

LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE



For The Technical Direction Of The LTPP Program



Program Area: Monitoring

Directive Number: P-6

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Supersedes: SHRP P-4

**Subject: Quality Assurance for Profile Data Collection
and Storage**

In order to ensure uniformity and reliability in profile data collection, the following quality assurance measures are to be observed in the profile data collection activities:

1. In addition to watching all onboard warning systems for signals of equipment malfunction, the operator shall examine plots of all profile runs for discrepancies and features that cannot be explained by observed pavement features.
2. The PROFSCAN version 1.4 (or later) software is to be used for field evaluation of all FHWA-LTPP test section profile measurements, with the following parameter settings:
 - Spike threshold value: 0.10 in.
 - Summary interval: 100 ft.
 - Seed (36 ft into run): 'Y'.
 - Tolerance on Mean: 1.0 percent.
 - Tolerance on Standard Deviation: 2.0 percent.
3. PROFSCAN results are to be used as a flag to alert the operator to the potential of non-pavement-related anomalies. A significant number of runs that are in fact error-free will be flagged when the above tolerances are used. However, less stringent tolerances will result in failure to flag many flawed data sets. The profiler operator is responsible for reviewing the data carefully to determine when a high degree of run-to-run variability is indicative of "bad" data and when it is indicative of pavement with a high degree of transverse variability.

- 4 When the PROFSCAN results indicate that spikes are present in the data, or that the run-to-run variability exceeds the specified tolerance, the operator is to determine if the cause of the anomaly is pavement-related or the result of equipment/operator errors or malfunctions.
- If the variability or spikes are believed to be due to operator or equipment, error, the operator is to identify and eliminate, correct, or avoid (as in the case of non-ideal lighting conditions) the cause of the anomalies and make additional runs until 5 runs free of equipment or operator error are obtained.
 - When anomalies in the data are believed to be due to legitimate pavement features, rather than errors, a total of seven runs should be made and evaluated using the PROFSCAN software.

If the data from the last two runs are consistent with those for the first five in terms of variability and the presence of pavement related anomalies, no further runs are required.

If the data from the last two runs differ from those for the first five runs, the operator shall reevaluate the cause of the variability or apparent spike condition, take appropriate corrective action, and make additional runs until he/she is confident that five error-free runs have been obtained.

- 5 The PROFCHK version 1.4 or later software is to be used to process all profile data prior to uploading into RIMS and NIMS with the following guidelines:
- The Quality Assurance indicator feature is to be used to flag all anomalous (e.g., spikes) features identified as either anomalous pavement (1), equipment failure (2), or unexplained results (3). Every effort should be made to identify the anomaly source(s), so that use of the unexplained results code (3) can be avoided.
- Features flagged as equipment failure (2) are to be logically deleted using the "View" option of the software, so that they are not included in the subsequent computation of profile statistics.
- The following profile statistics are to be calculated for all profile runs: IRI, RMSVA, Slope Variance, and Mays Output.

- Explanatory comments should be added wherever they might help future analysis of the data.
- The results of these analyses are to be saved to a file for uploading into RIMS. For a given test section and data, data for five runs are to be uploaded into RIMS according to the following criteria:

When five or more error-free runs are available, the first five such runs are to be uploaded into RIMS, independent of run-to-run variability.

When fewer than five error-free runs are available, the five runs with the fewest known errors are to be uploaded, independent of run-to-run variability. The errors present in the data must be flagged as described in section 5.

In applying the spike and variance criteria, the presence or absence of errors is based on the raw profile data. Flagging errors in the course of processing does not make the runs in which they appear "error free".

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Approved by:

