



# SURFACE VEHICLE RECOMMENDED PRACTICE

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## Taxonomy and Classification of Powered Micromobility Vehicles

### RATIONALE

This document has been reviewed to comply with the SAE Five-Year Review policy and has been revised to update the references section and to add NOTES to the Classification System section.

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## 1. SCOPE

This technical report provides a taxonomy and classification of powered micromobility vehicles. These vehicles may be privately owned or be available via shared- or rental-fleet operations. This technical report does not provide specifications or otherwise impose minimum safety design requirements for powered micromobility vehicles.

NOTE 1: There may be powered micromobility vehicles designed for different purposes: (1) human transport; (2) vocational applications; and (3) goods delivery. This technical report only covers vehicles that are primarily designed for (1). Other categories may be covered in future SAE Technical Reports.

NOTE 2: This technical report is aimed only to define and describe powered micromobility vehicle types and classifications. It does not prescribe safe or appropriate classifications of vehicles, nor does it suggest where in the transportation system the vehicle should operate.

NOTE 3: For taxonomy specifically related to shared- or rental-fleet operations of micromobility vehicles, refer to SAE J3163.

## 2. REFERENCES

### 2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

#### 2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

SAE J2358 Low-Speed Vehicles

SAE J3163 Taxonomy and Definitions for Terms Related to Shared Mobility and Enabling Technologies

SAE J3230/1 Kinematic Performance Metrics for Powered Standing Scooters

Goodsell, D. (1989). *Dictionary of automotive engineering*. SAE International.

#### 2.1.2 Code of Federal Regulations (CFR) Publications

Copies of these documents are available online at <https://www.ecfr.gov>.

16 CFR § 1512.2 Definitions

49 CFR § 571.3 Definitions

#### 2.1.3 Other Publications

NIOSH (1994). Applications manual for the revised NIOSH lifting equation. By Waters TR, Ph.D., Putz-Anderson V, Ph.D., Garg A, Ph.D. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 94-110 (Revised 9/2021), <https://doi.org/10.26616/NIOSH PUB94110revised092021>.

State of California Vehicle Code, Section 312.5

## 2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

### 2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

SAE J213      Motorcycle Classifications

SAE J1451      A Dictionary of Terms for the Dynamics and Handling of Single Track Vehicles (Motorcycles, Scooters, Mopeds, and Bicycles)

Chang, A., Miranda-Moreno, L., Clewlow, R., and Sun, L. (2019). *Trend or fad? Deciphering the enablers of micromobility in the U.S.* SAE International.

### 2.2.2 Other Publications

Fang, K., Weinstein Agrawal, A., and Hooper, A. (2019). *How and where should I ride this thing? Rules of the road for personal transportation devices.* Project 1713. Mineta Transportation Institute.

## 3. DEFINITIONS

The definitions provided below are developed for use in the context of powered micromobility vehicles only. Existing definitions for other vehicle classes (e.g., motor vehicles) and fields may conflict with the definitions provided below.

### 3.1 ACCELERATOR

The hand or foot lever or switch that regulates the speed and output of a motor.

NOTE: Accelerator is also referred to as throttle.

### 3.2 BICYCLE

A vehicle with two or three wheels, solely human-powered, propelled by operable pedals (or a hand-driven equivalent) affixed to a mechanical propulsion system transmitted to one or more wheels, and has handlebars for steering and a saddle-like seat.

NOTE: A trike or tricycle is a three-wheeled bicycle.

### 3.3 BODY

The external structure of a vehicle that may include a roof, fairing, windscreen, fenders, doors, or other external components.

### 3.4 BRAKES

The energy conversion mechanism used to slow, stop, or hold a vehicle.

### 3.5 BRAKING SYSTEM

The combination of one or more brakes and the related mechanisms of operation and control.

### 3.6 CENTER COLUMN

The structural element used by the operator to control the vehicle; it may be used for steering and stability and may have handlebars, turn indicators, brake controls or other controls (such as a throttle), or information devices.