

Wheelchair-Pavement Interaction Surveys

Recipient: Pathvu, Inc.

Grant: \$22,000 PI: Eric Sinagra

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Project Summary: 16



Background and Need

Since the U.S. Access Board received recommended roughness criteria for wheelchair accessible pathways (e.g., sidewalks, transit platforms, plazas, etc.) from researchers in 2018, this project measured roughness of interlocking concrete pavements (ICP) and permeable interlocking concrete pavements (PICP) and segmental paving slabs. Measurements were taken and roughness indices calculated using ASTM E3028 *Standard Practice for Computing Wheelchair Pathway Roughness Index as Related to Comfort, Passability, and Whole Body Vibrations from Longitudinal Profile Measurements* using the Pathway Measurement Tool or PathMeT shown in the picture below.

Objectives



In 2018, Pathvu measured 96 various concrete permeable and non-permeable concrete paver surfaces in the Pittsburgh, Philadelphia/New Jersey, and Northern Virginia areas using their PathMeT device shown to the left. Data regarding joint width, chamfer width, imagery, and Wheelchair Pathway Roughness Index (WPRI) values were collected according to ASTM E3028. The results were compared against published suggested thresholds by Duvall for the U.S. Access Board which follow:

Acceptable < 50 mm/m over 3 m

Marginal ≥ 50 mm/m and < 100 mm/m) over 100 m or greater

Unacceptable ≥ 100 mm/m (surface essentially denies access by wheelchair users)

Outcomes

According to those thresholds, 77 surfaces performed within the acceptable WPRI range, 19 performed with the cautioned range, and 0 were found to be in the unacceptable range. A correlation between joint width, chamfer width, and WPRI was evident. Joint and chamfer width appear to be significant factors in determining WPRI, especially chamfer width. The measurements inform the segmental concrete pavement industry regarding chamfer widths, specifically that they should be 4 mm or smaller to minimize wheelchair vibrations. The data should be useful in demonstrating to municipalities and wheelchair groups that given certain chamfer and joint widths, segmental concrete pavements provide a wheelchair accessible surface. Besides WPRI data, deliverables included a summary report and a PowerPoint presentation.

The complete research report can be downloaded [here](#)