

IMPROVING HPMS PAVEMENT DATA TO SUPPORT PERFORMANCE MANAGEMENT



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U.S. Department of Transportation
Federal Highway Administration

AGENDA

- Look at the Data
 - Report Card Purpose
 - Results
 - Details
- Hot Topics
- Future/Next Steps



GOAL

HPMS data - including
pavement performance data

- On time
- Complete
- Quality (confidence)



REPORT CARD PURPOSE

- Tool to use when reviewing current data submission based on trends in past data submissions
- National averages
- Doesn't say your data is right or wrong, but it deserves some attention



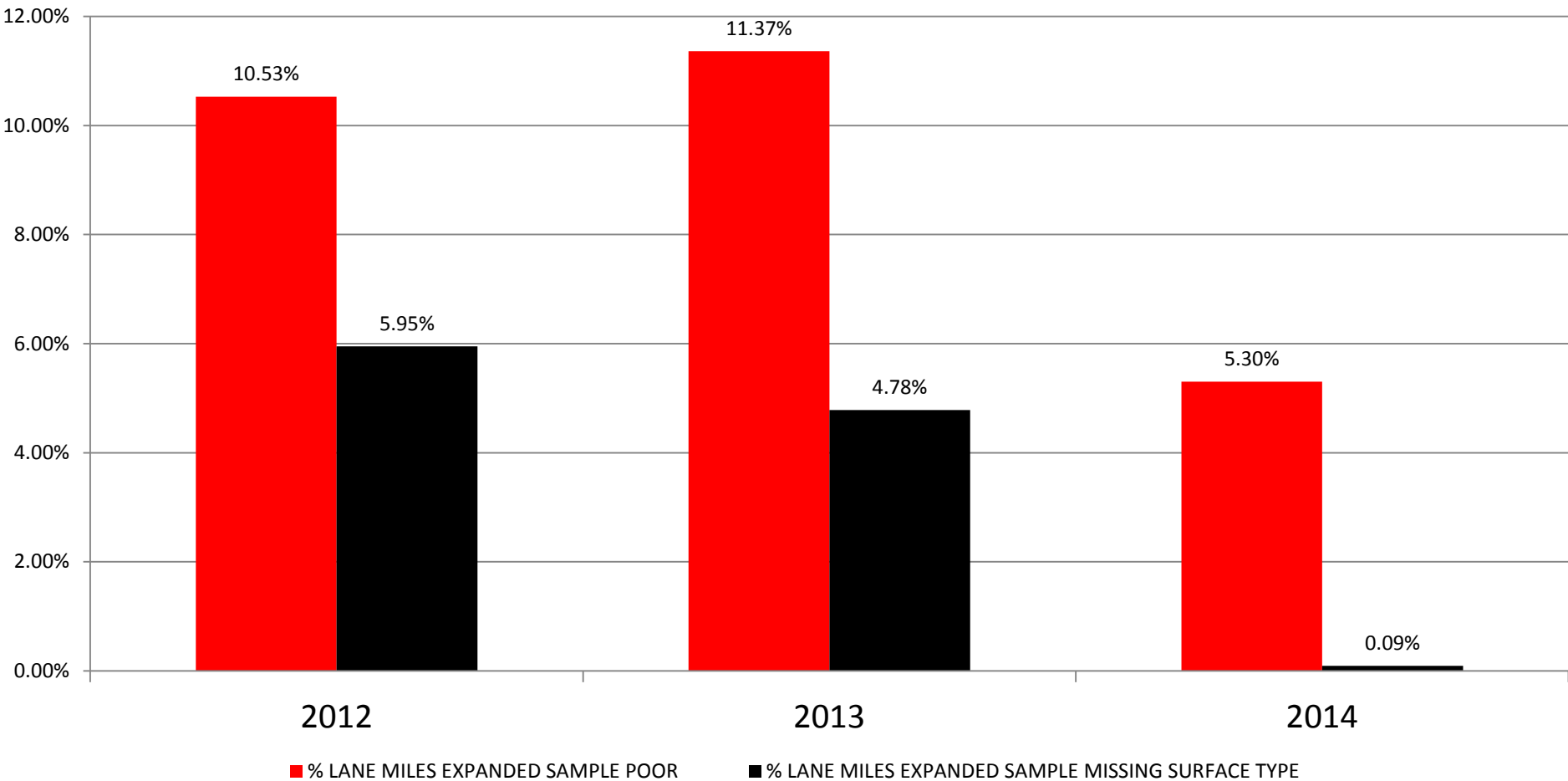
USING YOUR OWN DATA IS LIKE EATING YOUR DOG'S FOOD

IT WILL GET BETTER
IF YOU HAVE TO CONSUME IT.



RESULTS

% POOR AND MISSING SURFACE TYPE



NEWS FLASH

- Report Card is now built into the HPMSv8 Software under the Reports tab.

The screenshot displays the HPMS v8 Reports interface. The browser address bar shows the URL <https://proxy-p.fhwa.dot.gov/hpmst/#/ReviewMain>. The page header includes the U.S. Department of Transportation Federal Highway Administration logo and the title "Highway Performance Monitoring System v8.0". The navigation menu contains "DATA EDITORS", "DATA VALIDATION", "SAMPLE MANAGEMENT", "REPORTS & ANALYSIS", "DOCUMENTATION", "ADMIN", and "HELP". The "Reports" section is active, showing a filter for "Year: 2015" and "State: 19 - Iowa". A table lists various reports, with "Pavement Report Card" selected. Below the table are buttons for "Create Selected Reports", "Cancel Selected Reports", and "Download Selected Reports".

U.S. Department of Transportation
Federal Highway Administration

Highway Performance Monitoring System v8.0

Review National Maintenance

DATA EDITORS DATA VALIDATION SAMPLE MANAGEMENT REPORTS & ANALYSIS DOCUMENTATION ADMIN HELP

EXIT

Reports

Last updated: 10:58:26 AM

Year: 2015 State: 19 - Iowa

Report Name	Report Status	Submitted By	Submitted On	Last Modified On	Create	Cancel	Download	Preview PDF
Extent and Travel Report (Urban/Rural Summary)	0 - Not Created				<input type="checkbox"/>			
IRI on the Federal Aid Highways	0 - Not Created				<input type="checkbox"/>			
IRI on the NHS	0 - Not Created				<input type="checkbox"/>			
Length of Missing Pavement Data	0 - Not Created				<input type="checkbox"/>			
Overview	0 - Not Created				<input type="checkbox"/>			
Ownership	0 - Not Created				<input type="checkbox"/>			
Sample Adequacy	0 - Not Created				<input type="checkbox"/>			
Vehicle Summary Changes	0 - Not Created				<input type="checkbox"/>			
Sample VMT Comparison	0 - Not Created				<input type="checkbox"/>			
Validation Summary	0 - Not Created				<input type="checkbox"/>			
Extent and Travel Report (Nationwide)	0 - Not Created				<input type="checkbox"/>			
HM-20 (Public Road Length by Functional System)	0 - Not Created				<input type="checkbox"/>			
HM-60 (Estimated Public Road Lane - Miles by Functional System)	0 - Not Created				<input type="checkbox"/>			
VM-2 (Vehicle -Miles of Travel by Functional System)	0 - Not Created				<input type="checkbox"/>			
Pavement Report Card	0 - Not Created				<input checked="" type="checkbox"/>			

Create Selected Reports Cancel Selected Reports Download Selected Reports

10:58 AM 5/9/2016

DETAILS

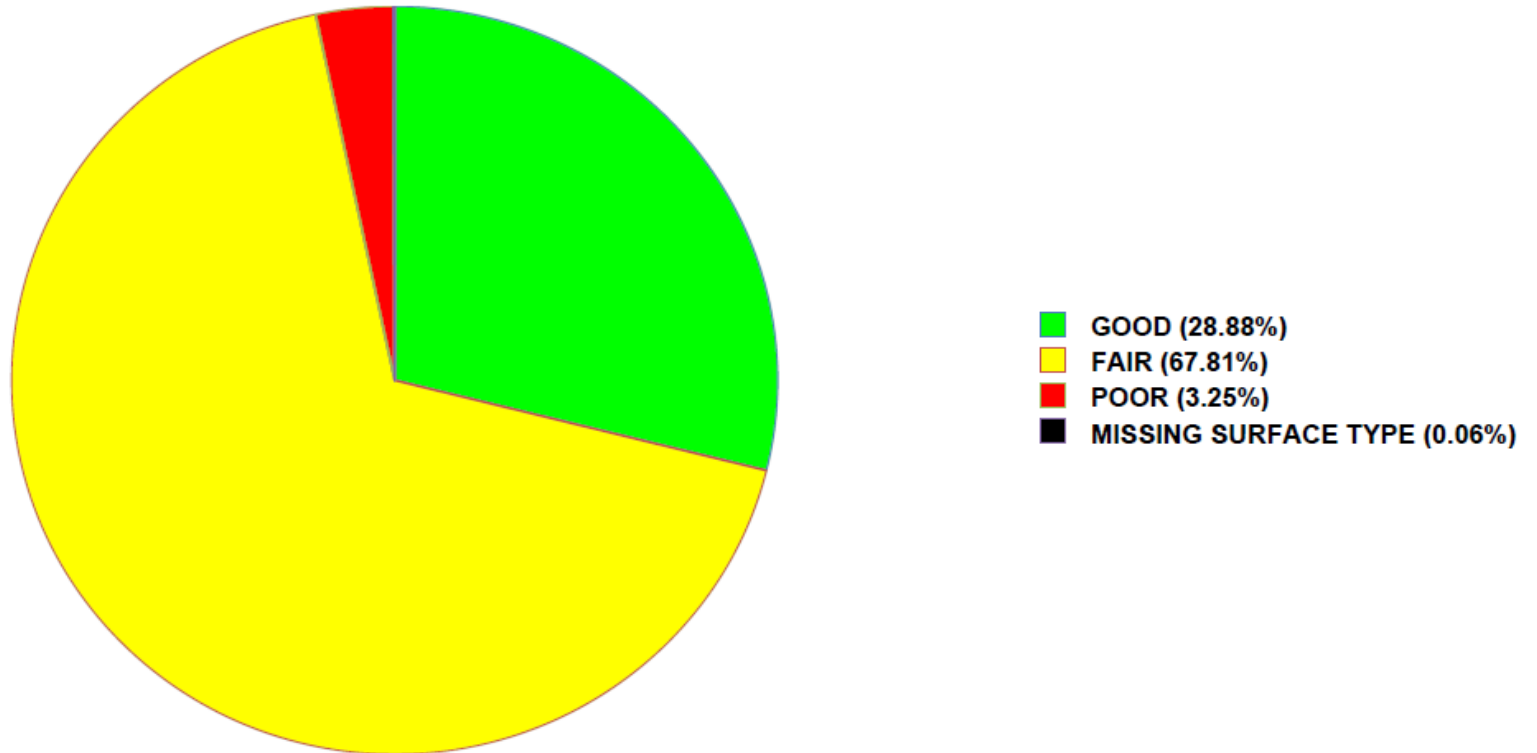
- Quantity
- Quality
- Distributions
- Caveats
 - January 2015 NPRM
 - Expanded sample based



EXPANDED SAMPLE LANE MILES RATING (INTERSTATE)

Stage: Review
Year: 2015
State:
Date: 05/31/2016

LANE MILES EXPANDED SAMPLE GOOD	1,460.884
LANE MILES EXPANDED SAMPLE FAIR	3,430.493
LANE MILES EXPANDED SAMPLE POOR	164.578
LANE MILES EXPANDED SAMPLE MISSING SURFACE TYPE	2.932
TOTAL	5,058.887
SAMPLE SIZE	28.74 %



ITEMS SHADED ORANGE ARE HPMS PAVEMENT PERFORMANCE DATA IMPROVEMENT ZONES WHERE DATA SHOULD BE VERIFIED OR CORRECTED

DATA CHECK AND PAVEMENT DATA QUANTITY (INTERSTATE)

Stage: Review
Year: 2015
State:
Date: 05/31/2016

DATA CHECK

PREVIOUS YEAR HM-41 INTERSTATE CENTERLINE MILES	1,104.490
SUBMITTED DATA INTERSTATE CENTERLINE MILES	1,104.300
DELTA	-0.190
PREVIOUS YEAR HM-43 INTERSTATE LANE MILES	5,165.490
SUBMITTED DATA INTERSTATE LANE MILES	5,179.415
DELTA	13.925

DATA QUANTITY - PAVEMENT

TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING CRACKING PERCENT DATA	109.677
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING FAULTING DATA	0.781
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING IRI DATA	17.690
TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT MISSING IRI DATA	55.190
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING RUTTING DATA	0.433
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS NOT PROPERLY CODED. A CODING OF 1 FOR UNSURFACED OR BLANK IS NOT ACCEPTABLE ON THE INTERSTATE.	2.932
TOTAL INTERSTATE LANE MILES WHERE THROUGH LANES IS CODED AS A 1, 2, OR 3. ALTHOUGH THIS IS POSSIBLE AT INTERSTATE TERMINAL SECTION OR SOME INTERCHANGES THESE SECTIONS SHOULD BE VERIFIED.	0.960
TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT EXCLUDING SECTIONS CODED AS A BRIDGE	5,017.918
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES EXCLUDING SECTIONS CODED AS A BRIDGE	5,058.887

ITEMS SHADED ORANGE ARE HPMS PAVEMENT PERFORMANCE DATA IMPROVEMENT ZONES WHERE DATA SHOULD BE VERIFIED OR CORRECTED

HPMS 8.0.1

PAVEMENT DATA QUALITY - IRI (INTERSTATE)

Stage: Review
Year: 2015
State:
Date: 05/31/2016

TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT WHERE IRI YEAR DOES NOT EQUAL YEAR_RECORD. IRI DATA IS REQUIRED TO BE COLLECTED AND REPORTED ANNUALLY ON THE INTERSTATE ALONG WITH THE DATE OF COLLECTION. IRI YEAR SHOULD EQUAL YEAR_RECORD	55.190
% INTERSTATE LANE MILES IRI YEAR DOES NOT EQUAL YEAR_RECORD. CUTOFF VALUE TO FLAG FOR VERIFICATION IS 0.00%	1.10 %

TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT WHERE IRI IS LESS THAN 30.0 INCHES/MILE. ALTHOUGH VALUES LESS THAN 30.0 INCHES PER MILE ARE POSSIBLE THEY ARE NOT LIKELY AND SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED IRI CUMULATIVE DISTRIBUTION.	393.060
% INTERSTATE LANE MILES IRI LESS THAN 30.0 INCHES PER MILE. AVERAGE VALUE IS 1.15%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 0.00%	7.83 %

TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT WHERE IRI IS GREATER THAN 400.0 INCHES/MILE. ALTHOUGH VALUES GREATER THAN 400.0 INCHES PER MILE ARE POSSIBLE THEY ARE NOT LIKELY AND SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED IRI CUMULATIVE DISTRIBUTION.	0.312
% INTERSTATE LANE MILES IRI GREATER THAN 400.0 INCHES PER MILE. AVERAGE VALUE IS 0.02%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 0.00%	0.01 %

ITEMS SHADED ORANGE ARE HPMS PAVEMENT PERFORMANCE DATA IMPROVEMENT ZONES WHERE DATA SHOULD BE VERIFIED OR CORRECTED

HPMS 8.0.1

PAVEMENT DATA QUALITY - CRACKING PERCENT (INTERSTATE)

Stage: Review
Year: 2015
State:
Date: 05/31/2016

TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED AS 0.00%. MULTIPLE STATES REPORTED VERY HIGH VALUES FOR THEIR PAVEMENTS AND THESE SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED CRACKING PERCENT CUMULATIVE DISTRIBUTION.	3,201.483
% INTERSTATE LANE MILES ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED AS 0.00%. AVERAGE IS 46.43% WITH A SD OF 33.02%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 79.45%	63.28 %
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED > 0.00% AND < 1.00%. THIS MAY BE AN INDICATION THAT A STATE MAY HAVE A PROBLEM CONVERTING DECIMAL TO PERCENTAGES. CRACKING PERCENT IS TO BE REPORTED IN MULTIPLES OF 5%. MULTIPLE STATES REPORTED VERY HIGH VALUES FOR THEIR PAVEMENTS AND THESE SHOULD BE VERIFIED.	0.000
% INTERSTATE LANE MILES ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED > 0.00% AND < 1.00%. AVERAGE IS 3.81% WITH A SD OF 11.22%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 15.03%	0.00 %
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES FOR PAVEMENTS CODED AS HMA WHERE CRACKING PERCENT IS REPORTED GREATER THAN 50.00%. CRACKING PERCENT FOR HMA IS LIMITED TO WHEELPATH AND THEREFORE SHOULD NOT EXCEED 50.00%. MULTIPLE STATES REPORTED VERY HIGH VALUES FOR THEIR PAVEMENTS AND THESE SHOULD BE VERIFIED.	16.191
% INTERSTATE LANE MILES ON EXPANDED SAMPLES FOR HMA PAVEMENTS WHERE CRACKING PERCENT IS REPORTED GREATER THAN 50.00%. AVERAGE IS 0.16% WITH A SD OF 0.54%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 0.00%	0.33 %
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED AS 100.00%. MULTIPLE STATES REPORTED VERY HIGH VALUES FOR THEIR PAVEMENTS AND THESE SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED CRACKING PERCENT CUMULATIVE DISTRIBUTION.	0.000
% INTERSTATE LANE MILES ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED AS 100.00%. AVERAGE IS 0.25% WITH A SD OF 0.75%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 1.00%	0.00 %

ITEMS SHADED ORANGE ARE HPMS PAVEMENT PERFORMANCE DATA IMPROVEMENT ZONES WHERE DATA SHOULD BE VERIFIED OR CORRECTED

PAVEMENT DATA QUALITY - FAULTING AND RUTTING (INTERSTATE)

Stage: Review
Year: 2015
State:
Date: 05/31/2016

TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS JOINTED PCC AND FAULTING IS EQUAL TO 0.00. MULTIPLE STATES REPORTED VERY HIGH VALUES AND THIS DATA SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED FAULTING CUMULATIVE DISTRIBUTION.	0.000
% INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS JOINTED PCC AND FAULTING IS EQUAL TO 0.00. AVERAGE IS 51.78% WITH A SD OF 31.60%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 83.38%	0.00 %
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS JOINTED PCC AND FAULTING IS GREATER THAN 1.00 INCH. MULTIPLE STATES REPORTED VERY HIGH VALUES AND THIS DATA SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED FAULTING CUMULATIVE DISTRIBUTION.	23.709
% INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS JOINTED PCC AND FAULTING IS GREATER THAN 1.00 INCH. AVERAGE IS 0.29% WITH A SD OF 1.67%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 0.00%	21.89 %
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS HMA AND RUTTING IS EQUAL TO 0.00. MULTIPLE STATES REPORTED VERY HIGH VALUES AND THIS DATA SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED RUTTING CUMULATIVE DISTRIBUTION.	0.000
% INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS HMA AND RUTTING IS EQUAL TO 0.00. AVERAGE IS 11.11% WITH A SD OF 22.20%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 33.31%	0.00 %
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS HMA AND RUTTING IS GREATER THAN 1.00 INCH. MULTIPLE STATES REPORTED VERY HIGH VALUES AND THIS DATA SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED RUTTING CUMULATIVE DISTRIBUTION.	7.090
% INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS HMA AND RUTTING IS GREATER THAN 1.00 INCH. AVERAGE IS 0.00% WITH A SD OF 0.01%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 0.00%	0.14 %
TOTAL INTERSTATE LANE MILES ON EXPANDED SAMPLES WHERE RUTTING IS REPORTED ON SURFACE TYPE = PCC OR CRCP	108.296
MANY STATES REPORT ALL DISTRESSES REGARDLESS OF SURFACE TYPE. VALUES OTHER THAN 0% OR 100% SHOULD BE VERIFIED AS THIS MAY BE AN ERROR OR THE RESULT OF DIFFERENT SOURCES OF REPORTING DATA	100.00 %
TOTAL INTERSTATE LANE MILES ON EXPANDED SAMPLES WHERE FAULTING IS REPORTED ON SURFACE TYPE = HMA OR CRCP	0.000
MANY STATES REPORT ALL DISTRESSES REGARDLESS OF SURFACE TYPE. VALUES OTHER THAN 0% OR 100% SHOULD BE VERIFIED AS THIS MAY BE AN ERROR OR THE RESULT OF DIFFERENT SOURCES OF REPORTING DATA	0.00 %

ITEMS SHADED ORANGE ARE HPMS PAVEMENT PERFORMANCE DATA IMPROVEMENT ZONES WHERE DATA SHOULD BE VERIFIED OR CORRECTED

HPMS 8.0.1 PAVEMENT DATA QUALITY - BRIDGE AND SECTION LENGTH (INTERSTATE)

Stage: Review
Year: 2015
State:
Date: 05/31/2016

BRIDGE LOCATION

PER MAP-21 BRIDGES ARE EXCLUDED FROM THE PERFORMANCE MEASURE CALCULATION. THE ABILITY TO ACCURATELY LOCATE BRIDGES IN HPMS IS VERY IMPORTANT IN THE CORRECT CALCULATION OF PAVEMENT CONDITION.

COUNT OF MAINLINE INTERSTATE BRIDGES FROM NBI INVENTORY	1,275
TOTAL INTERSTATE LANE MILES OF BRIDGES IN NBI INVENTORY	188.758
TOTAL LANE MILES ON FULL EXTENT BASIS CODED AS A BRIDGE IN HPMS	161.497

SECTION LENGTH

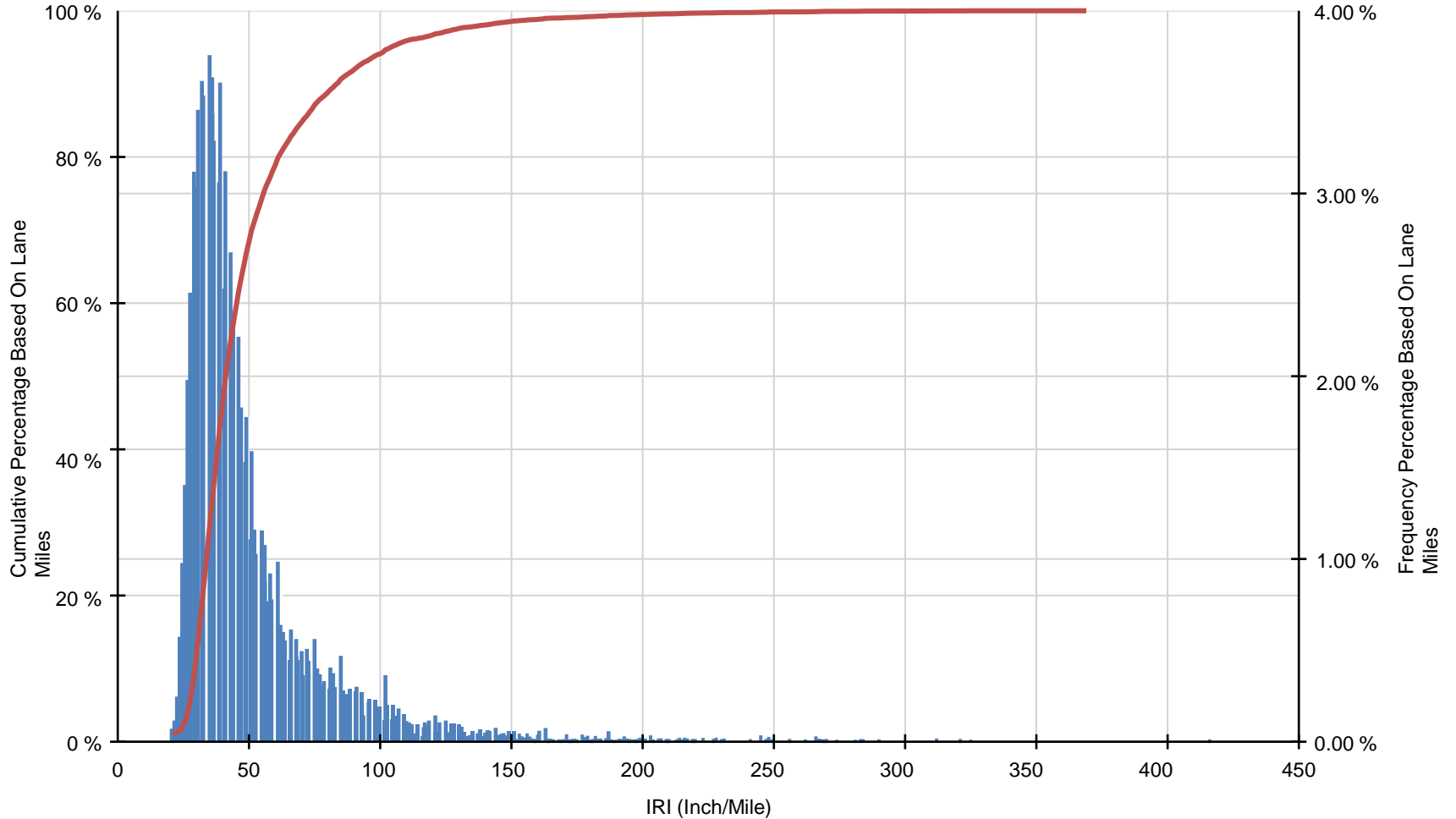
DISTRESS DATA SHOULD BE REPORTED IN SECTIONS 0.1 MILE IN LENGTH OR SHORTER

TOTAL INTERSTATE LANE MILES WHERE SECTION LENGTH IS GREATER THAN 0.1 MILE	55.32
CUTOFF VALUE FOR VERIFICATION IS 0.00%	1.07 %

ITEMS SHADED ORANGE ARE HPMS PAVEMENT PERFORMANCE DATA IMPROVEMENT ZONES WHERE DATA SHOULD BE VERIFIED OR CORRECTED

CUMULATIVE AND FREQUENCY DISTRIBUTION - IRI (INTERSTATE)

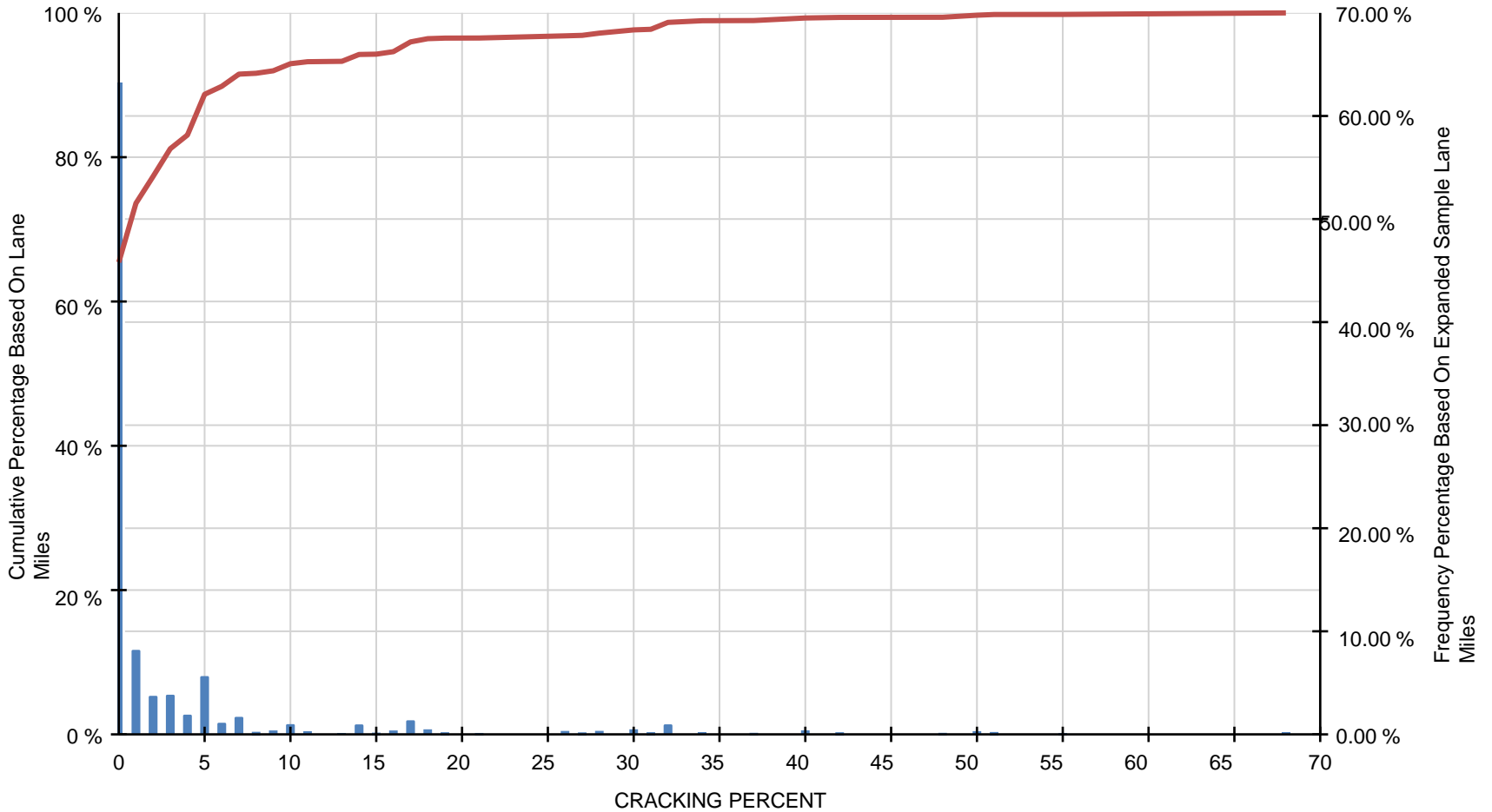
Stage: Review
Year: 2015
State:
Date: 05/31/2016



(Frequency of Missing IRI = 1.100%, missing data is included in the cumulative distribution graph.)

CUMULATIVE AND FREQUENCY DISTRIBUTION - CRACKING PERCENT (INTERSTATE)

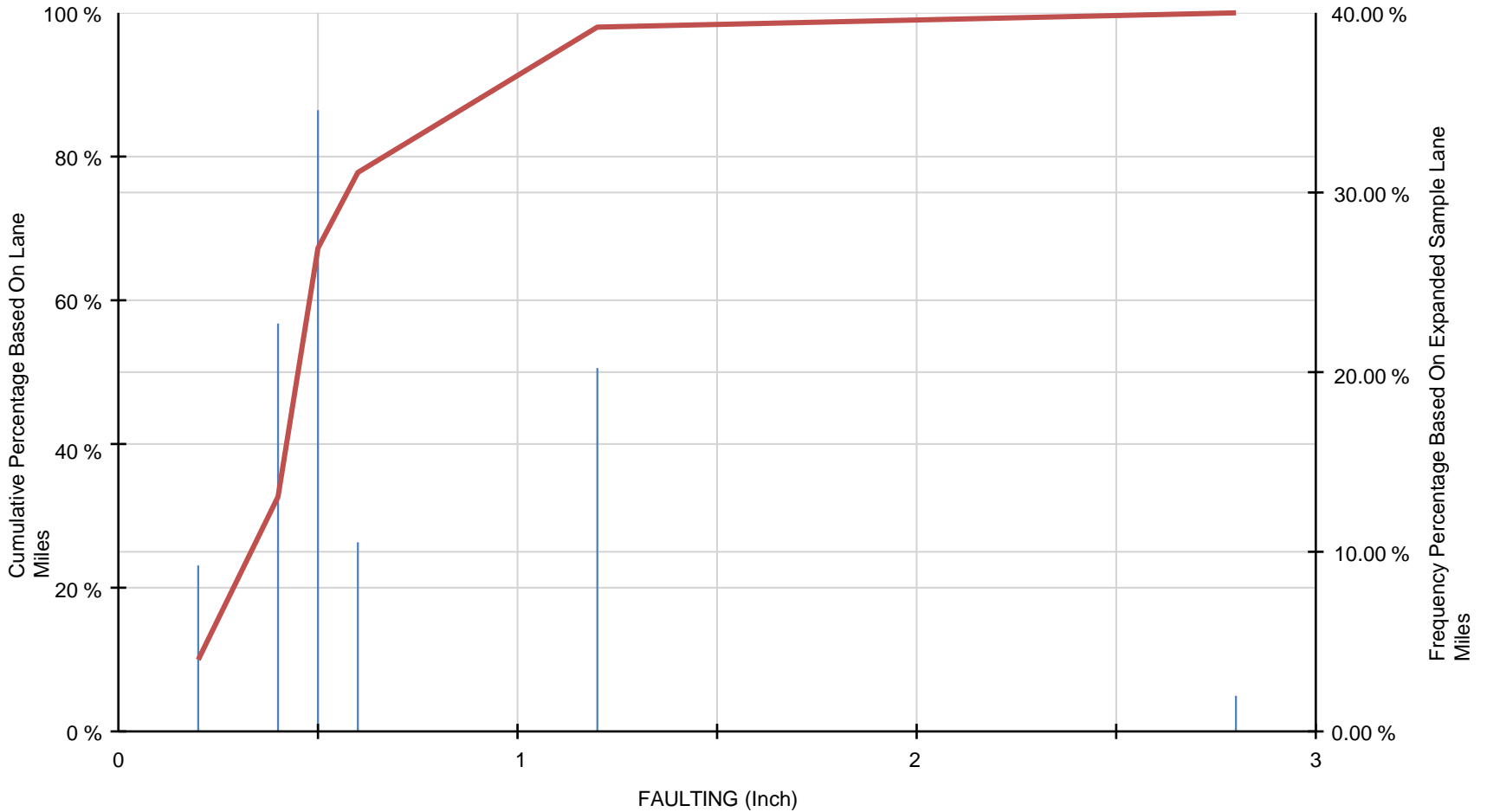
Stage: Review
Year: 2015
State:
Date: 05/31/2016



(Frequency of Missing CRACKING_PERCENT = 2.111%, missing data is included in the cumulative distribution graph.)

CUMULATIVE AND FREQUENCY DISTRIBUTION - FAULTING (INTERSTATE)

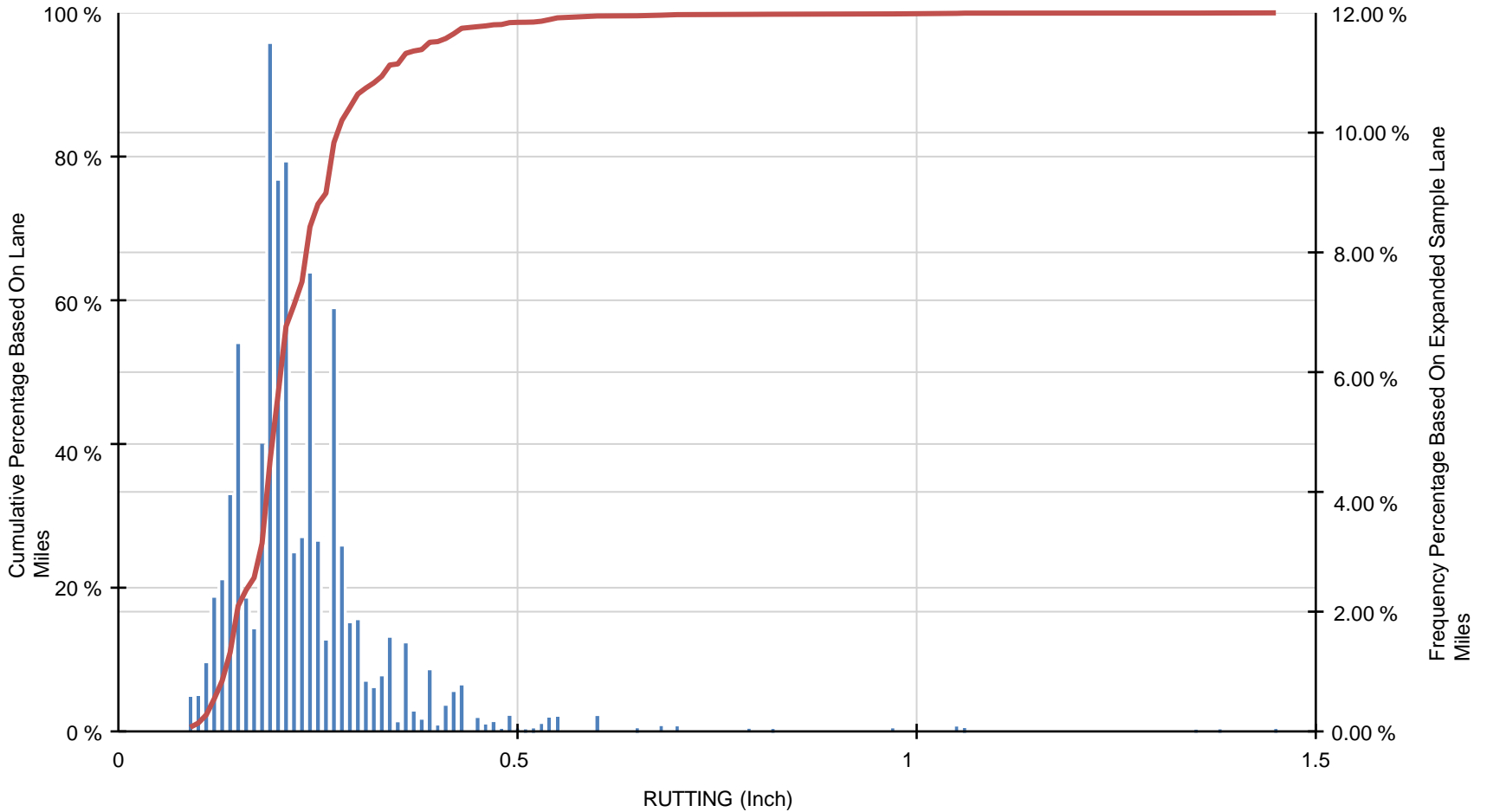
Stage: Review
Year: 2015
State:
Date: 05/31/2016



(Frequency of Missing FAULTING = 0.732%, missing data is included in the cumulative distribution graph.)

CUMULATIVE AND FREQUENCY DISTRIBUTION - RUTTING (INTERSTATE)

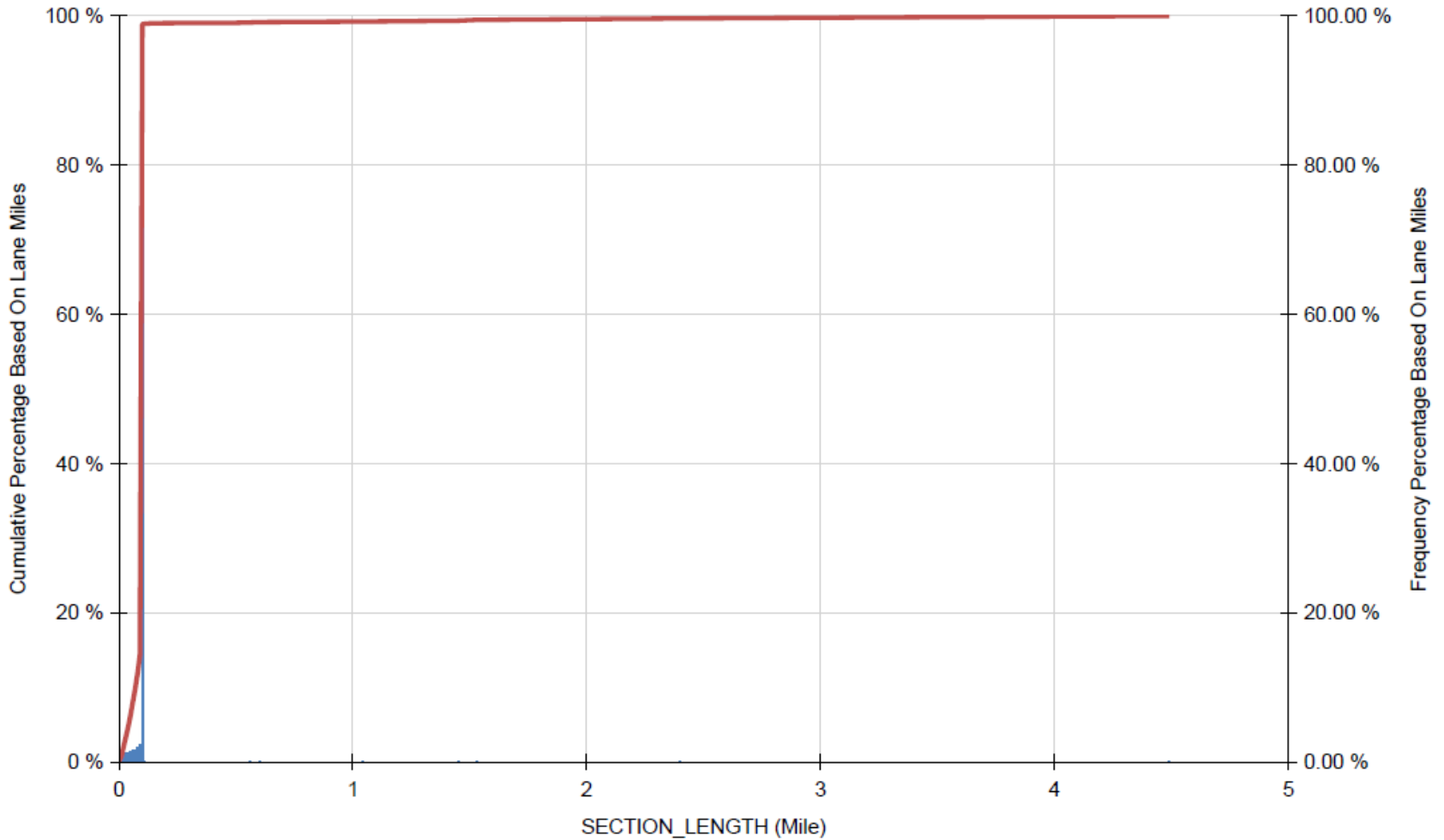
Stage: Review
Year: 2015
State:
Date: 05/31/2016



(Frequency of Missing RUTTING = 0.009%, missing data is included in the cumulative distribution graph.)

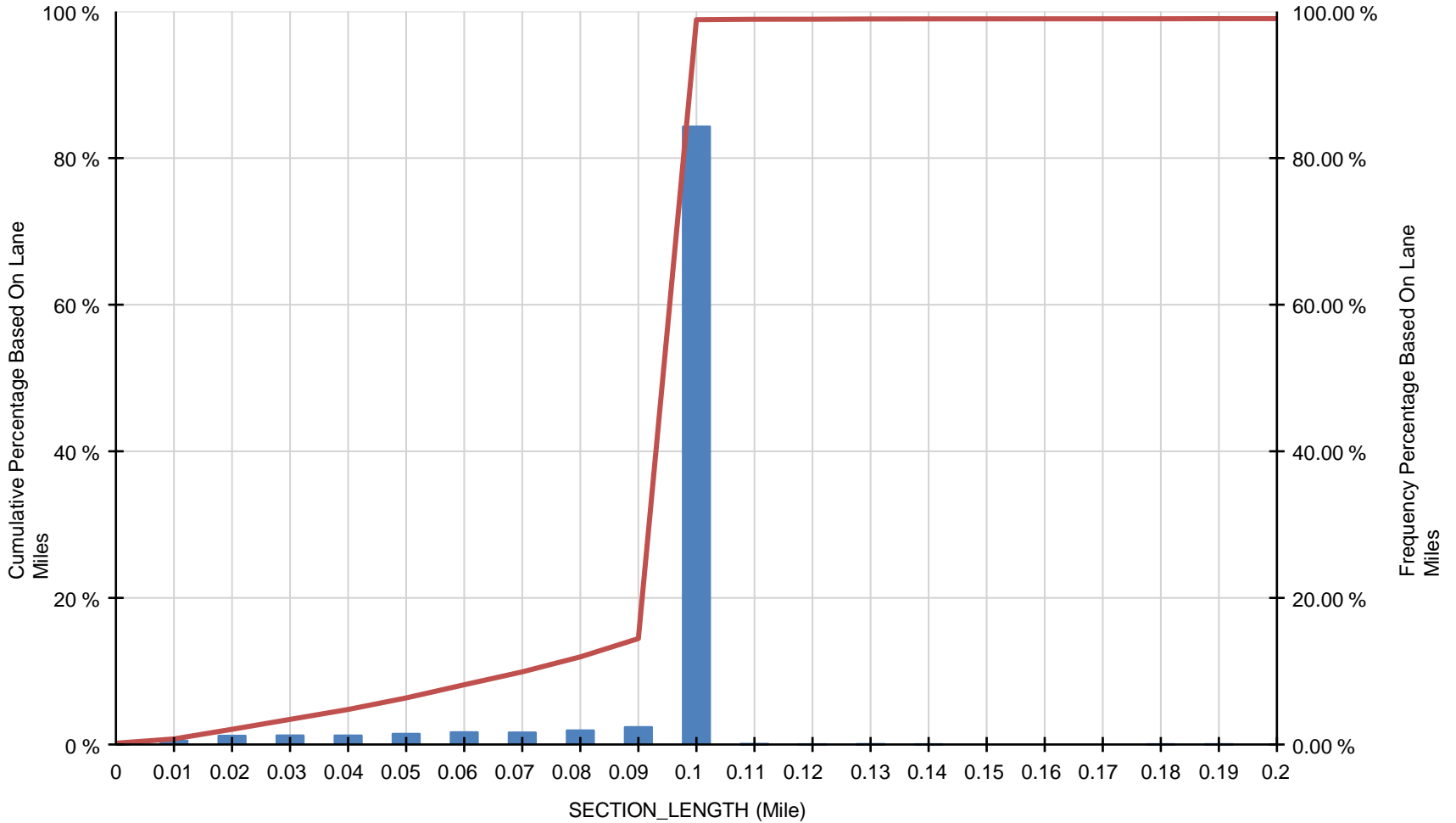
CUMULATIVE AND FREQUENCY DISTRIBUTION - SECTION LENGTHS (INTERSTATE)

Stage: Review
Year: 2015
State:
Date: 05/31/2016



CUMULATIVE AND FREQUENCY DISTRIBUTION - SECTION LENGTHS - CLOSEUP 0.0 TO 0.2 MILE IN LENGTH (INTERSTATE)

Stage: Review
Year: 2015
State:
Date: 05/31/2016



ISSUES IDENTIFIED IN SUBMISSIONS

- No zeros
- Average faulted joint
- Total rutting
- Rutting reported as faulting
- Default values
- Out of date data
- Decimal cracking
- High percentage cracking on HMA
- Zeros instead of nulls



HOT TOPICS

- Surface type
- Bridge location
- Section length
- Missing/default data
- HMA Cracking
- PCC Faulting
- HMA Rutting
- HMA Cracking
- PCC Faulting
- HMA Rutting
- Precision



FUTURE

- Temporal analysis – we will need to know if improvement have taken place on the road
- Comparison to LTPP test sections
- Interstate baseline project
- Action plans



CONCLUSIONS

- Data is improving
- More tools are forthcoming
- Data will be subject to more and more scrutiny
- Improved submissions are critical
 - Timeliness
 - Quantity
 - Quality

GOALS

- Improve Data as a Service
- The pay for performance model has confidence in the quality of the data.



