



Standard Practice for Computing Ride Number of Roads from Longitudinal Profile Measurements Made by an Inertial Profile Measuring Device¹

This standard is issued under the fixed designation E1489; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the mathematical processing of longitudinal profile measurements to produce an estimate of subjective ride quality, termed Ride Number (RN).

1.2 The intent of this practice is to provide the highway community a standard practice for the computing and reporting of an estimate of subjective ride quality for highway pavements.

1.3 This practice is based on an algorithm developed in National Cooperative Highway Research Project (NCHRP) 1–23 (1 and 2),² two Ohio Department of Transportation ride quality research projects (3 and 4), and work presented in Refs (5 and 6).

1.4 The computed estimate of subjective ride quality produced by this practice was named Ride Number (RN) in NCHRP Research Project 1–23 (1 and 2) to differentiate it from other measures of ride quality computed from longitudinal profile. Eq 1 of Section 8.2 represents the mathematical definition of Ride Number.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:³

E177 Practice for Use of the Terms Precision and Bias in

¹ This practice is under the jurisdiction of ASTM Committee E17 on Vehicle - Pavement Systems and is the direct responsibility of Subcommittee E17.33 on Methodology for Analyzing Pavement Roughness.

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² The boldface numbers in parentheses refer to the list of references at the end of this standard.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

ASTM Test Methods

- E867 Terminology Relating to Vehicle-Pavement Systems
- E950 Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
- E1170 Practices for Simulating Vehicular Response to Longitudinal Profiles of Traveled Surfaces
- E1364 Test Method for Measuring Road Roughness by Static Level Method
- E1500 Practice for Computing Mean Square Numerics from Road Surface Elevation Profile Records (Withdrawn 1998)⁴
- E1656 Guide for Classification of Automated Pavement Condition Survey Equipment
- E1927 Guide for Conducting Subjective Pavement Ride Quality Ratings

3. Terminology

3.1 *Terminology* used in this standard conforms to the definitions included in Terminology E867.

3.2 Definitions:

3.2.1 *Rideability Index (RI)*—an index derived from controlled measurements of longitudinal profile in the wheel tracks and correlated with panel ratings of rideability.

3.2.2 *Ride Number (RN)*—rideability index of a pavement using a scale of 0 to 5, with 5 being perfect and 0 being impassable.

4. Summary of Practice

4.1 The practice presented here was developed specifically for estimating subjective ride quality from longitudinal profile measurements.

4.2 This practice uses longitudinal profile measurements for two wheel tracks as an input to a mathematical computation of estimated subjective ride quality (RN). The profile must be represented as a series of elevation values taken at constant intervals along the wheel tracks.

⁴ The last approved version of this historical standard is referenced on www.astm.org.