



Update on MAP-21 Rulemaking

TPB Technical Committee
December 4, 2015

Eric Randall, Jon Schermann, Nicole McCall
Department of Transportation Planning

Item 6

Overview

- Updated schedule for MAP-21 Rulemaking
- Performance Process and Regional Coordination
- Initial data and performance measurement results for TPB planning area in the fields of:
 - Highway Safety
 - Highway Conditions: Pavement and Bridges

Performance Provisions – Rulemaking Schedule

	Planning Rules	Proposed Rulemaking	Final Rulemaking
Planning	<ul style="list-style-type: none"> • Statewide and Metropolitan Planning Rule 	June 2014	<i>May 2016</i>
Highway Safety	<ul style="list-style-type: none"> • Safety Performance Measure Rule • Highway Safety Improvement Program (HSIP) • Highway Safety Program Grants Rule 	March 2014	<i>February 2016</i> (Interim Final Rule for Grants issued January 2013).
Highway Conditions	<ul style="list-style-type: none"> • Pavement and Bridges Performance Measurement • Asset Management Plan 	January/February 2015	<i>May 2016</i>
Congestion / System performance	<ul style="list-style-type: none"> • System Performance Measures Rule (Congestion, Air Quality, and Freight) 	<i>November 30, 2015</i>	?
Transit	<ul style="list-style-type: none"> • Transit Asset Management • National Public Transportation Safety Program • Public Transportation Agency Safety Plan 	September 30, 2015 (Transit Asset) <i>December 17, 2015</i> (Agency Safety Plan)	?

Performance Provisions Activities

- **Data Collection**
 - Data from Federal or topic specific databases, usually available by state and jurisdiction.
 - Need to collect for TPB planning area (Fauquier County portion a challenge)
- **Performance Measures and Data Analysis**
 - Calculate measures for each year, e.g., number, rate, or percentage
 - Calculate trends of past performance, e.g., 5-year rolling average
- **Forecasting Trends**
 - Simple forecast is straight line extrapolation
 - Complex forecasts use statistical methods, and also predicted effects of projects and policies
- **Setting Targets**
 - Quantitative or qualitative, in coordination with DOTs and Transit Agencies
- **Performance Reporting**
 - Metropolitan System Performance Report every 4 years, other potential reports
- **Performance Based Planning and Programming (PBPP)**
 - Describe impacts of projects in TIP and link investment priorities toward achieving the performance targets

Regional Coordination

- TPB staff are analyzing data to develop performance measures for the TPB metropolitan planning area in:
 - **Highway Safety:** Number and Rate of Fatalities and of Serious Injuries
 - **Highway Condition:** Percentage of Pavement and of Bridges in Good condition and in Poor condition
- ❖ As TPB staff complete preliminary analysis for the TPB region, we are sharing with State DOTs for discussion.
- ❖ Today, sharing preliminary analysis with Technical Committee.

MAP-21 Proposed Rulemaking for Safety Performance Rule

Key Elements

- Covers fatalities and serious injuries on all public roads.
- Performance measures and data sources are specified in the NPRM.
- MPOs can choose to either set regional safety targets or agree to plan and program projects that contribute to the accomplishment of safety targets set by the state DOTs
- If an MPO does set targets, it must do so no later than 180 days after the state DOT sets its targets



Safety Performance Measures and Data Sources

Performance Measure	Description	Data Source
Number of Fatalities <i>(5 year rolling average)</i>	Total number of fatalities during a calendar year	FARS ¹
Rate of Fatalities per 100 million VMT <i>(5 year rolling average)</i>	Ratio of total fatalities to VMT	FARS and HPMS ²
Number of Serious Injuries <i>(5 year rolling average)</i>	Total number of serious injuries during a calendar year	State reported serious injury data ³
Rate of Serious Injuries per 100 million VMT <i>(5 year rolling average)</i>	Ratio of total serious injuries to VMT	State reported serious injury data ³ and HPMS

¹ FARS: Fatality Analysis Reporting System

² HPMS: Highway Performance Monitoring System

³ coded "A" in the KABCO injury classification scale

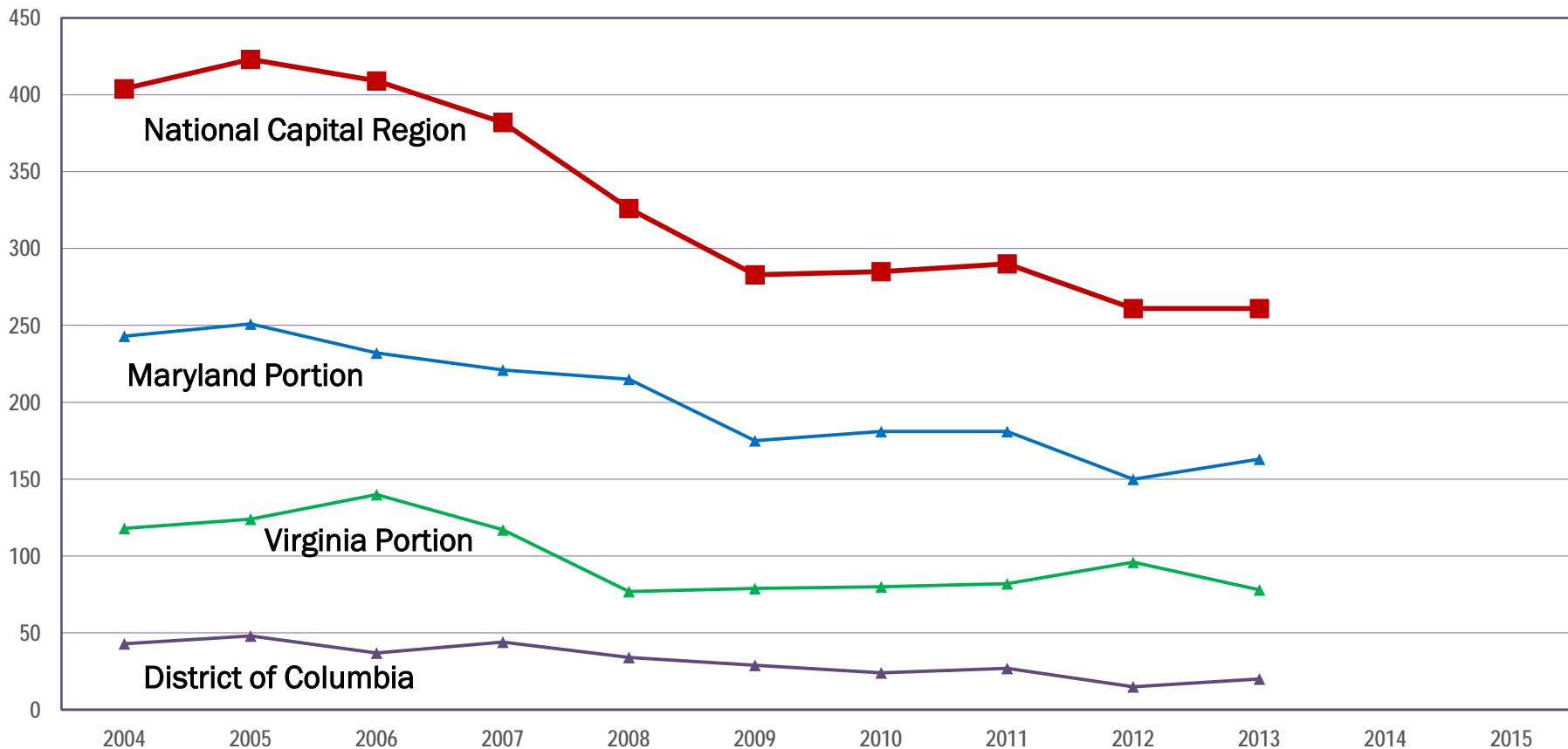
Data Availability

Data Element	District of Columbia	Maryland	Virginia
Number of Fatalities	√	√	√ *
Number of Serious Injuries	√	In process	√ *
VMT	√	√	√ *

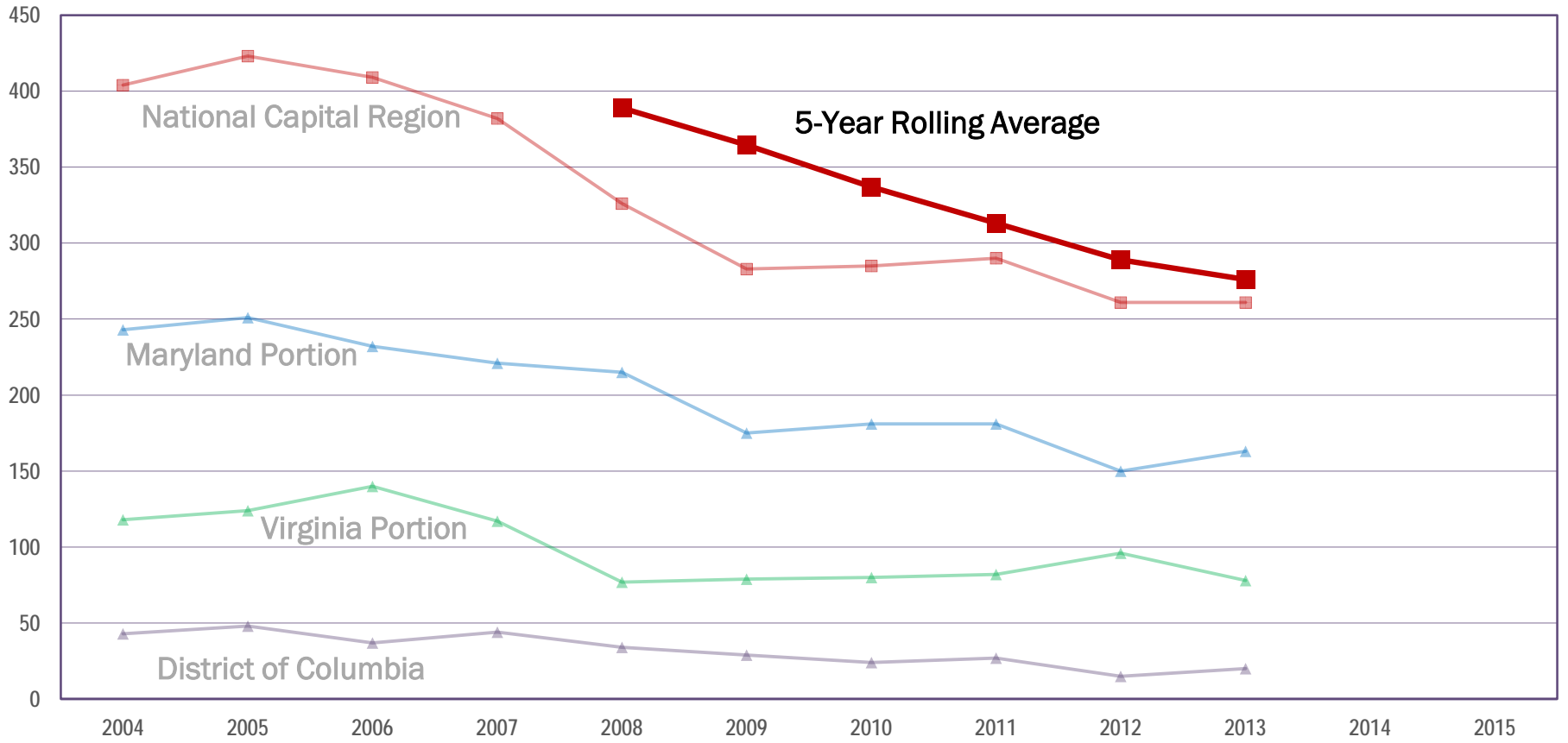
* Except for the urbanized area of Fauquier County

Data tables are in the handout

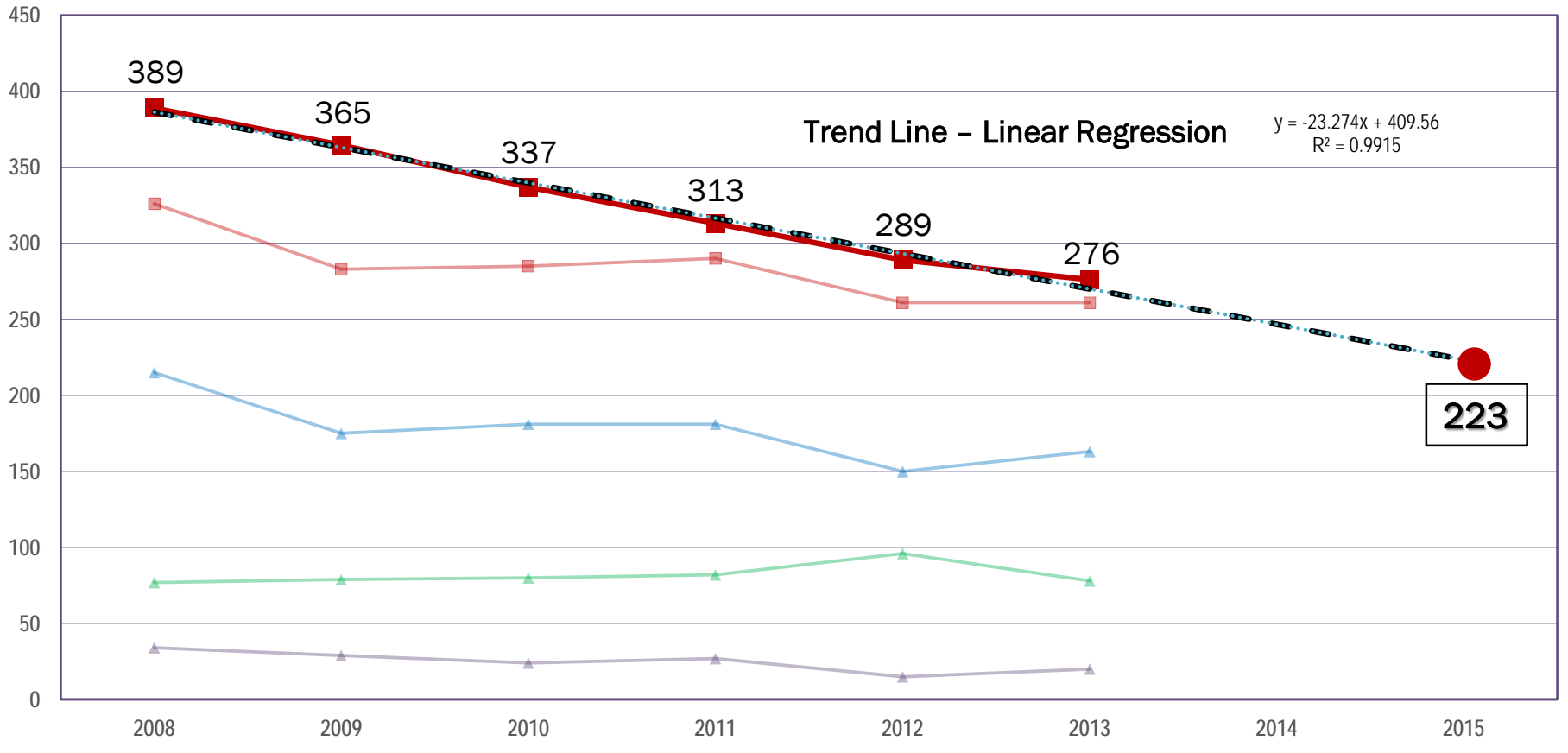
National Capital Region: Total Fatalities



National Capital Region: Total Fatalities - 5-year Rolling Average



National Capital Region: Total Fatalities - Trend Line



Next Steps

- Continue collaboration with Maryland, Virginia, and the District of Columbia
- Analyze serious injury data when available for Maryland counties
- Obtain and analyze safety data for the urbanized area of Fauquier County
- Provide periodic updates to this Committee and the Safety Subcommittee



MAP-21 Proposed Rulemaking for Pavement and Bridge Condition

- Notice of Proposed Rulemaking (NPRM) published January 5, 2015.
 - Definitions that will be applicable to the new Title 23 Code of Federal Regulations (CFR) 490; *National Performance Management Measures*
 - Process to be used by State DOTs and Metropolitan Planning Organizations (MPOs) to establish pavement and bridge condition-related performance targets.

Pavement and Bridge Performance Measures

Performance Measures

(1) Percentage of pavements on the Interstate System in **Good** condition

(2) Percentage of pavements on the Interstate System in **Poor** condition

(3) Percentage of pavements on the NHS (excl. Interstate System) in **Good** condition

(4) a Percentage of pavements on the NHS (excl. Interstate System) in **Poor** condition.

(5) Percentage of NHS Bridges Classified as in **Good** Condition

(6) Percentage of NHS Bridges Classified as in **Poor** Condition

- Pavement data submitted to Highway Performance Monitoring System (HPMS)
- Bridge ratings submitted to National Bridge Inventory (NBI)

Pavement Conditions – Data Requirements

extent – Entire NHS to be reported in 0.1 mile sections

Interstate – 2 Directions

Non Interstate NHS – 1 Direction

three inventory data elements:

1. Structure Type
2. Through Lanes
3. Surface Type

four metrics:

1. IRI (International Roughness Index)
2. Cracking Percent
3. Rutting (*asphalt only*)
4. Faulting (*jointed concrete only*)

Data Extent

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Extent - Section Length



The four metrics and three inventory data elements would be required to be reported in segments of 0.1 mile.

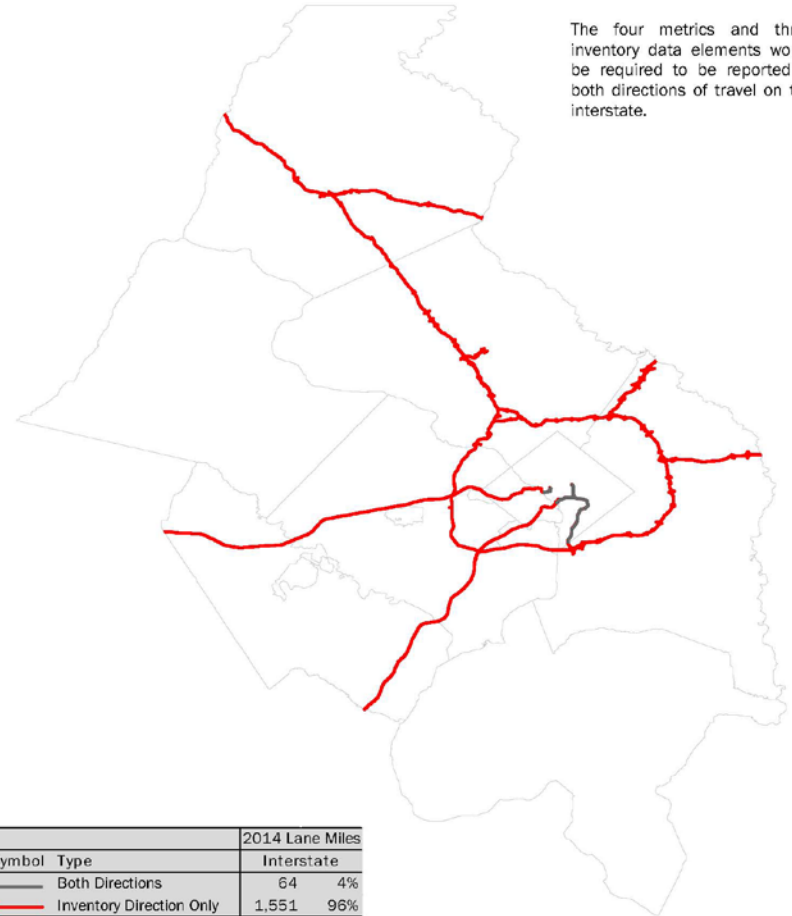
Shorter sections may be used at the beginning of a route, end of a route, or at locations where a section length of 0.1 mile is not achievable.

Symbol	Length	2014 Lane Miles			
		Interstate		Non-Interstate NHS	
Yellow	< 0.1 mile	343	21%	904	21%
Grey	= 0.1 mile	1,169	72%	2,963	67%
Red	> 0.1 mile	104	6%	524	12%
		1,616	100%	4,391	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015
MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Extent - Interstate System - Both Directions of Travel



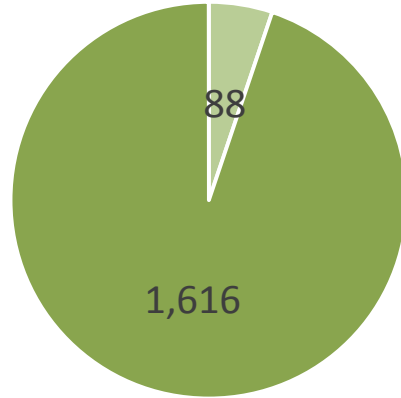
The four metrics and three inventory data elements would be required to be reported in both directions of travel on the interstate.

Symbol	Type	2014 Lane Miles	
		Interstate	
Grey	Both Directions	64	4%
Red	Inventory Direction Only	1,551	96%
		1,616	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015
MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

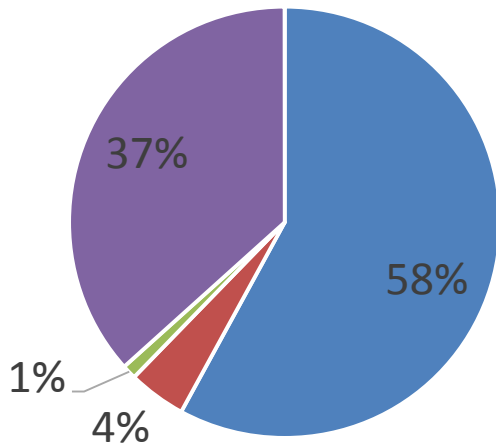
2014 Data Elements (Interstate)

Structure Type



■ Bridge ■ Other

Surface Type

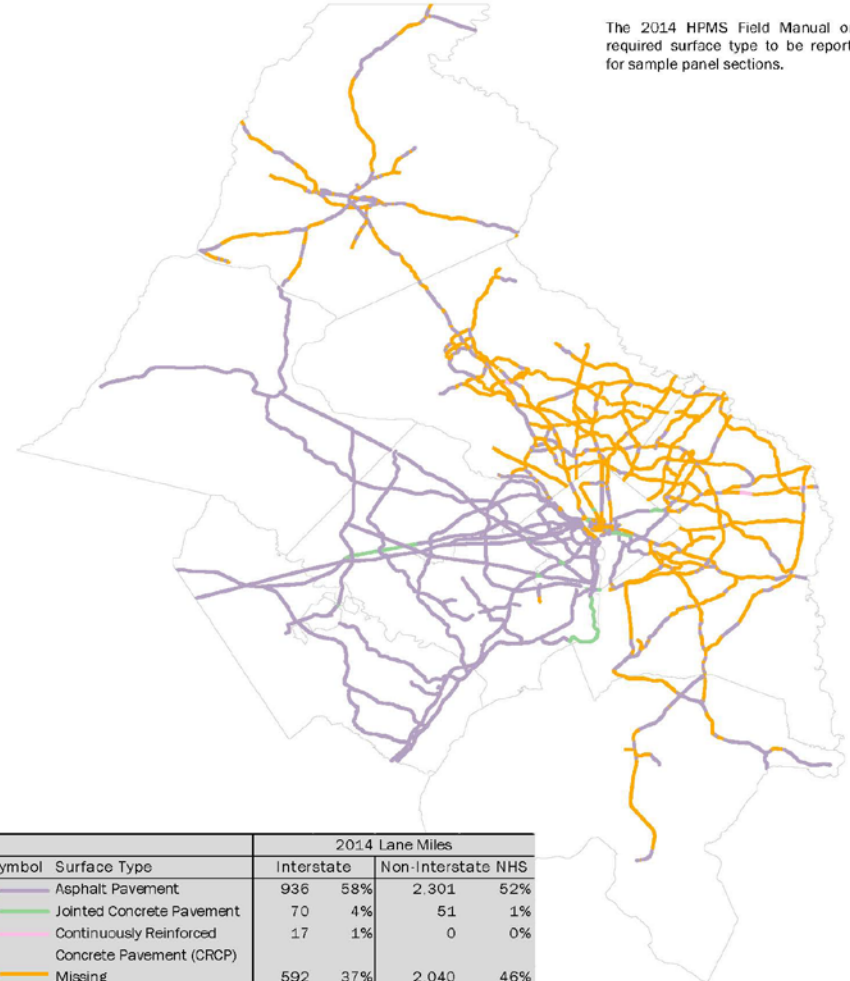


■ Asphalt Pavement
 ■ Jointed Concrete Pavement
 ■ CRCP
 ■ Missing

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Data Element - Surface Type

The 2014 HPMS Field Manual only required surface type to be reported for sample panel sections.



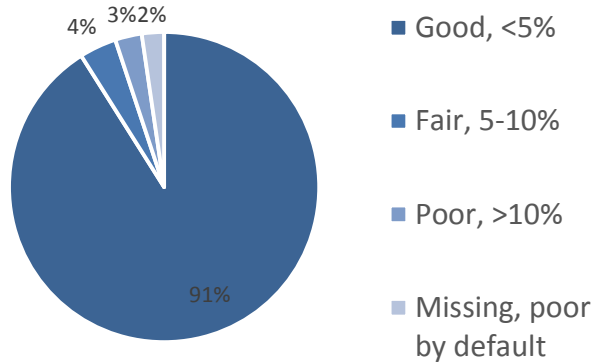
Symbol	Surface Type	2014 Lane Miles	
		Interstate	Non-Interstate NHS
—	Asphalt Pavement	936	2,301
—	Jointed Concrete Pavement	70	51
—	Continuously Reinforced Concrete Pavement (CRCP)	17	0
—	Missing	592	2,040
		1,616	4,391
		100%	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015. MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

2014 Metrics (Interstate)

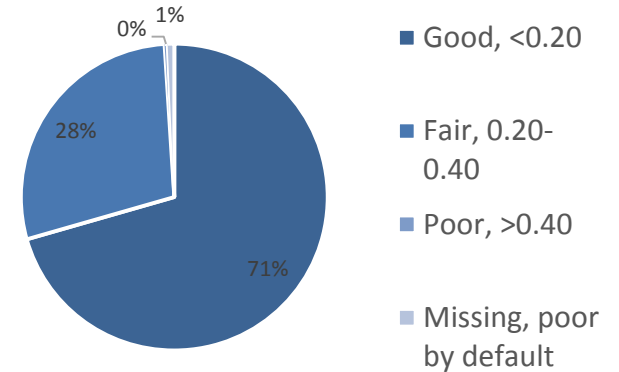
Cracking Percent

(pavement reported – 1024 miles)



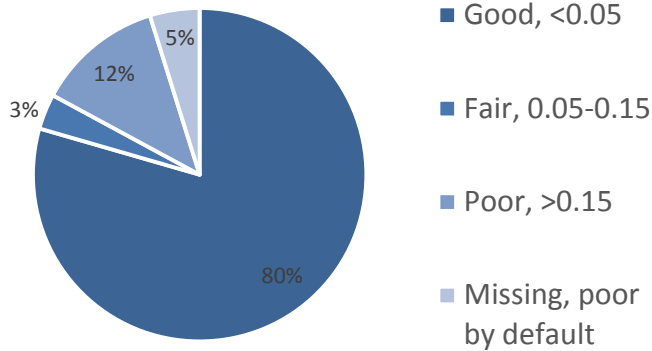
Rutting

(asphalt only – 936 miles)



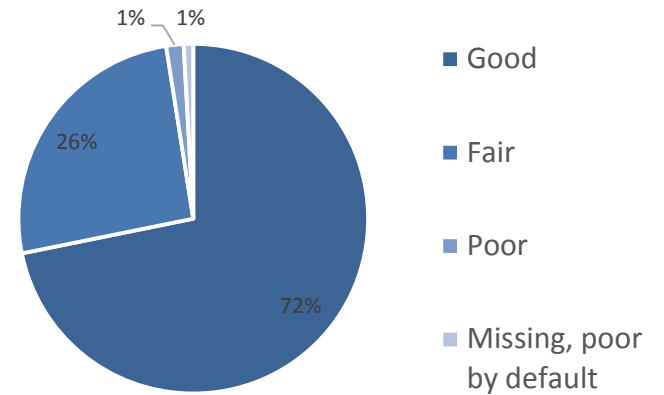
Faulting

(jointed concrete only – 70 miles)

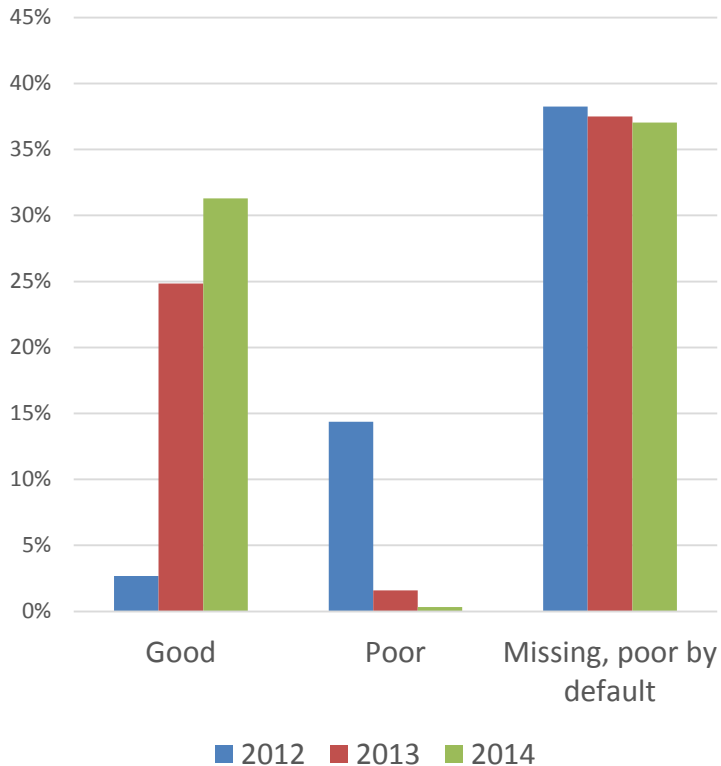


International Roughness Index

(1616 miles)



Overall Pavement Condition Rating, 2012-2014 (Interstate)



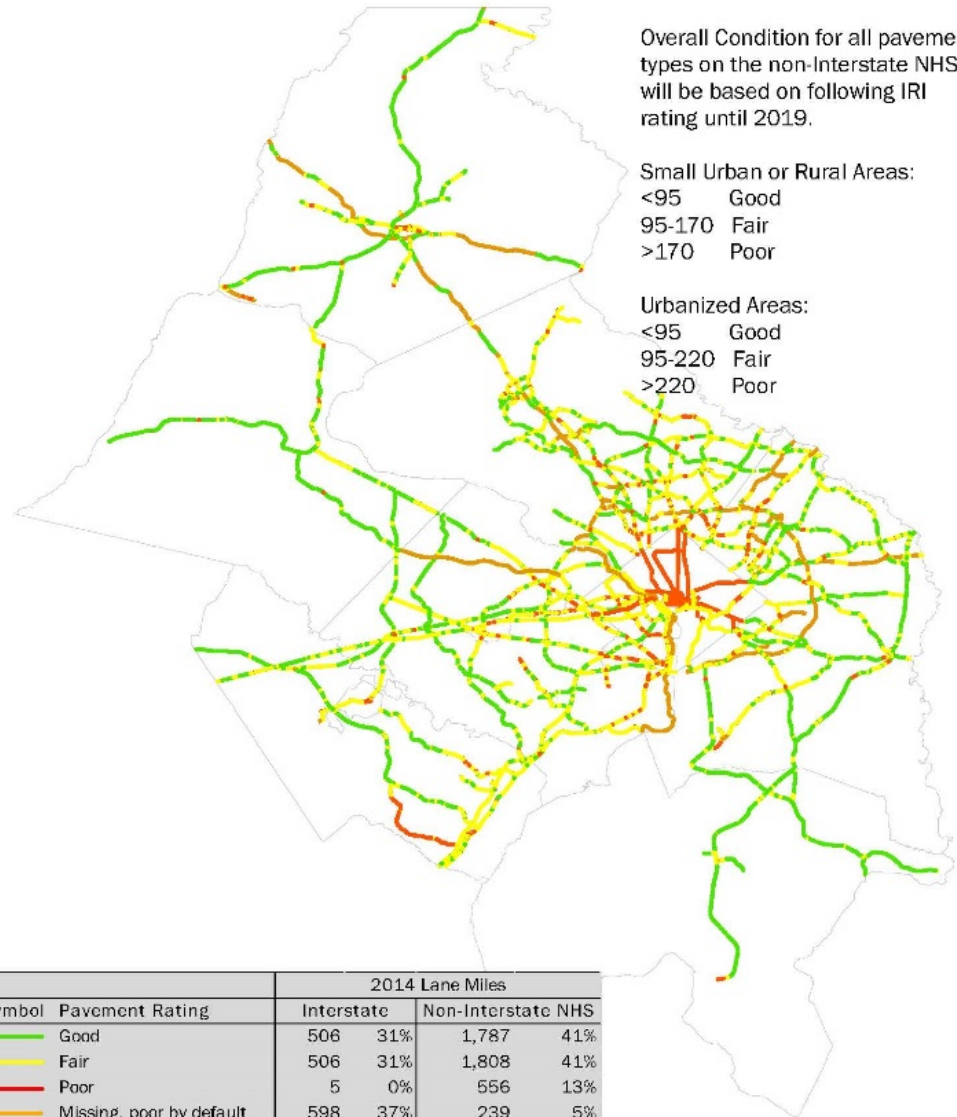
PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Overall Pavement Rating

Overall Condition for all pavement types on the non-Interstate NHS will be based on following IRI rating until 2019.

Small Urban or Rural Areas:
 <95 Good
 95-170 Fair
 >170 Poor

Urbanized Areas:
 <95 Good
 95-220 Fair
 >220 Poor



Symbol	Pavement Rating	2014 Lane Miles			
		Interstate		Non-Interstate NHS	
Green	Good	506	31%	1,787	41%
Yellow	Fair	506	31%	1,808	41%
Red	Poor	5	0%	556	13%
Orange	Missing, poor by default	598	37%	239	5%
		1,616	100%	4,391	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

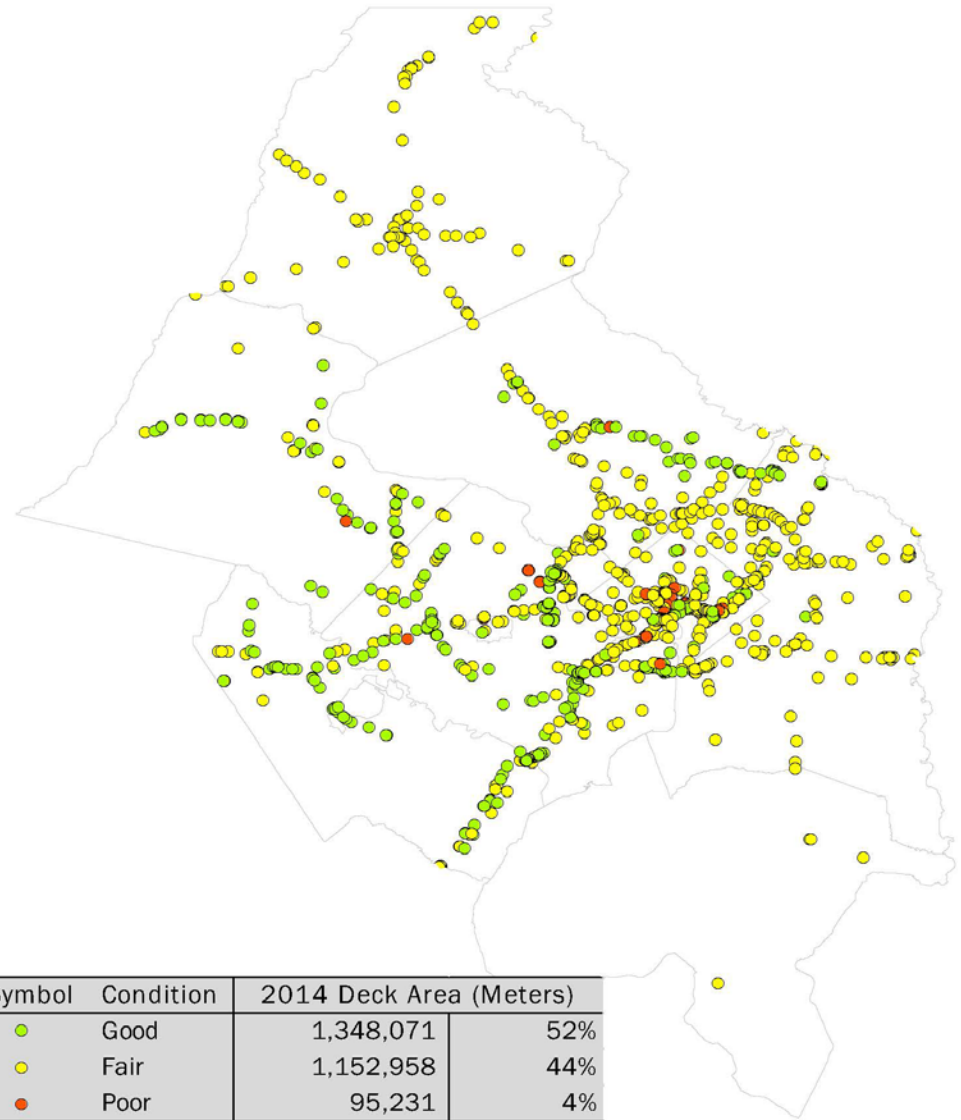
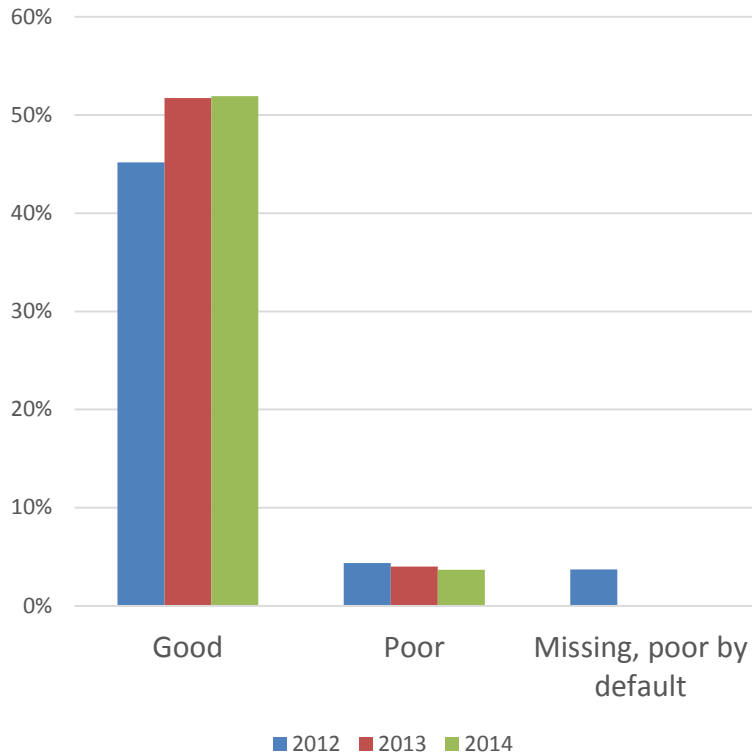
MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

Bridge Conditions – Still Under Development

- Data from NBI
- All NHS bridges including bridges on ramps connecting to the NHS and NHS bridges that cross a State border regardless of ownership or maintenance responsibility.
- Condition:
 - Minimum NBI Condition Ratings: Deck, Superstructure, Substructure, and Culverts
- Minimum level:
 - Structurally Deficient Classification: Same as above, plus Structural Evaluation and Waterway Adequacy

PROPOSED BRIDGE CONDITION RATING MEASURES

Overall Bridge Condition Rating, 2012-2014 (Interstate)



Symbol	Condition	2014 Deck Area (Meters)	
●	Good	1,348,071	52%
●	Fair	1,152,958	44%
●	Poor	95,231	4%
		2,596,261	100%

Notes: For planning purposes only.
 Developed by COG/TPB in December 2015 using 2014 NBI downloaded 1/22/2015.

Questions?



Fatalities (FARS - except for 2014)

Jurisdiction	Calendar Year													
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015	2016	2017
District of Columbia	43	48	37	44	34	29	24	27	15	20	46			
Charles County, MD	16	40	30	23	13	15	18	21	15	16				
Frederick County, MD	28	33	33	25	21	23	24	15	16	20				
Montgomery County, MD	79	44	58	48	51	39	47	40	36	40				
Prince George's County, MD	120	134	111	125	130	98	92	105	83	87				
Arlington County, VA	6	9	3	6	8	6	6	6	4	2	5			
Fairfax County, VA	64	62	67	54	29	37	35	45	46	40	33			
Loudoun County, VA	22	19	19	21	11	13	12	11	17	13	11			
Prince William County, VA	23	28	46	28	25	16	23	15	19	18	23			
Alexandria, VA	3	2	1	5	4	1	2	3	4	3	0			
Fairfax City, VA	0	1	3	1	0	2	0	1	5	2	0			
Falls Church, VA	0	0	0	0	0	1	2	0	0	0	0			
Manassas, VA	0	3	1	2	0	3	0	0	1	0	0			
Manassas Park, VA	0	0	0	0	0	0	0	1	0	0	0			
Total Fatalities	404	423	409	382	326	283	285	290	261	261	118			

Serious Injuries

Jurisdiction	Calendar Year													
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015	2016	2017
District of Columbia	n/a	n/a	357	363	304	347	303	305	344	309	314			
Charles County, MD	n/a	n/a												
Frederick County, MD	n/a	n/a												
Montgomery County, MD	n/a	n/a												
Prince George's County, MD	n/a	n/a												
Arlington County, VA	n/a	n/a	155	134	161	150	97	64	70	63	58			
Fairfax County, VA	n/a	n/a	1,565	1,409	1,102	1,050	892	823	788	706	614			
Loudoun County, VA	n/a	n/a	417	360	271	234	236	191	161	143	178			
Prince William County, VA	n/a	n/a	785	632	432	375	311	358	322	319	221			
Alexandria, VA	n/a	n/a	115	88	81	65	50	74	52	60	43			
Fairfax City, VA	n/a	n/a	11	8	15	25	17	14	21	9	24			
Falls Church, VA	n/a	n/a	37	41	24	17	12	14	9	33	19			
Manassas, VA	n/a	n/a	50	41	29	39	32	56	78	64	57			
Manassas Park, VA	n/a	n/a	10	6	2	1	4	3	1	1	2			
Total Fatalities	n/a	n/a	3502	3082	2421	2303	1954	1902	1846	1707	1530			

* preliminary data

100 M Annual VMT (calculated from weekday VMT)



Jurisdiction	Calendar Year													
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
District of Columbia	n/a	36.24	36.24	36.09	36.01	36.07	35.91	35.68	35.62	35.27	35.28			
Charles County, MD	n/a	12.71	12.81	12.84	12.57	12.45	12.47	12.44	12.50	12.46	12.53			
Frederick County, MD	n/a	29.69	30.14	30.09	29.22	29.26	29.70	29.59	30.03	30.06	29.99			
Montgomery County, MD	n/a	75.13	75.15	74.71	74.23	73.68	73.96	74.10	73.28	73.81	73.85			
Prince George's County, MD	n/a	89.02	87.71	87.54	86.95	85.81	86.79	86.85	88.04	87.96	88.18			
Arlington County, VA	n/a	17.02	16.71	16.63	16.30	15.85	16.15	16.69	16.21	15.78	15.50			
Fairfax County, VA	n/a	95.57	95.90	101.23	104.56	98.43	101.30	98.84	98.22	97.89	96.42			
Loudoun County, VA	n/a	21.71	22.73	24.03	23.03	23.60	25.23	24.90	24.92	25.36	25.88			
Prince William County, VA	n/a	32.37	31.78	32.02	33.68	32.12	33.52	33.94	33.83	34.13	33.82			
Alexandria, VA	n/a	7.22	7.17	7.36	7.92	7.74	7.93	7.77	7.76	7.74	7.55			
Fairfax City, VA	n/a	1.84	1.80	1.93	1.76	1.75	1.92	1.83	1.83	1.79	1.75			
Falls Church, VA	n/a	0.64	0.63	0.64	0.62	0.59	0.57	0.56	0.57	0.54	0.50			
Manassas, VA	n/a	1.62	1.69	1.64	1.75	1.62	1.64	1.65	1.66	1.60	1.58			
Manassas Park, VA	n/a	0.27	0.28	0.26	0.27	0.25	0.24	0.25	0.25	0.25	0.25			
Total Fatalities	n/a	421.06	420.73	427.01	428.87	419.21	427.31	425.09	424.73	424.66	423.08			

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Data Element - Structure Type

The 2014 HPMS Field Manual requires structure type to only be reported when a bridge, tunnel, or causeway is present.



Symbol	Type	2014 Lane Miles			
		Interstate		Non-Interstate NHS	
	Bridge	88	5%	89	2%
	No Structure / Other	1,616	95%	4,391	98%
		1,704	100%	4,480	100%

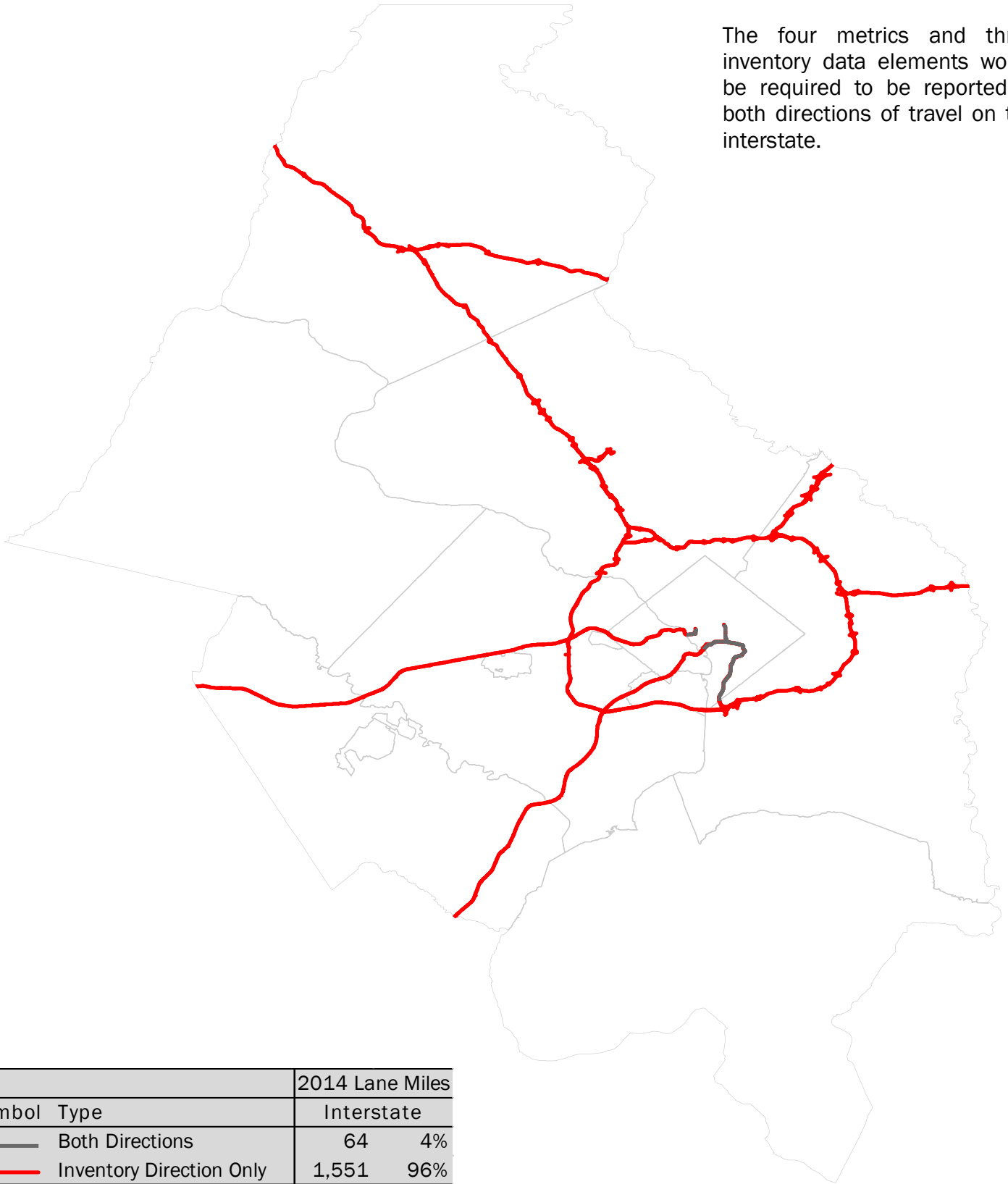
Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Extent - Interstate System - Both Directions of Travel

The four metrics and three inventory data elements would be required to be reported in both directions of travel on the interstate.



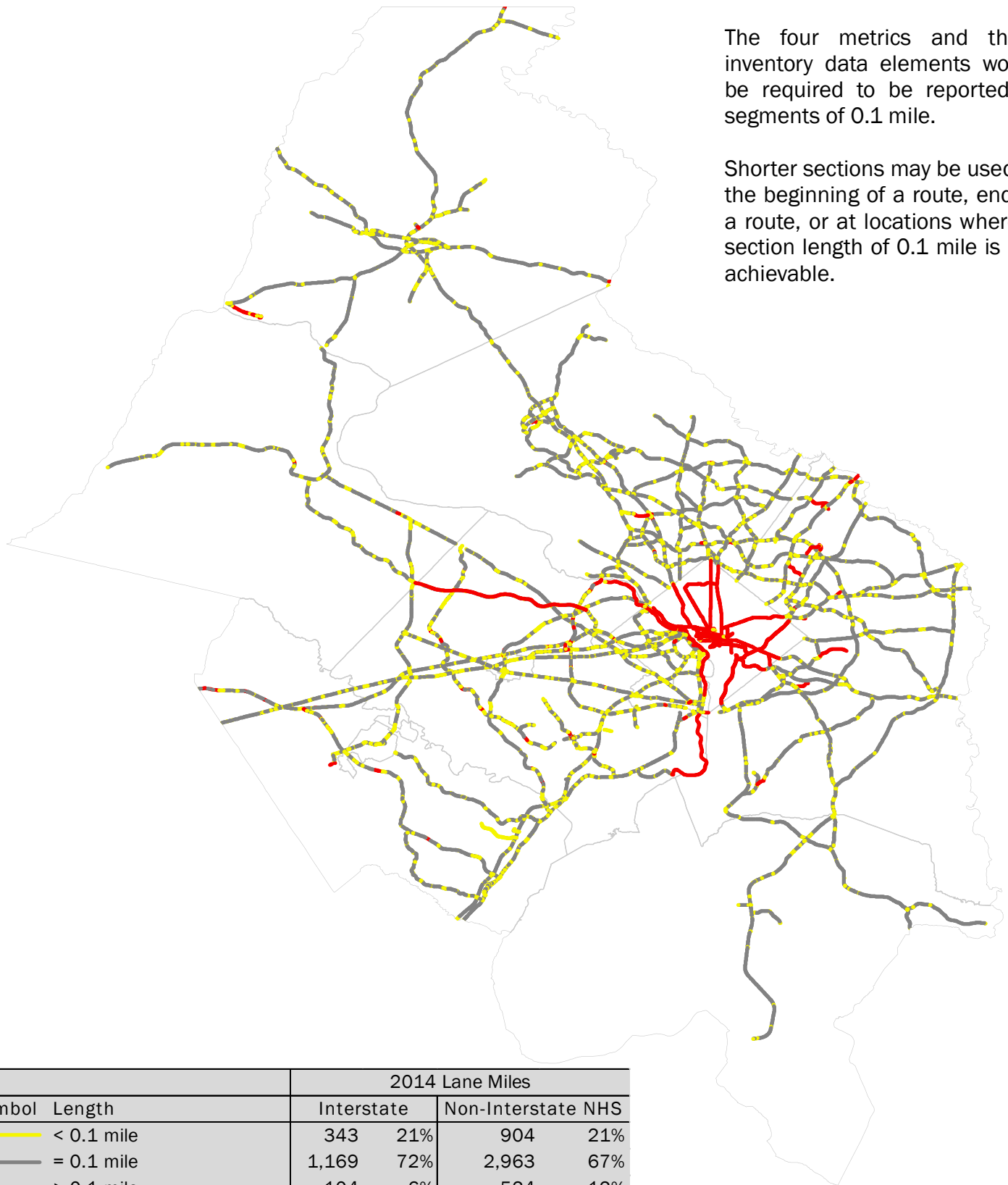
		2014 Lane Miles	
Symbol	Type	Interstate	
—	Both Directions	64	4%
—	Inventory Direction Only	1,551	96%
		1,616	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Extent - Section Length



The four metrics and three inventory data elements would be required to be reported in segments of 0.1 mile.

Shorter sections may be used at the beginning of a route, end of a route, or at locations where a section length of 0.1 mile is not achievable.

		2014 Lane Miles			
Symbol	Length	Interstate		Non-Interstate NHS	
—	< 0.1 mile	343	21%	904	21%
—	= 0.1 mile	1,169	72%	2,963	67%
—	> 0.1 mile	104	6%	524	12%
		1,616	100%	4,391	100%

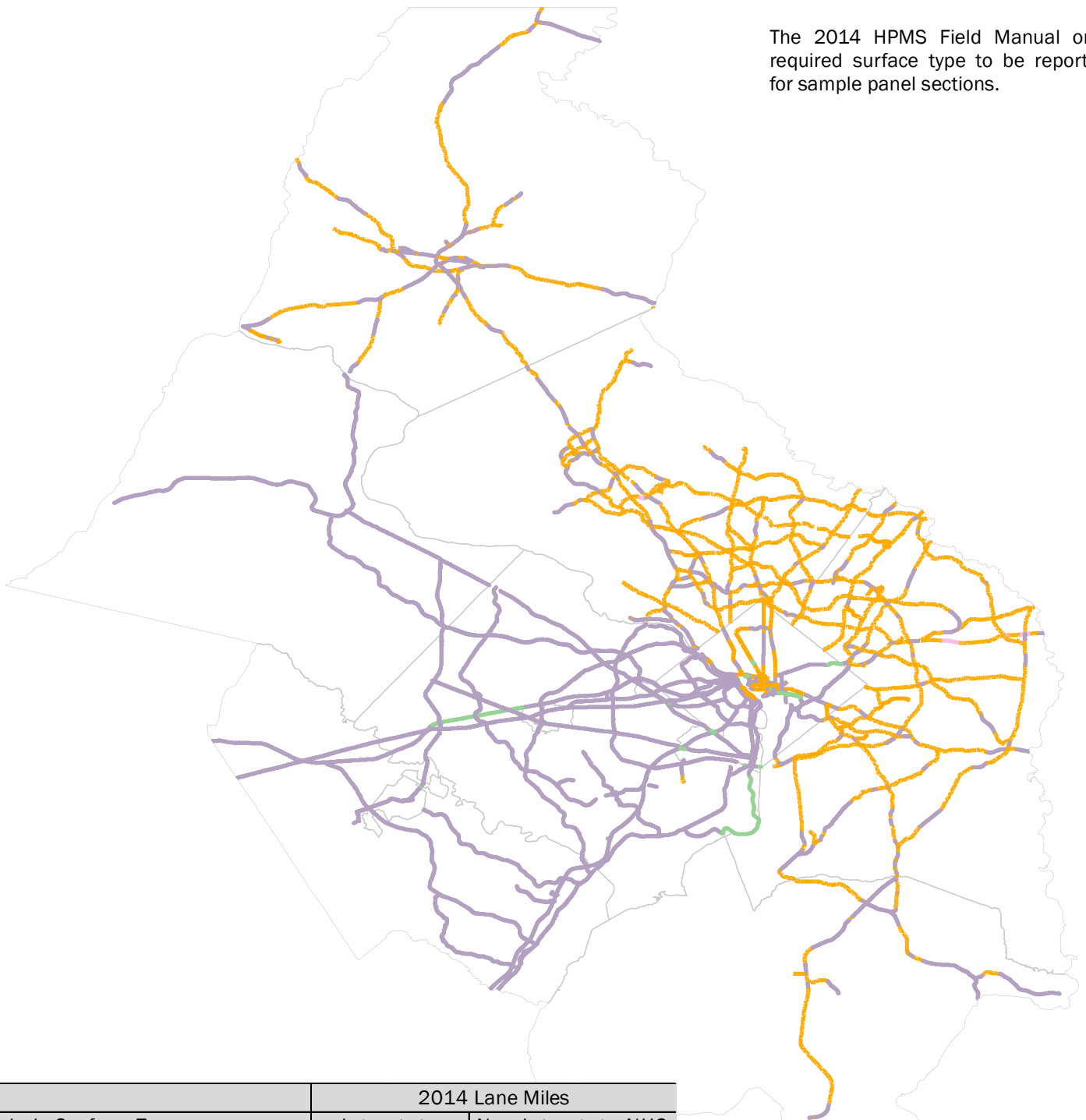
Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Data Element - Surface Type

The 2014 HPMS Field Manual only required surface type to be reported for sample panel sections.



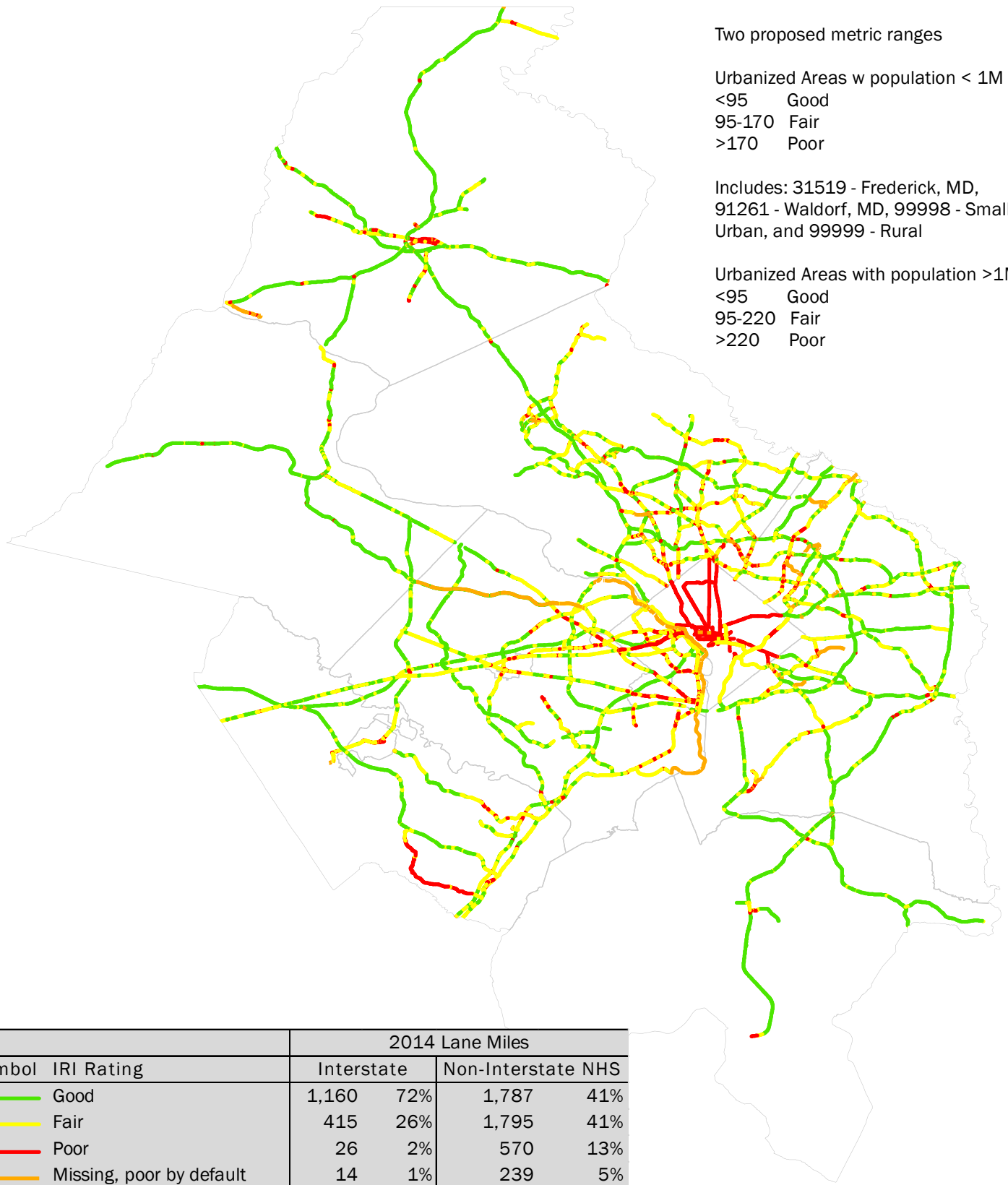
Symbol	Surface Type	2014 Lane Miles			
		Interstate		Non-Interstate NHS	
—	Asphalt Pavement	936	58%	2,301	52%
—	Jointed Concrete Pavement	70	4%	51	1%
—	Continuously Reinforced Concrete Pavement (CRCP)	17	1%	0	0%
—	Missing	592	37%	2,040	46%
		1,616	100%	4,391	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Metric - International Roughness Index (IRI)



Two proposed metric ranges

Urbanized Areas w population < 1M
 <95 Good
 95-170 Fair
 >170 Poor

Includes: 31519 - Frederick, MD,
 91261 - Waldorf, MD, 99998 - Small
 Urban, and 99999 - Rural

Urbanized Areas with population >1M
 <95 Good
 95-220 Fair
 >220 Poor

		2014 Lane Miles			
Symbol	IRI Rating	Interstate		Non-Interstate NHS	
—	Good	1,160	72%	1,787	41%
—	Fair	415	26%	1,795	41%
—	Poor	26	2%	570	13%
—	Missing, poor by default	14	1%	239	5%
		1,616	100%	4,391	100%

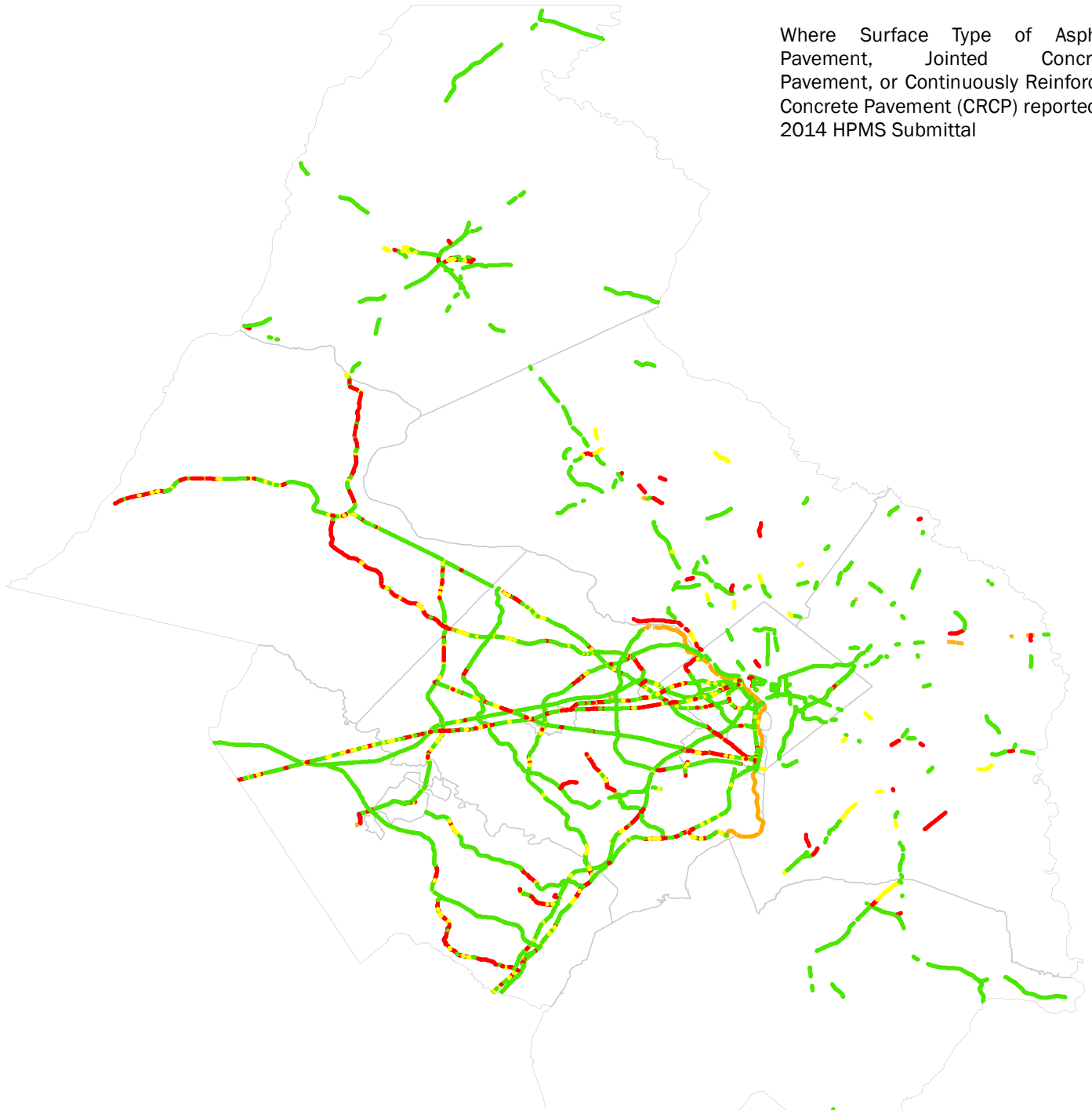
Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Metric - Cracking Percent

Where Surface Type of Asphalt Pavement, Jointed Concrete Pavement, or Continuously Reinforced Concrete Pavement (CRCP) reported in 2014 HPMS Submittal



Symbol	Cracking Pct Rating	2014 Lane Miles			
		Interstate		Non-Interstate NHS	
—	Good, <5%	932	91%	1,338	57%
—	Fair, 5-10%	40	4%	342	15%
—	Poor, >10%	29	3%	522	22%
—	Missing, poor by default	24	2%	150	6%
		1,024	100%	2,352	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Metric - Rutting

Where Surface Type of Asphalt Pavement reported in 2014 HPMS Submittal



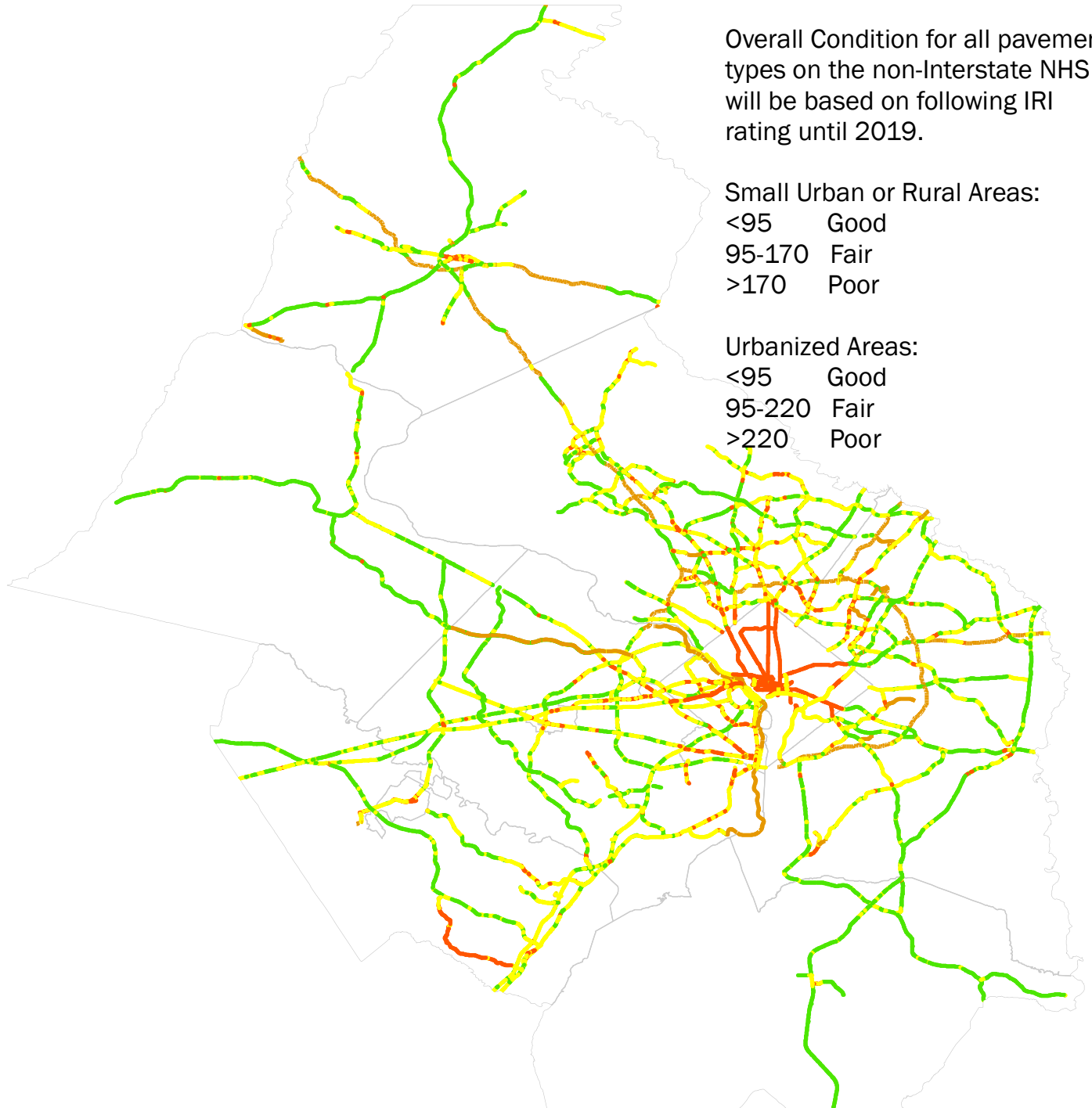
Symbol	Rutting Rating	2014 Lane Miles			
		Interstate		Non-Interstate NHS	
—	Good, <math>< 0.20</math>	661	71%	1,541	67%
—	Fair, 0.20-0.40	266	28%	618	27%
—	Poor, > 0.40	3	0%	22	1%
—	Missing, poor by default	6	1%	120	5%
		936	100%	2,301	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.

PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Overall Pavement Rating



Overall Condition for all pavement types on the non-Interstate NHS will be based on following IRI rating until 2019.

Small Urban or Rural Areas:

<95 Good
 95-170 Fair
 >170 Poor

Urbanized Areas:

<95 Good
 95-220 Fair
 >220 Poor

Symbol	Pavement Rating	2014 Lane Miles			
		Interstate		Non-Interstate NHS	
—	Good	506	31%	1,787	41%
—	Fair	506	31%	1,808	41%
—	Poor	5	0%	556	13%
—	Missing, poor by default	598	37%	239	5%
		1,616	100%	4,391	100%

Notes: For planning purposes only. Developed by COG/TPB in October and November 2015 using 2014 HPMS intersector files obtained from Tom Roff (FHWA) on 10/05/2015

MAP does not reflect the changes to Virginia's NHS approved by FHWA on 10/09/15.