Highway Performance Monitoring System
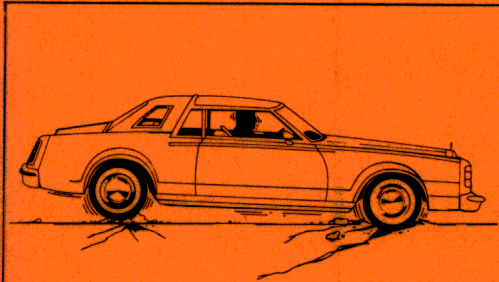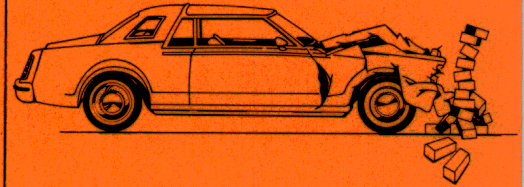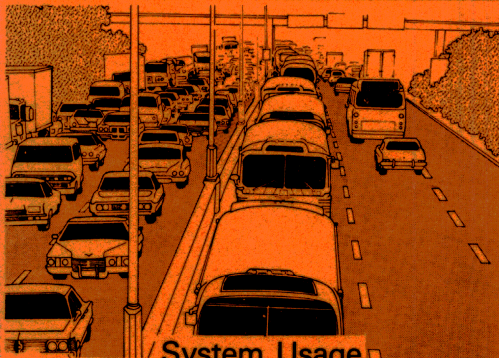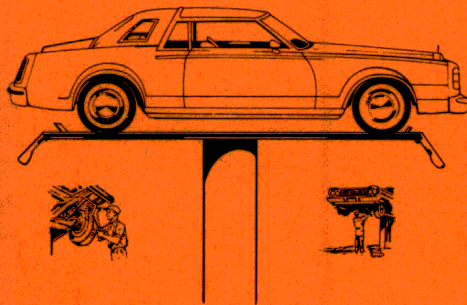
Procedural Manual For Data Submittal
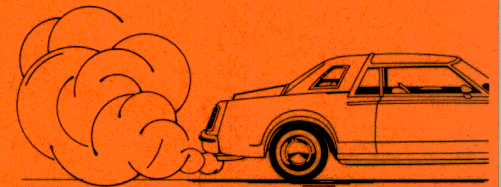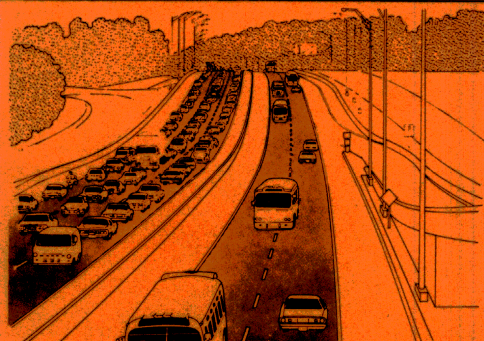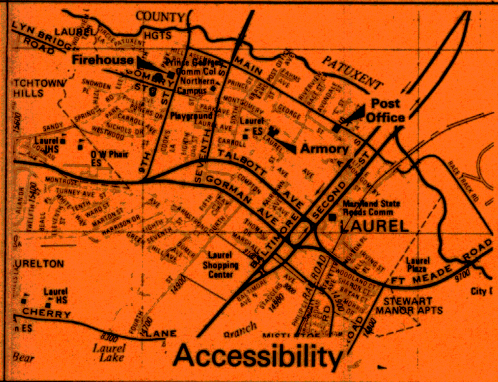

System Condition

Safety

System Usage

Vehicle Operating Cost

Air Pollution

Comfort and Convenience

Accessibility

U.S. DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Program Management Division

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

DATE: **2 4 AUG** 1979

SUBJECT: <u>ACTION</u>: Distribution of Computer Software for the Highway Performance Monitoring System (HPMS) Data Submittal

In reply refer to: HHP-12

FROM : Director of Highway Planning
Washington, D.C. 20590
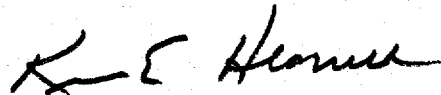
TO : All State Highway Agencies
THRU: Federal Highway Division Administrators

We appreciate the cooperative efforts of each State highway agency in implementing the Highway Performance Monitoring System. We fully recognize the magnitude of each State's efforts necessary to achieve this highly desirable goal. As a result, we have prepared software and guidelines for each State's use as an aid to develop the HPMS data submittal tape.

This memorandum transmits the "Procedural Manual for Data Submittal" and the associated battery of computer software that has been written to develop, edit and correct each State's section data that will be furnished to the FHWA on magnetic tape. The magnetic tape being distributed along with this memorandum and Procedural Manual contains the battery of programs as well as test data. All programs are written in COBOL.

Each State highway agency is encouraged to become familiar with the operation of this battery of programs through the use of the test data that have been furnished. Should problems occur when using the test data and/or in subsequent production runs, please contact:

Beverly Harrison
Special Studies Branch, HHP-12
Telephone: 202-426-0193

Kevin E. Heanue

Highway Performance Monitoring System

Procedural Manual
For Data Submittal

Table of Contents

Highway Performance Monitoring System (HPMS)

Procedural Manual for Developing
the Data Submittal Tape

Introduction

The module of programs supplied for a State to use in preparing their
HPMS data submittal tape will develop the database from cards or card
images, edit the section data, correct errors in the data, and develop
mileage, DVMT, and volume group summaries by functional class. The
module consists of a main (calling) program, STHPMS, and four subprograms:
DEVTAPE, EDITCK, UPDATE and SUMTBLES. (It should be noted that this module
of programs has the capability of processing a mixed dataset consisting of
both urban and rural section data.) The main program and four subprograms
are written in COBOL and were designed and developed on an IBM 360/65 with
full operating system (OS).

The module execution is controlled by user parameter cards through the
main program, STHPMS. STHPMS calls the subprograms required by the
options the user selected. The functions of the subprograms are as
follows:

DEVTAPE reads the rural and urban section data on cards or card
images in the FHWA worksheet format and creates the HPMS section
record format on tape in sort by ID within county. The subprogram
verifies that cards 1 and 2 and the optional cards specified by
the user are present for each section. Only sections having valid
card sets are added to the master dataset. A summary is produced
for each volume group by functional class giving the number of
sections added and rejected along with the sampled and expanded
mileage. Lists of input cards, cards in error and a summary of
sections for rural and urban areas are also produced.

EDITCK reads the HPMS dataset produced by DEVTAPE or UPDATE (or
a State developed tape in the required format) and checks each
data item for valid codes. Cross editing is also performed
among data items. Each section ID is checked for uniqueness
within a county. A listing is produced with errors and messages.[1]

UPDATE is used to correct section errors detected by the subprogram,
EDITCK. Using transaction cards with the proper code, the user is
able to delete or modify sections, and add or delete bridge and/or
railroad crossing ID's. (Note: DEVTAPE is used to add a new section

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[1] See Appendix A for a complete listing of edit specifications.

to the existing dataset.) A summary is produced by section ID
indicating the changes made to a section record. Also produced
is a listing of input transaction cards and a listing of cards
which have format errors.

SUMTBLES develops and produces two sets of summary tables. One
table gives a summary of 1978 sampled and expanded mileage, 1978
DVMT, 2000 DVMT, average section length and the number of sections
with lengths less than 0.3 for rural and 0.1 for urban for each
functional class by area. The second table is a summary for each
volume group within a functional class by area which contains the
number of sections sampled and sampled and expanded mileage.

The module has been designed to enable a State to develop, edit and
update their data for rural sections only or urban sections only if the
State finds this easier for their particular work environment. However,
the _final_ edit and summaries _must_ be run with only one dataset consisting
of both the rural and urban section data in sort by ID within county.

Data Submittal Tape Specifications

1. The tape should have the following characteristics:

    9 track   1600 BPI or 800 BPI
    EBCDIC
    Standard Labels

2. The rural and urban section data should be submitted on the same
    tape and in the same dataset in sort by section ID within county.
    The dataset name (DSNAME) should be URBRURXX, where XX is the two-
    digit State code (FIPS) listed in the "HPMS Field Implementation
    Manual."

3. The tape submitted should have a volume serial number of HPMSXX,
    where XX is the two-digit State code as listed in the "HPMS Field
    Implementation Manual."

4. The data control block (DCB) characteristics are to be as follows:

    RECFM=VB
    LRECL=1823
    BLKSIZE=9119

Each State is to submit the final edit run and the final two sets of
summary tables with their data tape. Remaining errors in the data are
to be explained on the edit listing. The tape and listings are to be
provided to the FHWA division office for forwarding to the Special
Studies Branch, HHP-12, by December 31, 1979.

STHPMS

A. Identification

Program Name: STHPMS
Language   : COBOL
Written By   : Beverly Harrison
                Special Studies Branch (HHP-12)
                Program Management Division, FHWA
                Washington, D.C. 20590
                Phone: 202-426-0193
Date   : May-June 1979

B. Purpose

STHPMS processes the cards (or card images) punched from the HPMS
rural and urban worksheets to develop a State's HPMS section database
on tape, edits the database checking to see if each data item meets
the specifications, updates the data items for each section found to
be in error and developes and produces summary tables for 1978 mileage,
1978 DVMT, 2000 DVMT and volume groups by functional class for each
area.

C. Components

STHPMS is the calling program in the module composed of four
subprograms--DEVTAPE, EDITCK, UPDATE, and SUMTBLES.

D. Parameter Cards

There are several types of parameter cards the user may elect to use
to execute STHPMS. The number and types of parameter cards required
depends on the program option(s) selected. The parameter cards may
be placed in the execution deck in any order.

1. State Name Card (ISTATE)

    This card is required for all executions of the program. The
    keyword ISTATE is coded in columns 1-6 followed by an equal
    sign (=) in column 7. Starting in column 8, 1-25 characters
    and blanks may be used to code the State name. The State name
    is followed with the two-digit State code found in the "HPMS
    Field Implementation Manual." Both digits must be coded and
    must be coded as /xx/, where xx is the State code.

        e.g., ISTATE=_ _TEST_HPMS_/99/

            ISTATE=TEST_HPMS/99/

2. Program Option Card (SELDEV, SELMOD, SELEDT, SELTAB)

The user must include <u>at least one</u> program option card and may include more than one <u>of these cards in an execution.</u>

a. SELDEV

This card enables the user to select the subprogram which processes the rural and/or urban cards (card images) punched from the HPMS worksheets and formats the cards into a record on tape for each sampled section. This card is also required when new sections are to be added to the existing database. SELDEV is punched in columns 1-6 followed by an equal sign (=) in column 7. The keywords for the options selected for the subprogram are then coded separated by a comma. The keywords may be coded in any order and are as follows:

<u>Required Keywords</u>

−<u>One</u> keyword from this set <u>must</u> be selected.

R   Cards for rural sections only are being input.

U   Cards for urban sections only are being input.

RU   Cards for both rural and urban sections are being input.

−<u>One</u> keyword from this set <u>must</u> be selected.

REQONLY   Only the required data are being submitted. (Cards 1 and 2 are being input.)

REQOPT   Required data plus some or all of the optional data are being submitted.(Cards 1-6 are being input.)

<u>Optional Keywords</u>

−If the keyword REQOPT is coded <u>at least one</u> of these keywords <u>must</u> be selected indicating which optional data is included.

CURVES   Indicates curves are included for all sections for some or all functional classes, Card 3.

GRADES   Indicates grades are included for all sections for some or all functional classes, Card 4.

BRIDID   Indicates bridge ID's are included for some or all sections where applicable, Card 5.

CROSSID   Indicates railroad crossing ID's are included
           for some or all sections where applicable,
           Card 6.

-ADDSECT is coded if new sections are to be added to the
 existing database.

-PUNERR is coded if the user wants the card sets in error
 punched as well as listed.

e.g., SELDEV=REQOPT,RU,GRADES,CROSSID   Rural and urban sections
                                        _   optional grades
                                        and railroad crossing
                                        ID's coded.

      SELDEV=PUNERR,R,REQONLY   Rural sections-required
                                         data only with card sets
                                         in error to be punched.

      SELDEV=RU,ADDSECT,REQOPT,CURVES   New rural and urban
                                        sections are being added
                                        to database with curves
                                        provided.

b. SELMOD

    This card enables the user to select the subprogram which
    modifies (updates) or deletes a section in the database.
    This card is required if the user is correcting coding
    errors detected by the edit program. SELMOD is punched
    in columns 1-6 followed by an equal sign (=) in column 7.
    Each keyword selected for a subprogram option is then
    coded, followed by a comma. The keywords can be in
    any order. The keywords for SELMOD are as follows:

    -One keyword from the following set must be coded.

    R   Rural sections only are to be modified or deleted.

    U   Urban sections only are to be modified or deleted.

    RU   Rural and urban sections are to be modified or
         deleted.

-<u>One</u> keyword from the following set <u>must</u> be coded.

ADDMOD   Indicates sections are to be <u>added</u> to the existing
tape <u>and</u> the database is then to be <u>modified</u>. When
this keyword is used, the program option card SELDEV
with keyword ADDSECT <u>must</u> also be included.

MODONLY Coded when sections are to be modified or deleted
and <u>no new</u> sections are being added.

    e.g., SELMOD=RU,MODONLY   Rural and urban sections are
to be modified or deleted.
No new sections are to be
added.

c.   SELEDT

This card enables the user to select the subprogram which checks
each data item to see if it has been coded to specifications.
In columns 1-6, punch SELEDT followed by an equal sign (=).
Starting in column 8, code the keyword(s) for the subprogram
option selected, each separated by a comma. The order of the
placement of the keywords is not significant. Select options
using the following keywords:

<u>Required Keyword</u>

-<u>One</u> of these keywords <u>must</u> be coded:

R   Rural sections are to be edited.

U   Urban sections are to be edited.

RU   Rural and urban sections are to be edited.

<u>Optional Keywords</u>

-FINAL   Indicates the final edit is to be made on the
rural <u>and</u> urban sections in the HPMS database.
The listing from this edit is to be submitted
to FHWA with the data tape.

-ERRMESS   Indicates the user wants a suppressed listing
with section ID, item number in error and
messages only. When this keyword is omitted,
the listing includes the value coded for each
data item for a section in error along with
item number in error and message.

-FHWADESIGN Indicates the State has used the volume groups and ADT ranges contained in the "HPMS Field Implementation Manual" and that the volume group number coded is to be checked against the 1978 ADT. If this keyword is <u>not</u> coded, the volume group number is <u>not</u> verified with the 1978 ADT value.

-MFRS Indicates the State is not coding the items that could be reported via MFRS (* items in Manual).

e.g., SELEDT=R,FHWADESIGN Rural sections to be edited with volume group number and 1978 ADT verified.

  SELEDT=FINAL,RU Final edit is to be made on all (rural and urban) HPMS sections.

d. SELTAB

This card enables the user to select the subprogram which developes and produces the summary tables for 1978 mileage, 1978 DVMT and 2000 ADT by functional class by area and the summary table for the volume groups by functional class, by area. SELTAB is coded in columns 1-6 followed by an equal sign (=). Starting in column 8, code the keyword(s) for the subprogram options selected with a comma separating each one. There is no required sequence for the keywords selected. The SELTAB keywords are:

 -<u>One</u> keyword from the following set <u>must</u> be selected.

  R Rural summary tables will be produced.

  U Urban summary tables will be produced.

  RU Rural and urban summary tables will be produced.

 -<u>One</u> or <u>both</u> of the following keywords <u>must</u> be selected.

  VOLGRP Indicates the summary tables for the volume groups are to be developed and printed.

  DVMTMILE Indicates the summary table (s) for the mileage and DVMT are to be developed and printed.

-Optional Keyword

FINAL   Indicates the final set of summary tables are
to be produced for the HPMS database and are
to be submitted to FHWA along with the final
edit and submittal tape.

e.g., SELTAB=FINAL,DVMTMILE,VOLGRP,RU   Final set of both
tables to be
produced.

SELTAB=VOLGRP,RU   The tables for the
volume group summaries
are to be produced
for use by the State.

3. Maximum Number Edit Errors (MAXERR)

This card is optional and is coded if the user wants the subprogram
which edits the data to stop execution when a maximum number of
sections with coding errors is reached. If MAXERR is included in
the execution deck, the program option card, SELEDT, must be
included. MAXERR is punched in columns 1-6 followed by an equal
sign (=). Starting in column 8, code the numeric value for the
maximum number of sections allowed to be in error. From 1 to 5
digits may be coded. The default value (card omitted) is for all
sections in the database to be edited.

e.g., MAXERR=550   Execution for the edit subprogram will
terminate when 550 sections with at least
one data item in error had been detected.

4. Functional Class Optional Curves/Grades Card (FUNCUR, FUNGRD)

These cards are required if the optional data is being provided
for curves and/or grades to indicate which functional class(es)
will have the data coded. They are necessary since the optional
grades and/or curves data must be provided for an entire functional
class. Both cards may be included in the same execution.

a. FUNCUR

This card is required if the user has included the SELDEV card
with the keywords, REQOPT and CURVES coded. In columns 1-6,
punch FUNCUR followed by an equal sign (=). Starting in
column 8, punch the functional class code for all classes
(rural and/or urban) which will have curve data coded. Leading
zeroes are optional for the rural functional class codes.

e.g., FUNCUR=2,11,14   Curves provided for rural functional
class 2 and urban functional classes
11 and 14.

FUNCUR=12,01,11 Curves provided for urban functional classes 11 and 12 and rural functional class 01.

  b. FUNGRD

This card is required if the user has included the SELDEV card with the keywords, REQOPT and GRADES coded. FUNGRD is punched in columns 1-6 followed by an equal sign (=). Punch the functional class code for <u>all</u> classes (rural and/or urban) which will have grade data coded starting in column 8. The leading zero for the rural functional class codes is optional.

    e.g., FUNGRD=17,11,01 Grades data will be provided for urban classes 17 and 11; rural, 01.

    FUNGRD=2,12,06,16 Grades data will be provided for rural classes, 02 and 06; urban, 12 and 16.

5. MFRS Option Card (OPMFRS)

This card is optional and is used only by a State submitting part of their HPMS data items via MFRS (* items on the worksheet in the HPMS Implementation Manual). If all data items are being coded in the HPMS database, this card will not be included in the execution deck. In columns 1-6, punch OPMFRS followed by an equal sign (=). <u>One</u> of the following keywords <u>must</u> then be coded starting in column 8.

  YFC Indicates all * items except functional class are coded via MFRS. The functional class code is being coded for all sections with the remaining * items coded zero.

  NFC Indicates all * items including functional class are being submitted via MFRS and are coded zero.

  e.g., OPMFRS=YFC Functional class is being coded and all remaining * items are coded zero.

    OPMFRS=NFC All * items including functional class are being coded zero.

E. Control Cards (Transactions)

If the program option SELMOD has been selected by the user, control cards are required to indicate which transactions are to be performed by subprogram UPDATE. There are four kinds of transaction control cards used by UPDATE:

-Delete a section

-Modify or update a section

-Add or delete bridge ID's

-Add or delete at-grade railroad crossing ID's

Each transaction card must contain the county and section ID coded for the section which is to be altered. The delete card _cannot_ be used with any of the other three transaction cards for the _same_ section; however, the other three cards may be included for the same section. If a combination of transaction cards is used, all of one kind must be placed together in sequence. There may be only one delete card per section and from 1 to 10 each of the other three transaction cards per section.

The card format for each transaction control card will be discussed separately.

1. Delete a section transaction card.

    This card enables the user to remove a section from the database. The card format is as follows:

Transaction card code---"D"	column 1
Sequence number--always "01"	columns 2-3
County code	columns 4-6
Section identification code	columns 7-18
Occurrence of section to be deleted	column 19
Blank	columns 20-80

    The county code _must_ be a three-digit numeric value. The section identification _must_ be coded exactly as the one to be deleted (embedded blanks must be the same if the ID was placed in database with blanks as part of it). The occurrence of the section to be deleted must be numeric and tells which matching section is to be deleted if there is more than one in the database.

    e.g., DO1124_ _RT11_ _10212   Delete the second section with
                                    matching ID.

2. Update or modify a section transaction card.

    This card enables the user to correct the coding errors in the data items. The update transaction card may be used in combination

with the bridge ID card and/or the at-grade railroad crossing
ID card. The card must have the following format:

Transaction card code--"U"	column 1
Sequence number--"01-10"	columns 2-3
County code	columns 4-6
Section ID	columns 7-18
Data item number to be updated and data value in the following format:	columns 19-80

$$/N_1,D_1/N_2,D_2/N_3,D_3/. . ./N_i,D_i/$$

where N_i = data item number to be updated*

D_i = new data value

*The data item numbers are listed in Appendix B.

Several updates may be coded on one card providing that the last
column coded contains a "/" thereby requiring both "N" and "D"
values for a given update to be on the same card. The value coded
for the data item must contain the same number of characters as
the length of the data item, i.e., to update Item 43, 2000 ADT,
one must code 6-digits. Leading zeroes must be coded for all
numeric data items.

The data items which have a part a, b, or c (e.g., Item 18 or
Item 27) must have the letter coded as part of the item number
as indicated in Appendix B--that is, to correct the right shoulder
width to "10" one would code /18-A,10/. The data items with more
than one set of values (e.g., railroad crossing or bridge ID's)
must have the position of the one to be corrected as part of the
item number as indicated in Appendix B--that is, to correct the
third railroad crossing ID, one would code /56-03,007631A/. The
position for the item number must be coded as two digits with
leading zero.

The sequence number always start with 01, must be two digits
and indicates the location of the update card when there is
more than one per section. The county code must have a three-
digit numeric value and the section ID must be coded exactly
as the ID for the section in the database. If all the data
item corrections required for a section cannot be coded on
10 update cards, another execution will have to be made to
correct any remaining data items. There cannot be more than
10 update cards with the same county and section ID code.

e.g., U01017_ _ _000011289/11,0110/27-B,03/ Item 11, section length is to be corrected to a value "0110"; Item 27-B, number at-grade inter-sections with stop signs is to be corrected to a value of "03".

U06020_ _ _ _ _ _ _ _286/53-E,02023/56-12,701936A/33,2/ Item 53-E, curves is changed to "02023"; Item 56, the 12th crossing ID is to be corrected to "701936A"; Item 33, terrain is changed to "2".

3. Add or delete Bridge ID's transaction card.

    This card enables the user to add the optional bridge ID's to an existing section, add more bridge ID's to a section which already has ID's coded (<99) or delete one or more ID's from the existing set of ID's for a section. This card may be used in combination with the update card and/or at-grade crossing ID card. The bridge ID transaction card format is as follows:

Transaction card code--"B"	column 1
Sequence number--"01-10"	columns 2-3
County code	columns 4-6
Section ID	columns 7-18
Function performed on bridge ID --"A" add ID's coded --"D" delete ID's coded	column 19
Bridge ID's to be added or deleted coded 15 characters each, 1 to 4 per card	columns 20-79
Blank	column 80

    The sequence number must begin with 01, be numeric and must have two digits coded. A three-digit numeric value must be coded for the county code and the section ID must be coded exactly as the existing section in the database. Only one function, "D" or "A", may be coded per card and all ID's coded on that card will be added or deleted; however, existing bridge ID's may be deleted for a section and new ID's added by coding one or more cards with a "D" and one or more with an "A". Each bridge ID must be 15 characters (blanks included) in length.

e.g., B01171_ _ _ _RT07628D2243CTYRT10RT25

    B02171_ _ _ _RT07628A_FED76982761072FED769871469352

       Two bridge transaction cards for one section. First a
       bridge ID is to be deleted and then two new ID's are
       to be added for the section.

If more than 40 bridge ID's are to be deleted and/or added
for a section, the subprogram UPDATE will need to be executed
more than once since the maximum number of ID's that can be
coded in one execution is 40 (4 per card, 10 cards maximum).

4. Add or delete at-grade railroad crossing ID's card.

The use of this card enables the user to add the optional
crossing ID's to an existing section, add more crossing ID's
to a section which already has ID's coded (<15) or delete one
or more ID's from the existing set of ID's for a section. The
crossing transaction card may be used in combination with the
update and/or bridge ID transaction cards. The card format is
as follows:

Transaction card code--"C"	column 1
Sequence number--"01-10"	columns 2-3
County code	columns 4-6
Section ID	columns 7-18
Function performed on Crossing ID —"A" add ID's coded —"D" delete ID's coded	column 19

Crossing ID's to be added or deleted
  coded as 7 characters each, 1 to 8
  per card
	columns 20-75

Blank	columns 76-80

The sequence number <u>must</u> be a two-digit numeric value and <u>must</u>
start with 01. The county code must be a three-digit numeric
value. The section ID coded must match the one in the database
exactly. Crossing ID's may be deleted and added for the same
section by using 2 or more crossing ID transaction cards, some
with a function of "D" and some with "A". Each crossing ID
coded <u>must</u> be 7 characters in length--six numeric digits and
one alphabetic.

e.g., C01273_ _ _ _ _ _12854D724329B816629F

C02273_ _ _ _ _ _12854A872131J923517D396424A157739H

Two crossing transaction cards for the same section.
The first function says delete 2 crossing ID's; then
add 4 crossing ID's to the section.

F. Input/Output Datasets

Several datasets are used during execution depending on the program
option(s) selected. For a reference to see the datasets required
for each program option, see Table 1.

1.	SYSUDUMP/SYSABEND	Standard "system output" dataset used if the program abnormally terminates during execution. Destined to the printer. Required for all executions.
2.	SYSOUT	Standard "systems output" dataset for printing system messages. Required for all executions.
3.	SYSIN	Input dataset containing the program parameter cards. Consists of 80 - character records. Required for all executions.
4.	PRINTOUT	Output dataset destined to the printer for listing of parameter cards, error messages and summary tables. Required for all executions.
5.	DATAIN	Input dataset containing the cards punched from the rural and/or urban worksheets or card images. Contains 80 - character records. Required for program option SELDEV. The card set must be in sort by functional class within area.
6.	SECTDATA	Input/output dataset which contains the HPMS section data. The DCB parameters are defined by the subprogram when used as input or output. Required output dataset for program option SELDEV. If SELDEV is coded with keyword ADDSECT, then the DISP parameter must be coded - DISP=(MOD,...) - so the added sections may be placed at the end of the current HPMS section database. Required input dataset for the program option SELEDT and/or SELTAB if these program options are selected with SELDEV without the keyword ADDSECT.

7. CURDATA

Input/output dataset which contains the HPMS section dataset. The DCB parameters are defined by the subprogram(s). Required output dataset for the program option SELDEV with keyword ADDSECT. Required input dataset for SELMOD. Required input dataset for SELEDT or SELTAB or SELEDT and SELTAB. Required input dataset for program option SELEDT and/or SELTAB and SELDEV with keyword ADDSECT.

8. NEWDATA

Input/output dataset which contains the HPMS section data. The DCB parameters are defined by the subprogram. Required output dataset for the program option SELMOD. Required input dataset for SELEDT and/or SELTAB if these program options are selected with (1) SELDEV with keyword ADDSECT and SELMOD with keyword ADDMOD or (2) SELMOD with keyword MODONLY.

9. ERRCARDS

Output dataset destined to the card punch. Contains 80 - character records. Required output for the program option SELDEV with keyword PUNERR.

10. ERRLIST

Output dataset destined to the printer. Required output dataset for the program option SELDEV and/or SELEDT and/or SELMOD. Contains user supplied cards found to be in error and/or error messages.

11. MODCARD

Input dataset destined to the card reader. Consists of the 80 - character transaction cards to modify and/or delete sections. Required dataset for program option SELMOD.

12. ALTFILE

Temporary input/output dataset required for the program option SELMOD. Contains the sorted valid transaction card sets to modify and/or delete HPMS sections. The DCB parameters are defined by the program.

13. SORTLIB

Dataset containing the sort routine. Required for program option SELDEV and/or SELTAB and/or SELMOD.

14. SORTWK01
    SORTWK02
    SORTWK03

Intermediate storage datasets for sorting applications. The sort program requires at least three work datasets. Additional work datasets may be defined with DD names beginning with SORTWK04 when larger amounts of data are to be sorted. Required datasets for program option SELDEV and/or SELTAB and/or SELMOD.

Table 1

Datasets Required for Each Program Option

	SELDEV	SELMOD	SELEDT	SELTAB
Datasets				
SYSUDUMP	O	O	O	O
SYSOUT	O	O	O	O
SYSIN	I	I	I	I
PRINTOUT	O	O	O	O
DATAIN	I			
SECTDATA	O			
CURDATA	O($^{Keyword}_{ADDSECT}$)	I	I	I
NEWDATA		O		
ERRCARDS	O($^{Keyword}_{PUNERR}$)			
ERRLIST	O	O	O	
MODCARD		I		
ALTFILE		O/I		
SORTLIB	I	I		I
SORTWK01	I	I		I
SORTWK02	I	I		I
SORTWK03	I	I		I

G. Program Operation

The parameter cards are read and processed to determine which program
option cards have been included and which keywords were selected for
these program options. Each card read is edited for general format--
valid parameter card name with valid keywords and numeric value where
required. Once a general error is detected, the remainder of the
parameter cards are read and listed without being processed for
selections along with the appropriate general error message. If the
end of the parameter cards are reached without any general error
being detected, a more detailed edit is performed on the set of
cards with specific error message(s) listed for any error(s) detected.
Some of the detailed edits are:

1. ISTATE card must be included in card set.

2. If SELMOD with keyword ADDMOD, then SELDEV card must
   be included in card set.

3. If MAXERR card is included, then SELEDT card must be
   present in card set.

4. If SELDEV with keywords REQOPT and CURVES, then FUNCUR
   must be included in card set.

If at least one error is detected--general or from the more detailed
editing--the execution of STHPMS terminates with the parameter cards
listed along with the appropriate error message(s).

Once the end of the parameter cards are reached with no errors, STHPMS
proceeds to call the subprogram(s) required to perform the program
option(s) selected by the user. Each subprogram operation will be
discussed briefly in the order in which they are called.

DEVTAPE (SELDEV)

Each set of cards is checked to verify that required card 1 and card 2
with matching ID's are present; and, if curves (card 3) and/or grades
(card 4) are to be provided,the program verifies each is present for
the functional classes coded on the FUNCUR or FUNGRD parameter cards.
If cards 5 or 6 are provided,the ID's are verified with those on
card 1. Any section with errors in the card set is not added to the
dataset created by the program. Each valid section is added to the
dataset in the HPMS record format (see Appendix C), added to the
appropriate matrix for the volume group summary by functional class
and added to the rural or urban section count. Upon reaching the end
of the section punched cards, the output dataset is sorted by section
ID within county; the volume group summary report is printed by functional
class by area; cards in error are listed with error messages and a
summary report for the data in the dataset is printed. Execution then
returns to the main program,STHPMS,and the next subprogram selected is
called.

UPDATE (SELMOD)

The transaction card sets are read and checked for general format
errors with each valid set being placed in a temporary dataset,
ALTFILE, with one record consisting of all cards (1-10) in a
transaction set. When the end of the transaction cards is reached,
ALTFILE is sorted by ID within county to match the ordering on the
dataset from DEVTAPE used as input for this program. Next, the
process of matching the section ID on the ALTFILE with the section
to be modified or deleted begins. Once a match is found, the section
record is not written on the new master dataset for a delete trans-
action or the section is written on the new master dataset with the
corrected (update) data value, bridge ID's added and/or deleted or
railroad crossing ID's added and/or deleted. This matching process
continues until the end of the ALTFILE or the section dataset is
reached. During this process, sections not being updated (unmatched)
are copied to the new master dataset. A summary is written indicating
the transactions by section ID for rural and urban. A listing is also
given showing all transaction cards input, cards in error and error
messages. Upon completion of all reports, execution control returns
to STHPMS and the next subprogram selected is called.

EDITCK (SELEDT)

Each section record is read and the rural/urban code is checked to
match the area with the user selection on the parameter card--R, U,
or RU. All data items in the section record are then verified for
valid codes with the data items which are coded for all sections
being edited. Next, the urban only or rural only data items are
verified. The program then checks to see if the MFRS option was
selected and uses the appropriate edits with MFRS coding or non-MFRS.
If the keyword FHWADESIGN was selected, each volume group number is
checked with the 1978 ADT coded to verify the ADT falls within the
range of ADT's for the volume group coded. Next, the program checks
to see if the section has any optional data coded; if so, then, it
checks to see which optional data and executes only the edits for
the optional data coded. If no errors are detected, the next section
record is read and the editing for that section is performed. If at
least one data item was found to be in error, a check is made to see
which print option was selected--section ID's with error messages
or section ID's, all coded values for data items and error messages.
The appropriate listing is then printed along with calculations being
made for the summary report. After the section with errors is printed,
a check is made to see if the number of sections in error exceeds the
maximum number of errors allowed, if not, a new section record is read
and the editing is performed for that section. When the maximum
number of errors allowed is exceeded or the end of the dataset is
reached, the edit summary report is printed and execution returns to
STHPMS and the next subprogram selected is called.

SUMTBLES (SELTAB)

The program reads each section record checking to see if the rural/ urban code matches the selection on the SELTAB parameter card--R, U, or RU. A work record is created containing the data items required for the calculations in the two summary tables--mileage and DVMT summaries or volume group summaries. Upon reaching the end of the HPMS section dataset, the work file is sorted by urbanized code (Note the urbanized code for rural sections is coded "000"; small urban, "999"). Each sorted record is then returned with the appropriate checks for placement of the data in the proper matrices and calculations being performed for each table selected--mileage and DVMT and/or volume group. When the end of an urbanized area or area is reached, the end calculations required for the mileage and DVMT table are performed if the user selected this summary. After all calculations are made, each table selected is printed with the mileage/DVMT table first; then, the volume group summary table for each functional class within the area. The above procedure continues until the end of the sorted file is reached. Execution then returns to STHPMS and execution stops.

H. Output

1. Dataset on Tape or Disk

The program option SELDEV creates a dataset with one record for each HPMS sampled section in the HPMS record format. The program option UPDATE creates a dataset with corrected values for the HPMS data items. Appendix C contains the HPMS record format.

2. Printed

a. List of parameter cards provided by the user.

b. Error messages if invalid parameter cards are used.

c. Volume group summaries for data added to dataset.

d. List of invalid cards when data is being added to dataset in card format with error message.

e. Error messages and/or section data item values from editing of data.

f. Update sumamries.

g. Summary tables for mileage, DVMT and volume groups.

Appendix D contains samples of printed output.

I. Error Messages

The messages are listed below for STHPMS and each program option.
(The edit messages for the data items in error will not be listed
as the edit specifications are included in Appendix A.)

STHPMS

1. "INVALID KEYWORD ON PARAMETER CARD" - Indicates the user has
    misspelled a keyword. Execution terminates.

2. "INVALID FORMAT ON PARAMETER CARD" - Indicates the equal sign,
    required slashes, or comma has been omitted. Execution terminates.

3. "REQUIRED STATE NAME CARD MISSING" - Indicates the ISTATE card
    is missing. Execution terminates.

4. "PROGRAM OPTION SELDEV SELECTED WITH REQOPT INDICATED. OPTIONAL
    DATA TO BE CODED WAS NOT INDICATED" - Indicates the user needs
    to verify the type of data being provided in card format.
    Execution terminates.

5. "VALUE CODED FOR MAX NUMBER ERRORS ALLOWED (NUMERR) OR STATE
    CODE OR FUNCTIONAL CLASS IS NOT NUMERIC" - Indicates a nonnumeric
    has been coded for a numeric. Execution terminates.

6. "FUNCTIONAL CLASS NOT INCLUDED FOR OPTIONAL CURVES AND/OR GRADES
    DATA" - Indicates user has coded keyword CURVES and/or GRADES
    WITHOUT INCLUDING THE FUNCUR and/or FUNGRD card. Execution
    terminates.

7. "INVALID CARD NAME ON PARAMETER CARD" - Indicates the user has
    miscoded the card name. Execution terminates.

8. "PROGRAM OPTION SELDEV SELECTED WITH REQONLY INDICATED. OPTIONAL
    DATA CODED ON SELDEV CARD. VERIFY " - Indicates the user needs to
    verify which type of data is being provided in card format.
    Execution terminates.

9. "SELDEV CARD DOES NOT HAVE TYPE DATA KEYWORD CODED REQONLY OR
    REQOPT" - Indicates the user has not coded what data are being
    provided in card format. Execution terminates.

10. "PARAMETER CARDS DO NOT CONTAIN AT LEAST ONE PROGRAM OPTION
    CARD--SELDEV, SELEDT, SELMOD, SELTAB" - Indicates the user did
    not select a program option. Execution terminates.

11. "MAXIMUM NUMBER ERRORS CODED WITHOUT PROGRAM OPTION SELEDT CARD" -
    Indicates the MAXERR card was included when the edit program was
    not selected. Execution terminates.

12. "SELDEV CODED REQONLY. CURVES AND/OR GRADES FUNCTIONAL CLASSES
    HAVE BEEN CODED. VERIFY CARDS" - Indicates the user needs to
    check what data is being provided in card format. Execution
    terminates.

13. "ADDMOD CODED ON SELMOD CARD. REQUIRED SELDEV CARD MISSING
    FOR THIS SELECTION" - Indicates new sections are to be added
    to the dataset, but the program which adds sections was not
    selected. Execution terminates.

14. "MODONLY CODED ON SELMOD CARD. SELDEV CARD CODED FOR THIS
    SELECTION IS IN ERROR. VERIFY SELECTIONS" - Indicates the
    program to add sections to dataset was selected but the keyword
    on SELMOD indicated sections in existing dataset were to be
    modified only. Execution terminates.

15. "PARAMETER CARDS CONTAIN AT LEAST ONE ERROR. CHECK ALL CARDS.
    EXECUTION TERMINATED" - Self-explanatory.

DEVTAPE (SELDEV)

1. "INVALID CARD NUM FOR REQONLY" - Required only data
   indicated but cards 3-6 are included or some other number
   is punched in column 80. Section is not added to dataset.
   Verify card number.

2. "ID's DON'T MATCH CARDS 1 & 2" - The section ID has been miscoded
   on one of the cards. Section is not added to dataset.

3. "CARD 1 MISSING FOR SECTION" - Each sampled section must have a
   card 1 & 2. Section is not added to dataset.

4. "CARD 2 MISSING FOR SECTION" - See No. 3 above.

5. "REQUIRED CARD 1 & 2 MISSING" - See No. 3 above.

6. "CARD 3 OR 4 MISSING FC LISTED" - Indicates the functional class
   coded on card 1 is to have curve (card 3) or grade (card 4) data
   coded. Section is not added to dataset.

7. "TOO MANY CROSSING ID CODED" - The section record format has been
   set up to allow for 1-15 railroad crossing ID's per section.
   Section is not added to dataset.

8. "ID's DON'T MATCH OPT CARD(S)" - The section ID coded on cards 3-6
   does not match the ID on cards 1 & 2. Section is not added to
   dataset.

9. "FC LISTED CARDS 3 & 4 NOT CODED" - Functional class has been coded to have <u>both</u> curves and grade data. <u>Both</u> cards are not coded. Section is not added to dataset.

10. "INVALID CARD NUMBER NOT 1-6" - Column 80 contains some other number or nonnumeric character. Section is not added to dataset.

11. "CHECK FC LIST FOR CUR/GRD" - Curve (card 3) or grade (card 4) data has been coded for a functional class not listed on FUNCUR or FUNGRD card. Section is not added to dataset.

12. "TOO MANY BRID ID CODED" - The section record format has been set up to allow for 1-99 bridge ID's per section. Section is not added to dataset.

13. "BRIDID (C5) NOT LISTED AS OPT" or "XINGID (C6) NOT LISTED AS OPT" or "CURVES (C3) NOT LISTED AS OPT" or "GRADES (C4) NOT LISTED AS OPT"- Optional data has been coded but was not indicated to be included. Section is not added to dataset.

14. "INVALID CODE CARD 1 COLUMN 79" - Card 1 contains an invalid rural/ urban code. Must be coded 1 for an urban section; coded 2 for a rural section. Section is not added to dataset.

15. "RU CODE NOT = TYPERUN SELECT" - Indicates the user coded R or U on the SELDEV card, but rural cards have been included when "U" was coded or urban cards have been included when "R" was coded. Section is not added to dataset.

UPDATE (SELMOD)

1. "UPDATE CARD IMPROPER FORM" - Indicates the user has not coded the update transaction card correctly. This card is not used.

2. "SEQ NUM MUST BE NUMERIC > 0" - Indicates the sequence number on the transaction card has been miscoded. The transaction is not used for the card set with matching ID.

3. "CK: SEQ NUM, ID or TRAN CODE" - The ordering of the transaction set should be verified, section ID and county code checked. In some situations, the transaction code may be invalid. The set with matching ID's is not used.

4. "DELETE CARDS > 1 WITH SAME ID"-More than one delete card has been included for the same section. The deletion is not performed for either card. Verify ID's on cards.

5. "INVALID TRANSACTION CODE" - The first column on the card does not contain a U, D, B, C. The transaction set with matching ID is not used.

6. "CARDS IN TRANSACTION SET > 10" - The ID's on all cards should be verified to see if two different section modifications have been coded as one or the transaction code should be verified to see if two different codes should have been used. The set is not used.

7. "TRAN CODE NOT =; SEQ # > 1, ID =" - Different transaction codes coded for same ID with a sequence number not equal 01. Verify ID, transaction code, and sequence number. The set is not used.

8. "TOO MANY BRID/XING ID FOR SECT" - Indicates the addition of bridge or crossing ID's exceeded the maximum number - bridge, 99; crossing, 15. Only the ID's beyond the maximum number were not added. Card with these ID's is listed.

9. "INVALID ITEM NUMBER" - Indicates that particular update could not be performed. All valid updates on card are performed.

10. "ID TRANS NOT = ID FOR SECTION" - Indicates the county code and section ID on the transaction card does not match any in the dataset. No transaction performed.

11. "OCCURRENCE OF DELETION INVALID" - Indicates ID for deletion matched but there was only one section with that ID. Deletion is not performed.

12. "INVALID FORMAT FOR UPDATE CARD" - Verify the coding of card. This particular card is not used but all valid cards in set are used and updates are performed.

13. "INVALID FORMAT FOR UPDATE" - Indicates that particular update has a coding error--not of form /xx,xxxx/ or /xx-x, xx/. All valid coded updates on card are used.

14. "INVALID FORMAT FOR BRIDID CARD' - Indicates that particular bridge transaction card is miscoded and is not used. Any valid cards in set are used with actions performed on section.

15. "INVALID FORMAT FOR XINGID CARD" - Indicates that particular crossing transaction card is miscoded and is not used. Any valid cards in set are used with actions performed on section.

16. "INVALID FORMAT FOR DELETE CARD" - Indicates the card is miscoded. The deletion is not performed.

17. "INVALID SUB-ITEM LETTER OR NUM" - Indicates the letter coded for item number 18, 27, 37, 42, 53, or 54 is miscoded or the bridge ID referenced is > 99 or the crossing ID referenced is > 15. The update is not performed. Any other valid updates on card are performed.

18. "CODE NOT 'A' or 'D' FOR ID'S" - Indicates the action to be performed on bridge or crossing ID is miscoded. This card is not used. Any other valid card in set is used.

19. "DEL BRID/XING ID DOESN'T MATCH" - Indicates the ID coded to be deleted from section bridge ID's or crossing ID's is not on data record. Verify. Any other valid ID to delete on card is deleted for section.

20. "INVALID ITEM NUM WITH SUB-ITEM" - Indicates a letter or number has been coded for an item number which has no subitems. See Appendix B to verify which data items have subitems. This particular update is not performed, but any valid update on card is performed.

21. "DEL CARD & OTHER TRAN CARD = ID" - Indicates a delete for a section has been coded with an update, crossing ID action or bridge ID action for the same section. Verify transaction codes. Cards are not used.

22. "ITEM NUM MUST HAVE SUB-ITEM" - Indicates the coded item number must have a letter or number subitem. This particular update is not made. Any other valid updates on card are performed.

J. Core and Timing

The amount of core and CPU time required depends on the program option selected or combination of program options selected. The amount of core for execution varies from approximately 100K bytes to 166K bytes. The approximate amount of core by program option is as follows:

```
DEVTAPE(SELDEV) 142K bytes
EDITCK(SELEDT)   100K bytes
*UPDATE(SELMOD)  134K bytes or 166K bytes
SUMTBLES(SELTAB)140K bytes
```

*SELMOD requires the larger amount of core for execution to sort the new master dataset if a county code or section ID is modified.

The amount of CPU time per 125 sections varies from 2.00 seconds to 8.70 seconds depending on the program option or combinations of program options being executed.

K.   Sample Run Setups

EDIT SETUP WITH MAXIMUM NUMBER ERRORS SET
PRINTED OUTPUT ERROR MESSAGES ONLY

```
//HPMS  EXEC  PGM=STHPMS,REGION=100K
//STEPLIB  DD  DSN=STATE.HPMS.LOADLIB,VOL=SER=SHP002,UNIT=SYSDA,
//    DISP=OLD
//SYSOUT  DD  SYSOUT=A
//SYSUDUMP  DD  SYSOUT=A
//SYSIN  DD  DATA
ISTATE=  TEST HPMS /99/
SELEDT=RU,FHWADESIGN,ERRMESS
MAXERR=100
/*
//PRINTOUT  DD  SYSOUT=A,DCB=(RECFM=FB,BLKSIZE=133)
//CURDATA  DD  UNIT=SYSDA,DISP=(OLD,KEEP),
//    VOL=SER=SHP002,DSNAME=HPMSTEST
//ERRLIST  DD  SYSOUT=A,DCB=(RECFM=FB,BLKSIZE=133)
/*
//
```

SUMMARY TABLES SETUP
RURAL ONLY

```
//HPMS  EXEC  PGM=STHPMS,REGION=140K
//STEPLIB  DD  DSN=STATE.HPMS.LOADLIB,VOL=SER=SHP002,UNIT=SYSDA,
//    DISP=OLD
//SYSOUT  DD  SYSOUT=A
//SYSUDUMP  DD  SYSOUT=A
//SYSIN  DD  DATA
ISTATE=  TEST HPMS /99/
SELTAB=VOLGRP,DVMTMILE,R
/*
//PRINTOUT  DD  SYSOUT=A,DCB=(RECFM=FB,BLKSIZE=133)
//CURDATA  DD  UNIT=SYSDA,DISP=(OLD,KEEP),
//    VOL=SER=SHP002,DSNAME=HPMSTEST
//SORTLIB  DD  DSNAME=SYS1.SORTLIB,DISP=SHR
//SORTWK01  DD  UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK02  DD  UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK03  DD  UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK04  DD  UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK05  DD  UNIT=SYSDA,SPACE=(CYL,(1,1))
/*
//
```

NOTE: Printed output requires 65 lines of print.

```
//HPMS     EXEC  PGM=STHPMS,REGION=150K
//STEPLIB  DD    DSN=STATE.HPMS.LOADLIB,VOL=SER=SHP002,UNIT=SYSDA,
//               DISP=OLD
//SYSOUT   DD    SYSOUT=A
//SYSUDUMP DD    SYSOUT=A
//SYSIN    DD    DATA
ISTATE=   TEST HPMS /99/
SELDEV=RU,REQPT,CURVES,GRADES,BRIDID,CROSSID
FUNCUR=06,02,12,16
FUNGRD=06,16,02
SELEDT=RU,FHWADESIGN
SELTAB=RU,DVMTMILE
/*
//PRINTOUT DD    SYSOUT=A,DCB=(RECFM=FB,BLKSIZE=133)
//SECTDATA DD    UNIT=SYSDA,DISP=(NEW,KEEP),SPACE=(TRK,(4,2)),
//               VOL=SER=SHP002,DSNAME=STATE.HPMS.TEST
//ERRLIST  DD    SYSOUT=A,DCB=(RECFM=FB,BLKSIZE=133)
//DATAIN   DD    DATA
        ...

        ...                SECTION DATA ON CARDS GO HERE

        ...
/*
//SORTLIB  DD    DSNAME=SYS1.SORTLIB,DISP=SHR
//SORTWK01 DD    UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK02 DD    UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK03 DD    UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK04 DD    UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK05 DD    UNIT=SYSDA,SPACE=(CYL,(1,1))
/*
//
```

NOTE: Printed output requires 65 lines of print.

SAMPLE SETUP
MODIFY SECTION DATASET & EDIT THE NEW MASTER DATASET
ONLY ERROR MESSAGES PRINTED FROM EDIT

```
//HPMS   EXEC   PGM=STHPMS,REGION=140K
//STEPLIB  DD   DSN=STATE.HPMS.LOADLIB,VOL=SER=SHP002,UNIT=SYSDA,
//    DISP=OLD
//SYSOUT   DD   SYSOUT=A
//SYSUDUMP  DD   SYSOUT=A
//SYSIN   DD   DATA
ISTATE=  TEST HPMS /99/
SELMOD=RU,MODONLY
SELEDT=RU,FHWADESIGN,ERRMESS
/*
//PRINTOUT  DD   SYSOUT=A,DCB=(RECFM=FB,BLKSIZE=133)
//CURDATA  DD   UNIT=SYSDA,DISP=(OLD,KEEP),
//    VOL=SER=SHP002,DSNAME=STATE.HPMS.TEST
//MODCARD   DD   DATA

               o
               o
               o
        CARDS TO MODIFY THE DATASET GO HERE
        o
        o
        o
/*
//ALTFILE   DD   UNIT=SYSDA,SPACE=(TRK,(2,1)),DISP=(NEW,DELETE),
//    DSNAME=&&WORKUP
//NEWDATA  DD   UNIT=SYSDA,SPACE=(TRK,(4,2),RLSE),DISP=(NEW,KEEP),
//    VOL=SER=SHP002,DSNAME=TEST.UPDATE.HPMS
//ERRLIST   DD   SYSOUT=A,DCB=(RECFM=FB,BLKSIZE=133)
//SORTLIB   DD   DSNAME=SYS1.SORTLIB,DISP=SHR
//SORTWK01   DD   UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK02   DD   UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK03   DD   UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK04   DD   UNIT=SYSDA,SPACE=(CYL,(1,1))
//SORTWK05   DD   UNIT=SYSDA,SPACE=(CYL,(1,1))
/*
//
```

NOTE: Printed output requires 65 lines of print.
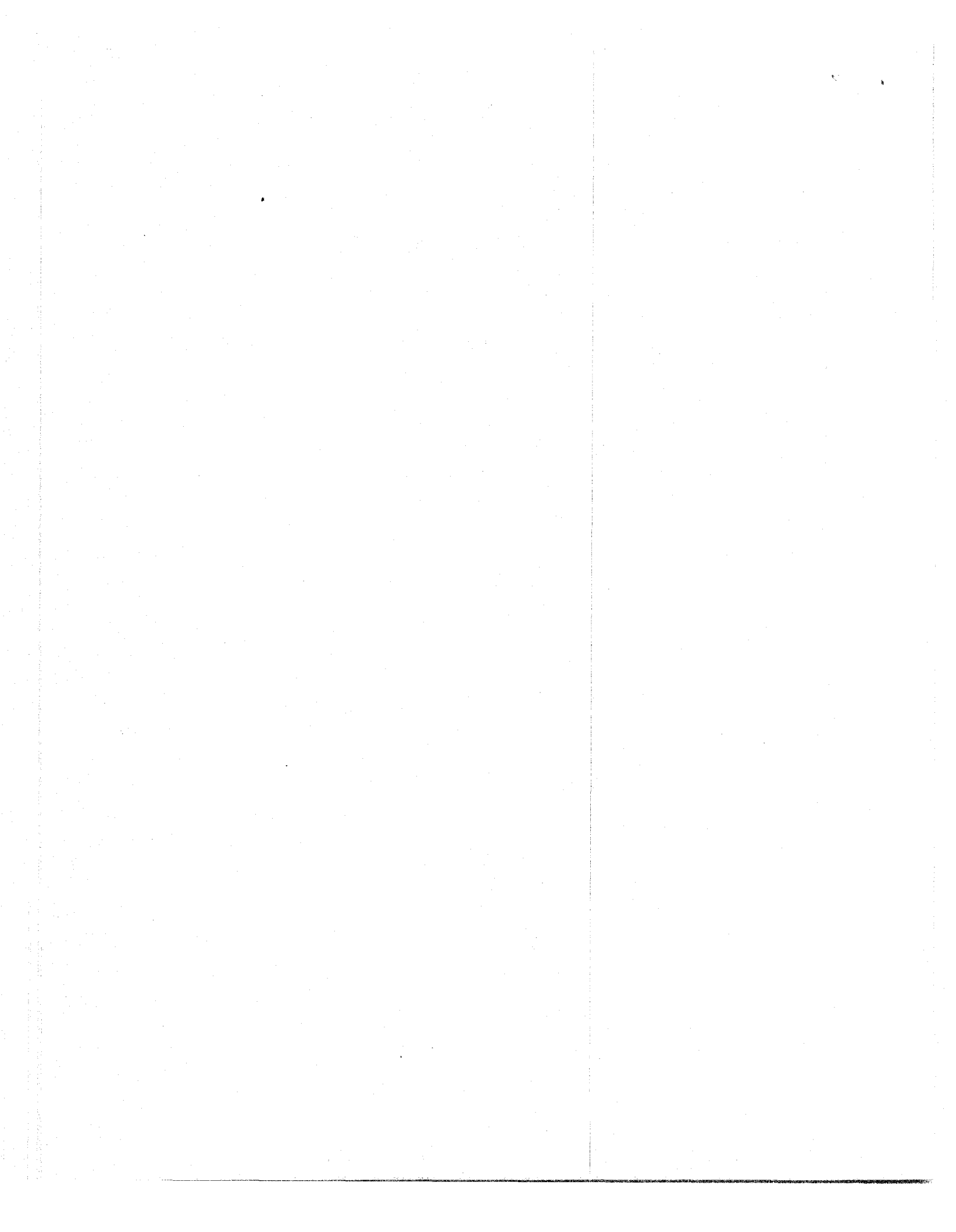
APPENDIX A

EDIT SPECIFICATIONS FOR HPMS SAMPLED DATA

The following specifications are to be met when editing the HPMS inventory data:

1. One asterisk (*) indicates items which may be optionally reported through the MFRS, as described in the HPMS/MFRS Coordination Section in Chapter I. The indicated items must contain zeroes, except for Functional Class (Item 8) and 1978 ADT (Item 36). We have requested that Items 8 and 36 be completed even if this option is selected, so that the edit and summary programs developed can be utilized to the maximum extent possible.

2. Two asterisks (**) indicate that when the MFRS option is selected, the following should be noted:

   a. The edits for Items 22, 24, 25, 49, 50, 51, and 52 (Rural) will be limited due to Item 21, Surface Type, not being reported.

   b. Items 15 and 52 (Urban) will be limited since Functional Class may not be reported.

DATA ITEM	EDIT TO BE PERFORMED
1 - Year	Must equal 78 for this submittal.
2 - State Code	Must match State code on edit program parameter control card.
3 - Type of Section ID	Must contain a value from 1 to 3.
4 - Section ID	Must be a nonzero alphanumeric and must be unique to this section on a countywide basis.
5 - Segment	Must be zero for this submittal.
* 6 - County Code	Must contain a nonzero numeric value.
7 - Urbanized Area Code (Urban Only)	Must contain a value from 001 to 291, 400-500, or "999".

* 8 – Functional Class	Rural: Must equal one of the following: "01", "02", "06", "07", "08". Urban: Must contain a value from 11 to 17.
* 9 – Federal-Aid System	Must equal one of the following: Rural: "1", "2", "4", "8". Urban: "1", "2", "3", "8".
*10 – Jurisdictional Responsibility	Must contain a value from 1 to 4.
11 – Section Length	Must contain a nonzero numeric entry.
*12 – Access Control	Must contain a value from 1 to 3.
13 – Number of Through Lanes	Rural: Should contain a value from 01 to 10. Urban: Should contain a value from 01 to 14.
14 – Lane Width	Should contain a value from 07 to 15.
**15 – Approach Width	If Item 8 > 13, this item should contain a value from 007 to 100. Otherwise, it must contain "000".
16 – Median Width	Must contain a numeric value. If Item 13 $\leq$ 2, this item should contain "00".
17 – Median Type	If Item 16 > 00, this item must contain a value from 1 to 3. Otherwise, it must contain "4".

18 – Shoulder Width
   a. Right
   b. Left
	The right shoulder should contain a value from 00 to 12. If Item 16 = 00, left shoulder must be 00, otherwise left shoulder should contain a value from 00 to 12.

19 - Shoulder Type	If Item 18a > 0, this item must contain a value from 1 to 3. Otherwise, it must contain "4" or "5".
20 - Drainage Adequacy	Must contain a value from 1 to 3.
*21 - Surface Type	Must contain one of the following: "30", "40", a value from 51 to 53, "60", "70", "80". If Item 8 is "11" or "01", this item should contain a value from 60 to 79. (MFRS detailed codes will be accepted by the edit.)
**22 - Pavement Section	If Item 21 > 49, this item must contain a value from 1 to 5. Otherwise, it must contain "0".
23 - Structural Number or Slab Thickness	a. If Item 22 contains "1", this item should contain a value from 10 to 60. b. If Item 22 contains "2", this item should contain a value from 06 to 12. c. If Item 22 does not contain "1" or "2", this item must contain "00".
**24 - Pavement Condition	If Item 21 > 49, this item must contain a value from 01 to 50. Otherwise, it must contain "00".
**25 - Skid Resistance	Urban: Must be in the range 20-80 or "00". Rural: If Item 21 > 49, this item must be in the range 20-80 or "00". Otherwise, it must be "00".
26 - Number of Grade- Separated Interchanges	Must contain a numeric value.
27 - Number of At-Grade Intersections with Public Facilities with: a. Signals b. Stop Signs c. Other or No Controls	 Must contain a numeric value. Must contain a numeric value. Must contain a numeric value.

28 – Prevailing Type of Signalization (Urban)	If Item 27a > 00, this item must contain a value from 1 to 3. Otherwise, it must contain "4".
29 – Typical Percent Green Time (Urban)	Must contain a numeric value and should be < 86. If Item 27a > 00, this item must not = 00.
30 – Number of Major Commercial/Industrial/ Recreational Access Points	Must contain a numeric value or be coded with the range codes R1 – R6.
31 – Type of Development (Rural Only)	Must be coded 1 or 2.
32 – Urban Location (Urban Only)	Must contain a value from 1 to 5.
33 – Terrain (Rural Only)	Must contain a value from 1 to 3.
*34 – Existing Right-of-Way Width	Should contain a value $\geq$ 15.
35 – Is Widening Feasible?	Must contain a value from 1 to 5.
*36 – 1978 ADT	Must contain a nonzero numeric value.
37 – Percent Trucks	
a. Peak Period	Must be numeric and should contain a value < 45.
b. Off Peak	Must be numeric and should contain a value < 45.
38 – K Factor	Must be numeric and should contain a value from 01 to 24.

39 – Directional Factor	Urban: a. If Item 40 contains "1", "3", "5", or "7", this item must contain "100". b. If Item 40 contains "2", "4", "6", "8", "9", or "10", this item should contain a value from 050 to 075. Rural: Should contain a value from 050 to 075 or 100.
40 – Type of Operation (Urban Only)	Must contain a value from 1 to 10 ("0" code is changed to 10).
41 – Parking (Urban Only) a. Peak Period b. Off Peak	 Must contain a value from 1 to 3. Must contain a value from 1 to 3.
42 – Capacity a. Peak Period b. Off Peak	 Rural – Must contain "000000" or must contain a nonzero numeric entry meeting the following conditions: (1) When item 13 = 3, it should contain a value < 4,000. (2) Otherwise, it should contain a value $\leq$ Item 13 x 1,000. Urban – Must contain a nonzero numeric entry $\leq$ Item 13 x 1,000. Must contain a nonzero numeric entry $\leq$ Item 13 x 1,000.
43 – 2000 ADT	Must contain a nonzero numeric entry.
44 – Number of Structures	Must contain a numeric value.
45 – Number of At-Grade Railroad Crossings	Must contain a numeric value.
46 – ADT Volume Group Identifier	Must contain a nonzero numeric value. For States using the FHWA developed approach, the number must be < 10. The 1978 ADT for this section must correspond to this volume group number for the ADT ranges outlined in the FHWA Manual.

47 - Expansion Factor	Must contain a value $\geq$ 0100.
48 - Speed Limit	Must contain a value from 15 to 56.
**49 - Percent of Length with Sight Distance $\geq$ 1500 feet (Rural Only)	If Item 21 > 49 and Item 13 = 2, this item should be in the range 010 to 100. Otherwise, it should contain "000".
**50 - Horizontal Alignment Adequacy (Rural Only)	If Item 21 > 49 and Item 53 is omitted, this item must contain a value from 1 to 4. Otherwise, it must contain a numeric value $\leq$ 4.
**51 - Vertical Alignment Adequacy (Rural Only)	If Item 21 > 49 and Item 54 is omitted, this item must contain a value from 1 to 4. Otherwise, it must contain a numeric value $\leq$ 4.
**52 - Average Highway Speed	Rural: a. If Item 8 > 6 and Item 21 > 49 and Item 31 = 1 and Item 53 is omitted, this item should contain a value from 35 to 70. b. If Item 8 > 6 and Item 21 > 49 and Item 31 = 2 and Item 53 is omitted, this item should contain a value from 35 to 70 or "00". c. If Item 8 < 7 and Item 21 > 49 and Item 53 is omitted, this item should contain a value from 35 to 70, otherwise, d. When Item 21 > 49, this item should be "00" or 35 to 70. Urban: If Item 8 = 11, 12, or 13, and Item 53 is omitted, this item must contain a numeric value which should be from 35 to 70. Otherwise, this item should contain "00".

The following edits apply to optional data Items 53, 54, 55, and 56, which may or may not be provided.

53 - Curves by Class	The number of curves field and curve length field must contain a numeric value for each curvature class. If the number of curves is > 0, the corresponding curve length field must contain a nonzero numeric value. If the number of curves equal "00", the corresponding curve length field must contain "000". The sum of the curve length fields must be ≤ section length.
54 - Grades by Class	The number of grades field and length field must contain a numeric value for each gradient class. If the number of grades is > 0, the corresponding length of grade field must contain a nonzero numeric value. If the number of grades equals 0, the corresponding length of grade field must contain "000". The sum of the grade lengths must approximately equal the section length.
55 - Bridge Identification Numbers	The number of ID's must equal the number of structures coded in Item 44.
56 - At-Grade Railroad Crossing Identification Numbers	The first six positions of each crossing ID must be a numeric value. The seventh character must be alphabetic. The number of ID's must = number of crossings coded in Item 45.

CROSS EDITS

Items 57, 8

If Rural/Urban Code = 1, then functional class is between 11 and < 17.

If Rural/Urban Code = 2, then functional class = "01", "02", "06", "07", or "08".

Items 8, 9

If Federal-Aid = 1, then functional class = "01" or "11".

APPENDIX B

DATA ITEM NUMBERS

NO.	REQUIRED FIELD LENGTH	NAME
1	2	Year
2	2	State Code
3	1	Type of Section ID
4	12	Section ID
5	1	Segment
6	3	County Code
7	3	Urbanized Area Code
8	2	Functional Class Code
9	1	Federal-Aid System
10	1	Jurisdictional Responsibility
11	4	Section Length
12	1	Access Control
13	2	Number of Through Lanes
14	2	Lane Width
15	3	Approach Width
16	2	Median Width
17	1	Median Type
18-A	2	Right Shoulder Width
18-B	2	Left Shoulder Width
19	1	Shoulder Type
20	1	Drainage Adequacy
21	2	Surface Type
22	1	Pavement Section
23	2	Structural Number or Slab Thickness
24	2	Pavement Condition
25	2	Skid Resistance
26	2	Number of Grade-Separated Interchanges
27-A	2	Number of At-Grade Intersections with Signals
27-B	2	Number of At-Grade Intersections with Stop Signs
27-C	2	Number of At-Grade Intersections with Other or No Controls
28	1	Prevailing Type of Signalization (Urban Only)
29	2	Typical Percent Green Time (Urban Only)
30	2	Number of Major Commercial/Industrial/ Recreational Access Points

NO.	REQUIRED FIELD LENGTH	NAME
31	1	Type of Development (Rural Only)
32	1	Urban Location (Urban Only)
33	1	Terrain (Rural Only)
34	3	Existing Right-of-Way Width
35	1	Is Widening Feasible?
36	6	1978 ADT
37-A	2	Peak Period Percent Trucks
37-B	2	Off Peak Percent Trucks
38	2	K Factor
39	3	Directional Factor
40	2 1/	Type of Operation (Urban Only)
41-A	1	Peak Period Parking (Urban Only)
41-B	1	Off Peak Parking (Urban Only)
42-A	5	Peak Period Capacity
42-B	5	Off Peak Capacity (Urban Only)
43	6	2000 ADT
44	2	Number of Structures
45	2	Number of At-Grade Railroad Crossings
46	2	ADT Volume Group Identifier
47	4	Expansion Factor
48	2	Speed Limit
49	3	Percent of Length with Sight Distance $\geq$ 1500 feet (Rural Only)
50	1	Horizontal Alignment Adequacy (Rural Only)
51	1	Vertical Alignment Adequacy (Rural Only)
52	2	Average Highway Speed

1/
The data code of "0" is recoded to "10" on the data tape and therefore
all other codes must be two digits.

NO.	NAME
	CURVES BY CLASS (5 characters required)

53-A	Number and Length of Curves from	0.5° to 1.4°
53-B	"	1.5° to 2.4°
53-C	"	2.5° to 3.4°
53-D	"	3.5° to 4.4°
53-E	"	4.5° to 5.4°
53-F	"	5.5° to 6.9°
53-G	"	7.0° to 8.4°
53-H	"	8.5° to 10.9°
53-I	"	11.0° to 13.9°
53-J	"	14.0° to 19.4°
53-K	"	19.5° to 27.9°
53-L	"	28° +

GRADES BY CLASS (5 characters required)

54-A	Number and Length of Grades from	0.0 to 0.4%
54-B	"	0.5 to 2.4%
54-C	"	2.5 to 4.4%
54-D	"	4.5 to 6.4%
54-E	"	6.5 to 8.4%
54-F	"	8.5 + %

NO.   NAME

BRIDGE ID NUMBERS (15 characters required)

55-01   The exact ID code for the first Bridge ID on the file
55-02   "   "   "   "   "   " second   "   " "   "   "

55-23   "   "   "   "   "   "   23rd   "   " "   "   "

55-99   "   "   "   "   "   "   99th   "   " "   "   "

At-GRADE RAILROAD CROSSING ID NOS. (7 characters required)

56-01   The exact ID Code for the first RR x'ing ID on the file
56-02   "   "   "   "   "   " second   "   "   "   "   "   "

56-11   "   "   "   "   "   "   11th   "   "   "   "   "   "

56-15   "   "   "   "   "   "   15th   "   "   "   "   "   "

APPENDIX C

HPMS Record Format

Part I: All Sections

Position	Item	Length			Rural Only	Urban Only
1	57	1		*Rural/Urban Code		
2-3	1	2		Year		
4-5	2	2		State Code		
6	3	1		Type of Section ID		
7-9	6	3		County Code		
10-21	4	12		Section ID		
22	5	1		Segment (Precoded: 0)		
23-25	7	3		Urban Area Code		✓
26-27	8	2		Functional Class		
28-29	46	2		Volume Group Identifier		
30	9	1		Federal-Aid System		
31	10	1		Jurisdictional Responsibility		
32-35	11	4 (xx.xx)		Section Length		
36-39	47	4 (xx.xx)		Expansion Factor		
40	12	1		Access Control		
41-42	13	2		Number of Through Lanes		
43-44	14	2		Lane Width		
45-47	15	3		Approach Width		✓
48-49	16	2		Median Width		
50	17	1		Median Type		
51-54	18A&B	4		Shoulder Width (Right A, Left B)		
55	19	1		Shoulder Type		
56	20	1		Drainage Adequacy		
57-58	21	2		Surface Type		
59	22	1		Pavement Section		
60-61	23	2		Structural Number		
62-63	24	2 (x.x)		Pavement Condition		
64-65	25	2		Skid Resistance		
66-67	26	2		Number Grade-Separated Interchanges		
68-69	27A	2		At-Grade Intersections: Signals		
70-71	27B	2		Stop Signs		
72-73	27C	2		Other or None		
74	28	1		Prevailing Type of Signalization		✓
75-76	29	2		% Green Time		✓
77-78	30	2		Number Entrances/Exits		
79	31	1		Type of Development		
80	32	1		Urban Location	✓	✓
81	33	1		Terrain	✓	
82-84	34	3		Existing Right-of-Way		
85	35	1		Is Widening Feasible?		
86-91	36	6		1978 ADT		
92-93	37A	2		% Trucks: Peak		
94-95	37B	2		Off-Peak		
96-97	38	2		K-Factor		
98-100	39	3		Directional Factor		

*Column 79 Card 1 on worksheets 1-Urban; 2-Rural

Position	Item	Length		Rural Only	Urban Only
101-102	40	2	*Type of Operation		✔
103	41A	1	Parking: Peak		✔
104	41B	1	Off-Peak		✔
105-109	42A	5	Capacity: Peak		
110-114	42B	5	Off-Peak		✔
115-120	43	6	2000 ADT		
121-122	44	2	Number Structures		
123-124	45	2	Number of At-Grade R.R. Crossings		
125-126	48	2	Speed Limit		
127-129	49	3	PSD ≥ 1500	✔	
130	50	1	Horizontal Alignment	✔	
131	51	1	Vertical Alignment	✔	
132-133	52	2	Average Highway Speed		
134-139	-	6	Continuation Code for Optional Data (6-positions coded zero; No optional data)		

*Type of Operation coded "0" is coded "10" on the tape record.

A State not submitting any of the optional data (cards 3-6) would submit data in the above 139 character record format with position 134-139 always coded "000000".

Part II - Sections with Optional Data Items Being Provided

A State submitting any of the optional data (cards 3-6) will have a
variable record format determined on an individual section basis. The
record would consist of the 133 characters formatted as in Part I plus
the codes to indicate which optional data is being provided and any
combination of the optional data. If none of the optional data being
submitted exists for a section, the record would contain the 139 fixed
characters only. The length of the variable record would have a
minimum of 139 characters and a maximum of 1819 characters.

In the variable length record format, positions 134-139 are fixed with
the remaining positions in the record depending on which optional data
is being submitted and exists for a section. These fixed positions
are coded as:

Position

134	Indicates curve data provided for section (0-No; 1-Yes)
135	Indicates grade data provided for section (0-No; 1-Yes)
136-137	Indicates bridge ID data provided for section (00-None; > 00 = # of ID's)
138-139	Indicates crossing ID data provided for section (00-None; > 00 = # of ID's)

The remaining part of the record will vary in the number of characters
from 7-1680 depending on the combinations of the optional data and the
number of bridge ID's and/or the number of at-grade crossing ID's. If
all optional data are provided, the data will be in the following order:

Item 53,	Curves by Class	60 characters
Item 54,	Grades by Class	30 characters
*Item 55,	Bridge ID's	15-1485 characters
*Item 56,	At-Grade Crossing ID's	7-105 characters

> *The record is designed to allow for 0-99 bridge ID's per
> section and/or 0-15 at-grade crossing ID's.

Any combination of the optional data would use the ordering given above
for the placement of the data in the section record, e.g., Item 53,
Item 56; Item 54, Item 55, Item 56; or Item 55, Item 56.

The following examples illustrate some of the different possibilities
for a State submitting optional data:

A State is submitting curve data for Interstate only, rural and
urban, and bridge ID's for all applicable sections.

a. The variable part of the record for an Interstate section
with three bridges would be:

Position

134	Coded "1"
135	Coded "0"
136-137	Coded "03"
138-139	Coded "00"
140-199	Curve data
200-244	Three bridge ID's

The record length for the section is 244 characters.

b. The record for a minor collector section with no bridges would consist of the 139 fixed characters with zero coded in the 134-139th positions. The section record would not contain any of the optional information since the State is providing curve data for Interstate sections only and the section has no bridges.

c. The variable part of the record for an Interstate section with no bridges would be:

Position

134	Coded "1"
135	Coded "0"
136-137	Coded "00"
138-139	Coded "00"
140-199	Curve data

The record length for the section is 199 characters.

d. The variable part of the record for a minor arterial section with 10 bridges would be:

Position

135	Coded "0"
136	Coded "0"
137	Coded "10"
138-139	Coded "00"
140-289	Ten bridge ID's

The record length for the section is 289. The section has no curve data since it is not an Interstate section.

APPENDIX D

SAMPLE PRINTED OUTPUT

DATE:08/28/79   STATE: TFST HPMS

H P M S   V O L U M E   G R O U P   S U M M A R Y

AREA: RURAL   FUNCTIONAL CLASS 02

VOLUME GROUP	NUM SECTIONS	SAMPLED MILEAGE	EXPANDED MILEAGE
1	0	0.00	0.00
2	45	90.10	1951.02
3	1	4.00	2.00
4	0	0.00	0.00
5	0	0.00	0.00
6	4	8.00	176.80
7	0	0.00	0.00
8	0	0.00	0.00
9	0	0.00	0.00
10	0	0.00	0.00
* >10	1	2.00	44.20
***	0	0.00	0.00
TOTALS	51	104.10	2174.02

*   ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

***   SECTIONS WHICH HAVE A NONNUMERIC VOLUME GROUP NUMBER OR = 00.

NUMBER SECTIONS WITH SECTION LENGTH OR EXPANSION FACTOR NOT NUMERIC OR = ZERO: 2

FINAL SUMMARY SEND TO HHP-12 FHWA WITH HPMS DATA TAPE AND FINAL EDIT.

Sample Printout Volume Group Summary Table

USER SUPPLIED PARAMETER CARDS

ISTATE= TEST HPMS /99/
SELDEV=RU,REQOPT,CURVES,GRADES,BRIDID,CROSSID
FUNCUR=06,02,12,16
FUNGRD=06,16,02
SELEDT=RU,FHWADESIGN
SELTAB=RU,DVMTMILE

ALL USER SUPPLIED CARDS PROCESSED. NO ERRORS WERE DETECTED.

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA: RURAL   FUNCTIONAL CLASS 01

VOLUME GROUP	NUMBER OF SECTIONS			MILEAGE SECTIONS ADDED	
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	0	1	1	4.10	86.10
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	0	1	1	4.10	86.10

*   ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

***   SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA: RURAL   FUNCTIONAL CLASS 02

| VOLUME GROUP | NUMBER OF SECTIONS | | | MILEAGE SECTIONS ADDED | |
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	0	0	0	0.00	0.00
3	0	1	1	4.00	2.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	1	1	2.00	44.20
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	1	0	1	0.00	0.00
TOTAL	1	2	3	6.00	46.20

*   ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

***   SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

D-4

DATE:08/30/79   STATE: TEST HPMS

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELUP TAPE

AREA: RURAL   FUNCTIONAL CLASS 03

VOLUME GROUP	N U M B E R O F S E C T I O N S			MILEAGE SECTIONS ADDED	
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	0	1	1	2.00	44.20
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	0	1	1	2.00	44.20

*   ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA: RURAL   FUNCTIONAL CLASS 06

VOLUME GROUP	NUMBER OF SECTIONS			MILEAGE SECTIONS ADDED	
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	0	0	0	0.00	0.00
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	1	1	2	2.00	44.20
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	1	1	2	2.00	44.20

* ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

H P M S V O L U M E G R O U P S U M M A R Y

DEVELOP TAPE

AREA: RURAL   FUNCTIONAL CLASS 07

VOLUME GROUP	N U M B E R O F S E C T I O N S			MILEAGE SECTIONS ADDED	
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	0	0	0	0.00	0.00
3	0	1	1	2.35	18.94
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	0	1	1	2.35	18.94

*   ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA: URBANIZED 070   FUNCTIONAL CLASS 11

VOLUME GROUP	NUMBER OF SECTIONS			MILEAGE SECTIONS ADDED	
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	0	0	0	0.00	0.00
3	0	1	1	0.95	21.89
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
● >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	0	1	1	0.95	21.89

* ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA: URBANIZED 074   FUNCTIONAL CLASS 11

| VOLUME GROUP | NUMBER OF SECTIONS | | | MILEAGE SECTIONS ADDED | |
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	0	0	0	0.00	0.00
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	1	1	0.00	0.00
TOTAL	0	1	1	0.00	0.00

*   ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

***   SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

DATE:C6/30/79   STATE: TEST HPMS

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA: URBANIZED 070   FUNCTIONAL CLASS 12

VOLUME GROUP	N U M B E R O F S E C T I O N S			MILEAGE SECTIONS ADDED	
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	1	0	1	0.00	0.00
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	1	0	1	0.00	0.00

* ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA: URBANIZED   070   FUNCTIONAL CLASS 14

VOLUME GROUP	NUMBER OF SECTIONS			MILEAGE SECTIONS ADDED	
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	0	0	0	0.00	0.00
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	1	1	0.95	21.89
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	0	1	1	0.95	21.89

* ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

H P M S V O L U M E G R O U P S U M M A R Y

DEVELOP TAPE

AREA: URBANIZED 070   FUNCTIONAL CLASS 13

VOLUME GROUP	NUMBER OF SECTIONS			MILEAGE SECTIONS ADDED	
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	0	0	0.00	0.00
2	1	0	1	0.00	0.00
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	1	0	1	0.00	0.00

* ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

DATE:08/30/79   STATE: TEST HPMS

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA: URBANIZED 070   FUNCTIONAL CLASS 17

VOLUME GROUP	NUMBER OF SECTIONS REJECTED	ADDED	TOTAL	MILEAGE SECTIONS ADDED SAMPLED	EXPANDED
1	0	1	1	0.30	2.40
2	0	0	0	0.00	0.00
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	0	1	1	0.30	2.40

* ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

H P M S   V O L U M E   G R O U P   S U M M A R Y

DEVELOP TAPE

AREA:SMALL URBAN   FUNCTIONAL CLASS 12

| VOLUME GROUP | NUMBER OF SECTIONS | | | MILEAGE SECTIONS ADDED | |
	REJECTED	ADDED	TOTAL	SAMPLED	EXPANDED
1	0	1	1	0.85	22.95
2	0	0	0	0.00	0.00
3	0	0	0	0.00	0.00
4	0	0	0	0.00	0.00
5	0	0	0	0.00	0.00
6	0	0	0	0.00	0.00
7	0	0	0	0.00	0.00
8	0	0	0	0.00	0.00
9	0	0	0	0.00	0.00
10	0	0	0	0.00	0.00
* >10	0	0	0	0.00	0.00
***	0	0	0	0.00	0.00
TOTAL	0	1	1	0.85	22.95

* ALL VOLUME GROUP NUMBERS > 10. VERIFY FUNCTIONAL CLASS HAS >10 VOLUME GROUPS.

*** SECTION HAS INVALID VOLUME GROUP NUM OR SECTION LENGTH OR EXP FACT OR CARD 2 MISSING.

NOTE: A SECTION REJECTED FOR AN INVALID CODE IN COLUMN 79, CARD 1, IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH DID NOT HAVE A REQUIRED CARD 1 IS NOT COUNTED IN ANY VOL GRP SUMMARY TABLE.

NOTE: A SECTION WHICH HAS AN INVALID CARD NUM FOR THE SPECIFIED TAPE FORMAT IS NOT COUNTED IN ANY VOL GRP SUMMARY TAB.

DATE:08/30/79   STATE: TEST HPMS

H P M S   D A T A   T A P E   S U M M A R Y

DEVELOP TAPE

RURAL/URBAN

RECORD FORMAT: REQUPT

OPTIONAL DATA INCLUDED(CARDS 3-6):   CURVES   GRADES   BRIDGES   XINGS

NUMBER SECTIONS ADDED: URBAN   5   RURAL   6

NUMBER SECTIONS REJECTED: URBAN   2   RURAL   2   WRONG RUCODE   0

NUMBER CARDS WITH INVALID CARD NUMBER: 0

NUMBER SECTIONS WITH CARD1 MISSING: 1

DATE:08/33/79   STATE: TEST HPMS

H P M S   M I L E A G E   A N D   D V M T   S U M M A R Y   T A B L E

BY FUNCTIONAL CLASS

AREA: RURAL

FC	NUM SECTIONS	SAMPLED MILEAGE	EXPANDED MILEAGE	1978 DVMT (100'S)	2000 DVMT (100'S)	AVG SECT LGTH	# SECT LGTH < .3
01	1	4.10	86.10	23247.0	26260.5	4.10	0
02	2	6.00	46.20	14000.0	15366.0	3.00	0
06	1	2.00	44.20	13260.0	14586.0	2.00	0
07	1	2.35	18.94	1041.7	1079.5	2.35	0
08	0	0.03	0.00	0.0	0.0	0.00	0
***	1	2.00	44.20	13260.0	14586.0	2.00	0
OTALS	6	16.45	239.64	64808.7	71878.0	2.74	0

***   SECTIONS WHICH HAVE AN INVALID FUNCTIONAL CLASS CODE.

NUMBER SECTIONS WITH NON-NUMERIC OR ZERO SECTION LENGTH, EXPANSION FACTOR, 1978 ADT OR 2000 ADT: 0

WORK SUMMARY FOR STATE

DATE:08/30/79   STATE: TEST HPMS

H P M S   M I L E A G E   A N D   D V M T   S U M M A R Y   T A B L E

BY FUNCTIONAL CLASS

AREA: URBANIZED OTO

FC	NUM SECTIONS	SAMPLED MILEAGE	EXPANDED MILEAGE	1978 DVMT (100'S)	2000 DVMT (100'S)	AVG SECT LGTH	# SECT LGTH < .1
11	1	0.95	21.89	5691.4	6567.0	0.95	0
12	0	0.00	0.00	0.0	0.0	0.00	0
13	0	0.00	0.00	0.0	0.0	0.00	0
14	1	0.95	21.89	5691.4	6567.0	0.95	0
15	0	0.00	0.00	0.0	0.0	0.00	0
16	0	0.00	0.00	0.0	0.0	0.00	0
17	0	0.00	0.00	0.0	0.0	0.00	0
### OTALS	2	1.90	43.78	11382.8	13134.0	0.95	0

SECTIONS WHICH HAVE AN INVALID FUNCTIONAL CLASS CODE.

NUMBER SECTIONS WITH NON-NUMERIC OR ZERO SECTION LENGTH, EXPANSION FACTOR, 1978 ADT OR 2000 ADT: 1.

WORK SUMMARY FOR STATE

DATE:08/30/79   STATE: TEST HPMS

H P M S   M I L E A G E   A N D   D V M T   S U M M A R Y   T A B L E

BY FUNCTIONAL CLASS

AREA: URBANIZED 074

FC	NUM SECTIONS	SAMPLED MILEAGE	EXPANDED MILEAGE	1978 DVMT (100'S)	2000 DVMT (100'S)	AVG SECT LGTH	# SECT LGTH < .1
11	0	0.00	0.00	0.0	0.0	0.00	0
12	0	0.00	0.00	0.0	0.0	0.00	0
13	0	0.00	0.00	0.0	0.0	0.00	0
14	0	0.00	0.00	0.0	0.0	0.00	0
15	0	0.00	0.00	0.0	0.0	0.00	0
16	0	0.00	0.00	0.0	0.0	0.00	0
17	0	0.00	0.00	0.0	0.0	0.00	0
*** TOTALS	0	0.00	0.00	0.0	0.0	0.00	0

***   SECTIONS WHICH HAVE AN INVALID FUNCTIONAL CLASS CODE.

NUMBER SECTIONS WITH NON-NUMERIC OR ZERO SECTION LENGTH, EXPANSION FACTOR, 1978 ADT OR 2000 ADT: 1

WORK SUMMARY FOR STATE

H P M S   M I L E A G E   A N D   D V M T   S U M M A R Y   T A B L E

BY FUNCTIONAL CLASS

AREA: SMALL URBAN

FC	NUM SECTIONS	SAMPLED MILEAGE	EXPANDED MILEAGE	1978 DVMT (100'S)	2000 DVMT (100'S)	AVG SECT LGTH	# SECT LGTH < .1
11	0	0.00	0.00	0.0	0.0	0.00	0
12	1	0.85	22.95	4131.0	5049.0	0.85	0
13	0	0.00	0.00	0.0	0.0	0.00	0
14	0	0.00	0.00	0.0	0.0	0.00	0
15	0	0.00	0.00	0.0	0.0	0.00	0
16	0	0.00	0.00	0.0	0.0	0.00	0
17	0	0.00	0.00	0.0	0.0	0.00	0
***							0
TOTALS	1	0.85	22.95	4131.0	5049.0	0.85	0

***   SECTIONS WHICH HAVE AN INVALID FUNCTIONAL CLASS CODE.

NUMBER SECTIONS WITH NON-NUMERIC OR ZERO SECTION LENGTH, EXPANSION FACTOR, 1978 ADT OR 2000 ADT: 0

WORK SUMMARY FOR STATE

LISTING OF REJECTED SECTIONS OR CARD
RURAL/URBAN

CARD NUM	CODED DATA	LOCATION	ERROR
1	720 204050070022300C021422101066116030036500000BB0002111803000000334121	35	CARD 2 MISSING FOR SECTION
1	8001706210200204123610808116040031400100000010011160403000010010421	48	CARD3 OR 4 MISSING FC LISTED
2	801205C03960030000001506221050000000000000000000000000000000000002	49	
4	800101501005000000000000000000000000000000000000000000000000000004	50	CHECK FC LIST FOR CUR/GRD
1	210999070122100951041200040306061170030320010000004000322040011	59	
2	2100260CC06041305523303760C384C030000010000223055650000000000002	60	
3	2103009000000000000000000000000000000000000000000000000000000003	61	
4	21000000000006400600000001003 0C00000000000000000000000000000004	62	
5	2103BRIDGE 1 5	63	
2	78991SHORT SEC502002600C6041305523303760038400366117030032000100000400203222040011	64	CARD 1 MISSING FOR SECTION
1	3109990701321009510412000403066117030032C001000000022305555650000000000002	68	CHECK FC LIST FOR CUR/GRD
2	31002600C06041305523303760C38400300000000000000000000000000000000003	69	
3	31003010C000000000000000000000000000000000000000000000000000000003	70	
4	310000000000004006000000010030000000000000000000000000000000000004	71	

(All rows above have CARD NUM listing showing 78991 for each section)

D-20

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6): 001   SECTION ID(ITEM 4):   __555__777_2__   SEGMENT(ITEM5): 0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	1	19	SHOULDER TYPE	1	36	1978 ADT	018000
1	YEAR	78	20	DRAINAGE ADEQUACY	2	37-A	% TRUCKS: PEAK	02
2	STATE CODE	35	21	SURFACE TYPE	60	37-B	OFF PEAK	04
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	4	38	K-FACTOR	25
7	URBAN AREA CODE	070	23	STRUCTURAL NUMBER	02	39	DIRECTIONAL FACTOR	055
8	FUNCTIONAL CLASS	17	24	PAVEMENT CONDITION	51	40	TYPE OPERATION	02
46	VOLUME GROUP IDENTIFIER	01	25	SKID RESISTANCE	00	41-A	PARKING: PEAK	3
9	FEDERAL-AID SYSTEM	3	26	NUM GRADE-SEPARATED INTERCH	00	41-B	OFF PEAK	0
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	02	42-A	CAPACITY: PEAK	00800
11	SECTION LENGTH	0030	27-B	STOP SIGNS	00	42-B	OFF PEAK	00750
47	EXPANSION FACTOR	0800	27-C	OTHER/NONE	01	43	2000 ADT	000000
12	ACCESS CONTROL	0	28	PREVAILING TYPE SIGNALIZATION	1	44	NUMBER STRUCTURES	00
13	NUMBER OF THROUGH LANES	02	29	% GREEN TIME	50	45	NUMBER AT-GRADE RR CROSSINGS	01
14	LANE WIDTH	09	30	NUMBER ENTRANCES/EXITS	00	48	SPEED LIMIT	40
15	APPROACH WIDTH	015	31	TYPE OF DEVELOPMENT	0	49	PSD > OR = 1500	000
16	MEDIAN WIDTH	00	32	URBAN LOCATION	0	50	HORIZONTAL ALIGNMENT	0
17	MEDIAN TYPE	4	33	TERRAIN	0	51	VERTICAL ALIGNMENT	0
18-A	SHOULDER WIDTH: RIGHT	00	34	EXISTING RIGHT-OF-WAY	060	52	AVERAGE HIGHWAY SPEED	40
18-B	LEFT	00	35	IS WIDENING FEASIBLE?	1	--	CONTINUATION CODE	000001

OPTIONAL DATA:
56-XING ID:1234567

ERRORS AND MESSAGES:

ITEM		
ITEM 2		STATE CODE DOES NOT MATCH STATE CODE ON PARAMETER CARD
ITEM 12		ACCESS CONTROL MUST CONTAIN A 1, 2, OR 3
ITEM 19, 18		SHOULDER TYPE CODE MUST BE 4 OR 5 WHEN ITEM 18-RIGHT SHOULDER- = 0
ITEM 23, 22		STRUCTURAL NUMBER MUST BE ZERO WHEN ITEM 22 NOT = 1 OR 2
ITEM 24, 21		PAVEMENT CONDITION MUST BE IN RANGE 01 TO 50 WHEN ITEM 21 > 49
ITEM 32	URBAN	URBAN LOCATION CODE MUST BE IN RANGE 1-5
ITEM 38		K FACTOR MUST BE NUMERIC AND SHOULD CONTAIN A VALUE IN THE RANGE 01-24. VERIFY
ITEM 41	URBAN	PARKING PEAK AND OFF-PEAK MUST BE 1, 2, OR 3
ITEM 43		2000 ADT MUST BE NON-ZERO NUMERIC
ITEM 46, 36		ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY
ITEM 52,8	URB	AHS SHOULD BE 00 WHEN ITEM 8 > 13. VERIFY
ITEM 56		AT-GRADE RR CROSSING ID MUST BE 6-DIGITS AND 1 ALPHABETIC

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6):   005   SECTION ID(ITEM 4):   1___3_2245C   SEGMENT(ITEM5):   0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	1	19	SHOULDER TYPE	1	36	1978 ADT	018000
1	YEAR	78	20	DRAINAGE ADEQUACY	2	37-A	% TRUCKS: PEAK	04
2	STATE CODE	99	21	SURFACE TYPE	60	37-B	OFF PEAK	05
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	1	38	K-FACTOR	14
7	URBAN AREA CODE	999	23	STRUCTURAL NUMBER	47	39	DIRECTIONAL FACTOR	050
8	FUNCTIONAL CLASS	12	24	PAVEMENT CONDITION	34	40	TYPE OPERATION	02
46	VOLUME GROUP IDENTIFIER	01	25	SKID RESISTANCE	00	41-A	PARKING: PEAK	3
9	FEDERAL-AID SYSTEM	2	26	NUM GRADE-SEPARATED INTERCH	00	41-B	OFF PEAK	3
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	01	42-A	CAPACITY: PEAK	02880
11	SECTION LENGTH	0085	27-B	STOP SIGNS	00	42-B	OFF PEAK	02850
47	EXPANSION FACTOR	2700	27-C	OTHER/NONE	00	43	2000 ADT	022000
12	ACCESS CONTROL	2	28	PREVAILING TYPE SIGNALIZATION	1	44	NUMBER STRUCTURES	00
13	NUMBER OF THROUGH LANES	04	29	% GREEN TIME	77	45	NUMBER AT-GRADE RR CROSSINGS	00
14	LANE WIDTH	12	30	NUMBER ENTRANCES/EXITS	00	48	SPEED LIMIT	55
15	APPROACH WIDTH	000	31	TYPE OF DEVELOPMENT	0	49	PSD > OR = 1500	000
16	MEDIAN WIDTH	24	32	URBAN LOCATION	4	50	HORIZONTAL ALIGNMENT	0
17	MEDIAN TYPE	3	33	TERRAIN	0	51	VERTICAL ALIGNMENT	0
18-A	SHOULDER WIDTH: RIGHT	C8	34	EXISTING RIGHT-OF-WAY	180	52	AVERAGE HIGHWAY SPEED	60
18-B	LEFT	06	35	IS WIDENING FEASIBLE?	4	--	CONTINUATION CODE	100000

OPTIONAL DATA:
53-CURVES: 00000 01001 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000

ERRORS AND MESSAGES:

   ITEM 46, 36   ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6): 017   SECTION ID(ITEM 4): _____41   SEGMENT(ITEM5): 0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	2	19	SHOULDER TYPE	1	36	1978 ADT	030000
1	YEAR	78	20	DRAINAGE ADEQUACY	1	37-A	% TRUCKS: PEAK	01
2	STATE CODE	99	21	SURFACE TYPE	60	37-B	OFF PEAK	04
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	4	38	K-FACTOR	12
7	URBAN AREA CODE	000	23	STRUCTURAL NUMBER	00	39	DIRECTIONAL FACTOR	050
8	FUNCTIONAL CLASS	03	24	PAVEMENT CONDITION	31	40	TYPE OPERATION	00
46	VOLUME GROUP IDENTIFIER	02	25	SKID RESISTANCE	40	41-A	PARKING: PEAK	0
9	FEDERAL-AID SYSTEM	2	26	NUM GRADE-SEPARATED INTERCH	01	41-B	OFF PEAK	0
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	00	42-A	CAPACITY: PEAK	03690
11	SECTION LENGTH	0200	27-B	STOP SIGNS	00	42-B	OFF PEAK	00000
47	EXPANSION FACTOR	2210	27-C	OTHER/NONE	01	43	2000 ADT	033000
12	ACCESS CONTROL	2	28	PREVAILING TYPE SIGNALIZATION	0	44	NUMBER STRUCTURES	02
13	NUMBER OF THROUGH LANES	04	29	% GREEN TIME	00	45	NUMBER AT-GRADE RR CROSSINGS	00
14	LANE WIDTH	12	30	NUMBER ENTRANCES/EXITS	00	48	SPEED LIMIT	50
15	APPROACH WIDTH	000	31	TYPE OF DEVELOPMENT	1	49	PSD > OR = 1500	000
16	MEDIAN WIDTH	36	32	URBAN LOCATION	0	50	HORIZONTAL ALIGNMENT	0
17	MEDIAN TYPE	1	33	TERRAIN	1	51	VERTICAL ALIGNMENT	0
18-A	SHOULDER WIDTH: RIGHT	08	34	EXISTING RIGHT-OF-WAY	160	52	AVERAGE HIGHWAY SPEED	50
18-B	LEFT	08	35	IS WIDENING FEASIBLE?	4	--	CONTINUATION CODE	000000

ERRORS AND MESSAGES:

ITEM 8	FUNCTIONAL CLASS CODE IS INVALID
ITEM 50,21,53 RURAL	HORIZONTAL ALIGNMENT MUST BE IN RANGE 1-4 WHEN ITEM 21 > 49 AND ITEM 53 IS NOT PROVIDED
ITEM 51,21,54 RURAL	VERTICAL ALIGNMENT MUST BE IN RANGE 1 TO 4 WHEN ITEM 21 > 49 AND ITEM 54 IS NOT PROVIDED
ITEM 52,8,21,31 RUR	VERIFY VALUE CODED ITEM 52; ITEM 8, 21 OR 31 IS IN ERROR
ITEM 57,8	RUR-URB CODE = 2; FUNCTIONAL CLASS CODE MUST BE 01,02,06,07 OR 08

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6): 104   SECTION ID(ITEM 4): CROSS EDIT01   SEGMENT(ITEM5): 0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	2	19	SHOULDER TYPE	4	36	1978 ADT	005500
1	YEAR	78	20	DRAINAGE ADEQUACY	2	37-A	% TRUCKS: PEAK	30
2	STATE CODE	99	21	SURFACE TYPE	54	37-B	OFF PEAK	35
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	0	38	K-FACTOR	15
7	URBAN AREA CODE	000	23	STRUCTURAL NUMBER	10	39	DIRECTIONAL FACTOR	100
8	FUNCTIONAL CLASS	07	24	PAVEMENT CONDITION	00	40	TYPE OPERATION	00
46	VOLUME GROUP IDENTIFIER	03	25	SKID RESISTANCE	10	41-A	PARKING: PEAK	0
9	FEDERAL-AID SYSTEM	4	26	NUM GRADE-SEPARATED INTERCH	00	41-B	OFF PEAK	0
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	02	42-A	CAPACITY: PEAK	03000
11	SECTION LENGTH	0235	27-B	STOP SIGNS	01	42-B	OFF PEAK	00000
47	EXPANSION FACTOR	0806	27-C	OTHER/NONE	00	43	2000 ADT	005700
12	ACCESS CONTROL	3	28	PREVAILING TYPE SIGNALIZATION	0	44	NUMBER STRUCTURES	03
13	NUMBER OF THROUGH LANES	02	29	% GREEN TIME	00	45	NUMBER AT-GRADE RR CROSSINGS	02
14	LANE WIDTH	11	30	NUMBER ENTRANCES/EXITS	10	48	SPEED LIMIT	50
15	APPROACH WIDTH	000	31	TYPE OF DEVELOPMENT	2	49	PSD > OR = 1500	000
16	MEDIAN WIDTH	00	32	URBAN LOCATION	0	50	HORIZONTAL ALIGNMENT	2
17	MEDIAN TYPE	2	33	TERRAIN	1	51	VERTICAL ALIGNMENT	2
18-A	SHOULDER WIDTH: RIGHT	10	34	EXISTING RIGHT-OF-WAY	042	52	AVERAGE HIGHWAY SPEED	30
18-B	LEFT	04	35	IS WIDENING FEASIBLE?	3	--	CONTINUATION CODE	000401

OPTIONAL DATA:
55-STRUC ID: BRIDGE   31 BRIDGE   32 BRIDGE   33 BRIDGE   34
56-XING ID:495644R

ERRORS AND MESSAGES:

ITEM 17, 16	MED TYPE CODE MUST BE 4 WHEN ITEM 16 = 0
ITEM 18, 16	LEFT SHOULDER WIDTH MUST BE ZERO WHEN ITEM 16 = 00
ITEM 19, 18	SHOULDER TYPE CODE MUST BE IN RANGE 1-3 WHEN ITEM 18-RIGHT SHOULDER- > 0
ITEM 21	SURFACE TYPE CODE IS INVALID
ITEM 22, 21	VERIFY VALUE CODED FOR ITEM 22; ITEM 21 IS IN ERROR
ITEM 23, 22	STRUCTURAL NUMBER MUST BE ZERO WHEN ITEM 22 NOT = 1 OR 2
ITEM 24, 21	VERIFY VALUE CODED FOR ITEM 24; ITEM 21 IS IN ERROR
ITEM 25, 21 RURAL	VERIFY VALUE CODED FOR ITEM 25; ITEM 21 IS IN ERROR
ITEM 42, 13 RURAL	CAPACITY SHOULD BE < OR = NUMBER LANES TIMES 1000 OR ZERO
ITEM 49, 21, 13	VERIFY VALUE CODED FOR ITEM 49; ITEM 21 OR 13 IN ERROR
ITEM 50, 21 RURAL	VERIFY VALUE CODED FOR ITEM 50; ITEM 21 IS IN ERROR
ITEM 51, 21 RURAL	VERIFY VALUE CODED FOR ITEM 51; ITEM 21 IS IN ERROR
ITEM 52,8,21,31 RUR	VERIFY VALUE CODED ITEM 52; ITEM 8, 21 OR 31 IS IN ERROR
ITEM 55,44	BRIDGE ID NUMBER OF ID'S MUST = NUMBER OF STRUCTURES, ITEM 44
ITEM 56,45	AT-GRADE RR CROSSING ID NUMBER OF ID'S MUST = NUMBER OF RR CROSSINGS, ITEM 45

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6): 193   SECTION ID(ITEM 4):   95 87675   SEGMENT(ITEM5): 0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	2	19	SHOULDER TYPE	1	36	1978 ADT	027000
1	YEAR	78	20	DRAINAGE ADEQUACY	2	37-A	% TRUCKS: PEAK	02
2	STATE CODE	99	21	SURFACE TYPE	60	37-B	OFF PEAK	04
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	3	38	K-FACTOR	12
7	URBAN AREA CODE	000	23	STRUCTURAL NUMBER	00	39	DIRECTIONAL FACTOR	050
8	FUNCTIONAL CLASS	01	24	PAVEMENT CONDITION	29	40	TYPE OPERATION	00
46	VOLUME GROUP IDENTIFIER	02	25	SKID RESISTANCE	00	41-A	PARKING: PEAK	0
9	FEDERAL-AID SYSTEM	1	26	NUM GRADE-SEPARATED INTERCH	02	41-B	OFF PEAK	0
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	00	42-A	CAPACITY: PEAK	03920
11	SECTION LENGTH	0410	27-B	STOP SIGNS	00	42-B	OFF PEAK	00000
47	EXPANSION FACTOR	2100	27-C	OTHER/NONE	00	43	2000 ADT	030500
12	ACCESS CONTROL	1	28	PREVAILING TYPE SIGNALIZATION	0	44	NUMBER STRUCTURES	02
13	NUMBER OF THROUGH LANES	04	29	% GREEN TIME	00	45	NUMBER AT-GRADE RR CROSSINGS	00
14	LANE WIDTH	12	30	NUMBER ENTRANCES/EXITS	00	48	SPEED LIMIT	55
15	APPROACH WIDTH	000	31	TYPE OF DEVELOPMENT	1	49	PSD > OR = 1500	000
16	MEDIAN WIDTH	30	32	URBAN LOCATION	0	50	HORIZONTAL ALIGNMENT	1
17	MEDIAN TYPE	3	33	TERRAIN	1	51	VERTICAL ALIGNMENT	1
18-A	SHOULDER WIDTH: RIGHT	08	34	EXISTING RIGHT-OF-WAY	200	52	AVERAGE HIGHWAY SPEED	60
18-B	LEFT	08	35	IS WIDENING FEASIBLE?	4	--	CONTINUATION CODE	000200

OPTIONAL DATA:
55-STRUC ID: 217369728452083 432198765432109

ERRORS AND MESSAGES:

   ITEM 46, 36   ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6):   700   SECTION ID(ITEM 4):   354 2172C   SEGMENT(ITEM5):   0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	2	19	SHOULDER TYPE	1	36	1978 ADT	037000
1	YEAR	78	20	DRAINAGE ADEQUACY	1	37-A	% TRUCKS: PEAK	01
2	STATE CODE	99	21	SURFACE TYPE	70	37-B	OFF PEAK	04
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	2	38	K-FACTOR	25
7	URBAN AREA CODE	000	23	STRUCTURAL NUMBER	00	39	DIRECTIONAL FACTOR	050
8	FUNCTIONAL CLASS	02	24	PAVEMENT CONDITION	40	40	TYPE OPERATION	00
46	VOLUME GROUP IDENTIFIER	03	25	SKID RESISTANCE	60	41-A	PARKING: PEAK	0
9	FEDERAL-AID SYSTEM	2	26	NUM GRADE-SEPARATED INTERCH	01	41-B	OFF PEAK	0
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	00	42-A	CAPACITY: PEAK	00000
11	SECTION LENGTH	0400	27-B	STOP SIGNS	00	42-B	OFF PEAK	00000
47	EXPANSION FACTOR	0050	27-C	OTHER/NONE	00	43	2000 ADT	039000
12	ACCESS CONTROL	1	28	PREVAILING TYPE SIGNALIZATION	0	44	NUMBER STRUCTURES	01
13	NUMBER OF THROUGH LANES	04	29	% GREEN TIME	00	45	NUMBER AT-GRADE RR CROSSINGS	00
14	LANE WIDTH	12	30	NUMBER ENTRANCES/EXITS	01	48	SPEED LIMIT	10
15	APPROACH WIDTH	000	31	TYPE OF DEVELOPMENT	1	49	PSD > OR = 1500	090
16	MEDIAN WIDTH	16	32	URBAN LOCATION	0	50	HORIZONTAL ALIGNMENT	0
17	MEDIAN TYPE	2	33	TERRAIN	0	51	VERTICAL ALIGNMENT	0
18-A	SHOULDER WIDTH: RIGHT	08	34	EXISTING RIGHT-OF-WAY	200	52	AVERAGE HIGHWAY SPEED	60
18-B	LEFT	08	35	IS WIDENING FEASIBLE?	3	--	CONTINUATION CODE	110000

OPTIONAL DATA:
53-CURVES: 01002 01000 01004 00000 00000 00000 00000 00000 00000 00000 00000 00000
54-GRADES: 02030 01007 01005 00000 00000 00000

ERRORS AND MESSAGES:

ITEM 23, 22	STRUCTURAL NUMBER SHOULD BE IN RANGE 06-12 WHEN ITEM 22 = 2
ITEM 33 RURAL	TERRAIN CODE MUST BE IN RANGE 1-3
ITEM 38	K FACTOR MUST BE NUMERIC AND SHOULD CONTAIN A VALUE IN THE RANGE 01-24. VERIFY
ITEM 46, 36	ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY
ITEM 47	EXPANSION FACTOR MUST BE IN THE RANGE 0100 TO 9999
ITEM 48	SPEED LIMIT MUST BE IN THE RANGE 15 TO 56
ITEM 49, 13 RURAL	PSD > OR = 1500 SHOULD BE 000 WHEN ITEM 13 > 2 OR ITEM 21 < 49
ITEM 53	CURVES BY CLASS NUM OF CURVES > 00 MUST HAVE LENGTH > 000
ITEM 54,11	GRADES BY CLASS SUM OF GRADES LENGTHS MUST = ITEM 11

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6): 999   SECTION ID(ITEM 4): _____41   SEGMENT(ITEM5): 0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	1	19	SHOULDER TYPE	1	36	1978 ADT	026000
1	YEAR	78	20	DRAINAGE ADEQUACY	1	37-A	% TRUCKS: PEAK	06
2	STATE CODE	99	21	SURFACE TYPE	70	37-B	OFF PEAK	04
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	3	38	K-FACTOR	13
7	URBAN AREA CODE	070	23	STRUCTURAL NUMBER	00	39	DIRECTIONAL FACTOR	055
8	FUNCTIONAL CLASS	14	24	PAVEMENT CONDITION	32	40	TYPE OPERATION	02
46	VOLUME GROUP IDENTIFIER	07	25	SKID RESISTANCE	00	41-A	PARKING: PEAK	3
9	FEDERAL-AID SYSTEM	2	26	NUM GRADE-SEPARATED INTERCH	01	41-B	OFF PEAK	3
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	00	42-A	CAPACITY: PEAK	03760
11	SECTION LENGTH	0095	27-B	STOP SIGNS	00	42-B	OFF PEAK	03840
47	EXPANSION FACTOR	2305	27-C	OTHER/NONE	00	43	2000 ADT	030000
12	ACCESS CONTROL	1	28	PREVAILING TYPE SIGNALIZATION	4	44	NUMBER STRUCTURES	01
13	NUMBER OF THROUGH LANES	04	29	% GREEN TIME	00	45	NUMBER AT-GRADE RR CROSSINGS	00
14	LANE WIDTH	12	30	NUMBER ENTRANCES/EXITS	00	48	SPEED LIMIT	55
15	APPROACH WIDTH	000	31	TYPE OF DEVELOPMENT	0	49	PSD > OR = 1500	000
16	MEDIAN WIDTH	40	32	URBAN LOCATION	3	50	HORIZONTAL ALIGNMENT	0
17	MEDIAN TYPE	3	33	TERRAIN	0	51	VERTICAL ALIGNMENT	0
18-A	SHOULDER WIDTH: RIGHT	06	34	EXISTING RIGHT-OF-WAY	220	52	AVERAGE HIGHWAY SPEED	65
18-B	LEFT	06	35	IS WIDENING FEASIBLE?	4	--	CONTINUATION CODE	000100

OPTIONAL DATA:
55-STRUC ID: BRIDGE   1

ERRORS AND MESSAGES:

  ITEM 15, 8   URBAN   APPROACH WIDTH SHOULD BE IN RANGE 007-100 WHEN ITEM 8 > 13. VERIFY
  ITEM 52,8   URB   AHS SHOULD BE 00 WHEN ITEM 8 > 13. VERIFY

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6): 999   SECTION ID(ITEM 4):   501   SEGMENT(ITEM5): 0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	1	19	SHOULDER TYPE	1	36	1978 ADT	026000
1	YEAR	78	20	DRAINAGE ADEQUACY	1	37-A	% TRUCKS: PEAK	06
2	STATE CODE	99	21	SURFACE TYPE	70	37-B	OFF PEAK	04
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	3	38	K-FACTOR	13
7	URBAN AREA CODE	070	23	STRUCTURAL NUMBER	00	39	DIRECTIONAL FACTOR	055
8	FUNCTIONAL CLASS	11	24	PAVEMENT CONDITION	32	40	TYPE OPERATION	02
46	VOLUME GROUP IDENTIFIER	03	25	SKID RESISTANCE	00	41-A	PARKING: PEAK	3
9	FEDERAL-AID SYSTEM	1	26	NUM GRADE-SEPARATED INTERCH	01	41-B	OFF PEAK	3
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	00	42-A	CAPACITY: PEAK	03760
11	SECTION LENGTH	0095	27-B	STOP SIGNS	00	42-B	OFF PEAK	03840
47	EXPANSION FACTOR	2305	27-C	OTHER/NONE	00	43	2000 ADT	030000
12	ACCESS CONTROL	1	28	PREVAILING TYPE SIGNALIZATION	4	44	NUMBER STRUCTURES	00
13	NUMBER OF THROUGH LANES	04	29	% GREEN TIME	00	45	NUMBER AT-GRADE RR CROSSINGS	00
14	LANE WIDTH	12	30	NUMBER ENTRANCES/EXITS	00	48	SPEED LIMIT	55
15	APPROACH WIDTH	000	31	TYPE OF DEVELOPMENT	0	49	PSD > OR = 1500	000
16	MEDIAN WIDTH	40	32	URBAN LOCATION	3	50	HORIZONTAL ALIGNMENT	0
17	MEDIAN TYPE	3	33	TERRAIN	0	51	VERTICAL ALIGNMENT	0
18-A	SHOULDER WIDTH: RIGHT	06	34	EXISTING RIGHT-OF-WAY	220	52	AVERAGE HIGHWAY SPEED	65
18-B	LEFT	06	35	IS WIDENING FEASIBLE?	4	--	CONTINUATION CODE	000000

ERRORS AND MESSAGES:

   ITEM 46, 36   ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY

CODED VALUES FOR SECTION IN ERROR & ERROR MESSAGES
RURAL/URBAN

COUNTY(ITEM 6): 999   SECTION ID(ITEM 4): _____ 506   SEGMENT(ITEM5): 0

ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE	ITEM NUM	ITEM NAME	CODED VALUE
57	RURAL/URBAN CODE	1	19	SHOULDER TYPE	1	36	1978 ADT	026000
1	YEAR	8	20	DRAINAGE ADEQUACY	1	37-A	% TRUCKS: PEAK	06
2	STATE CODE	99	21	SURFACE TYPE	70	37-B	OFF PEAK	04
3	TYPE SECTION ID	1	22	PAVEMENT SECTION	3	38	K-FACTOR	13
7	URBAN AREA CODE	074	23	STRUCTURAL NUMBER	00	39	DIRECTIONAL FACTOR	055
8	FUNCTIONAL CLASS	11	24	PAVEMENT CONDITION	32	40	TYPE OPERATION	02
46	VOLUME GROUP IDENTIFIER	03	25	SKID RESISTANCE	00	41-A	PARKING: PEAK	3
9	FEDERAL-AID SYSTEM	1	26	NUM GRADE-SEPARATED INTERCH	01	41-B	OFF PEAK	3
10	JURISDICTIONAL RESPONSIBILITY	1	27-A	AT-GRADE INTERSECT: SIGNALS	00	42-A	CAPACITY: PEAK	03760
11	SECTION LENGTH	AAAA	27-B	STOP SIGNS	00	42-B	OFF PEAK	03840
47	EXPANSION FACTOR	2305	27-C	OTHER/NONE	00	43	2000 ADT	030000
12	ACCESS CONTROL	1	28	PREVAILING TYPE SIGNALIZATION	4	44	NUMBER STRUCTURES	00
13	NUMBER OF THROUGH LANES	04	29	% GREEN TIME	00	45	NUMBER AT-GRADE RR CROSSINGS	00
14	LANE WIDTH	12	30	NUMBER ENTRANCES/EXITS	00	48	SPEED LIMIT	55
15	APPROACH WIDTH	000	31	TYPE OF DEVELOPMENT	0	49	PSD > OR = 1500	000
16	MEDIAN WIDTH	40	32	URBAN LOCATION	3	50	HORIZONTAL ALIGNMENT	0
17	MEDIAN TYPE	3	33	TERRAIN	0	51	VERTICAL ALIGNMENT	0
18-A	SHOULDER WIDTH: RIGHT	06	34	EXISTING RIGHT-OF-WAY	220	52	AVERAGE HIGHWAY SPEED	65
18-B	LEFT	06	35	IS WIDENING FEASIBLE?	4	--	CONTINUATION CODE	000000

ERRORS AND MESSAGES:

ITEM 1	YEAR MUST BE 78
ITEM 11	SECTION LENGTH MUST BE A NON-ZERO NUMERIC
ITEM 46, 36	ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY

E D I T   S U M M A R Y
RURAL/URBAN

NUMBER SECTIONS EDITED: RURAL: 6   URBAN: 5

NUMBER SECTIONS IN ERROR: RURAL: 4   URBAN: 5

END OF DATASET WAS REACHED BEFORE MAXIMUM NUMBER ERRORS FOR EDIT RUN

WORK EDIT FOR STATE.

USER SUPPLIED PARAMETER CARDS

ISTATE= TEST HPMS /39/
SELMOD=RU,MODONLY
SELEDT=RU,FHWADESIGN,CRI-MFSS

ALL USER SUPPLIED CARDS PROCESSED. NO ERRORS WERE DETECTED.

TRANSACTION CARDS SUPPLIED
RURAL/URBAN

CARD LOC	COUNTY	SECTION ID	CARD
1	001	__555_777_2	U020 1 555 777 2/2,99/12,2/56-1,999721B/
2	001	__555_777_2	U01 01 555 777 2/44,02/45,3/
3	001	__555_777_2	C01001 555 777 2A777777X666666Y
4	001	__555_777_2	B01001 555 777 2ATEST ADD BRID01TEST ADD BRID02
5	193	__95_87675	D01193 95 876751
6	170	0__354_21720	B011700 354 21720DNO MATCH DEL ID
7	170	0__354_21720	B02 700 354 21720ATEST ADD BRID01TEST ADD BRID02TEST ADD BRID03
8	170	0__354_21720	U011700 354 21720/44,03/48,45/
9	999	_____501	U01999 501/33,1/27,01/
10	999	_____501	U02999 50145,06/18-C,10/37-A,25/
11	999	_____501	C01999 501AADD TEST BRID01
12	999	_____501	B01999 501111111A222222B333333C
13	999	_____501	B02999 501A444444D555555E666666F
14	193	_____72183	D01193 721832
15	193	_____72183	D02193 721831
16	017	_____40	B01017 40AADD TEST BRID01
17	017	_____40	C01017 40999999Z
18	017	_____40	U01017 40/6,018/
19	999	___921_768	U01999 921 768/10,1/38,22/
20	999	_____501	U01999 501/37-A,10-1,78-47,2215/
21	999	_____501	U02999 501/7,307/14,10/51,1/
22	999	_____501	B01999 501ABRID01 TEST ADDBRID02 TEST ADD
23	700	___354_21721	D01700 354 217211
24	017	_____41	U01017 41/8,02/
25	018	_____44	C01018 44A887766X
26	018	_____44	U02018 44/6,019/
27	005	1____3_22450	U01051 3 22450/46,02/52,45/45,01/
28	005	1____3_22450	U02051 3 22450/53-C,01002/44,02/
29	005	1____3_22450	B01051 3 22450AADD BRID01 TEST
30	005	1____3_22450	C01051 3 22450A6234572
31	104	CROSS_EDIT01	U01104CROSS EDIT01/17,4/18-B,00/19,2/
32	104	CROSS_EDIT01	U02104CROSS EDIT01/45,01/44,04/23,00/

VALID TRANSACTION SETS WERE PROCESSED. UPDATE PROCESS STARTED. NEW MASTER DATASET TO BE DEVELOPED.

FILES OPENED. MERGE PROCESS STARTED TO UPDATE SECTDATA AND CREATE DATASET NEWDATA--THE NEW MASTER FILE.

DATE: 5/31/79   STATE: TEST HPMS

T R A N S A C T I O N S   B Y   S E C T I O N   I D
(SUMMARY IS BY COUNTY CODE AND SECTION ID ON NEW MASTER DATABASE)

COUNTY	SECTION ID	NUMBER ITEMS UPDATED	BRIDGE ID	CROSSING ID	SECTION DELETED
001	555 777 2	4	A-2 D-0 0	A-2 D-0 0	
005	1 2 22450	5	A-1 D-0 0	A-1 D-0 0	
017	41	4	A-1 D-0 0	A-1 D-0 0	
104	CROSS DITCH	0	A-1 D-0 0	A-1 D-0 0	
193	95 87675	0	A-4 D-0 0	A-3 D-0 0	X
999	501	4			

DATE: 06/30/79   STATE: TEST HPMS

H P M S   U P D A T E   S U M M A R Y   R E P O R T
RURAL/URBAN

*SECTIONS MODIFIED:	RURAL: 2	URBAN: 3	
SECTIONS DELETED:	RURAL: 1	URBAN: 0	
SECTIONS INPUT:	RURAL: 6	URBAN: 5	

* INCLUDES SECTION WITH UPDATED DATA ITEM AND/OR BRIDGE ID'S ADDED OR DELETED AND/OR CROSSING ID'S ADDED OR DELETED.

END OF SECTION DATABASE REACHED BEFORE ALL TRANSACTIONS WERE PROCESSED.
TRANSACTION BEING PROCESSED OR LAST ONE PROCESSED: 999   921 768   U

SECTIONS WERE MODIFIED OR DELETED ONLY IN THIS EXECUTION. NO NEW SECTIONS WERE ADDED TO THE DATABASE.

DATE: 08/../79   STATE: TEST HPMS

T R A N S A C T I O N   C A R D S   I N   E R R O R
(LISTED TRANSACTION SETS WERE NOT ADDED TO ALTER FILE AND NONE WERE USED IN DEVELOPING UPDATED DATABASE)

CARD LOC		CODED CARD	ERROR MESSAGE
14	DU1193	721832	DELETE CARDS > 1 WITH SAME ID
15	DN2193	721831	
25	CO1018	4448877 66X	TRAN CODE NOT =; SEQ# >1, ID =
26	U2218	44/6.019/	

ERRORS DETECTED DURING MERGE PROCESS

INPUT CARD POSITION	SEQ NUM	COUNTY	SECTION ID	TRANS CODE	CODED ERROR OR VERIFY	ERROR MESSAGE
1	1	001	___555__777_6	U	56-1	INVALID SUB-ITEM LETTER OR NUM
18	16	017	_____40	U	CK CNTY & SECT ID CODED	ID TRANS NOT = ID FOR SECTION
17	16	017	_____4L	C	CK CNTY & SECT ID CODED	ID TRANS NOT = ID FOR SECTION
16	16	017	_____4C	B	CK CNTY & SECT ID CODED	ID TRANS NOT = ID FOR SECTION
8	2	170	C__354_2172U	U	CK CNTY & SECT ID CODED	ID TRANS NOT = ID FOR SECTION
6	2	170	C__354_2172C	B	CK CNTY & SECT ID CODED	ID TRANS NOT = ID FOR SECTION
23	2	700	___354_21721	D	CK CNTY & SECT ID CODED	ID TRANS NOT = ID FOR SECTION
20	1	999	_____501	U	CHECK /'S AND ,'S	INVALID FORMAT FOR UPDATE CARD
9	1	999	_____501	U	27	ITEM NUM MUST HAVE SUB-ITEM
9	2	999	_____501	U	CHECK /'S AND ,'S	INVALID FORMAT FOR UPDATE CARD
12	1	999	_____501	D	1	CODE NOT 'A' OR 'D' FOR ID'S

ITEM NUMBERS AND ERROR MESSAGES BY SECTION ID
RURAL/URBAN

COUNTY(ITEM 6): 001   SECTION ID(ITEM 4): ___555__777_2   SEGMENT(ITEM5): 0
ERRORS AND MESSAGES:
ITEM 19, 18   SHOULDER TYPE CODE MUST BE 4 OR 5 WHEN ITEM 18-RIGHT SHOULDER- = 0
ITEM 23, 22   STRUCTURAL NUMBER MUST BE ZERO WHEN ITEM 22 NOT = 1 OR 2
ITEM 24, 21   PAVEMENT CONDITION MUST BE IN RANGE 01 TO 50 WHEN ITEM 21 > 49
ITEM 52 URBAN   URBAN LOCATION CODE MUST BE IN RANGE 1-5
ITEM 38   K FACTOR MUST BE NUMERIC AND SHOULD CONTAIN A VALUE IN THE RANGE 01-24. VERIFY
ITEM 41 URBAN   PARKING PEAK AND OFF-PEAK MUST BE 1, 2, OR 3
ITEM 43   2000 ADT MUST BE NON-ZERO NUMERIC
ITEM 45   NUMBER OF AT-GRADE CROSSINGS MUST BE NUMERIC
ITEM 46, 36   ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY
ITEM 52,8   URB   AHS SHOULD BE 00 WHEN ITEM 8 > 13. VERIFY
ITEM 56   AT-GRADE RR CROSSING ID MUST BE 6-DIGITS AND 1 ALPHABETIC
ITEM 56,45   AT-GRADE RR CROSSING ID   NUMBER OF ID'S MUST = NUMBER OF RR CROSSINGS, ITEM 45

COUNTY(ITEM 6): 005   SECTION ID(ITEM 4): 1____3_22+20   SEGMENT(ITEM5): 0
ERRORS AND MESSAGES:
ITEM 55,44   BRIDGE ID   NUMBER OF ID'S MUST = NUMBER OF STRUCTURES, ITEM 44

COUNTY(ITEM 6): 017   SECTION ID(ITEM 4): _____41   SEGMENT(ITEM5): 0
ERRORS AND MESSAGES:
ITEM 46, 36   ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY
ITEM 50,21,53 RURAL HORIZONTAL ALIGNMENT MUST BE IN RANGE 1-4 WHEN ITEM 21 > 49 AND ITEM 53 IS NOT PROVIDED
ITEM 51,21,54 RURAL VERTICAL ALIGNMENT MUST BE IN RANGE 1 TO 4 WHEN ITEM 21 > 49 AND ITEM 54 IS NOT PROVIDED

COUNTY(ITEM 6): 104   SECTION ID(ITEM 4): CROSS_EDIT-1   SEGMENT(ITEM5): 0
ERRORS AND MESSAGES:
ITEM 21   SURFACE TYPE CODE IS INVALID
ITEM 22, 21   VERIFY VALUE CODED FOR ITEM 22; ITEM 21 IS IN ERROR
ITEM 24, 21   VERIFY VALUE CODED FOR ITEM 24; ITEM 21 IS IN ERROR
ITEM 25, 21 RURAL   VERIFY VALUE CODED FOR ITEM 25; ITEM 21 IS IN ERROR
ITEM 42, 13 RURAL   CAPACITY SHOULD BE < OR = NUMBER LANES TIMES 1000 OR ZERO
ITEM 49, 21, 13   VERIFY VALUE CODED FOR ITEM 49; ITEM 21 OR 13 IN ERROR
ITEM 50, 21 RURAL   VERIFY VALUE CODED FOR ITEM 50; ITEM 21 IS IN ERROR
ITEM 51, 21 RURAL   VERIFY VALUE CODED FOR ITEM 51; ITEM 21 IS IN ERROR
ITEM 52,8,21,31 RUR   VERIFY VALUE CODED ITEM 52; ITEM 8, 21 OR 31 IS IN ERROR

COUNTY(ITEM 6): 700   SECTION ID(ITEM 4): ___354_2.7.0   SEGMENT(ITEM5): 0
ERRORS AND MESSAGES:
ITEM 23, 22   STRUCTURAL NUMBER SHOULD BE IN RANGE 06-12 WHEN ITEM 22 = 2
ITEM 33 RURAL   TERRAIN CODE MUST BE IN RANGE 1-3
ITEM 38   K FACTOR MUST BE NUMERIC AND SHOULD CONTAIN A VALUE IN THE RANGE 01-24. VERIFY
ITEM 46, 36   ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY
ITEM 47   EXPANSION FACTOR MUST BE IN THE RANGE 0100 TO 9999
ITEM 48   SPEED LIMIT MUST BE IN THE RANGE 15 TO 56
ITEM 49, 13   RURAL   PSD > OR = 1500 SHOULD BE 00 WHEN ITEM 13 > 2 OR ITEM 21 < 49
ITEM 53   CURVES BY CLASS   NUM OF CURVES > 00 MUST HAVE LENGTH > 000
ITEM 54,11   GRADES BY CLASS   SUM OF GRADES LENGTHS MUST = ITEM 11

COUNTY(ITEM 6): 999   SECTION ID(ITEM 4): _____41   SEGMENT(ITEM5): 0
ERRORS AND MESSAGES:
ITEM 15, 8 URBAN   APPROACH WIDTH SHOULD BE IN RANGE 007-100 WHEN ITEM 8 > 13. VERIFY
ITEM 52,8   URB   AHS SHOULD BE 00 WHEN ITEM 8 > 13. VERIFY

COUNTY(ITEM 6): 900   SECTION ID(ITEM 4): _____5_1   SEGMENT(ITEM5): 0
ERRORS AND MESSAGES:
ITEM 46, 36   ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY
ITEM 55,44   BRIDGE ID   NUMBER OF ID'S MUST = NUMBER OF STRUCTURES, ITEM 44
ITEM 55   AT-GRADE RR CROSSING ID MUST BE 6-DIGITS AND 1 ALPHABETIC
ITEM 56,45   AT-GRADE RR CROSSING ID   NUMBER OF ID'S MUST = NUMBER OF RR CROSSINGS, ITEM 45

ITEM   URBAN   AN URBAN SECTION HAS A VALUE CODED FOR A RURAL ONLY DATA ITEM. CHECK ALL RURAL ITEMS

COUNTY(ITEM 6): 900   SECTION ID(ITEM 4): 529   SEGMENT(ITEM 5): 0
ERRORS AND MESSAGES:
ITEM 1   YEAR MUST BE 78
ITEM 11   SECTION LENGTH MUST BE A NON-ZERO NUMERIC
ITEM 46, 36 ADT VOLUME GROUP(FOR FHWA APPROACH) IDENTIFIER IS INVALID FOR 1978 ADT VALUE CODED. VERIFY

DATE: 10/30/79   STATE: TEST HPMS

E D I T   S U M M A R Y
RURAL/URBAN

NUMBER SECTIONS EDITED: RURAL: 5   URBAN: 5

NUMBER SECTIONS IN ERROR: RURAL: 3   URBAN: 5

END OF DATASET WAS REACHED BEFORE MAXIMUM NUMBER ERRORS FOR EDIT RUN

WORK EDIT FOR STATE.