FLORIDA DEPARTMENT OF TRANSPORTATION
State Materials Office
5007 NE 39th Avenue
Gainesville, Florida 32609

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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.

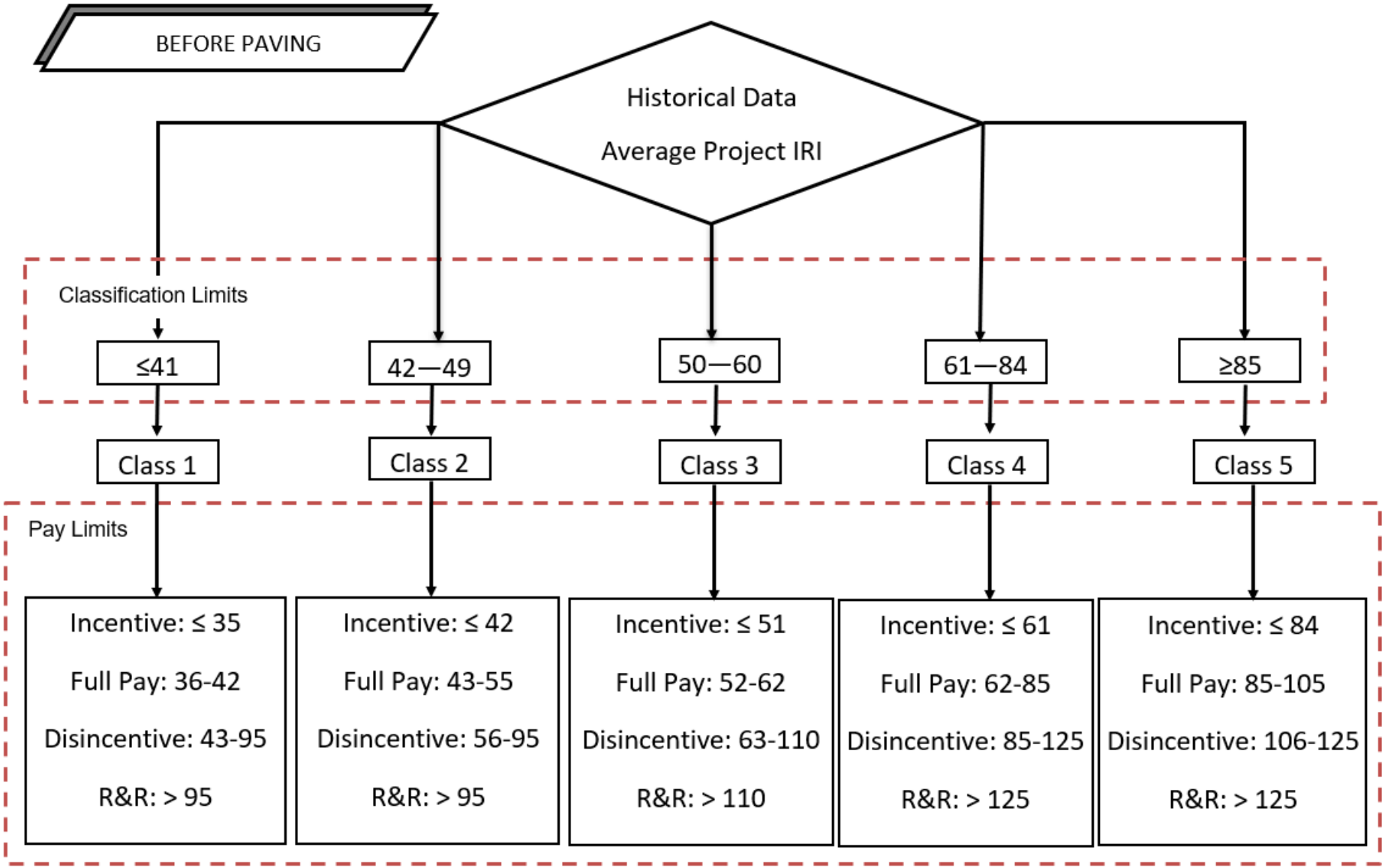
3.3.4 Refer to **Figure 1** and assign the Smoothness Class based on the IRI Classification Limit range that the combined historical overall project IRI falls within.

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.

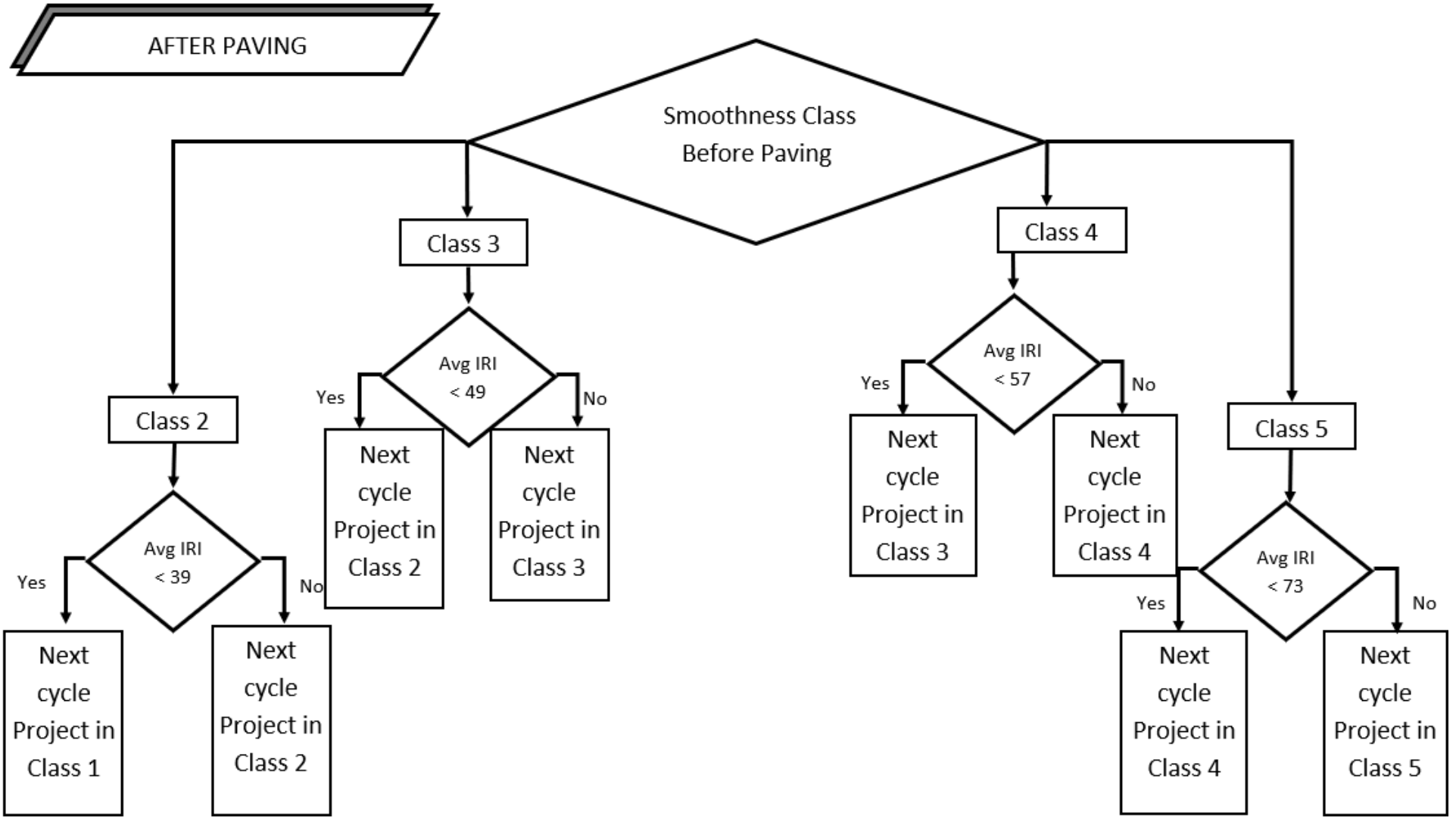



Figure 2. Decision Tree - Smoothness Class After Paving