

Quality Management – Accuracy example

- An agency wish to verify the accuracy of the automated IRI measuring equipment of the vendor (Service provider). The table (see next slide) presents the IRI data (in m/km) the vendor and the reference values established by the on control sections. The agency established the reference IRI values by measuring the profile using Class I profiler (road and level survey) and calculating the IRI based on Quarter Car Simulation.
 - i. Check if there is a significant difference between the manual measurement by agency and the measurements from sensor data of the vendor equipment.
 - ii. Check for potential bias, i.e., if the pavement condition is consistently under- or overestimated as a result of the automated data collection process.
 - iii. If the agency requirement for accuracy for is ± 5 percent compared Class I profiler measurement, check if the automated equipment is acceptable or not

Hint: Use paired t-test (95% level of confidence)

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S.No	IRI_agency	IRI_vendor	S.No	IRI_agency	IRI_vendor
1	1.6	1.4	10	4.6	4.6
2	6.4	6.5	11	2.4	2.6
3	8	7.9	12	5.6	5.4
4	3.2	3.3	13	4.1	4.1
5	4.1	4.4	14	2	2
6	3.4	3.7	15	3.1	3.4
7	3.4	3.6	16	4.6	4.6
8	2.2	2.6	17	2.8	3.1
9	5	5	18	4.9	5.1
			19	5	5.1

Quality Management – Precision example

The rutting data in the table has been collected from field validation testing that involved five repeated runs of the automated sensor measurement equipment at a pavement section. If the agency acceptance criterion for the rutting measurement ± 1.25 mm standard deviation for 5 runs. Evaluate if the measurement's method precision meets the acceptance criterion accounting for the sample variation. Assume the data follows a normal distribution.

Section	Rutting (mm)
1	10.79
2	13.94
3	12.69
4	8.63
5	11.25