
**Smart community infrastructures —
Smart transportation by autonomous
vehicles on public roads**

*Infrastructures urbaines intelligentes — Transport intelligent par
véhicules autonomes sur la voie publique*



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Introduction

Various countries are facing critical issues as their population ages, often at a rate higher than expected. One of the challenges is the shortage of manpower, where many sectors, including transportation, face constraints. At the same time, as their economic activities expand, travel demands have also become more diversified, thus imposing additional demand on transportation networks. These challenges are especially acute for cities, where increased transportation needs have brought about traffic congestion and led to a lower quality of life.

To overcome such challenges, cities have tried to improve transportation systems in a variety of ways, investing in mass transit ranging from light rail transit to metro as well as public bus services. In mass transit, Automatic Train Operation (ATO) has been widely used for decades. ATO are mostly deployed at grade of automation 4, i.e. Unattended Train Operation (UTO), where the system is fully run without any staff on board, as introduced in the metro systems in Barcelona, Copenhagen, Hong Kong, Sao Paulo, Singapore, Tokyo and Vancouver.

Beyond mass transit, transportation services on public roads have potential to be automated as well. Autonomous shuttle services are in operation as a means to provide first and last mile connectivity between transport nodes and homes or workplaces as well as transport services within designated areas such as campuses, parks and neighbourhoods. Such services have already been deployed in Beijing, Las Vegas, Melbourne, Nice and Singapore.

Smart transportation by autonomous vehicles will work as a solution to transportation issues and concerns in cities. However, the outcomes can be achieved only when autonomous vehicles are applied under organised conditions with safety as a top priority. This document describes the concept of smart transportation and aims to accelerate the proper introduction of autonomous vehicles onto public roads.

NOTE 1 As of November 2021, there are no international or national standards published on the basic behaviour and safety of autonomous vehicles operating on public roads except for the Singapore Technical Reference (TR) 68 series, the summaries of which are available in [Annex A](#) for information.

NOTE 2 For autonomous vehicle introduction into on-demand responsive passenger services with shared vehicles, ISO 37168 can be useful.