

Passenger Space Ratio of Hong Kong Public Transport

The Passenger Space Ratio (PSR) is a measure of the average amount of space available to each passenger. It is calculated by dividing the total passenger capacity of a vehicle by its floor area. On buses, ferries and metros, a higher PSR means a less crowded and more comfortable journey, while a lower PSR often indicates cramped conditions, especially during peak hours.

With one of the highest population densities in the world, Hong Kong's public transport (e.g. MTR, buses and ferries) is designed to optimise space. Are they designed to ensure a relatively comfortable journey for passengers? In addition, in an era of social distancing, PSR has become even more important as it relates to passenger safety and minimising health risks in public transport environments.

We collect the dimensions and capacity of different public transport and calculate their PSR:

Public transport	Floor dimension	Capcaity	PSR (m ² /ppl)
Taxi (Toyota Crown)	2.3m × 1.73m	5	0.80
Minibus (Toyota Coaster)	6.2m × 2.0m	17	0.73
Bus (Dennis Trident)	12.8m × 2.55m × 2	Upper: 63	0.52
		Lower: 84	0.39
Ferry (Star Ferry)	33.8m × 8.6m × 2	400	1.45
MTR (URL Q-Train)	180m × 3.2m	Seats: 312	1.85
		Stand: 3480	0.17
Airplane (Airbus-A350)	46.8m × 5.6m	314	0.83

(Note: As Hong Kong citizens love travelling, we include the PSR of an airplane).

An academic suggested that the PSR of vehicles with all passengers seated should be between 0.51 and 1.0, while a comfortable standing load should be between 0.36 and 0.50. We find that all public transport in Hong Kong meets the standard, except for the MTR during peak hours. In conclusion, Hong Kong's public transport system has high ridership and high standards. Our transport system remains one of the most efficient in the world.

Reference:

- Li, Zheng & Hensher, David. (2013). Crowding in Public Transport: A Review of Objective and Subjective Measures. Journal of Public Transportation. 16. 107-134. <https://doi.org/10.5038/2375-0901.16.2.6>.
- https://en.wikipedia.org/wiki/Toyota_Comfort
- https://www.citybus.com.hk/tc/uploadedPublication/7261_Dec%202014_P16.pdf
- https://en.wikipedia.org/wiki/Toyota_Coaster
- <https://hkferry.fandom.com/zh/wiki/%E5%A4%A9%E6%98%9F%E5%B0%8F%E8%BC%AA?variant=zh-hk>
- <https://www.starferry.com.hk/tc/Classic>
- https://en.wikipedia.org/wiki/MTR_Urban_Lines_Vision_Train
- https://en.wikipedia.org/wiki/Airbus_A350

Credit:

- Picture of the Star Ferry on the poster is adapted from the work of Star Ferry 4th Generation - 3D model by Jeremychit, available at <https://sketchfab.com/3d-models/star-ferry-4th-generation-205e3b9de21d4c728998ca4e963289cf>