
**Smart community infrastructures —
Smart transportation for energy
saving operation by intentionally
driving slowly**

*Infrastructures urbaines intelligentes — Transport intelligent
pour une exploitation économe en énergie par une conduite lente
intentionnelle*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Energy savings is a priority issue for all cities. ISO 37154, and especially ISO 37161, has addressed how, where and in what situations energy consumed in transportation services can be saved.

Rail services are indispensable as one of the most efficient means to convey people, delivery items and freight within cities, between cities and in a large city zone. Rail services are comprised of many service and technical aspects. To save energy in rail services, there are many options to review for improving energy efficiency. Energy savings by slowing the speed of the train and still achieving minimum service schedules is a method that is frequently employed. This method of operation is applicable to other transportation services or modes that are based on scheduling. Energy saving by modifying speed profiles offers great energy savings when widely applied to all transportation services.

The principle of this method is rather simple. All trains, buses, trucks and ferries typically run on a service line or sailing route at the maximum speed technically allowed. Reducing the running speed will reduce the energy consumption. Commonly, all transportation modes, passengers and freight, are scheduled to include standing-by time to provide passengers and freight shippers with convenient service schedules, providing good connections and avoiding odd time for pickup and delivery. Service schedules can be designated so that when passing another service at a station with more tracks or lanes on a single-track line or traffic road, or at a wider point on a narrow sailing route, a train, bus, truck or ferry should come to the station or point by the time designated. If the designated arriving time is set later than the expected arrival time at a maximum speed, the train or other transportation mode can run slower. Overall, this will lead to a reduction in the amount of energy to be consumed.

Slow running avoids high acceleration and deceleration, compared to when running at a higher speed. Passenger-friendly driving will additionally be realized when operating in this energy saving method. From an environmental standpoint, slow running will contribute to a reduction in carbon monoxide emission, hydrocarbons, nitrogen oxides, sulphur oxides, lead and aromatic compounds, if services by engine-driven vehicles.

This document describes how to save energy in scheduled transportation services by modifying speed profiles.

In the development of this document, ISO Guide 82 has been taken into account in addressing sustainability issues.

Smart community infrastructures — Smart transportation for energy saving operation by intentionally driving slowly

1 Scope

This document describes how to organize smart transportation to save energy consumed in operation, by modifying speed profiles of trains, buses, trucks and ferries, which is also able to offer passenger-friendly driving of transportation vehicles.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

transportation dispatch

services operated by using vehicles along with *service schedules* (3.2)

Note 1 to entry: The vehicles used are normally trains, buses, trucks, ferries and others as listed in ISO 37154, 5.2.4.

3.2

service schedule

timetable to be followed when driving for *transportation dispatch* (3.1)

3.3

section

tracks, lanes or sailing routes active for operation of *transportation dispatch* (3.1) between stations, stops or terminals

Note 1 to entry: In sailing routes, way points can be placed between ferry terminals to ensure on-time operation if a long distance between terminals. In this case, the route between way points is a section.

3.4

line

sections (3.3) combined

3.5

route

lines (3.4) or part thereof that are combined for through transportation services between lines

3.6

division

specific parts created and identified on a line or route by dividing a *section* (3.3) thereon to gradually change running speed in a section