INTERNATIONAL STANDARD

ISO 37158

First edition
2019-07

Smart community infrastructures — Smart transportation using battery-powered buses for passenger services

Infrastructures urbaines intelligentes — Transport intelligent utilisant des bus alimentés par des batteries pour le transport de voyageurs

Reference number
ISO 37158:2019(E)

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Published in Switzerland

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Foreword

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This document was prepared by Technical Committee ISO/TC 268, *Sustainable cities and communities*, Subcommittee SC 1, *Smart community infrastructures*.

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Introduction

City centres, often small areas, are frequently congested with internal-combustion-engine-driven vehicles. This creates significant city issues, including air pollution from greenhouse gases (GHGs) and irritation to citizens from noise and vibration. The number of internal-combustion-engine-driven private vehicles nowadays is small. Heavy trucks, which are commonly driven by internal combustion engines, are not allowed in city centres. Thus, the main source of such air pollution and environmental irritation is now commercial vehicles, i.e. buses equipped with internal combustion engines (see Annex A). Fuel energy is more efficiently converted to driving forces by motors consuming electric power generated from fuel than by engines directly burning fuel. Therefore, motor-driven or battery-powered buses are suitable options for transportation vehicles.

Bus transportation systems offer convenient and casual transport for citizens in all cities as they can operate in narrow streets in accordance with passenger flow changes in a city and require minimum facilities for bus stops. However, although bus journeys are popular among citizens, the ride comfort is not always of a high quality due to sudden stops to avoid collisions or traffic accidents, and irritating jerky movements caused by the traction mechanism in the internal combustion engine driving systems. Such behaviour can give passengers motion sickness or discomfort or even lead to injuries.

At the same time as promoting modal shifts from conventional to alternative systems, service performance and quality should be maintained or improved, in particular regarding low environmental impact, safe and steady operation and passenger ride comfort. Battery-powered bus transportation systems are now commonly used for short-distance transportation and contribute to solving the issues mentioned previously in a number of cities across the world (see Annex B).