

NOTES

PENNDOT HPMS DATA COLLECTION GUIDE



***Bureau of Planning and Research
Transportation Planning Division
April 2016
(Updated October 2020)***



NOTES



State Street – Dauphin County

NOTES

INTRODUCTION

The purpose of this document is to provide you with some additional guidance for the more troublesome items you may encounter while collecting data for the Highway Performance Monitoring System (HPMS). This document is not intended to replace the current FHWA HPMS Field Manual, but rather give you another tool to aid you in the collection of the HPMS Data.

Please note: Not every data item is included in this document, only the data items we thought needed further clarification.

Several of the data items are generated from the Department's Roadway Management System (RMS) and do not require any data entry for either the State or Local Federal Aid HPMS samples. After checking the items that are reported from RMS, if you disagree with the coding of these items, notify the coordinator responsible for your area below. If you have any further questions or comments, we encourage you to call one of the coordinators at the following numbers:

**HPMS – Coordinator East:
Patrick McVeigh – 717.772.0567**

**HPMS – Coordinator West:
John Moloney – 717.787.2187**

Due to policy changes the FHWA HPMS Manual has not been updated since December 2016. Subsequent errata sheets have been published in 2018 and 2019.

Link to December 2016 FHWA HPMS Field Manual:
<https://www.fhwa.dot.gov/policyinformation/hpms/fieldmanual/>

District HPMS Coordinators

District 1-0

Jacki Deeter 814.678.7359

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NOTES

Thickness of the most recent pavement overlay.

- Reporting should be consistent with IRI inventory direction and lane.
- Values can also be obtained from construction plans for use in the Table.
- An overlay is more than 0.5 inch.

Item Value Calculation Method

Predominance - The reported value must be based on the most prevalent value within the limits of the section.

Numbers in parenthesis after the HPMS Items are the corresponding pages for that data item in the December 2016 FHWA HPMS Field Manual

Data Items

Data Item 1 – Functional System (4-16)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*
Urban	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*

FE+R* = Full Extent for all public roads, including ramps located within grade-separated interchanges.

The Functional System Code is the responsibility of the Bureau of Planning and Research.

- 1 = Interstate (01 & 11)
- 2 = Principal Arterial – Other Freeway/Expressway (03 & 12)
- 3 = Principal Arterial - Other (02 & 14)
- 4 = Minor Arterial (06 & 16)
- 5 = Major Collector (07 & 17)
- 6 = Minor Collector (08 & 18)
- 7 = Local (09 & 19)

(#s) = Functional Class Codes used by PennDOT

Data Item 3 – Facility Type (4-18)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*
Urban	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*	FE+R*

FE+R* = Full Extent for all public roads, including ramps located within grade-separated interchanges.

This data item is the operational characteristic of the roadway, regardless of whether the section is on a structure.

- 1 = One-Way Roadway
- 2 = Two-Way Roadway
- 4 = Ramp

- 5 = Non-Mainline
- 6 = Non-Inventory Direction
- 7 = Planned/Unbuilt

1 - One-Way Roadway

A roadway or structure section with traffic moving in one direction during non-peak period hours.



2 - Two-Way Roadway

A roadway or structure section with traffic moving in both directions during non-peak period hours.



Data Item 54 – Year Last Improvement (4-116)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

The year in which the roadway surface was last improved.

- 0.5 inch or more of compacted pavement material must be put in place for it to be considered a surface improvement.
- Completion date is the actual date the construction ended or the date when the project was opened to traffic.
- Retain the coded improvement year until another improvement affecting the surface is completed.

Data Item 55 – Year Last Construction (4-117)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

The year in which the roadway was constructed or reconstructed.

- Reconstruction is the replacement of the existing pavement structure with an equivalent or increased structure. Although recycled materials may be used in the new pavement structure, reconstruction usually requires the complete removal and replacement of at least the old pavement surface, and often also the base.
- If a new pavement surface were placed without first removing the old pavement surface, the resulting pavement should be considered an overlay (surface improvement, not construction – Data Item 56), even if the existing pavement was rubblized prior to placing the new pavement surface.

Data Item 56 – Last Overlay Thickness (4-118)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

- For Jointed Concrete Pavements, Cracking Percent is the percentage of slabs within the section that exhibit transverse cracking. Partial slabs shall contribute to the section that contains the majority of the slab length.
- For CRCP (Item 49 code '5'), the Cracking Percent is the percentage of the area of the section exhibiting longitudinal cracking, punchouts, and/or patching. Transverse cracking shall not be considered in the Cracking Percent for CRCP.
- Round the percentage to the nearest percent.

Example:

The fatigue cracking in the sample is 500 feet long and 2 feet wide in each wheel path.

$(500 \text{ feet}) \times (2 \text{ feet}) \times (2 \text{ wheel paths}) = 2000 \text{ square feet}$

$(2000 \text{ square feet}) / (63,360 \text{ square feet}) = 3.2 \text{ percent}$

Rounding 3.2 percent to the nearest percent = 3 percent

Longitudinal Cracking

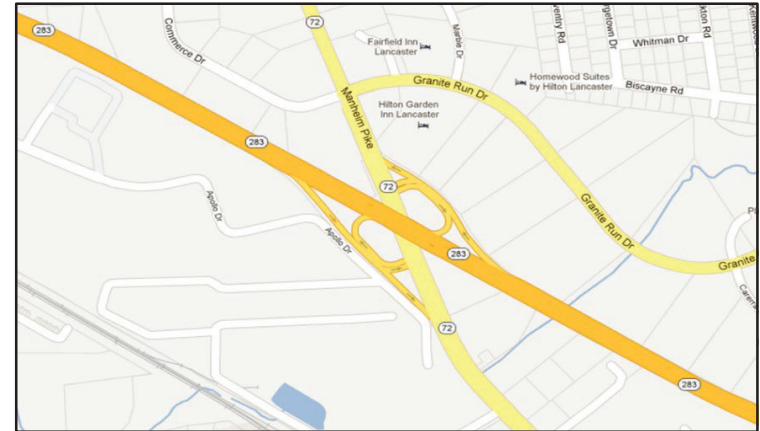


Alligator Cracking



4 - Ramp

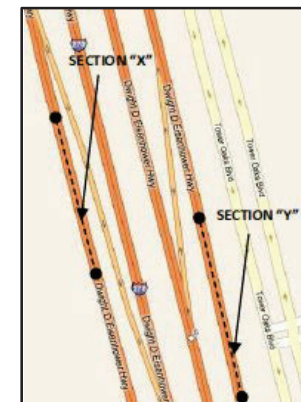
A non-mainline junction or connector that is contained within a grade-separated interchange.



Source: Google Maps – Lancaster, PA

5 - Non-Mainline

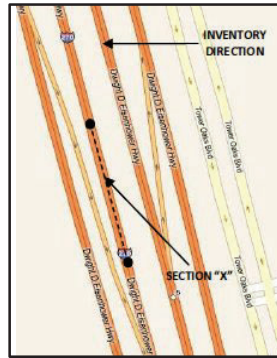
A road or lane that provides access to and from sites that are adjacent to a roadway section such as bus terminals, park-and-ride lots, ramps to truck weigh stations, and rest areas.



Source: FHWA HPMS Field Manual - Bing Maps

6 - Non-Inventory Direction

The non-inventory side of a multi-road roadway.



Source: FHWA HPMS Field Manual - Bing Maps

Data Item 5 – Access Control (4-26)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	FE	FE	SP	SP		
Urban	FE	FE	FE	FE	SP	SP	SP	

FE = Full Extent SP = Sample Panel Sections

This data item is the degree of access control on the section.

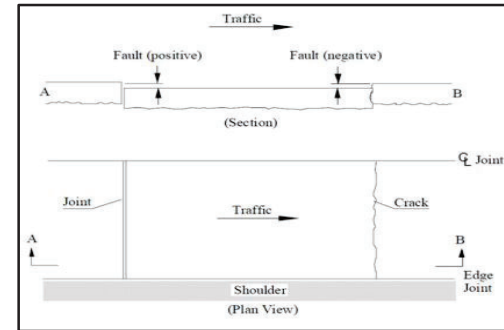
1- Full Access Control

- Grade separated interchanges with selected public roads.
- No at-grade crossings.
- No direct driveway connections.



This data item is the average depth of pavement faulting on the section, rounded to the nearest 0.01 inch.

Pavement faulting is the vertical displacement between adjacent jointed concrete panels in the direction of travel.



Source: FHWA HPMS Field Manual - LTPP Distress & Identification Manual

- Pavement faulting data is collected on a 2-year cycle.
- Measure every jointed concrete panel and average the values.



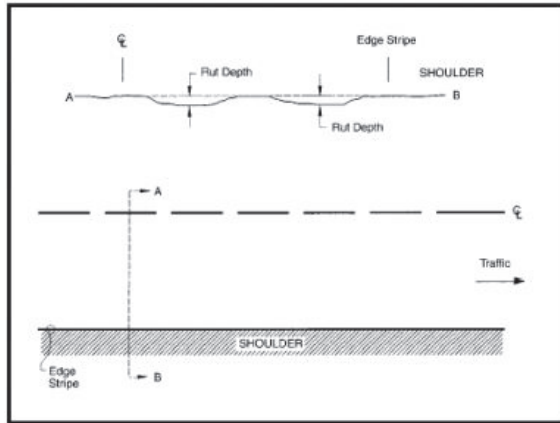
Source: FHWA HPMS Field Manual – TXDOT, Construction Division

Data Item 52 – Cracking Percent (4-106)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	SP	SP	SP	SP		
Urban	FE	FE	SP	SP	SP	SP	SP	

FE = Full Extent SP = Sample Panel Sections

- For Asphalt pavements, Cracking Percent is the percentage of the total area exhibiting visible fatigue type cracking (both longitudinal and/or pattern) for all severity levels in the wheel path in each section.



Source: FHWA HPMS Field Manual - LTPP Distress & Identification Manual

- Measure the pavement rutting and round the value to the nearest 0.01 inch.
- Measure each wheel path of the pavement in multiple locations and average the values.
- Pavement rutting data is collected on a 2-year cycle.



Source: FHWA HPMS Field Manual – TXDOT, Construction Division

Data Item 51 – Faulting (4-102)

Functional System	NHS	1	2	3	4	5	6	7
		IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	SP	SP	SP	SP		
Urban	FE	FE	SP	SP	SP	SP	SP	

FE = Full Extent SP = Sample Panel Sections

2- Partial Access Control

- Grade separated interchanges with selected public roads.
- Some at-grade crossings with selected public roads.
- Direct driveway connections have been minimized through the use of frontage roads or other local access restrictions.



3- No Access Control

- At-grade crossings.
- Direct driveway connections.



Data Item 10 – Peak Lanes (4-33)

Functional System	NHS	1	2	3	4	5	6	7
		IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the number of through lanes in the peak direction of traffic flow on the section during the peak hour.

- Include reversible lanes, parking lanes, and shoulders that are legally used for through traffic for non-High Occupancy Vehicle (HOV) and High Occupancy Vehicle (HOV) operation.
- If the section is an urban roadway, code the peak direction.
- If the section is a rural roadway with 2 - 3 lanes, code both directions.
- If the section is a rural roadway with 4 or more lanes, code the peak direction.
- [(the number of peak lanes) + (the number of counter peak lanes)] ≥ (the number of through lanes)
- The peak period is represented by the period of the day when observed traffic volumes are the highest.

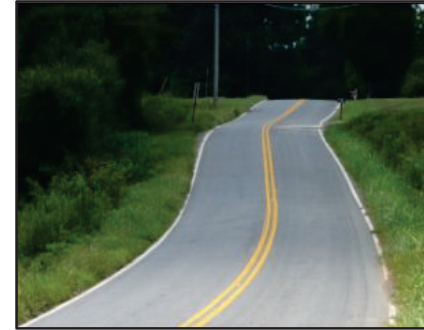
One-Way Through Lanes - Peak Direction



Two-Way Through Lanes - Peak Direction



Passing Not Allowed in Either Direction of Travel



The following data items are to be visually verified in the field and should be noted if they do not appear to be accurate. Actual measurements are not to be completed.

Data Item 50 – Rutting (4-99)

Functional System	NHS	1	2	3	4	5	6	7
		IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	SP	SP	SP	SP		
Urban	FE	FE	SP	SP	SP	SP	SP	

FE = Full Extent SP = Sample Panel Sections

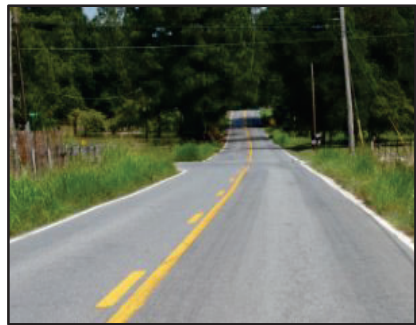
This data item is the average depth of pavement rutting on the section, rounded to the nearest 0.01 inch.

A rut is a longitudinal surface depression in the wheel path of the pavement and it may have associated transverse displacement.

Passing Allowed in Both Directions of Travel



Passing Not Allowed in Inventory Direction of Travel



Passing Allowed in Inventory Directions of Travel



Data Item 11 – Counter Peak Lanes (4-34)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the number of through lanes used on the section in the counter peak direction during the peak hour.

- Include reversible lanes, parking lanes, and shoulders that are legally used for through traffic.
- [(the number of peak lanes) + (the number of counter peak lanes)] ≥ (the number of through lanes)
- For urban roads, code based on the counter peak direction of travel.
- For rural 2 or 3-lane roads, do not code this data item.



Data Item 12 – Turn Lanes - Right (4-34)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural								
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the type of right turning lanes or bays on the urban section in the inventory direction during peak-period.

- 1 = No Intersections Exist on the Section
- 2 = Multiple Exclusive Right Turning Lanes
- 3 = Continuous Exclusive Right Turning Lane
- 4 = Single Exclusive Right Turning Lane
- 5 = Right Turns Allowed from Through Lane
- 6 = Right Turns not Allowed During Peak Period

- If the peak capacity for a section is governed by a controlling intersection, code the type of turning lanes at that controlling intersection.
- When determining the types of turning lanes on a section, include turning lanes that are located at entrances to shopping centers, industrial parks, and other large traffic generating facilities.
- Through traffic movement is prohibited in an exclusive turning lane.
- If a section has a signalized or stop sign intersection that is critical to the flow of traffic, code the type of turning lanes at that critical intersection.
- If a section does not have a controlling, signalized, or stop sign intersection, code the type of turning lanes during the peak hour for a typical intersection on the section.
- If an intersection has a continuous turning lane with a painted turn bay, code the intersection as a continuous turning lane.
- If through traffic and turning movements can be made from a lane at an intersection, it is not an exclusive turning lane.
- If a section has a roundabout, code the intersection as an intersection where turns are permitted and no exclusive right turning lane exists.
- Use code 6 when “no right turn permitted” signs are present at the intersection you choose as the busiest (most controlling). It should also be used if right turns cannot physically be made along the sample due to roadway conditions and access control is coded as “2” or “3”.
- Use code “1” when access control is coded as “1”.

1 - No Intersection

No intersections exist in the section.



2 - Multiple Right Turning Lanes

Right turn is permitted from multiple exclusive right turning lanes. Through traffic movement is prohibited in these lanes. Multiple turning lanes allow for simultaneous turns from all turning lanes.



3 - Mountainous Terrain

Any combination of grades and horizontal or vertical alignment that causes heavy vehicles to operate at extremely low speeds for significant distances or at frequent intervals.



Data Item 46 – Percent Pass Sight (4-90)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban								

SP = Sample Panel Sections

This data item is the percentage of a section that meets the sight distance requirement for passing in the inventory direction.

All rural, paved, 2-lane Sample Panel sections.

The percentage of passing sight distance = [(the length of the section that is striped for passing allowed) / (the length of the section)] * 100

- Restriping to narrower lanes, resulting in an additional lane on a multi-lane roadway does not constitute widening potential.

Data Item 44 – Terrain Type (4-87)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural		SP	SP	SP	SP	SP		
Urban								

SP = Sample Panel Sections

To determine terrain type, consider that terrain of an extended length of the roadway of the section, rather than the grade on the specific Sample Panel section.

Terrain type should be collected on Rural sample sections only.

- 1 = Level
- 2 = Rolling
- 3 = Mountainous

1 - Level Terrain

Any combination of grades and horizontal or vertical alignment that permits heavy vehicles to maintain the same speed as passenger cars. This includes short grades of not more than 2 percent.



2 - Rolling Terrain

Any combination of grades and horizontal or vertical alignment that causes heavy vehicles to reduce their speeds substantially below those of passenger cars, but does not cause heavy vehicles to operate at crawl speeds for any significant length of time.



3 - Continuous Right Turning Lane

Right turn is permitted from a continuous exclusive right turning lane. Through traffic movement is prohibited in these lanes.



4 - Single Right Turning Lane

Right turn is permitted from a single exclusive right turning lane.



5 - Right Turn Allowed from Through Lane

Right turn is allowed from a through lane. There is not an exclusive turning lane.



6 - Right Turns Not Allowed



Data Item 13 – Turn Lanes - Left (4-39)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural								
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the type of left turning lanes or bays on the urban section in the inventory direction during peak period.

- 1 = No Intersections Exist on the Section
- 2 = Multiple Exclusive Left Turning Lanes
- 3 = Continuous Exclusive Left Turning Lane
- 4 = Single Exclusive Left Turning Lane
- 5 = Left Turns Allowed from Through Lane
- 6 = Left Turns not Allowed During Peak Period

F – Environmentally Sensitive Areas



G – Parkland



Data Item 42 – Widening Potential (4-84)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP	SP	
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the number of through lanes that could be potentially added to the roadway, in both directions.

- If more than 9 through lanes could be potentially added, code as 9 lanes.
- Code this item based on how feasible it is to widen the existing roadway, based on the presence of obstacles and the proximity of the obstacle to the roadway.
- Consider medians, areas within the existing right-of-way, and areas outside the existing right-of-way to be available for widening.
- Do not consider restriction because of current right-of-way width or projected traffic.

D – Terrain Restrictions



E – Historic/Archaeological Sites



- If the peak capacity for a section is governed by a controlling intersection, code the type of turning lanes at that controlling intersection.
- When determining the types of turning lanes on a section, include turning lanes that are located at entrances to shopping centers, industrial parks, and other large traffic generating facilities.
- Through traffic movement is prohibited in an exclusive turning lane.
- If a section has a signalized or stop sign intersection that is critical to the flow of traffic, code the type of turning lanes at that critical intersection.
- If a section does not have a controlling, signalized, or stop sign intersection, code the type of turning lanes during the peak-hour for a typical intersection on the section.
- If an intersection has a continuous turning lane with a painted turn bay, code the intersection as a continuous turning lane.
- If through traffic and turning movements can be made from a lane at an intersection, it is not an exclusive turning lane.
- Use code 6 when “no left turn permitted” signs are present at the intersection you choose as the busiest (most controlling). It should also be used if left turns cannot physically be made along the sample due to roadway conditions and access control is coded as “2” or “3”.
- Use code “1” when access control is coded as “1”.

1 - No Intersection

No intersections exist in the section.



2 - Multiple Left Turning Lanes

Left turn is permitted from multiple exclusive left turning lanes. Through traffic movement is prohibited in these lanes. Multiple turning lanes allow for simultaneous turns from all turning lanes.



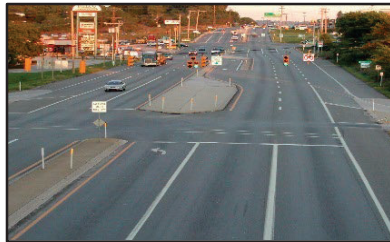
3 - Continuous Left Turning Lane

Left turn is permitted from a continuous exclusive left turning lane. Through traffic movement is prohibited in these lanes.



4 - Single Left Turning Lane

Left turn is permitted from a single exclusive left turning lane.



5 - Left Turn Allowed from Through Lane

Left turn is allowed from a through lane. There is not an exclusive turning lane.

A – Dense Development



B – Major Transportation Facilities



C – Other Public Facilities (i.e. School, Hospital, and Library)



Data Item 41 – Widening Obstacle (4-82)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the types of obstacles that prevent the widening of the existing roadway for additional through lanes. One or more types of obstacles can be entered.

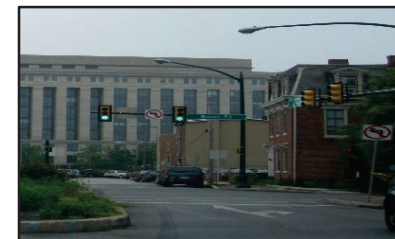
- Code obstacles that are within approximately 100 feet of the outer edge of the through lanes in either direction on the section.
- Code all conditions that apply in either direction, on either side of the section.
- Enter any combination of multiple codes.
- Code X - no obstacles, cannot be used in combination of another code.
- If Data Item 42 (Widening Potential) is coded '8' lanes or less, then this data item should be coded "A" through "G".

- X = No Obstacles
- A = Dense Development
- B = Major Transportation Facilities
- C = Other Public Facilities
- D = Terrain Restrictions
- E = Historic/Archaeological Sites
- F = Environmentally Sensitive Areas
- G = Parkland

X – No Obstacles



6 - Left Turns Not Allowed



Data Item 14 – Speed Limit (4-44)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	SP	SP	SP	SP		
Urban	FE	FE	SP	SP	SP	SP	SP	

FE = Full Extent SP = Sample Panel Sections

Use the Vehicle Code—Title 75 if the speed limit is not posted.

- 35 mph in any urban district (boroughs, cities)
- 25 mph in a residential district if the roadway is one of the following:
 - Not a numbered traffic route
 - Functionally classified as a local highway.
- 55 mph in other locations

If the speed limit changes within a section, report the predominant speed limit.

Data Item 17 – Route Number (4-47)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	FE	FE	FE			
Urban	FE	FE	FE	FE	FE			

FE = Full Extent

- If two or more routes of the same functional system are signed along a roadway section (i.e. US 11 and US 15), code the lowest route number (i.e., US 11).
- If two or more routes of differing functional systems are assigned along a roadway section (i.e. Interstate 78 and US 22), code the data item in accordance with the highest functional system on the route (in this example, Interstate 78).



Data Item 18 – Route Signing (4-48)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	FE	FE	FE			
Urban	FE	FE	FE	FE	FE			

FE = Full Extent

- 1 = Not Signed
- 2 = Interstate
- 3 = US
- 4 = State
- 5 = Off-Interstate Business Marker
- 6 = County
- 7 = Township
- 8 = Municipal
- 9 = Parkway/Forest Marker
- 10 = None of the Above

- When a section is signed with two or more identifiers (i.e. Interstate 83 and US 322), code the highest order identifier on the route (in this example, Interstate 83). Follow the hierarchy as ordered above.

- 2 = Parking Allowed on Both Sides
- 3 = No Parking Allowed

1 - Parking Allowed On One Side



2 - Parking Allowed On Both Sides



3 – No Parking Allowed



Data Item 39 – Shoulder Width - Left (4-79)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP	SP	
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the width of the left shoulder on a divided highway, rounded to the nearest foot.

Do not include parking or bicycle lanes in the shoulder width.

- Left shoulders are only coded on a divided Highway
- If median width and left shoulder width combined is less than 4 feet, then the left shoulder width is zero.
- Code left shoulder widths only if median and left shoulder width combined is more than 4 feet.
- Where the width changes along the sample, code the predominant width
- Include rumble strips and gutter pans
- Measure to the nearest foot



Data Item 40 – Peak Parking (4-80)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural								
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the type of parking on the section during the peak hour.

- If parking is available beyond the shoulder, code as No Parking Allowed (code value 3)
 - Code Interstates and Freeways as No Parking Allowed (code value 3).
 - If parking lanes are used for through traffic or turning lanes during the peak hour, code the in-use condition.
- 1 = Parking Allowed on One Side



Data Item 19 – Route Qualifier (4-49)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	FE	FE	FE			
Urban	FE	FE	FE	FE	FE			

FE = Full Extent

- 1 = No Qualifier/Not Signed
- 2 = Alternate
- 3 = Business Route
- 4 = Bypass Business
- 5 = Spur
- 6 = Loop
- 7 = Proposed
- 8 = Temporary
- 9 = Truck Route
- 10 = None of the Above



Data Item 20 – Alternate Route Name (4-51)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	FE	FE	FE	FE	FE			
Urban	FE	FE	FE	FE	FE			

FE = Full Extent

A non-numeric designation for a route. Examples for this data item would be “Schuylkill Expressway” (PA), “Pacific Coast Highway” (CA) and the “Garden State Parkway” (NJ).

Data Item 29 – Signal Type (4-61)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP*	SP*	SP*	SP*	SP*	SP*		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections SP* = Sample Panel Sections (optional)

As a best practice, contact the respective PennDOT Engineering District for the signals in question to obtain information on the type of signal and green time. Signal type may also be determined utilizing the TSMO layer in PennDOT One Map.

- 1 = Uncoordinated Fixed Time
- 2 = Uncoordinated Traffic Actuated
- 3 = Coordinated Progressive
(coordinated signals through several intersections)
- 4 = Coordinated Real-time Adaptive
- 5 = No signal system exists



Data Item 30 – Percent Green Time (4-63)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP*	SP*	SP*	SP*	SP*	SP*		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections SP* = Sample Panel Sections (optional)

7- Barrier Curb/No Shoulder



Data Item 38 – Shoulder Width - Right (4-77)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

Do not include parking or bicycle lanes in the shoulder width.

This data item is the width of the right shoulder, rounded to the nearest foot.

- Where the width changes along the sample, code the predominant width
- Include rumble strips and gutter pans
- Measure to the nearest foot



4- Stabilized



Source: FHWA HPMS Field Manual

5- Combination



Source: FHWA HPMS Field Manual

Do not use a code '5' (combination)

Example: If the shoulder cross section is 2 foot paved and 3 foot stabilized, record the surface type as stabilized, Type '4'.

6- Earth



This data item is the percentage of green time allocated during peak period (i.e. 7am – 9am or 4pm – 6pm) for through traffic at signalized intersections on the section in the inventory direction.

- If the section has more than one signalized intersection, calculate the percent green time at the predominate intersection.
- If the signal has a green arrow for turning movements, do not include the green arrow time for timing of the green cycle.
- Uncoordinated Traffic Actuated Signals require a value.

To Calculate Percent Green Time

1. Using a stop watch, time the entire signal cycle (red, amber, and green) in seconds.
2. Using a stop watch, time the green signal cycle in seconds.
3. Percent Green Time = $[(\text{green signal cycle time}) / (\text{entire signal cycle time})] * 100$
4. Record the time and repeat Steps 1-3 three times.
5. Add the percent green times and divide by 3.
6. Average percent green time = $[(\text{percent green time}) + (\text{percent green time}) + (\text{percent green time})] / 3$

Data Item 31 – Number Signals (4-65)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the number of signalized at-grade intersections on the section that control traffic in the inventory direction.

- A signalized intersection has a traffic signal which cycles through red, amber, and green.
- If the access point to a large traffic generator (i.e. shopping centers, malls, large work sites, office parks, apartment complexes, and subdivisions) is controlled by a traffic signal, the access point is considered an intersection.
- If a section begins and ends at a signalized intersection, only count the ending intersection. Do not count the beginning intersection.
- If the section has a continuous cross street on a divided highway, count the intersections as a single intersection.
- If the section has a non-continuous cross street that is separated by a minimum of 50 feet, count both intersections.

Data Item 32 – Stop Signs (4-66)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the number of stop sign controlled at-grade intersections on the section that control traffic in the inventory direction.

- If an intersection is controlled by a continuously operating flashing red signal, count the intersection as a Stop Sign Controlled Intersection.
- Do not count stop signs on the intersecting roads.
- If the access point to a large traffic generator (i.e. shopping centers, malls, large work sites, office parks, apartment complexes, and subdivisions) is controlled by a stop sign, the access point is considered an intersection.
- If a section begins and ends at a stop-sign controlled intersection, only count the ending intersection. Do not count the beginning intersection.
- If the section has a non-continuous cross street that is separated by a minimum of 50 feet, count both intersections.

Data Item 33 – At Grade Other (4-68)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the number of at-grade intersections on the section in the inventory direction where traffic is not controlled by either a signal or a stop sign; is controlled by other types of signage or some other devices.

- If an intersection is controlled by a continuously operating flashing yellow signal, count the intersection as an At Grade Other Intersection.
- If the access point to a large traffic generator (i.e. shopping centers, malls, large work sites, office parks, apartment complexes, and subdivisions) is controlled by a stop sign, the access point is considered an intersection.
- If a section begins and ends at an intersection controlled by a device other than a traffic signal or stop sign, only count the ending intersection. Do not count the beginning intersection.
- If an intersection is a roundabout, code as At Grade Other Intersection.
- At Grade Other intersections are not counted on the opposite side of the sample on divided highways with medians, unless a crossover lane exists.
- If the cross street is not continuous and is separated by at least 50 feet, then it should be counted as two intersections.

Data Item 34 – Lane Width (4-70)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

1- None



2- Surfaced-bituminous



Source: FHWA HPMS Field Manual

3- Surfaced-concrete



Data Item 37 – Shoulder Type (4-74)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

- If the shoulder type varies over the extent of the section, code the predominant Shoulder Type.
- If the left and right shoulder types are different shoulder types, code the right shoulder type as the predominant Shoulder Type.
- If there is a shoulder in front of a barrier curb, code the Shoulder Type and Shoulder Width. Code the shoulder if it is at least one foot (1ft) or greater. Do not code the area behind the barrier curb as a shoulder.
- Ignore mountable curbs. If there is a shoulder in front of or behind a mountable curb, code the Shoulder Type and Shoulder Width.
- If the section has parking abutting the through lane, there is not an area that is considered a shoulder. Code as No Shoulder (code value 1).
- A bike lane must be signed or delineated by pavement markings to be considered a bike lane. If the section has a bike lane abutting the through lane, there is not an area that is considered a shoulder. Code as No Shoulder (code value 1).
- If there is parking abutting the through-lane, there is not an area that is considered a shoulder. Code as No Shoulder (code value 1).
- If there is parking on one side of a divided roadway and a shoulder or a curb on the other side, code the Peak Parking Type, Shoulder Type, and Shoulder Width.
- If there is a surface type change between the lane and curb or striping is present, code the Shoulder Type and Shoulder Width.
- Do **not** use combination shoulder, code "5".
- Local Federal Aid Route Samples ONLY
 - If a barrier curb and paved shoulder appear to exist simultaneously:
 - If no striping exists, code as Barrier Curb.
 - If striping exists and measurement from curb to white line is less than 6 feet, code as Barrier Curb.
 - If striping exists and measurement from curb to white line is 6 feet or greater, code the Shoulder Type and Shoulder Width.
- For State Highway Samples
 - Do not change Shoulder Type the District has chosen.

- 1= None
 2= Surfaced – bituminous
 3= Surfaced – concrete
 4= Stabilized
 5= Combination
 6= Earth
 7= Barrier Curb – no shoulder in front of curb

This data item is the measure of the existing lane width, rounded to the nearest foot.

Although RMS has minimum (6 feet) and maximum (18 feet) allowable entries, please report the actual measured lane widths.

To Measure Lane Width

Measure the prevailing through lane width. Round the value to the nearest foot.

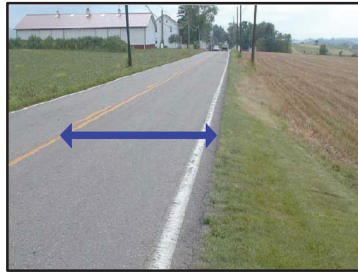
- When striping exists, count the lane width from paint line to paint line.



- When striping is placed inside the edge of the pavement, to keep traffic from breaking the pavement edge, ignore the striping and measure from the pavement edge to the center of a single center stripe, or, if double striping exists, measure to the center of the two stripes.
- If parking is allowed, use six to eight feet for parking. The remaining distance would be your lane width. Remain consistent with all samples, unless there are painted parking lines.
- Where there is no delineation between the through traffic lane and the shoulder or parking lane, or where there is no centerline, measure the entire width of roadway, divide by 2, and deduct the parking width. Report the actual lane width.
- If more than one lane exists, measure all lanes in the inventory direction and use the average value to the nearest foot. If widths vary over the sample section use the predominant width.

2 Lane Road

Measure from the white stripe to the center of the double yellow stripe. Round the value to the nearest foot.



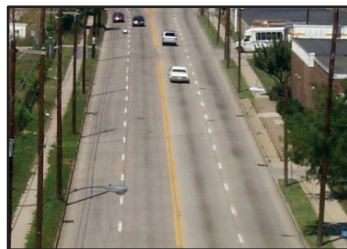
3 Lane Road

Measure from the white stripe to the center of the double yellow stripe and divide the value by 2. Round the value to the nearest foot.



4 Lane Road

Measure from the white stripe to the center of the double yellow stripe and divide the value by 2. Round the value to the nearest foot.



No Shoulder

Measure between the points where the edge of the road appears to break away and slope toward the ditch and divide the value by 2. Round the value to the nearest foot.

7- Positive Barrier – Rigid

A median with a rigid positive barrier. No deflection of vehicle upon impact.



Data Item 36 – Median Width (4-73)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP	SP	
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the width of the median on the section, rounded to the nearest foot.

Enter “999” where the median width is 1000 feet or greater.

Median width should be the predominant width including any left shoulders. Measure between the inside edges of the through lanes.



4- Unspecified - Positive Barrier

Only to be used when thick impenetrable vegetation exists. Use codes "5", "6", or "7" when coding man-made positive barriers.

**5- Positive Barrier – Flexible**

A median with a flexible positive barrier. Considerable deflection of vehicle upon impact.

**6 – Positive Barrier – Semi-Rigid**

A median with a semi-rigid positive barrier. Some deflection of vehicle upon impact.

**No Center Line**

Measure the full width of the road and divide the value by 2. Round the value to the nearest foot.

If the gutter has been filled during overlay, measure between the points where the edge of the road meets the curb face and divide the value by 2.

**Interstate**

Measure one lane. Round the value to the nearest foot.



Bike Lanes

- PennDOT Publication 13M – Defined as a portion of a roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.
- A bicycle symbol with directional arrows placed on the roadway designate “Marked Shared Lanes” as defined in the AASHTO Guide for the Development of Bicycle Facilities 2012, Fourth Edition and MUTCO. This is **not** a designated bike lane and should not be marked on the sample sheet as “Y” bike lane exists.
- Do not include bike lane width in shoulder with if shoulder exists along with a bike lane.
- Do not include bike lane width in travel lane width.



Data Item 35 – Median Type (4-71)

Functional System		1	2	3	4	5	6	7
	NHS	IH	OFE	OPA	MiA	MaC	MiC	Local
Rural	SP	SP	SP	SP	SP	SP		
Urban	SP	SP	SP	SP	SP	SP	SP	

SP = Sample Panel Sections

This data item is the type of median on the section.

A median is the portion of a divided highway that is separating the traveled way for traffic in opposing directions.

- 1 = None
- 2 = Unprotected
- 3 = Curbed
- 4 = Positive Barrier – Unspecified
- 5 = Positive Barrier – Flexible
- 6 = Positive Barrier – Semi-Rigid
- 7 = Positive Barrier – Rigid

1- None

No median or an unprotected area less than 4 feet wide.



2- Unprotected

A median without a barrier and 4 or more feet wide.



3- Curbed

A median with a barrier or mountable curb with a minimum height of 4 inches.

