

PENNDOT – PAPA 2024 BUS TOUR

PENNDOT’S IRI SPECIFICATIONS, POLICIES & PROCEDURES



BRENT TRIVELPIECE

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- FHWA Quality Assurance Stewardship Review of PennDOT:
June 17-21, 2019
 - Review of PennDOT's QA Program to ensure compliance with the Title 23 Code of Federal Regulations (CFR) Part 637 Subpart B
 - Reviewed the material acceptance practices on several projects in Districts 3, 8, 9 & 10
 - Opportunity for Improvement identified in FHWA's Final Report: January 2020
 - PennDOT included contractors' test results in the acceptance decision for ride quality measurements without independent verification which doesn't comply with 23 CFR 637 Subpart B
 - CFR requires a verification of at least 10% when using data obtained by the contractor in the acceptance decision
 - PennDOT was performing an annual IRI verification on at least one (1) project per District



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- FHWA Quality Assurance Stewardship Review of PennDOT
 - PennDOT's Construction Quality Assurance Division (CQAD) and Roadway Inventory Testing Unit (RITU) began meeting with FHWA in May 2020 to address the Opportunity for Improvement
 - Revisions to the following were required:
 - Publication 408, Section 404: Evaluation of **Asphalt** Pavement Ride Quality and Payment of Incentive
 - Included with Pub 408/2020 Change 7: Effective for all projects let on or after October 6, 2023
 - Publication 408, Section 507: Evaluation of **Concrete** Pavement Ride Quality and Payment of Incentive
 - Included with Pub 408/2020 Change 7: Effective for all projects let on or after October 6, 2023
 - Publication 2, B/6/23: Evaluating Ride Quality of Newly Constructed Pavements
 - Effective on April 1, 2023
 - Publication 19, PTM No. 428: Measuring Pavement Profile Using a Light Weight Profiler
 - Effective in September 2023
 - Form M-7 (12-22): Daily IRI Data Collection Form



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- Revisions to Publication 408, Section 404 & Section 507
 - Daily calibration results must be provided to the Representative before taking any measurements
 - Raw unfiltered data files and a summary printout of the IRI & MRI values must be provided to the Representative within 24 hours of taking measurements
 - Operator must carry a valid PennDOT certification card during profiling
 - Contractor must identify and delineate the profiling limits and excluded area on the day(s) RITU performs verification testing
 - Section 404.3(f) & 507.3(f) Verification were added:
 - Department will perform verification testing on **all federally funded projects** at a minimum of 1-day and on at least 10% of the project's lane miles being evaluated concurrently with the contractor's IRI acceptance testing.
 - A virtual meeting must be scheduled with RITU to coordinate the verification procedures
 - Three (3) verification tolerances were established



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- Verification Tolerances:
 - The verification MRI does not exceed the acceptance MRI by more than 6.1 inches/mile on at least 90% of the 528 feet lots for each lane
 - The average verification MRI does not exceed the average acceptance MRI by more than 6.1 inches/mile for all lots tested in each lane
 - The difference in the length for all lots tested in each lane is less than 0.2%
- If the verification tolerances aren't met:
 - The Department (IIC, ACE, RITU & CQAD) will immediately review the testing procedures, equipment, and personnel used in the contractor's acceptance testing to determine if the test results are acceptable.
 - If contractor's acceptance test results are not considered acceptable:
 - RITU's test results will be used for the incentive payment
 - Contractor's **profiler** certification will be suspended and must be recertified



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- Publication 408, Section 404 (Asphalt)
 - General Requirements: At least two of the following construction operations must be included in areas included in ride-quality lot measurements
 - Profile milling as specified in **Section 492**
 - This will almost never apply. Don't confuse this with Section 491. Section 492 requires a machine capable of milling a full-lane width up to 12-feet wide in one pass.
- Publication 408, Section 507 (Concrete)
 - Approach slabs and pavement relief joints placed under another contract were added to the excluded areas for lot incentive payment.



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- Publication 2, Project Office Manual (POM) B/6/23, Evaluating Ride Quality of Newly Constructed Pavements
 - Included a Checklist for Light Weight Profiling (LWP) IRI Testing
 - Requires the inspector to complete Form M-7
 - CQAD Chief will identify projects subject to verification and notify the RITU by April 30th of each year
 - Districts will provide 14 days advance notice to the RITU for the dates the contractor is scheduled to perform smoothness testing
 - Identifies the Department people that will review the contractor's acceptance test results if the verification tolerances are not met
 - Districts no longer need to submit data to RITU

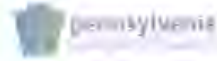


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- Publication 19, PTM No. 428, Measuring Pavement Profile Using a Light Weight Profiler
 - Provided a definition for MRI
 - Requires certified operators to carry their PennDOT certification card during profiling on Department projects
 - Requires the raw unfiltered data files to be provided to the Representative within 24 hours of testing



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PennDOT Inspector's Checklist for Light Weight Profiling (LWP) IRI Testing

M-7 (12-22)



DAILY IRI DATA COLLECTION FORM

Current Date: _____

Instructions:

1. Construction Inspector should convene with Light Weight Profiler Operator and complete all of Section 1, before testing begins.
2. Light Weight Profiler Operator should complete all of Section 2, before or after testing.

SECTION 1 - Construction Inspector

To be filled out by the **Construction Inspector** overseeing profiler testing

Construction Inspector's Name _____ Operator's Certification Date _____
 Construction Inspector's Phone Number _____ Verified Operator's Certification Card
 Pavement Type: Asphalt Concrete Profiler's Certification Date _____
 Concrete Joint Spacing _____ Profiler's Certification Number _____
 Verify lasers are spaced 69 inches apart +/-1.5 in Yes No Equipment Number _____
 If previous answer was "No", what is the actual laser spacing _____ Did operator perform a laser block calibration Yes No
 Comments _____

SECTION 2 - LWP Operator

To be filled out by the **Operator of the profiler device** (and verified by the **Construction Inspector** overseeing profiler testing)

Date of Testing _____ County _____ State Route Number _____
 Operator's Name _____ Begin Segment/Offset _____
 Company _____ End Segment/Offset _____
 Operator's Phone Number _____ Project Name or Number _____
 Type of Lasers/Beam Width Single Point 1/4" 1" 3"
 4" > 4" Triod Other _____ Construction Station Begin _____
 Number of Lasers _____ Construction Station End _____
 Last Distance Calibration Date _____ Lot Numbers Tested _____
 Software Name and Version _____ Pavement Condition Wet Dry
 Approximate Air Temperature _____
 Was a lead in performed before test area Yes No
 Comments _____

SECTION 3 - Submittals

Inspector Responsibilities: Fill out Form M-7 daily, and submit Form M-7 along with the test data to the inspector in charge.

Note: If you have any questions regarding the LWP field-testing contact RITU at 717-787-7291, or email your questions to RA-POIRIDATACOLLECT@pa.gov.

SAVE AS

PRINT FORM

Steps	Actions	Inspector Notes
<input type="checkbox"/> 1.	The inspector will meet with the LWP operator at the job site the day of testing. Reference the PTM No. 428 for all steps of the LWP operation.	
<input type="checkbox"/> 2.	Go over all safety protocols. Make sure the proper traffic control is set up before proceeding with testing.	
<input type="checkbox"/> 3.	Verify the PennDOT-issued certification decal date and software version on the LWP device is current and valid.	
<input type="checkbox"/> 4.	Verify the LWP operator's PennDOT-issued certification card is current and make a photocopy. Begin filling out the M-7 Form for the day of testing.	
<input type="checkbox"/> 5.	Witness and verify as the LWP operator conduct their calibrations/verifications (bounce, block verification, and if applicable accelerometer). Collect the printed results for each day of testing.	
<input type="checkbox"/> 6.	Identify a distance verification area (secure at least 528 feet of straight road). The distance will be measured using a steel tape or electronic measuring device.	
<input type="checkbox"/> 7.	Have the operator conduct a distance verification with the device. The verification must be within +/- 0.1% of the actual measured length (ex. +/- 0.5 ft tolerance within a 528-foot verification area). Collect the printed results for each day of testing.	
<input type="checkbox"/> 8.	Coordinate with the contractor's foreman to identify and mark the limits of the testing area. Record the beginning and ending stations and/or segments & offsets of each test section. Identify and mark excluded areas and point them out to the operator.	
<input type="checkbox"/> 9.	Remind the operator that the IRI/MRI report must include the information according to PTM No. 428, Section 10.4.	
<input type="checkbox"/> 10.	Witness the LWP operator conduct the IRI testing in the proper direction and lane. If possible, verify the sensors are positioned over the wheel path while testing.	
<input type="checkbox"/> 11.	Collect the contractor's LWP data for that day of testing which will include the original test files, IRI/MRI reports, and unfiltered ERD or PPF files. NOTE: Make sure to collect the printed and electronic copies of the tested data, including a copy of the calibration files.	
<input type="checkbox"/> 12.	Have the LWP operator complete Section 2 on Form M-7.	
<input type="checkbox"/> 13.	All final pavement test data submitted for payment must be delivered to the inspector in charge. This data includes but is not limited to: <ul style="list-style-type: none"> - Calibration test files and reports (ex. bounce, block, distance) - Raw test files, including unfiltered ERD or PPF files. - IRI/MRI reports (hard copy) - All completed Form M-7s 	



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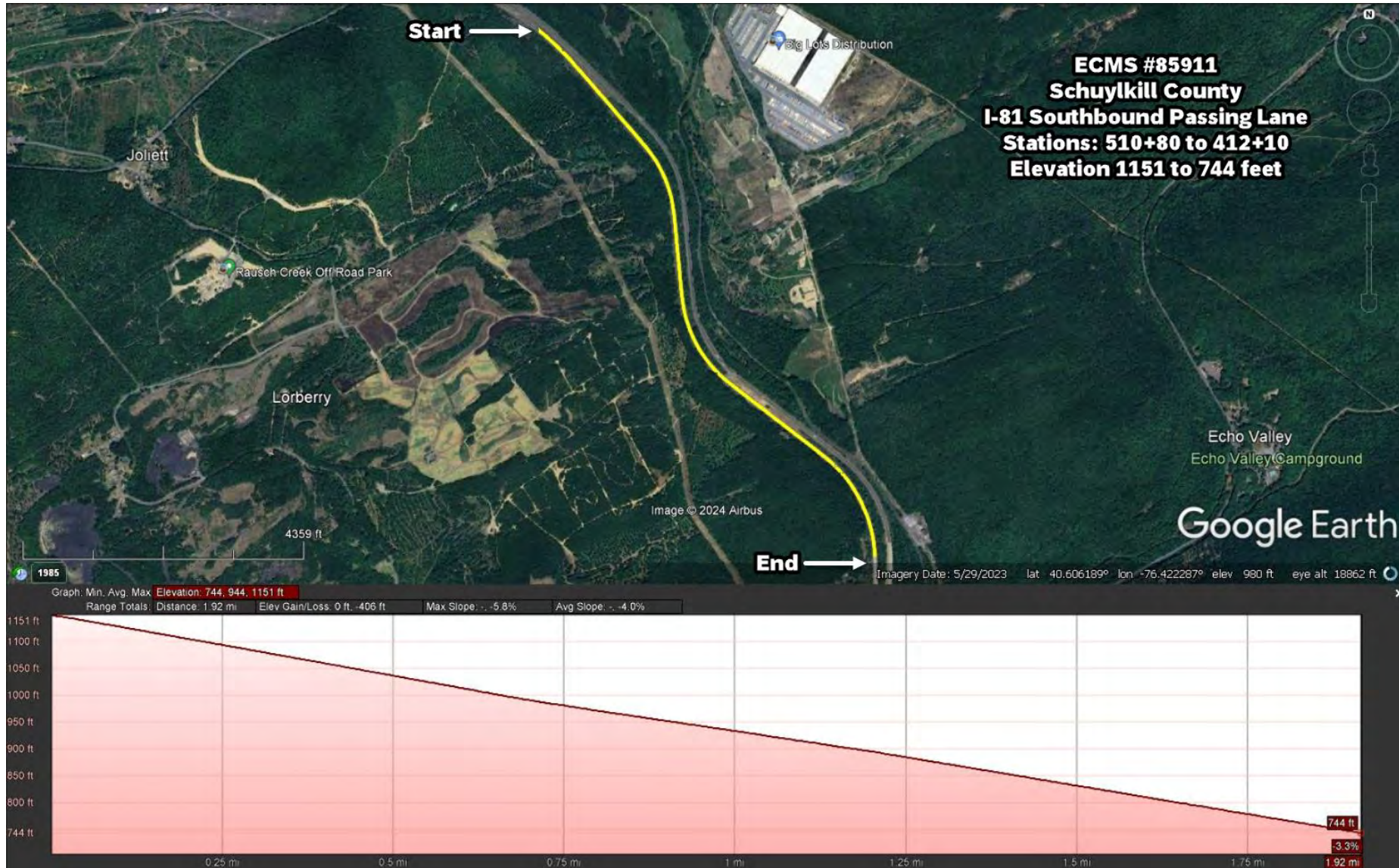
- PennDOT Issued Certification Decal on the LWP



- Operator's PennDOT Issued Certification Card



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Report Type

IRI QA Verification

ECMS #

85911

Criteria 1: The verification MRI does not exceed the acceptance MRI by more than 6.1 inches/mile for at least 90% of the lots submitted for payment. Any lots where the contractor fails to provide final raw (unfiltered) binary data will be counted as failed lots.
 Criteria 2: The average verification MRI does not exceed the average acceptance MRI by more than 6.1 inches/mile.
 Criteria 3: The acceptance length of each lane is within 0.2 percent of the verification length.

SR 81 SBPL					
% Difference					
Criteria 1		MRI <-6.1 or missing data	% Difference	% Met	Criteria Met
	Count	0	0%	100%	Yes
Difference in Average MRI					
Criteria 2	RITU Average MRI	Contractor Average MRI	Difference MRI	Criteria Met	
	Received 46.1	Reported 45.0	-1.1	Yes	
Difference in Length					
Criteria 3	RITU Distance	Contractor Distance	Difference DMI	% Difference	Criteria Met
	Received 9857	Reported 9870	13	0.1%	Yes



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PennDOT			
Lane Distance	Lane MRI	Lane Left IRI	Lane Right IRI
9857.0	46.1	38.9	53.3

Contractor			
Lane Distance	Lane MRI	Lane Left IRI	Lane Right IRI
9870.0	45.0	36.2	53.8

Lane Distance Difference	Lane MRI Difference
13.0	-1.1

PennDOT Processed						Exclusion Code	Contractor Processed						Lot	Comparison			
Start (ft)	Stop (ft)	Length (ft)	MRI	Left IRI	Right IRI		Start (ft)	Stop (ft)	Length (ft)	MRI	Left IRI	Right IRI		MRI Diff	Left Diff	Right Diff	Notes
51080.0	50552.0	528.0	60.8	52.3	69.3		51080.0	50552.0	528.0	61.5	51.3	71.7	0.6	-1.1	2.4		
50552.0	50024.0	528.0	40.6	36.1	45.0		50552.0	50024.0	528.0	41.6	32.9	50.3	1.0	-3.3	5.3		
50024.0	49496.0	528.0	37.4	36.0	38.8		50024.0	49496.0	528.0	41.8	33.1	50.5	4.4	-2.9	11.8		
49496.0	48968.0	528.0	38.1	34.6	41.6		49496.0	48968.0	528.0	42.6	31.9	53.3	4.5	-2.7	11.7		
48968.0	48440.0	528.0	43.3	38.7	48.0		48968.0	48440.0	528.0	41.6	34.1	49.1	-1.7	-4.6	1.1		
48440.0	47912.0	528.0	42.8	39.6	46.0		48440.0	47912.0	528.0	41.3	34.7	48.0	-1.5	-4.9	1.9		
47912.0	47384.0	528.0	53.8	46.0	61.6		47912.0	47384.0	528.0	50.6	43.3	57.8	-3.2	-2.6	-3.8		
47384.0	46856.0	528.0	45.7	39.0	52.4		47384.0	46856.0	528.0	44.2	37.2	51.2	-1.5	-1.8	-1.2		
46856.0	46328.0	528.0	56.1	44.4	67.8		46856.0	46328.0	528.0	56.5	43.7	69.2	0.3	-0.7	1.4		
46328.0	45800.0	528.0	43.3	32.1	54.5		46328.0	45800.0	528.0	41.9	31.1	52.8	-1.4	-1.0	-1.7		
45800.0	45272.0	528.0	45.9	37.3	54.5		45800.0	45272.0	528.0	41.4	33.5	49.3	-4.5	-3.8	-5.2		
45272.0	44744.0	528.0	53.6	41.3	65.8		45272.0	44744.0	528.0	51.5	40.2	62.9	-2.0	-1.2	-2.9		
44744.0	44216.0	528.0	49.0	43.4	54.7		44744.0	44216.0	528.0	44.5	37.7	51.4	-4.5	-5.7	-3.3		
44216.0	43688.0	528.0	44.2	38.2	50.2		44216.0	43688.0	528.0	42.5	33.7	51.3	-1.7	-4.5	1.2		
43688.0	43160.0	528.0	44.8	37.8	51.8		43688.0	43160.0	528.0	42.9	34.1	51.7	-1.9	-3.7	-0.1		
43160.0	42632.0	528.0	44.9	36.7	53.1		43160.0	42632.0	528.0	41.8	35.1	48.6	-3.1	-1.7	-4.5		
42632.0	42104.0	528.0	41.4	34.3	48.5		42632.0	42104.0	528.0	41.4	31.8	51.0	0.0	-2.5	2.5		
42104.0	41576.0	528.0	42.1	33.6	50.7		42104.0	41576.0	528.0	39.6	32.8	46.4	-2.5	-0.8	-4.3		
41576.0	41223.0	353.0	48.5	35.9	61.1		41576.0	41210.0	366.0	45.1	34.7	55.4	-3.4	-1.2	-5.7		



Questions or Comments??

