LTPP Weigh-in-Motion (WIM) System:
Model Performance Specifications and Application Requirements for Equipment – Hardware and Software
Version 2.0

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ETG MODS

U.S. Department of Transportation
Federal Highway Administration

Long-Term Pavement Performance
Serving your need for durable pavements

Introduction

It is the intent of these specifications to establish the minimum requirements for high speed weigh-in-motion equipment utilized the purpose of collecting traffic data at Long-Term Pavement Performance (LTPP) Specific Pavement Studies (SPS) sites.

High Speed Weigh-in-Motion System

The Weigh-in-Motion System (hereafter WIM system) shall include equipment and software for collecting, processing, storing, transmitting and manipulating information related to the counting, classifying and speed monitoring of all vehicles and the weighing of trucks and buses at highway speeds.

The WIM system shall provide for single threshold weighing, and operate over a speed range of 5 mph to 100 mph. Single threshold weighing shall consist of scales in each lane of measurement. The weigh sensors shall cover the entire lane width. The WIM system shall consist of the following components:

1. Wheel scales shall report weight data for each wheel track (right axle weight and left axle weight). Such wheel weight data shall be uniform across the total width of the scale.

2. A WIM controller shall be installed in the controller cabinet. The WIM controller shall include all of the equipment and software to calculate, store and transmit to a host computer all data specified in these specifications. Either a keyboard and monitor or a portable personal computer (including protective case) for the purpose of accessing the WIM controller shall be furnished as part of the WIM controller. The WIM controller shall operate on AC power with a DC battery backup system to provide uninterrupted power to the WIM controller during AC power outages for a minimum of one hour. The system shall be able to operate on solar power if AC power is unavailable. The modem to be installed in the controller cabinet shall be compatible with the host computer modems described elsewhere in these specifications. The user shall have the capability of entering a site designation code up to three characters.

3. Surge protection devices against lightning and other transient high voltage consisting of:
   ➢ Power Source Protection
   ➢ Phone Line Protection
   ➢ Loop Input Protection
   ➢ WIM Sensor Protection
   ➢ Grounding
     ▪ All conduit shall be metal and bonded with #8 bare copper wire.
     ▪ A ground rod with an impedance of 10 ohms or less shall be placed at the cabinet foundation.
     ▪ The ground rod shall be connected to the electronics backplane with #6 bare wire.
     ▪ If solar powered, a lightning rod shall be placed on top of the solar panel pole, and shall be independently grounded.

4. All necessary interconnecting cables and miscellaneous materials to make an operational system.

Functional Requirements

1. The WIM system shall be able to accommodate vehicles and vehicle combinations with up to eleven axles and shall automatically determine the following for each vehicle, by lane of travel:
   ➢ Weight of each axle by left and right wheel weights, speed, axle spacing, and vehicle length. The WIM system shall provide for calibration features such that the accuracy required under LTPP standards for equipment performance verification can be met
   ➢ Vehicle Classification. The WIM system shall provide for a minimum of 15 vehicle classifications. Class 1 through Class 13 shall be used according to the classification scheme shown in Section 4, Appendix A, of the Federal Highway Administration 3d edition of the Traffic Monitoring Guide, February 1995. Class 14 will identify special vehicles as determined by the user. Class 15 will identify any vehicle not conforming to the classification criteria for Classes 1 through 14. Classification criteria for Classes 1 through 14 shall be programmable by the user. The WIM system shall provide sufficient flexibility in spacings and weights (axle and/or gross) for each of these classes so that accurate classifying is achievable.

➢ Invalid Measurements. An "invalid measurement" code shall be assigned to any vehicle meeting the front axle weight threshold (discussed below) when (1) the left and right wheel weights of any axle have a difference of 40 percent or more; and (2) either of the wheel weights of such axle exceeds 2.0 kip. Both the 40 percent and 2.0 kip values shall be programmable by the operator. Any vehicle assigned an "invalid measurement" code shall not be considered a "Weighed Vehicle" but shall be classified and counted and all vehicle data shall be stored in the vehicle record.

➢ Determination of Weight Violations. For any vehicle meeting the front axle weight threshold (discussed below), the WIM system shall determine which, if any, axle(s) or axle grouping(s) exceed the weight limits set forth in the "Weight Violation Table" contained in these specifications. Any vehicle with one or more weight violations will be coded as to such a violation or combination of violations. The weight limitations set forth in the "Weight Violation Table" shall be the default settings. Such weights shall be programmable by the user.

2. The WIM controller shall calculate and store all specified data on a storage medium. The on-site data storage device shall have the capacity to store a minimum of fourteen days of vehicle count data and individual vehicle records. The storage device shall be completely solid state with no mechanical components and shall be a type not susceptible to loss of accumulated data should electrical power be interrupted. The WIM controller shall continue to calculate and store data for all vehicles passing through the system during periods of access, both on-site by portable PC and by the host computer for purposes of programming, real-time view and downloading of data.

   The WIM controller shall store the following data:
   ➢ Hourly vehicle counts by lane, by class and by speed range for each 24-hour period (Class/Count Summary).
   ➢ Individual vehicle records for all vehicles with a front axle weight greater than 3.5 kip (hereafter referred to as "truck records"). The front axle weight threshold for truck records shall be programmable by the operator with 3.5 kip as default setting. Each truck record shall include, as a minimum, the following data:
      ▪ Time and Date
      ▪ Lane Number
      ▪ Vehicle Number
      ▪ Speed
      ▪ Vehicle Classification
      ▪ Weight in kips of each wheel or dual set of wheels by left and right side and by axle number
      ▪ Spacing in feet between each sequentially numbered axle
      ▪ Overall length of each vehicle or combination of vehicles in feet
      ▪ Code for weight violation(s)
      ▪ Code for invalid measurement(s)

3. Data shall be calculated and formatted such that all data can be accessed and all required reports can be generated by use of the WIM system application software.

4. All equipment with exception of the WIM controller's modem shall operate properly within an atmospheric temperature range of -40°C to +70°C or –40°F to 158°F without the need of an added heating or cooling device.

5. The WIM controller shall have the communication capabilities to allow off-site personnel to view the operation of the WIM site and to allow for data transfer through telemetry over a dial-up, voice-grade telephone line. The WIM controller's modem shall be fully compatible with the host computer modem. The modem shall be specified by the WIM vendor. The WIM controller shall also allow on-site personnel to connect a computer to the WIM system for on-site observation and for the transfer of data.

High Speed WIM System Application Software

An application program, hereafter referred to as the "system program," which can be run on the host computer shall be furnished as part of the high speed WIM system. The host computer will be furnished by others and will consist of:

- ➢ Personal computer using the current version of the Windows Operating System.
- ➢ Printer
- ➢ A 56,600 Baud modem.

The system program shall provide communications between the host computer and the on-site WIM controller and shall process downloaded data to generate the specified ASCII files. Although referred to herein as a single software program, communications functions and data processing functions may be provided as two separate programs as long as all functional requirements are met. The system program shall be "user friendly", hierarchical menu driven and shall perform the following applications:

Communications

1. The communications portion of the system program shall include the following applications:
   - ➢ Real Time View. The real time view application shall provide for the on-line monitoring of traffic. The display on the host computer shall depict the axle configuration of each vehicle passing through the site. The contents and format for the real time display shall be similar to the sample display contained in these specifications. The user shall have the options of displaying either all traffic or only vehicle classifications 4 through 15 as well as the option of displaying a selected individual lane or all lanes. Printing of the real time data on the host computer printer shall be facilitated by means of an on/off toggle key from the keyboard.
   - ➢ System Data Programming. The system data programming application shall provide for on-line modification to the WIM controller's software parameters, such as speed and weight calibration factors, vehicle classification parameters, weight violation table parameters, and front axle weight threshold.
   - ➢ Manual Downloading. The manual downloading application shall provide for the downloading of selected daily data files from the storage medium of the WIM controller to the storage medium of the host computer. The program shall provide for a listing of the daily data files stored in the WIM controller and shall provide for user selection of the file or files to be downloaded from such a listing. The program shall provide for the downloading of the current day's data stored as of the time of downloading.
   - ➢ Automatic Downloading. The automatic downloading applications shall provide for unattended downloading of daily data files stored in the WIM controller's storage medium to the storage medium of the host computer. The program shall provide the following:
     - ▪ User's input for the date and time that unattended downloading is to begin.
     - ▪ Downloading of all daily files not previously downloaded by the automatic downloading application.
     - ▪ At least three attempts to make telephone connection with the WIM controller.
     - ▪ At least three attempts to download files from the WIM controller before aborting download.
     - ▪ Discontinuation of telephone connection after downloading of files from the WIM controller (or after an abort)) and returning the host computer to a standby mode.
   - ➢ History File. The history file application shall create a daily file, which chronologically records events occurring during manual and automatic downloading sessions. Such events shall include, but not be limited to, modem result messages, start and end time of each file download and any pertinent messages generated by the program. The program shall provide for either:
     - ▪ The history file shall be in the form of an ASCII text file which can be viewed or sent to the printer or,
     - ▪ A menu selection which shall provide for a listing of available history files and user selection of a file to be sent to the printer in the form of a report.

2. The communications portion of the system program shall meet the following functional requirements:
   - Host computer's modem configuration. The program shall initialize the host computer's modem so that all necessary operating characteristics are set.
   - Baud Rate. The program will provide for operation at a minimum rate of 19200 baud.
   - Error Control. The program shall not in any way disable the modems' error-checking features, which prevent phone-line noise from corrupting data during file downloading.
   - File Downloading Monitoring. The program shall display a window that allows the user to monitor the progress of file downloading. The program shall also provide for the abort of a file download.

<u>Report Preparation</u>
The report preparation application shall generate specified reports using the downloaded data. Such reports shall be sent to the host computer printer or to file. The program shall prepare the following reports:
   - From vehicle class/count summary file:
     - Distribution of class and speed counts by lane.
     - Distribution of vehicle counts by hour of day by lane.
     - Distribution of vehicle classifications by hour of day.
     - Distribution of vehicle classifications by day of month.
     - Distribution of vehicles by speed by hour of day.
   - From individual truck records file:
     - Distribution of truck record data by lane.
     - Distribution of weight violations and invalid measurements of vehicle classifications 4 through 15.
     - Distribution of weight violations by hour of day for vehicle classifications 4 through 14.
     - Distribution of overweight vehicles by hour of day for vehicle classifications 4 through 14.
     - Distribution of gross weights for vehicle classifications 4 through 14.
     - Distribution of 18 kip equivalent single axle loadings (ESALs) by hour of day for vehicle classifications 4 through 14. Program provides for user input of:
       - o Pavement type:
         - (1) flexible pavement and structural number; or,
         - (2) rigid pavement and slab thickness.
       - o Vehicle status:
         - (1) "all "weighed vehicles (default); or,
         - (2) "legal only" weighed vehicles; or,
         - (3) "overweight only" weighed vehicles.
     - Distribution of axles by groups (single, tandem, tridem) by hour of day for vehicle classifications 4 through 14.
     - Distribution of trucks by day of month for classifications 4 through 15.

Determination of 18 kip equivalent single axle loads shall be in accordance with the methodology of the 1993 AASHTO Pavement Design Guide.

The reports shall include all information contained in and formatted similarly to the sample reports contained in these specifications (See Appendix A). The reports shall be printed in condensed print when necessary to fit on 8-½ inch x 11-inch sheets. The program shall provide for the generation of reports in the following two modes:
   - Manual Mode. For daily reports the program shall provide for user selection of the date and the specific report. For monthly reports, the program shall provide for user selection of the month/year and the specific report. The selected month report shall include the data from all downloaded daily data files resident with the system program on a directory or subdirectory of the host computer's storage medium. The program shall also provide for user selection of the lane or lanes to be covered by the specific report (not applicable to the "Distribution of Class and Speed Counts by Lane," "the Distribution of Vehicle Counts by Hour of Day by Lane," and the "Distribution of Truck Record Data by Lane" reports). The default shall be "all lanes." The printed report shall note which lanes are represented.

➢ Automatic Mode. The program shall provide for user designation of one or a combination of the specific daily reports for automatic processing. User selection of lane or lanes is not required (the "all lanes" default may be used). User selection of vehicle status for the 18 kip ESAL report is not required (the "all" weighed vehicles default may be used). Such designations shall be effected by means of either:
  ▪ An ASCII text file, which can be revised with text editor or word processor, supplied with a "Sample" designation; or,
  ▪ A menu selection, which shall provide for user input designation.

  Upon selection of automatic mode of report preparation by the user, the program shall send to the printer all pre-designated reports for all downloaded daily data files resident with the system program on a directory or subdirectory of the host computer's storage medium. The designated reports shall remain in effect for subsequent automatic mode sessions unless report designation, is revised by the user.

Truck Record Batch Print
The truck record batch print application shall provide for the display of, all on/off printer-toggle of individual truck records. The program shall provide for a listing of the daily truck records files available on the storage medium of the host computer and the user's selection of one of those files. The program shall also provide for the user's selection of the vehicle class or classes for which individual truck records will be displayed or printed as well as the starting hour of day.

The user shall have the following options in viewing and printing the individual truck records.
➢ Scroll and print continuously all records for the selection of class(es); user has capability to stop/resume scrolling or terminates program.
➢ Scroll each record one at a time; user has capability to:
  ▪ Print displayed record and display next record.
  ▪ Display next record.
  ▪ Terminate program.

An example of the truck record batch print is included in Appendix A.

ASCII Export Utility
The ASCII export utility application shall allow the user to generate specified ASCII files using downloaded files. The user will have the choice of:
➢ Vehicle Class/Count Summary file:
  ▪ ASCII classification file
  ▪ ASCII speed file
➢ Individual Truck Record file:
  ▪ ASCII truck record file

The file formats for these files are contained in Appendix A.

<u>Traffic Monitoring Guide Files Utility</u>
The TMG files utility shall allow the user to generate ASCII files conforming to the instructions contained in Section 6 of the FHWA Traffic Monitoring Guide 3rd edition using downloaded files.

Data Files
Notwithstanding the method of data manipulation and formatting used by the WIM controller, data files shall conform to the following:

➢ Individual daily data files shall be created and stored in the storage medium of the WIM controller. Each daily data file shall include data for each 00:00 hour through a 23:59 hour period and shall have a file name which uniquely identifies the file as to site designation, date, and file contents (i.e., class/count summary data, individual truck record data, or both).

➢ The daily data files shall be created at the start of each day. Data for each vehicle shall be filed within one hour of the vehicle's passing through the site, and the current day's files shall be accommodative to efficient use of storage medium space and rapid downloading via modem to the host computers.

➢ Daily files containing class/count summary data and individual truck records data may be created in the storage medium of the WIM controller as two separate daily files or as one daily file. However, if one daily file is created and downloaded as such, the system program shall create two separate daily files, each with a file name which uniquely identifies it as to site, date and whether it is a vehicle class/count summary file or an individual truck records file.

Acceptance Test

The WIM Vendor shall demonstrate that the WIM system is available for use by the owner by successfully completing the acceptance test for each lane of data collection. The acceptance test shall consist of the following:

➢ Verification of WIM System Accuracy

▪ <u>Step One.</u> Obtain at least 2 trucks to use for testing the WIM system accuracy. Select truck types that are most representative of the trucks that frequent the WIM location. One of the test trucks shall be a class 9 truck that has air ride suspension for both tractor and trailer, a non-liquid load, and loaded to a minimum of 90 percent of the truck's legal operating weight. The other truck will be of the 2nd most commonly occurring type of truck, and loaded to 80 – 90% of the truck's legal operating weight. If the class 9 truck is the most common type of truck at the WIM location, it is OK to use two class 9 trucks for testing the WIM system's accuracy. No unloaded trucks will be used for testing the WIM system's accuracy. The procedure for weighing and measuring the test vehicle(s) to obtain reference values is found in sections 7.1.3 to 7.1.3.7 of ASTM E 1318-02:

7.1.3.1 "Measure the center-to-center spacing between successive axles on each test vehicle and record this data to the nearest 0.1 ft (0.03m) as axle-spacing reference values."

7.1.3.2 " Weigh each test vehicle a minimum of three times, with brakes released, as described in 7.1.1 and 7.1.2 to measure tire loads for the wheel(s) on each end of every axle on the static vehicle. Move the vehicle completely away from the scale or weigher before beginning a new set of tire-load measurements, and always approach the weighing devices from the same direction for weighing. Sum the applicable tire loads to determine wheel, axle, and tandem-axle loads as well as gross-vehicle weight each time the vehicle is weighed." (A scale which weighs individual axle and tandem loads is acceptable).

7.1.3.3 " Calculate the arithmetic mean for all wheel load, axle-load, tandem-axle-load, and gross-vehicle-weight values that result from weighing each test vehicle three or more times; …"

Average the three "static weight values" of the test vehicle(s) for the drive axle-load(s), 1st tandem-axle load(s), 2nd tandem-axle load(s), and gross-vehicle weight(s) to derive the static weights used in the accuracy verification.

Some type of communication, (cellular phone, CB radio, etc.), with the driver(s) of the test vehicle(s) will need to be established before the initial calibration begins.

▪ <u>Step Two.</u> The communications software shall have a history file, (log file), applications which will create a daily file, in an ASCII type format, which chronologically records events occurring

during initial calibration runs (and the final verification runs). Such events shall include, but not be limited to, recording the initial calibration factors of the WIM system, the calibration runs, final calibration factors, and any changes made to the calibration factors during the initial calibration runs (and the final verification runs).

- Step Three. The test truck(s) is driven over the WIM sensors in each lane a minimum of three times at each set speed point, and three times at each 8kph (5mph) increment between the first and third speed points.

  Due to the temperature variations usually occurring during the course of the day, the truck will start at the lowest speed point and continue in sequence to the highest speed point. If the three speed points are set at 40 mph, 55 mph, and 70 mph, then the test truck(s) will start at 40mph and then go in sequence to 45 mph, then to 50 mph, etc., until the 70 mph point is reached. The truck(s) will then start all over again and repeat the same sequence two more times until there are a total of 21 runs for each test truck used in the validation.

  The gross weight percent error is calculated for each run and plotted on a "Gross Weight Percent Error by Vehicle Speed" graph for each WIM lane. These graphs are analyzed to make the final adjustments to the WIM weight factors if necessary. They are also used to record pavement effects on vehicle dynamics for the site history.

  If for any reason an adjustment needs to be made to the WIM Weight or Spacing factors, before all runs are completed, the validation runs will have to start all over again.

- Step Four. Download the data file and close and save the history (log) file. For the site calibration to be accepted, the gross weight percent error of the validation data will have to be evenly distributed around the zero axis of the "Gross Weight Percent Error by Vehicle Speed" graph for each speed point in each WIM lane.

  For a Type I WIM System the validation data will meet (or exceed) the functional performance requirements as found in table 2 under Section 5 of the ASTM E 1318-02 of the Standard Specifications for Highway WIM with a 95% Confidence Limit:
  o Gross-Vehicle Weight: +/- 10%
  o Axle-Group Load: +/- 15%
  o Axle Load: +/- 20%

➢ Continuous operation of WIM system on-site equipment for 15 consecutive days following completion of the WIM system accuracy validation testing. Failure of the system to record and store data meeting the requirements set forth in these specifications for an accumulated time exceeding 3 hours during the 15 day-period shall be cause for the acceptance test to be repeated.
➢ Testing of the WIM system application software during the above noted 15 day-period and the full working day following the 15 day-period. Failure of the software to perform any application meeting the requirements set forth in these specifications shall be cause for the acceptance test to be repeated.

Failure of the host computer or its peripheral equipment or of a communication line not furnished by the WIM vendor to transmit data may not be considered unacceptable performance, provided the WIM vendor demonstrates to the satisfaction of the owner that the failure is not caused by any of the WIM vendor furnished equipment.

Maintenance and Operations Manuals

The WIM vendor shall furnish a maintenance manual for the WIM controller, including vehicle detector sensor units and an operation manual for the system. The maintenance manual and operation manual may be combined into one manual. The manual(s) shall include, but need not be limited to, the following items:

- ➤ Specifications
- ➤ Design characteristics
- ➤ General operation theory
- ➤ Function of all controls
- ➤ Trouble shooting procedure (diagnostic routine)
- ➤ Block circuit diagram
- ➤ Geographical layout of components
- ➤ Schematic diagrams, signal responses and acceptable thresholds
- ➤ List of component parts with stock numbers
- ➤ Documentation for application software

Appendix A
Sample Reports

LTPP NEEDS TO DESIGN AND INCLUDE IN "APPENDIX A" THE "DISTRIBUTION OF AXLES BY GROUPS (SINGLE, TANDEM, TRIDEM) BY HOUR OF DAY FOR VEHICLE CLASSIFICATIONS 4 THROUGH 14" REPORT AS REQUIRED BY SECT. 6.20 (2) (G) -----------------------------

```
=================================================
=================================================
==================
SITE DESIGNATION:
DATE:
=================================================
=================================================
==================
                                              LANE
NUMBER  <number of lanes varies with contract
requirements>
                                              -----
------
                    1              2              3
4          5
            COUNT      %    COUNT      %    COUNT
%    COUNT      %    COUNT      %    COUNT      %
COUNT      %
            ------------   ------------   -------
-----   ------------   ------------   -----------
-   ------------
 CLASS

   1            0    0.0         0    0.0
0    0.0         6    0.0         6    0.0
   2        22521   82.4     24464   82.7
28540   90.6     23974   87.6     99499   85.9
   3         2687    9.8      2395    8.1  ------
--------------------   2324    7.4      1919
7.0      9325    8.1
   4           14    0.1        21    0.1  |
|        16    0.1        13    0.0        64    0.1
   5         1152    4.2      1297    4.4  |
"COUNT" entries for    |       486    1.5       56
0.2      2991    2.6
   6           82    0.3       101    0.3  |
example only           |         9    0.0       917
3.3      1109    1.0
   7            1    0.0         3    0.0  |
|         0    0.0        24    0.1        28    0.0
   8          280    1.0       402    1.4  |
|         3    0.0        32    0.1       717    0.6
   9          340    1.2       544    1.8  ------
--------------------         4    0.0         0
0.0       888    0.8
  10           10    0.0         1    0.0
0    0.0         1    0.0         4    0.0
  11           84    0.3       104    0.4
0    0.0         0    0.0       188    0.2
  12            3    0.0         5    0.0
0    0.0         0    0.0         8    0.0
  13            1    0.0         0    0.0
0    0.0         0    0.0         1    0.0
  14           28    0.1        46    0.2
0    0.0         0    0.0        74    0.1
  15          142    0.5       206    0.7
127    0.4       434    1.6       909    0.8

------      ------------   ------------   -------
-----   ------------   ------------   -----------
-   -------------
TOTAL       27337  100.0     29589  100.0
31509  100.0     27376  100.0    115811  100.0
=================================================
=================================================
==================
SPEED
(MPH)
  1- 5           2    0.0         6    0.0
2    0.0         4    0.0        14    0.0
  6-10           0    0.0         0    0.0
4    0.0        10    0.0        14    0.0
 11-15          10    0.0         5    0.0
32    0.1        28    0.1        75    0.1
 16-20          48    0.2        33    0.1
75    0.2        88    0.3       244    0.2
 21-25         271    1.0       280    0.9
269    0.9       179    0.7       999    0.9
 26-30         641    2.3       615    2.1
480    1.5       349    1.3      2085    1.8
 31-35        1047    3.8       838    2.8
731    2.3       606    2.2      3222    2.8
```

```
 36-40        1165    4.3      1073    3.6
1077    3.4       891    3.3      4206    3.6
 41-45        1645    6.0       913    3.1
927    2.9       997    3.6      4482    3.9
 46-50        5140   18.8      2063    7.0
1027    3.3       893    3.3      9123    7.9
 51-55        9487   34.7      5641   19.1
2508    8.0      1147    4.2     18783   16.2
 56-60        5613   20.5     13537   45.8
14134   44.9      3243   11.8     36527   31.5
 61-65        1872    6.8      3284   11.1
7211   22.9      9701   35.4     22068   19.1
 66-70         277    1.0      1170    4.0
2749    8.7      6614   24.2     10810    9.3
 71-75          79    0.3        90    0.3
234    0.7      2240    8.2      2643    2.3
 76-80          24    0.1        34    0.1
45    0.1       327    1.2       430    0.4
 81-85          13    0.0         7    0.0
4    0.0        51    0.2        75    0.1
 86-90           3    0.0         0    0.0
0    0.0         8    0.0        11    0.0
 91-95           0    0.0         0    0.0
0    0.0         0    0.0         0    0.0
 96-100          0    0.0         0    0.0
0    0.0         0    0.0         0    0.0
 > 100           0    0.0         0    0.0
0    0.0         0    0.0         0    0.0

------      ------------   ------------   -------
-----   ------------   ------------   -----------
-   -------------
TOTAL       27337  100.0     29589  100.0
31509  100.0     27376  100.0    115811  100.0

AVG.SPEED       51             55
57             61             56
=================================================
=================================================
==================
```

```
DISTRIBUTION OF VEHICLE COUNTS BY HOUR OF DAY BY          -------------
LANE                                                      --------------------
====================================================
====================================================     DAILY
=====================                                                         1              2              3
SITE DESIGNATION:                                         4          5          6
DATE:                                                     TOTALS
====================================================                        -----          -----          -----
====================================================     -----        -----      -----
=====================                                    ------

HOURLY SUMMARY                                     LANE
NUMBER   <number of lanes varies with contract
requirements>                                    -----    ====================================================
--------------                                   ------   ====================================================
------                                                    =====================
                                                          ====================================================
HOURLY                                                    ====================================================
  HOUR                    1            2            3      =====================
4          5          6
TOTALS
------            -----        -----        -----
-----        -----      -----
-------
00-01
01-02
02-03
03-04
04-05
05-06
------            -----        -----        -----
-----        -----      -----
-------
QTR TOTALS
====================================================
====================================================
=====================
06-07
07-08
08-09
09-10
10-11
11-12
------            -----        -----        -----
-----        -----      -----
-------
QTR TOTALS
====================================================
====================================================
=====================
12-13
13-14
14-15
15-16
16-17
17-18
------            -----        -----        -----
-----        -----      -----
-------
QTR TOTALS
====================================================
====================================================
=====================
18-19
19-20
20-21
21-22
22-23
23-24
------            -----        -----        -----
-----        -----      -----
-------
QTR TOTALS

====================================================
====================================================
=====================
====================================================
====================================================
=====================

DAILY SUMMARY
DAILY COUNTS BY LANE
```

```
DISTRIBUTION OF VEHICLE CLASSIFICATIONS BY HOUR OF        -------------
DAY                                                       --------------
=====================================================
=====================================================     TOTAL
======================                                              1        2        3        4        5        6
SITE DESIGNATION:            LANE NO's <display          7        8        9       10       11       12       13       14
user's entry as to selected lane(s)>                     15      VEHICLES
DATE:                                                             -----    -----    -----    -----    -----    ----
=====================================================    -    -----    -----    -----    -----    -----    -----    -----
=====================================================    -----    -----      --------
======================
                                                         COUNT
HOURLY SUMMARY
VEHICLE COUNTS                                            PERCENT
--------------
--------------
                                                         =====================================================
HOURLY                                                   =====================================================
 HOUR            1        2        3        4        5        6   ======================
7        8        9       10       11       12       13       14   =====================================================
15      TOTALS                                           =====================================================
------          -----    -----    -----    -----    -----    ----   ======================
-    -----    -----    -----    -----    -----    -----    -----
-----    -----      --------
00-01
01-02
02-03
03-04
04-05
05-06
------          -----    -----    -----    -----    -----    ----
-    -----    -----    -----    -----    -----    -----    -----
-----    -----      --------
QTR TOTALS
=====================================================
=====================================================
======================
06-07
07-08
08-09
09-10
10-11
11-12
------          -----    -----    -----    -----    -----    ----
-    -----    -----    -----    -----    -----    -----    -----
-----    -----      --------
QTR TOTALS
=====================================================
=====================================================
======================
12-13
13-14
14-15
15-16
16-17
17-18
------          -----    -----    -----    -----    -----    ----
-    -----    -----    -----    -----    -----    -----    -----
-----    -----      --------
QTR TOTALS
=====================================================
=====================================================
======================
18-19
19-20
20-21
21-22
22-23
23-24
------          -----    -----    -----    -----    -----    ----
-    -----    -----    -----    -----    -----    -----    -----
-----    -----      --------
QTR TOTALS

=====================================================
=====================================================
======================
=====================================================
=====================================================
======================

DAILY SUMMARY
VEHICLE COUNTS
```

DISTRIBUTION OF VEHICLE CLASSIFICATIONS BY DAY OF
MONTH
===
===
=======================
SITE DESIGNATION: LANE NO's <display
user's entry as to selected lane(s)>
DATE: 01/92
===
===
=======================
DAILY
VEHICLE COUNTS
SUMMARY   1   2   3   4   5   6
7   8   9   10   11   12   13   14
15   TOTALS
------   --- ------- ------ ---- ------ ---
-- ---- ---- ------ ---- ---- ----- ----
----- -----   --------
 1 WED
 2 THU
 3 FRI
 4 SAT
------   --- ------- ------ ---- ------ ---
-- ---- ---- ------ ---- ---- ----- ----
----- -----   --------
DAILY AVG
===
===
=======================
 5 SUN
 6 MON
 7 TUE
 8 WED
 9 THU
10 FRI
11 SAT
------   --- ------- ------ ---- ------ ---
-- ---- ---- ------ ---- ---- ----- ----
----- -----   --------
DAILY AVG
===
===
=======================
12 SUN
13 MON
14 TUE
15 WED
16 THU
17 FRI
18 SAT
------   --- ------- ------ ---- ------ ---
-- ---- ---- ------ ---- ---- ----- ----
----- -----   --------
DAILY AVG
===
===
=======================
19 SUN
20 MON
21 TUE
22 WED
23 THU
24 FRI
25 SAT
------   --- ------- ------ ---- ------ ---
-- ---- ---- ------ ---- ---- ----- ----
----- -----   --------
DAILY AVG
===
===
=======================
26 SUN
27 MON
28 TUE
29 WED
30 THU
31 FRI
------   --- ------- ------ ---- ------ ---
-- ---- ---- ------ ---- ---- ----- ----
----- -----   --------
DAILY AVG

===
===
=======================
MONTHLY
VEHICLE COUNTS
SUMMARY   1   2   3   4   5   6
7   8   9   10   11   12   13   14
15   TOTALS
------   --- ------- ------ ---- ------ ---
-- ---- ----- ------ ----- ----- ----- ----
----- -----   --------
TOTALS
PERCENT
DAILY AVG

```
DISTRIBUTION OF VEHICLES BY SPEED BY HOUR          85th Percentile  :              Total Vehicles
===================================================   > 70 MPH :            Percentage Vehicles > 70
===================================================   MPH :
=================
SITE DESIGNATION:                LANE NO's <display   ===================================================
user's entry as to selected lane(s)>                  ===================================================
DATE:                                                 =================
===================================================   ===================================================
===================================================   ===================================================
=================                                     =================


SPEED RANGE, MPH

----------------
HOUR
RANGE          00-30   31-35   36-40   41-45
46-50   51-55   56-60   61-65   66-70   71-75
76-80    > 80
--------        -----   -----   -----   -----
-----   -----   -----   -----   -----   -----
-----   -----

00 - 01
01 - 02
02 - 03
03 - 04
04 - 05
05 - 06
--------        -----   -----   -----   -----
-----   -----   -----   -----   -----   -----
-----   -----
QTR TOTALS
==========
06 - 07
07 - 08
08 - 09
09 - 10
10 - 11
11 - 12
--------        -----   -----   -----   -----
-----   -----   -----   -----   -----   -----
-----   -----
QTR TOTALS
==========
12 - 13
13 - 14
14 - 15
15 - 16
16 - 17
17 - 18
--------        -----   -----   -----   -----
-----   -----   -----   -----   -----   -----
-----    -----
QTR TOTALS
==========
18 - 19
19 - 20
20 - 21
21 - 22
22 - 23
23 - 24
--------        -----   -----   -----   -----
-----   -----   -----   -----   -----   -----
-----    -----
QTR TOTALS
==========


DAILY SPEED SUMMARY
-------------------

Total Vehicles    :              Total Vehicles
> 55 MPH :            Percentage Vehicles > 55
MPH :
Average Speed     :              Total Vehicles
> 60 MPH :            Percentage Vehicles > 60
MPH :
Median Speed      :              Total Vehicles
> 65 MPH :            Percentage Vehicles > 65
MPH :
```

DISTRIBUTION OF TRUCK RECORD DATA BY LANE <report
to cover all records contained in truck records
file>
===
===
==================
SITE DESIGNATION:
DATE:
===
===
==================

                                                   LANE
NUMBER <number of lanes varies with contract
requirements>

CLASS   1   2   3
4   5   6   ALL LANES
------   ------------   ------------   -------
-----   -----------   ------------   -----------
-   -----------
            COUNT   %   COUNT   %   COUNT
%   COUNT   %   COUNT   %   COUNT   %
COUNT   %

   1   0   0.0   0   0.0
0   0.0   0   0.0   0   0.0
   2   0   0.0   0   0.0
0   0.0   0   0.0   0   0.0
   3   152   3.7   342   14.7   ------
---------------------   87   4.0   74
1.9   655   5.2
   4   18   0.4   13   0.6 |
| 3   0.1   5   0.1   39   0.3
   5   560   13.6   354   15.2 |
"COUNT" entries for | 306   14.2   574
14.7   1794   14.3
   6   129   3.1   67   2.9 |
example only | 66   3.1   104
2.7   366   2.9
   7   3   0.1   0   0.0 |
| 0   0.0   27   0.7   30   0.2
   8   350   8.5   134   8.8 |
| 278   12.9   357   9.1   1119   8.9
   9   1775   43.1   918   39.4   ------
---------------------   961   44.4   1698
43.5   5352   42.7
  10   3   0.1   1   0.0
4   0.2   4   0.1   12   0.1
  11   783   19.0   332   14.2
302   14.0   754   19.3   2171   17.3
  12   56   1.4   30   1.3
32   1.5   68   1.7   186   1.5
  13   5   0.1   2   0.1
0   0.0   7   0.2   14   0.1
  14   122   3.0   34   1.5
37   1.7   104   2.7   297   2.4
  15   158   3.8   66   2.8
78   3.6   128   3.3   430   3.4

------   ------------   ------------   -------
-----   -----------   ------------   -----------
-   -------------
TOTAL   4121 100.0   2330 100.0
2161 100.0   3907 100.0   12520 100.0

===
===
==================

                                                   LANE
NUMBER

STATUS   1   2   3
4   5   6   ALL LANES
------   ------------   ------------   -------
-----   -----------   ------------   -----------
-   -----------

            COUNT   %   COUNT   %   COUNT
%   COUNT   %   COUNT   %   COUNT   %
COUNT   %

LEGAL   3353   81.4   1866   80.1
1976   91.4   3076   78.7   10271   82.0
OVR'WT   662   16.0   384   16.5
127   5.9   715   18.3   2249   18.0
INVALID   106   2.6   80   3.4
59   2.7   116   3.0   361   2.9

        |
   |
        | Note:
   |
        | The line items under "STATUS" are to be
based upon the Contractor's coding scheme for weight
   |
        | violation and invalid measurements. If the
coding system identifies invalid measurements other
   |
        | than imbalance (such as "out-of-range"
values, system errors, etc.), each unique type of
invalid |
        | measurement should be broken down as a
"STATUS" line item.
   |
        |
   |
        |

------   ------------   ------------   -------
-----   -----------   ------------   -----------
-   ------------
TOTAL   4121 100.0   2330 100.0
2162 100.0   3907 100.0   12520 100.0

===
===
==================

DISTRIBUTION OF WEIGHT VIOLATIONS AND INVALID   --
MEASUREMENTS FOR VEHICLE CLASSIFICATIONS 4 THROUGH --
15   -----------------
===
===
====================
SITE DESIGNATION: LANE NO's <display
user's entry as to selected lane(s)>
DATE:
===
===
====================

                        VEHICLES
*********   NUMBER OF   *********
          TOTAL   WITH   TOTAL
TOTAL   PERCENT   ********* WEIGHT
VIOLATIONS *********
          VEHICLES   INVALID   VEHICLES
VEHICLES   VEHICLES
CLASS   COUNTED   MEASUREMENTS   WEIGHED
OVERWEIGHT   OVERWEIGHT   AXLE   TANDEM
GROSS   BRIDGE
------   -------   ------------   -------   -
---------   ----------   ----   ------
-----   ------

   4
   5
   6
   7
   8
   9
  10
  11
  12
  13
  14
  15

------   -------   ------------   -------   -
---------   ----------   ----   ------
-----   ------
TOTALS

      PERCENT VEHICLES NOT CLASSIFIED (CLASS 15) :
_____

       PERCENT VEHICLES WITH INVALID MEASUREMENTS :
_____

 |
 |
 | Notes:
 |
 |
 |
 | "Percent Vehicles Not Classified" = Class 15
Total Vehicle Count / Total Vehicles Counted
 |
 | "Percent Vehicles With Invalid Measurements" =
Total Vehicles With Invalid Measurements / Total
Vehicles Counted |
 | "Vehicles Counted" - "Vehicles With Invalid
Measurements" = "Vehicles Weighed"
 |
 |
 |
 | All weight and weight violation reporting and
calculations based on data for "weighed vehicles"
 |
 |
 |

```
DISTRIBUTION OF WEIGHT VIOLATIONS BY HOUR OF DAY FOR      DAILY SUMMARY
VEHICLE CLASSIFICATIONS 4 THROUGH 14                      -------------
=====================================================     *************    NUMBER OF     **************
=====================================================                      TOTAL        TOTAL
===============                                           PERCENT                 ************* WEIGHT
SITE DESIGNATION:              LANE NO's <display         VIOLATIONS **************
user's entry as to selected lane(s)>                                     VEHICLES     VEHICLES
DATE:                                                     VEHICLES
=====================================================                    WEIGHED      OVERWEIGHT
=====================================================     OVERWEIGHT             AXLE           TANDEM
===============                                           GROSS     BRIDGE
                                                                    -------      ----------     ------
HOURLY SUMMARY                                            ----              ----         ------          --
-------------                                            ---       ------
*************    NUMBER OF     **************
                TOTAL        TOTAL
PERCENT                 ************* WEIGHT
VIOLATIONS **************
                VEHICLES     VEHICLES
VEHICLES
 HOUR           WEIGHED      OVERWEIGHT               =====================================================
OVERWEIGHT             AXLE           TANDEM          =====================================================
GROSS     BRIDGE                                      ===============
-------         -------      ----------     ------    =====================================================
----             ----         ------          --      =====================================================
---       ------                                      ===============
00-01
01-02
02-03
03-04
04-05
05-06
------          -----        -----          ----
-                -----        -----          --
---       -----
QTR TOTALS
=====================================================
=====================================================
===============
06-07
07-08
08-09
09-10
10-11
11-12
------          -----        -----          ----
-                -----        -----          --
---       -----
QTR TOTALS
=====================================================
=====================================================
===============
12-13
13-14
14-15
15-16
16-17
17-18
------          -----        -----          ----
-                -----        -----          --
---       -----
QTR TOTALS
=====================================================
=====================================================
===============
18-19
19-20
20-21
21-22
22-23
23-24
------          -----        -----          ----
-                -----        -----          --
---       -----
QTR TOTALS

=====================================================
=====================================================
===============
=====================================================
=====================================================
===============
```

```
DISTRIBUTION OF OVERWEIGHT VEHICLES BY HOUR OF DAY                      TOTAL    TOTAL    PERCENT
FOR VEHICLE CLASSIFICATIONS 4 THROUGH 14                                VEH'S    VEH'S    VEH'S
====================================================                    WEIGHED  OVERWT   OVERWT            4
====================================================           5        6        7        8        9        10       11       12
==============                                                 13       14
SITE DESIGNATION:            LANE NO's <display                         -------- -------- --------  -----    ----
user's entry as to selected lane(s)>                           -  -----    ----  -----    -----    -----    -----    -----
DATE:                                                          -----    -----
====================================================
====================================================
==============                                                 ====================================================
HOURLY SUMMARY                                                 ====================================================
NUMBER OVERWEIGHT VEHICLES                                     ==============
-------------                                                  ====================================================
-------------------------                                      ====================================================
            TOTAL    TOTAL    PERCENT                          ==============
            VEH'S    VEH'S    VEH'S
HOUR        WEIGHED  OVERWT   OVERWT            4
5        6        7        8        9        10       11       12
13       14
-----       -------- -------- --------  -----    ----
-  -----    ----  -----    -----    -----    -----    -----
-----    -----

00-01
01-02
02-03
03-04
04-05
05-06
-----       -------- -------- --------  -----    ----
-  -----    ----  -----    -----    -----    -----    -----
-----    -----
QTR TOTALS
====================================================
====================================================
==============
06-07
07-08
08-09
09-10
10-11
11-12
-----       -------- -------- --------  -----    ----
-  -----    ----  -----    -----    -----    -----    -----
-----    -----
QTR TOTALS
====================================================
====================================================
==============
12-13
13-14
14-15
15-16
16-17
17-18
-----       -------- -------- --------  -----    ----
-  -----    ----  -----    -----    -----    -----    -----
-----    -----
QTRTOTALS
====================================================
====================================================
==============
18-19
19-20
20-21
21-22
22-23
23-24
-----       -------- -------- --------  -----    ----
-  -----    ----  -----    -----    -----    -----    -----
-----    -----
QTR TOTALS
====================================================
====================================================
=============
====================================================
====================================================
==============
DAILY SUMMARY
NUMBER OVERWEIGHT VEHICLES
-------------
-------------------------
```

```
DISTRIBUTION OF GROSS WEIGHTS FOR VEHICLE
CLASSIFICATIONS 4 THROUGH 14
===================================================
===================================================
====================
SITE DESIGNATION:              LANE NO's <display
user's entry as to selected lane(s)>
DATE:
===================================================
===================================================
====================

VEHICLE COUNTS

--------------
GROSS WT
  KIPS                4     5     6     7     8
9     10    11    12    13    14     TOTALS
 -------           ----- ----- ----- ----- ----- -
---- ----- ----- ----- ----- -----      ------

  0-  5
  5- 10
 10- 15
 15- 20
 20- 25
 25- 30
 30- 35
 35- 40
 40- 45
 45- 50
 50- 55
 55- 60
 60- 65
 65- 70
 70- 75
 75- 80
 80- 85
 85- 90
 90- 95
 95-100
100-105
105-110
110-115
115-120
  > 120
 ------            ----- ----- ----- ----- ----- -
---- ----- ----- ----- ----- -----      ------
TOTALS

===================================================
===================================================
====================
===================================================
===================================================
====================
```

DISTRIBUTION OF 18 KIP ESALS BY HOUR OF DAY FOR
VEHICLE CLASSIFICATIONS 4 THROUGH 14
FOR _____ <display
user's entries as to pavement type and str. no. or
slab thickness>
==
==
===========
SITE DESIGNATION: LANE NO's
<display user's entry as to selected lane(s)>
DATE: VEH STATUS
<display user's entry as to "LEGAL ONLY", "OVWT
ONLY" or "ALL" (default)
==
==
===========
HOURLY SUMMARY

ESALS BY HOUR BY CLASS
                       TOTAL

                 VEH'S   TOTAL
HOUR   WEIGHED ESALS   4   5
6   7   8   9   10   11   12   13
14
-----   -------- -------- ----- -----
----- ----- ----- ----- ----- ----- ----- ---
-- -----
00-01
01-02
02-03
03-04
04-05
05-06
-----   -------- -------- ----- -----
----- ----- ----- ----- ----- ----- ----- ---
-- -----
QTR TOTALS
==
==
===========
06-07
07-08
08-09
09-10
10-11
11-12
-----   -------- -------- ----- -----
----- ----- ----- ----- ----- ----- ----- ---
-- -----
QTR TOTALS
==
==
===========
12-13
13-14
14-15
15-16
16-17
17-18
-----   -------- -------- ----- -----
----- ----- ----- ----- ----- ----- ----- ---
-- -----
QTR TOTALS
==
==
===========
18-19
19-20
20-21
21-22
22-23
23-24
-----   -------- -------- ----- -----
----- ----- ----- ----- ----- ----- ----- ---
-- -----
QTR TOTALS

==
==
===========

==
==
===========
DAILY SUMMARY

                           TOTALS   4   5
6   7   8   9   10   11   12   13
14
                           ------ ----- -----
----- ----- ----- ----- ----- ----- ----- ---
-- -----
VEH'S WEIGHED :
18 KIP ESALS :
AVERAGE ESAL :

==
==
===========
==
==
===========

```
DISTRIBUTION OF TRUCKS BY DAY OF MONTH FOR                        ------  ------  ------  ----    ----  ---
CLASSIFICATIONS 4 THROUGH 15                                 ---  -----  ----  -----  ------  -----  -----  -----
==================================================           ----  -----  -----
==================================================           TOTALS
====================                                         PERCENT
SITE DESIGNATION:            LANE NO's <display
user's entry as to selected lane(s)>
DATE:
==================================================
==================================================
====================

DAILY SUMMARY
-------------
            TOTAL   TOTAL   TOTAL   PCT    ---------
--------------------- COUNTED VEHICLES ------------
--------------------
            VEHS    VEHS    VEHS    VEHS
DAY         CNTD    WGHD    OVWT    OVWT       4
5       6       7       8       9       10      11      12
13      14      15
------      ------  ------  -----   ----    ----  ---
---  -----  ----  -----  ------  -----  -----  -----
----  -----  -----
 1 WED
 2 THU
 3 FRI
 4 SAT
==================================================
==================================================
====================
 5 SUN
 6 MON
 7 TUE
 8 WED
 9 THU
10 FRI
11 SAT
==================================================
==================================================
====================
12 SUN
13 MON
14 TUE
15 WED
16 THU
17 FRI
18 SAT
==================================================
==================================================
====================
19 SUN
20 MON
21 TUE
22 WED
23 THU
24 FRI
25 SAT
==================================================
==================================================
====================
26 SUN
27 MON
28 TUE
29 WED
30 THU
31 FRI
==================================================
==================================================
====================

MONTHLY SUMMARY
---------------

            TOTAL   TOTAL   TOTAL   PCT    ---------
--------------------- COUNTED VEHICLES ------------
--------------------
            VEHS    VEHS    VEHS    VEHS
            CNTD    WGHD    OVWT    OVWT       4
5       6       7       8       9       10      11      12
13      14      15
```

```
ASCII SPEED FILE FORMAT                                       ASCII TRUCK RECORD FILE FORMAT

                                                                             DECIMAL   STARTS
FIELD              LENGTH   STARTS IN COLUMN         FIELD          LENGTH    PLACES    IN COLUMN
                                                     -----          ------    -------   ---------
Lane                 2           1
Hour                 2           4                   LANE             1                    1
Count,  0-35 MPH     4           7                   MONTH            2                    3
Count, 36-40 MPH     4          12                   DAY              2                    6
Count, 41-45 MPH     4          17                   YEAR             2                    9
Count, 46-50 MPH     4          22                   HOUR             2                   12
Count, 51-55 MPH     4          27                   MINUTE           2                   15
Count, 56-60 MPH     4          32                   SECOND           2                   18
Count, 61-65 MPH     4          37                   VEHICLE NO.      5                   21
Count, 66-70 MPH     4          42                   CLASS            2                   27
Count, 71-75 MPH     4          47                   GROSS WEIGHT     6         1         30
Count, 76-80 MPH     4          52                   LENGTH           6         1         37
Count, 81-85 MPH     4          57                   SPEED            5         1         44
Count, >85 MPH       4          62                   VIOLATION CODE   3                   50
                                                     AXLE 1 RT. WEIGHT  4       1         54
                                                     AXLE 1 LT. WEIGHT  4       1         59
        ASCII CLASSIFICATION FILE FORMAT             AXLE 2 RT. WEIGHT  4       1         64
                                                     AXLE 2 LT. WEIGHT  4       1         69
FIELD              LENGTH   STARTS IN COLUMN         AXLE 1-2 SPACING   4       1         74
                                                     AXLE 3 RT. WEIGHT  4       1         79
Lane                 2           1                   AXLE 3 LT. WEIGHT  4       1         84
Hour                 2           4                   AXLE 2-3 SPACING   4       1         89
Count, Class 1       4           7                   AXLE 4 RT. WEIGHT  4       1         94
Count, Class 2       4          12                   AXLE 4 LT. WEIGHT  4       1         99
Count, Class 3       4          17                   AXLE 3-4 SPACING   4       1        104
Count, Class 4       4          22                   AXLE 5 RT. WEIGHT  4       1        109
Count, Class 5       4          27                   AXLE 5 LT. WEIGHT  4       1        114
Count, Class 6       4          32                   AXLE 4-5 SPACING   4       1        119
Count, Class 7       4          37                   AXLE 6 RT. WEIGHT  4       1        124
Count, Class 8       4          42                   AXLE 6 LT. WEIGHT  4       1        129
Count, Class 9       4          47                   AXLE 5-6 SPACING   4       1        134
Count, Class 10      4          52                   AXLE 7 RT. WEIGHT  4       1        139
Count, Class 11      4          57                   AXLE 7 LT. WEIGHT  4       1        144
Count, Class 12      4          62                   AXLE 6-7 SPACING   4       1        149
Count, Class 13      4          67                   AXLE 8 RT. WEIGHT  4       1        154
Count, Class 14      4          72                   AXLE 8 LT. WEIGHT  4       1        159
Count, Class 15      4          77                   AXLE 7-8 SPACING   4       1        164
                                                     AXLE 9 RT. WEIGHT  4       1        169
                                                     AXLE 9 LT. WEIGHT  4       1        174
                                                     AXLE 8-9 SPACING   4       1        179
For the above two files :                            VENDOR SPECIFIC OPTIONAL FIELDS     184

    Each field shall be comma delimited.
    For each day's file, there is one record
    for each lane for each hourly period.           This file shall include every "truck record" contained in the
                                                     daily data file. Each field shall be comma delimited and padded
                                                     with blanks to complete the fixed logical record length.

                                                     For axle weight only weighing (in lieu of right and left wheel
                                                     weighing), either the "AXLE n RT. WEIGHT" or the "AXLE n LT.
                                                     WEIGHT" field may be used for the "AXLE n WEIGHT".
```

```
                      REAL TIME VIEW
                      ================


**********************************************************************************


    Veh No.: _____        Class: _____      Lane: _____       Speed: _____

    Time: _____      Date: _____            Vehicle Length: _____

    Invalid Measurement Code:_____      Wt. Violation(s):_____

                                       AXLE NO.
            TOTALS         1       2       3       4       5       6       7       8       9

Ax. Wt. 76.1       10.9    15.0    16.2    17.2    16.8
(kip)
Ax. Sp. 56.9          11.8    4.5    36.4    4.2
(ft)


**********************************************************************************



Note:  Entries following Axle Wt. and Axle Space are for example
       purposes only.
```

```
                              TRUCK RECORD BATCH PRINT

                            =========================

****************************************************************************************

Site Designation: _____    Lane: _____    Time: _____    Date: _____    Speed: _____

Vehicle No.: _____    Class: _____    Invalid Code: _____    Veh. Wheelbase: _____    Veh. Length: _____

Gross Wt.(kips): _____    Weight Violation(s): _____

Axle No.              1         2         3         4         5         6         7         8         9

Rt. Wheel Wt.(kip)   5.4       7.3       8.0       8.5       8.3
Lt. Wheel Wt.(kip)   5.5       7.7       8.2       8.7       8.5
                     ----------------------------------------------------------------------------------------
Axle Wt.(kips)      10.9      15.0      16.2      17.2      16.8
Axle Space (feet)        11.8      4.5      36.4      4.2
         *******************************************************************************************


Note:  Entries following Axle Wt. and Axle Space are for example purposes only.
```

```
WEIGHT VIOLATION TABLE
=========================================================

(All weights in pounds)


AXLE WEIGHT

      Axle No. 1   ----------------------  12500

      All other axles --------------------  20000


TANDEM AXLE WEIGHT

      Two consecutive axles with an axle
      spacing not exceeding 8.4 feet  ------  34000


GROSS VEHICLE WEIGHT

      All vehicles  -----------------------  80000


BRIDGE WEIGHT

      See page following ----
```

BRIDGE WEIGHT

Distance in nearest whole foot between the extremes of any group of 2 or more consecutive axles	2 Axles	3 Axles	4 Axles	5 Axles	6 Axles	7 Axles	8 Axles	9 Axles
< 8	34000	34000	34000	34000	34000	-----	-----	-----
8	34000	34000	34000	34000	34000	-----	-----	-----
9	39000	42500	42500	42500	42500	-----	-----	-----
10	40000	43500	43500	43500	43500	-----	-----	-----
11	40000	44000	44000	44000	44000	-----	-----	-----
12	40000	45000	50000	50000	50000	-----	-----	-----
13	40000	45500	50500	50500	50500	-----	-----	-----
14	40000	46500	51500	51500	51500	-----	-----	-----
15	40000	47000	52000	52000	52000	-----	-----	-----
16	40000	48000	52500	52500	52500	-----	-----	-----
17	40000	48500	53500	53500	53500	-----	-----	-----
18	40000	49500	54000	54000	54000	-----	-----	-----
19	40000	50000	54500	54500	54500	-----	-----	-----
20	40000	51000	55500	55500	55500	-----	-----	-----
21	40000	51500	56000	56000	56000	-----	-----	-----
22	40000	52500	56500	56500	56500	-----	-----	-----
23	40000	53000	57500	57500	57500	-----	-----	-----
24	40000	54000	58000	58000	58000	74000	-----	-----
25	40000	54500	58500	58500	58500	74500	80000	-----
26	40000	55500	59500	59500	59500	75000	80000	-----
27	40000	56000	60000	60000	60000	76000	80000	80000
28	40000	57000	60500	60500	60500	76500	80000	80000
29	40000	57500	61500	61500	61500	77000	80000	80000
30	40000	58500	62000	62000	62000	77500	80000	80000
31	40000	59000	62500	62500	62500	78000	80000	80000
32	40000	60000	63500	63500	63500	78500	80000	80000
33	40000	60000	64000	64000	64000	79500	80000	80000
34	40000	60000	64500	64500	64500	80000	80000	80000
35	40000	60000	65500	65500	65500	80000	80000	80000
36	40000	60000	68000	66000	66000	80000	80000	80000
37	40000	60000	68000	66500	66500	80000	80000	80000
38	40000	60000	68000	67500	67500	80000	80000	80000
39	40000	60000	68000	68000	68000	80000	80000	80000
40	40000	60000	68500	70000	70000	80000	80000	80000
41	40000	60000	69500	72000	72000	80000	80000	80000
42	40000	60000	70000	73280	73280	80000	80000	80000
43	40000	60000	70500	73280	73280	80000	80000	80000
44	40000	60000	71500	73280	73280	80000	80000	80000
45	40000	60000	72000	76000	80000	80000	80000	80000
46	40000	60000	72500	76500	80000	80000	80000	80000
47	40000	60000	73500	77500	80000	80000	80000	80000
48	40000	60000	74000	78000	80000	80000	80000	80000
49	40000	60000	74500	78500	80000	80000	80000	80000
50	40000	60000	75500	79000	80000	80000	80000	80000
51	40000	60000	76000	80000	80000	80000	80000	80000
52	40000	60000	76500	80000	80000	80000	80000	80000
53	40000	60000	77500	80000	80000	80000	80000	80000
54	40000	60000	78000	80000	80000	80000	80000	80000
55	40000	60000	78500	80000	80000	80000	80000	80000
56	40000	60000	79500	80000	80000	80000	80000	80000
57	40000	60000	80000	80000	80000	80000	80000	80000
58	40000	60000	80000	80000	80000	80000	80000	80000
>58	40000	60000	80000	80000	80000	80000	80000	80000