



Florida Method of Test for Non-Limited Access Roadways Smoothness Classification

Designation: FM 5-623

1. SCOPE

- 1.1 This method covers the determination of the smoothness class of a non-limited access roadway suitable for high-speed inertial profiler testing.
- 1.2 This test method establishes guidelines for resurfacing projects where historical roughness data is available, road-widening projects and new roadway alignments where historical roughness data is not available.

2. APPLICABLE DOCUMENTS

- 2.1 Florida Department of Transportation – Standard Specifications for Road and Bridge Construction – Section 330: Hot Mix Asphalt – General Construction Requirements

FM 5-549 Florida Method of Test for Measuring Longitudinal Profiles Using a High-Speed Inertial Profiler

ASTM E950 – Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer-Established Inertial Profiling Reference.

ASTM E1926 – Standard Practice for Computing International Roughness Index of Roads from Longitudinal Profile Measurements.

3. PROCEDURE BEFORE TESTING THE PROJECT

- 3.1 Gather the new project information including the following roadway features:
 - 3.1.1 Roadway ID
 - 3.1.2 State/US Road Number
 - 3.1.3 Design Speed
 - 3.1.4 Functional Classification RCI Feature 121 (Urban, Rural)
 - 3.1.5 Facility Classification RCI Feature 122 (Access Control: 3-None or 2-Partial)
 - 3.1.6 Project Length
 - 3.1.7 Testing Limits (Mileposts).
 - 3.1.8 Friction Course Type
 - 3.1.9 Number of Lanes



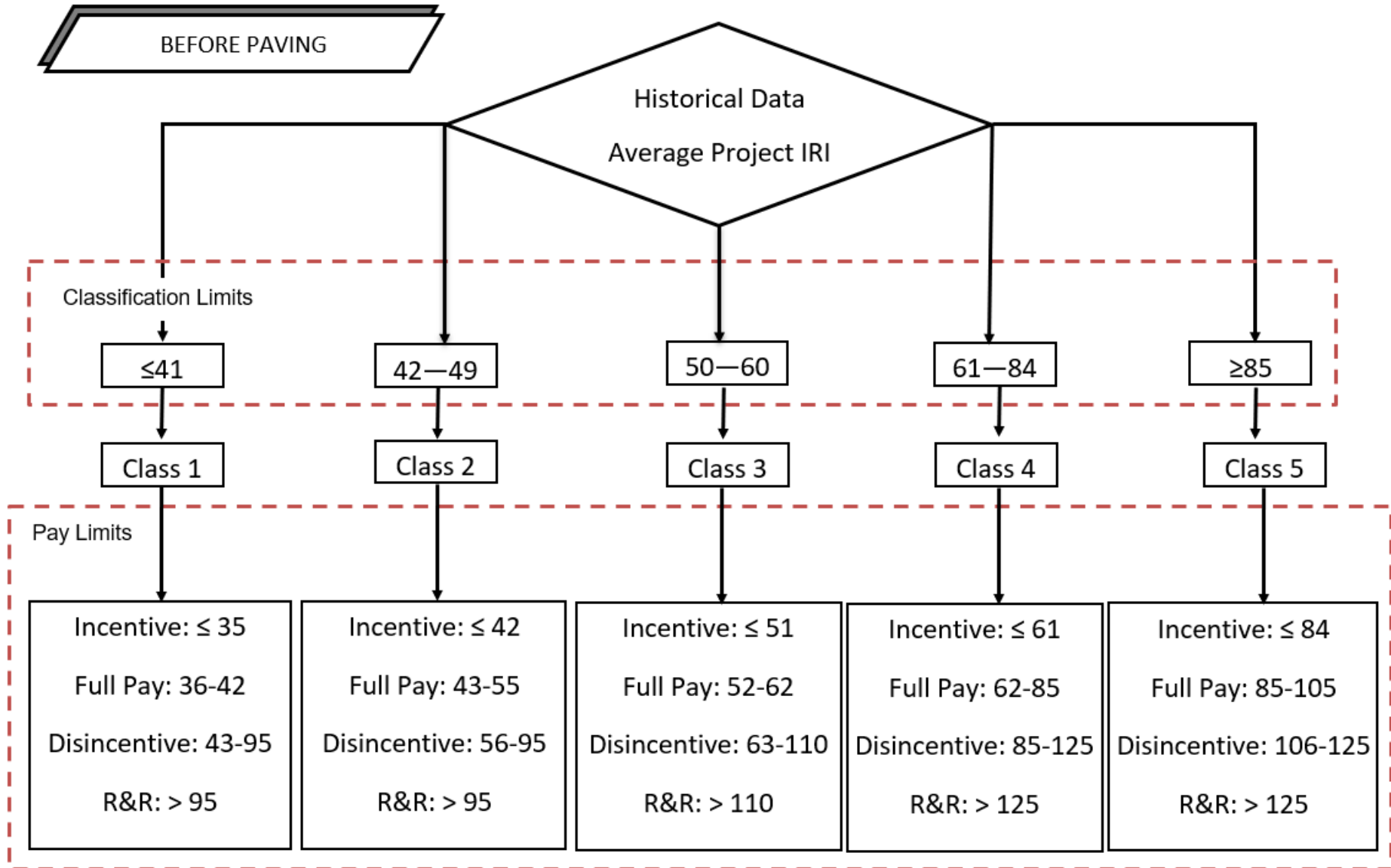
- 3.1.10 AADT and Percent Truck
- 3.1.11 Historical IRI Data
 - 3.1.11.1 Acceptance Data
 - 3.1.11.2 Pavement Condition Data
- 3.2 If historical acceptance roughness data is 50% or greater matching for the new project limits:
 - 3.2.1 Determine the overall project IRI using historical data.
 - 3.2.2 Refer to **Table 1** and assign the Smoothness Class based on the IRI Classification Limit range that the overall project IRI falls within.
- 3.3 If historical acceptance roughness data is less than 50% matching for new project testing limits:
 - 3.3.1 Reprocess available matching historical acceptance data
 - 3.3.2 Reprocess remaining matching Pavement Condition Data
 - 3.3.3 Determine the combined historical data overall project IRI.
 - 3.3.4 Refer to **Figure 1** and assign the Smoothness Class based on the IRI Classification Limit range that the combined historical overall project IRI falls within.
- 3.4 If historical data is not available assign the project to Smoothness Class 2 by default.

Table 1. IRI Classification and Pay Limits

Smoothness Class	IRI Classification Limits	IRI Pay Limits			
		Incentive	Full Pay	Disincentive	R&R
1	≤ 41	≤ 35	36 - 42	43 - 95	>95
2	42 - 49	≤ 42	43 - 55	56 - 95	>95
3	50 - 60	≤ 51	52 - 62	63 - 110	>110
4	61 - 84	≤ 61	62 - 85	86 - 125	>125
5	≥ 85 -	≤ 84	85 - 105	106 - 125	>125



Figure 1. Decision Tree – IRI Classification and Pay Limits





4. PROCEDURE AFTER TESTING THE PROJECT

Upon completion of the laser acceptance testing of the new project, the engineer will use the pre-pave assigned Smoothness Class and the current project average IRI and will refer to the decision tree shown in **Figure 2** to determine if the project needs to be moved to a lower Smoothness Class (e.g., from Smoothness Class 3 to Smoothness Class 2). For considering projects where post paving Smoothness Class is higher than pre-pave assigned Smoothness Class (e.g., from Smoothness Class 3 to Smoothness Class 4) “Engineering Decision - Did major changes occur in roadway design or facility use (e.g., intersections, manholes etc.) that may have impacted paving operations, resulting in a less smooth pavement?”

5. REPORTS

- 5.1 Summary Report – The summary report for each test section shall include data on the following items:
 - 5.1.1 Project Information: Financial Project Number, Roadway ID, District, County, Roadway ID, State/US Road, Lanes and Total Miles Tested, Mix Design, Paving Contractor, Use of Material Transfer Device (MTD), Paving time and Surface Type
 - 5.1.2 Testing Information: Date/Time Tested, Operator, Driver, Vehicle.
 - 5.1.3 Test results.
 - 5.1.4 Smoothness Class applied to project before paving to determine the pay limits.
 - 5.1.5 Achieved Smoothness Class determined after resurfacing and testing the project for Laser Acceptance.



Figure 2. Decision Tree - Smoothness Class After Paving

