HPMS PAVEMENT PERFORMANCE DATA REPORT CARD

2014 HPMS Data Submission

Highway Information Seminar

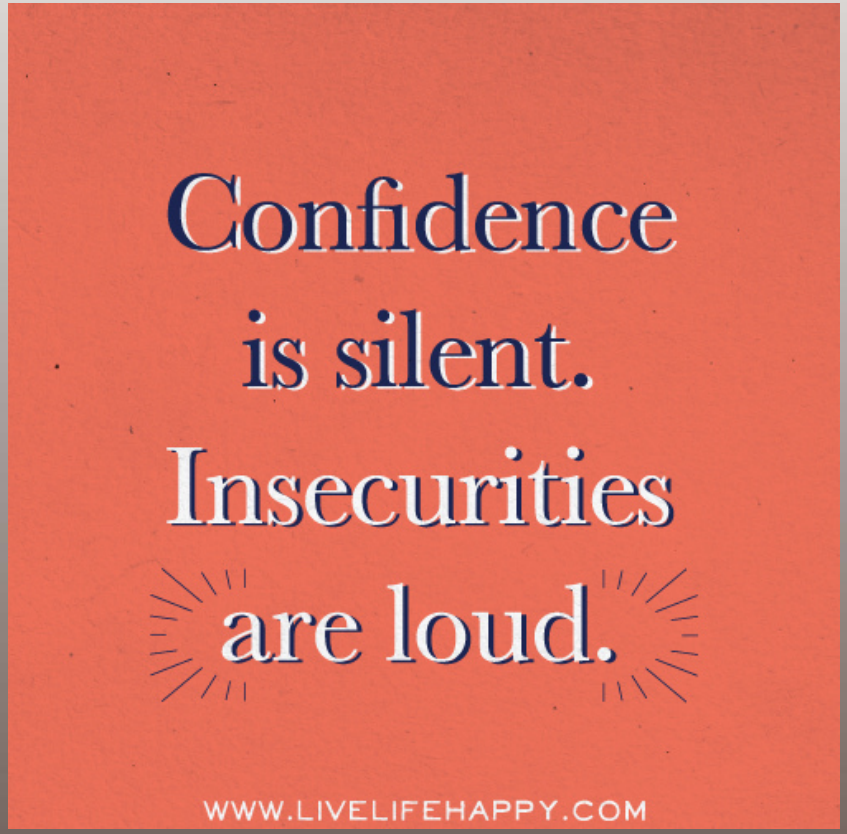
September 24, 2015

Outline

- Goals
- Report Card Purpose
- Results
- Details
- Future/Next Steps

Goals

Improve HPMS Pavement Performance Data quality so the agency has confidence as we use it in performance management



What does that mean?

HMPS data - including pavement performance data

–On time

–Complete

–Quality (confidence)

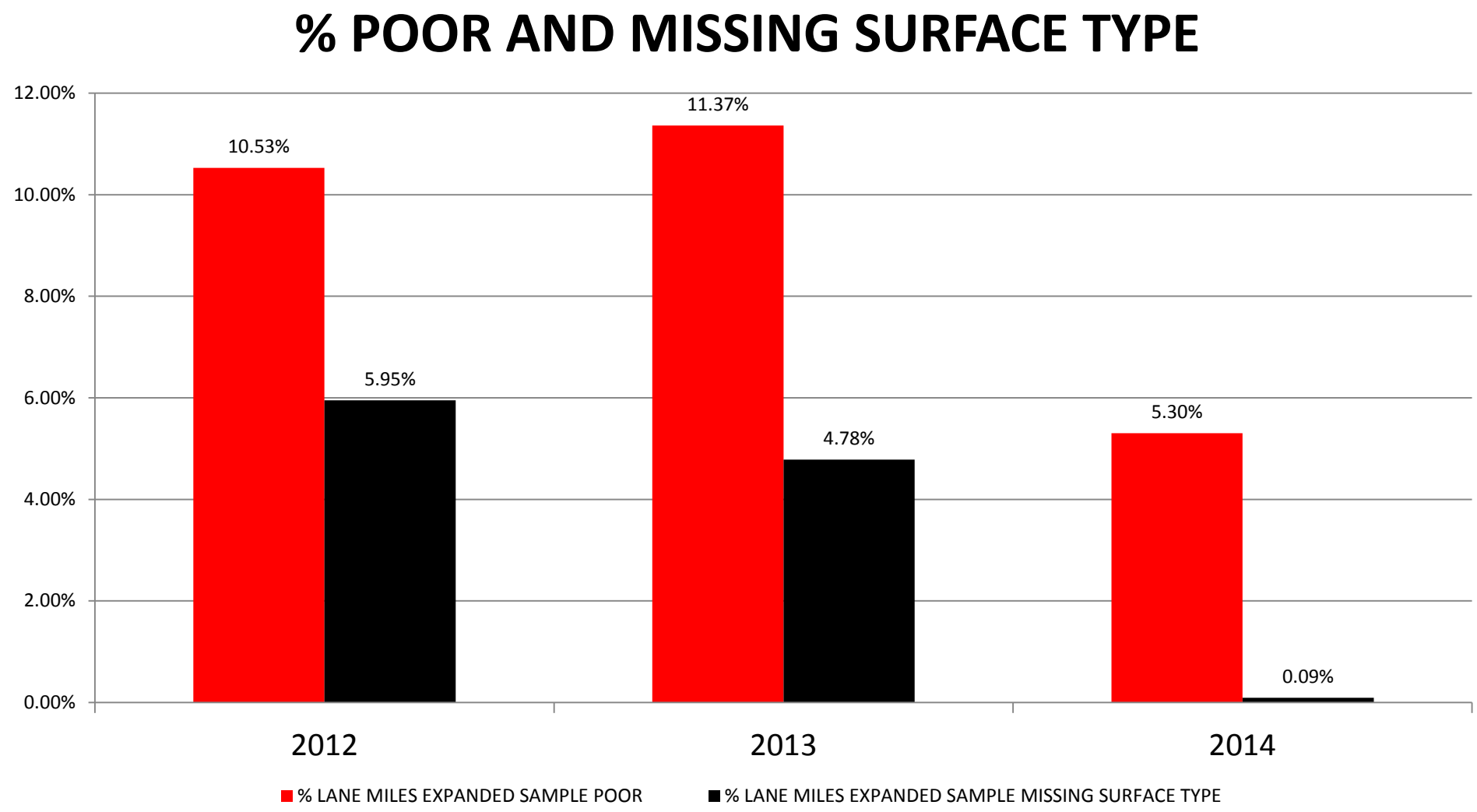
Report Card Purpose

- Tool to use when reviewing current data submission based on trends in past data submissions
- 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.

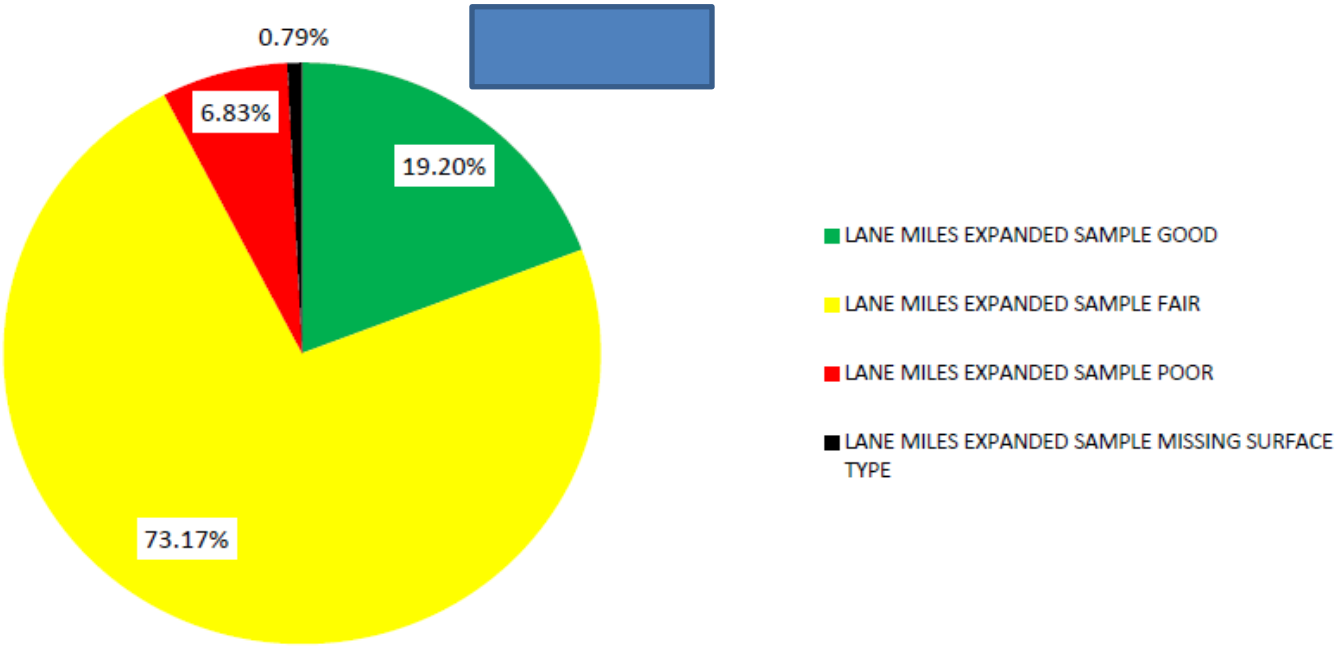
Results


% POOR AND MISSING SURFACE TYPE
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
10.53%
5.95%
11.37%
4.78%
5.30%
0.09%
2012
2013
2014
% LANE MILES EXPANDED SAMPLE POOR
% LANE MILES EXPANDED SAMPLE MISSING SURFACE TYPE

Details

- Quantity
- Quality
- Distributions

GOOD-FAIR-POOR	YEAR RECORD	2014
LANE MILES EXPANDED SAMPLE GOOD		2882.731
LANE MILES EXPANDED SAMPLE FAIR		10984.369
LANE MILES EXPANDED SAMPLE POOR		1024.930
LANE MILES EXPANDED SAMPLE MISSING SURFACE TYPE		119.219
TOTAL		15011.249



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

DATA IMPORT CHECK	
FIPS CODE	
STATE NAME	
STATE ABBREVIATION	
2013 HM-41 INTERSTATE CENTERLINE MILES	2451.432
IMPORTED DATA INTERSTATE CENTERLINE MILES	2451.360
DELTA	-0.072
2013 HM-43 INTERSTATE LANE MILES	14866.790
IMPORTED DATA INTERSTATE LANE MILES	15207.240
DELTA	340.450
HPMS DATA QUANTITY - PAVEMENT	
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING CRACKING PERCENT DATA	5082.535
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING FAULTING DATA	532.776
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING IRI DATA	395.339
TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT MISSING IRI DATA	779.040
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING RUTTING DATA	370.148
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.	119.219
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.	7.330
TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT EXCLUDING SECTIONS CODED AS A BRIDGE	14449.670
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES EXCLUDING SECTIONS CODED AS A BRIDGE	15011.249

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

DATA IMPORT CHECK	
FIPS CODE	
STATE NAME	
STATE ABBREVIATION	
2013 HM-41 INTERSTATE CENTERLINE MILES	2185.040
IMPORTED DATA INTERSTATE CENTERLINE MILES	2185.040
DELTA	0.000
2013 HM-60 INTERSTATE LANE MILES	9864.660
IMPORTED DATA INTERSTATE LANE MILES	9896.260
DELTA	-31.600
HPMS DATA QUANTITY - PAVEMENT	
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING CRACKING PERCENT DATA	0.000
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING FAULTING DATA	0.000
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING IRI DATA	0.000
TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT MISSING IRI DATA	0.000
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES MISSING RUTTING DATA	0.000
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.	0.000
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.	4.300
TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT EXCLUDING SECTIONS CODED AS A BRIDGE	9516.390
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES EXCLUDING SECTIONS CODED AS A BRIDGE	9548.635

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

HPMS DATA QUALITY - PAVEMENT	
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	812.213
% INTERSTATE LANE MILES IRI YEAR DOES NOT EQUAL YEAR_RECORD	15.74%
TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT WHERE IRI IS LESS THAN 30 INCHES/MILE. ALTHOUGH VALUES LESS THAN 30 INCHES PER MILE ARE POSSIBLE THEY ARE NOT LIKELY AND SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED IRI CUMULATIVE DISTRIBUTION.	99.103
% INTERSTATE LANE MILES IRI LESS THAN 30 INCHES PER MILE. AVERAGE VALUE IS 0.75%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 1.3%	1.92%
TOTAL INTERSTATE LANE MILES BASED ON FULL EXTENT WHERE IRI IS GREATER THAN 400 INCHES/MILE. ALTHOUGH VALUES GREATER THAN 400 INCHES PER MILE ARE POSSIBLE THEY ARE NOT LIKELY AND SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED IRI CUMULATIVE DISTRIBUTION.	0.008
% INTERSTATE LANE MILES IRI GREATER THAN 400 INCHES PER MILE. AVERAGE VALUE IS 0.01%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 0.03%	0.00%

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

HPMS DATA QUALITY - PAVEMENT	
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED AS ZERO. 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.	4654.546
% INTERSTATE LANE MILES ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED AS ZERO. AVERAGE IS 47%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 57%	90.84%
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED BETWEEN 0 AND 1. 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.	47.468
% INTERSTATE LANE MILES ON EXPNDED SAMPLES WHERE CRACKING PERCENT IS REPORTED BETWEEN 0 AND 1%. AVERAGE IS 2.8%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 5.6%	0.93%
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES FOR PAVEMENTS CODED AS HMA WHERE CRACKING PERCENT IS REPORTED GREATER THAN 50%. CRACKING PERCENT FOR HMA IS LIMITED TO WHEELPATH AND THEREFORE SHOULD NOT EXCEED 50%. MULTIPLE STATES REPORTED VERY HIGH VALUES FOR THEIR PAVEMENTS AND THESE SHOULD BE VERIFIED.	1.140
% INTERSTATE LANE MILES ON EXPANDED SAMPLES FOR HMA PAVEMENTS WHERE CRACKING PERCENT IS REPORTED GREATER THAN 50%. AVERAGE IS 0.7%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 1.5%	0.03%
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE CRACKING PERCENT IS REPORTED AS 100%. 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%. AVERAGE IS 0.7%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 1.7%	0.00%

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

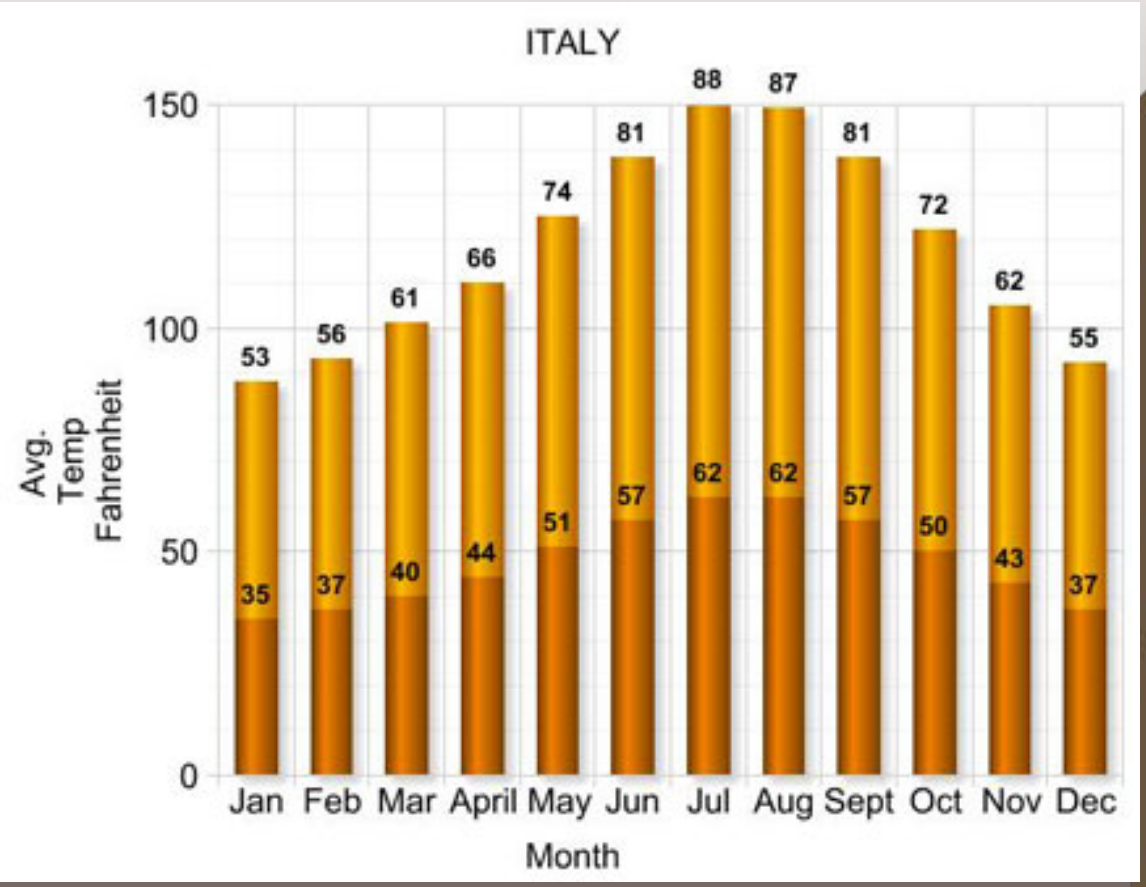
HPMS DATA QUALITY - PAVEMENT	
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS JOINTED PCC AND FAULTING IS EQUAL TO ZERO. MULTIPLE STATES REPORTED VERY HIGH VALUES AND THIS DATA SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED FAULTING CUMULATIVE DISTRIBUTION.	5.163
% INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS JOINTED PCC AND FAULTING IS EQUAL TO ZERO. AVERAGE IS 36.2%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 46.2%	10.19%
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS JOINTED PCC AND FAULTING IS GREATER THAN 1 INCH. 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 GREATER THAN 1 INCH. AVERAGE IS 0.9%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 2.4%	0.00%
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS HMA AND RUTTING IS EQUAL TO ZERO. MULTIPLE STATES REPORTED VERY HIGH VALUES AND THIS DATA SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTACHED RUTTING CUMULATIVE DISTRIBUTION.	32.562
% INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS HMA AND RUTTING IS EQUAL TO ZERO. AVERAGE IS 9.5%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 14.2%	15.99%
TOTAL INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS HMA AND RUTTING IS GREATER THAN 1 INCH. MULTIPLE STATES REPORTED VERY HIGH VALUES AND THIS DATA SHOULD BE VERIFIED. YOU MAY WISH TO REFER TO THE ATTCHED RUTTING CUMULATIVE DISTRIBUTION	0.000
% INTERSTATE LANE MILES BASED ON EXPANDED SAMPLES WHERE SURFACE TYPE IS HMA AND RUTTING IS GREATER THAN 1 INCH. AVERAGE IS 3.0%, CUTOFF VALUE TO FLAG FOR VERIFICATION IS 6.6%	0.00%
TOTAL INTERSTATE LANE MILES ON EXPANDED SAMPLES WHERE RUTTING IS REPORTED ON SURFACE TYPE = PCC OR CRCP	50.653
	100.00%
TOTAL INTERSTATE LANE MILES ON EXPANDED SAMPLES WHERE FAULTING IS REPORTED ON SURFACE TYPE = HMA OR CRCP	203.691
	100.00%

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

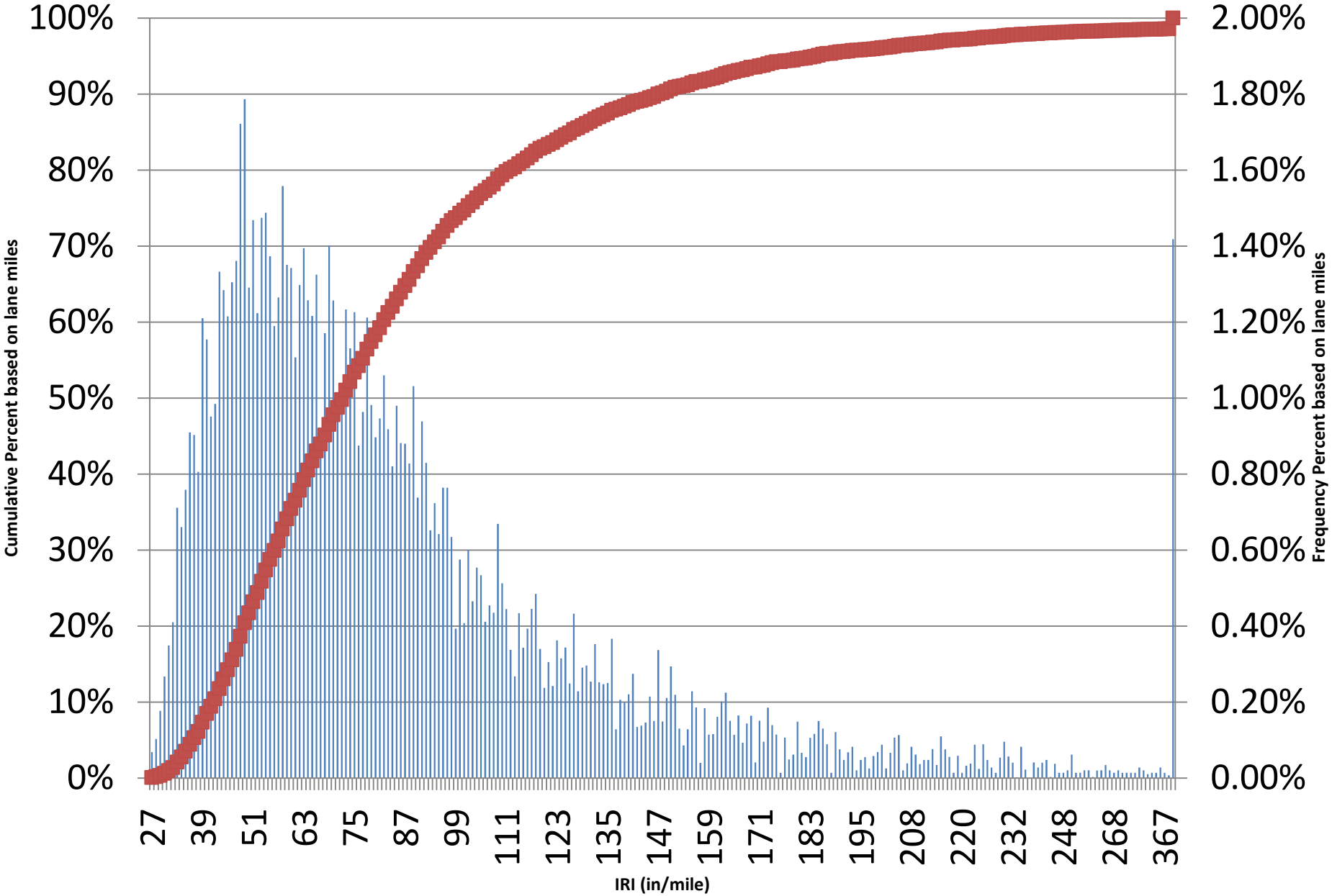
HPMS DATA QUALITY - BRIDGE LOCATION PER MAP-21 BRIDGES ARE EXCLUDED FROM THE PERFORMANCE MEASURE CALCULATION. THE ABILITY TO ACCURATELY LOCATE BRIDGES IS HPMS IS VERY IMPORTANT IN THE CORRECT CALCULATION OF PAVEMENT CONDITION.	
COUNT OF MAINLINE INTERSTATE BRIDGES	3019
TOTAL INTERSTATE LANE MILES OF BRIDGES IN NBI INVENTORY	836.258
(1) ESTIMATED TOTAL INTERSTATE LANE MILES IF DATA FROM NBI IS APPLIED TO HPMS IN 0.1 MILE SECTIONS. (ESTIMATE WAS DONE BASED ON BRIDGE LENGTH)	1724.850
(2) TOTAL LANE MILES ON FULL EXTENT BASIS CODED AS A BRIDGE IN HPMS	757.570

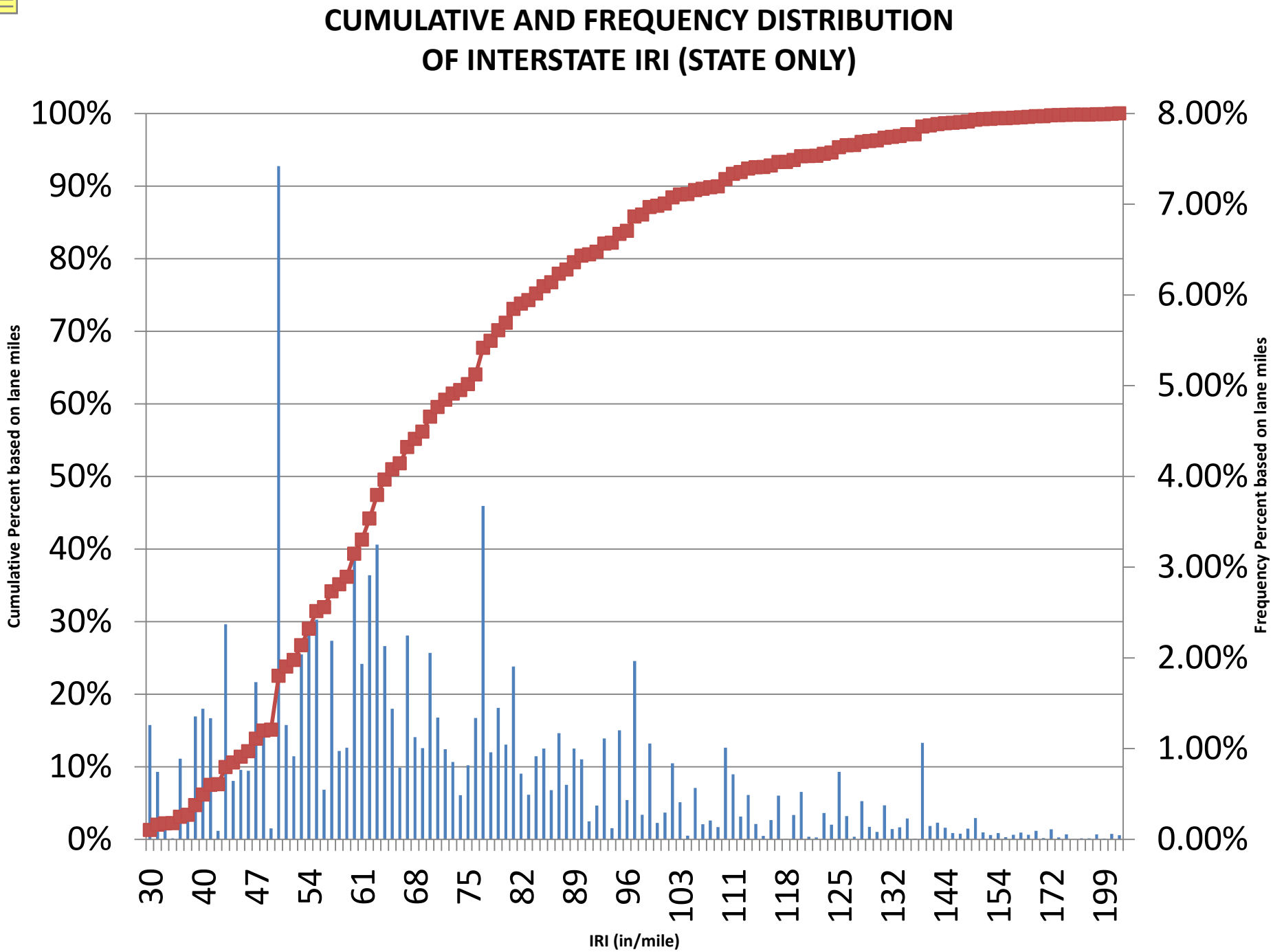
ITEMS SHADED ORANGE ARE HPMS PAVEMENT PERFORMANCE DATA IMPROVEMENT ZONES WHERE DATA SHOULD BE VERIFIED OR CORRECTED

A PICTURE IS WORTH A THOUSAND WORDS



CUMULATIVE AND FREQUENCY DISTRIBUTION OF INTERSTATE IRI (STATE ONLY)

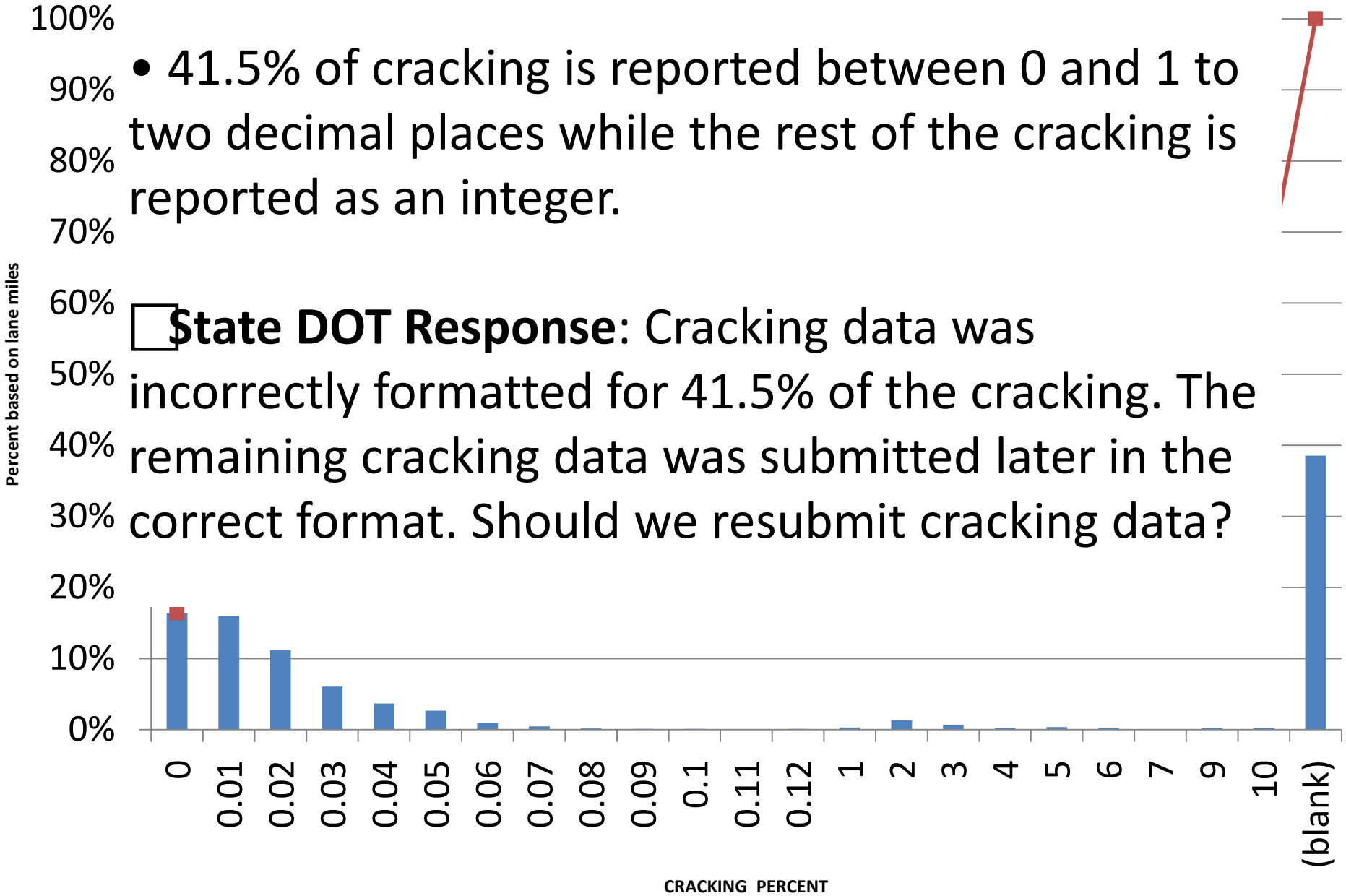



CUMULATIVE AND FREQUENCY DISTRIBUTION
OF INTERSTATE IRI (STATE ONLY)
Cumulative Percent based on lane miles
Frequency Percent based on lane miles
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
8.00%
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
30
40
47
54
61
68
75
82
89
96
103
111
118
125
132
144
154
172
199
IRI (in/mile)

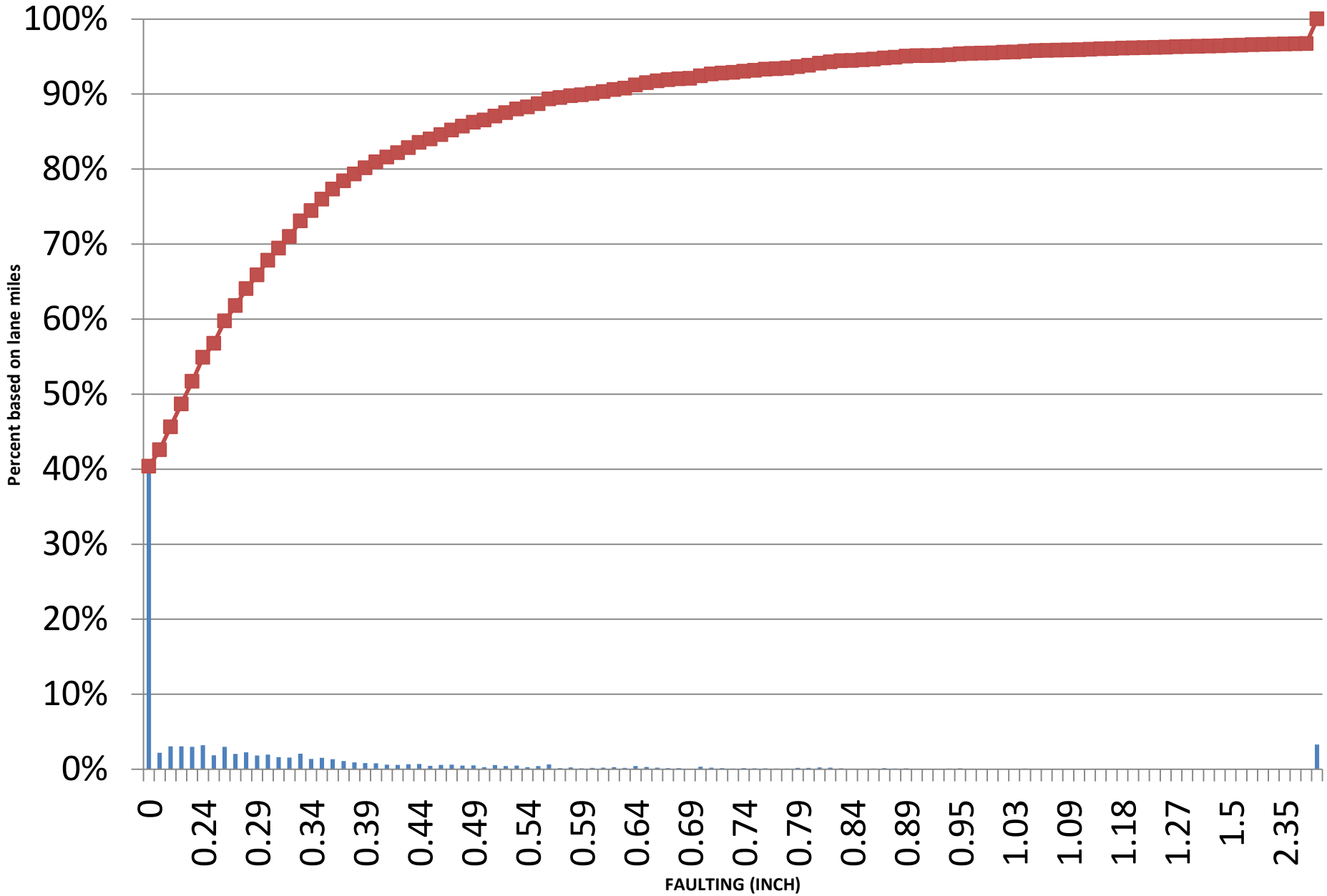
CUMULATIVE AND FREQUENCY DISTRIBUTION OF INTERSTATE CRACKING PERCENT (STATE ONLY)

- 41.5% of cracking is reported between 0 and 1 to two decimal places while the rest of the cracking is reported as an integer.

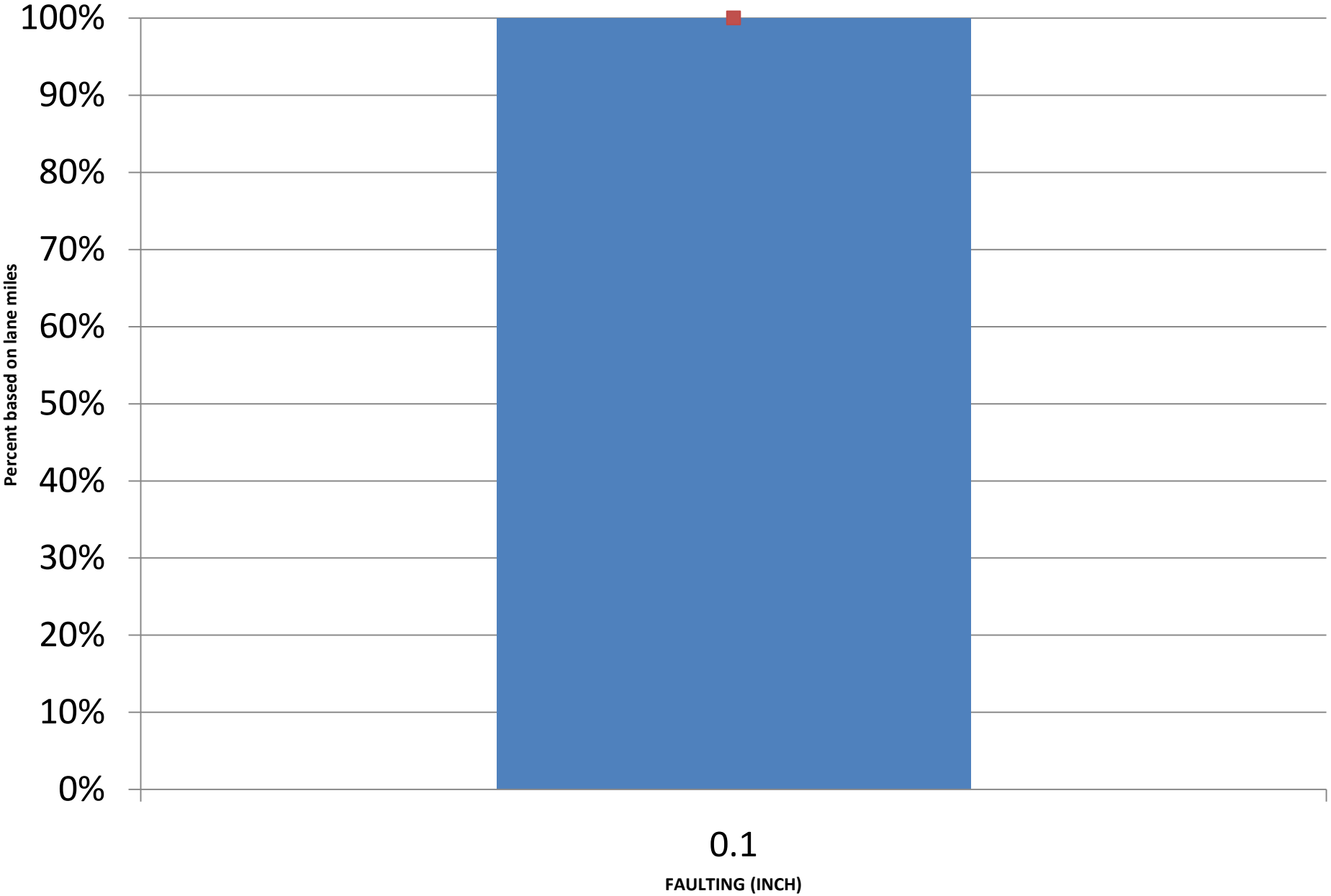
- **State DOT Response**: Cracking data was incorrectly formatted for 41.5% of the cracking. The remaining cracking data was submitted later in the correct format. Should we resubmit cracking data?



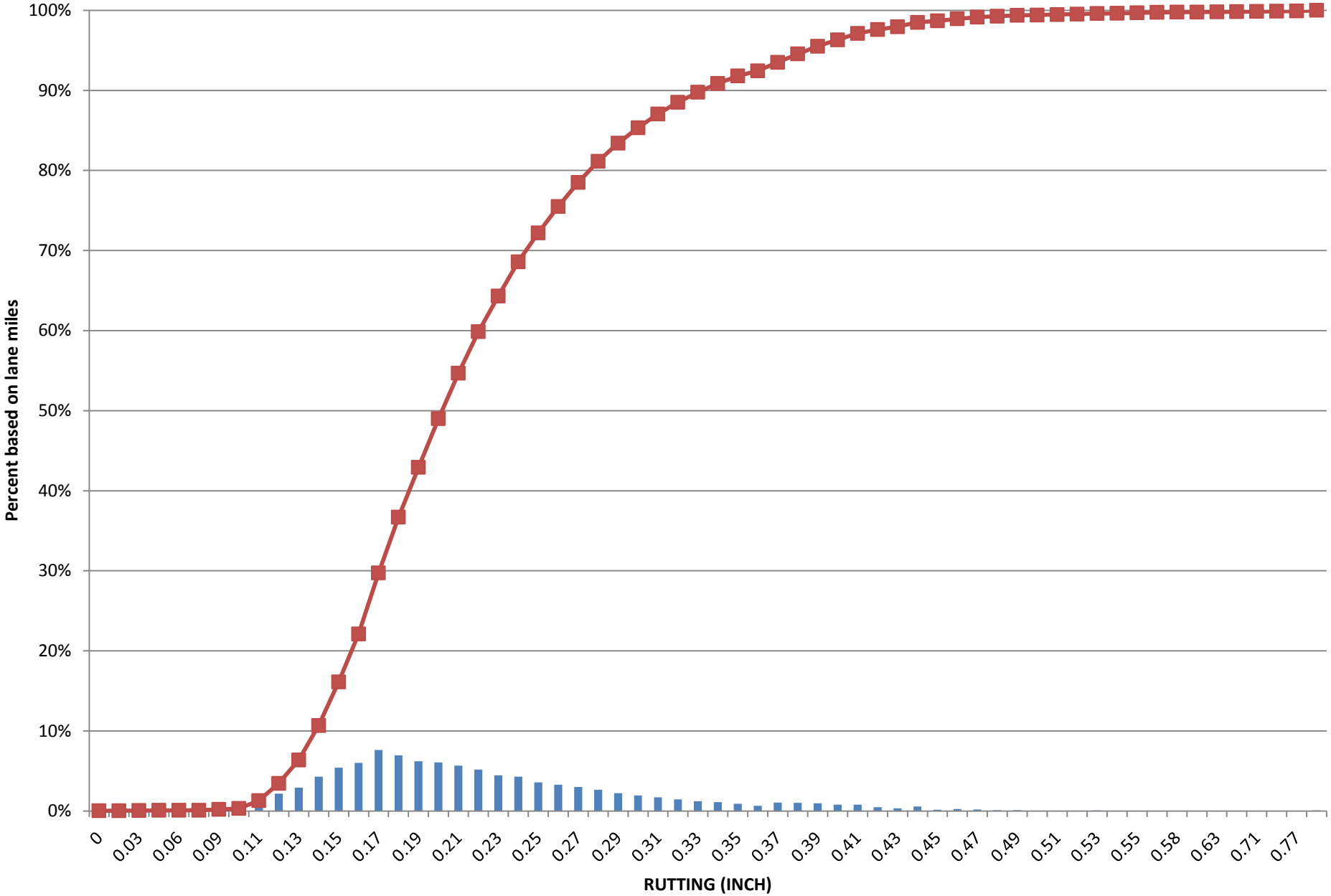
CUMULATIVE AND FREQUENCY DISTRIBUTION OF INTERSTATE FAULTING (STATE ONLY)



CUMULATIVE AND FREQUENCY DISTRIBUTION OF INTERSTATE FAULTING (STATE ONLY)



CUMULATIVE AND FREQUENCY DISTRIBUTION OF INTERSTATE RUTTING (STATE ONLY)

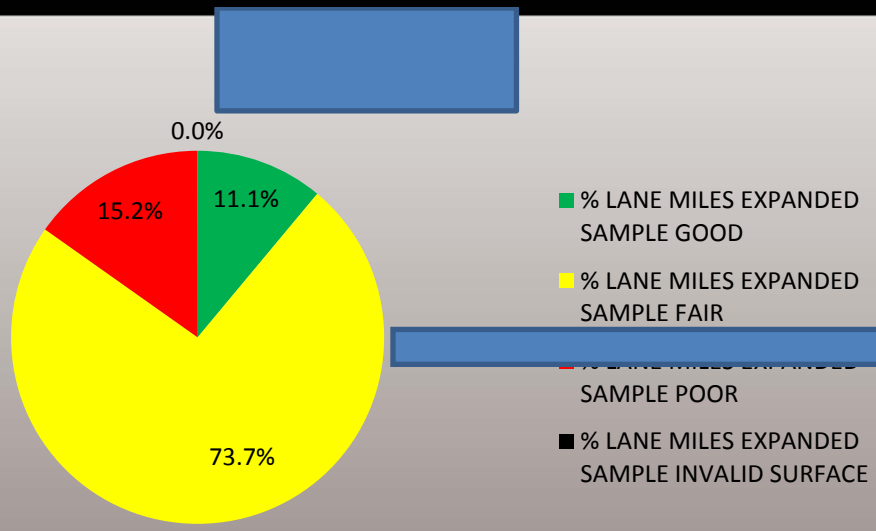


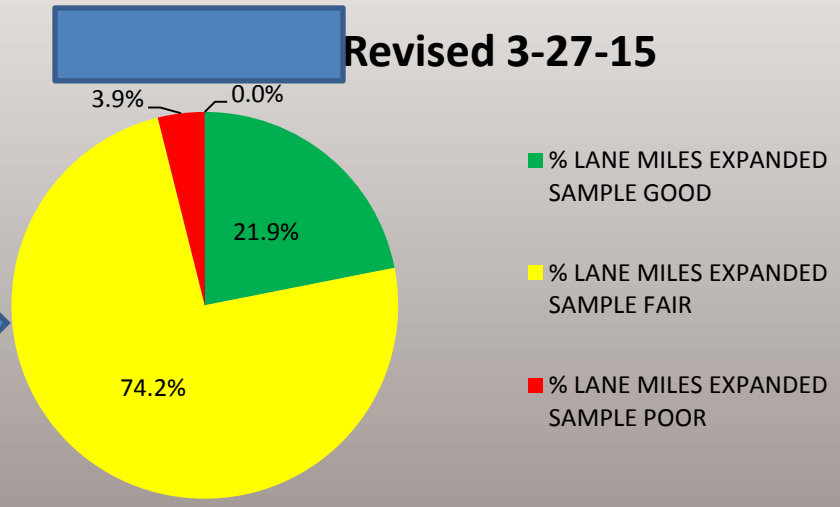
Issues Identified in Submissions

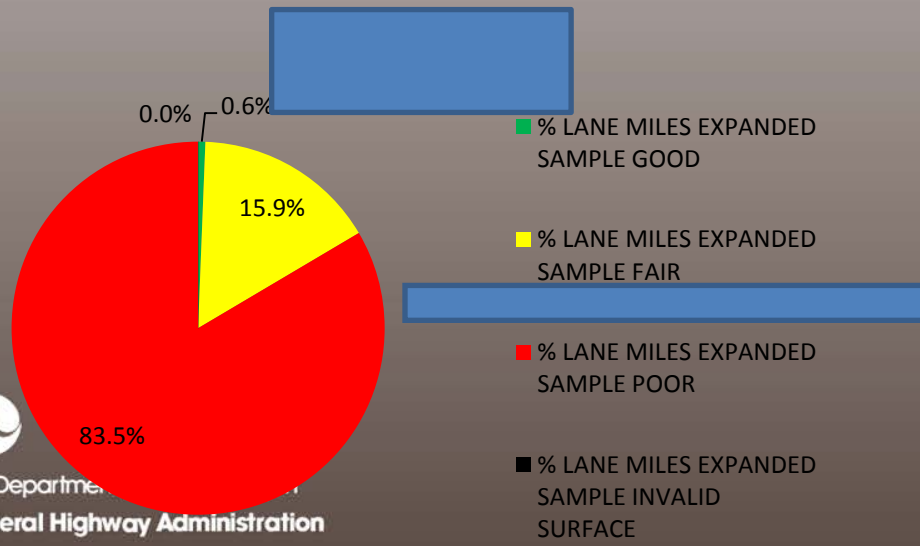
- Average faulted joint
- Total rutting
- Rutting reported as faulting
- Default values

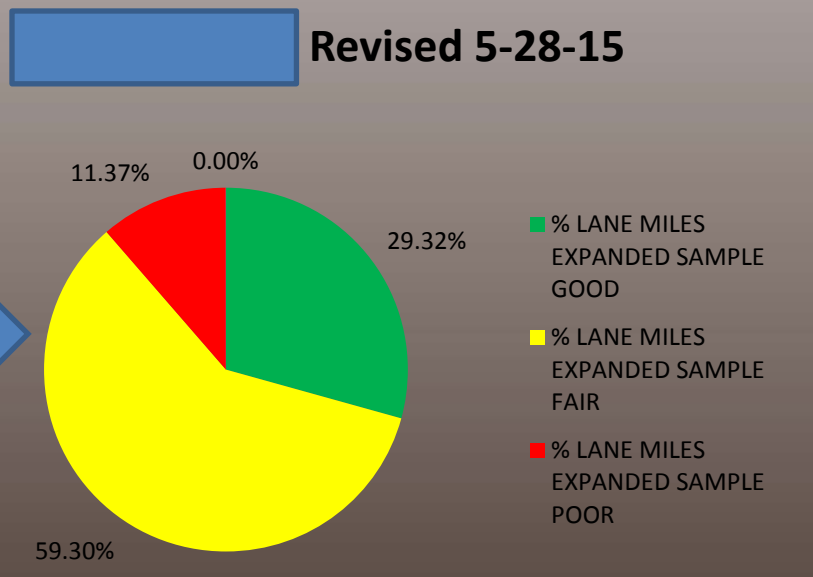
- Out of date data
- Decimal cracking
- High percentage cracking on HMA
- Zeros instead of nulls

Resubmissions









U.S. Departme
Federal Highway Administration

Future

- Report card built into HPMS data submission for all HPMS data
  - Use by States
  - Use by Division
  - Correct items before submitted to FHWA
  - Items beyond pavement (Scorecard)
- Non-Interstate NHS Report Card

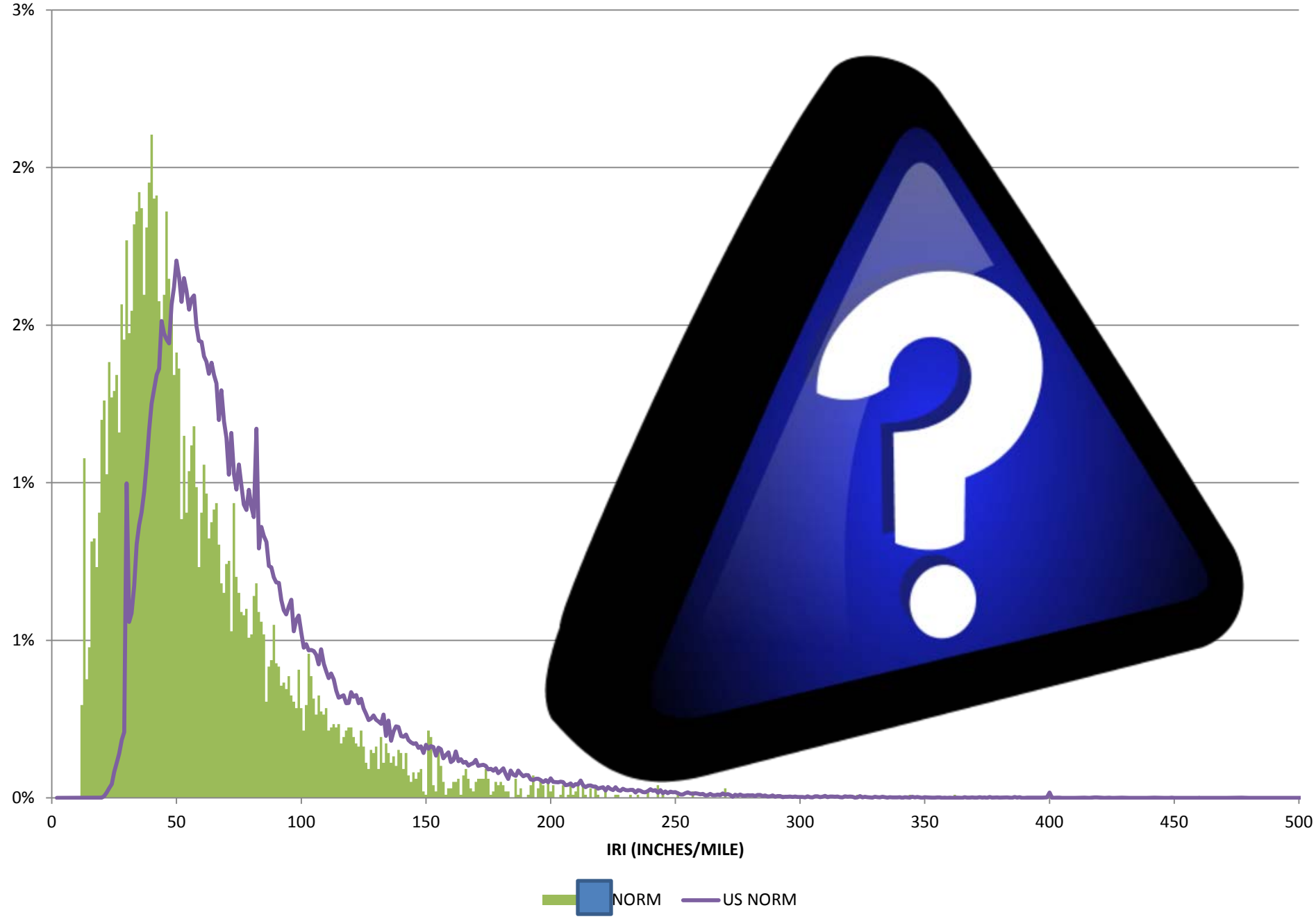
Future

- 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

DISTRIBUTION OF INTERSTATE IRI



Contacts

- HPPI state contact
  - Justin Clarke 202-366-9245: AZ, CO, ID, MT, NM, NC, PA, UT, VA, and WY
  - Ron Erickson 202-366-5033: KY, MI, NJ, and NY
  - Joe Hausman202-366-5047: AL, AK, CA, FL, GA, IN, MS, NV, OK, and SC
  - Tom Roff 202-366-5035: HI, IL, IA, MN, TN, WV, WI, and PR
  - Rob Rozycki 202-366-5059: CT, KS, ME, MA, NE, NH, ND, RI, SD, and VT
  - Ron Vaughn 202-366-9248: AR, DE, DC, LA, MD, MO, OH, OR, TX, and WA
- HIAP – Max Grogg 515-233-7306