## Standard Practice for

# Assessment of Static Performance in Transverse Pavement Profiling Systems

**AASHTO Designation: PP 106-21[1]**

**First Adopted: 2021**

**Technical Subcommittee: 5a, Pavement Measurement**

AASHTO

American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, DC 20004

Standard Specification for

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## 1. SCOPE

1.1. This practice describes the procedure to assess the specifications, accuracy, and precision of the sensor system used on transverse pavement profilers (TPP) in static mode. The particular specifications which will be assessed are transverse spacing, transverse width, vertical spacing, straightness error, vertical measurement error, and transverse measurement error.

1.2. The minimum requirements stipulated herein are intended to focus on the need for accurate and repeatable transverse measurements for network- and project-level data collection.

1.3. If any part of this practice is in conflict with referenced documents, such as ASTM standards, this practice takes precedence for its purposes.

1.4. This standard practice is intended to be conducted in conjunction with three other standard practices to fully assess and certify the TPP in typical operating conditions. For ground reference and transverse width assessment, see PP 109; for body motion assessment, see PP 107; and for assessment of drift mitigation, see PP 108.

1.5. *This practice 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 practice to establish appropriate safety and health practices and determine the applicability of regulatory limitations related to and prior to its use.*

## 2. REFERENCED STANDARDS

2.1. *AASHTO Standards*:

- PP 107, Assessment of Body Motion Cancelation in Transverse Pavement Profiling Systems
- PP 108, Assessment of Navigation Drift Mitigation in Transverse Pavement Profiling Systems
- PP 109, Assessment of Highway Performance in Transverse Pavement Profiling Systems
- PP 111, Definition of Terms Related to Transverse Pavement Profiling Systems and Ground Reference Equipment

## 3. TERMINOLOGY

3.1. See PP 111 for definitions of terms used in this standard practice.

3.2. Table 1 provides the physical parameter definitions, symbols, and default values to be used when administering this standard.

**Table 1**—Physical Parameter Definitions and Default Values

| Physical Parameter | Symbol | Default Value(s) |
|---|---|---|
| Minimum Length of the Straightedge | $L_{se}$ | 4.0 m (13 ft) |
| Minimum Width of the Straightedge | $W_{se}$ | 25 mm (1 in.) |
| Vertical Height of the Gauge Blocks | $h_{g1}$ | 75 ± 2 mm (3 ± 0.1 in.), 50 ± 1 mm (2 ± 0.05 in.), 25 ± 1 mm (1 ± 0.05 in.), |
| | $h_{g2}$ | 25 ± 1 mm (1 ± 0.05 in.), 12 ± 1 mm (0.5 ± 0.05 in.), 6 ± 1 mm (0.25 ± 0.05 in.) |
| Minimum Transverse Width of the Gauge Blocks | $w_g$ | 19 mm (0.75 in.) |
| Transverse Distance from the Base of the Stair-Stepped Gauge Block | $d_s$ | 25 mm (1 in.) |
| Number of Transverse Profiles to be Collected per Straightedge Location | $n_p$ | 10 |
| Distance that the TPP Shall Be Raised in Addition to the Vertical Distance from the Road Surface to the Top of the Straightedge | $d_v$ | 0 + 25 mm (0 + 1 in.) |
| Desired transverse locations of gauge blocks from the Transverse Centerline | $d_t$ | 2.0 ± 0.05 m (6.5 ± 0.2 ft) |

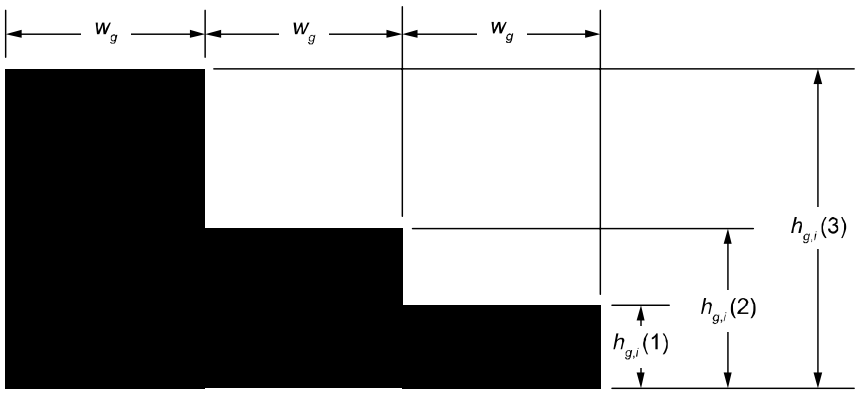


**Figure 1**—Default General Stair-Stepped Gauge Block Dimensions

## 4. SIGNIFICANCE AND USE

4.1. Measured transverse profiles of road surfaces are used to extract pavement deformation parameters such as rut depth, cross slope, and edge/curb drop-off. The accuracy of the estimated pavement deformation parameters depends on the measured transverse profile accurately representing a transverse section of the road surface.

4.2. Requirements on the specifications of mapping sensors ensure that the measured profile accurately represents the road surface. In addition, it is essential that the TPP sensors be able to accurately and precisely measure the height and transverse location of the road surface points.

4.3. This practice outlines standard procedures for assessing the operational accuracy and precision of transverse pavement profilers related to static measurement components. This standard prescribes procedures to evaluate transverse spacing between measurements, total width of measurements, vertical spacing of the measurements, straightness of the transverse measurements, and vertical and transverse measurement accuracy and precision. Because the data are used for subsequent calculations for rut depth, cross slope, and edge/curb drop-off, tables of the necessary accuracy and precision are provided in the form of bias and confidence intervals for each use.