# Simulating Trucks in CORSIM

Minnesota Department of Transportation
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# Simulating Trucks in CORSIM

.

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# 1.0 Overview

Truck operations have a profound impact on traffic operations according to the Highway Capacity Manual:

> Heavy vehicles adversely affect traffic in two ways: they are larger than passenger cars and occupy more roadway space; and they have poorer operating capabilities than passenger cars, particularly with respect to acceleration, deceleration, and the ability to maintain speed on upgrades. The second impact is more critical. The inability of heavy vehicles to keep pace with passenger cars in many situations creates large gaps in the traffic stream, which are difficult to fill by passing maneuvers. The resulting inefficiencies in the use of roadway space cannot be completely overcome. (HCM2000, 2-4&2-5)

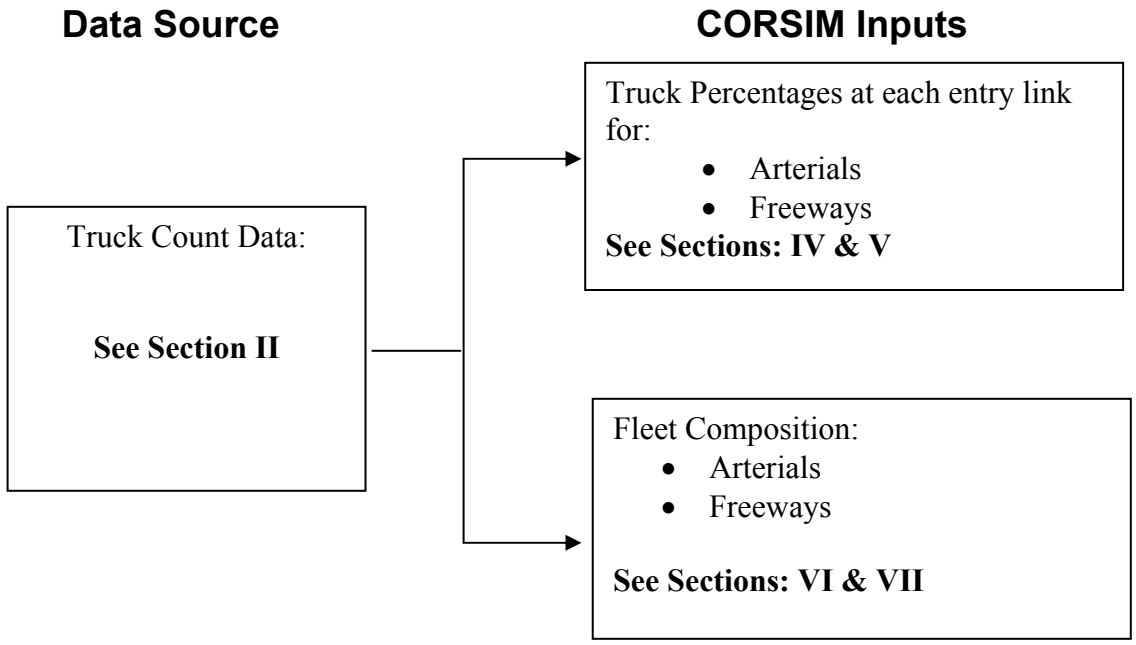
Heavy vehicles affect CORSIM in the same ways; therefore, accurately representing the truck percentages and fleet composition (i.e. mix of single unit trucks, medium semis, heavy semis and double trailer trucks) is essential for credible analysis using CORSIM. The purpose of this manual is to provide the procedure for incorporating truck percentages and fleet composition information into the CORSIM model.

Traffic without Trucks consists of a steady traffic stream with close headway

Traffic with Trucks consists of large gaps in the traffic stream

Truck data is used in two CORSIM inputs: truck percentage and fleet composition. Figure 1 illustrates the data sources used to compute the truck percentages and fleet composition.

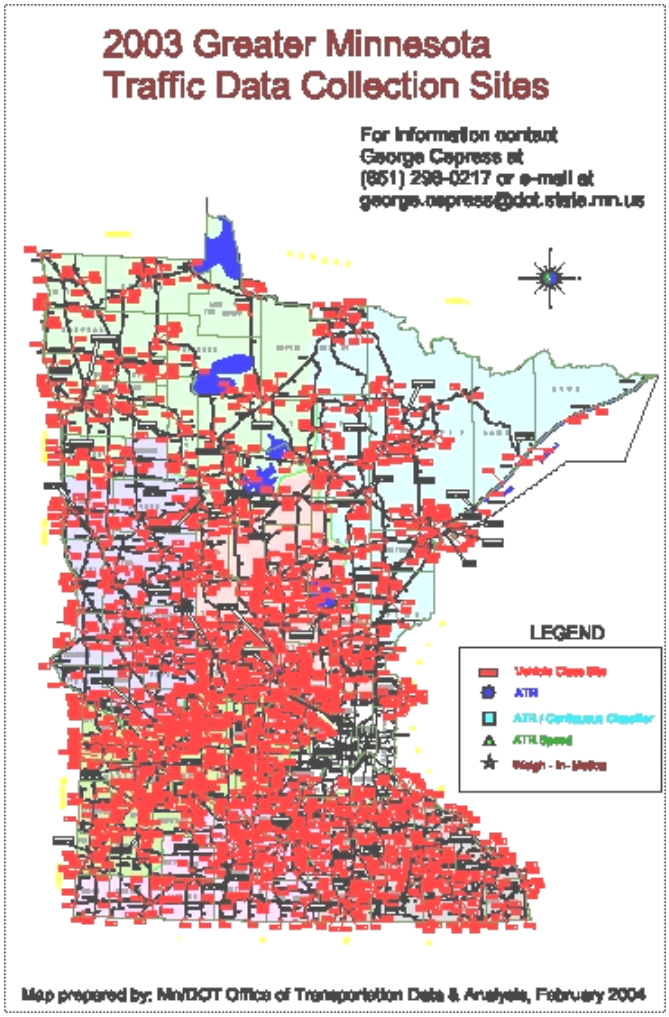
**Figure 1: Data flow diagram**

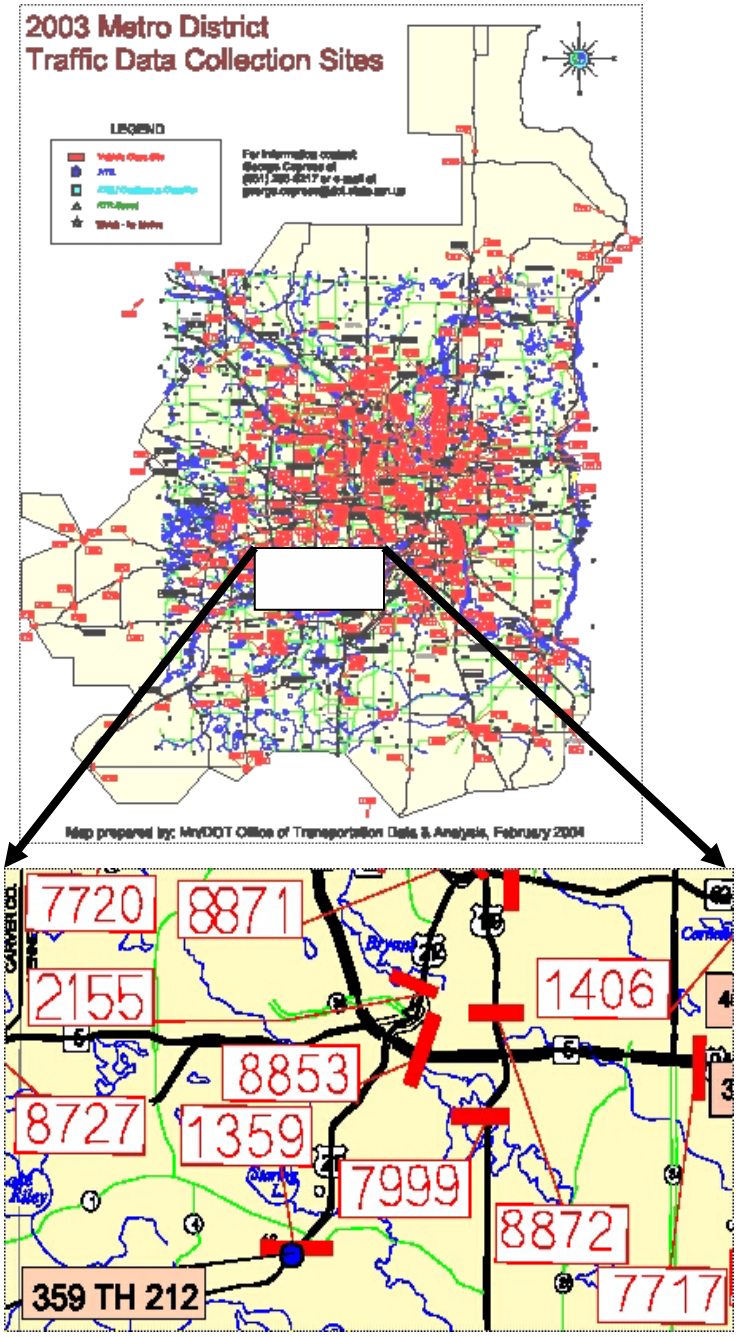


## 2.0 Acquiring Truck Count Information

Mn/DOT's Office of Transportation Data and Analysis manages vehicle classification sites throughout Minnesota. These counts are collected either manually, or by tubes, which count the numbers and types of vehicles on the roadway. These sites are located on major highways. Maps of these site locations are available for both the Metro region and outstate Minnesota. Below are the maps are for viewing in *.pdf format at: http://www.dot.state.mn.us/tda/html/traffic.html

**Figure 2: Site Location Maps**




I-494 and TH 169

This document will follow the steps to set up a project concerning the TH169 and I-494 interchange 169 and 494. The sites needed for a project would be:

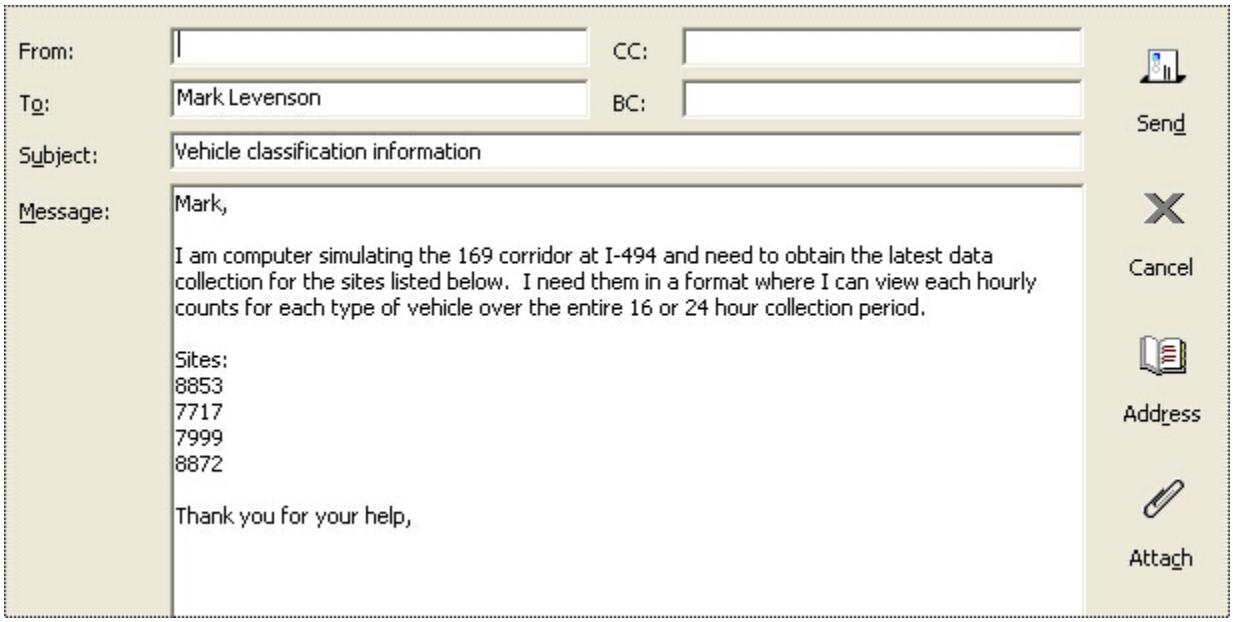
8853 (494 west of 169)
7717 (494 east of 169)
7999 (169 south of 494)
8872 (169 north of 494)

Steps for Requesting truck information:

1) Access the Mn/DOT website: http://www.dot.state.mn.us/tda/html/traffic.html and determine the data collection site(s) that most closely represent the project area. The number of site will increase with the size of the model and the characteristic of the roadway under consideration.
2) Assemble a list of the ID numbers from the maps for each site needed.
3) Submit a data request via e-mailed to the Mn/DOT Office of Transportation Data & Analysis. The current contact is listed at http://www.dot.state.mn.us/tda/html/traffic.html

**Figure 3: Sample Email**

Make sure that you indicate within the e-mail that the truck information is going to be used for operational modeling. Have the requester provide a brief description of the construction limits. The requester should also check with the Office of Transportation & Data Analysis unit to verify that the sites collected accurately represent this area. They may be aware of some problems with the site or additional data collection that has occurred that's not currently available on the website.




The email should include construction limits, proposed list of data collection sites, the application the data will be used for and needs to explain that the information needed is the hourly counts of each separate type of vehicle. Without including this information, the format you receive may only have summarized information used for a different analysis.

# 3.0 Data Assembly

The vehicle classification site information will be transmitted in the form of a Word, Excel or text document, and includes both directions of traffic (i.e. both northbound and southbound). The data in the Word or text document can be copied and pasted into an Excel spreadsheet. Doing this step will save time and minimize the likelihood of errors created by hand calculations.

**BODY TYPE REPORT BASED ON PRELIMINARY ADJUSTED VEHICLE CLASSIFICATION COUNT** 7/7/2004

**SITE: 7999** **ROUTE:** TH 169 **DESCRIPTION:** SHAKOPEE BYPASS SO OF I-494 **COUNTY:** HENNEPIN **DIST:** 5 **RECORDER:** RMH

| | | | | *Single Units* | | | | | | | | *Semis Heavies* | | | | | | | | *Trailers* | | *Twins* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Begin | Date | Pass. Vehicle | 2ax | 2ax | 3ax | 3ax+ | 3ax | 3ax | 4ax | 4ax | 5ax dump | 5ax | 5ax grain | 5ax | 5ax | 5ax other | 6ax+ | Bus | HTWT | HTWT | TSax+ | Total Vehicles |
| **North** | 6:00 | 10/17/03 | 0 | 39 | 5 | 26 | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 16 | 11 | 1 | 23 | 12 | 1 | 7 | 0 | 0 | 148 |
| | 7:00 | 10/17/03 | 0 | 24 | 0 | 22 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 11 | 8 | 3 | 30 | 17 | 5 | 6 | 0 | 0 | 131 |
| | 8:00 | 10/17/03 | 0 | 53 | 1 | 41 | 1 | 3 | 0 | 4 | 0 | 0 | 4 | 28 | 16 | 3 | 49 | 21 | 3 | 5 | 0 | 1 | 233 |
| | 9:00 | 10/17/03 | 0 | 49 | 0 | 39 | 0 | 1 | 0 | 7 | 0 | 0 | 10 | 25 | 8 | 7 | 56 | 26 | 5 | 5 | 0 | 1 | 239 |
| | 10:00 | 10/17/03 | 0 | 77 | 0 | 43 | 1 | 4 | 0 | 1 | 0 | 0 | 6 | 17 | 17 | 11 | 84 | 31 | 0 | 3 | 0 | 0 | 295 |
| | 11:00 | 10/17/03 | 0 | 64 | 1 | 45 | 1 | 1 | 0 | 1 | 0 | 2 | 5 | 11 | 13 | 6 | 83 | 25 | 2 | 1 | 0 | 0 | 261 |
| | 12:00 | 10/17/03 | 0 | 64 | 0 | 44 | 0 | 2 | 0 | 4 | 0 | 1 | 4 | 7 | 8 | 4 | 63 | 17 | 6 | 7 | 0 | 0 | 231 |
| | 13:00 | 10/16/03 | 0 | 77 | 1 | 58 | 0 | 0 | 0 | 1 | 0 | 3 | 4 | 20 | 15 | 3 | 37 | 4 | 6 | 5 | 0 | 1 | 235 |
| | 14:00 | 10/16/03 | 0 | 73 | 0 | 63 | 1 | 1 | 0 | 3 | 0 | 1 | 8 | 6 | 6 | 4 | 35 | 4 | 13 | 2 | 0 | 1 | 221 |
| | 15:00 | 10/16/03 | 0 | 74 | 0 | 41 | 0 | 0 | 0 | 4 | 0 | 0 | 3 | 13 | 4 | 6 | 48 | 14 | 11 | 1 | 0 | 0 | 219 |
| | 16:00 | 10/16/03 | 0 | 48 | 0 | 27 | 1 | 0 | 0 | 3 | 0 | 1 | 5 | 4 | 3 | 2 | 32 | 4 | 1 | 2 | 0 | 0 | 133 |
| | 17:00 | 10/16/03 | 0 | 34 | 0 | 18 | 0 | 0 | 0 | 1 | 0 | 0 | 6 | 6 | 4 | 3 | 30 | 1 | 6 | 4 | 0 | 0 | 113 |
| | 18:00 | 10/16/03 | 0 | 33 | 0 | 8 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 2 | 3 | 1 | 33 | 1 | 5 | 3 | 0 | 2 | 97 |
| | 19:00 | 10/16/03 | 0 | 12 | 0 | 5 | 1 | 0 | 0 | 4 | 0 | 1 | 5 | 13 | 2 | 1 | 22 | 3 | 2 | 0 | 0 | 1 | 72 |
| | 20:00 | 10/17/03 | 0 | 10 | 0 | 4 | 1 | 0 | 0 | 3 | 0 | 1 | 4 | 8 | 2 | 1 | 19 | 2 | 3 | 1 | 0 | 1 | 60 |
| | 21:00 | 10/17/03 | 0 | 8 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 4 | 2 | 1 | 16 | 1 | 2 | 1 | 0 | 1 | 43 |
| | *Directional Totals:* | | 0 | 739 | 8 | 487 | 8 | 13 | 0 | 41 | 0 | 13 | 76 | 191 | 122 | 57 | 660 | 183 | 71 | 53 | 0 | 9 | 2731 |

**Figure 4: Classification site data** **(Full sized on next page)**

The data request may or may not include the passenger vehicles. Examples will be provided that cover how to determine the truck percentage and fleet composition with and without the passenger vehicles values provided. In Figure 4, the passenger vehicle column lists zeros for each time period. This is common among many of the classification counts, since numerous sites are manually counted and trying to obtain an accurate number for passenger vehicles is not feasible.

## 3.1 Example where passenger vehicle column is all zeros

When the passenger vehicle column is empty, the total number of vehicles on the road at the time when the classification counts were taken can be obtained from the instrumented system by using the DataExtract program. Mainline detector stations should be used that are in close vicinity of the classification site. (Reference the Data Extraction Cookbook on the Mn/DOT's Office of Traffic, Security and Operations modeling website: http://www.dot.state.mn.us/trafficeng/modeling/index.html for help with Data Extract route). Data Extract can be setup to collect the one-hour volumes for exactly the dates and times needed.

**BODY TYPE REPORT BASED ON PRELIMINARY ADJUSTED VEHICLE CLASSIFICATION COUNT** 7/7/2004

**SITE: 7999** **ROUTE:** TH 169 **DESCRIPTION:** SHAKOPEE BYPASS SO OF I-494 **COUNTY:** HENNEPIN **DIST:** 5 **RECORDER:** RMH

| | | | | *Single Units* | | | | | | | | *Semis* | *Heavies* | | | | | | | *Trailers* | | *Twins* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Begin | Date | Pass. Vehicle | 2ax | 2ax | 3ax | 3ax+ | 3ax | 3ax | 4ax | 4ax | 5ax dump | 5ax | 5ax grain | 5ax | 5ax | 5ax other | 6ax+ | Bus | HTWT | HTWT | TSax+ | Total Vehicles |
| **North** | 6:00 | 10/17/03 | 0 | 39 | 5 | 26 | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 16 | 11 | 1 | 23 | 12 | 1 | 7 | 0 | 0 | 148 |
| | 7:00 | 10/17/03 | 0 | 24 | 0 | 22 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 11 | 8 | 3 | 30 | 17 | 5 | 6 | 0 | 0 | 131 |
| | 8:00 | 10/17/03 | 0 | 53 | 1 | 41 | 1 | 3 | 0 | 4 | 0 | 0 | 4 | 28 | 16 | 3 | 49 | 21 | 3 | 5 | 0 | 1 | 233 |
| | 9:00 | 10/17/03 | 0 | 49 | 0 | 39 | 0 | 1 | 0 | 7 | 0 | 0 | 10 | 25 | 8 | 7 | 56 | 26 | 5 | 5 | 0 | 1 | 239 |
| | 10:00 | 10/17/03 | 0 | 77 | 0 | 43 | 1 | 4 | 0 | 1 | 0 | 0 | 6 | 17 | 17 | 11 | 84 | 31 | 0 | 3 | 0 | 0 | 295 |
| | 11:00 | 10/17/03 | 0 | 64 | 1 | 45 | 1 | 1 | 0 | 1 | 0 | 2 | 5 | 11 | 13 | 6 | 83 | 25 | 2 | 1 | 0 | 0 | 261 |
| | 12:00 | 10/17/03 | 0 | 64 | 0 | 44 | 0 | 2 | 0 | 4 | 0 | 1 | 4 | 7 | 8 | 4 | 63 | 17 | 6 | 7 | 0 | 0 | 231 |
| | 13:00 | 10/16/03 | 0 | 77 | 1 | 58 | 0 | 0 | 0 | 1 | 0 | 3 | 4 | 20 | 15 | 3 | 37 | 4 | 6 | 5 | 0 | 1 | 235 |
| | 14:00 | 10/16/03 | 0 | 73 | 0 | 63 | 1 | 1 | 0 | 3 | 0 | 1 | 8 | 6 | 6 | 4 | 35 | 4 | 13 | 2 | 0 | 1 | 221 |
| | 15:00 | 10/16/03 | 0 | 74 | 0 | 41 | 0 | 0 | 0 | 4 | 0 | 0 | 3 | 13 | 4 | 6 | 48 | 14 | 11 | 1 | 0 | 0 | 219 |
| | 16:00 | 10/16/03 | 0 | 48 | 0 | 27 | 1 | 0 | 0 | 3 | 0 | 1 | 5 | 4 | 3 | 2 | 32 | 4 | 1 | 2 | 0 | 0 | 133 |
| | 17:00 | 10/16/03 | 0 | 34 | 0 | 18 | 0 | 0 | 0 | 1 | 0 | 0 | 6 | 6 | 4 | 3 | 30 | 1 | 6 | 4 | 0 | 0 | 113 |
| | 18:00 | 10/16/03 | 0 | 33 | 0 | 8 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 2 | 3 | 1 | 33 | 1 | 5 | 3 | 0 | 2 | 97 |
| | 19:00 | 10/16/03 | 0 | 12 | 0 | 5 | 1 | 0 | 0 | 4 | 0 | 1 | 5 | 13 | 2 | 1 | 22 | 3 | 2 | 0 | 0 | 1 | 72 |
| | 20:00 | 10/17/03 | 0 | 10 | 0 | 4 | 1 | 0 | 0 | 3 | 0 | 1 | 4 | 8 | 2 | 1 | 19 | 2 | 3 | 1 | 0 | 1 | 60 |
| | 21:00 | 10/17/03 | 0 | 8 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 4 | 2 | 1 | 16 | 1 | 2 | 1 | 0 | 1 | 43 |
| | *Directional Totals:* | | 0 | 739 | 8 | 487 | 8 | 13 | 0 | 41 | 0 | 13 | 76 | 191 | 122 | 57 | 660 | 183 | 71 | 53 | 0 | 9 | 2731 |

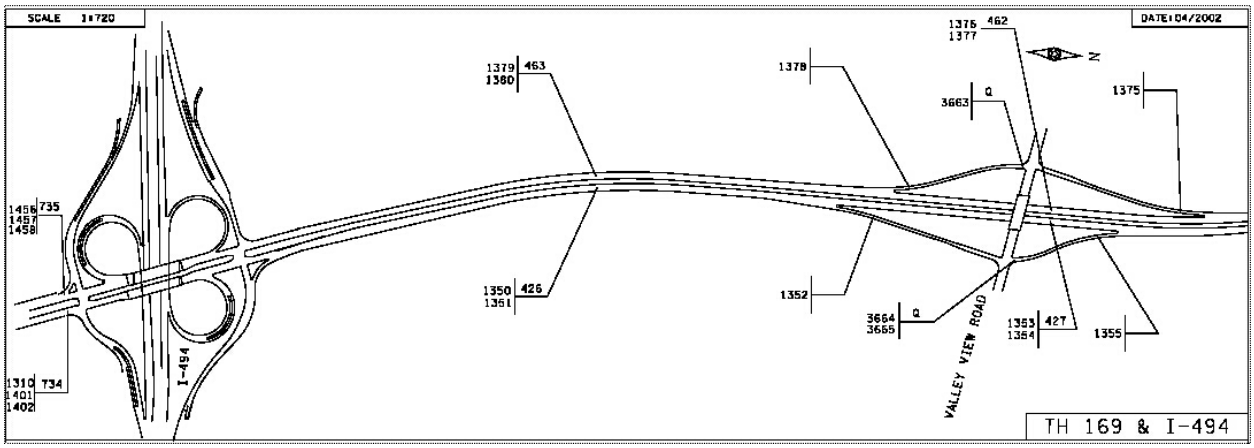



**Figure 5: Diagram of detectors on TH-169 at I-494** **(Full sized on next page)**

For the vehicle classification site 7999 in Figure 4 the closest detectors were used for acquiring the total volume. The site is located at Old Shakopee Road and TH169 (3.5 miles south of I-494), but since detectors on TH169 only go as far south as I-494, the most southern mainline detectors stations where used (Stations: 734 & 735). For the northbound direction, the volume on the roadway is the sum of detectors: 1310, 1401, and 1402; for southbound, it is the sum of detectors: 1456, 1457, and 1458.

Data is collected for the AM and PM peak period. Figure 6 provides an example of the data extract file format for the 6:00am to 9:00 A.M. time period.

| | 1310 | 1401 | 1402 | 1456 | 1457 | 1458 |
|---|---|---|---|---|---|---|
| | Volume | Volume | Volume | Volume | Volume | Volume |
| | 10/17/2003 | 10/17/2003 | 10/17/2003 | 10/17/2003 | 10/17/2003 | 10/17/2003 |
| 7:00 AM | 736 | 682 | 1024 | 205 | 566 | 638 |
| 8:00 AM | 749 | 803 | 1035 | 298 | 635 | 696 |
| 9:00 AM | 699 | 710 | 1035 | 261 | 641 | 715 |

**Figure 6: Data Extract Data**

***Note: The time stamp for each volume count is for the previous hour of data collection. But, in the vehicle classification site data the time noted is the time data collection started. So, for example, you will need the 7:00 A.M. line above for the 6:00 A.M. line in the vehicle classification file.***

## 3.2 Example where passenger vehicle column is filled in

Figure 7 is a vehicle classification site for TH169 north of I-494; this classification site has the passenger vehicles counted. In this instance, data extract and the detector volumes are not needed since the total volume is provided with just the vehicle classification data.

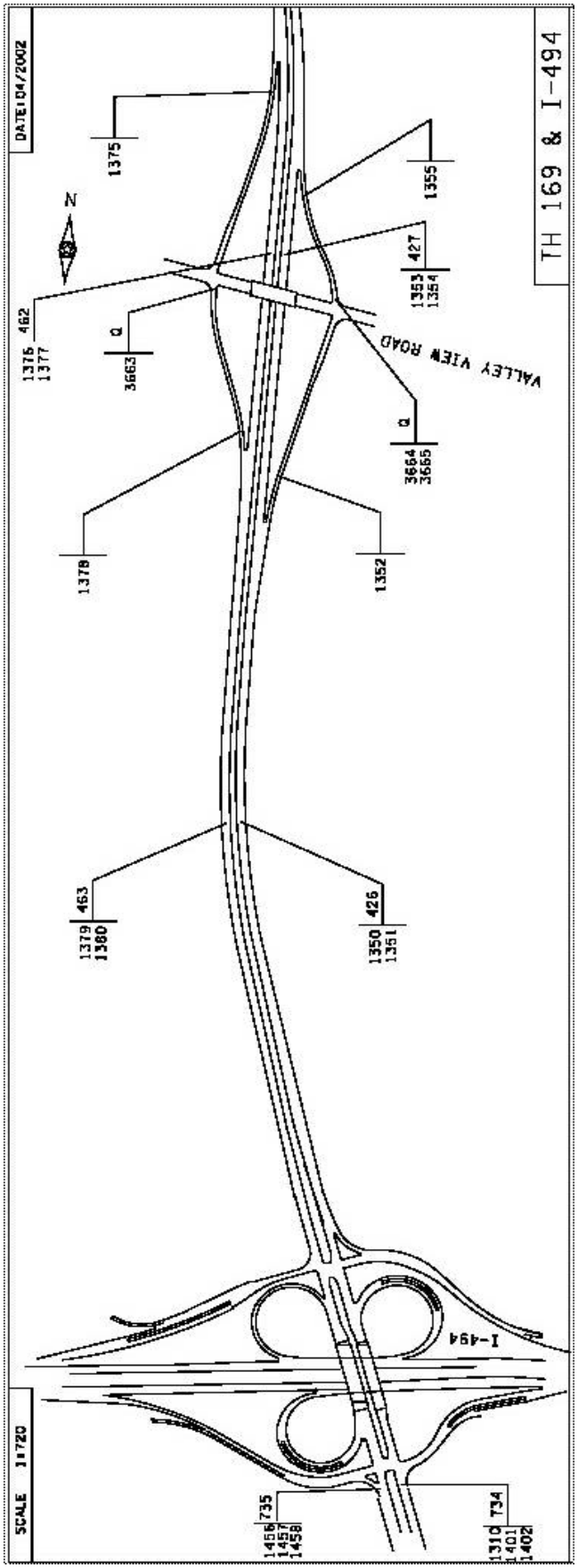



**Figure 5: Diagram of detectors on TH 169 and I-494**

**BODY TYPE REPORT BASED ON PRELIMINARY ADJUSTED VEHICLE CLASSIFICATION COUNT** 7/7/2004

**SITE: 8872** **ROUTE:** TH 169 **DESCRIPTION:** N OF JCT I-494 **COUNTY:** HENNEPIN **DIST:** 5 **RECORDER:** RMH

| | | | | | *Single Units* | | | | | | | *Semis* *Heavies* | | | | | | | | *Trailers* | | *Twins* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Begin | Date | Pass. Vehicle | 2ax | 2ax | 3ax | 3ax+ | 3ax | 3ax | 4ax | 4ax | 5ax dump | 5ax | 5ax grain | 5ax | 5ax | 5ax other | 6ax+ | Bus | HTWT | HTWT | TSax+ | Total Vehicles |
| **North** | 6:00 | 07/15/03 | 2283 | 39 | 1 | 19 | 1 | 2 | 0 | 5 | 0 | 2 | 2 | 0 | 4 | 3 | 34 | 4 | 3 | 11 | 0 | 3 | 2416 |
| | 7:00 | 07/15/03 | 2615 | 54 | 0 | 25 | 0 | 2 | 0 | 4 | 0 | 1 | 3 | 0 | 8 | 1 | 26 | 7 | 8 | 3 | 0 | 2 | 2759 |
| | 8:00 | 07/15/03 | 2399 | 75 | 0 | 19 | 1 | 3 | 0 | 6 | 0 | 2 | 1 | 0 | 16 | 4 | 33 | 11 | 2 | 5 | 0 | 0 | 2577 |
| | 9:00 | 07/15/03 | 1866 | 78 | 1 | 20 | 1 | 1 | 0 | 7 | 0 | 3 | 3 | 1 | 10 | 8 | 72 | 5 | 3 | 2 | 0 | 0 | 2081 |
| | 10:00 | 07/15/03 | 1680 | 72 | 1 | 26 | 0 | 0 | 0 | 6 | 0 | 6 | 2 | 0 | 6 | 11 | 53 | 13 | 4 | 7 | 0 | 1 | 1888 |
| | 11:00 | 07/15/03 | 1819 | 84 | 0 | 30 | 1 | 3 | 0 | 10 | 0 | 0 | 1 | 0 | 7 | 7 | 39 | 6 | 5 | 6 | 0 | 0 | 2018 |
| | 12:00 | 07/15/03 | 1854 | 58 | 0 | 32 | 1 | 3 | 0 | 3 | 0 | 1 | 3 | 3 | 7 | 9 | 48 | 6 | 4 | 3 | 0 | 0 | 2035 |
| | 13:00 | 07/16/03 | 1686 | 71 | 0 | 19 | 0 | 0 | 0 | 13 | 0 | 6 | 0 | 9 | 6 | 6 | 54 | 19 | 3 | 8 | 0 | 0 | 1900 |
| | 14:00 | 07/16/03 | 1940 | 78 | 1 | 24 | 0 | 2 | 0 | 7 | 0 | 3 | 3 | 4 | 10 | 8 | 34 | 8 | 4 | 6 | 0 | 0 | 2132 |
| | 15:00 | 07/16/03 | 2008 | 52 | 2 | 10 | 3 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 4 | 5 | 33 | 8 | 1 | 3 | 0 | 0 | 2137 |
| | 16:00 | 07/16/03 | 2027 | 41 | 1 | 8 | 0 | 2 | 0 | 8 | 0 | 0 | 2 | 0 | 3 | 2 | 20 | 9 | 4 | 2 | 0 | 0 | 2129 |
| | 17:00 | 07/16/03 | 2205 | 35 | 0 | 11 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 3 | 6 | 2 | 19 | 5 | 1 | 0 | 0 | 0 | 2294 |
| | 18:00 | 07/16/03 | 1868 | 23 | 0 | 3 | 0 | 2 | 0 | 4 | 0 | 0 | 1 | 0 | 6 | 1 | 18 | 3 | 2 | 0 | 0 | 0 | 1931 |
| | 19:00 | 07/16/03 | 1621 | 12 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 5 | 1 | 16 | 1 | 1 | 0 | 0 | 2 | 1665 |
| | 20:00 | 07/16/03 | 1400 | 10 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 4 | 1 | 13 | 2 | 1 | 0 | 0 | 1 | 1438 |
| | 21:00 | 07/16/03 | 1200 | 8 | 0 | 2 | 0 | 1 | 0 | 2 | 1 | 1 | 1 | 0 | 3 | 1 | 10 | 1 | 1 | 0 | 0 | 0 | 1232 |
| | *Directional Totals:* | | 30471 | 790 | 7 | 252 | 8 | 25 | 0 | 87 | 1 | 29 | 25 | 20 | 105 | 70 | 522 | 108 | 47 | 56 | 0 | 9 | 32632 |

**Figure 7: Classification site data with passenger vehicle count**

# 4.0 Calculating Truck Percents

After incorporating the total hourly traffic volumes from the detectors into the developing Excel spreadsheet, a good organizational procedure would be to highlight the AM and PM peak periods that are being used in the operational models. This will help to distinguish which data and hours are being focused on.

## 4.1 Example of blank passenger vehicle column continued

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BODY TYPE REPORT BASED ON PRELIMINARY ADJUSTED VEHICLE CLASSIFIC | | | | | | | | | | | 7/7/2004 | | | | | | | | | | | | | | Calculations | |
| 2 | SITE: | 7999 | | ROUTE | TH 169 | | DESCRIPTION | | SHAKOPEE BYPASS SO OF I-494 | | | | | COUNTY: | | HENNEPIN | | DIST: | 5 | | RECORDER: | | RMH | | total vehicles | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | found by | | |
| 4 | | Begin | | Pass. | 2ax | 3ax | 3ax+ | 3ax | 4ax | 5ax | 5ax | 5ax | 5ax | 5ax | 5ax | HTWT | Total | | | | | | | | detector | | ave % trucks |
| 5 | | | Date | Vehicle | 2ax | | | | 3ax | | 4ax | | dump | | grain | | | other | 6ax+ | Bus | HTWT | | T5ax+ | Vehicles | station data | % trucks | for peak hour |
| 6 | North | 6:00 | 10/17/2003 | 0 | 39 | 5 | 26 | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 16 | 11 | 1 | 23 | 12 | 1 | 7 | 0 | 0 | 148 | 2581 | 5.734212 | |
| 7 | | 7:00 | 10/17/2003 | 0 | 24 | 0 | 22 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 11 | 8 | 3 | 30 | 17 | 5 | 6 | 0 | 0 | 131 | 2773 | 4.724125 | 6.685264 |
| 8 | | 8:00 | 10/17/2003 | 0 | 53 | 1 | 41 | 1 | 3 | 0 | 4 | 0 | 0 | 4 | 28 | 16 | 3 | 43 | 21 | 3 | 5 | 0 | 1 | 233 | 2443 | 9.537454 | |
| 9 | | 9:00 | 10/17/2003 | 0 | 49 | 0 | 39 | 0 | 1 | 0 | 7 | 0 | 0 | 10 | 25 | 8 | 7 | 56 | 26 | 5 | 5 | 0 | 1 | 239 | | | |
| 10 | | 10:00 | 10/17/2003 | 0 | 77 | 0 | 43 | 1 | 4 | 0 | 1 | 0 | 0 | 6 | 17 | 17 | 11 | 84 | 31 | 0 | 3 | 0 | 0 | 295 | | | |
| 11 | | 11:00 | 10/17/2003 | 0 | 64 | 1 | 45 | 1 | 1 | 0 | 1 | 0 | 2 | 5 | 11 | 13 | 6 | 83 | 25 | 2 | 1 | 0 | 0 | 261 | | | |
| 12 | | 12:00 | 10/17/2003 | 0 | 64 | 0 | 44 | 0 | 2 | 0 | 4 | 0 | 1 | 4 | 7 | 8 | 4 | 63 | 17 | 6 | 7 | 0 | 0 | 231 | | | |
| 13 | | 13:00 | 10/16/2003 | 0 | 77 | 1 | 58 | 0 | 0 | 0 | 1 | 0 | 3 | 4 | 20 | 15 | 3 | 37 | 4 | 6 | 5 | 0 | 1 | 235 | | | |
| 14 | | 14:00 | 10/16/2003 | 0 | 73 | 0 | 63 | 1 | 1 | 0 | 3 | 0 | 1 | 8 | 6 | 6 | 4 | 35 | 4 | 13 | 2 | 0 | 1 | 221 | | | |
| 15 | | 15:00 | 10/16/2003 | 0 | 74 | 0 | 41 | 0 | 0 | 0 | 4 | 0 | 0 | 3 | 13 | 4 | 6 | 48 | 14 | 11 | 1 | 0 | 0 | 219 | 2332 | 9.391081 | |
| 16 | | 16:00 | 10/16/2003 | 0 | 48 | 0 | 27 | 1 | 0 | 0 | 3 | 0 | 1 | 5 | 4 | 3 | 2 | 32 | 4 | 1 | 2 | 0 | 0 | 133 | 2091 | 6.360593 | 7.150995 |
| 17 | | 17:00 | 10/16/2003 | 0 | 34 | 0 | 18 | 0 | 0 | 0 | 1 | 0 | 0 | 6 | 6 | 4 | 3 | 30 | 1 | 6 | 4 | 0 | 0 | 113 | 1982 | 5.701312 | |
| 18 | | 18:00 | 10/16/2003 | 0 | 33 | 0 | 8 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 2 | 3 | 1 | 33 | 1 | 5 | 3 | 0 | 2 | 87 | | | |
| 19 | | 19:00 | 10/16/2003 | 0 | 12 | 0 | 5 | 1 | 0 | 0 | 4 | 0 | 1 | 5 | 13 | 2 | 1 | 22 | 3 | 2 | 0 | 0 | 1 | 72 | | | |
| 20 | | 20:00 | 10/17/2003 | 0 | 10 | 0 | 4 | 1 | 0 | 0 | 3 | 0 | 1 | 4 | 8 | 2 | 1 | 19 | 2 | 3 | 1 | 0 | 1 | 60 | | | |
| 21 | | 21:00 | 10/17/2003 | 0 | 8 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 4 | 2 | 1 | 16 | 1 | 2 | 1 | 0 | 1 | 43 | | | |
| 22 | | Directional Tota | | 0 | 739 | 8 | 487 | 8 | 13 | 0 | 41 | 0 | 13 | 76 | 181 | 122 | 57 | 660 | 183 | 71 | 53 | 0 | 9 | 2731 | | | |
| 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | Begin | | Pass. | 2ax | 3ax | 3ax+ | 3ax | 4ax | 5ax | 5ax | 5ax | 5ax | 5ax | 5ax | HTWT | Total | | | | | | | | | | |
| 26 | | | Date | Vehicle | 2ax | | | | 3ax | | 4ax | | dump | | grain | | | other | 6ax+ | Bus | HTWT | | T5ax+ | Vehicles | | | |
| 27 | South | 6:00 | 10/17/2003 | 0 | 36 | 1 | 19 | 0 | 0 | 0 | 3 | 0 | 3 | 6 | 8 | 11 | 5 | 32 | 6 | 3 | 4 | 0 | 0 | 137 | 1592 | 8.605528 | |
| 28 | | 7:00 | 10/17/2003 | 0 | 52 | 0 | 32 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 8 | 8 | 13 | 34 | 20 | 6 | 1 | 0 | 0 | 181 | 1760 | 10.28409 | 10.57959 |
| 29 | | 8:00 | 10/17/2003 | 0 | 59 | 1 | 33 | 1 | 1 | 0 | 6 | 0 | 5 | 5 | 13 | 6 | 10 | 61 | 20 | 5 | 4 | 0 | 0 | 230 | 1790 | 12.84916 | |
| 30 | | 9:00 | 10/17/2003 | 0 | 73 | 2 | 39 | 0 | 3 | 0 | 6 | 0 | 5 | 6 | 16 | 10 | 12 | 73 | 22 | 3 | 2 | 0 | 0 | 272 | | | |
| 31 | | 10:00 | 10/17/2003 | 0 | 73 | 1 | 35 | 1 | 0 | 0 | 2 | 0 | 3 | 11 | 13 | 11 | 11 | 64 | 28 | 12 | 2 | 0 | 0 | 267 | | | |
| 32 | | 11:00 | 10/17/2003 | 0 | 65 | 0 | 37 | 1 | 3 | 0 | 6 | 0 | 2 | 13 | 12 | 12 | 9 | 54 | 24 | 7 | 2 | 0 | 0 | 247 | | | |
| 33 | | 12:00 | 10/17/2003 | 0 | 40 | 0 | 29 | 0 | 2 | 0 | 6 | 0 | 5 | 7 | 7 | 6 | 8 | 50 | 25 | 3 | 2 | 0 | 0 | 190 | | | |
| 34 | | 13:00 | 10/16/2003 | 0 | 50 | 2 | 53 | 1 | 1 | 0 | 2 | 0 | 4 | 12 | 15 | 13 | 9 | 58 | 6 | 12 | 1 | 0 | 0 | 239 | | | |
| 35 | | 14:00 | 10/16/2003 | 0 | 65 | 1 | 48 | 1 | 0 | 0 | 4 | 0 | 3 | 5 | 8 | 11 | 7 | 51 | 8 | 3 | 7 | 0 | 0 | 222 | | | |
| 36 | | 15:00 | 10/16/2003 | 0 | 43 | 1 | 52 | 0 | 1 | 0 | 2 | 0 | 1 | 3 | 11 | 10 | 6 | 33 | 2 | 4 | 3 | 0 | 0 | 172 | 2291 | 7.507639 | |
| 37 | | 16:00 | 10/16/2003 | 0 | 48 | 0 | 36 | 0 | 0 | 0 | 3 | 0 | 1 | 7 | 6 | 3 | 3 | 31 | 4 | 4 | 2 | 0 | 0 | 148 | 2394 | 6.182122 | 6.030925 |
| 38 | | 17:00 | 10/16/2003 | 0 | 39 | 2 | 15 | 0 | 2 | 0 | 7 | 0 | 0 | 5 | 5 | 1 | 2 | 21 | 0 | 5 | 7 | 0 | 0 | 111 | 2521 | 4.403015 | |
| 39 | | 18:00 | 10/16/2003 | 0 | 27 | 3 | 8 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 10 | 4 | 0 | 20 | 5 | 5 | 4 | 0 | 0 | 91 | | | |
| 40 | | 19:00 | 10/16/2003 | 0 | 18 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 7 | 10 | 3 | 3 | 36 | 1 | 0 | 2 | 0 | 1 | 86 | | | |
| 41 | | 20:00 | 10/16/2003 | 0 | 15 | 1 | 5 | 1 | 1 | 0 | 0 | 0 | 1 | 5 | 8 | 3 | 1 | 30 | 2 | 1 | 2 | 0 | 1 | 77 | | | |
| 42 | | 21:00 | 10/16/2003 | 0 | 12 | 1 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 8 | 2 | 1 | 25 | 2 | 1 | 2 | 0 | 1 | 62 | | | |
| 43 | | Directional Tota | | 0 | 715 | 17 | 446 | 7 | 15 | 0 | 50 | 0 | 35 | 103 | 158 | 114 | 100 | 673 | 175 | 74 | 47 | 0 | 3 | 2732 | | | |
| 44 | | Site Totals: | | 0 | 1454 | 25 | 933 | 15 | 28 | 0 | 91 | 0 | 48 | 179 | 349 | 236 | 157 | 1333 | 358 | 145 | 100 | 0 | 12 | 5463 | | | |
| 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Figure 8: Truck percent calculations** **(Full sized on next page)**

To calculate the percent trucks column, the "Vehicles" column (This the total trucks since there were no passenger cars counted) is divided by the total vehicles counted by the detector station.

Once the truck percentage has been calculated for each hour of the AM and PM periods, in both directions, find the average truck percent over the entire model period. ***The average percentage of trucks over the total model period is the value that needs to be coded into CORSIM.***

Detectors 1310, 1401, 1402

Detectors 1456, 1457, 1458

**BODY TYPE REPORT BASED ON PRELIMINARY ADJUSTED VEHICLE CLASSIFIC** 7/7/2004

**SITE:** 7999 **ROUTE** TH 169 **DESCRIPTION** SHAKOPEE BYPASS SO OF I-494 **COUNTY:** HENNEPIN **DIST:** 5 **RECORDER:** RMH

| | | Begin | Date | Pass. Vehicle | 2ax | 3ax | 3ax+ | 3ax | 4ax | 5ax | 5ax | 5ax | 5ax | 5ax | 5ax | HTWT | Total | other | 6ax+ | Bus | HTWT | | T5ax+ | Vehicles | Calculations: total vehicles found by detector station data | % trucks | ave % trucks for peak hour |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2ax | | | | 3ax | | 4ax | | dump | | grain | | | | | | | | | | | | |
| North | | 6:00 | 10/17/2003 | 0 | 39 | 5 | 26 | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 16 | 11 | 1 | 23 | 12 | 1 | 7 | 0 | 0 | 148 | 2581 | 5.734212 | |
| | | 7:00 | 10/17/2003 | 0 | 24 | 0 | 22 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 11 | 8 | 3 | 30 | 17 | 5 | 6 | 0 | 0 | 131 | 2773 | 4.724125 | 6.665264 |
| | | 8:00 | 10/17/2003 | 0 | 53 | 1 | 41 | 1 | 3 | 0 | 4 | 0 | 0 | 4 | 28 | 16 | 3 | 43 | 21 | 3 | 5 | 0 | 1 | 233 | 2443 | 9.537454 | |
| | | 9:00 | 10/17/2003 | 0 | 49 | 0 | 39 | 0 | 1 | 0 | 7 | 0 | 0 | 10 | 25 | 8 | 7 | 56 | 26 | 5 | 5 | 0 | 1 | 239 | | | |
| | | 10:00 | 10/17/2003 | 0 | 77 | 0 | 43 | 1 | 4 | 0 | 1 | 0 | 0 | 6 | 17 | 17 | 11 | 84 | 31 | 0 | 3 | 0 | 0 | 235 | | | |
| | | 11:00 | 10/17/2003 | 0 | 64 | 1 | 45 | 1 | 1 | 0 | 1 | 0 | 2 | 5 | 11 | 13 | 6 | 83 | 25 | 2 | 1 | 0 | 0 | 261 | | | |
| | | 12:00 | 10/17/2003 | 0 | 64 | 0 | 44 | 0 | 2 | 0 | 4 | 0 | 1 | 4 | 7 | 8 | 4 | 63 | 17 | 6 | 7 | 0 | 0 | 231 | | | |
| | | 13:00 | 10/16/2003 | 0 | 77 | 1 | 58 | 0 | 0 | 0 | 1 | 0 | 3 | 4 | 20 | 15 | 3 | 37 | 4 | 6 | 5 | 0 | 1 | 235 | | | |
| | | 14:00 | 10/16/2003 | 0 | 73 | 0 | 63 | 1 | 1 | 0 | 3 | 0 | 1 | 8 | 6 | 6 | 4 | 35 | 4 | 13 | 2 | 0 | 1 | 221 | | | |
| | | 15:00 | 10/16/2003 | 0 | 74 | 0 | 41 | 0 | 0 | 0 | 4 | 0 | 0 | 3 | 13 | 4 | 6 | 48 | 14 | 11 | 1 | 0 | 0 | 219 | 2332 | 9.391081 | |
| | | 16:00 | 10/16/2003 | 0 | 48 | 0 | 27 | 1 | 0 | 0 | 3 | 0 | 1 | 5 | 4 | 3 | 2 | 32 | 4 | 1 | 2 | 0 | 0 | 133 | 2091 | 6.360593 | 7.150995 |
| | | 17:00 | 10/16/2003 | 0 | 34 | 0 | 18 | 0 | 0 | 0 | 1 | 0 | 0 | 6 | 6 | 4 | 3 | 30 | 1 | 6 | 4 | | | 113 | 1982 | 5.701312 | |
| | | 18:00 | 10/16/2003 | 0 | 33 | 0 | 8 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 2 | 3 | 1 | 33 | 1 | 5 | 3 | | | 97 | | | |
| | | 19:00 | 10/16/2003 | 0 | 12 | 0 | 5 | 1 | 0 | 0 | 4 | 0 | 1 | 5 | 13 | 2 | 1 | 22 | 3 | 2 | 0 | | | 72 | | | |
| | | 20:00 | 10/17/2003 | 0 | 10 | 0 | 4 | 1 | 0 | 0 | 3 | 0 | 1 | 4 | 8 | 2 | 1 | 19 | 2 | 3 | 1 | | | 60 | | | |
| | | 21:00 | 10/17/2003 | 0 | 8 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 4 | 2 | 1 | 16 | 1 | 2 | 1 | | | 43 | | | |
| | | ***Directional Total*** | | 0 | 739 | 8 | 487 | 8 | 13 | 0 | 41 | 0 | 13 | 76 | 191 | 122 | 57 | 660 | 183 | 71 | 53 | | | 131 | | | |
| | | Begin | Date | Pass. Vehicle | 2ax | 3ax | 3ax+ | 3ax | 4ax | 5ax | 5ax | 5ax | 5ax | 5ax | 5ax | HTWT | Total | other | 6ax+ | Bus | HTWT | | T5ax+ | Vehicles | | | |
| | | | | | 2ax | | | | 3ax | | 4ax | | dump | | grain | | | | | | | | | | | | |
| South | | 6:00 | 10/17/2003 | 0 | 36 | 1 | 19 | 0 | 0 | 0 | 3 | 0 | 3 | 6 | 8 | 11 | 5 | 32 | 6 | 3 | 4 | 0 | 0 | 137 | 1592 | 8.605528 | |
| | | 7:00 | 10/17/2003 | 0 | 52 | 0 | 32 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 8 | 8 | 13 | 34 | 20 | 6 | 1 | 0 | 0 | 181 | 1760 | 10.28409 | 10.57959 |
| | | 8:00 | 10/17/2003 | 0 | 59 | 1 | 33 | 1 | 1 | 0 | 6 | 0 | 5 | 5 | 13 | 6 | 10 | 61 | 20 | 5 | 4 | 0 | 0 | 230 | 1790 | 12.84916 | |
| | | 9:00 | 10/17/2003 | 0 | 73 | 2 | 39 | 0 | 3 | 0 | 6 | 0 | 5 | 6 | 16 | 10 | 12 | 73 | 22 | 3 | 2 | 0 | 0 | 272 | | | |
| | | 10:00 | 10/17/2003 | 0 | 73 | 1 | 35 | 1 | 0 | 0 | 2 | 0 | 3 | 11 | 13 | 11 | 11 | 64 | 28 | 12 | 2 | 0 | 0 | 267 | | | |
| | | 11:00 | 10/17/2003 | 0 | 65 | 0 | 37 | 1 | 3 | 0 | 6 | 0 | 2 | 13 | 12 | 12 | 9 | 54 | 24 | 7 | 2 | 0 | 0 | 247 | | | |
| | | 12:00 | 10/17/2003 | 0 | 40 | 0 | 29 | 0 | 2 | 0 | 6 | 0 | 5 | 7 | 7 | 6 | 8 | 50 | 25 | 3 | 2 | 0 | 0 | 190 | | | |
| | | 13:00 | 10/16/2003 | 0 | 50 | 2 | 53 | 1 | 1 | 0 | 2 | 0 | 4 | 12 | 15 | 13 | 9 | 58 | 6 | 12 | 1 | 0 | 0 | 239 | | | |
| | | 14:00 | 10/16/2003 | 0 | 65 | 1 | 48 | 1 | 0 | 0 | 4 | 0 | 3 | 5 | 8 | 11 | 7 | 51 | 8 | 3 | 7 | 0 | 0 | 222 | | | |
| | | 15:00 | 10/16/2003 | 0 | 43 | 1 | 52 | 0 | 1 | 0 | 2 | 0 | 1 | 3 | 11 | 10 | 6 | 33 | 2 | 4 | 3 | 0 | 0 | 172 | 2291 | 7.507639 | |
| | | 16:00 | 10/16/2003 | 0 | 48 | 0 | 36 | 0 | 0 | 0 | 3 | 0 | 1 | 7 | 6 | 3 | 3 | 31 | 4 | 4 | 2 | 0 | 0 | 148 | 2394 | 6.182122 | 6.030925 |
| | | 17:00 | 10/16/2003 | 0 | 39 | 2 | 15 | 0 | 2 | 0 | 7 | 0 | 0 | 5 | 5 | 1 | 2 | 21 | 0 | 5 | 7 | 0 | 0 | 111 | 2521 | 4.403015 | |
| | | 18:00 | 10/16/2003 | 0 | 27 | 3 | 8 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 10 | 4 | 0 | 20 | 5 | 5 | 4 | 0 | 0 | 91 | | | |
| | | 19:00 | 10/16/2003 | 0 | 18 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 7 | 10 | 3 | 3 | 36 | 1 | 0 | 2 | 0 | 1 | 86 | | | |
| | | 20:00 | 10/16/2003 | 0 | 15 | 1 | 5 | 1 | 1 | 0 | 0 | 0 | 1 | 5 | 8 | 3 | 1 | 30 | 2 | 1 | 2 | 0 | 1 | 77 | | | |
| | | 21:00 | 10/16/2003 | 0 | 12 | 1 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 8 | 2 | 1 | 25 | 2 | 1 | 2 | 0 | 1 | 62 | | | |
| | | ***Directional Total*** | | 0 | 715 | 17 | 446 | 7 | 15 | 0 | 50 | 0 | 35 | 103 | 158 | 114 | 100 | 673 | 175 | 74 | 47 | 0 | 3 | 2732 | | | |
| | | ***Site Totals:*** | | 0 | 1454 | 25 | 933 | 15 | 28 | 0 | 91 | 0 | 48 | 179 | 343 | 236 | 157 | 1333 | 358 | 145 | 100 | 0 | 12 | 5463 | | | |

## 4.2 Continuation the passenger vehicles counted example

If the data supplied from the site did include the passenger vehicles, then the total trucks is derived by subtracting the passenger vehicles from the total vehicles.

Total Vehicles – Passenger Vehicles = Total Trucks

If the data comes in the form below, the total number of trucks is the sum of the heavy vehicles and total vehicles is the sum of the heavy vehicles and passenger vehicles.

| | DATE | TIME | M-CYCLE | CAR | PICKUP | BUS | 2AXSU | 3AXSU | 4+AXSU | 3+4SEMI | 5AXSEMI | HTWT | TWINS | TWINS | TWINS | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northeast | 04/05/00 | 11:00 | 2 | 1045 | 296 | 18 | 51 | 7 | 0 | 11 | 12 | 0 | 0 | 0 | 0 | |

Passenger Vehicles + Heavy Vehicles = Total Vehicles

The percent of trucks is calculated by dividing total trucks by the total vehicles, see Figure 9.

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BODY TYPE REPORT BASED ON PRELIMINARY ADJUSTED VEHICLE CLASSIFICATION | | | | | | | | | | | | 7/7/2004 | | | | | | | | | | | | | Calculations | |
| 2 | SITE: | 8872 | | ROUTE | TH 169 | | DESCRIPTION | | N OF JCT I-494 | | | COUNTY: | | HENNEPIN | | DIST: | 5 | | RECORDER: | | RMH | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | Begin | Pass. | | 2ax | 3ax | 3ax+ | 3ax | 4ax | 5ax | 5ax | 5ax | 5ax | 5ax | 5ax | HTWT | Total | | | | | | | | | ave % trucks |
| 5 | | | Date | Vehicle | 2ax | | | | 3ax | | 4ax | | dump | | grain | | | other | 6ax+ | Bus | HTWT | | T5ax+ | Vehicles | total trucks | % trucks | for peak hour |
| 6 | North | 6:00 | 7/15/2003 | 2283 | 39 | 1 | 19 | 1 | 2 | 0 | 5 | 0 | 2 | 2 | 0 | 4 | 3 | 34 | 4 | 3 | 11 | 0 | 3 | 2416 | 133 | 5.50497 | |
| 7 | | 7:00 | 7/15/2003 | 2615 | 54 | 0 | 25 | 0 | 2 | 0 | 4 | 0 | 1 | 3 | 0 | 8 | 1 | 26 | 7 | 8 | 3 | 0 | 2 | 2759 | 144 | 5.21926 | 5.87717 |
| 8 | | 8:00 | 7/15/2003 | 2399 | 75 | 0 | 19 | 1 | 3 | 0 | 6 | 0 | 2 | 1 | 0 | 16 | 4 | 33 | 11 | 2 | 5 | 0 | 0 | 2577 | 178 | 6.90726 | |
| 9 | | 9:00 | 7/15/2003 | 1866 | 78 | 1 | 20 | 1 | 1 | 0 | 7 | 0 | 3 | 3 | 1 | 10 | 8 | 72 | 5 | 3 | 2 | 0 | 0 | 2081 | | | |
| 10 | | 10:00 | 7/15/2003 | 1680 | 72 | 1 | 26 | 0 | 0 | 0 | 6 | 0 | 6 | 2 | 0 | 6 | 11 | 53 | 13 | 4 | 7 | 0 | 1 | 1888 | | | |
| 11 | | 11:00 | 7/15/2003 | 1819 | 84 | 0 | 30 | 1 | 3 | 0 | 10 | 0 | 0 | 1 | 0 | 7 | 7 | 39 | 6 | 5 | 6 | 0 | 0 | 2018 | | | |
| 12 | | 12:00 | 7/15/2003 | 1854 | 58 | 0 | 32 | 1 | 3 | 0 | 3 | 0 | 1 | 3 | 3 | 7 | 9 | 48 | 6 | 4 | 3 | 0 | 0 | 2035 | | | |
| 13 | | 13:00 | 7/16/2003 | 1686 | 71 | 0 | 19 | 0 | 0 | 0 | 13 | 0 | 6 | 0 | 9 | 6 | 6 | 54 | 19 | 3 | 8 | 0 | 0 | 1900 | | | |
| 14 | | 14:00 | 7/16/2003 | 1940 | 78 | 1 | 24 | 0 | 2 | 0 | 7 | 0 | 3 | 3 | 4 | 10 | 8 | 34 | 8 | 4 | 6 | 0 | 0 | 2132 | | | |
| 15 | | 15:00 | 7/16/2003 | 2008 | 52 | 2 | 10 | 3 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 4 | 5 | 33 | 8 | 1 | 3 | 0 | 0 | 2137 | 129 | 6.0365 | |
| 16 | | 16:00 | 7/16/2003 | 2027 | 41 | 1 | 8 | 0 | 2 | 0 | 8 | 0 | 0 | 2 | 0 | 3 | 2 | 20 | 9 | 4 | 2 | 0 | 0 | 2129 | 102 | 4.79098 | 4.90239 |
| 17 | | 17:00 | 7/16/2003 | 2205 | 35 | 0 | 11 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 3 | 6 | 2 | 19 | 5 | 1 | 0 | 0 | 0 | 2294 | 89 | 3.87969 | |
| 18 | | 18:00 | 7/16/2003 | 1868 | 23 | 0 | 3 | 0 | 2 | 0 | 4 | 0 | 0 | 1 | 0 | 6 | 1 | 18 | 3 | 2 | 0 | 0 | 0 | 1931 | | | |
| 19 | | 19:00 | 7/16/2003 | 1621 | 12 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 5 | 1 | 16 | 1 | 1 | 0 | 0 | 2 | 1665 | | | |
| 20 | | 20:00 | 7/16/2003 | 1400 | 10 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 4 | 1 | 13 | 2 | 1 | 0 | 0 | 1 | 1438 | | | |
| 21 | | 21:00 | 7/16/2003 | 1200 | 8 | 0 | 2 | 0 | 1 | 0 | 2 | 1 | 1 | 1 | 0 | 3 | 1 | 10 | 1 | 1 | 0 | 0 | 0 | 1232 | | | |
| 22 | | *Directional Totals:* | | 30471 | 790 | 7 | 252 | 8 | 25 | 0 | 87 | 1 | 29 | 25 | 20 | 105 | 70 | 522 | 108 | 47 | 56 | 0 | 9 | 32632 | | | |
| 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | Begin | Pass. | | 2ax | 3ax | 3ax+ | 3ax | 4ax | 5ax | 5ax | 5ax | 5ax | 5ax | 5ax | HTWT | Total | | | | | | | | | |
| 25 | | | Date | Vehicle | 2ax | | | | 3ax | | 4ax | | dump | | grain | | | other | 6ax+ | Bus | HTWT | | T5ax+ | Vehicles | | | |
| 26 | South | 6:00 | 7/2/2003 | 1173 | 40 | 3 | 16 | 0 | 1 | 0 | 6 | 0 | 0 | 3 | 0 | 8 | 2 | 30 | 7 | 3 | 4 | 0 | 0 | 1296 | 123 | 9.49074 | |
| 27 | | 7:00 | 7/2/2003 | 1611 | 61 | 0 | 24 | 0 | 2 | 0 | 7 | 0 | 2 | 3 | 0 | 4 | 6 | 37 | 2 | 3 | 4 | 0 | 0 | 1766 | 155 | 8.7769 | 9.76554 |
| 28 | | 8:00 | 7/2/2003 | 1565 | 88 | 0 | 28 | 1 | 1 | 0 | 3 | 0 | 3 | 1 | 0 | 4 | 6 | 54 | 0 | 4 | 1 | 0 | 0 | 1759 | 194 | 11.029 | |
| 29 | | 9:00 | 7/2/2003 | 1454 | 63 | 0 | 31 | 0 | 2 | 0 | 5 | 0 | 5 | 1 | 2 | 4 | 17 | 49 | 2 | 7 | 3 | 0 | 0 | 1645 | | | |
| 30 | | 10:00 | 7/2/2003 | 1541 | 78 | 2 | 35 | 0 | 1 | 0 | 8 | 0 | 7 | 3 | 0 | 8 | 11 | 69 | 2 | 4 | 5 | 0 | 0 | 1774 | | | |
| 31 | | 11:00 | 7/2/2003 | 1755 | 82 | 1 | 23 | 1 | 2 | 0 | 4 | 0 | 5 | 0 | 2 | 4 | 10 | 62 | 2 | 1 | 2 | 0 | 0 | 1956 | | | |
| 32 | | 12:00 | 7/2/2003 | 1869 | 74 | 1 | 38 | 1 | 1 | 0 | 0 | 0 | 4 | 4 | 0 | 4 | 10 | 79 | 0 | 3 | 3 | 0 | 0 | 2091 | | | |
| 33 | | 13:00 | 7/17/2003 | 1678 | 71 | 1 | 22 | 0 | 2 | 0 | 4 | 0 | 3 | 4 | 1 | 3 | 9 | 50 | 10 | 2 | 7 | 0 | 0 | 1867 | | | |
| 34 | | 14:00 | 7/17/2003 | 1885 | 67 | 0 | 18 | 0 | 3 | 0 | 5 | 0 | 5 | 2 | 1 | 6 | 4 | 42 | 12 | 4 | 4 | 0 | 0 | 2058 | | | |
| 35 | | 15:00 | 7/17/2003 | 2178 | 40 | 2 | 10 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 5 | 5 | 28 | 3 | 4 | 7 | 0 | 0 | 2291 | 113 | 4.93234 | |
| 36 | | 16:00 | 7/17/2003 | 1906 | 42 | 0 | 20 | 0 | 1 | 0 | 3 | 0 | 2 | 3 | 1 | 2 | 3 | 22 | 9 | 2 | 1 | 0 | 0 | 2017 | 111 | 5.50322 | 4.6378 |
| 37 | | 17:00 | 7/17/2003 | 1915 | 26 | 2 | 7 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 3 | 0 | 16 | 1 | 4 | 2 | 0 | 0 | 1984 | 69 | 3.47782 | |
| 38 | | 18:00 | 7/17/2003 | 2017 | 14 | 2 | 4 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 3 | 28 | 8 | 4 | 4 | 0 | 1 | 2094 | | | |
| 39 | | 19:00 | 7/17/2003 | 1472 | 9 | 0 | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 2 | 0 | 1 | 2 | 22 | 1 | 0 | 3 | 0 | 1 | 1519 | | | |
| 40 | | 20:00 | 7/17/2003 | 1300 | 12 | 1 | 3 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 2 | 20 | 6 | 1 | 3 | 0 | 1 | 1355 | | | |
| 41 | | 21:00 | 7/17/2003 | 1100 | 10 | 1 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 2 | 18 | 1 | 1 | 3 | 0 | 1 | 1145 | | | |
| 42 | | *Directional Totals:* | | 26419 | 777 | 16 | 282 | 5 | 25 | 0 | 64 | 0 | 40 | 28 | 9 | 61 | 92 | 626 | 66 | 47 | 56 | 0 | 4 | 28617 | | | |
| 43 | | *Site Totals:* | | 56890 | 1567 | 23 | 534 | 13 | 50 | 0 | 151 | 1 | 69 | 53 | 29 | 166 | 162 | 1148 | 174 | 94 | 112 | 0 | 13 | 61249 | | | |

**Figure 9: Truck percent calculations with passenger vehicles known (Full sized on next page)**

Once the truck percentage has been calculated for each hour of the AM and PM periods, in both directions, find the average truck percent over the entire model period. ***The average percent of trucks over the total model period is the value that needs to be coded into CORSIM.***

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BODY TYPE REPORT BASED ON PRELIMINARY ADJUSTED VEHICLE CLASSIFICATION | | | | | | | | | | | | 7/7/2004 | | | | | | | | | | | | | Calculations | |
| 2 | SITE: | 8872 | | ROUTE | TH 169 | | DESCRIPTION | | N OF JCT I-494 | | | COUNTY: | | HENNEPIN | | DIST: | 5 | | RECORDER: | | RMH | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | Begin | Pass. | | 2ax | 3ax | 3ax+ | 3ax | 4ax | 5ax | 5ax | 5ax | 5ax | 5ax | 5ax | HTWT | Total | | | | | | | | | ave % trucks |
| 5 | | | Date | Vehicle | 2ax | | | | 3ax | | 4ax | | dump | | grain | | | other | 6ax+ | Bus | HTWT | | T5ax+ | Vehicles | total trucks | % trucks | for peak hour |
| 6 | North | 6:00 | 7/15/2003 | 2283 | 39 | 1 | 19 | 1 | 2 | 0 | 5 | 0 | 2 | 2 | 0 | 4 | 3 | 34 | 4 | 3 | 11 | 0 | 3 | 2416 | 133 | 5.50497 | |
| 7 | | 7:00 | 7/15/2003 | 2615 | 54 | 0 | 25 | 0 | 2 | 0 | 4 | 0 | 1 | 3 | 0 | 8 | 1 | 26 | 7 | 8 | 3 | 0 | 2 | 2759 | 144 | 5.21928 | 5.87717 |
| 8 | | 8:00 | 7/15/2003 | 2399 | 75 | 0 | 19 | 1 | 3 | 0 | 6 | 0 | 2 | 1 | 0 | 16 | 4 | 33 | 11 | 2 | 5 | 0 | 0 | 2577 | 178 | 6.90726 | |
| 9 | | 9:00 | 7/15/2003 | 1866 | 78 | 1 | 20 | 1 | 1 | 0 | 7 | 0 | 3 | 3 | 1 | 10 | 8 | 72 | 5 | 3 | 2 | 0 | 0 | 2081 | | | |
| 10 | | 10:00 | 7/15/2003 | 1680 | 72 | 1 | 26 | 0 | 0 | 0 | 6 | 0 | 6 | 2 | 0 | 6 | 11 | 53 | 13 | 4 | 7 | 0 | 1 | 1888 | | | |
| 11 | | 11:00 | 7/15/2003 | 1819 | 84 | 0 | 30 | 1 | 3 | 0 | 10 | 0 | 0 | 1 | 0 | 7 | 7 | 39 | 6 | 5 | 6 | 0 | 0 | 2018 | | | |
| 12 | | 12:00 | 7/15/2003 | 1854 | 58 | 0 | 32 | 1 | 3 | 0 | 3 | 0 | 1 | 3 | 3 | 7 | 9 | 48 | 6 | 4 | 3 | 0 | 0 | 2035 | | | |
| 13 | | 13:00 | 7/16/2003 | 1686 | 71 | 0 | 19 | 0 | 0 | 0 | 13 | 0 | 6 | 0 | 9 | 6 | 6 | 54 | 19 | 3 | 8 | 0 | 0 | 1900 | | | |
| 14 | | 14:00 | 7/16/2003 | 1940 | 78 | 1 | 24 | 0 | 2 | 0 | 7 | 0 | 3 | 3 | 4 | 10 | 8 | 34 | 8 | 4 | 6 | 0 | 0 | 2132 | | | |
| 15 | | 15:00 | 7/16/2003 | 2008 | 52 | 2 | 10 | 3 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 4 | 5 | 33 | 8 | 1 | 3 | 0 | 0 | 2137 | 129 | 6.0365 | |
| 16 | | 16:00 | 7/16/2003 | 2027 | 41 | 1 | 8 | 0 | 2 | 0 | 8 | 0 | 0 | 2 | 0 | 3 | 2 | 20 | 9 | 4 | 2 | 0 | 0 | 2129 | 102 | 4.79098 | 4.90239 |
| 17 | | 17:00 | 7/16/2003 | 2205 | 35 | 0 | 11 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 3 | 6 | 2 | 19 | 5 | 1 | 0 | 0 | 0 | 2294 | 89 | 3.87969 | |
| 18 | | 18:00 | 7/16/2003 | 1868 | 23 | 0 | 3 | 0 | 2 | 0 | 4 | 0 | 0 | 1 | 0 | 6 | 1 | 18 | 3 | 2 | 0 | 0 | 0 | 1931 | | | |
| 19 | | 19:00 | 7/16/2003 | 1621 | 12 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 5 | 1 | 16 | 1 | 1 | 0 | 0 | 2 | 1665 | | | |
| 20 | | 20:00 | 7/16/2003 | 1400 | 10 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 4 | 1 | 13 | 2 | 1 | 0 | 0 | 1 | 1438 | | | |
| 21 | | 21:00 | 7/16/2003 | 1200 | 8 | 0 | 2 | 0 | 1 | 0 | 2 | 1 | 1 | 1 | 0 | 3 | 1 | 10 | 1 | 1 | 0 | 0 | 0 | 1232 | | | |
| 22 | *Directional Totals:* | | | 30471 | 790 | 7 | 252 | 8 | 25 | 0 | 87 | 1 | 29 | 25 | 20 | 105 | 70 | 522 | 108 | 47 | 56 | 0 | 9 | 32632 | | | |
| 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | Begin | Pass. | | 2ax | 3ax | 3ax+ | 3ax | 4ax | 5ax | 5ax | 5ax | 5ax | 5ax | 5ax | HTWT | Total | | | | | | | | | |
| 25 | | | Date | Vehicle | 2ax | | | | 3ax | | 4ax | | dump | | grain | | | other | 6ax+ | Bus | HTWT | | T5ax+ | Vehicles | | | |
| 26 | South | 6:00 | 7/2/2003 | 1173 | 40 | 3 | 16 | 0 | 1 | 0 | 6 | 0 | 0 | 3 | 0 | 8 | 2 | 30 | 7 | 3 | 4 | 0 | 0 | 1296 | 123 | 9.49074 | |
| 27 | | 7:00 | 7/2/2003 | 1611 | 61 | 0 | 24 | 0 | 2 | 0 | 7 | 0 | 2 | 3 | 0 | 4 | 6 | 37 | 2 | 3 | 4 | 0 | 0 | 1766 | 155 | 8.7769 | 9.76554 |
| 28 | | 8:00 | 7/2/2003 | 1565 | 88 | 0 | 28 | 1 | 1 | 0 | 3 | 0 | 3 | 1 | 0 | 4 | 6 | 54 | 0 | 4 | 1 | 0 | 0 | 1759 | 194 | 11.029 | |
| 29 | | 9:00 | 7/2/2003 | 1454 | 63 | 0 | 31 | 0 | 2 | 0 | 5 | 0 | 5 | 1 | 2 | 4 | 17 | 49 | 2 | 7 | 3 | 0 | 0 | 1645 | | | |
| 30 | | 10:00 | 7/2/2003 | 1541 | 78 | 2 | 35 | 0 | 1 | 0 | 8 | 0 | 7 | 3 | 0 | 8 | 11 | 69 | 2 | 4 | 5 | 0 | 0 | 1774 | | | |
| 31 | | 11:00 | 7/2/2003 | 1755 | 82 | 1 | 23 | 1 | 2 | 0 | 4 | 0 | 5 | 0 | 2 | 4 | 10 | 62 | 2 | 1 | 2 | 0 | 0 | 1956 | | | |
| 32 | | 12:00 | 7/2/2003 | 1869 | 74 | 1 | 38 | 1 | 1 | 0 | 0 | 0 | 4 | 4 | 0 | 4 | 10 | 79 | 0 | 3 | 3 | 0 | 0 | 2091 | | | |
| 33 | | 13:00 | 7/17/2003 | 1678 | 71 | 1 | 22 | 0 | 2 | 0 | 4 | 0 | 3 | 4 | 1 | 3 | 9 | 50 | 10 | 2 | 7 | 0 | 0 | 1867 | | | |
| 34 | | 14:00 | 7/17/2003 | 1885 | 67 | 0 | 18 | 0 | 3 | 0 | 5 | 0 | 5 | 2 | 1 | 6 | 4 | 42 | 12 | 4 | 4 | 0 | 0 | 2058 | | | |
| 35 | | 15:00 | 7/17/2003 | 2178 | 40 | 2 | 10 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 5 | 5 | 28 | 3 | 4 | 7 | 0 | 0 | 2291 | 113 | 4.93234 | |
| 36 | | 16:00 | 7/17/2003 | 1906 | 42 | 0 | 20 | 0 | 1 | 0 | 3 | 0 | 2 | 3 | 1 | 2 | 3 | 22 | 9 | 2 | 1 | 0 | 0 | 2017 | 111 | 5.50322 | 4.6378 |
| 37 | | 17:00 | 7/17/2003 | 1915 | 26 | 2 | 7 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 3 | 0 | 16 | 1 | 4 | 2 | 0 | 0 | 1984 | 69 | 3.47782 | |
| 38 | | 18:00 | 7/17/2003 | 2017 | 14 | 2 | 4 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 3 | 28 | 8 | 4 | 4 | 0 | 1 | 2094 | | | |
| 39 | | 19:00 | 7/17/2003 | 1472 | 9 | 0 | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 2 | 0 | 1 | 2 | 22 | 1 | 0 | 3 | 0 | 1 | 1519 | | | |
| 40 | | 20:00 | 7/17/2003 | 1300 | 12 | 1 | 3 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 2 | 20 | 6 | 1 | 3 | 0 | 1 | 1355 | | | |
| 41 | | 21:00 | 7/17/2003 | 1100 | 10 | 1 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 2 | 18 | 1 | 1 | 3 | 0 | 1 | 1145 | | | |
| 42 | *Directional Totals:* | | | 26419 | 777 | 16 | 282 | 5 | 25 | 0 | 64 | 0 | 40 | 28 | 9 | 61 | 92 | 626 | 66 | 47 | 56 | 0 | 4 | 28617 | | | |
| 43 | *Site Totals:* | | | 56890 | 1567 | 23 | 534 | 13 | 50 | 0 | 151 | 1 | 69 | 53 | 29 | 166 | 162 | 1148 | 174 | 94 | 112 | 0 | 13 | 61249 | | | |
| 44 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

# 5.0 Coding CORSIM with truck percentages

The truck percentage is coded into CORSIM at the entry nodes (8000) of the model. At these nodes the vehicles per hour are entered along with the truck percentage. Based on the above TH-169/I-494 example, the AM average truck percent northbound for the site south of I-494 is going to be coded into the southern entry point of the roadway for the AM model. The PM average truck percent northbound at this station is also coded for the southern entry point of the roadway for the PM model. Then, the AM and PM average truck percents for the southbound portion of the station north of 494 will be entered the northern entry point of the roadway.

## 5.1 Coding into CORSIM using the *.tno file

The truck percentage is entered by double-clicking on the entry node and entering the percentage in the box under the heading: "Vehicle Types (other than passenger cars)". The percentage of trucks can only be entered in whole numbers. The below figure is an example of the TSIS screen used to enter the truck percentages into the model for node 8100 (the northbound direction in the AM model for the site in examples one and three).

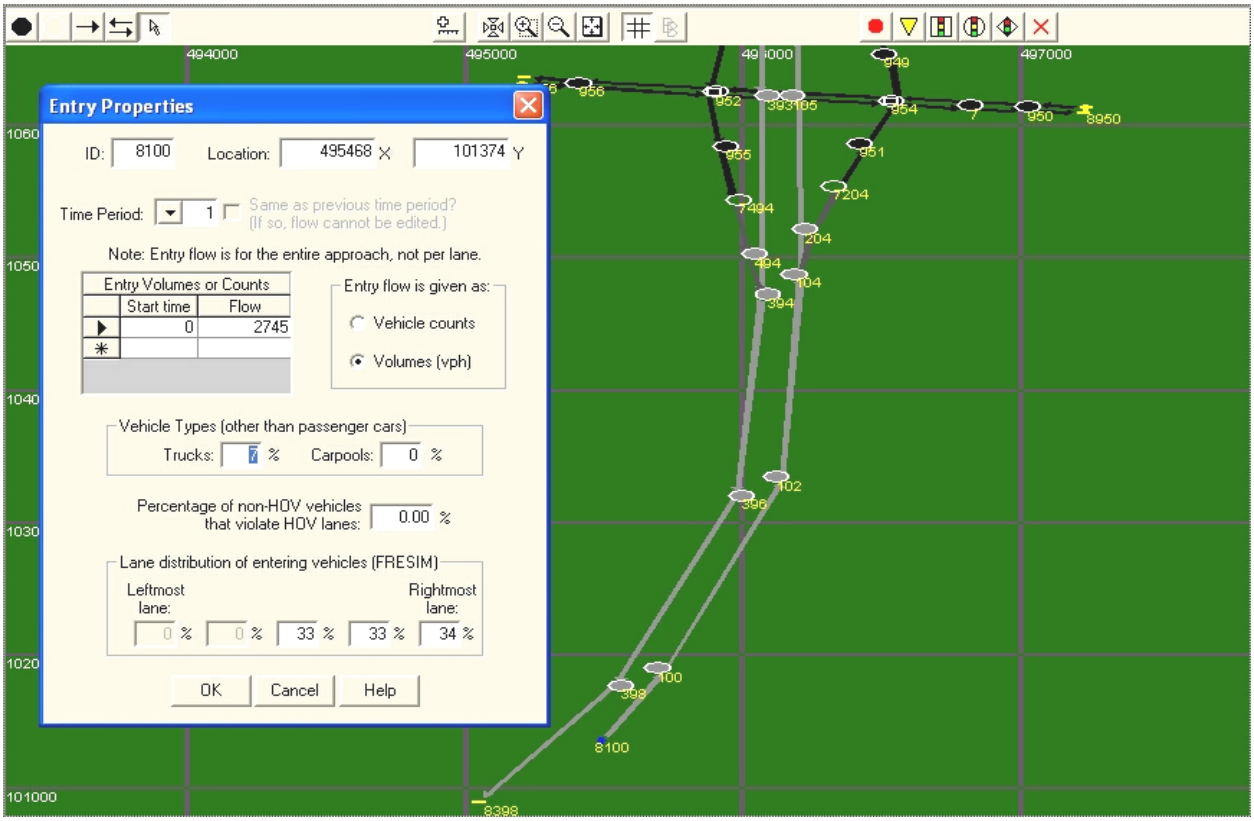



**Figure 10: TSIS screen used to enter truck percentages**

Reminder: A truck percentage must be entered for each time period.

## 5.2 Coding into CORSIM using the *.trf file

Another option for coding the truck percentage is to edit record type 50. This is done by modifying the .trf file. To enter the truck percent for entry node #8100 from the above example, go to record type 50 and edit the columns 13-16 and enter the percentage of trucks

```
173817391741 65017501641                                                  25
176217641772 5031523  35                                                  25
8100 1003844   7   0    0                          0   0   0   0   0   50
8140 1403822   3   0    0                          0   0   0   0   0   50
8156 1561212   3   0    0                          0   0   0   0   0   50
8268 268 184   3   0    0                          0   0   0   0   0   50
8300 3003032   3   0    0                          0   0   0   0   0   50
8340 340 696   3   0    0                          0   0   0   0   0   50
8352 3523034   3   0    0                          0   0   0   0   0   50
8458 458 118   3   0    0                          0   0   0   0   0   50
8500 5005340   3   0    0                          0   0   0   0   0   50
8700 7006848   3   0    0                          0   0   0   0   0   50
8802 8021402   3   0    0                          0   0   0   0   0   50
 500 504   7                                                             74
 500 506  18                                                             74
```

AM peak percent for northbound is 6.67%, so input 7%

**Figure 11: Record type 50 used to enter truck percentages**

The highlighted number is the truck percentage for node 8100, once again in whole numbers. After entering the truck percentage for each entry node in card 50 for the first time period, it can be copied and pasted in for all the other time periods in the model, since the truck percentage is an average of the whole simulated period and will stay the same throughout the entire simulated time.

# 6.0 Calculating Fleet Composition

The fleet composition split between the different vehicle types is calculated using the vehicle classification data. For each of the four groups of vehicles (SUTs, 3&4 axle semis, 5+ axle semis, and double bottom trailers) the total amount of vehicles are calculated by adding together all the values for every direction, at every freeway or arterial classification site and in every hour of the model. For example, if the two stations below were the only two freeway sites in the model, the AM total amount of SUTs would be:

$$\left(\begin{array}{l}(39+5+26+1)+(24+0+22+0)+\\(53+1+41+1)+(36+1+19+0)+\\(52+0+32+0)+(59+1+33+1)\end{array}\right) + \left(\begin{array}{l}(19+5+4)+(34+7+0)+(41+7+0)+\\(26+5+0)+(30+3+0)+(65+3+0)\end{array}\right) = 696$$

Site one data — Site two data — Total SUTs

**Site One:**

| | | | | Single Units | | | | Semis | | | | Heavies | | | | | | | | Trailers | | Twins | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Begin | Date | Pass. Vehicle | 2ax | 2ax | 3ax | 3ax+ | 3ax | 3ax | 4ax | 4ax | 5ax dump | 5ax | 5ax grain | 5ax | 5ax | 5ax other | 6ax+ | Bus | HTWT | HTWT | TSax+ | Total Vehicles |
| North | 6:00 | 10/17/03 | 0 | 39 | 5 | 26 | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 16 | 11 | 1 | 23 | 12 | 1 | 7 | 0 | 0 | 148 |
| | 7:00 | 10/17/03 | 0 | 24 | 0 | 22 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 11 | 8 | 3 | 30 | 17 | 5 | 6 | 0 | 0 | 131 |
| | 8:00 | 10/17/03 | 0 | 53 | 1 | 41 | 1 | 3 | 0 | 4 | 0 | 0 | 4 | 28 | 16 | 3 | 49 | 21 | 3 | 5 | 0 | 1 | 233 |
| | . | | | | | | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | | | | | | |
| South | 6:00 | 10/17/03 | 0 | 36 | 1 | 19 | 0 | 0 | 0 | 3 | 0 | 3 | 6 | 8 | 11 | 5 | 32 | 6 | 3 | 4 | 0 | 0 | 137 |
| | 7:00 | 10/17/03 | 0 | 52 | 0 | 32 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 8 | 8 | 13 | 34 | 20 | 6 | 1 | 0 | 0 | 181 |
| | 8:00 | 10/17/03 | 0 | 59 | 1 | 33 | 1 | 1 | 0 | 6 | 0 | 5 | 5 | 13 | 6 | 10 | 61 | 20 | 5 | 4 | 0 | 0 | 230 |

1 2 3 4 5 6 7 8

SUT — 3 & 4 axle Semi-Trailer — 5+ axle Semi-Trailer — Double Bottom Trailer

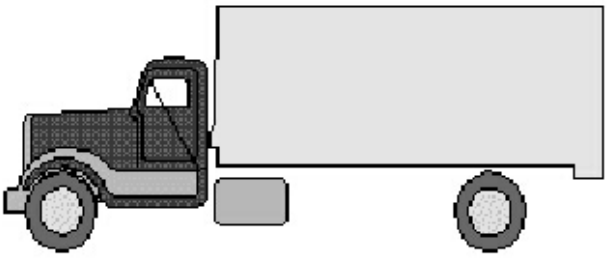
**Site Two:**

| | DATE | TIME | M-CYCLE | CAR | PICKUP | BUS | 2AXSU | 3AXSU | 4+AXSU | 3+4SEMI | 5AXSEMI | HTWT | TWINS | TWINS | TWINS | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northeast | 04/06/00 | 6:00 | 0 | 1244 | 348 | 11 | 19 | 5 | 4 | 4 | 10 | 1 | 0 | 0 | 0 | |
| | 04/06/00 | 7:00 | 4 | 2555 | 428 | 19 | 34 | 7 | 0 | 11 | 8 | 7 | 1 | 0 | 1 | |
| | 04/06/00 | 8:00 | 1 | 2228 | 440 | 14 | 41 | 7 | 0 | 8 | 13 | 5 | 0 | 0 | 0 | |
| | . | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | |
| Southwest | 04/06/00 | 6:00 | 2 | 890 | 256 | 6 | 26 | 5 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | |
| | 04/06/00 | 7:00 | 1 | 1355 | 222 | 3 | 30 | 3 | 0 | 14 | 12 | 1 | 0 | 0 | 0 | |
| | 04/06/00 | 8:00 | 0 | 1154 | 245 | 18 | 65 | 3 | 0 | 4 | 16 | 1 | 0 | 0 | 0 | |

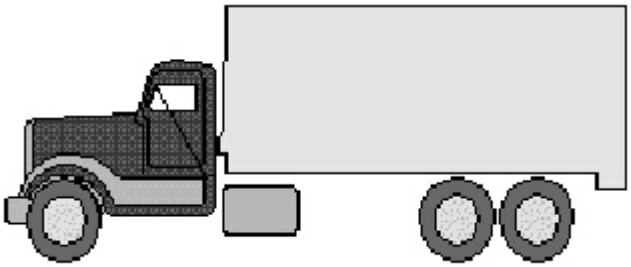
SUT — 3 & 4 axle Semi-Trailer — 5+ axle Semi-Trailer — Double Bottom Trailer

**Figure 12: Heavy Vehicle Types**

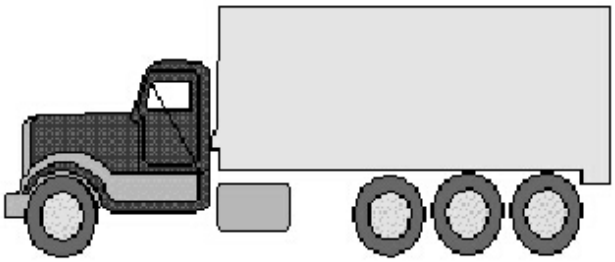
1) 2 axle Single Unit



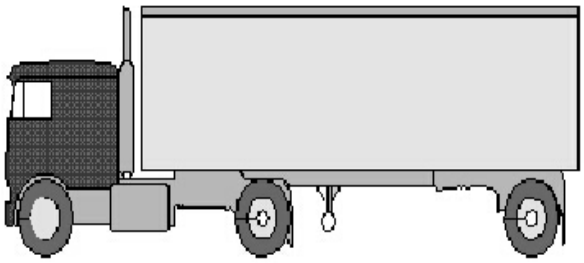
2) 3 axle Single Unit



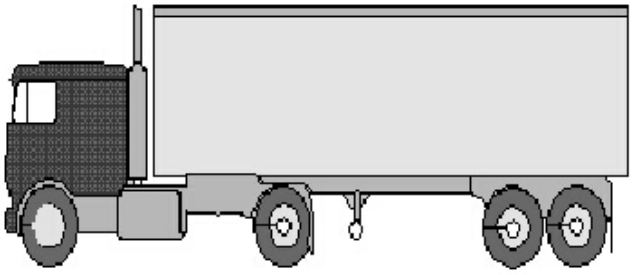
3) 4+ axle Single Unit



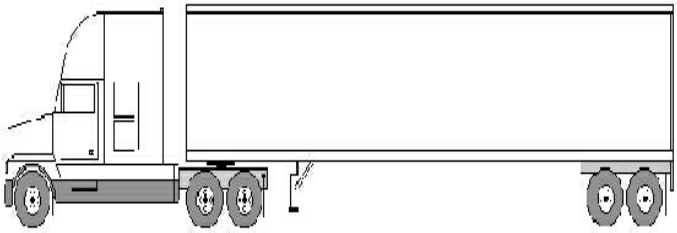
4) 3 axle Semi-Trailer



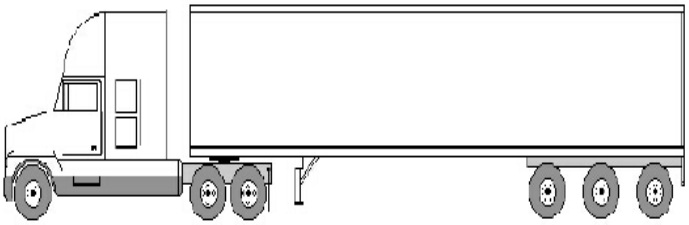
5) 4 axle Semi-Trailer



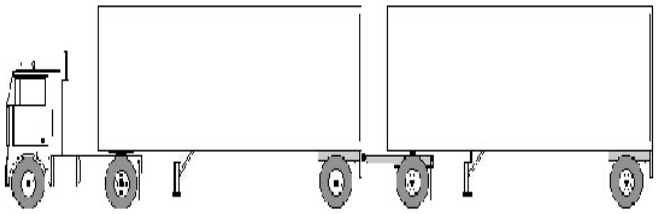
6) 5 axle Semi-Trailer



7) 6+ axle Semi-Trailer



8) Double Bottom Trailer



**Determining fleet vehicle split:**

$$\% \text{ SUTs} = \frac{\text{Total SUTs}}{\text{Tot. SUT} + \text{Tot. 3\&4 axle Semis} + \text{Tot. 5+ axle Semis} + \text{Tot. Double Semis}}$$

$$\% \text{ Double Bottom Trailers} = \frac{\text{Total Double Bottom Trailers}}{\text{Tot. SUT} + \text{Tot. 3\&4 axle Semis} + \text{Tot. 5+ axle Semis} + \text{Tot. Dbl Semis}}$$

To determine the split between medium and heavy semis, use the following Census Bureau counts to convert number of axles to weight:

- 13.9% of 3&4 axle semi-trailers are medium weight (under 26,000 lbs)
- 86.1% of 3&4 axle semi-trailers are heavy weight (over 26,000 lbs).
- For 5+ axle semi-trailers, 1.3% of 5+ axle semi-trailers are medium weight.
- The remaining 98.7% of 5+ axle semi-trailers are heavy weight.

Thus, calculating the percent of medium weight and heavy weight semis is as follows:

$$\% \text{ Medium Semis} = \frac{0.139*(\text{Total 3\&4 axle Semis}) + 0.013*(\text{Total 5+ axle Semis})}{\text{Tot. SUT} + \text{Tot. 3\&4 axle Semis} + \text{Tot. 5+ axle Semis} + \text{Tot. Dbl Semis}}$$

$$\% \text{ Heavy Semis} = \frac{0.861*(\text{Total 3\&4 axle Semis}) + 0.987*(\text{Total 5+ axle Semis})}{\text{Tot. SUT} + \text{Tot. 3\&4 axle Semis} + \text{Tot. 5+ axle Semis} + \text{Tot. Dbl Semis}}$$

** Note: After calculating the above percentages, round them to the nearest whole percentage and be sure they add to 100%, adjust if they do not.*

# 7.0 Inserting Fleet Composition into CORSIM

CORSIM uses global parameters to model the fleet composition. Record type 71 is used for the FRESIM network, and record type 58 is used for the NETSIM network. CORSIM defines vehicle types for FRESIM and NETSIM using the following table:

| FRESIM Vehicle Type | NETSIM Vehicle Type | Vehicle Description |
|---|---|---|
| 1 | 5 | Low-performance passenger car |
| 2 | 1 | High-performance passenger car |
| 3 | 2 | Single-unit truck |
| 4 | 6 | Semi-trailer truck with medium load |
| 5 | 7 | Semi-trailer truck with full load |
| 6 | 8 | Double-bottom trailer truck |
| 7 | 4 | Conventional bus |
| 8 | 9 | Low-performance passenger car |
| 9 | 3 | High-performance passenger car |

Carpool vehicles

**Figure 13: Table of vehicle type descriptions**

For example, a low-performance passenger car is vehicle type 1 in FRESIM and vehicle type 5 in NETSIM. Similarly, a high performance passenger car is vehicle type 2 in FRESIM and vehicle type 1 in NETSIM, and so on.

## 7.1 Coding FRESIM network for fleet splits

Create a spreadsheet similar to the one on the next page and enter the four truck-type percentages found for the freeway network in the highlighted cells of the "% of trucks that are of this type" column. All of the other numbers in the table can be duplicated from below.

### RT 71: FRESIM Sub-model Vehicle Type Specifications (Fleet Composition)

| Description | | Entry Description | Vehicle Type | Vehicle Length | Jerk Value | Max Deceleration for vehicle type | % of P.C. that are of this type | % of Trucks that are of this type | % of Mass transit | % of carpool that are of this type | Vehicle performance index | Ave No. of persons per veh | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Units | Integer | Feet | Ft/sec$^3$ (10ths) | ft/sec$^2$ | % | % | % | % | Integer | People (100ths) | |
| **Fleet Component** | **Vehicle Type** | **Range** | 9-Jan | 10-125 | 0000-9999 | 0-150 | 0-100 | 0-100 | 0-100 | 0-100 | 7-Jan | Lane No. | RT |
| Passenger Cars | 1-Low Performance | | 1 | 15 | 70 | 150 | 25 | | | | 2 | 130 | 71 |
| | 2-High Performance | | 2 | 17 | 70 | 150 | 75 | | | | 2 | 130 | 71 |
| Truck | 3-Single unit | | 3 | 30 | 70 | 150 | | | | | 3 | 120 | 71 |
| | 4-Semi-trailer with medium load | | 4 | 62 | 70 | 125 | | | | | 5 | 120 | 71 |
| | 5-Semi Trailer with full load | | 5 | 53 | 70 | 125 | | | | | 5 | 120 | 71 |
| | 6-Double bottom Trailer | | 6 | 64 | 70 | 125 | | | | | 6 | 120 | 71 |
| Bus | 7-Conventional | | 7 | 40 | 70 | 150 | | | 100 | | 7 | 2500 | 71 |
| Carpool | 8-Low performance | | 8 | 15 | 70 | 150 | | | | 25 | 1 | 250 | 71 |
| | 9-High Performance | | 9 | 17 | 70 | 150 | | | | 75 | 2 | 250 | 71 |

Below is the card 71 that needs to be inserted into time period one of the model. The 3rd, 4th, 5th, and 6th, rows in column 6 of card 71 are the truck percentages as entered into the table above.

```
1  15  70 150  25   0   0   0   2 130                                71
2  17  70 150  75   0   0   0   2 130                                71
3  30  70 150   0   0   0   0   3 120                                71
4  62  70 125   0   0   0   0   5 120                                71
5  53  70 125   0   0   0   0   5 120                                71
6  64  70 125   0   0   0   0   6 120                                71
7  40  70 150   0   0 100   0   72500                                71
8  15  70 150   0   0   0  25   1 250                                71
9  17  70 150   0   0   0  75   2 250                                71
```

## 7.2 Coding NETSIM network for fleet splits

Create a spreadsheet similar to below and enter the four truck type percents found for the freeway network in the highlighted cells of the "% of trucks that are of this type" column. All of the other numbers in the table can be duplicated from below. *(Note the vehicle type column differs from the FRESIM table)*

**RT 58:NETSIM Sub-model Vehicle Type Specification (Fleet Composition)**

| 7Description | | Entry Description | Vehicle Type | Vehicle Length | Mean Queue Discharge Factor | % of P.C. that are of this type | % of Trucks that are of this type | % of Mass transit | % of carpool that are of this type | Ave No. of persons per veh | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Units | integer | Feet | % | % | % | % | % | People (100ths) | |
| **Fleet Component** | **Vehicle Type** | **Range** | 9-Jan | 10-125 | 50-500 | 0-100 | 0-100 | 0-100 | 0-100 | Lane No. | RT |
| Passenger Cars | 1-High Performance | | 1 | 17 | 100 | 75 | | | | 130 | 58 |
| | 5-Low Performance | | 5 | 15 | 100 | 25 | | | | 130 | 58 |
| Truck | 2-Single unit | | 2 | 30 | 100 | | | | | 120 | 58 |
| | 6-Semi-trailer with medium load | | 6 | 62 | 100 | | | | | 120 | 58 |
| | 7-Semi Trailer with full load | | 7 | 53 | 100 | | | | | 120 | 58 |
| | 8-Double bottom Trailer | | 8 | 64 | 100 | | | | | 120 | 58 |
| Bus | 4-Conventional | | 4 | 40 | 100 | | | 100 | | 2500 | 58 |
| Carpool | 3-High performance | | 3 | 17 | 100 | | | | 100 | 250 | 58 |
| | 9-Low Performance | | 9 | 15 | 100 | | | | 0 | 250 | 58 |

Below is the card 58 that needs to be inserted into the first time period of the model. The 3rd, 4th, 5th, and 6th, rows in column 5 are the truck percentages as entered into the table above.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 15 | 100 | 25 | 0 | 0 | 0 | 130 | 58 |
| 1 | 17 | 100 | 75 | 0 | 0 | 0 | 130 | 58 |
| 2 | 30 | 100 | 0 | | 0 | 0 | 120 | 58 |
| 6 | 62 | 100 | 0 | | 0 | 0 | 120 | 58 |
| 7 | 53 | 100 | 0 | | 0 | 0 | 120 | 58 |
| 8 | 64 | 100 | 0 | | 0 | 0 | 120 | 58 |
| 4 | 40 | 100 | 0 | 0 | 100 | 0 | 2500 | 58 |
| 9 | 15 | 100 | 0 | 0 | 0 | 0 | 250 | 58 |
| 3 | 17 | 100 | 0 | 0 | 0 | 100 | 250 | 58 |

## 8.0 Submittal Requirements

1. Electronic copy of raw data counts from the Mn/DOT Office of Transportation Data & Analysis
    - See Figures 4 & 7
2. Electronic copy of the excel spreadsheet used to calculate truck percentages and fleet splits.
    - See figures 8 & 9
3. Electronic and paper copies of the RT 58 and RT 71 spreadsheets.
4. Technical Memo explaining any deviations in CORSIM from the calculated numbers.