

Dataset of Various Road Measurements on Concrete Surfaces

Marius Staat ^{*,†} , Philipp Bühler [†]  and Martin Gießler 

Institute of Vehicle System Technology, Karlsruhe Institute of Technology, 76131 Karlsruhe, Germany

* Correspondence: marius.staat@kit.edu; Tel.: +49-721-608-45367

† These authors contributed equally to this work.

Abstract

Artificially created road surfaces are typically used in indoor test benches or simulations to study tire-road contact. This dataset contains measurements from real-world concrete highways. The data contained in the dataset can be used as a road model in simulations, or artificially generated roadways can be compared with the dataset. In addition, road surface wear can be taken into account, since measurements are available from positions with varying levels of traffic (in the lateral direction). The dataset consists of road data from four measurement positions on two federal highways in southwestern Germany. A total of four measurement methods were used: high-resolution 3D scans, texture depth measurements, skid resistance measurements, and the sand patch test. The methods are described in detail in the article. All data have been processed to ensure they can be used as effectively as possible by other researchers. A comparison of methods was conducted for the results of the texture depth measurements and the sand patch method. The dataset was uploaded to RADAR4KIT under the following DOI:

Dataset: <https://doi.org/10.35097/ku8qs1jt347zxyeq>.

Dataset License: CC BY-NC-SA 4.0

Keywords: 3D scan; British pendulum tester; skid resistance tester; sand patch test; road surface characteristics; texture depth; exposed aggregate concrete; broom finish; federal highway

1. Summary

This dataset contains measurements of concrete highway surfaces obtained using various methods. At four locations on two federal highways in southwestern Germany, the surface was characterized using 3D scans, texture depth measurements (using an ELAtexture (ELA) device), the skid resistance tester (SRT, also known as *British Pendulum Tester*), and the sand patch test (SPT). The Institute of Vehicle System Technology at Karlsruhe Institute of Technology (KIT) operates two internal drum tire test benches with real road surfaces. Here, various aspects of tire-road contact are investigated [1,2]. This dataset is intended to serve as a comparison with real road surfaces. In addition, the goal is to determine which of the methods used are best suited for use on the internal drum test bench. The aim is to determine whether traditional methods (SRT, SPT) can be replaced by modern, contactless methods (3D scan, ELA).

The dataset provides access to real-world road data from Germany. The 3D scans can, for example, serve as a basis for tire-road simulation models. Furthermore, the methods used can be compared based on the dataset. In addition, the wear of different concrete road



Academic Editor: Xiang Lian

Received: 24 August 2026

Revised: 22 September 2026

Accepted: 24 September 2026

Published: 2 October 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

surfaces can be compared over time, since measurements are available for various traffic lanes and the emergency lane and surfaces of different ages.

2. Data Description

This dataset contains various measurements of concrete road surfaces on federal highways. It consists of 3D scans, texture depth measurements, skid resistance tester (SRT) measurements, and sand patch tests (SPT).

2.1. Measurement Positions

The measurements were taken on concrete highway sections in southwestern Germany. The measurements on the highway A5 were taken south of Karlsruhe in the southbound direction; the measurements on the highway A6 were taken east of Kaiserslautern in the eastbound direction. The locations are shown in Figure 1. The measurements took place on 11 and 12 August 2025.

A location at the beginning of the construction zone on the A5 was selected (A5_L1). The position was free of debris and damage to the road surface. All measurement procedures were carried out at this location. In addition, approximately 3 km farther south, at the end of the construction zone, only 3D scans and texture depth measurements were performed at a second location (A5_L2). Both locations are covered with exposed aggregate concrete, which has a maximum grain size of 8 mm and is 7 years old.

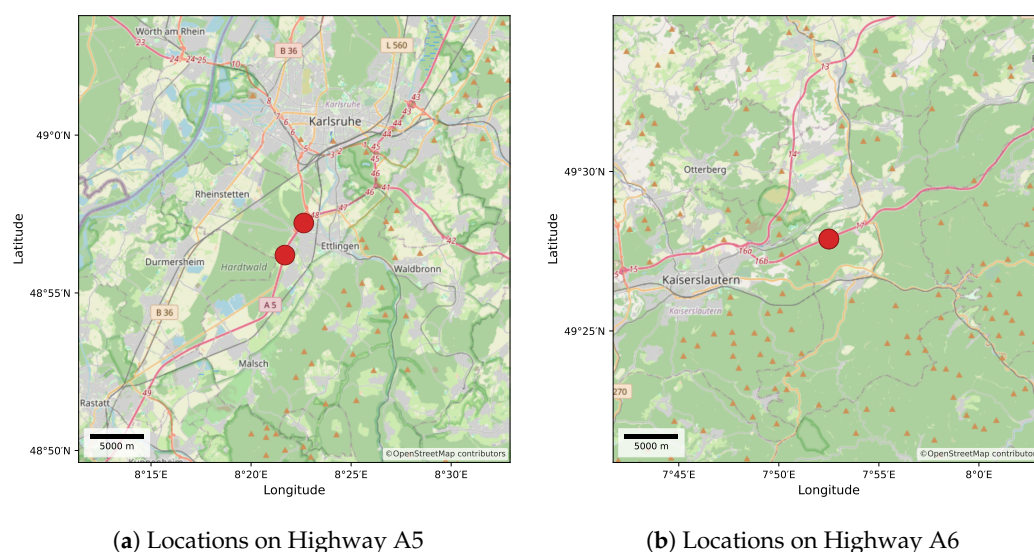


Figure 1. Maps of measurement locations on the highways. (a) shows the 2 positions south of Karlsruhe on the highway A5; northern: A5_L1 and southern: A5_L2. (b) shows the 2 positions east of Kaiserslautern on the highway A6 (A6_L1 and A6_L2. Since the points are close together, only one point is shown on the map). The small numbers along the highways indicate the exits. © OpenStreetMap contributors.

A location at the beginning of the construction zone on the A6 was selected (A6_L1). The location was free of debris and damage to the road surface. All measurement procedures were carried out here. In addition, approximately 0.3 km farther (in the eastbound direction) at a second location (A6_L2) within the construction zone, only 3D scans and texture depth measurements were performed. At both locations, the surface consists of the following: Emergency lane, second and third lane: broom finished, approximately 44 years old. The first lane has been renewed with a turf drag finish, maximum grain size of 22 mm and is 11 years old.

Figure 2 provides an overview of the measurement positions used. On the A6, the first and second lanes were closed. Measurements were taken at 5 positions (M1–M5). On the A5, only the first lane was closed, so there are only 3 positions (M1–M3). Position M1 is always located in the emergency lane and is therefore very rarely driven over. Positions M2 and M4 are located in the right rolling track of the respective lane and are therefore heavily trafficked. Due to the rule of keeping to the right (German traffic code) and heavy truck traffic, the road at M2 is rolled over much more frequently. M3 and M5 are located in the center of the respective lane and are therefore rolled over less frequently. Additionally, Figure A1 shows a photo of the measurement positions during the SPT at A6_L1.

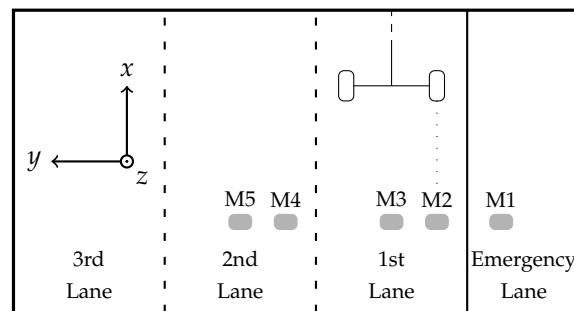


Figure 2. A section of a three-lane highway with an emergency lane. The measurement positions (M1 to M5) are marked, as well as the orientation of the coordinate system used (x : driving direction and y : lateral direction). As an example, the axis of a vehicle in the first lane is added. (M4 and M5 were only used on highway A6.)

2.2. 3D Scans

The 3D scans were captured using the scanner manufacturer's *VXelements 12* software and originally saved as *.csf files. Since this format cannot be processed using free software, the 3D scans were converted. The data are now available in binary *.ply and *.stl format. These formats can be processed using any software.

2.3. Texture Depth Measurements

The texture depth measurements are saved in *.ela files on the ELAtextur measuring device. These files are structured like *.xml files. Using the ELA analysis software ("ELA Auswertesoftware", Version 1.1.10.76, provided by the manufacturer), the height profiles were filtered according to DIN EN ISO 13473-1:2019 [3], converted and saved in *.csv tables. The ELAtextur takes two circular height measurements with a laser at each position. Each table contains one measurement position and consists of the following columns: Position in mm (along the circular path of the measurement (0 mm to 400 mm)); height profile 1 in μm ; height profile 2 in μm .

In addition, height profiles were filtered and the Mean Profile Depth (MPD) and Estimated Texture Depth (ETD) values were calculated for each measurement according to DIN EN ISO 13473-1:2019 (MPD) and DIN EN 13036-1:2010 (ETD) [3–5] and saved in a summary report as *.pdf. This report also includes visualizations of all height profiles and the device calibration data from before and after the measurements. In addition, all measured values were compiled into a summary.csv, with the following columns: measurement position; MPD in mm; ETD in mm.

2.4. Skid Resistance Tests

The SRT measurement data were recorded manually during the measurements. The Pendulum Test Values (PTV) are stored in a *.csv table. The file contains one line per measurement position, with the following columns: measurement position, raw PTV ($\times 5$), (arithmetic) mean of raw PTV, standard deviation of raw PTV, temperature corrected mean

PTV, rubber temperature of slider (in °C). The temperature-dependent correction of the measured PTV was performed in accordance with DIN EN 13036-4:2011 [6].

2.5. Sand Patch Tests

The sand patch data include the raw images in *.jpg format and the analysis output. For each measurement position, a segmentation mask highlighting the detected sand area and an annotated visualization overlay showing the equivalent circle diameter, centroid, and calculated Mean Texture Depth (MTD) value are provided as *.png files. In addition, all numerical results and calibration parameters are archived in a *summary.csv* file, with the following columns: measurement position; MTD in mm; calculated diameter $D_{calculated}$ in mm; scaling in mm/px.

2.6. Data Naming and Structure

Regardless of the measurement method, the following naming convention is used for all data:

Highway_Location_Position_Half.extension

As an example, a texture depth measurement (ELA) taken in the rolling track of the first lane on the A5, first location (northern) in the left half of the measurement area, results in the following naming: A5_L1_M2_L.ela (also see Section 2.1). If measurements were repeated, *_rep* is appended to the name.

The measurement data were uploaded to RADAR4KIT (<https://doi.org/10.35097/ku8qs1jt347zxyeq>). It is stored in a single zip file with the structure shown in Figure 3. The data are categorized in folders according to the measurement methods used for the road surface (3D scan, ELA, SRT, Sand Patch). If the data are in different conditions (raw/processed), they are sorted into sub-folders.

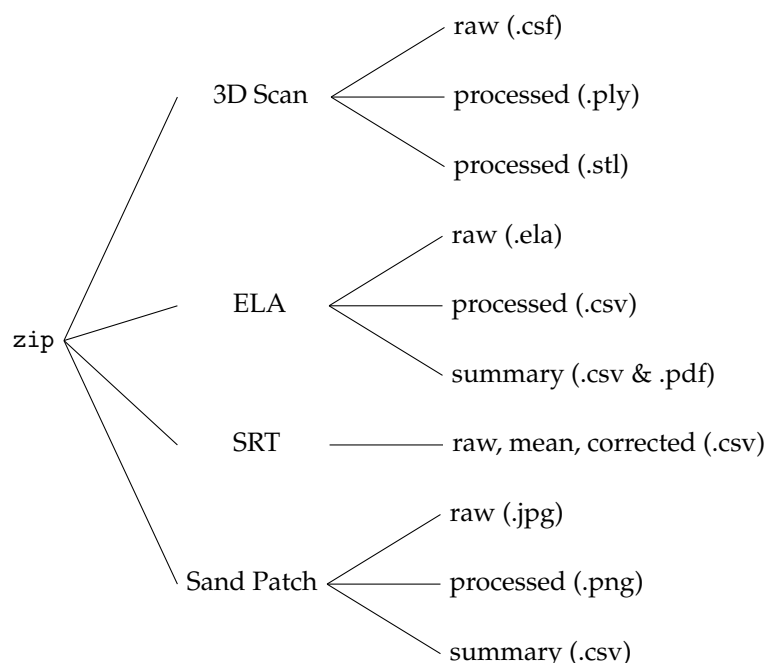


Figure 3. Data Structure on the RADAR4KIT Repository. The dataset was divided into sub-folders, sorted by measurement method and condition.

3. Methods

3.1. Overview of Applied Methods

Each measurement position (M1–M5) is defined by the reference frame of the 3D scan (see Figures 4 and A2). Reflective markers are affixed to the frame; these serve as reference points for the 3D scanner. Within the area of the 3D scan (20 cm × 30 cm), the additional measurement methods are applied to the left and right halves, respectively.

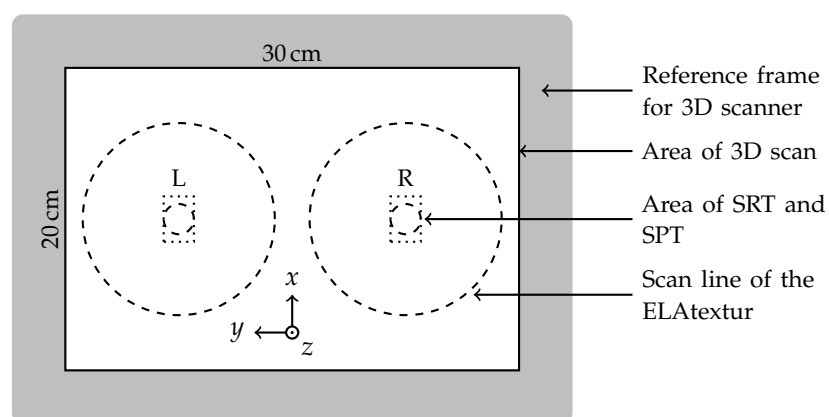


Figure 4. Detailed description of measurement positions M1 to M5. Within the area of the 3D scan, the area is divided into left and right halves, and the other methods are applied to both sides.

Before taking the measurements, the road surface was cleaned with a broom and then with compressed air. First, a 3D scan was performed. Next, the texture depth measurements were taken. Following the non-contact methods, the SRT pendulum was used. After using the SRT pendulum, we waited until the area had completely dried again. The sand patch test was performed last, as the sand remained as a residue.

The following sections describe the methods used and the procedure in greater detail. They also address potential sources of error that could compromise data quality and the measures taken to prevent them.

3.2. 3D Scan

A Creaform Go!SCAN 3D handheld 3D scanner was used to record the road surface. It has a measurement resolution of 0.1 mm and a resolution of the mesh of 0.2 mm [7]. Reflective targets were attached to the reference frame (see Figure 4) to ensure optimal positioning during the scanning process. To ensure alignment with the direction of travel, the reference frame was always positioned parallel to the edge of a concrete slab. The setup is shown in Figure A2. To prevent reflections off the road surface rock grains, the entire scan area was sprayed with an anti-reflective and matting spray (AESUB blue scanning spray, self-vanishing, see [8]). The 3D scanner was always calibrated according to the manufacturer's instructions before measurements began. The handheld scanner was moved over the section at various angles until all visible gaps in the scan were closed. The scan was then saved in Creaform's *VXelements 12* software.

During the measurements, it became apparent that direct sunlight in the measurement area degraded the 3D scan, as the scanner could no longer detect the white light it emitted for scanning. As a countermeasure, the scan area was always kept completely shaded to ensure that 3D scanning was possible. In cases of uncertainty, the measurement was repeated, and both versions are included in the dataset.

To improve compatibility for publication and reduce the file size, the 3D scans were processed afterward. The scans were manually cut so that only the area within the reference

frame was included. Additionally, isolated patches were automatically removed (threshold of 10). The 3D scans were then exported as binary .ply and .stl files.

3.3. Texture Depth

Before use, the ELAtextur was calibrated according to the manufacturer's instructions. The texture depth was then measured at each measurement position on both the left and right halves (see Figure 4). After the measurements were taken, the device's calibration was checked again. The calibration was within the optimal range for every use. The data were stored on the device. Subsequently, the data were provided as described in Section 2.3.

Dirt or particles on the road surface can be a potential source of error in ELA measurements. This was prevented by cleaning the measurement site beforehand.

3.4. Skid Resistance Test

The measurements using the SRT pendulum (also *British Pendulum Tester*) were performed in accordance with DIN EN 13036-4:2011 [6]. A pendulum tester with a slider 57 (wide slider) was used. The pendulum is inspected externally on a regular basis.

The SRT pendulum was positioned parallel to the direction of travel (x) and leveled horizontally using the integrated spirit level. The vertical position of the pendulum head axis was then adjusted by setting the contact length using the sliding length gauge. The rubber slider and the test surface (road surface) were then wetted, and the temperature of the rubber body was measured using an infrared laser thermometer.

The pendulum tests were then conducted. When necessary, the road surface and rubber body were wetted again. The PTV and temperatures were recorded manually.

The PTV are provided as raw values. In addition, the means and standard deviations were calculated for each measurement position. The means were also reported with temperature correction (according to DIN EN 13036-4 [6]) (see Section 2.4).

SRT measurements are highly susceptible to interference from significant macro-irregularities (e.g., exposed rock grains). When positioning the SRT pendulum, care was taken to ensure that the measurement area had a texture that was as homogeneous as possible. Additional measurement errors were avoided through the repetitions specified in the standard DIN EN 13036-4:2011 [6].

3.5. Sand Patch Test

The sand patch test was conducted according to Kaufmann [9] and DIN EN 13036-1:2010 [5]. In this test, 14 g of standard sand I fine (German: "Normsand I fein") according to DIN 1164-58 [10] (which is approx. 10 cm³) was used and spread in a circular pattern using a wooden spreading tool with a diameter of 50 mm. The measuring position was protected from the wind by a metal frame (see Figure A1).

Images of the sand patches were taken using an Apple iPhone 15 Pro immediately after the sand patch test. The camera was positioned parallel to the road surface to minimize perspective distortion. Each image includes two vertically aligned measurement scales (folding meters in x and y) next to the sand patch to ensure consistent scaling as shown in Figure 5.

The scale (mm/px) for calculating the sand patch surface area was determined by interactively selecting two calibration points at a known distance in the evaluation script (see red lines from 0 cm to 10 cm in Figure 5) to calculate the mm-per-pixel-ratio for each image. The Euclidean distance was used to ensure that a folding meter held at an angle did not distort the calibration. EXIF metadata were automatically extracted. The camera included an orientation tag, so images were algorithmically rotated to the correct orientation for consistent processing.

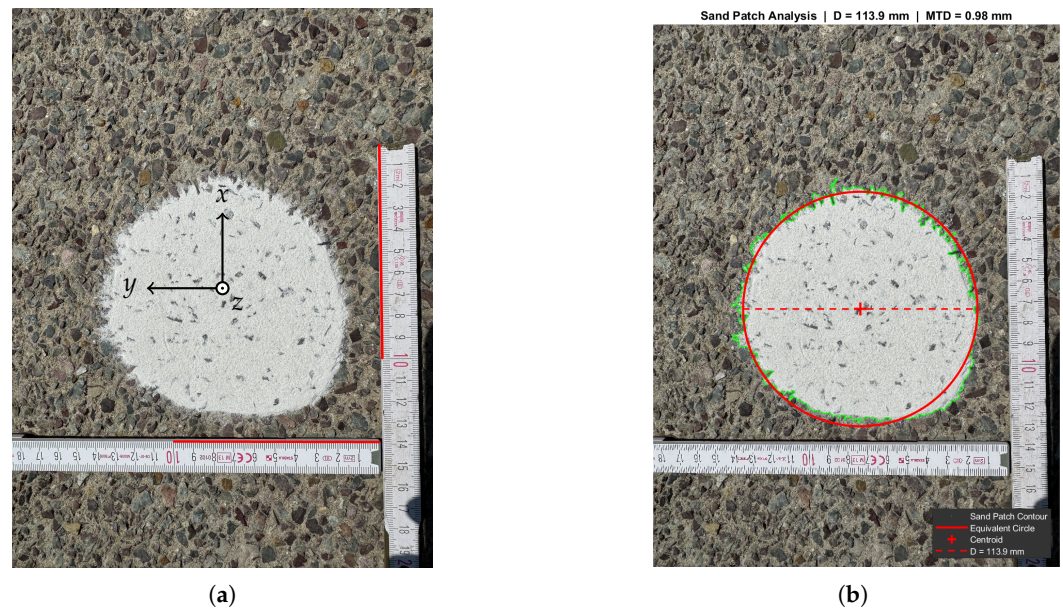


Figure 5. Example of an original image and a processed image for the SPT for A5_L1_M1_R. (a) Definition of the reference scale (red lines) on the SPT image for A5_L1_M1_R for the calculation of the mm-per-pixel ratio. (b) Processed image for A5_L1_M1_R, showing the detected outer edge of the sand area (green line), the calculated equivalent diameter and centroid (red), and the calculated MTD value.

The digital image analysis was performed in MATLAB R2025a using the Image Processing Toolbox [11].

The mean texture depth (*MTD*, in mm) was determined according to Kaufmann [9]:

$$MTD = \frac{4V}{\pi D^2} \quad (1)$$

where V is the sand sample volume in mm^3 and D is the (calculated) diameter of the sand-covered area in mm.

Known sources of error in the SPT include environmental factors (e.g., wind blowing the sand away), uneven distribution of the sand, or inaccurate determination of the sand patch's diameter. To avoid these errors, a windscreen was placed around the sand patch. To account for the non-circular distribution and to ensure reproducible diameter measurements, these were performed using digital image processing. In doing so, care was taken to ensure that the orientation of the phone camera and the folding meters was accounted for and did not lead to perspective distortion.

4. User Notes

This section provides a brief comparison of the classical sand patch test and the newer non-contact texture depth measurement method using the ELAtextur device.

According to DIN EN ISO 13473-1:2021 [3] and ASTM E 1845-23 [12], there is a correlation between the measured MPD value and the ETD value calculated using the following equation:

$$ETD = 1.1 \cdot MPD \quad (2)$$

Equation (2) is valid in the range of $0.3 \text{ mm} < MPD < 3 \text{ mm}$ [3,12]. Therefore, measurements with a $MPD \leq 0.3 \text{ mm}$ were not included in the comparison in Figure 6 (no MPD values $\geq 3 \text{ mm}$ occurred).

To compare the MTD values obtained from the sand patch test with the MPD values from the texture depth measurements (ELA), the ETD values are calculated from the MPD values using Equation (2).

Figure 6 shows the results of both methods. For all measurements shown, the coefficient of determination is $R^2 = 0.67$. On the A5, the result is $R^2_{A5} = 0.82$, and on the A6, it is $R^2_{A6} = 0.54$.

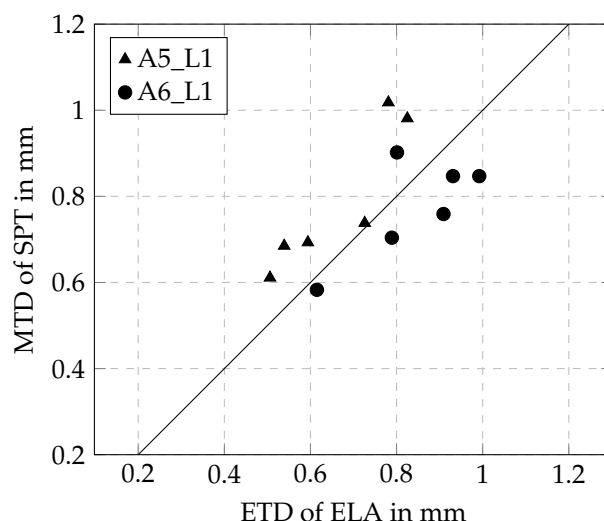


Figure 6. Comparison of Texture Depth values from the ELA_{textur} (calculated ETD) and the SPT (MTD).

The coefficient of determination (R^2) for the A5 is likely higher because the surface of the A5 uses a smaller grain size and consists of exposed aggregate concrete. This results in a more homogeneous surface overall. For the A6, with its larger grain size and drag textures (broom finish and turf drag finish), the texture is less homogeneous, resulting in a lower R^2 .

It is known from the literature that the SPT is more time-consuming and less reproducible, as it is highly operator-dependent and more sensitive to local irregularities in the pavement surface [13–16]. Therefore, texture depth measurements using the ELA_{textur} appear to be more suitable, as the device delivers reliable results regardless of the operator. Thanks to its built-in filtering, irregularities also have less impact. Thanks to contactless laser measurement, no residue is left on the road surface.

Author Contributions: Conceptualization, P.B. and M.S.; methodology, M.S.; software, P.B.; validation, P.B. and M.S.; resources, M.G.; data curation, M.S.; writing—original draft preparation, P.B. and M.S.; writing—review and editing, P.B., M.S. and M.G.; visualization, M.S.; supervision, M.G.; project administration, M.G. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The original data presented in the article are openly available in RADAR4KIT at <https://doi.org/10.35097/ku8qs1jt347zxyeq> under license CC BY-NC-SA 4.0.

Acknowledgments: The authors would like to thank *The Federal Highway and Transport Research Institute (BAST)*, Bergisch Gladbach, Germany for providing measurement equipment and expertise, as well as for putting them in touch with relevant local contacts. The authors would also like to thank *Otto Alte-Teigeler GmbH*, Bietigheim, Germany and its subsidiary *SAT Spezialbau GmbH*, Karlsruhe,

Germany for providing measurement equipment, expertise, and access to their construction site. The authors would also like to thank *Die Autobahn GmbH des Bundes: Niederlassung Südwest & West*, Stuttgart/Montabaur, Germany, for granting access to their construction site and providing information on the road sections. During the preparation of this manuscript, the authors used OpenAI's ChatGPT version 5.5 for the purposes of generating the TikZ code and positioning elements. The layout and the concept for the images were created by the authors. The authors have reviewed and edited the output and take full responsibility for the content of this publication.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

A5/A6	Federal Highway A5/A6 ("Autobahn A5/A6")
ETD	Estimated Texture Depth (in mm)
L/R	Left/Right half of respective Measurement Position
L1/L2	Location 1/2 on respective highway
M1–M5	Measurement Positions 1–5 within respective location
MPD	Mean Profile Depth (in mm)
MTD	Mean Texture Depth (in mm)
PTV	Pendulum Test Value (of SRT Pendulum)
R^2	Coefficient of Determination
SPT	Sand Patch Test
SRT	Skid Resistance Test(er)

Appendix A

The appendix includes photos of the measurements taken on the highway. These photos may help other researchers better understand the setup or the situation, or, if necessary, reproduce the tests.

Figure A1 shows photos of SPT and ELA measurements on the A6. Figure A2 shows a photo of the 3D scan and the simultaneous texture depth measurement at A6_L1. The difference in road surface between the first lane and the emergency lane is clearly visible.

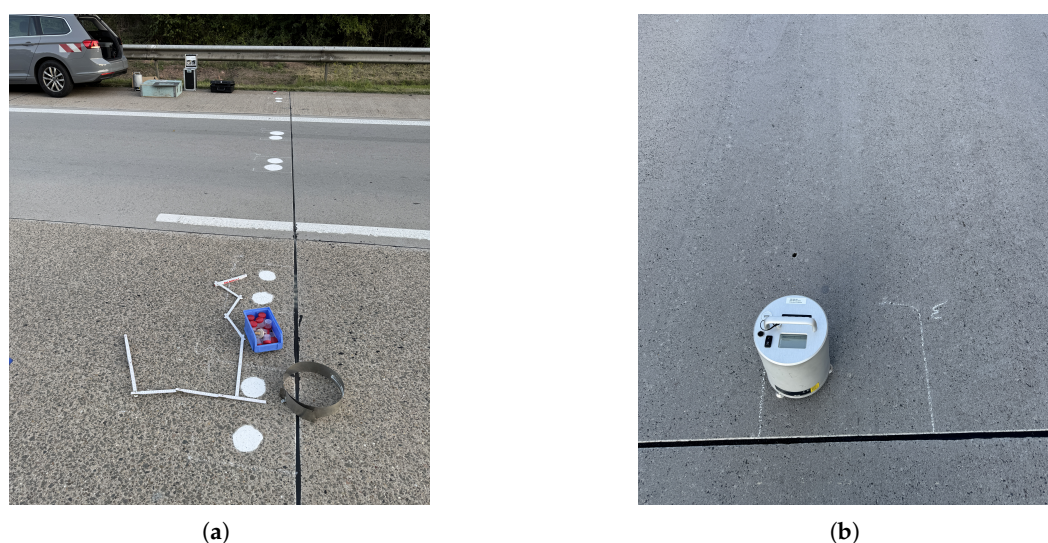


Figure A1. Photos of the measurements taken on the A6. (a) shows the completed SPT measurements at A6_L1, with folding meters attached to A6_L1_M5_R. The chalk markings indicate the area covered by the 3D scan. The other measuring devices can be seen in the background. (b) shows the ELA texture device at A6_L1_M3_L during a texture depth measurement.



Figure A2. Setup for the 3D scan of A6_L1_M2. Power station and laptop (finalizing the scan); the scanner is in its carrying case, which includes an integrated calibration plate. The reference frame was positioned parallel to the edge of the concrete slab so that the orientation matches the direction of travel (arrow points in the x direction). On the left, you can see the ELAtexture device during a texture depth measurement on A6_L1_M1_R. The white residue comes from the vanishing scanning spray.

The following applies to both figures (Figures A1 and A2): The emergency lane and the second lane have a broom finish surface, approximately 44 years old. The first lane was resurfaced and consists of a turf drag finish surface with a smaller grain size, approximately 11 years old (see Section 2.1 for details).

References

- Schläfle, S.; Unrau, H.J.; Gauterin, F. Influence of Load Condition, Tire Type, and Ambient Temperature on the Emission of Tire–Road Particulate Matter. *Atmosphere* **2023**, *14*, 1095. [CrossRef]
- Staat, M.; Gießler, M.; Gauterin, F.; Jungen, B. New Method to Evaluate the Groove Wander Effect on an Internal Drum Test Bench. *Vehicles* **2025**, *7*, 83. [CrossRef]
- DIN EN ISO 13473-1:2021-11; Charakterisierung der Textur von Deckschichten Unter Verwendung von Oberflächenprofilen-Teil 1: Bestimmung der Mittleren Profiltiefe (ISO 13473-1:2019, Korrigierte Fassung 2021-06). DIN Media GmbH: Berlin, Germany, 2021. [CrossRef]
- IWS Messtechnik GmbH. Texturtiefe-Messgerät ELAtexture 3.0. Available online: <https://iwsmesstechnik.de/textur/elatextur/> (accessed on 12 August 2026).
- DIN EN 13036-1:2010-10; Oberflächeneigenschaften von Straßen und Flugplätzen-Prüfverfahren-Teil 1: Messung der Makrotexturtiefe der Fahrbahnoberfläche mit Hilfe Eines Volumetrischen Verfahrens. Deutsche Fassung EN 13036-1:2010. DIN Media GmbH: Berlin, Germany, 2010. [CrossRef]
- DIN EN 13036-4:2011-12; Oberflächeneigenschaften von Straßen und Flugplätzen-Prüfverfahren-Teil 4: Verfahren zur Messung der Griffigkeit von Oberflächen: Der Pendeltest. Deutsche Fassung EN 13036-4:2011. DIN Media GmbH: Berlin, Germany, 2011. [CrossRef]
- Creaform Inc. Go!SCAN 3D–Technische Spezifikationen. Available online: <https://www.creaform3d.com/de/products/portable-3d-scanners/handheld-portable-3d-scanner-goscan-3d/technical-specifications> (accessed on 12 August 2026).
- Scanningspray Vertriebs GmbH. AESUB Blue: Vanishing State-of-the-Art Scanning Spray. Available online: <https://aesub.com/prod/aesub-blue-2/> (accessed on 12 August 2026).
- Kaufmann, N. Das Sandflächenverfahren. *Straßenbautechnik* **1971**, *24*, 131–135.
- DIN 1164:1958-12; Portlandzement, Eisenportlandzement, Hochofenzement (Zurückgezogen). DIN Media GmbH: Berlin, Germany, 1958.
- The MathWorks, Inc. Image Processing Toolbox. Available online: <https://de.mathworks.com/products/image-processing.html> (accessed on 12 August 2026).
- ASTM International. *Standard Practice for Calculating Pavement Macrotexture Mean Profile Depth*; Technical Report ASTM E1845-23; ASTM International: West Conshohocken, PA, USA, 2023. [CrossRef]
- ASTM International. *Standard Test Method for Measuring Pavement Macrotexture Depth Using a Volumetric Technique*; Technical Report ASTM E965-15R24; ASTM International: West Conshohocken, PA, USA, 2024. [CrossRef]

14. Hasic, T.; Cremer, M.; Özcan, B. *Sensitivitätsuntersuchungen zur Robusten Rauigkeitsermittlung von Betonoberflächen auf Basis von bildbasierten 3D-Punktwolken*; Ruhr-Universität Bochum: Bochum, Germany, 2023. [[CrossRef](#)]
15. Sengoz, B.; Topal, A.; Tanyel, S. Comparison of pavement surface texture determination by sand patch test and 3D laser scanning. *Period. Polytech. Civ. Eng.* **2012**, *56*, 73. [[CrossRef](#)]
16. Vogler, N.; Gluth, G.; Oppat, K.; Kühne, H.C. Charakterisierung von Bauteiloberflächen mittels Lasertriangulation bei der Instandsetzung. In *Proceedings of the Messen und Überwachen im Wasserbau und am Gewässer*; Number 53 in Dresdner Wasserbauliche Mitteilungen; Technische Universität Dresden, Institut für Wasserbau und technische Hydromechanik: Dresden, Germany, 2015; pp. 445–454.

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.