Archive Highway Performance Monitoring System (HPMS) Data Item Descriptions for 1988-1992

The following data item descriptions should be used with HPMS universe and sample archive data files for years 1988 through 1992. These data item descriptions include the coding instructions and definitions originally used to create the files; item descriptions follow the same sequence as the comma delimited ASCII universe and sample files. Note that all included text and software references are not applicable.

UNIVERSE MILEAGE CODING INSTRUCTIONS

IDENTIFICATION DATA ITEMS

Item 1 – State Control Field (Length = 100)

This portion of the record is for the use of the State. However, in view of the increased utility and emphasis on graphic capabilities and Geographic Information Systems (GIS), at both the State and Federal levels, the States are requested, on an optional basis, to supply the beginning and ending latitude and longitude coordinates for each universe and sample section. The primary interest is in the arterial systems at the Federal level, however, the States may provide coordinates for other systems, if they are available. Since there is no room in the current record to accommodate these data, we are requesting that the optional data be placed in the State Control Field until the HPMS record format is changed for other reasons. At that time, space will be provided elsewhere in the data record. The following field positions are to be used:

Beginning Point Latitude; positions 70-76; length -7

Beginning Point Longitude; positions 77-83; length – 7

Ending Point. Latitude; positions 84-90; length – 7

Ending Point Longitude; positions 91-97; length – 7

The data fields are to be right-justified, zero-filled and contain positive degrees, with an implied decimal point, four places in from the rightmost position. For example, a point at Latitude 35 deg., 33 min., 22 sec. = 35.556111 deg., and would be coded as "0355561". Similarly, a point at Longitude 121 deg., 5 min., 52 sec. = 121.097777 deg., and would be coded as "1210978".

If the State groups data (Item 7 = 3), zero fill these fields for the grouped section records, as well as for those records that are not reported (this need be done only if the State is reporting for some systems and not for others).

Should a State have coordinates, but cannot use this reporting method, other means for providing these data will be accepted at this time. This may include a separate file of coordinates tied to the HPMS route milepoint, or some other means of identification, such

as a copy of the front of the HPMS records (county, 10, etc.). Thorough documentation of these files including record and field format will also be required. Please contact FHWA Headquarters (HPM-20) for more information exchange, if the State will provide these data in an external file.

Coordinate reporting for some systems will likely be standardized for HPMS in the future.

Item 2 – Year (Length = 2)

Enter the last two digits of the calendar year for which the data apply. For example, the 1989 data reported in 1990 would be coded "89".

Item 3 – State Code (Length = 2)

The Federal Information Processing Standards (FIPS) codes are used. (See Federal Information Processing Standards Publication 5, "States of the United States".)

Item 4 – County Code (Length = 3)

Item 5 – Rural/Urban Designation (Length = 1)

Federal-aid urban area boundaries apply – small urban and urbanized areas are defined as Federal-aid urban areas or portion thereof within the State boundary. Use the 3-digit FIPS county code (see Federal Information Processing Standards Publication 6, "Counties of the States of the United States"). If a State elects to use some other coding scheme, supply a copy of the code relationship to the county FIPS codes to FHWA Headquarters (HPPI-20).

Code and Description:

Code 1 = Rural

Code 2 = Small Urban (population of 5,000 to under 49,999)

Code 3 = Urbanized (population of 50,000 and over)

Item 6 – Urbanized Area Code (Length = 5)

This item must be coded when Item 5, Rural/Urban designation is coded "3" for urbanized. Otherwise, this field is not required.

The State may sample urbanized areas individually (which is highly encouraged) or it may group two-or-more urbanized areas into one-or-more collective groups (which is now discouraged). In order to identify how the State is sampling urbanized areas, this item must be coded in the format XXYYY where:

XX = 00 – If urbanized area is being individually sampled

XX = Sequential – If two-or-more areas are being grouped, one code # from 11 should be used for each group. For example, if a State has consolidated all urbanized areas into one group, only "11" should be coded. If areas have been consolidated into two groups plus some individual areas, the first group of areas must be coded "11", the second group must be coded "12", and the individual areas must be coded "00".

YYY = The actual 3-digit urbanized area code, depending on which urbanized area the section mileage falls within. The urbanized area code for the specific urbanized area is always coded regardless of the sampling option selected.

Both XX and YYY must be coded for all urbanized area universe and sample records.

Item 7 – Type of Section/Grouped Data Identification (Length = 1)

Enter the code that indicates the type of section identification used.

Code and Description:

Code 1 = Route, Milepoint

Code 2 = A – Node, B – Node, Segment

Code 3 = Grouped Data – a countywide unique number

Code 4 = Unique Number – a countywide unique number

See examples in Item 8.

Item 8 – Section/Grouped Data Identification (Length =12)

This field is used as a location identifier or for unique identification. It provides a State with flexibility for identifying sections in accordance with its needs independent of the unique identification maintained for HPMS sample sections (see Item 24, Sample number). This item may change to suit the needs of the State. The Sample Number must never change. The appropriate 10 is as follows:

1. For all Interstate, use route-milepoint identification compatible with that used for the Interstate Cost Estimates (ICE). Inventory milepoints for the "as built" Interstate should be used for this item and the ICE.

2. For non-Interstate arterial and collector sections, including samples, use either route-milepoint or A-node, B-node identification.

3. For non-Interstate, non-sample grouped data, use a countywide, unique, identification number.

4. For other sections, use an identification unique within each county.

Examples for each method follow:

1. Route, Milepoint (Item 7 = 1)

Inventory route number is coded in positions 115-120, right justified. Except for Interstate, the inventory route number is not necessarily the same as that posted along the roadway, but is a number used to uniquely identify a route within the State.

Milepoint is coded in positions 121-126, right justified, (xxx.xxx – implied decimal point). The milepoint represents the distance in miles from a set reference point to the beginning of this highway segment. The reference point could be a State or county line or the point where the particular route originates. The milepoint is the position along a route where one of the values in the segment record changes. The milepoint numbering format should be such that the combination of county, inventory route number, and milepoint will define a unique location.

Example: Inventory Route 50 with milepoint 79.20

Pos.	114	115	116	117	118	119	120	121	122	123	124	125	126
Code	I	0	0	0	0	5	0	0	7	9	2	0	0

2. A-Node, B-Node -Segment (Item 7 = 2)

A-Node is coded in Positions 115-119, right justified

B-Node is coded in Positions 120-124, right justified

Segment is coded in Positions 125-126, right justified

The node numbers are unique within the State. They are usually located at major intersections, political boundaries, etc.

The segment number provides the position of the roadway segment being coded on the link between the same A-node and B-node pair.

The segment is the position along the roadway where one of the data items changes. The number in this field should be low for the segment that begins at the A-node, and must increase for each segment progressing toward the B-node. While sequential numbers may be used, it is advantageous to leave gaps in the numbering to provide for expansion of the number of coded segments over time. For instance, if a section now contains only one segment, a "50" could be coded in this field to allow for changes over time on either end. The maximum number of segments between any A-node, B-node pair is 99.

Example: **A**-Node – 572, **B**-Node – 691, **Segment** – 4

Pos.	114	115	116	117	118	119	120	121	123	124	125	126	127
Code	2	0	0	5	7	2	0	0	6	9	1	0	4

3. Grouped Data (Item 7 = 3)

Any countywide unique number with no more than 12 digits is coded, right justified.

Grouped data is an aggregation of roadway mileage, where at least the following data items are homogeneous across all mileage being combined: Items 1-12, and 15-19.

NOTE: Interstate and sample sections cannot be grouped. All other arterials, collectors and locals may be grouped.

Example: 98365

Pos.	114	115	116	117	118	119	120	121	123	124	125	126	127
Code	3	0	0	0	0	0	0	0	9	8	3	6	5

4. Unique Number (Item 7 = 4)

Any countywide unique number with no more than 12 digits is coded right justified.

Example: 4321

Pos.	114	115	116	117	118	119	120	121	123	124	125	126	127
Code	4	0	0	0	0	0	0	0	0	4	3	2	1

NOTE: Items 1-8 contain the identification portion of the section records.

SYSTEM DATA ITEMS

Item 9 – Functional System (Length = 2)

Code and Description:

Rural

Code 01 = Principal Arterial – Interstate

Code 02 = 02 Principal Arterial – Other

Code 03 = Minor Arterial

Code 04 = Minor Collector

Code 09 = Local

Urban

Code 11 = Principal Arterial – Interstate

Code 12 = Principal Arterial – Other Freeways and Expressways

Code 14 = Other Principal Arterial

Code 16 = Minor Arterial

Code 17 = Collector

Code 19 = Local

Codes 12&13 and 14&15 have been used in the past to identify non-connecting/connecting link portions of the urban Other Freeways and Expressways and Other Principal Arterial functional systems. Although codes 13 and 15 may still be used, if desired, codes 12 and 13 will be treated as code 12, and codes 14 and 15 will be treated as code 14.

Definitions of the highway functional systems can be found in "Highway Functional Classification, Concepts, Criteria and Procedures," FHWA, July 1974.

Item 10 – Generated Functional System Code (Length = 1)

This field consists of a code that is generated based on Item 9, Functional System, that is used as a software aid. It is encoded by the HPMS Submittal Software, SELCALC option described in Chapter VI. If Item 9 is changed by non-HPMS software, the SELCALC option must be run to obtain the proper code in this field. This code is automatically updated when using the SELMODU option of the HPMS Submittal Software to update Item 9. The codes are as follows:

Code and Description:

Code 1 = Interestate **(Rural)** and Interstate **(Urban)**

Code 2 = Other Principal Arterial **(Rural)** and Other Freeways and Expressways **(Urban)**

Code 3 = Minor Arterial **(Rural)** and Other Principal Arterial **(Urban)**

Code 4 = Major Collector **(Rural)** and Minor Arterial **(Urban)**

Code 5 = Minor Collector **(Rural)** and Collector **(Urban)**

Code 6 = Local **(Rural)** and Local **(Rural)**

Item 11 – Federal-aid System (Length = 1)

Code and Description:

Code 1 = Interstate

Code 2 = Federal-aid Primary (Other than Interstate)

Code 3 = Federal-aid Urban

Code 4 = Federal-aid Secondary (Rural Only)

Code 8 = Non-Federal-aid

Item 12 – Federal-aid System Status (Length = 1)

Code 1 = Federal-aid System open-to-traffic

Code 2 = Federal-aid System not yet built or not-open-to-traffic

Code 8 = Non-Federal-aid open-to-traffic

A section is considered "open to traffic" when the geometric standards of the section are reasonably adequate for vehicle use and the roadway is open to present daily traffic.

ALL NON-FEDERAL-AID MILEAGE REPORTED SHOULD BE OPEN TO TRAFFIC.

ITEM 13 – Route Signing (Length =1)

Only Interstate is required to be reported under this item. The reporting of routes other than Interstate is optional. These codes specify the manner in which the highway segment is or will be signed and do not necessarily bear any relationship to the Federal-aid System category. If not reporting this data item, this field should be coded "0". If roadway is unsigned, code this field "7".

Code and Descriptions

Code 0 = Not reported

Code 1 = Interstate

Code 2 = U.S.

Code 3 = State

Code 4 = County

Code 5 = Township

Code 6 = Municipal

Code 7 = None of the above or not signed

When a route is signed with two-or-more identifiers (for example, Interstate Route 83 and U.S. Route 32), the code for the highest class of route should be used (Interstate in the above example). The hierarchy is in the order listed above. Signed Interstate business routes, unless they are built to Interstate standards and are part of the Interstate system, – should be reported as non-Interstate routes.

Item 14 – Route Number (Length = 5)

Enter the Interstate route number, right justified. This item is optional for non-Interstate routes. If two-or-more routes of the same class in the hierarchy (see Item 13) are signed along a roadway section, the lowest route number should be entered in this field. If Item 13 is coded "0", zero-fill this field.

Only the officially approved AASHTO Interstate route number should be coded, right-justified. Extra alphanumeric characters should not be entered – zero-fill the remaining digits. Short Interstate route spurs should be identified with their own approved route number and not that of the main route.

Alaska, Hawaii and Puerto Rico may use alpha characters in the Interstate route number field as part of the official AASHTO route number. Other exceptions to the Interstate numeric rule include a major route that has a parallel or diverging branch with fully paired directional roadways and has an official route number containing a letter for relative direction (i.e., E for east). For example, route 35 in Minnesota splits with 35E going through St. Paul and 35W through Minneapolis.

JURISDICTION DATA ITEMS

Item 15 – Governmental Level of Control (Length = 2)

This data element is used to identify the level of government that has responsibility for the facility. In the case of toll authorities, this code is not dependent upon a toll being charged. Where more than one code could be used for a section, the lowest numerical code shall be reported (i.e., if county and town boundaries are the same and only one governing body exists, use code "02").

Code and Description:

01 = State Highway Agency

02 = County Highway Agency

03 = Town or Township Highway Agency

04 = Municipal Highway Agency

11 = State Park, Forest, or Reservation Agency

12 = Local Park, Forest, or Reservation Agency

21 = Other State Agencies

25 = Other Local Agencies

26 = Private

31 = State Toll Authority

32 = Local Toll Authority

60 = Other Federal Agencies (not listed below)

62 = Bureau of Indian Affairs

64 = U.S. Forest Service

66 = National Park Service

68 = Bureau of Land Management

70 = Military Reservation/Corps of Engineers

Item 16 – Special Systems (Length = 2)

This field is used to code the special funding categories in which some existing and open-to-traffic highway segments fall (but not-open-to-traffic Federal-aid Systems should be included). These special systems are separate and distinct from those outlined in previously defined fields. Special systems may overlap previously defined systems. For example, the National Forest Highway System may include mileage under jurisdiction of a State or local government. However, if the mileage is part of the National Forest Highway System, it should be coded as such in this field. Where conflicts exist, the 40/41/42 codes have priority – otherwise use the lower numbered code (i.e., use "15" where "15" and "20" are both applicable, but use "42" where both "20" and "42" are applicable).

Code and Description:

Code 01 = Not on a Special System

Code 02 = National Forest Highway System 1/

Code 03 = National Forest Development Roads and Trails

Code 04 = National Park Service Parkway 1/

Code 05 = National Park Roads and Trails

Code 06 = Indian Reservation Roads and Bridges 1/

Code 10 = Appalachian Development Highway 1/

Code 15 = Appalachian Highway Access Road

Code 20 = Priority Primary Route (23 U.S.C. 147)

Code 25 = Great River Road (23 U.S.C. 148)

Code 30 = Defense Access Road (23 U.S.C. 210) l/

Code 40 = Addition to the Interstate System (23 U.S.C. 139 (a))

Code 41 = Addition to the Interstate System (23 U.S.C. 139 (c))

Code 42 = Future addition to the Interstate System (23 U.S.C. 139 (b)) 2/

1/ These definitions are intended to be consistent with 23 U.S.C. 101(a), Definitions and Declaration of Policy.

2/ This definition is intended to be consistent with 23 U.S.C. 143(f) (2) and 23 U.S.C. 101(a).

3/ Mileage constructed via Defense Access Road funds.

4/ Highway mileage designated as part of the Interstate System under the provisions of 23 U.S.C. 139(a) should be coded "40" for this data element and should be functionally classified as Interstate (Item 9 should be coded "01" or "11"). Item 11 should be coded "1".

5/ Highway mileage designated as a future part of the Interstate System under the provisions of 23 U.S.C. 139(b) should be coded "42" for this data element. This mileage is part of the Federal-aid Primary System (Item 11 should be coded "2") and should not be functionally classified as Interstate until the highway has been officially designated as part of the Interstate System.

OPERATION DATA ITEMS

Item 17- Type of Facility (Length = 1)

Code 1 = One-way

Code 2 = Two-way

Definitions: **One-Way** – A one-way is a roadway with traffic moving in one direction only. When part of a one-way couplet, each roadway should be inventoried independently to obtain universe data. **Two-Way** – A road with two-way traffic during non-rush hours.

Item 18 – Designated Truck Route/Parkway (Length = 1)

Designated truck routes (codes "1", "2") are those sections/routes that are available to truck tractor and 48-foot (or longer if grandfathered) semitrailer combinations, and to truck tractor and 28-foot twin trailer combinations that may be 102 inches wide with no overall length limitations.

The designated truck routes are (1) routes included in the National Truck Network designated under 23 Code of Federal Regulations (CFR) 658, Appendix A, and authorized by Sections 411 (length) and 416 (width) of the Surface Transportation Assistance Act of 1982, and (2) other roadways both on and off of the Federal-aid Systems, designated under State authority.

*The following **are not to be included** as designated truck routes for the purposes of this data item (use code "4")*:

a. Routes (or portions thereof) that simply provide "access" for these large vehicles to terminals and for food, fuel, repair or rest services.

b. Those routes designated *only* under State authority that restrict that restrict some of the trucks described above because of length or width limitations or because of time of day restrictions.

For purposes of this data element, a parkway (code "3") is a highway that has full or partial access control, is usually located within a park or a ribbon of park-like developments, and *prohibits commercial vehicles*. In this instance, buses are not considered commercial vehicles.

Code **1** = Designated truck route under *Federal authority* in 23 CFR 658. This code would include all Interstate and those sections/routes designated *only* under Federal authority or under *both* Federal and State authority. It would not include the routes in those 15 States that have designated all, or almost all, of the non-Interstate Federal-aid Primary; use code "2" under this situation, if there are no limitations/restrictions 1/

Code **2** = Designated truck route *only* under *State authority* and *fully available* to both combinations of trucks described above 1/

Code **3** = Parkway – not on a designated truck route

Code **4** = Not a Parkway – not on a designated truck route

1/ Those States designating all, or almost all, of its non-Interstate Federal-aid Primary are: AR, CO, IN, KS, LA, MS, MT, NE, NV, OH, OK, SD, TX, WA AND WY. Code "2" shall be used for this mileage if it is fully available to the trucks described above.

Item 19 – Toll (Length = 1)

Code **1** = Non-Toll

Code **2** = Toll

Code **3** = Interstate Toll segment under Secretarial Agreement (Section 105 of 1978 Federal-aid Highway Act)

Code **4** = Interstate Toll segment under Secretarial Agreement now free of tolls

If portions of a roadway can be traversed without the payment of a toll, but a toll is charged on other portions, the segment is considered to be toll. This applies even if a vehicle can enter and exit from the main through route without payment of a toll. If a toll is charged in only one direction, the "free" direction is also considered to be toll. The coding for this item should agree with any other data furnished to FHWA.

If a roadway was built with and is still maintained by toll funds, the roadway is considered toll.

OTHER DATA

Item 20 – Section/Group Length (xxx.xxx – implied decimal) (Length = 6)

Mileage should be reported as measured along the centerline of the roadway. On independently aligned, divided highways, the reported mileage should be the average of the lengths of the directional roadways, measured along their centerlines. When a route terminates at an interchange, the length is measured as the average of the two directional, connecting roadway lengths to the first points of intersection or crossover/under with the other mainline route. Where a route length is reported from or to the intersection with another route, the point of measurement should be taken as the theoretical center of the intersection if the two routes were unseparated highways meeting at grade. Except in the case of the terminating route described above, ramps are considered part of the mainline routes and are not considered for HPMS length purposes.

For non-Interstate, non-sample type highways where records by category of mileage are grouped, the total mileage in the category is coded. Should it be necessary to code a

number larger than 999.999, two or more records should be included so as to produce the required sum. Care should be taken to avoid splitting the mileage equally between records so that the possibility of mistaking these for duplicate records can be avoided – the section identifications must be unique.

While provision has been made for coding to a maximum precision of 0.001 miles, records should reflect the precision normally utilized by the State, but at least to the nearest tenth. This not only provides maximum precision, but alleviates rounding, programming, and checking problems. The field should be coded with trailing and leading zeros, depending on the precision obtained, e.g., 56.2 miles would be coded "056200".

Item 21 – Annual Average Daily Traffic (AADT) (Required for all Interstate and sample sections; optional for remaining sections. 1/) (Length. 6)

Enter the section's AADT (total, both directions for two-way facilities and directional if part of a one-way couplet or just one-way) for the given year. Since many applications, including VMT estimates, will be based on sample section AADT's, the States are encouraged to concentrate on counts for sample sections of the highway system, and to provide "actual counts" adjusted to represent AADT rather than "estimates".

The reported AADT values are to be annually updated. Current traffic data taken from sites near/adjacent to continuous automatic traffic recorders (ATR's) are the preferred source in lieu of coverage counts. AADT values that are derived from pneumatic tube counts should include the application of seasonal, weekday/weekend, and growth factors (if not current year counts), as well as corrections for vehicles with more than 2-axles.

Leading zeros must be coded. For example, an AADT of 25,300 vehicles per day is coded "025300". The field is zero filled when not used.

1/ If AADT information is accurate and available for all sections (except local functional system), the State may wish to enter all AADT data in order to use a software option that will calculate the volume group expansion factors for sample sections, automatically (no universe mileage cards are required). The software is described in Chapter VI under the SELEXPF option.

Item 22 – Number of Through Lanes (Required for all Interstate and sample sections) (Length = 2)

Enter the prevailing number of through lanes in both directions (excluding collector-distributor lanes, weaving lanes, frontage road lanes, parking and turning lanes, etc.) carrying through traffic in the off-peak period. Exclude truck climbing lanes unless the length and importance is sufficient to warrant inclusion. Other additional short-length

lanes needed for toll booth operations, special emergency turnaround lanes, and deceleration lanes serving service stations and restaurants accessible under special circumstances in the roadway median, etc., should also be excluded.

Enter "00" for all non-applicable sections.

Item 23 – Record Continuation Code (Length = 5)

This field must be present in all records. It indicates what type of section record is being coded, consists of three elements, and is normally encoded by software. It consists of the following:

Record Positions and Descriptions:

159-163 – Indicates Universe Record, only **00000**

159 – Indicates Sample Record **1**

160-161 – Number of Structure ID's provided **xx**

162-163 – Number of Railroad Crossing 10's provided **yy**

where "xx" and "yy" are counts of the 10's provided with leading zeroes coded. Enter "00" if none are reported.

Examp1es:

A sample section that has no ID's coded for either structures or railroad crossings . **"10000"**

A sample record with 4 railroad crossing ID's and no structure ID's . **"10004"**

A universe record **"00000"**

NOTE: This is the end of the record for all non-sample sections.

SAMPLE SECTION CODING INSTRUCTIONS

Samples are obtained only from open-to-traffic, public road mileage under the jurisdiction of and maintained by a public authority.

IDENTIFICATION DATA ITEMS

Item 24 – Sample Number (Length = 12)

Code the sample section identifier used for this section in the original HPMS submission or a unique number for a new sample section. This number may be route-milepoint or A-node,

B-node, Segment, but, once coded, will be considered as a unique number that cannot change in the future. It will be assigned to all subdivided portions of the sample sections, as necessary.

Item 25 – Sample Subdivision (Length = 1)

This field will be used if it becomes necessary to subdivide a section due to operational or capital improvements on part of the section's length. Initially, this field is coded "0". If the section is subdivided over time, the code "0" is changed to 1, 2, 3, etc, depending upon the number of subdivisions (sections) created from the original section. Item 24, Sample Number always remains the same.

Sample sections should be subdivided only when significant changes have occurred. Routine maintenance, short lengths of surfacing or sealing, or repair of several joints would not normally constitute a significant change. If more than nine subdivisions are proposed, it is suggested that the section be reviewed for recombination of contiguous subdivisions with similar characteristics. Recombining contiguous subdivisions that have become homogeneous should be done annually.

COMPUTATIONAL ELEMENTS

Item 26 – AADT Volume Group Identifier (Length = 2)

Enter the code representing the AADT volume group from which this sample section was selected.

Item 27 – Expansion Factor (Length = 6 – xxx.xxx – implied decimal)

Enter the factor to the nearest one-thousandth.

By definition, the expansion factor is the ratio of the total mileage in a volume group to the total sampled volume group mileage.

Expansion Factor -Total miles in the Volume Group / Sampled miles in the Volume Group

For small urban and rural areas, code the expansion factor for the volume group within the functional system to which the section belongs to the nearest thousandth. For urbanized areas, code the expansion factor for the volume group within the functional system and individual urbanized area or grouped urbanized areas to which the section belongs.

If, for any reason, the expansion factor for a given group exceeds 100.000, additional sections in the volume group must be selected for sampling until the expansion factor is reduced to a maximum of 100.000.

It should be stressed that the same expansion factor is used for all sample sections in the same volume group of a functional system (except for Interstate subcategories which are considered separately), and that it is normally calculated and encoded by software. A tabular summary of expansion factors by volume group within each functional system and geographic area will be prepared by the State and submitted along with the required data. HPMS Submittal Software will create the required table; this action is preferred by FHWA. However, if a State chooses to develop its own expansion factor table, the computer generated tables must still be executed to ensure that multiple expansion factors do not exist and that reported values are correct. The table would contain the following:

Table IV-1

Expansion Factor Computation

Area, System, and Volume Group	(A) Total Mileage of Sample Section	(B) Total Mileage of Volume Group	(C) Expansion Factor Col B / Col A
Rural Interstate			
Group 1			
Group 2			
Group 3			
Etc.			
Rural, Other Principal Arterial			
Group 1			
Group 2			
Group 3			
Etc.			
Etc.			

PAVEMENT ATTRIBUTES: PAVEMENT DATA ITEMS

Item 28 Surface/Pavement Type (Length = 2)

Enter the code that represents the type of surface on the section. These codes are consistent with the Financial Management Information System (FMIS).

Codes and Descriptions:

Code 20 = Unimproved Road – A road using the natural surface and maintained to permit bare passabi1ity for motor vehicles, but not conforming to the requirements for a graded and drained road. The road may have been bladed and minor improvements may have been made locally. (Unpaved)

Code 30 = Graded and Drained – A road of natural earth aligned and graded to permit reasonably convenient use by motor vehicles and with drainage systems (natural and artificial) sufficient to prevent serious impairment of the road by normal surface water. It is with or without dust palliative treatment or a continuous course of special borrow material to protect the new roadbed temporarily and to facilitate immediate traffic service. (Unpaved)

Code 40 = Soil, Gravel or Stone – A road, the surface of which consists of mixed soil, stabilized soil, gravel or stone. Gravel or stone surfaces may also be stabi1ized. (Unpaved)

Code 51 = Bituminous Surface-Treated – An earth road, a soil-surfaced road, or a gravel or stone road to which has been added by any process a bituminous surface course with or without a seal coat, the total compacted thickness of which is less than 1 inch. Seal coats include those known as chip seals, drag seals, plant-mix seals, and rock asphalt seals. (Low Type)

Code 52 = Mixed Bituminous – A road, the surface course of which is 1 inch or greater and less than 7 inches in compacted thickness composed of gravel, stone, sand or similar material, and mixed with bituminous material under partial control as to grading and proportions. (Intermediate Type)

Code 53 = Bituminous Penetration – A road, the surface course of which is 1 inch or greater and less than 7 inches in compacted thickness composed of gravel, stone, sand or similar materia1, bound with bituminous penetration material. (Intermediate Type)

Code 61 = High Flexible – Mixed bituminous or bituminous penetration road on a flexible base with a combined (surface and base) thickness of 7 inches or more. Includes any

bituminous concrete, sheet asphalt or rock asphalt having a high 1oad-bearing capacity. (High Type Flexible)

Code 62 = Composite; Flexible over Rigid – Mixed bituminous or bituminous penetration road on a rigid pavement with a combined (surface and base) thickness of 7 inches or more. Includes any bituminous concrete, sheet asphalt or rock asphalt overlay that is greater than 1 inch of compacted bituminous material. Otherwise, use rigid pavement codes. (High Type Flexible)

NOTE: If applicable, codes 74, 75 and 76 have priority over other rigid surface type codes.

Code 71 = High Rigid; Plain Jointed – Portland cement concrete pavement that is jointed but is without reinforcing. (High Type Rigid)

Code 72 = High Rigid; Reinforced Jointed – Reinforced (with mesh or equivalent) portland cement concrete pavement that has been jointed. (High Type Rigid)

Code 73 = High Rigid; Continuously Reinforced – Continuously reinforced portland cement concrete pavement. (High Type Rigid)

Code 74 = Rigid over Rigid; Bonded or Partially Bonded – Portland cement concrete pavement over a portland cement concrete pavement where the two separate layers have been bonded. (High Type Rigid)

Code 75 = Rigid over Rigid; Un bonded '(i.e., bond breaker used) – Portland cement concrete pavement over a portland cement concrete pavement where the two separate layers are unbonded. (High Type Rigid)

Code 76 = Rigid over Flexible – Portland cement concrete pavements that have been placed over a bituminous (mixed or penetration) pavement. (High Type Rigid)

Code 80 = Brick, Block or Other Combination – A road consisting of paving brick; stone, asphalt, wood and other block; steel or wood with or without a bituminous wearing surface less than 1 inch in compacted thickness. Includes roads with combination of wearing surfaces. (High Type Flexible)

Item 29 – Concrete Joint Spacing (Length = 2)

This item is required for Interstate, Other Freeways and Expressways and Other Principal Arterials. Enter the joint spacing to the nearest foot. Code the leading zero where necessary. If there is no jointing or the surface type is not portland cement concrete, code "00". A weighted average is to be coded where the joint spacing is variable. Only the surface layer is to be considered. Construction joints (used primarily for continuously reinforced

concrete pavements) are not to be considered. The intent of this item is to obtain a measure for all intentionally formed joints.

Item 30 – Load Transfer Devices (including dowel bars) (Length = 1)

Enter the code to indicate whether or not load transfer devices (including dowel bars) have been used in jointed portland cement concrete pavements. This item is required for Interstate, Other Freeways and Expressways and Other Principal Arterials. Only the surface layer is to be considered. Code "0" where this item is not applicable due to functional system or to surface type. Continuously reinforced Portland cement concrete surfaces would normally be joint1ess (except for construction joints) – code "0" to indicate non-applicability.

Code 1 = No load transfer devices have been used

Code 2 = Load transfer devices have been used

Item 31 – Pavement Section (Length = 1)

Enter the appropriate code to indicate that the structural number (SN) for f1exib1e pavements or the slab thickness (D) for rigid pavements is known or enter the code for the type of pavement section (heavy, medium, light) where SN or D is not reported. The SN or D, as appropriate, is required for Interstate, Other Freeways and Expressways and Other Principal Arterials. Where available, code SN or D for all functiona1 systems. A roadway with at least 1 inch of compacted f1exib1e overlay (disregarding short patches) is considered a f1exible pavement for purposes of this code.

To assist in determining the type of pavement section for those sections where SN or D, as appropriate, are not required or are not available, Table IV-2 has been prepared showing typical pavement sections. This guide includes typical thicknesses of surface, base and subbase. Unpaved facilities are those designated as unimproved, graded and drained earth, gravel or stone (codes 20/30/40 in Item 28).

Code and Description:

Code 0 = Unpaved

Code 1 = "SN" known

Code 2 = "D" known

Code 3 = Heavy

Code 4 = Medium

Code 5 = Light

Table IV-2

PAVEMENT SECTION CODING

Code	Type of Section (Flexible Pavement)	"SN" Range (Flexible Pavement)	Surface Type and Thick. (Flexible Pavement)	Base Type and Thick. (Flexible Pavement)	Subbase Type and Thick (Flexible Pavement)	Range in Pavement Thickness "D"(Rigid Pavement)
3	Heavy	4.6-6.0	6" Asphaltic Concrete	12" Aggregate or 8" Asphaltic Concrete	13" Aggregate	> 9.0" (*8" if continously Reinforced*)
4	Medium	3.1-4.5	4" Asphaltic Concrete	8" Aggregate or 6" Asphaltic Concrete	8" Aggregate	7.1-9.0" (*6" if continously Reinforced*)
5	Light	1.3-3.0	3" Asphaltic Concrete Surface Treatment	4" Aggregate	4" Aggregate	6.0-7.0"

Item 32 – Structural Number (SN) or Slab Thickness (D) (Length = 2)

This item is required for Interstate. Other Freeways and Expressways and Other Principal Arterials. Where available, code SN or D for all functional systems. Enter the SN value to the nearest tenth (x.x – implied decimal) for those sections coded -18 in Item 31. Enter D (in inches) for those sections coded "2" in Item 31. Otherwise code "00".

Item 33 – Type of Base (Length = 1)

This item is required for Interstate, Other Freeways and Expressways and Other Principal Arterials. Enter the code that describes the type of base. Use the highest numerical code

where a 8ixture of Materials have been used. Code "0" where this item is not applicable due to functional system requirements. The codes used for this item are consistent with the Financial Management Information System (FMIS) coding scheme. HPMS code "3" includes all stabilized FMIS codes of "3" to "7".

Code and Description:

Code 1 = Roadbed Soil.

Code 2 = Granular Material.

Code 3 = Stabilized earth or granular material with admixture (cement. lime, fly ash, asphalt, etc.)

Code 5 = Not applicable due to raised roadway (causeway, bridge deck, etc.)

Code 8 = Hot mix asphalt

Code 9 = Lean concrete.

Item 34 Type of Subgrade (Length = 1)

Enter the code that describes the type of material used for the subgrade on the section. This item is required for Interstate, Other Freeways and Expressways and Other Principal Arterials. Code MO" where this item is not applicable due to functional system requirements.

Code and Description:

Code 1 = Coarse graded material (gravel, sand, etc.)

Code 2 = Fine graded material (original earth, clay, etc).

Code 3 = Not applicable due to raised roadway (causeway, bridge deck, etc.)

Item 35 – Subsurface Drainage (Length = I)

Enter the code that describes the subsurface drainage provided on the section for all Interstate, Other Freeways and Expressways and Other Principal Arterial sections. Code "0" where this item is not app1icable due to functional system requirements. These codes are consistent with the financial Information Management System (FMIS). The intent of this item is to obtain information about base drainage and edge drains, specifically. Ignore other types of drainage systems for HPMS purposes.

Code 1 = Dense (undrainable) base without edge drains (i.e., no subsurface drainage).

Code 2 = Dense (undrainable) base with edge drains

Code 3 = Drainable base without edge drains.

Code 4 = Drainable base with edge drains.

Code 5 = Not applicable due to raised roadway (causeway, bridge deck, etc.)

In the situation where edge drains no longer function, use "without edge drains" codes.

Item 36 – Measured Pavement Roughness (Length = 3)

Zero-fill for unpaved roadways.

This item is required for all paved rural arterials and urban Interstate and other freeways and expressways. It is suggested for all other paved sample sections (see Table IV-3). Enter the actual calibrated roughness measurement to the nearest inch per mill. Provide leading zeroes for measurements less than "100". Enter "000" when not reported.

Table IV-3

Roughness Reporting Requirements

Functional System	Roughness
RURAL	
Interstate	Required
Other Principal Arterial	Required
Minor Arterial	Required
Major Collector	Suggested
Minor Collector	Suggested
URBAN	
Interstate	Required
Other Fwys and Exprswys	Required

Other Principal Arterial	Suggested
Minor Arterial	Suggested
Collector	Suggested

Item 37 – Reserved for Federal Use (Length = 12)

This field shall be zero-filled when not using the HPMS Submittal Software to update and maintain the data. The HPMS software will zero-fill, otherwise.

Item 38 – Pavement Condition (Length = 2 – x.x – implied decimal)

Enter the pavement condition, actual Present Serviceability Rating (PSR) or equivalent, to the nearest tenth, for all paved sections. For unpaved sections (defined in Item 31), code "00". The ratings are equivalent to those used in making a PSR, so recent PSR and Present Serviceability Index (PSI) ratings may be used where available. Also if current sufficiency ratings of pavement condition (but excluding geometrics) are available, a correlation between the sufficiency rating scale and the PSR scale or rating factors may be developed so that such existing ratings may be used.

If there are no recent PSR, PSI, or sufficiency ratings that can be adapted, the section should be rated from the following table. In view of the growing national concern regarding pavement deterioration, careful attention to realistic pavement condition ratings is strongly suggested. Estimates to the nearest tenth within the applicable range should be made, e.g. – 2.3. This is most important for comparisons to prior years. Where different lanes have different pavement condition ratings, code the worst condition.

PAVEMENT CONDITION RATING

Table IV-4

Use full range of values)

PSR | Verbal Ratings | Description

PSR 5.0 = Very Good (Only new or nearly new pavements are likely to be smooth enough and sufficiently free of cracks and patches to qualify for this category. All pavements constructed or resurfaced during the data year would normally be rated very good.

PSR 4.0 = Good (Pavements in this category, although not quite as smooth as those described above, give a first class ride and exhibit few, if any visible signs of surface

deterioration. Flexible pavements may be beginning to show evidence of rutting and fine random cracks. Rigid pavements may be beginning to show evidence of slight surface deterioration, such as minor cracks and spalling.)

PSR 3.0 = Fair (The riding qualities of pavements in this category are noticeably inferior to those of new pavements, and may be Fair barely tolerable for high speed traffic. Surface defects of flexible pavements may include rutting, map cracking, and extensive patching. Rigid pavements in this group may have a few joint failures, faulting and cracking, and some pumping.)

PSR 2.0 = Poor (Pavements that have deteriorated to such an extent that they affect the speed of free-flow traffic. Flexible pavement may have large potholes and deep cracks. Distress includes raveling, cracking, rutting, and occurs over 50 percent or more of the surface. Rigid pavement distress includes joint spalling, faulting, patching, cracking, scaling, and may include pumping and faulting.)

PSR 1.0 = Very Poor (Pavements that are in an extremely deteriorated condition. The facility is passable only at reduced speeds, and with considerable ride discomfort. Large potholes and deep cracks exist. Distress occurs over 75 percent or more of the surface.)

PSR 0.0

Item 39 – Overlay or Pavement Thickness (Length = 3 – xx.x – implied decimal)

Enter the overlay pavement thickness or the pavement thickness (for new pavements) to the nearest tenth (in inches) when an improvement has been completed on the section. This item is intended to be coded when resurfacing is accomplished as part of any improvement or when the pavement is completely reconstructed. It shall remain fixed (retained in the HPMS data record) until another resurfacing/reconstruction improvement is completed on the section. Code "000" initially.

All Type of Improvement codes (Item 41), with the possible exception of "40", "50" and "60" (Major or Minor Widening and Restoration and Rehabilitation), would cause a change to this item (or the initial coding of this item). When this item is changed (or initially coded), Item 40, Year of Surface Improvement, should also be changed.

The thickness reported here should include all newly laid pavement including replacement pavement material where milling has occurred.

IMPROVEMENTS DATA ITEMS

Item 40 – Year of Surface Improvement (Length = 4)

Enter the year when a surface improvement (e.g., resurfacing or reconstruction, including new samples selected on newly constructed or improved roadway facilities) has been completed on the section; e.g., 1988 would be coded "1988". Do not remove this entry in subsequent data years it shall be retained in the HPMS data record until another improvement affecting the surface is completed on the section. Initially, (for existing non-improved sections) this field should be 'coded "0000".

All Type of Improvement codes (Item 41), with the possible exception of "40", "50" and "60" (Major or Minor Widening and Restoration and Rehabilitation), would cause a change to this item (or the initial coding of this item). If this field is changed (or initially coded), check to see if Item 39, Overlay or Pavement Thickness, should also be changed.

Item 41 – Type of Improvement (Length = 2)

This item is coded as defined below for all improvements completed during the reporting year. If completed improvements overlap, use the improvement type code with the highest priority (lowest numerical code). If no improvements were completed during the reporting year, the section shall retain the last improvement type coded. Do not include routine maintenance. Code "00", initially. The codes are consistent with the Financial Management Information System (FMIS), but contain an extra digit in some instances, and are somewhat more elaborate in other cases.

If only a portion of the section was improved and completed during the reporting year, the section should be split into two or more segments at the point(s) of change. Use one of the following codes:

Code and Improvement Type Definitions:

Code 10: NEW ROUTE – The only time this code could possibly be used is when a new sample has been randomly chosen on a newly constructed roadway that was completed and opened to traffic in the data year being reported.

Code 20: RELOCATION – Construction of a faci1ity on new location that replaces an existing route to the extent that the old route is abandoned. If the existing facility remains in use as a co11ector or higher functional system, do not code the improvement and retain the old facility as the sample with no improvement (unless the old facility was also improved). If the existing facility is abandoned, the sample should be placed (selected) on the new facility and coded with this improvement type; if the existing location becomes a local functional system facility, delete the sample.

RECONSTRUCTION – Construction on approximate alignment of an existing route where the pavement structure is substantially removed and replaced. Such reconstruction may

include widening to provide additional through lanes, adding grade separations, and replacing other highway elements. Adjustment to existing horizontal and vertical alignment can be made. Code one of the following types of reconstruction (Codes 31 to 35). The last digit of each code corresponds to the FMIS codes.

Code 31: RECONSTRUCTION TO FREEWAY – Complete reconstruction to freeway design standards on substantially existing alignment. This improvement type always includes the addition of full control of access. It may include the addition of through lanes, dualizing, addition of interchanges or grade separations, or widening of through lanes, depending on what was required to bring the facility to freeway standards.

Code 32: RECONSTRUCTION WITH MORE LANES – Complete reconstruction on substantially the same alignment with the addition of through lanes to the existing section. Alignment, shoulder, and drainage deficiencies are corrected.

Code 33: RECONSTRUCTION TO WIDER LANES – Complete reconstruction on substantially the same alignment with through lanes at least one foot wider thin the existing section. Alignment, shoulder, and drainage deficiencies are corrected.

Code 34: PAVEMENT RECONSTRUCTION WITH ALIGNMENT IMPROVEMENTS – Reconstruction of the highway section to correct a pavement deficiency. Specific horizontal or vertici1 alignment deficiencies are also corrected

Code 35: PAVEMENT RECONSTRUCTION – Complete reconstruction on substantially the same alignment without widening the pavement structure. Drainage deficiencies and minor alignment deficiencies are corrected.

Code 40: MAJOR WIDENING – The addition of through lanes or dualization of an existing facility where the existing pavement is salvaged. Also included, where necessary, is the resurfacing of existing pavement and other incidental improvements such as drainage and shoulder improvements.

Code 50: MINOR WIDENING – The addition of more width per through lane to the roadway of an existing facility without adding 'through lanes. The existing pavement is salvaged. In many cases, the improvement will include resurfacing the existing pavement and other incidental improvements such as shoulder and drainage improvements.

Code 60: RESTORATION AND REHABILITATION – Work required to return an existing pavement (including shoulders) to a condition of adequate structural support or to a condition adequate for placement of an additional stage of construction. There may be some upgrading of unsafe features or other incidental work in conjunction with restoration and rehabilitation. Typical improvements would include replacing spalled or

malfunctioning joints; substantial pavement stabilization prior to resurfacing; grinding/grooving of rigid pavements; replacing deteriorated materials; reworking or strengthening bases or subbases, and adding underdrains. If this type of improvement is done in preparation for resurfacing, it should be reported separately only if the resurfacing is not completed in the year for which the data is reported. This HPMS code would include FMIS Type of Rehabilitation codes of "01" and "02" (subsealing, joint repair, diamond grinding, milling, inlays, etc.)

Code 71: RESURFACING WITH SHOULDER IMPROVEMENTS AND PORTLAND CEMENT CONCRETE PAVEMENT RESTORATION – Placement of additional portland cement concrete material over the existing roadway to improve serviceability or to provide additional strength. Shoulders are widened or reconstructed to provide additional strength. There may be some upgrading of unsafe features and other incidental work. This code should also be used when concrete restoration includes techniques such as sub-sealing, joint repair, diamond grinding, etc. Where surfacing is constructed by separate project as a final stage of construction, the type of improvement should be the same as that of the preceding stage – -relocation, reconstruction, minor widening, etc.

Code 72: RESURFACING WITH SHOULDER IMPROVEMENTS AND BITUMINOUS PAVEMENT RESTORATION – Placement of at least 1 inch of compacted bituminous material over the existing roadway to improve serviceability or to provide additional strength Shoulders are widened or reconstructed to provide additional strength. There may be some upgrading of unsafe features and other incidental work. Where surfacing is constructed by separate project as a final stage of construction, the type of improvement should be the same as that of the preceding stage – relocation, reconstruction, minor widening, etc.

Code 77: RESURFACING WITH PORTLAND CEMENT CONCRETE PAVEMENT RESTORATION – Placement of additional portland cement concrete material over the existing roadway to improve serviceability or to provide additional strength. There may be some upgrading of unsafe features and other incidental work in conjunction with resurfacing. This code should also be used when concrete restoration includes techniques such as subsealing, joint repair, diamond grinding, etc. Where surfacing is constructed by separate project as a final stage of construction, the type of improvement should be the same as that of the preceding stage--relocation, reconstruction, minor widening, etc.

Code 78: RESURFACING WITH BITUMINOUS PAVEMENT RESTORATION – Placement of at least 1 inch of compacted bituminous material over the existing roadway to improve serviceability or to provide additional strength. There may be some upgrading of unsafe features and other incidental work in conjunction with resurfacing. Where surfacing is

constructed by separate project as a final stage of construction, the type of improvement should be the same as that of the preceding stage – relocation, reconstruction, minor widening, etc.

GEOMETRICS/CONFIGURATION

Item 42 – Access Control (Length = 1)

Enter the code for the type of access control as defined below:

Code and Type of Access Control:

Code 1 = Full Access Control--Preference has been given to through traffic movements by providing interchanges with selected public roads and by prohibiting crossing at grades and by prohibiting direct driveway connections.

Code 2 = Partial Access Control--Preference has been given to through traffic movement. In addition to possible interchanges, there may be some crossings at-grade with public roads, but direct private driveway connections have been minimized through the use of frontage roads or other local access restrictions.

Code 3 = No Access Control--For HPMS purposes, this code includes all sections that do not meet the criteria for the above codes.

GENERAL GUIDELINES – For coding Number of Through Lanes (Item 22), Lane Width (Item 43), Shoulder Type (Item 44), Shoulder Width (Item 45) and Peak Parking (Item 65)

All of these data items need to be considered together in order to properly code them for HPMS. The normal descriptions are given under the respective data item. This section simply provides some additional guidelines where the coding of one item depends on one of the other items.

The number of through lanes and the lane width should be coded according to the striping, if present, or according to the usage if no striping or only centerline striping is present. The roadway beyond the ends of the sample section being inventoried may be considered when the number of lanes and the lane width, in particular, are being coded. For example, if the sample section is short and typically wider than the rest of the contiguous roadway, code the typical roadway usage according to the rest of the roadway for these two data items. Shoulder width (or lane width) cannot include parking lanes, bicycle lanes or bikeways. There is no shoulder (or shoulder width) under these circumstances. If there is parking on one side of a roadway and a shoulder or a curb on the other side, code both parking and shoulder type (and shoulder width), accordingly.

A shoulder cannot exist between a traffic lane and a parking lane that is completely within the roadway boundaries. Code no shoulder and zero (00) shoulder width under this circumstance. Code the lane width as it is actually being used.

As with all HPMS data items, code the lesser or worse condition where the two sides of the roadway differ.

It is recognized that the total roadway width may not be fully represented under a few of the coding schemes that would develop under these guidelines. Under these situations, the "lost" roadway area is considered to be for acceleration/deceleration, parking movement, driveway turning, weaving, etc., for which there are no data items in HPMS.

Item 43 – Lane Width (Length = 2)

Enter the prevailing traffic lane width (through lanes) to the nearest foot. Provide the leading zero for lane widths less than 10 feet. There are situations where the traffic lane and the shoulder have the same surface with no delineation to distinguish the lane from the shou1der. In such cases, use a reasonable width for each based on the actual width used by traffic. For example, a 32-foot total paved surface width with centerline striping only and no additional shoulder width could be coded as 12-foot lanes with 4-foot shoulders. See the "GENERAL GUIDE INES", above, for further coding Applications.

In some situations, striping is placed inside the edge of the pavement in order to keep traffic (particularly trucks) from raveling the edge. Ignore the striping and code the actual lane width under this situation. For example, a 2-lane roadway that contains a solid stripe one foot inside the edge of the roadway (to the left of the right shoulder), having a width from centerline to edge-striping of 11 feet, should be coded as 12 feet.

Item 44 – Shoulder Type (Length = 1)

Enter the code for the predominant type of shoulder on the section. If left and right shoulder types differ on a multilane facility, the right shoulder type should be considered to be the predominant type. If the section has both shoulders and, curbs (i.e., a shoulder bounded by a curb or a mountable curb and then a shoulder), code the shoulder. See the "GENERAL GUIDELINES" above Item 43, Lane Width, for further coding applications. These codes are consistent with the Financial Management Information System (FMIS).

Code and Descriptions:

Code 1 = None – No shoulders or curbs exist.

Code 2 = Surfaced with Bituminous Material – A bituminous course over a granular or stabilized base.

Code 3 = Surfaced with Portland Cement Concrete (not tiCed) – A portland cement concrete course over a granular or stabilized base.

Code 4 = Surfaced with Tied Portland Cement Concrete – A portland cement concrete course over a granular or stabilized base that is part of the mainline pavement.

Code 5 = Stabilized – A gravel or other granular material, with or without admixture, capable of supporting most loads even under wet conditions.

Code 6 = Combination – A part of the shoulder width is surfaced and/or a part is stabilized, and/or a part is turf, etc. – some combination of codes 2-5,7.

Code 7 = Earth – Natural earth with or without turf.

Code 8 = Curbed – No shoulders exist; section is curbed.

Item 45 – Shoulder Width (Length = 4)

45a – Right Shoulder – Enter the width to the nearest foot. Enter "00" if no right shoulder exists. (Length = 2)

45b – Left Shoulder – On divided highways, enter the width of the left (median) shoulder to the nearest foot. Enter "00" where no left shoulder exists. (Length = 2)

Do not include parking or bicycle lanes. Use the predominant width where it is not constant. Particular attention should be paid to "combination" shoulders to ensure that the total width is being reported. See the "GENERAL GUIDELINES" above Item 43, Lane Width, for further coding applications.

Item 46 – Median Type (Length = 1)

Enter one of the following codes

Code 1: Curbed

Code 2: Positive 'Barrier

Code 3: Unprotected

Code 4: None

A positive barrier would normally consist of guard-rail or concrete, but could consist of a line of closely-spaced (large) trees or of thick, impenetrable shrubbery on most of the section. Turning lanes or bays are not considered medians unless a median exists on the major portion of the roadway, and the turning lanes/bays are cut into the median at intersections, entrances to commercial enterprises, etc.

Item 47 – Median Width (Length = 2)

Enter the predominant median width (including shoulders, if any), measured between the inside edges of the through roadways, to the nearest foot. Enter "00" for undivided roadways. Enter "99" where the median width is 100 feet or greater. Ignore turning bays cut into the median.

Item 48 – Existing Right-of-Way Width (Length = 3)

Enter the prevailing right-of-way width in feet for the section. Where data are unavailable, estimates are sufficient. In heavily built up areas such as the CBD where the only space between the curbs and buildings is the sidewalk area, enter the curb-to-curb width. Code "999" where the right-of-way is 1000 feet or greater. Provide leading zeroes, where necessary.

Item 49 – Is Widening Feasible? (Length = 1)

Enter the appropriate code to indicate the extent to which it is feasible to widen the existing road. Consider only the physical features along the roadway section, such as numerous large buildings, severe terrain, cemeteries and park land; do not consider restrictions because of current right-of-way width, State practices concerning widening, politics or projected traffic. Single-family residences, barns, private garages, etc. are considered expendable for purposes of this item. Office buildings, shopping centers and other large enterprises would not be considered expendable. The code is to represent the lanes that cou1d be added in both directions, e.g. if a lane could be added for each direction of the roadway, then use code "4"; if only some widening could occur (a few feet, perhaps), use code "2".

Restriping to narrower lanes, such that an additional lane results in a multilane facility, does not constitute widening feasibility. When coding this item, medians and other areas already within (as well as outside) the right-of-way are considered to be available for widening.

Code 1: No widening is feasible

Code 2: Yes, partial lane

Code 3: Yes, one lane

Code 4: Yes, two lanes

Code 5: Yes, three lanes or more

Items 50-53 – Coding Guide for Horizontal and Vertical Alignment

Highway Category	Item 50: Horizontal Alignment Adequacy	Item 51: Curves by Class	Item 52: Vertical Alignment Adequacy	Item 53: Grades by Class
Paved – Rural				
Principal Arterial	Code "0"	Required	Code "0"	Required
Minor Arterial	Code "0"	Required	Code "0"	Required
Major Collector	Required	Not Req'd	Required	Not Req'd
Minor Collector	Required	Not Req'd	Required	Not Req'd
Paved – Urban				
Principal Arterial	Code "0"	Required	Code "0"	Required
Minor Arterial	Not Req'd	Not Req'd	Not Req'd	Not Req'd
Collector	Not Req'd	Not Req'd	Not Req'd	Not Req'd

Item 50 – Horizontal Alignment Adequacy (Rural only) (Length = 1)

This item is required for paved rural collectors unless Item 51, Curves by Class, is present. (See Table IV-5, above.) Code "0" when Item 51 is reported (the HPMS calculation software will insert an appropriate value) or when this item is not required. If Item 51 is not reported for the required systems (rural arterials and urban principal arterials) this item should be appropriately coded. The following codes will be used:

Code 1 = All curves meet appropriate design standards for the type of roadway. Reduction of curvature would be unnecessary even if reconstruction were required to meet other efficiencies (i.e., capacity, vertical alignment, etc.).

Code 2 = Although some curves are below appropriate design standards for new construction, all curves can be safely and comfortably negotiated at the prevailing speed limit on the section. The speed limit was not established by the design speed of curves.

Code 3 = Infrequent curves with design speeds less than the prevailing speed limit on the section. Infrequent curves may have reduced speed limits for safety purposes.

Code 4 = Several curves uncomfortable and/or unsafe when traveled at the prevailing speed limit on the section, or the speed limit on the section is severely restricted due to the design speed of curves.

Item 51 – Curves by Class (Length = 91)

This item is required for paved rural arterials (Interstate, other principal arterial and minor arterial) and urban principa1 arterials (Interstate, other freeways and expressways and other principal arterial), but may be reported for other functional systems if the data are available. (See Table IV-5, above.) Zero-fill this item when it is not reported. When this item is not reported for the required systems, Item 50, Horizontal Alignment Adequacy should be coded. The following data will be reported:

Curve Classes by Degree of Curvature	Number of Curves (right justified)	Record Positions	Length of Curves in Class (implied decimal) (xx.xxx miles)	Record Positions
a. 0.0-0.4	--	238-239	- - - - -	240-244
b. 0.5-1.4	--	245-246	- - - - -	245-246
c. 1.5-2.4	--	252-253	- - - - -	254-258
d. 2.5-3.4	--	259-260	- - - - -	261-265
e. 3.5-4.4	--	266-267	- - - - -	268-272
f. 4.5-5.4	--	273-274	- - - - -	282-286

h. 7.0-8.4	--	287-288	- - — – -	289-293
i. 8.5-10.9	--	294-295	- - — – -	296-300
k. 14.0-19.4	--	308-309	- - — – -	310-314
1. 19.5-27.9	--	315-316	- - — – -	317-321
m. 28+	--	322-323	- - — – -	324-328

The format is a 91-position field with 13 classes of curves reported (13 x 7). For each of the 13 curve classes, the numbers of curves (2 positions) and class length (5 positions, with implied decimal (xx.xxx mile) are reported. The sum of the lengths of curves must equal the section length.

Item 52 – Vertical Alignment Adequacy (Rural only) (Length = 1)

This item is required for paved rural collectors unless Item 53, Grades by Class, is present. (See Table IV-5, above.) Code "0" when Item 53 is reported (the HPMS calculation software will insert an appropriate value) or when this item is not required. If Item 53 is not reported for the required systems (rural arterials and urban principal arterials) this item should be appropriately coded. The following codes will be used:

Code 1: All grades (rate and length) and vertical curves meet minimum design standards appropriate for the terrain. Reduction in rate or length of grade would be unnecessary even if reconstruction were required to meet other deficiencies (i.e., capacity, horizontal alignment, etc.).

Code 2: Although some grades (rate and/or length) and vertical curves are below appropriate design standards for new construction, all grades and vertical curves provide sufficient sight distance for safe travel and do not substantially affect the speed of trucks.

Code 3: Infrequent grades and vertical curves that impair sight distance and/or affect the speed of trucks (when truck climbing lanes are not provided).

Code 4: Frequent grades and vertical curves that impair sight distance and/or severely affect the speed of trucks; truck climbing lanes are not provided.

Item 53 – Grades by Class (Length = 42)

This item is required for paved rural arterials (Interstate, other principal arterial and minor arterial) and urban principal arterials (Interstate, other freeways and expressways and

other principal arterial), but may be reported for other functional systems if the data are available. (See Table IV-5, above.) Zero-fill this item when it is not reported. When this item is not reported for the required systems, Item 52, Vertical Alignment Adequacy should be coded. The following data will be reported:

Grade Classes by Gradient (Percent)	Number of Grades (Right Justified)	Record Position	Length of Grades in Class (implied decimal) (xx.xxx miles)	Record Position
a. 0.0-0.4	--	330-331	-----	332-336
b. 0.5-2.4	--	337-338	-----	339-343
c. 2.5-4.4	--	344-345	-----	346-350
d. 4.5-6.4	--	351-352	-----	353-357
e. 6.5-8.4	--	358-359	-----	360-364
f. 8.5 +	--	365-366	-----	367-371

The format is a 42-position field with 6 classes of grades reported (6 x 7). For each of the 6 grade classes, the numbers of grades (2 positions) and the grade length (5 positions, with implied decimal (xx.xxx miles)) are reported. The sum of the lengths of grades must equal the section length.

Item 54 – Percent of Length with Sight Distance of 1500 Feet (Rural, paved 2-lane facilities only) (Length = 3)

For all rural, paved two-lane facilities, excluding dense rural sections, enter the percent of the section length (estimated to the nearest 10 percent) which has an available passing sight distance (as measured from the driver's eye to the road surface) of at least 1500 feet. Striping should be used for this measurement where it delineates unsafe passing zones. Contiguous roadway on both ends of the section are to be considered in estimating this item, particularly where the section is very short (i.e., 1500 feet = .28 mile). Where there is a discernable directional difference, enter the more restrictive sight distance percentage.

See Appendix C for optional estimating procedures. Code "000" for nonapplicable sections including dense rural.

TRAFFIC/CAPACITY DATA ITEMS

Item 55 – Speed Limit (Length = 2)

Enter the daytime speed limit (for automobiles) posted or legally mandated on the greater part of the section.

Item 56 – Weighted Design Speed (Rural only) (Length = 2)

This item is required for all paved rural collectors with type of development – rural (Item 71 =1). Code "00" for all sections for which the weighted design speed is not supplied. Enter the weighted design speed, to the nearest 5 mph, as determined by weighting the design speed of the individual horizontal curves and tangents in the section by the length of each. This item is calculated by the HPMS Submittal Software when Curves by Class (Item 51) are present. When Curves by Class are not provided for the required systems (rural arterials and urban principal arterials), this item must be appropriately coded.

Item 57 – Percent Commercial Vehicles (Peak and Off-Peak) (Length = 4)

Enter the percentage of commercial vehicles to the nearest whole percent. Commercial vehicles include classes 4 through 13 (buses through seven-or more axle, multi-trailer trucks) as identified in Chapter II and in the Traffic Monitoring Guide (TMG). These vehicle classes are discussed in Chapter 3 of the TMG, and exclude pickups, panels, etc. Certain routes may exhibit significant differences in commercial vehicle percentages between peak and non-peak hour operation (i.e., recreational routes), and such differences can have a significant bearing on the calculation of capacity. In those cases where the State determines that such peak operations have a significant bearing on capacity calculations, separate peak usage values are to be reported even if they must be estimated. In those situations where such differences are known not to exist, the same percentage should be reported for both peak and non-peak. The vehicle classification data reported for each sample section should be representative of the commercial vehicle activity over all days of the week and seasons of the year.

57a – Peak Percent Commercial Vehicles (Length = 2)

57b – Off-Peak Percent Commercial Vehicles (Length = 2)

Item 58 – K-Factor (Length = 2)

Enter the K-factor – the design hour volume (30th highest hour) – as a percentage of the annual average daily traffic, to the nearest percent.

Item 59 – Directional Factor (Length = 3)

Enter the percentage of the design hour volume (30th highest hour) flowing in the peak direction, to the nearest 5 percent. Code "100" for one-way facilities. Provide leading zeroes, where necessary.

Item 60 – Peak Capacity (Length = 5)

Urban Areas

Enter the present hourly capacity (in one direction) reflecting the peak-period situation, taking into consideration the peak-period parking regulations, signalization, local bus movements, etc. The procedures described in the 1985 "Highway Capacity Manual" (HCM) should be used for these calculations. For purposes of this data element, a service flow consistent with Level of Service "E" as defined in the 1985 HCM should be calculated.

Often urban street capacity is governed by a critical intersection in the section under study. When this is the case, code the capacity for the critical intersection. Otherwise, code the capacity of a typical intersection. Where detailed information is not known assumptions will necessarily have to be made regarding such items as percent right and left turns in order to calculate capacity by section.

Rural (Optional)

Enter the present hourly capacity (total of both directions for two-lane facilities and for one direction on multi-lane facilities). Capacity is the maximum service flow at Level of Service "E", as described in the 1985 HCM. The procedures described in the HCM should be used for this calculation; however, the rural capacity is normally calculated by the HPMS Submittal Software.

In built-up areas of small towns (population less than 5,000), it may be more reasonable to calculate capacity using the procedures described in the HCM for urban areas, but the capacity should still be reported as a total of both directions for two-lane facilities and for one direction on multi-lane facilities. It is requested that a capacity for dense rural sections be coded as it is very difficult to calculate a reasonable value based on the data reported.

This field should be zero filled when not reported.

Item 61 – Volume/Service Flow Ratio (V/SF) (Length = 3 – x.xx -implied decimal)

This field is generated by the HPMS Submittal Software from data within the HPMS record.

Item 62 – Turning Lane (Urban Data Item) (Length = 2)

Item 62 – Turning Lane (Urban Data Item) (Length = 2)

LEFT Turning Lanes/Bays (Length =1)

Code 1 = Multiple left turning lanes/bays exists (includes a continuous left turning lane that becomes multiple left turn bays just prior to the intersection). Through movements are prohibited in these lanes

Code 2 = A continuous left turning lane exists from intersection to intersection. Through movements 'are prohibited in this lane.

Code 3 = A single left turning bay exists

Code 4 = No left turning lanes/bays exist (intersections do exist).

Code 5 = No left turns are permitted during the peak period.

RIGHT Turning Lanes/Bays (Length =1)

Code 1 = Multiple right turning lanes/bays exist (includes a continuous right turning lane that becomes multiple right turn bays just prior to the intersection). Through movements are prohibited in these lanes.

Code 2 = A continuous right turning lane exists from intersection to intersection. Through movements are prohibited in this lane.

Code 3 = A single right turning bay exists

Code 4 = No right turning lanes/bays exist (intersections do exist).

Code 5 = No right turns are permitted during the peak period.

Examples:

(1) A critical intersection with signals on a section contains 2 left turn lanes and a right turn bay; code "13".

(2) No signal controlled intersections exist on a section with 3 intersections. One of the intersections has a turn bay for right turns; however, the capacity entered in Item 60 did not take the right turn bay into consideration. The code would be "44" for the section.

Item 63 Prevailing Type of Signalization (Urban Data Item) (Length=1)

Enter the appropriate code that best describes the predominant signal system on the section. Code "0" for rural sections.

Code 1 = Uncoordinated Fixed Time (includes pre-programmed changes for rush hour or other time periods)

Code 2 = Traffic Actuated

Code 3 = Progressive (coordinated signals)

Code 4 = Progressive (coordinated signals)

Item 64 – Typical Peak Percent Green Time (Urban Data Item) (Length = 2)

Enter the typical percent green time in effect during peak hours at the signalized intersections for the route which is being inventoried. Enter "00" if no signalized intersections exist. Where signals are traffic actuated, code an estimated average green time during peak hours. Ignore green-arrow time for turning movements – this item is intended to obtain through movement green time. Code "00" for rural sections.

Item 65 – Peak Parking (Urban Data Item) (Length = 1)

Enter the appropriate code reflecting the type of peak-hour parking, if any, that exists on the section. If parking prohibitions are routinely ignored, use the "permitted" code(s) to reflect the actual situation rather than the regulations. The facility does not have to be formally signed or striped for parking to use the permitted code(s) (i.e., parking is simply available). If parking is actually beyond the shoulder (or beyond the pavement edge where no shoulder exists), use code "3" for no parking. Code "0" for rural sections. See the "GENERAL GUIDELINES above Item 43, Lane Width, for further coding applications.

Code 1 = Parking permitted one side

Code 2 = Parking permitted both sides

Code 3 = No parking allowed or none available

Item 66 – Future AADT Length = 6)

Enter the forecasted annual average daily traffic (AADT) (total both directions) for the appropriate year entered in Item 67, Year of Future AADT. This cannot be for less than 17 years nor for more than 22 years. The intent is to obtain a 20-year forecast, but it may be for some other period of time that is within the noted timespan. For example, the future AADT may be for any of the years 2006 to 2011 for the 1989 data year to be reported in 1990. This item may be updated anytime, but must be updated when the forecast falls below the 17-year limit.

Item 67 – Year of Future AADT (Length = 2)

Enter the last two digits of the year for which Item 66, Future AADT has been forecasted. This cannot be less than 17 years nor more than 22 years from the data year. For example, a 20-year forecast reported for the 1989 data year would be coded "09" (for the year, 2009).

ENVIRONMENT DATA ITEMS

Item 68 – General Climate Zone (Length = 2)

This code is entered by the HPMS Submittal Software from county/climate zone equivalency tables. It should be checked by the State and may be changed if found not to be representative of the area in question. Once corrected, there should be no further need for change except under extraordinary situations. Note that if the county code is changed, the climate zone will be updated, if necessary, by the HPMS Submittal Software. If county codes are updated via a State procedure, the climate zone should be updated

Item 69 – Drainage Adequacy (Length =1)

Enter the code for the drainage adequacy of the section. Adequacy is based on the height of the grade line, the design of the cross section, and the capability of the cross-drains, both in condition and capacity, to maintain a well-drained surface on a stable subgrade.

Code 1 = Good – Fully adequate drainage and cross section design. No evidence of flooding, erosion, ponding, or other water damage.

Code 2 = Fair – Height of grade line, cross section, or culvert capacity somewhat below the standard for the type of roadway that would comply with standards if rebuilt. Drainage structures are structurally sound. Some added maintenance effort required due to drainage and sedimentation problems.

Code 3 = Poor – Evidence of severe flooding, ponding, erosion, or other drainage problems. Drainage structures may be in poor condition. Considerable excess maintenance effort required due to drainage and sedimentation problems.

Item 70 – Type of Terrain (Rural Data Item) (Length = 1)

Enter the code for the predominant terrain type through which the section passes. Code "0" for urban sections.

Code 1 = Flat Terrain – That condition where highway sight distances, as governed by both horizontal and vertical restrictions, are generally long or could be made to be so without construction difficulty or major expenses.

Code 2 = Rolling Terrain – That condition where the natural slopes consistently rise above and fall below the highway grade line and where occasional steep slopes offer some restriction to normal highway horizontal and vertical alignment.

Code 3 = Mountainous Terrain – That condition where the longitudinal and transverse changes in the elevation of the ground with respect to the highway are abrupt and where the roadbed requires frequent benching or side hill excavation.

Item 71 – Type of Development (Rural Data Item) (Length =1)

Enter the code for the predominant type of development. Code "0" for I urban sections.

Code 1 = Rural – All areas outside of Federal-aid urban boundaries (places of 5,000 or more population), excluding those described as "dense".

Code 2 = Dense – Those areas outside of Federal-aid urban boundaries which have urban characteristics (i.e., small towns) or areas in which major recreational facilities, such as parks, ski resorts, scenic overlooks, and rest areas, have significant impact on traffic operation of the adjacent facility.

Item 72 – Urban Location (Urban Data Item) (Length = 1)

Enter the appropriate code that best reflects present land use in the area adjacent to the section. If an area appears to fit two of these categories, the code for the higher density of development should be used (lower numerical code). Code "0" for rural sections.

Code 1 = Central Business District (CBD) – That portion of a municipality in which the dominant land use is for intense business activity. The CBD is characterized by large numbers of pedestrians, commercial vehicle loadings of goods and people, a heavy demand for parking space, and high parking turnover.

Code 2 = Fringe – That portion of a municipality immediately outside the CBD in which there is a wide range in type of business activity, generally including small businesses, light industry, warehousing, automobile service activities, and intermediate strip development, as well as some concentrated residential areas. Most of the traffic in this area involves trips that do not have an origin or destination within the area. This area is characterized by moderate pedestrian traffic and a lower parking turnover than is found in the CBD, but may include large parking areas serving that district.

Code 3 = Outlying Business District. – That portion of a municipality or an area within the influence of a municipality, normally separated by some distance from the CBD and its fringe area, and in which the principal land use is for business activity. This district has its own local traffic circulation superimposed on through movements to and from the CBD, a relatively high parking demand and turnover, and moderate pedestrian traffic. Compact off-street shopping developments entirely on one side of the street are not included in the scope of this definition.

Code 4 = Residential – That portion of a municipality, or an area within the influence of a municipality, in which the dominant land use is residential development, but where small businesses may be included. This area is characterized by few pedestrians and a low parking turnover.

Code 5 = Rural in character.

Item 73 – Number of Grade-Separated Interchanges (Length = 2)

For all freeway and expressway facilities enter the number of grade-separated interchanges. If a section begins and ends with an interchange, only one of the interchanges is counted. The direction of inventory shou1d always be consistent, statewide, (i.e., increasing milepoint or east to west or south to north, etc.) for all sections. Enter "00" if none exist or if the facility being sampled is not a freeway or an expressway.

An expressway is defined as a divided highway for through traffic with full or partial access control and including grade separations at all or most major intersections. A freeway is defined as an expressway with full control of access.

Item 74 – Number of At-Grade Intersections with Public Roads (Length = 6)

This data item pertains to the type of traffic controls on the route being inventoried and not those of the intersecting route. It consists of three elements. Only those controls facing (controlling) the route being inventoried are counted. If a section begins and ends with an intersection, only one of the intersections is counted. The direction of inventory should always be consistent, statewide, (i.e., increasing milepoint or east to west or south to north, etc.) for all sections. Controls at shopping centers, industrial parks and other large traffic generating enterprises, should be included.

74a – Signa1s – Enter the number of intersections with a signal controlling the route being inventoried. If none, enter "00". A signal that cycles through red, yellow, and green for all or a portion of the day shall be counted as a signalized intersection. (Length = 2)

74b – Stop Signs--Enter the number of intersections with a stop sign controlling the route being inventoried. A continuous1y operating, flashing red signal shall be counted as a stop sign control. If none, code "00". (Length = 2)

74c – Other or No Controls – Enter the number of intersections where the route being inventoried is not controlled by either a signal or a stop sign – or is controlled by other types of signing or has no controls. A continuously operating, flashing yellow signal shall be considered as "other or no control". If none, code "00". (Length = 2)

Item 75 – Number of Structures (Length = 2)

Enter the number of structures located within the section. Supply a leading zero where necessary. Include structures built over or under an obstruction such as water, highway, railway, pedestrian-way, depression, etc., and having a passageway for carrying traffic or other moving loads, and having a length measured along the centerline of the crossing of 20-or-more feet. Include structures that pass over the facility as well as those on the facility (except as noted below). Twin (side by side) structures are to be reported as two separate structures.

All highway grade-separated structures are to be reported only once, as part of the facility of highest functional system. If the higher type facility is not the sample, then the structure is not reported. If two sample sections intersect by means of a structure and both roadways are on the same functional system, report the structure data with the roadway on which the deck is located. Ramps or collector/distributor roadways are not considered part of a mainline sample for this item, and structures on these facilities are not reported unless the ramp or collector/distributor actually passes over or under the sample.

For any structure included in this field, the corresponding structure identification number will be recorded in Item 77. Code "00" if no structures exist. A maximum of "50" may be coded in this field. If more than that number of structures exist on the section, the section must be subdivided.

Item 76 – Number of At-Grade Railroad Crossings (Length = 2)

Enter the number of at-grade railroad crossings on the section. Supply a leading zero where necessary. Multiple tracks should be reported as a single crossing. Exclude crossings on abandoned railroads. For any grade crossing in this field, the corresponding grade crossing identification number will be recorded in Item 78. Code "00" if no at-grade crossings exist. A maximum of "15" may be coded in this field. If more than that number of railroad crossings exist on the section, the section must be subdivided.

SUPPLEMENTAL DATA ITEMS

NOTE: The following items constitute the variable portion of the sample record. The items are not reported if the data do not exist on the section.

Item 77 – Structure Identification Numbers (Variable – Length = 15 x Item 75)

For each structure reported in Item 75, the appropriate l5-digit unique structure identification number is coded from the "Bridge Inventory and Appraisal of the Nation's Bridges" (also referred to as the National Bridge Inventory or NBI). For example, if Item 75 = 03, this item will contain three structure ID fields, each l5-digits long for a total of 45-digits. A maximum of 50 structure ID's may be coded in this field. If there are more than 50

structures on this section, it must be split into two or more segments. If there are no structures on the section, this item is not coded.

The l5-digit structure ID's must be exactly the same as those in the NBI including embedded, leading or trailing blanks or zeroes.

Item 78 – At-Grade Railroad Crossing Identification Numbers (Variable -Length = 7 x Item 76)

For each at-grade railroad crossing reported in Item 76, the appropriate 7-digit railroad grade crossing ID is coded from the "National Railroad Highway Crossing Inventory." For example, if Item 76 = 02, this item will contain two railroad crossing ID fields, each 7-digits long, for a total of l4-digits. A maximum of 15 railroad crossing ID's may be coded in this field. If more than 15 railroad crossings exist on this section, it must be split into two or more segments. If there are no railroad crossings on this section, this item is not coded.