



## Fact sheet – Regulation of Segways

Number 17, 2016

Part of the [Tranzinfo Hot Topics](#) series, this fact sheet offers a selection of current material as well as some pertinent older material on the issues facing governments as they deal with the rising popularity of Segways.

### Contents:

[Glossary](#)

[Safety](#)

[Benefits](#)

[Jurisdictional approaches](#)

### Glossary

“The Segway PT is a two-wheeled, self-balancing, battery-powered electric vehicle... *PT* is an abbreviation for personal transporter...Computers, sensors, and electric motors in the base of the Segway PT keep the device upright when powered on with balancing enabled. The rider commands the PT to go forward or backward by shifting their weight forward or backward on the platform... To turn and steer, the rider shifts the handlebar to the left or right.” ([Segway PT](#) Wikipedia page, viewed 28 June 2016)

“The word Segway originated as a brand name for a *personal electronic transportation device*. However, over time, the word has become common terminology to include all makes and brands of this kind of *personal electronic transportation device*. Other brand names include Winglet (Toyota Motor Corporation), Airwheel S3 (Airwheel Australia) and Robstep (Robstep Australia).”

([Segway review discussion paper](#), ACT Government, Justice and Community Safety Directorate, April 2016, p. 4)

For this fact sheet, we use Segway as a generic term as outlined in the definition above.

[Back to top](#)

## Safety

### [Are electric self-balancing scooters safe in vehicle crash accidents?](#)

Xu, J et al., Accident Analysis & Prevention, vol. 87, February 2016, pp. 102-116. Results of this modelling study show that the use of electric self-balancing scooters (ESS) does not pose a higher risk than walking in most vehicle crashes.

### [Evaluation of the effects of a personal mobility vehicle on multiple pedestrians using personal space](#)

Pham, TQ et al., IEEE Transactions on Intelligent Transportation Systems, Volume 16, Issue 4, 2015, pp. 2028-37.

A simulation model was used to study the interaction between a personal mobility vehicle (PMV) and pedestrians and to investigate the effects of a PMV in pedestrian flows using the concept of personal space (PS). Results showed that the invasion of pedestrians' PS and levels of discomfort and fear of PMVs increase with increasing pedestrian density.

### [Injuries following Segway personal transporter accidents: case report and review of the literature](#)

Ashurst, J, Wagner, B, Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health, 16(5), 2015, pp. 693-695.

Only recently have reports been published about serious injuries that have been sustained while operating this device. This case describes a 67-year-old male who sustained an oblique fracture of the shaft of the femur while using the Segway for transportation around his community. Article includes a review of the literature.

### [Serious injuries related to the Segway Personal Transporter : a case series](#)

Boniface, K et al., Annals of Emergency Medicine, 57(4), April 2011, pp. 370-74.

A review of a series of emergency department visits revealed that the severity of trauma in patients injured by the use of Segways is significant. Further investigation into the risks of use is recommended.

### [Operating characteristics of the Segway™ Human Transporter](#)

Miller, S et al., Science Applications International Corporation, Federal Highway Administration, 2010, 68 p.

Report examines the operating characteristics of the Segway Human Transporter (HT), such as acceleration and stopping distance (both planned and unplanned stops) as well as riders' approach speed and clearance distance when navigating around obstacles. Results are intended to support the possible incorporation of Segway HT traffic into the design and regulation of shared-use paths and roadways.

### [An analysis of Segway behavior focusing on safety distance for pedestrians and gaze of riders](#)

Nishiuchi, H et al., 17<sup>th</sup> ITS World Congress, ITS Japan; ITS America; ERTICO, 2010, 11p

This research analyses Segway riders' behaviour through several experiments, such as determining a safe distance from pedestrians, and the movement of gaze of Segway riders using an Eye-Mark recorder equipped with CCD video camera. Results of these experiments could inform decisions on the regulation of Segways in Japan.

[Back to top](#)

## Benefits

### [Use of personal mobility devices for first-and-last mile travel: The Macquarie-Ryde trial](#)

Dowling, R et al., Proceedings of the 2015 Australasian Road Safety Conference, 14 - 16 October, Gold Coast, Australia

Electric-motored personal mobility devices (PMDs) could provide an answer to traffic congestion by getting people out of cars for short trips ("first-and-last mile" travel). City of Ryde council, Macquarie University, and Transport for NSW examined PMD use within the road transport system.

### [Personal mobility sharing: a simulation study](#)

Tomita, K, Hashimoto, N & Matsumoto, O, Transportation Research Board 94<sup>th</sup> annual meeting, 2015.

In this paper, the authors conduct a multi-agent simulation to investigate how human behaviour changes, especially regarding modal shift, when standing mobility units are introduced. Describes experiments conducted in the Mobility Robot Experimental Zone in Tsukuba using a Toyota Winglet and by analysing data collected from questionnaires. The goal of their simulation is to predict and plan for future demand for personal mobility transportation.

### [Electric unicycles, minifarthings and the future of urban transport](#)

Faulks, I et al., The Conversation, 6 May 2013.

Discusses the possibilities of using personal mobility devices, or PMDs, as a solution to urban travel.

### [Measuring the Acceptability of Self-Balancing Two-Wheeled Personal Mobility Vehicles](#)

Li, A & Ando, R, Journal of the Eastern Asia Society for Transportation Studies, Volume 10, Issue 0, 2013, pp. 444-453

This study focuses on the social acceptability of personal mobility vehicles, which is a key factor in their future introduction and implementation. Potential uses of these vehicles include tourism and excursions, short-distance trips in downtown areas, and traversing within buildings.

### [Improving California's Bay area rapid transit district connectivity and access with Segway human transporter and other low-speed mobility devices](#)

Transportation Research Records Journal of the Transportation Research Board, Volume 1927, 2006

An evaluation of the potential for low-speed travel modes including Segways to improve transit access to a Bay Area Rapid Transit District station and surrounding employment centres in California. Describes a proposed field test.

### [Bridging the last mile: a study of the behavioral, institutional, and economic potential of the Segway Human Transporter](#)

Shaheen, S & Finson, R, Transportation Research Board Paper 03-4470, 2004.

Efficient transit station access is often limited in the US, and a more comprehensive approach is needed that offers a range of integrated "door-to-door" mobility services that enhance connectivity, provide customer flexibility, and potentially increase transit ridership. The Segway Human Transporter (Segway HT) is evaluated as an innovative mobility device that could provide such a demand-responsive, easy to use transport mode to link home, work, and other activity destinations.

[Back to top](#)

## **Jurisdictional approaches**

### **ACT**

#### **Status**

Private use prohibited on roads and road-related areas such as footpaths and bicycle paths. Classified as a motor vehicle that does not comply with relevant vehicle standards.

## Reports

[Segway review discussion paper](#)

ACT Government, Justice and Community Safety Directorate, Canberra, ACT, 2016.

Examines the issues relating to the use of Segways and Segway-type vehicles in the ACT and considers whether greater use of these vehicles can be allowed while satisfying safety and amenity considerations.

## NSW

### Status

Prohibited on NSW paths and roads, classed as an unregistered vehicle. They do not comply with the Australian Design Rules (ADRs) therefore are eligible for registration and cannot be used on roads.

For more information see:

<http://www.rms.nsw.gov.au/roads/registration/unregistered.html>

## Reports

[Report on non-registered motorised vehicles](#)

Parliament of New South Wales , Staysafe , 2014.

Report on the increasing use of non-registered motorised vehicles, such as mobility scooters, Segways and electric bicycles, on public roads and footpaths and their impact on road safety.

## Queensland

### Status

Classified under: Personal mobility devices.

Legal to be used on Queensland paths. Rules for use include speed limit of 12km/hr, use of helmet.

For more information see *Rules for personal mobility devices*:

<http://www.qld.gov.au/transport/safety/rules/nonpowered/personal-mobility-devices/index.html>

## Reports

[Segway PT safety: a review of the legislative and safety implications of Segway PT use on or around the road network](#)

Department of Transport and Main Roads 2012. Tabled in Queensland Parliament 2013.

Department of Transport and Main Roads documents relating to the legal use of Segways on Queensland footpaths and bikeways since 1 July 2012 released under Right to Information. Click on links [Part 1 \(PDF, 4.42 MB\)](#) , [Part 2 \(PDF, 6.74 MB\)](#) , [Part 3 \(PDF, 6.74 MB\)](#) , [Part 4 \(PDF, 14.04 MB\)](#) , [Part 5 \(PDF, 6.77 MB\)](#)

## South Australia

### Status

Classified under: Motorised wheeled recreational device.  
Prohibited on paths and roads, classed as an unregistered vehicle.  
For more information see: <http://dpti.sa.gov.au/news/?a=248791>

## Tasmania

### Status

Classified under: wheeled recreational devices.  
Illegal to use a Segway on a public street or path, except as part of a commercial tour. Tour operators can apply for a permit.  
For more information see:  
<http://www.transport.tas.gov.au/registration/information/segways>

### [Motorised self-balancing boards](#)

Media release, Registrar of Motor Vehicles, December 2015.  
Hover boards can only be used in Tasmania on private property with no exceptions.

## Victoria

### Status

Classified under: Motorised personal mobility device.  
Prohibited on paths and roads, classed as an unregistered vehicle.  
For more information see: <https://www.vicroads.vic.gov.au/safety-and-road-rules/road-rules/a-to-z-of-road-rules/motorised-personal-mobility-devices>

## Western Australia

### Status

Classified under: Electric Personal Transporters.  
Prohibited on roads and paths and classed as an unregistered vehicle.  
Can be used as part of a supervised commercial tour with appropriate licence.  
For more information see: <http://preview.transport.wa.gov.au/taxis/novelty-tour-vehicle-licences.asp>

## International

**US states** have adopted [different regulatory approaches](#).

The **Institute for Transportation and Development Policy** published a paper examining the use of motorised two-wheeled vehicles, including Segways, in **Asia** and [suggests](#) areas for regulation and reform.

**Japan's** Ministry of Land, Infrastructure, Transport and Tourism decided to [allow](#) Segways and similar machines on certain public streets.

**Segway** has produced a fact sheet summarising the regulatory status of their vehicles in various [international jurisdictions](#). See also Segway's [Wikipedia page](#) for a list of regulations in international jurisdictions.

[Back to top](#)

**This fact sheet was produced by ARRB Group Library, part of Tranzinfo, the Australian and New Zealand network of land transport libraries. The authors thank the Queensland Department of Transport and Main Roads Library for access to their research.**

### Australia

Air Services Australia Library  
ARRB Group, MG Lay Library  
Arup Library  
Centre for Automotive Safety Research Library  
Commonwealth Department of Infrastructure and Regional Development Library  
Hargrave-Andrew Library, Monash University  
Jacobs Library  
Main Roads Western Australia Library  
Queensland Department of Transport and Main Roads Library  
Transport Library, Transport for NSW  
SA Department of Planning, Transport & Infrastructure Library  
SMEC Library  
Tasmanian Department of State Growth Library  
University of Tasmania Launceston Campus, incorporating former Australian Maritime College Library  
Victorian Government Library Service  
Victorian Transport Accident Commission Library  
WA Department for Transport Library

### New Zealand

Ministry of Transport Library  
New Zealand Transport Agency Library  
Opus International Consultants Library  
Traffic Design Group