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# Intelligent transport systems — Indoor navigation for personal and vehicle ITS station —

## Part 1: General information and use case definition

*Systèmes de transport intelligents — Navigation interne pour station personelle et véhicule ITS —*

*Partie 1: Informations générales et définition des cas d'utilisation*

Reference number
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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

ISO 17438 consists of the following parts, under the general title *Intelligent transport systems — Indoor navigation for personal and vehicle ITS station*:

— *Part 1: General information and use case definition*

The following parts are planned:

— *Part 2: Requirements and specifications for indoor map data format*

— *Part 3: Requirements and specifications for indoor positioning reference data format*

— *Part 4: P/V and central ITS stations interface requirements and specifications for indoor positioning and map data*

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# Introduction

This part of ISO 17438 defines requirements and specifications for the indoor map data format, positioning reference data, and interface between the P/V ITS station and central ITS station to support indoor navigation.

Applications supporting indoor navigation for personal and vehicle ITS stations need to obtain indoor map data and positioning reference data through the existing ITS station components.

The following standards are subject to analysis regarding their applicability in supporting indoor navigation service provision.

— ISO/TR 10992, *Intelligent transport systems — Use of nomadic and portable devices to support ITS service and multimedia provision in vehicles*

— ISO 14825, *Intelligent transport systems — Geographic Data Files (GDF) — GDF5.0*

— OGC 10-191r1, *Requirements and Space-Event Modelling for Indoor Navigation*

— OGC 12-019, *OGC City Geography Markup Language (CityGML) Encoding Standard*

— CEN/TS 00278207, *Identification of Fixed Objects in Public Transport*

— ISO 24099, *Navigation data delivery structures and protocols*


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# Intelligent transport systems — Indoor navigation for personal and vehicle ITS station —

# Part 1:
# General information and use case definition

## 1 Scope

This part of ISO 17438 specifies the indoor navigation system architecture including additional components that are added to the existing ITS system and use cases in providing indoor navigation to various types of users including drivers, passengers, and pedestrians using personal and vehicle ITS stations.

— The personal and vehicle ITS station in the role of end user terminal running indoor navigation functionality.

— Indoor map containing indoor geometry, network topology, and POI data reflecting characteristics of indoor space.

— Indoor positioning reference data containing information of positioning infrastructure: WiFi AP, RFID Reader, Bluetooth AP, etc.

— Data providers to provision the indoor map or indoor positioning reference data.

— Indoor data server registry to provision the information of indoor data server.

— Indoor positioning functionality in the personal and vehicle ITS station using indoor positioning reference data.

— Indoor positioning functionality in the central ITS station using indoor positioning reference data.

— Interface between the P/V ITS station and central ITS station to communicate indoor map data and indoor positioning reference data.

This part of ISO 17438 includes “General Information”, which provides a general overview and structure of each part of ISO 17438. It also specifies “Use Cases” related to the indoor navigation for personal and vehicle ITS stations.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TR 10992, *Intelligent transport systems — Use of nomadic and portable devices to support ITS service and multimedia provision in vehicles*

## 3 Terms, definitions, symbols, and abbreviated terms

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TR 10992 and the following apply.

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**3.1.1**
**indoor navigation**
location-based service to guide user to destination using *indoor map data* (3.1.3) and the current location of the user in *indoor space* (3.1.2)

**3.1.2**
**indoor space**
area limited to an artificial structure (building, tunnel, etc.) and not available to conventional satellite-based positioning systems such as GPS

**3.1.3**
**indoor map data**
data to present information about *indoor space* (3.1.2)

Note 1 to entry: It includes indoor geometry, network topology, and POI data.

**3.1.4**
**indoor positioning reference data**
group of information that can be used to determine a P/V ITS station or user's position

Note 1 to entry: Detailed compositions vary depending on the positioning technologies, such as WiFi, RFID, etc.

**3.1.5**
**indoor positioning**
process of deciding location of P/V ITS station in the *indoor space* (3.1.2)

**3.1.6**
**indoor-outdoor seamless navigation**
route guidance service between indoor and outdoor environments and/or vice versa

## 3.2 Abbreviated terms

GPS Global Positioning System

OGC Open Geospatial Consortium

PND Personal Navigation Device

POI Point Of Interest

P/V Personal/Vehicle

RFID Radio Frequency Identification

RG Route Guidance

RP Route Planning

TBT Turn By Turn

XML Extensible Mark-up Language

# 4 General information

## 4.1 Document overview and structure

ISO 17438 provides all documents and references required to support the implementation of indoor navigation. ISO 17438 consists of the following documents.

— Part 1: General information and use case definitions


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