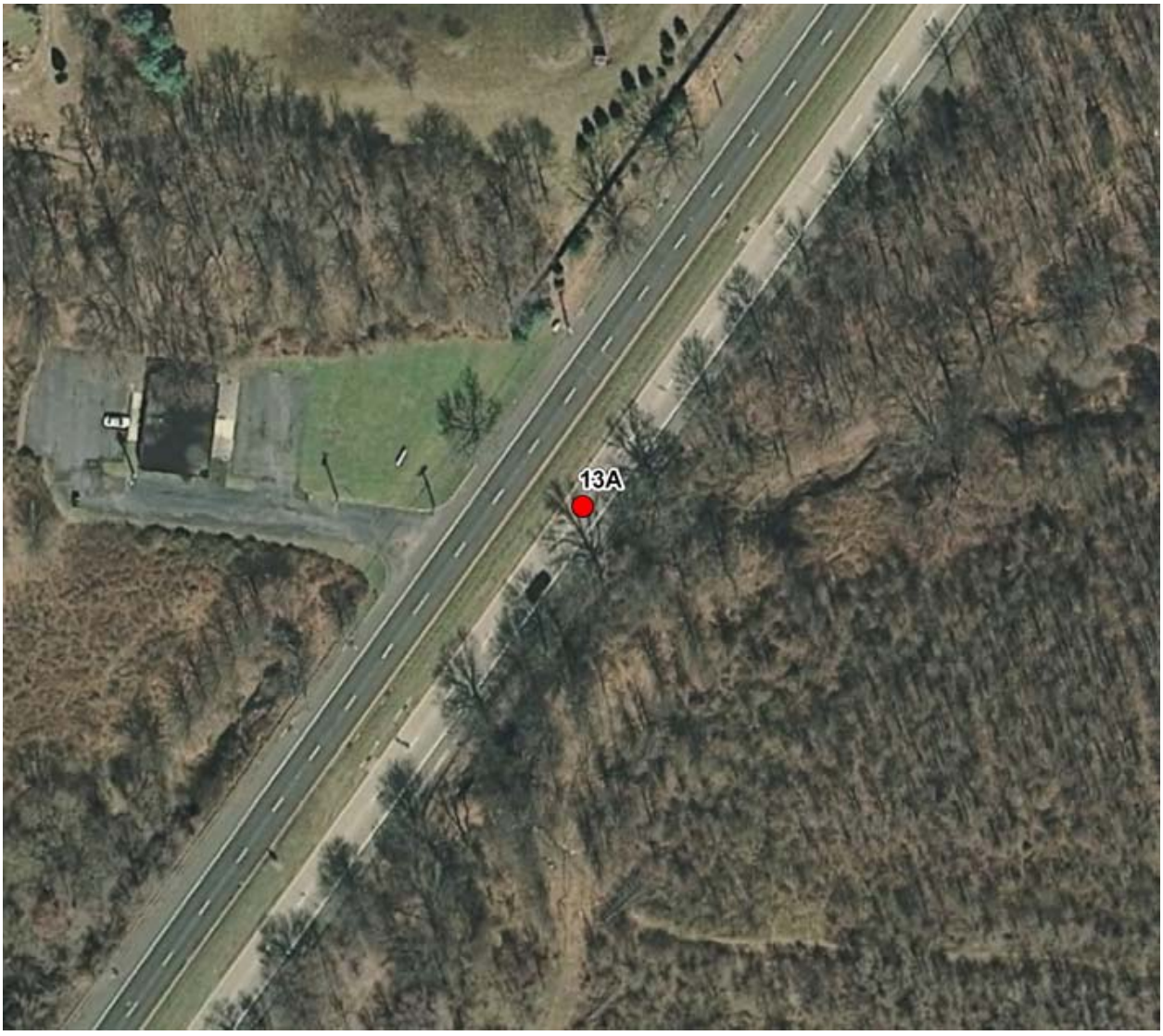

Figure 1-130A: Aerial View of WIM Station at US 130, MP 70.6

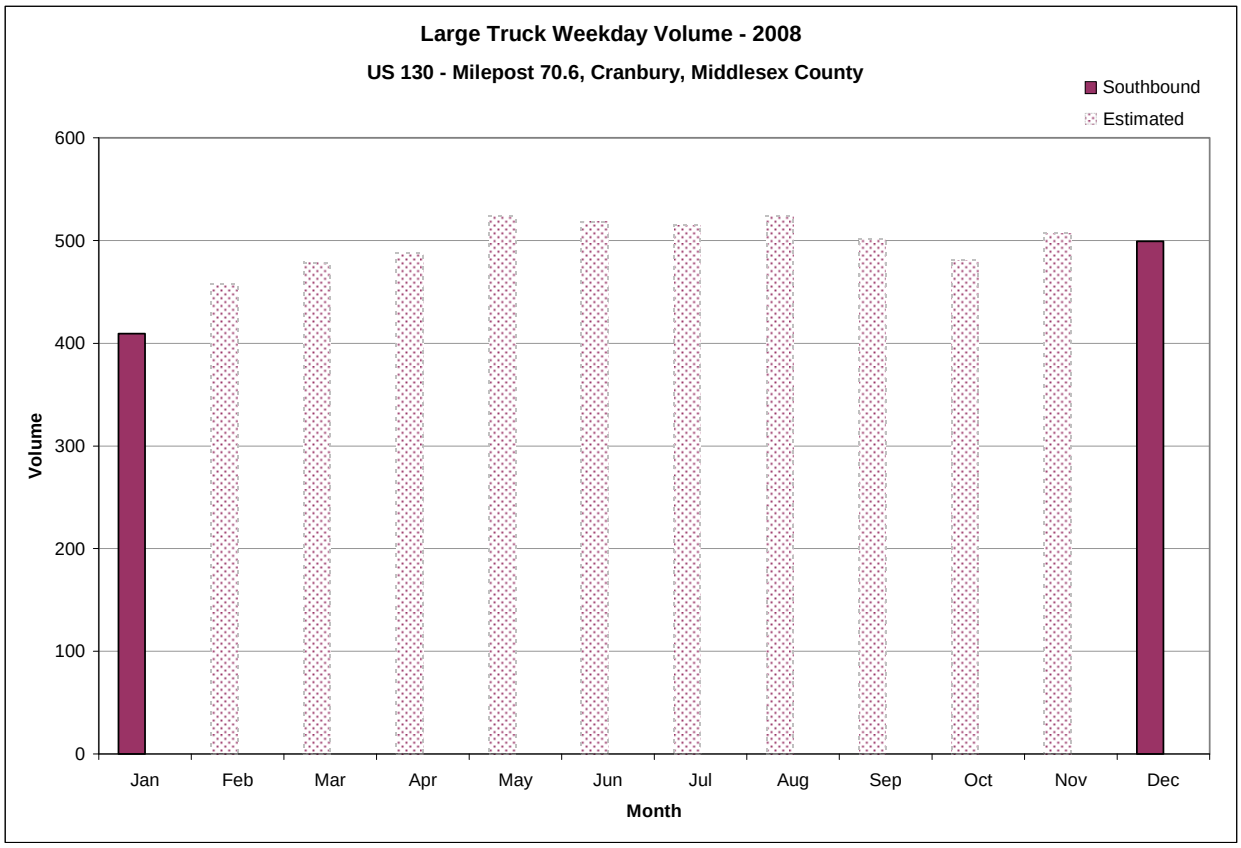

Figure 2-130A: Annual Profile of Large Truck Volume at US 130, MP 70.6
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-130A,** limited data were available for southbound NJ 130 milepost 70.6. Between January and December 2008 there were 410 and 500 large trucks per weekday at that location.

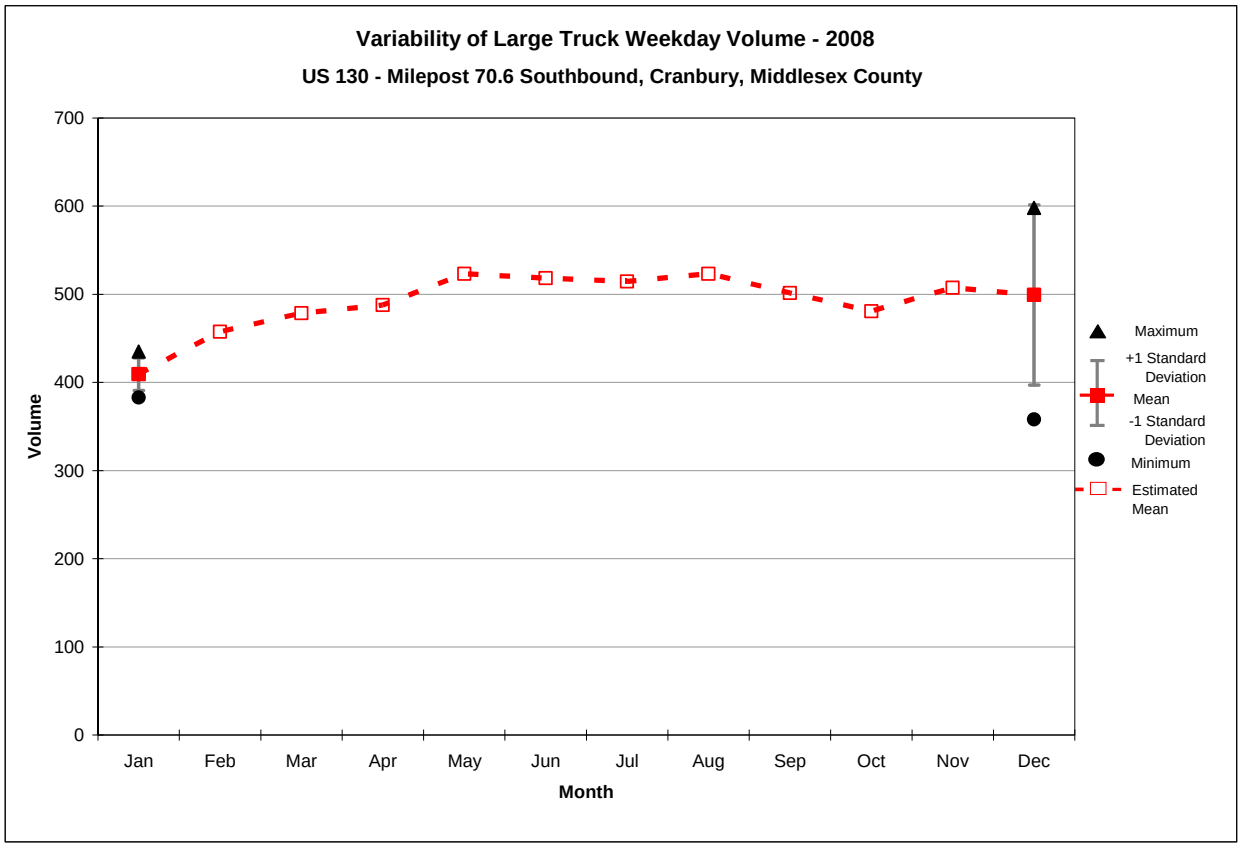

Figure 3B-130A: Variability of Large Truck Volume at Southbound US 130, MP 70.6
Note: Some means were estimated due to insufficient/unavailable data.

Figure 3B-130A shows the range of weekday large truck volume at southbound US 130 milepost 70.6. While this information is based on extremely limited data observations for two months, tremendous variability occurred in December 2008. During the four observation days of that month a peak of some 600 large trucks occurred on December 29, 2008 and the minimum volume of 360 occurred on December 22, 2008, the day of a winter weather event. The range of January 2008 large truck volume was about 50 with a standard deviation of 18.5.

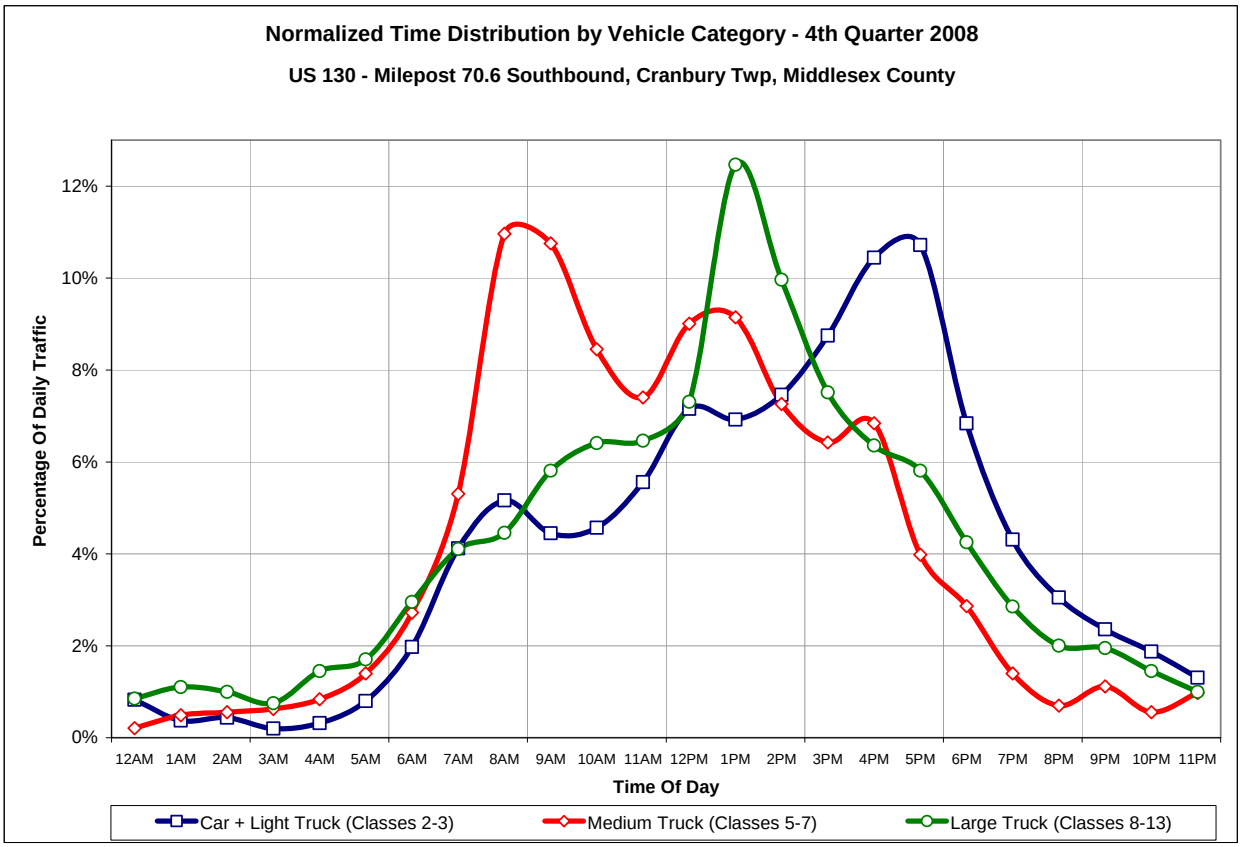

Figure 4B-130A: Daily Profile of Volume at Southbound US 130, MP 70.6

Figure 4B-130A shows the relative daily profile of traffic by vehicular category in the southbound direction at US 130 MP 70.6 during the 4th quarter of 2008. The large truck volume peaked sharply between 1:00 and 2:00 p.m. when over 12% of all large truck traffic occurred – later than at most locations and much more intensely. This was the heaviest hour of large truck relative share of any of the locations analyzed for this report. Medium trucks peaked earlier than typical, between 8:00 to 10:00 a.m. Auto volume grew throughout the day to a peak during the 3:00 to 6:00 p.m. period.

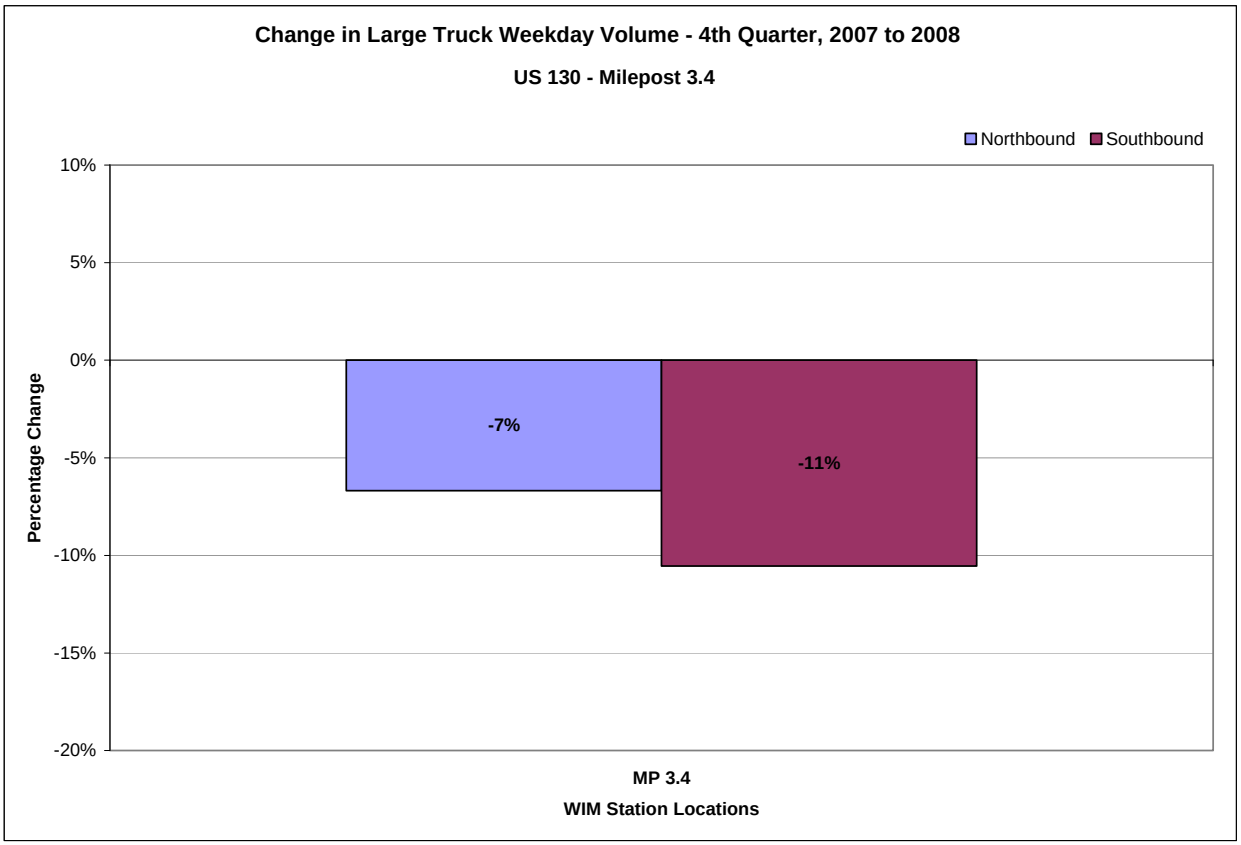

Figure 5-US130: Change in Large Truck Volume on US 130 – 4th Quarter 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

As shown in **Figure 5-130**, large truck volume on US 130 at milepost 3.4 declined in both directions between the 4th quarter of 2007 and 2008 by a moderate amount. This trend is generally in line with the month to month volume change throughout 2008.

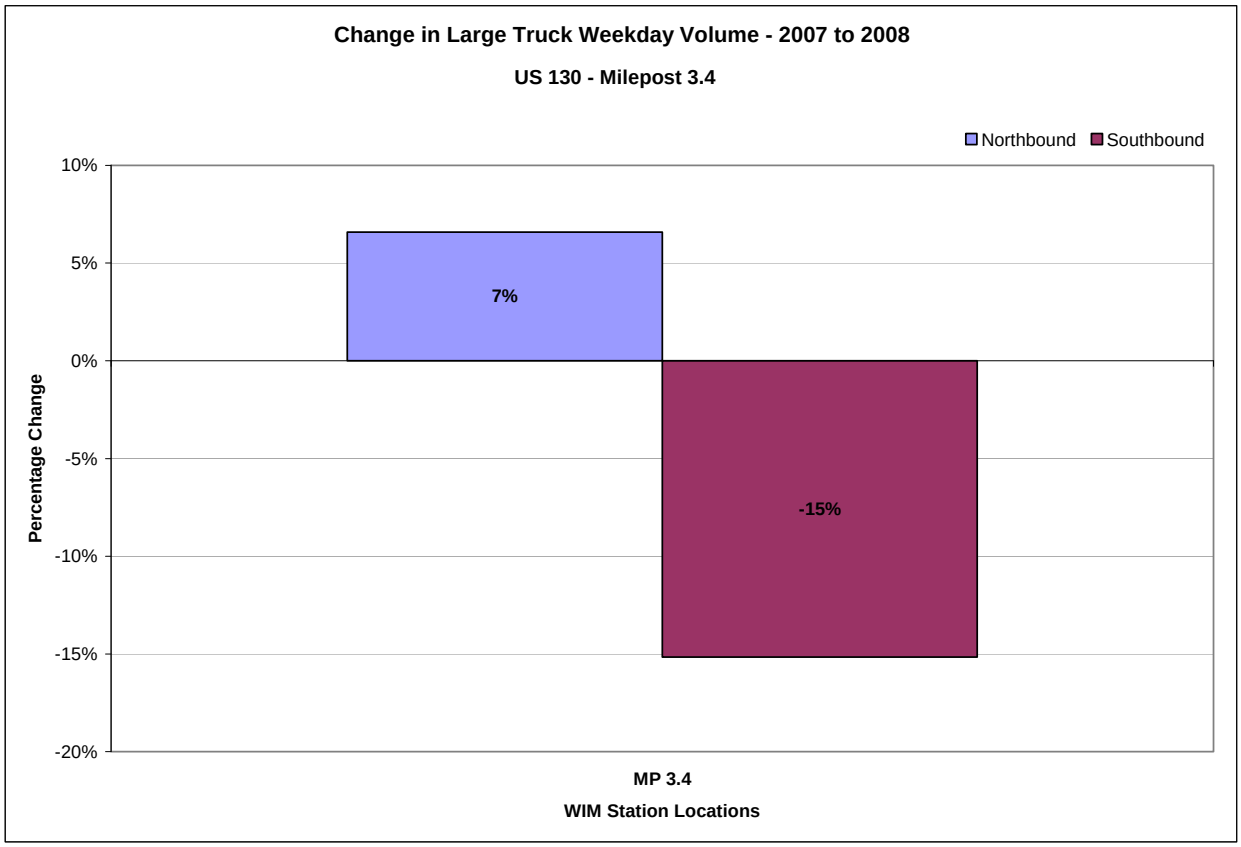

Figure 6-US130: Change in Large Truck Volume on US 130 – 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

Figure 6-130 shows large truck volume on US 130 at milepost 3.4 increasing moderately in the northbound direction while declining significantly for the opposing flow. One should note that 2007 data was unavailable prior to August and September 2007 northbound volume was uncharacteristically low. Excepting September, a comparison of comparable months shows instead a moderate decline northbound. The southbound decline is true to all comparable months.

WIM Station 31B: NJ 31, MP 13.0

WIM Station 31B is located at milepost 13.0 of NJ Route 31 in East Amwell, Hunterdon County. At this location NJ 31 is a two-lane Rural Principal Arterial and is included in the New Jersey Access Network. **Figure 1-31B** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years however limited data was available for 2008 particularly in the northbound direction.

Figure 1-31B: Aerial View of WIM Station at NJ 31, MP 13.0

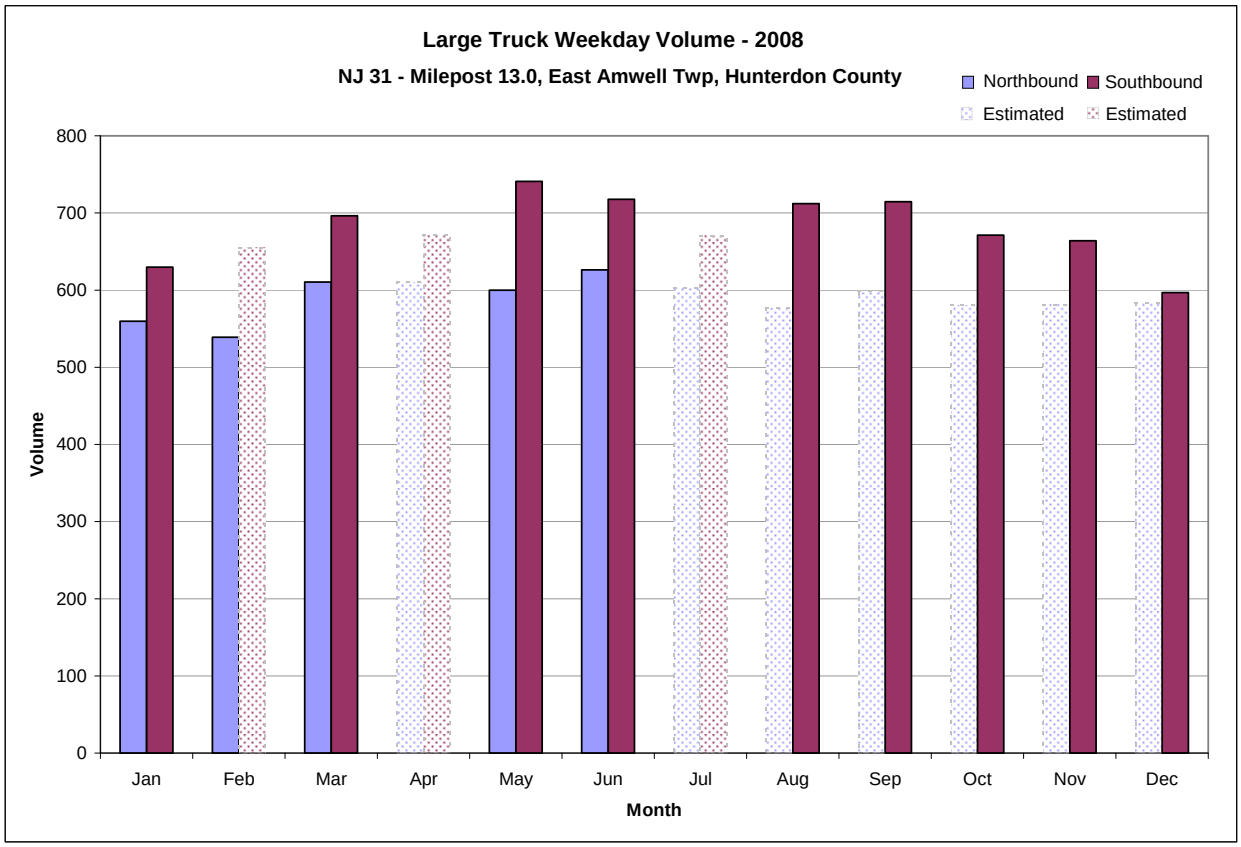

Figure 2-31B: Annual Profile of Large Truck Volume at NJ 31, MP 13.0
Note: Some means were estimated due to insufficient/unavailable data.

As shown in **Figure 2-31B,** large truck volume ranged from approximately 550 to 750 per direction per weekday during 2008 at NJ 31 milepost 13.0. Volume increased to a peak in May 2008 and steeply declined after September 2008 in the southbound direction. There was insufficient data to determine an exact northbound trend. The lowest southbound ADT occurred in December 2008. Southbound volume exceeded northbound in each of the four months when comparable data was available.

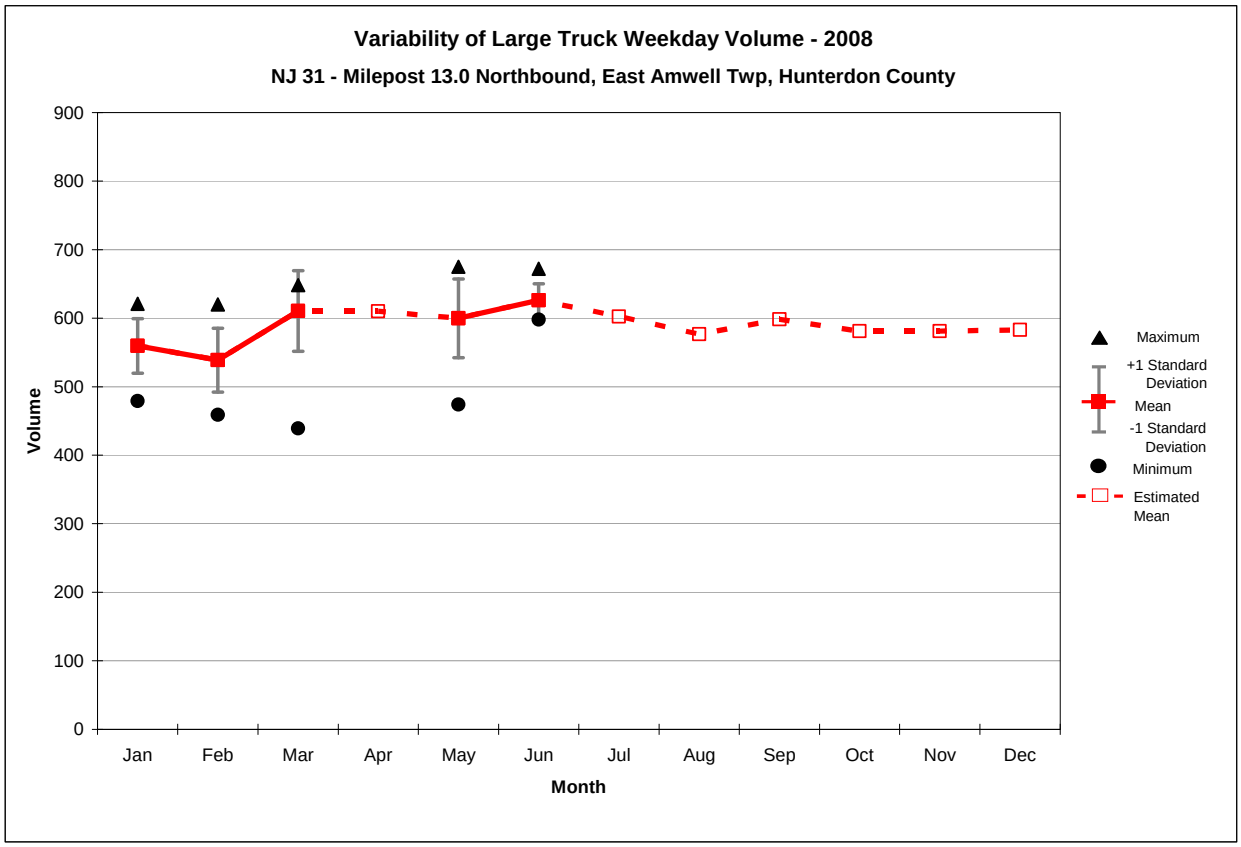

Figure 3A-31B: Variability of Large Truck Volume at Northbound NJ 31, MP 13.0
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at northbound NJ 31 milepost 13.0 is shown in **Figure 3A-31B**. While this information is based on limited data observations March and May 2008 were high variability months. In 2008, May had the overall maximum weekday: the 15th when 675 crossed here and March had the minimum observation on the 21st when there were just 439.

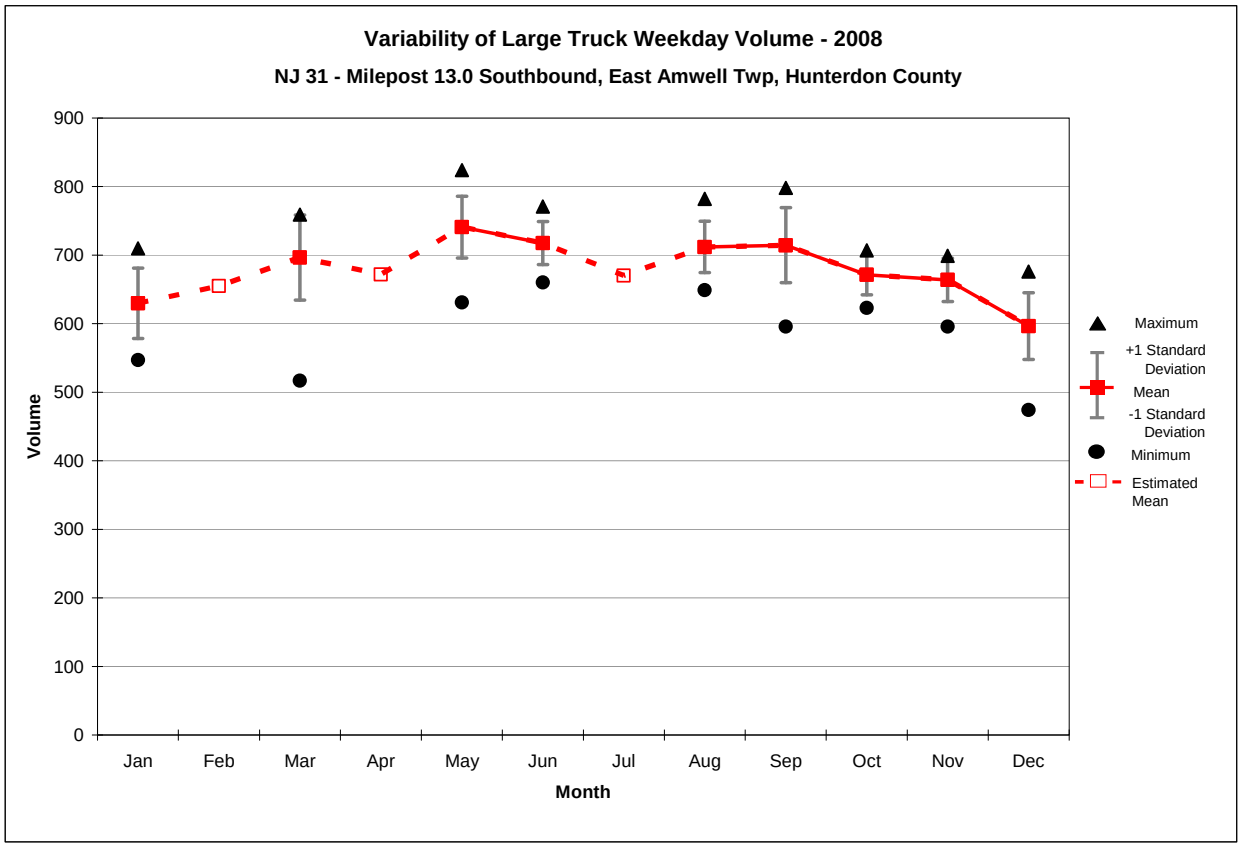

Figure 3B-31B: Variability of Large Truck Volume at Southbound NJ 31, MP 13.0
Note: Some means were estimated due to insufficient/unavailable data.

The range of weekday large truck volume at southbound NJ 31 milepost 13.0 is shown in **Figure 3B-31B**. Variability was generally high for several months of the year. From the available data, the highest weekday volume occurred on May 29, 2008 when 824 large trucks crossed southbound over the WIM Station. Very little variation was evident in October and November 2008. Of the data given, the annual minimum occurred on December 19, 2008 when the WIM counter registered 474 large trucks.

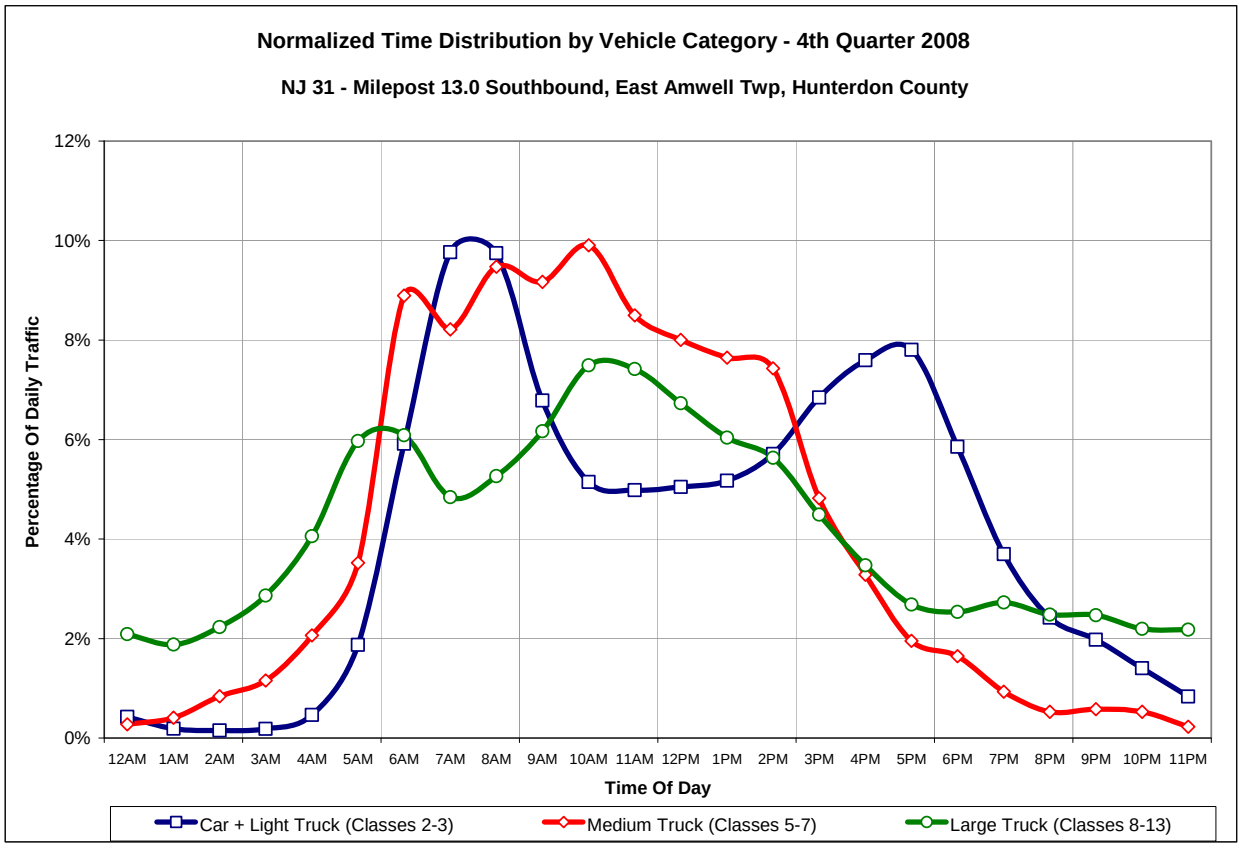

Figure 4B-31B: Daily Profile of Volume at Southbound NJ 31, MP 13.0

Figure 4B-31B shows the relative daily profile of traffic by vehicular category in the southbound direction at NJ 31 MP 13.0 during the 4th quarter of 2008. As typical of most non-Interstate locations, large truck volume peaked between 10:00 a.m. and 12:00 p.m. when over 15% of all large truck traffic occurred. There was smaller peak between 5:00 and 7:00 a.m. when 12% of the daily large truck total traversed the location. However, the large overall volume and relatively high overnight large truck count suggests a Profile 2 pattern on this arterial. Medium trucks followed a more pronounced profile with a sharp rise at 6:00 a.m., followed by a sustained peak until 11:00 a.m., and a sharp drop after 3:00 p.m. Auto volume followed a typical commuter route pattern with highest peak during the 7:00 to 9:00 a.m. period and a lesser peak during the late afternoon.

WIM Station 31D: NJ 31, MP 26.4

WIM Station 31D is located at milepost 26.4 of NJ Route 31 in Readington, Hunterdon County. At this location NJ 31 is a four-lane Urban Principal Arterial and is included in the New Jersey Access Network. **Figure 1-31D** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years and a complete data set was available for 2008.

Figure 1-31D: Aerial View of WIM Station at NJ 31, MP 26.4

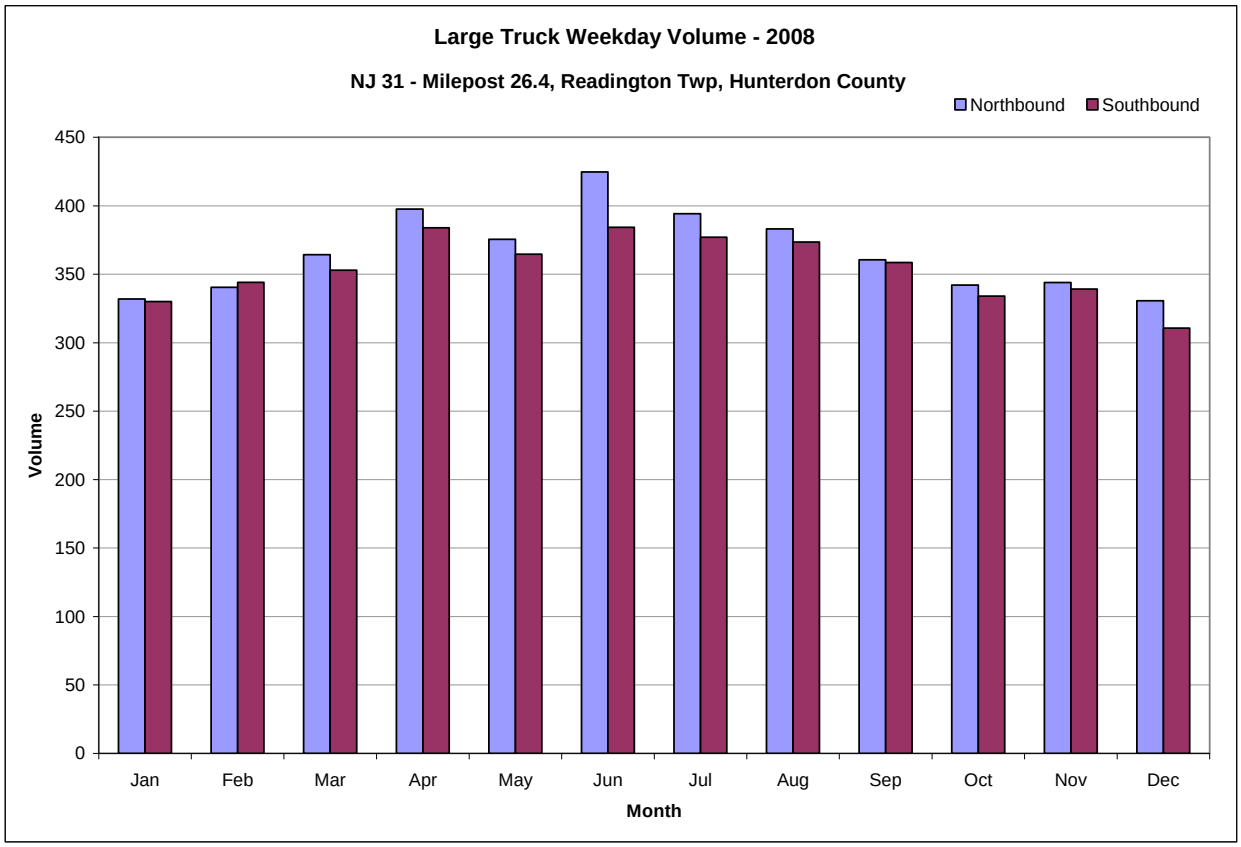

Figure 2-31D: Annual Profile of Large Truck Volume at NJ 31, MP 26.4

As shown in **Figure 2-31D,** large truck volume ranged from approximately 280 to 430 per direction per weekday during 2008 at NJ 31 milepost 26.4. Volume peaked in June 2008 and exhibited a steadily declining trend for the remainder of the year in the both northbound and southbound directions. The minimum large truck ADT occurred in December 2008 for both directions of travel. Northbound volume generally exceeded southbound large truck volume at milepost 26.4 by approximately 5% throughout the year. In all but one month higher large truck ADT occurred in the northbound direction.

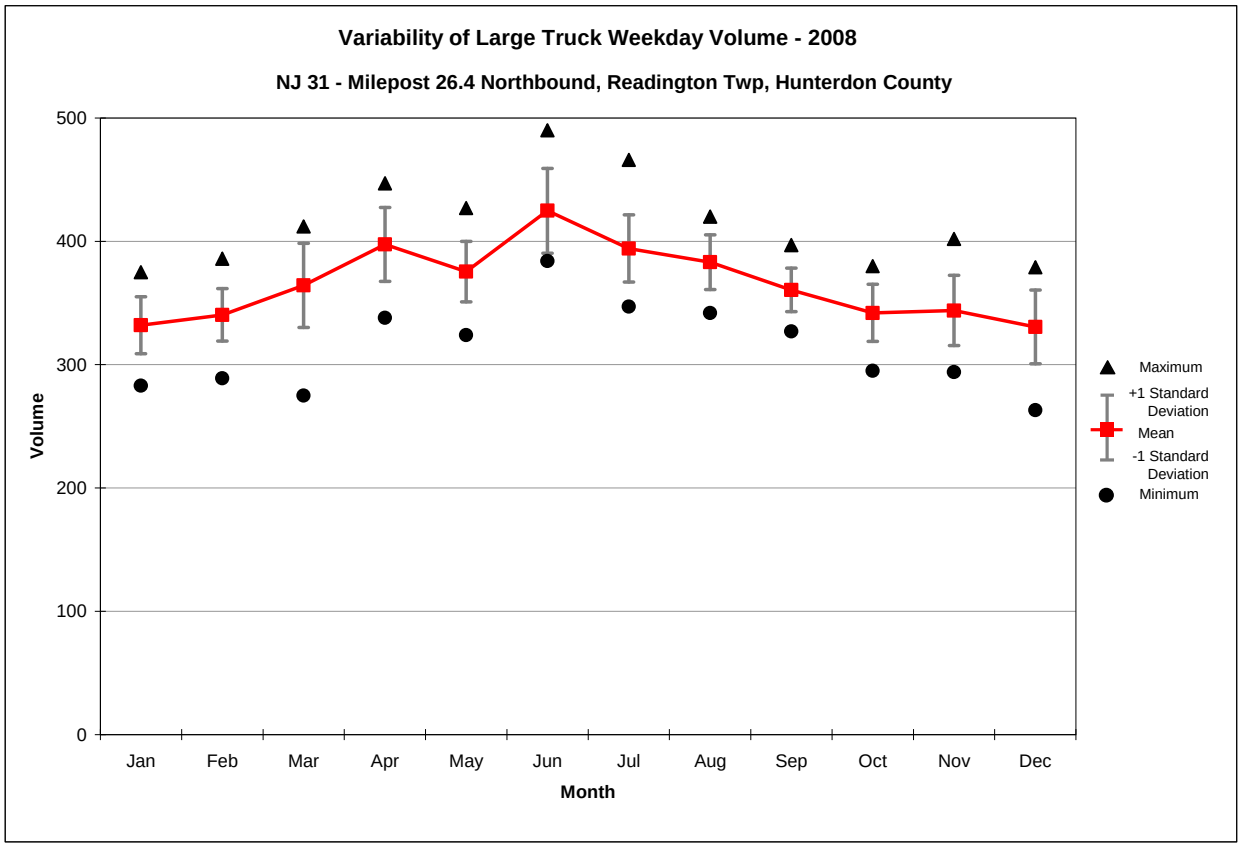

Figure 3A-31D: Variability of Large Truck Volume at Northbound NJ 31, MP 26.4

Figure 3A-31D depicts the range of weekday large truck volume at northbound NJ 31 milepost 26.4. The greatest variability was experienced in March and June 2008, and the least variability in September 2008. From the available data, the maximum weekday volume of 490 trucks occurred on June 26, 2008 and the minimum volume of 263 trucks occurred on December 19, 2008.

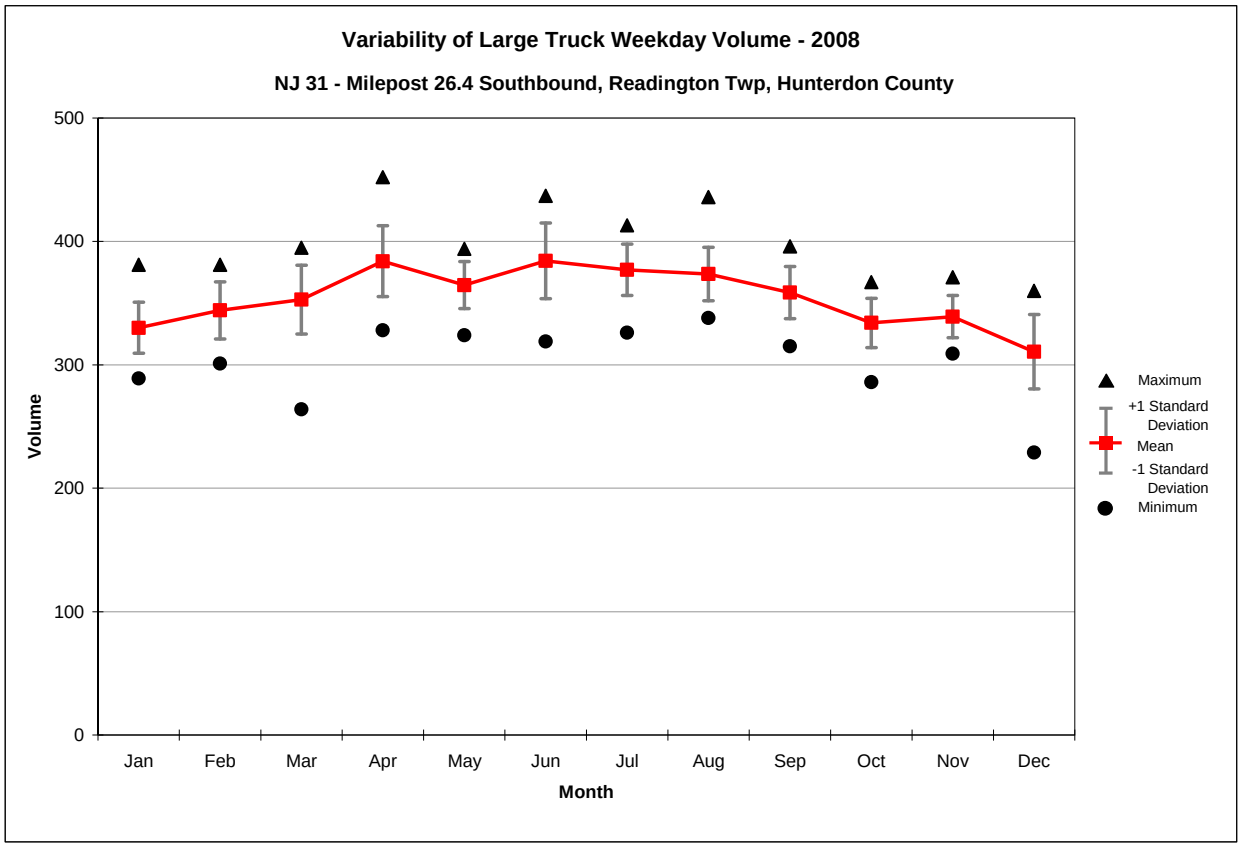

Figure 3B-31D: Variability of Large Truck Volume at Southbound NJ 31, MP 26.4

The range of weekday large truck volume at southbound NJ 31 milepost 26.4 is shown in **Figure 3B-31D**. The greatest variability was experienced in June and December 2008 and the least variability in November 2008. The highest weekday volume of 452 trucks occurred on April 16, 2008 and the annual minimum recorded on December 19, 2008.

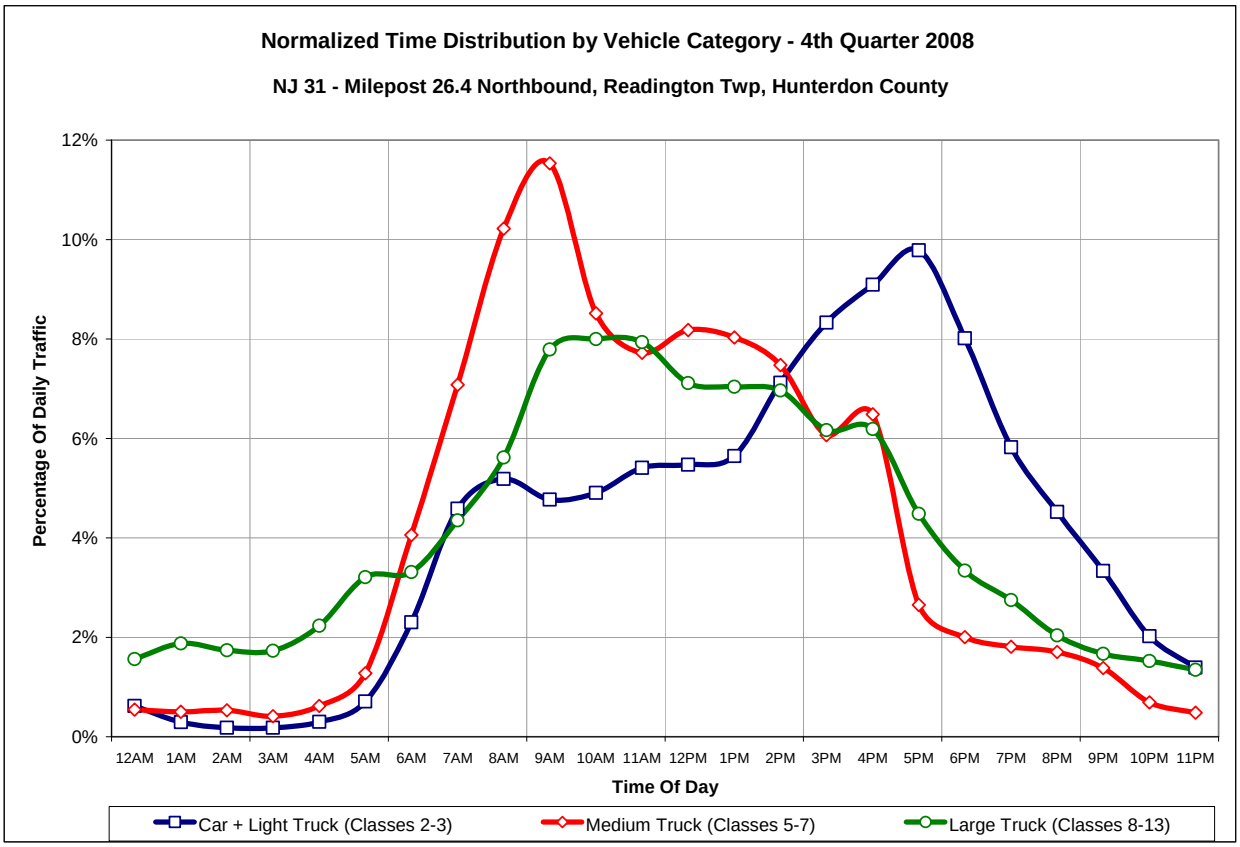

Figure 4A-31D: Daily Profile of Volume at Northbound NJ 31, MP 26.4

Figure 4A-31D shows the relative daily profile of traffic by vehicular category in the northbound direction at NJ 31 milepost 26.4 during the 4th quarter of 2008. As typical of most locations, large truck volume peaked between 9:00 a.m. and 12:00 p.m. when 24% of all large truck traffic occurred. Medium trucks followed a sharply peaked profile with maximum volume between 9:00 and 10:00 a.m. when nearly 12% of the daily volume occurred. Auto volume followed a directional commuter pattern with a pronounced peak during the 3:00 to 6:00 p.m. period.

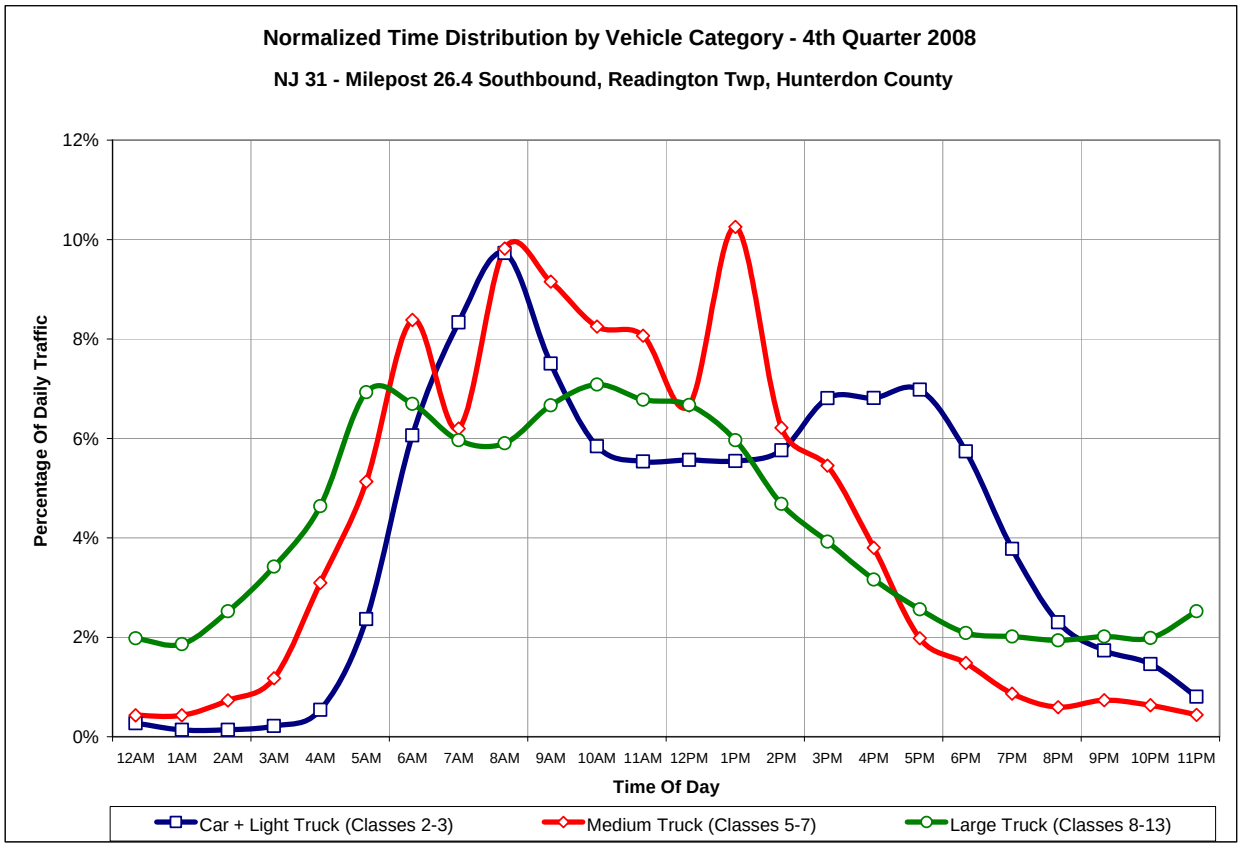

Figure 4B-31D: Daily Profile of Volume at Southbound NJ 31, MP 26.4

Figure 4B-31D shows the relative daily profile of traffic by vehicular category in the southbound direction at NJ 31 milepost 26.4 during the 4th quarter of 2008. The large truck volume was highest during a nine hour stretch between 5:00 a.m. and 2:00 p.m. This sustained peak and relatively high overnight volume is indicative of a Profile 2 pattern. Medium trucks followed a more peaked profile with maximum volume between 1:00 and 2:00 p.m. when over 10% of the daily medium truck traffic occurred. Auto volume followed a commuter route pattern with a higher peak during the 8:00 to 9:00 a.m. period and a lesser peak during the late afternoon.

WIM Station 31C: NJ 31, MP 40.4

WIM Station 31C is located at milepost 40.4 of NJ Route 31 in Washington Township, Warren County. At this location NJ 31 is a two-lane Urban Principal Arterial and is included in the New Jersey Access Network. **Figure 1-31C** shows the location and surrounding features. WIM data has been continuously recorded at this location for more than four years and a complete data set was available for 2008.

Figure 1-31C: Aerial View of WIM Station at NJ 31, MP 40.4

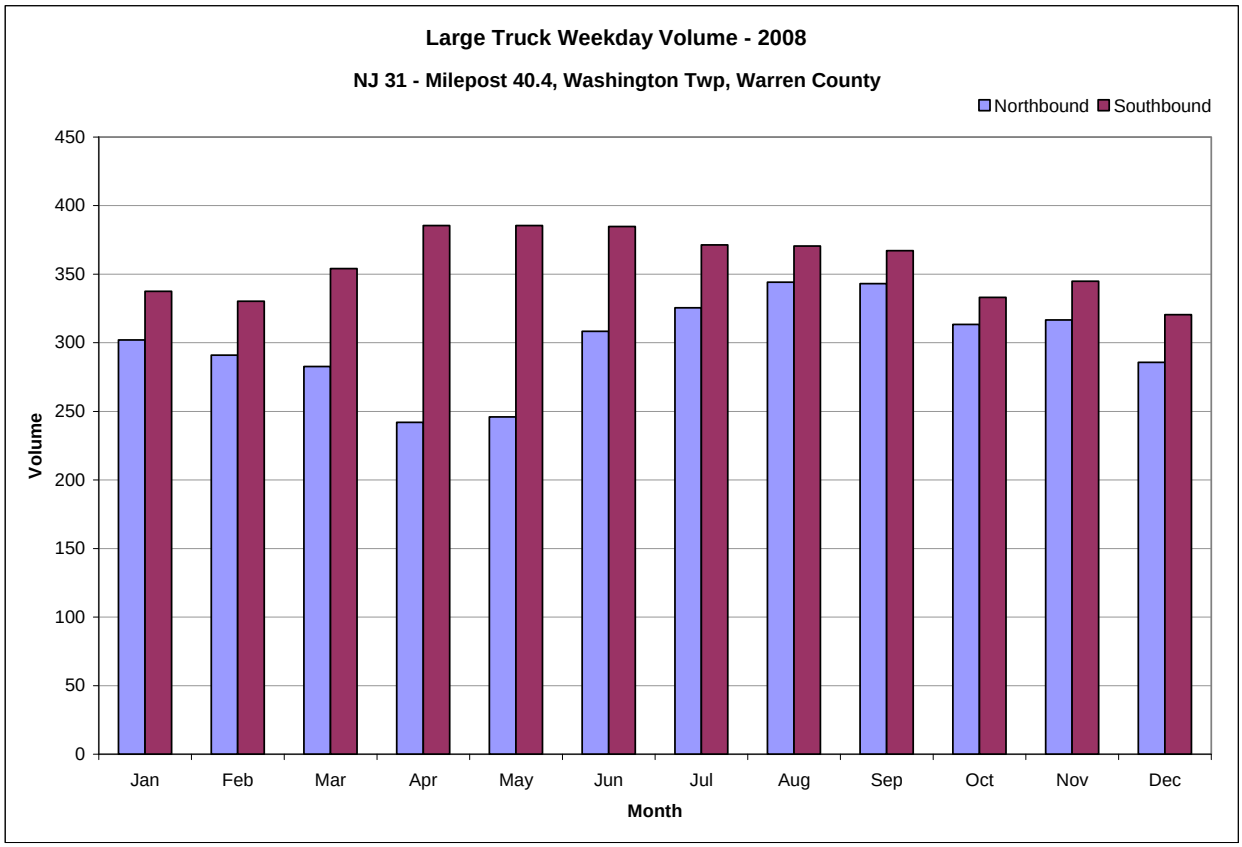

Figure 2-31C: Annual Profile of Large Truck Volume at NJ 31, MP 40.4

As shown in **Figure 2-31C,** unusually low large truck volume was experienced at northbound NJ 31 milepost 40.4 in April and May 2008 when the weekday volume was 80% of the remainder of the year. Nearly 5% of vehicles were not classified in the northbound direction in both months which may have been a contributing factor. Northbound volume peaked in August 2008 however southbound volume peaked in April 2008 and exhibited a steady decline for the rest of the year. Southbound volume exceeded northbound volume for each month of the year and by a combined 20% over the course of the year. This is in contrast to the lesser pattern at NJ 31, milepost 26.4 where northbound generally was greater.

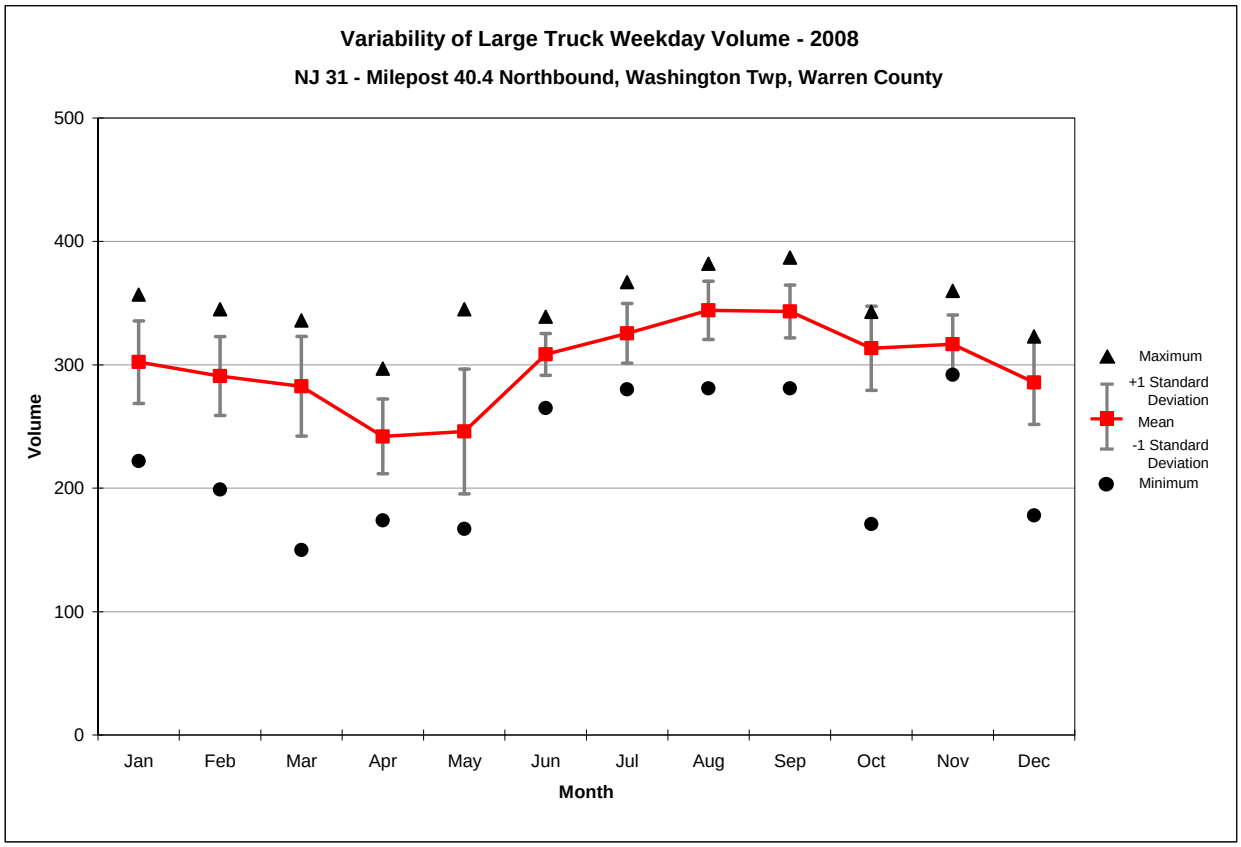

Figure 3A-31C: Variability of Large Truck Volume at Northbound NJ 31, MP 40.4

The range of weekday large truck volume at northbound NJ 31 milepost 40.4 is shown in **Figure 3A-31C**. The greatest variability was experienced in May 2008 and the least variability in June 2008. The May 2008 high variability was matched by unexpected low average large truck volume as seen in Figure 2-31C. From the available data, the high volume of 387 large trucks occurred on September 16, 2008 and the low volume of 167 occurred on May 15, 2008 – the same day the maximum large truck volume occurred at northbound NJ 31, milepost 13.0.

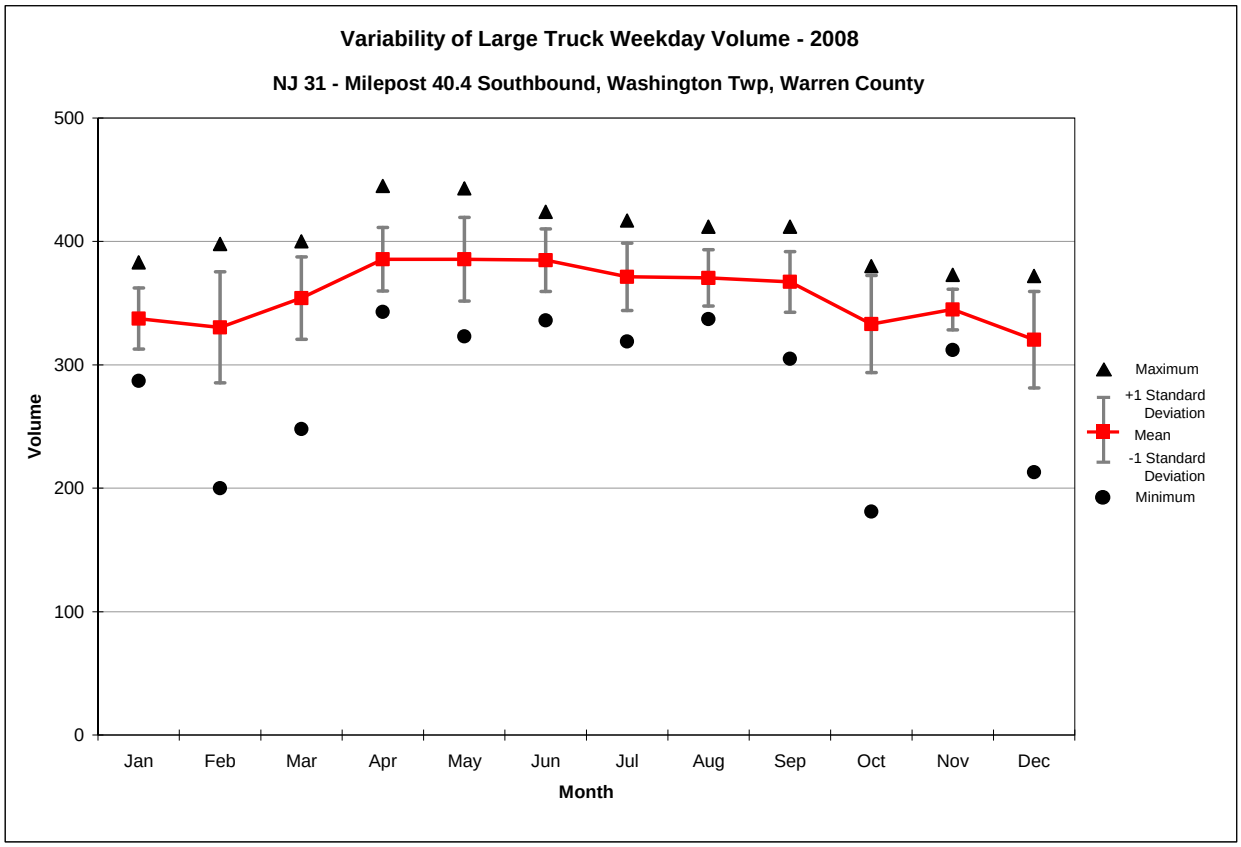

Figure 3B-31C: Variability of Large Truck Volume at Southbound NJ 31, MP 40.4

Figure 3B-31C illustrates the range of weekday large truck volume at southbound NJ 31 milepost 40.4. The greatest variability was experienced in February, October and December 2008 and the least variability in November 2008. The high variability is most likely due to very low volumes during those months. The minimum volume of 181 trucks occurred on October 28, 2008 and highest recorded weekday volume of 445 trucks occurred on April 30, 2008.

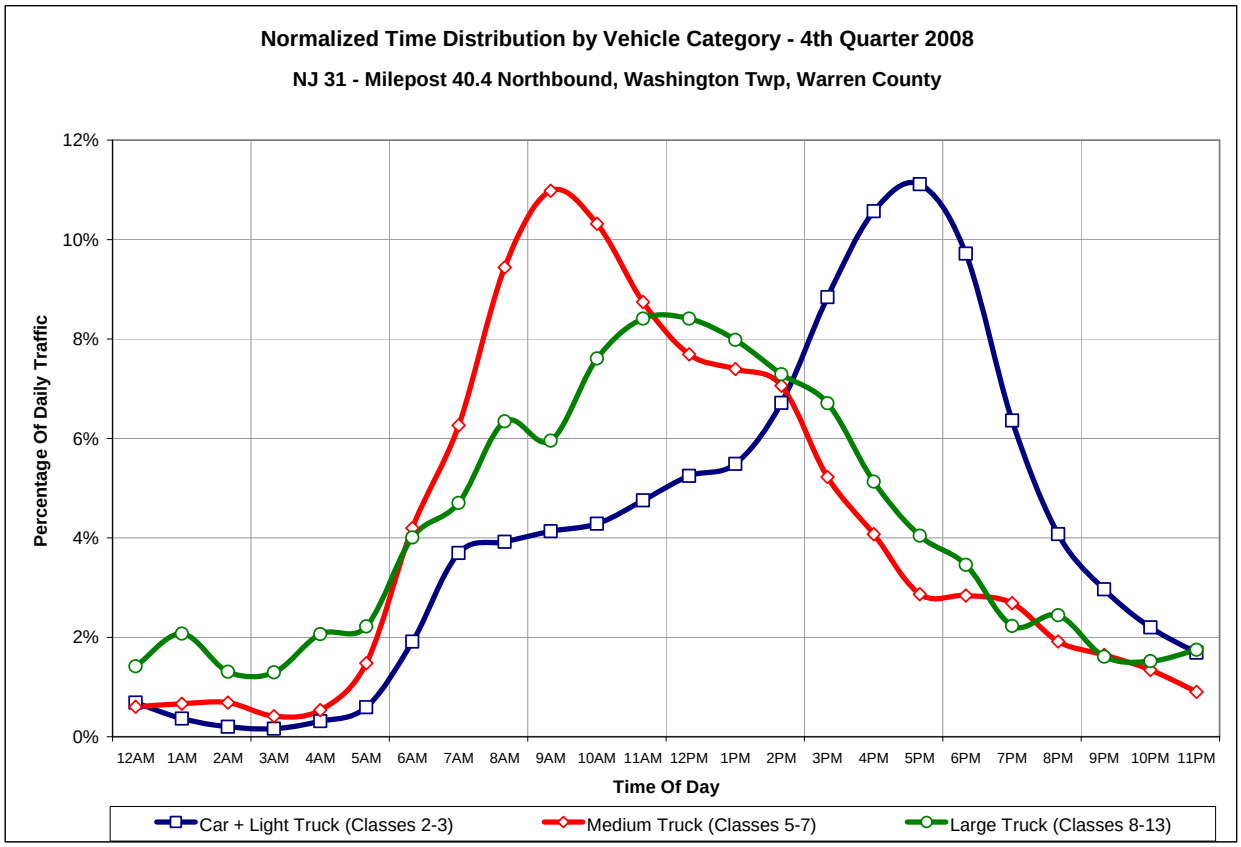

Figure 4A-31C: Daily Profile of Volume at Northbound NJ 31, MP 40.4

Figure 4A-31C shows the relative daily profile of traffic by vehicular category in the northbound direction at NJ 31 milepost 40.4 during the 4th quarter of 2008. The large truck volume was greatest between 11:00 a.m. and 2:00 p.m. when nearly 24% of all large truck traffic occurred. Medium trucks followed a more peaked profile with maximum volume between 9:00 and 11:00 a.m. when nearly 21% of the daily volume occurred. Auto volume followed an intense directional commuter pattern with a pronounced peak during the 4:00 to 6:00 p.m. two hour period when a full 21% of all personal vehicles traveled.

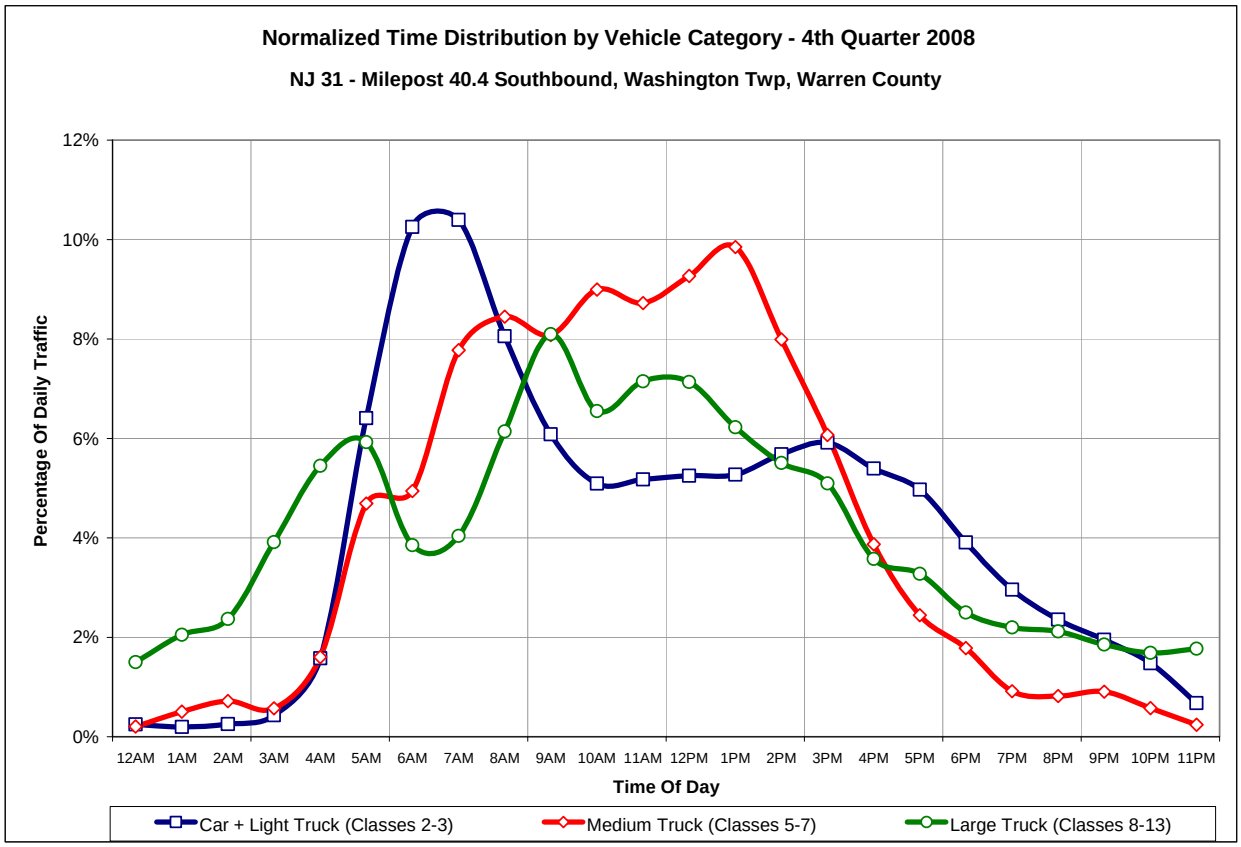

Figure 4B-31C: Daily Profile of Volume at Southbound NJ 31, MP 40.4

Figure 4B-31C shows the relative daily profile of traffic by vehicular category in the southbound direction at NJ 31 milepost 40.4 during the 4th quarter of 2008. The large truck volume peaked between 9:00 and 10:00 a.m. when nearly 8% of all large truck traffic occurred. Medium trucks volume grew steadily throughout the day peaking between 1:00 and 2:00 p.m. when nearly 10% of the daily medium truck traffic occurred. Auto volume followed a strong commuter route pattern with highest peak during the 6:00 to 8:00 a.m. period with nearly 20% of daily auto volume.

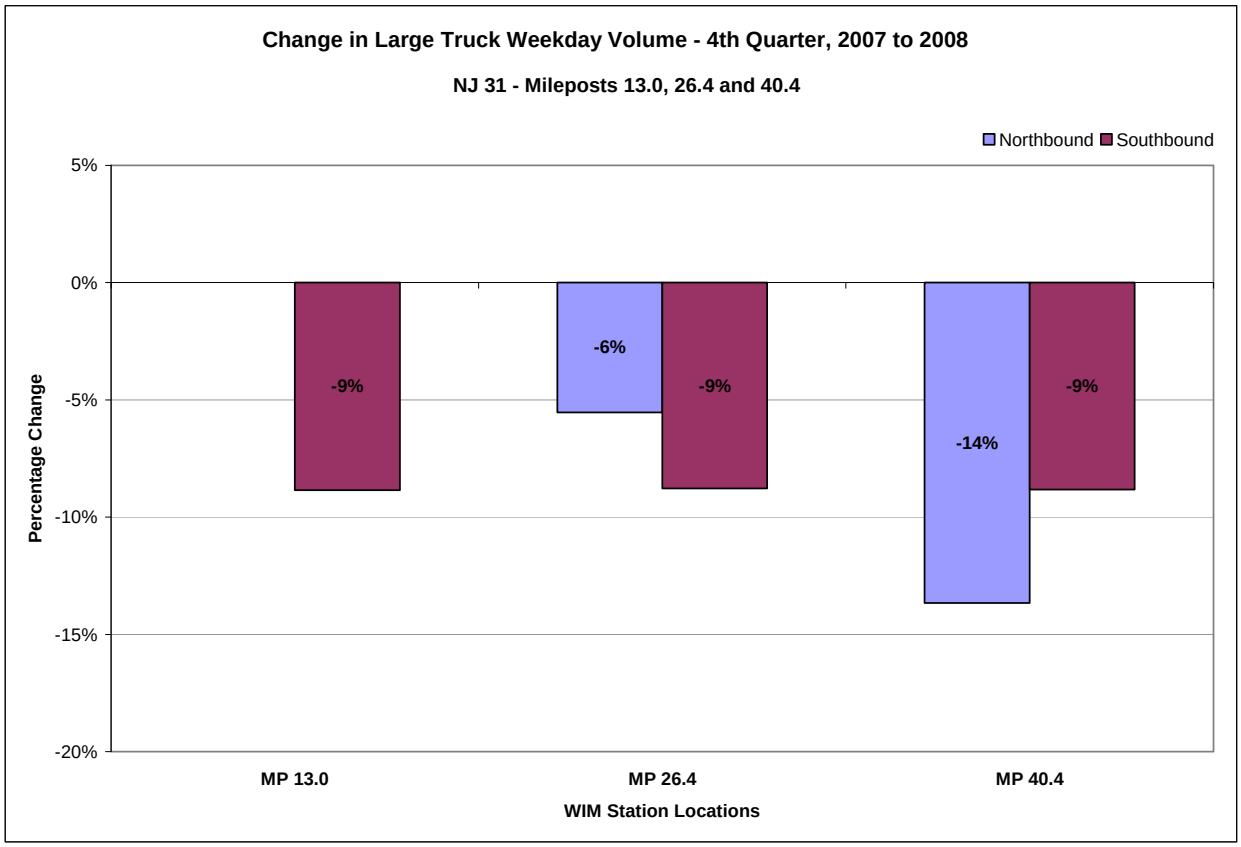

Figure 5-NJ31: Change in Large Truck Volume on NJ 31 – 4th Quarter 2007 to 2008
Note: Some chart features are missing due to insufficient/unavailable data.

As shown in **Figure 5-NJ31**, large truck volume on NJ 31 decreased measurably between the 4th quarter of 2007 and 2008 in both directions of travel. The decline was uniformly 9% at all three southbound stations but was exacerbated as travel moved northbound from milepost 26.4 to 40.4.

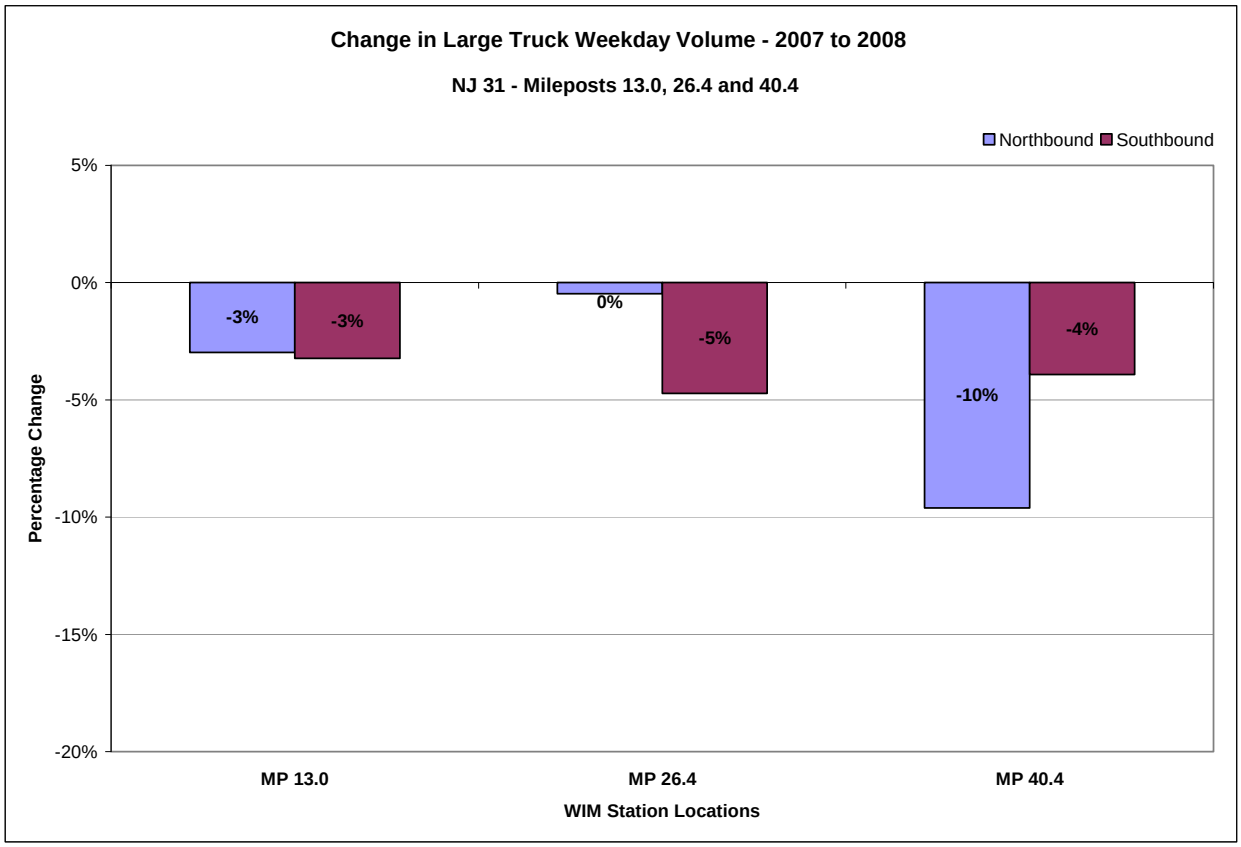

Figure 6-NJ31: Change in Large Truck Volume on NJ 31 – 2007 to 2008

Figure 6-NJ31 shows the change in large truck volume on NJ 31 between 2007 and 2008. The decline was relatively small between the two years at each of the locations except northbound at milepost 40.4 where a 10% drop was occurred. The nearly flat change at northbound milepost 26.4 was one of the mildest decreases seen among the stations analyzed in this report.

Large Truck Volume Summary

The following maps graphically depict the change in large truck weekday ADT from 2007 to 2008. For readability purposes for bi-directional WIM Stations, northbound and eastbound data has been shown separately from southbound and westbound data.

Statewide, declines were experienced at each WIM Station analyzed in this report except the low volume northbound US 130 milepost 3.4 where 2007 data was scarce. Overall, the declines were less significant in the north- and eastbound directions – the direction of most through trips – as seen in **Figures B** and **C**. Besides the location on US 130, northbound I-287 milepost 61.7 and northbound NJ 31 milepost 26.4 were the only other locations to not register a significant year to year decline. Only one north- or eastbound location, I-80 milepost 32.4 declined by more than 10%. By contrast, no locations in the south- and westbound directions declined by less than 2% and one, the pair to the sole increasing station at US 130 milepost 3.4, declined by 15%.

In summary, the newly adopted large truck regulations (January 2008) do not appear to have significantly impacted the routing of large trucks in New Jersey to date. The WIM station data for the National Network routes show declining volumes across-the-board between 2007 and 2008. Large trucks on the New Jersey Access Network routes have also declined, but in general showed a lesser volume reduction pre-regulation change to post-regulation change than the National Network locations. There are a number of possible reasons why these reductions and differences may have occurred.

Figure B: Change in Large Truck Volume – 2007 to 2008 (Northbound and Eastbound)

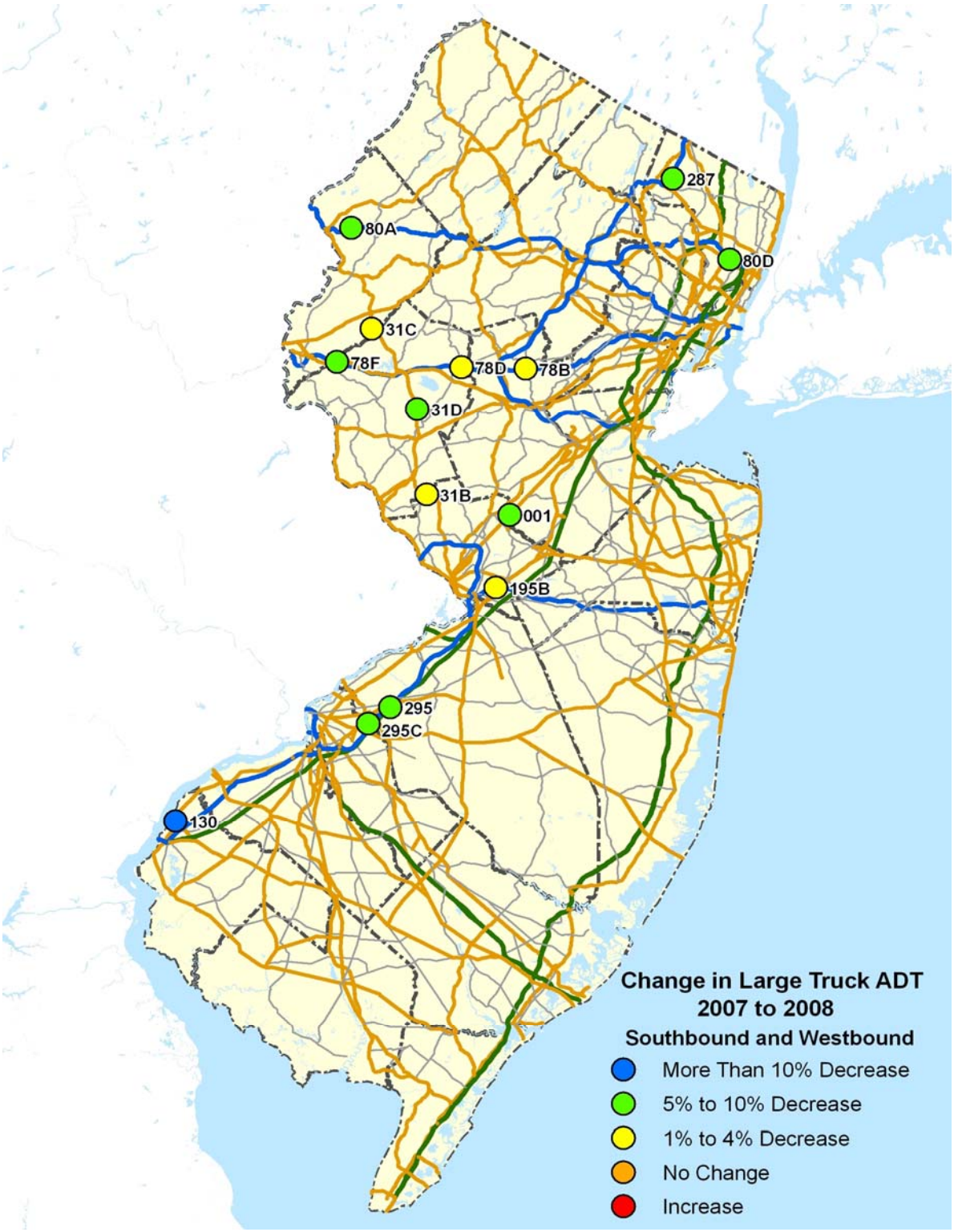

Figure C: Change in Large Truck Volume – 2007 to 2008 (Southbound and Westbound)

The level of underlying economic activity is likely the most significant factor in the change in large truck volume between 2007 and 2008 in New Jersey. A comparison of the change in weekday large truck volume for the period 2007 through 2008 for each of the nine facilities analyzed is shown in **Figure D**. The percent change in large truck volume at each directional WIM station (or toll location) on each facility was averaged to calculate the quarter to quarter change for that facility. This graph also shows the change in U.S. Gross Domestic Product (GDP) as an indication of overall economic activity and demand for goods movement.

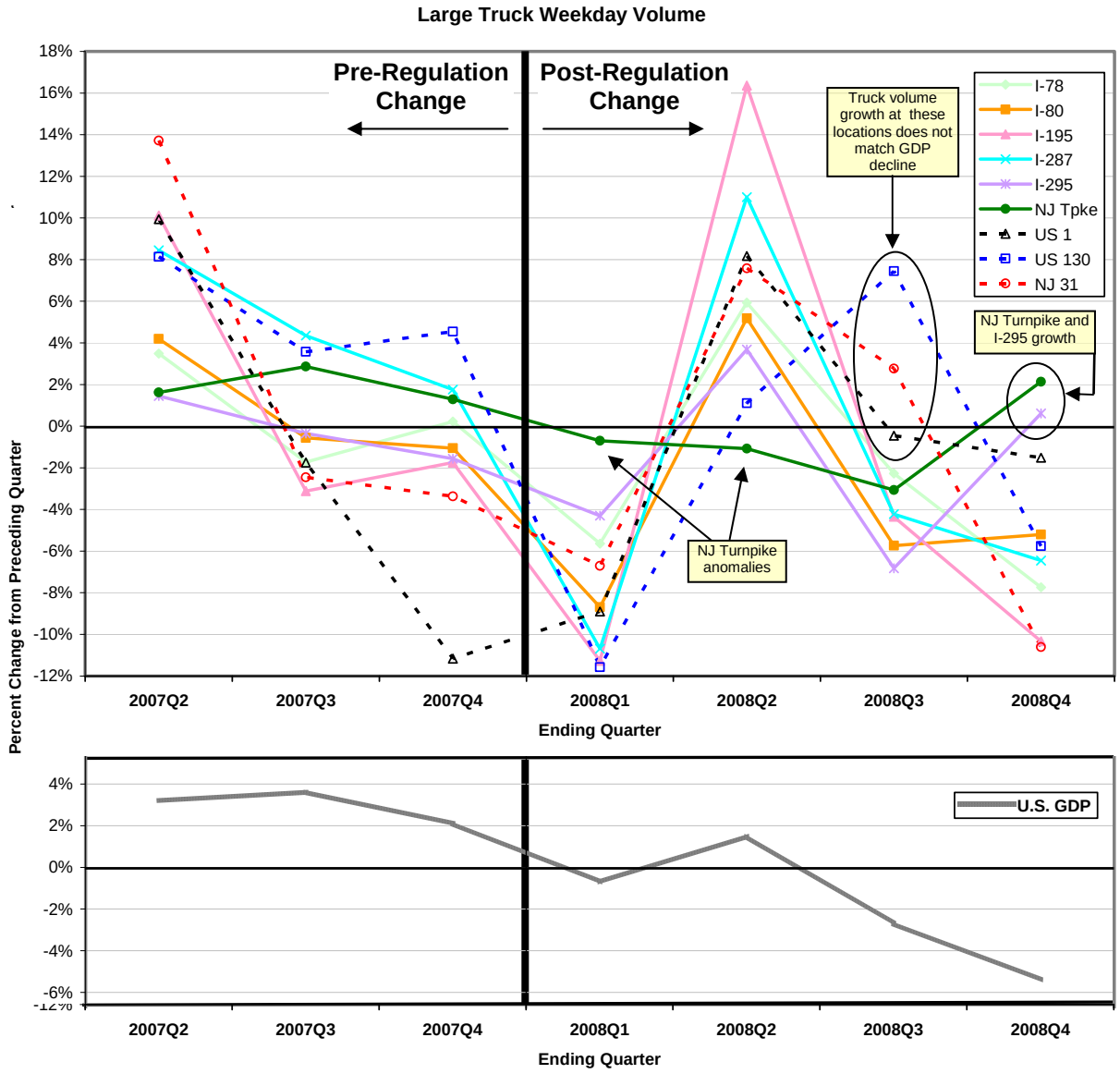

Figure D: Change in Large Truck Volume by Facility and GDP – 2007 and 2008

Notes: For New Jersey Turnpike and DRJTBC facilities, large trucks defined as trucks with five or more axles; holidays and weekend are included. U.S. GDP is seasonally adjusted and based on chained 2005 dollars.
U.S. GDP Source: US Bureau of Economic Analysis

What we see in **Figure D** is that the national seasonally adjusted GDP was declining in all but one quarter of 2008 and most significantly in the latter half of the year. By comparison, the large truck volume in New Jersey generally followed a similar although more pronounced trend with a sharp decline in the first quarter of 2008, a considerable upswing during the second quarter, and generally declining growth in the final two quarters.

From the graph it is apparent that large truck traffic on the New Jersey Access Network corridors (US 1, US 130, and NJ 31) were the only three to show growth or nearly flat change during the economy's contraction during the third quarter of 2008. It is unclear what may have caused this variation in trend from the other National Network corridors. Further monitoring of these corridors will be required to see if this deviation continues.

Additionally, the New Jersey Turnpike, the state's busiest large truck thoroughfare, exhibited an atypical pattern compared to non-tolled roadways. On this facility, tempered volume declines occurred during the first three quarters of 2008 which were followed by positive change during the final quarter of the year – a time when the economy was shrinking. Truck drivers' favoring of a tolled road during a deepening recession does not match expectations; however a slight uptick on the parallel I-295 during that period may indicate strength in the north-south goods movement market.

Figure E which shows the volume change averaged for each directional count station by truck access network further illustrates the impact of the economy on large truck volume. The GDP trend was largely matched by large truck volume on both the 29 National Network classification count locations and the 13 New Jersey Access Network WIM stations. The one divergent trend – New Jersey Access Network facilities' collective third quarter growth despite the national economic indicator – is evident. Again, the reasons for this are unclear; however, further monitoring and analysis of future data and data for additional corridors may provide some clues.

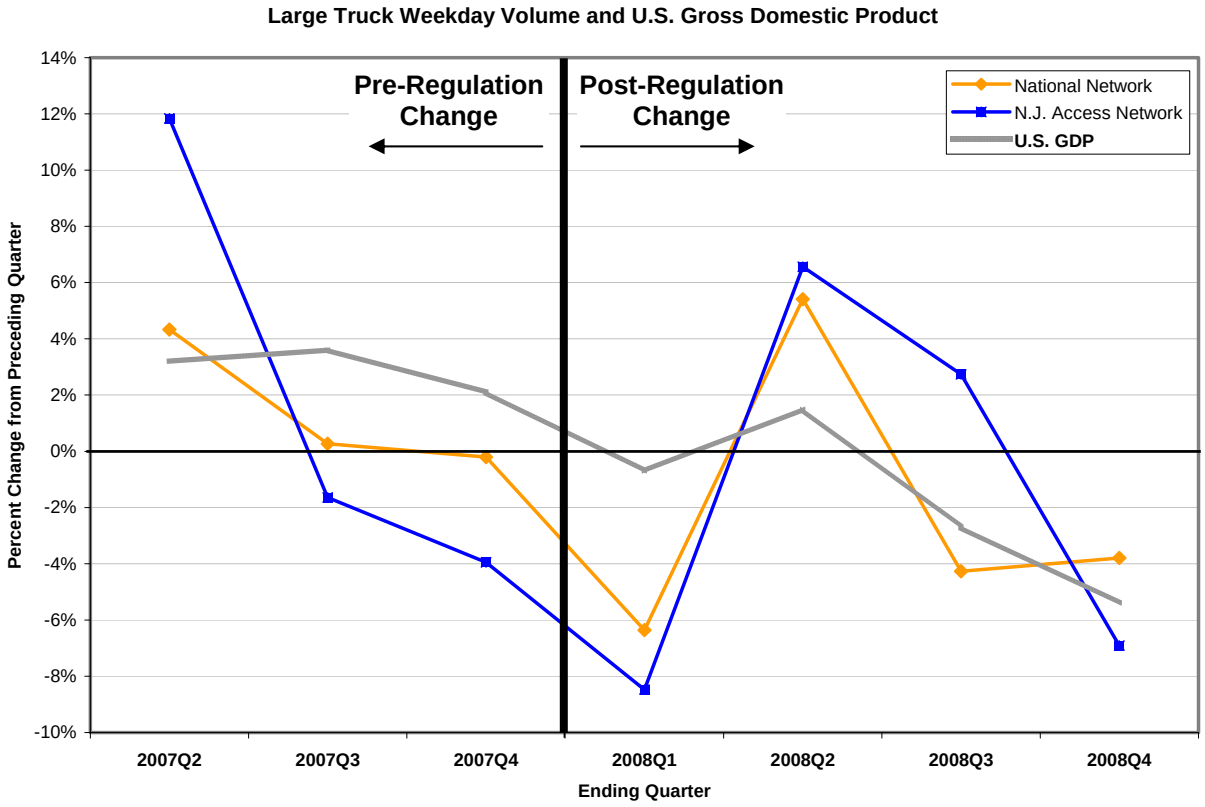

Figure E: Change in Large Truck Volume by Network and GDP – 2007 and 2008
Notes: For New Jersey Turnpike and DRJTBC facilities, large trucks defined as trucks with five or more axles; holidays and weekend are included. U.S. GDP is seasonally adjusted and based on chained 2005 dollars.
U.S. GDP Source: US Bureau of Economic Analysis

This Large Truck Monitoring Program Report is intended to be the first in an ongoing multi-year program that will track the volume of large truck flows throughout the state. We will continue to monitor these large truck flows statewide and assess the meaning or changes in trends as they appear. Monitoring of large truck volume on New Jersey roadways is currently proceeding with the collection and analysis of additional WIM data throughout 2009. For the 2009 report additional station locations will be analyzed in an effort to better identify truck volume patterns. It will be seen whether the patterns and trends observed during the first year of the new truck regulations and presented in this report will persist with subsequent study.

Appendix A - Vehicle Classification Schemas

Large Trucks as defined in this report are highlighted in yellow.

FHWA Vehicle Classification

Class	Vehicle	Detail
1	Motorcycles	
2	Passenger Cars	2 Axles/4 Tires
3	Light Trucks/Other	2 Axles/4 Tires
4	Buses	
5	Single-Unit Trucks	2 Axles/6 Tires
6		3 Axles
7		4 or More Axles
8	Single-Trailer Trucks	4 or Less Axles
9		5 Axles
10		6 or More Axles
11	Multi-Trailer Trucks	5 or Less Axles
12		6 Axles
13		7 Axles

DRJTBC Vehicle Classification

Class	Vehicle	Detail
1	Passenger Cars	
2	Trucks	2 Axles
3		3 Axles
4		4 Axles
5		5 Axles
6		6 Axles
7		7 Axles

NJTA Vehicle Classification

Class	Vehicle	Detail
1	Passenger Cars	
2	Trucks	2 Axles
3		3 Axles
4		4 Axles
5		5 Axles
6		6 Axles
B2	Buses	2 Axles
B3		3 Axles