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Intelligent transport systems — Seamless positioning for multimodal transportation in ITS stations —

Part 2: Nomadic and mobile device dataset for positioning data fusion

Systèmes de transport intelligents — Positionnement homogène pour le transport multimodal dans les stations ITS —
Partie 2: Ensemble de données d'appareils nomades et mobiles pour la fusion de données de positionnement

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

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Introduction

As new forms of mobility services (e.g. e-mobility, delivery robot, autonomous driving) are emerging in the intelligent transport systems (ITS) industry, the role of the nomadic device is becoming indispensable. Currently, mobility service platforms use position data gathered via the nomadic devices of the passengers, and positioning systems rely on global navigation satellite system (GNSS) technology. The functionality of the system is occasionally constrained by network interference, GNSS-denied environments and data loss. A seamless positioning system would enable interoperability between ITS domains to provide a seamless location-based service.

The main objective of a seamless positioning system is to support the development of a robust and ubiquitous indoor and outdoor seamless positioning solution for a mobile user (e.g. multimodal transportation) so that anyone can experience mobility services regardless of location, environment and disabilities.

The seamless positioning system consists of three domains:

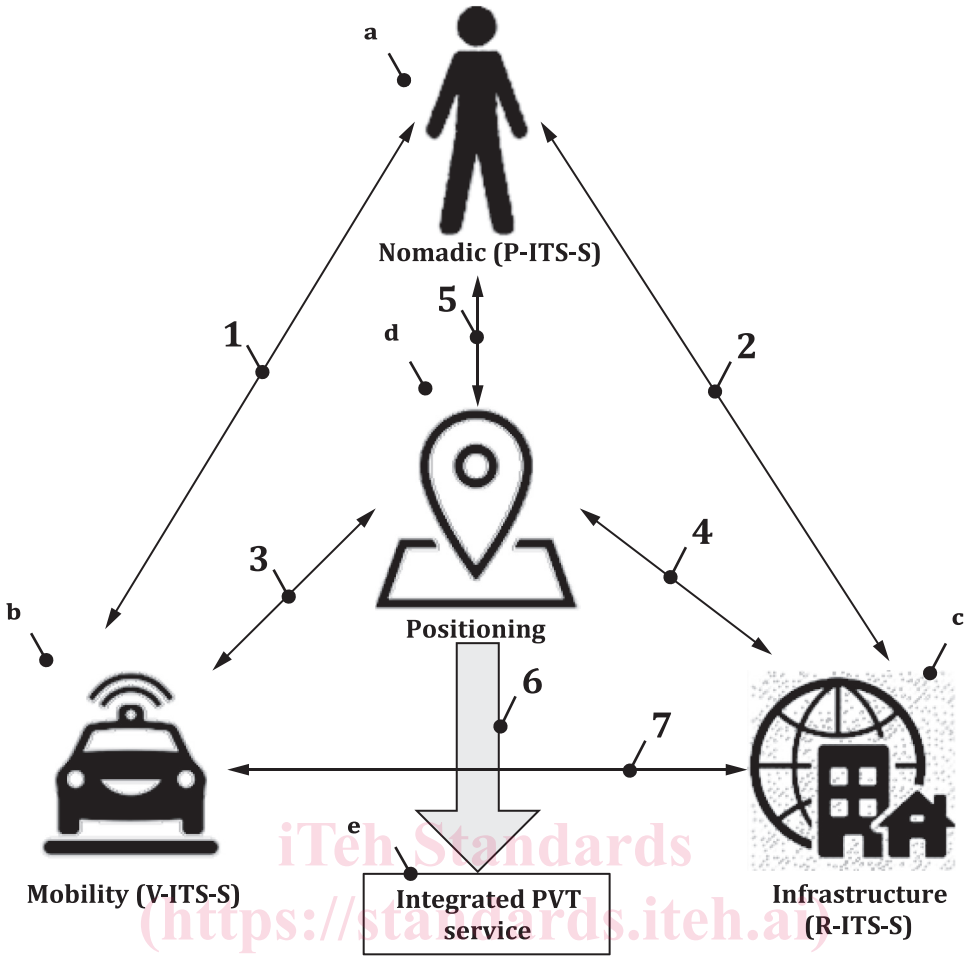
— nomadic device [e.g. personal intelligent transport system station (P-ITS-S)],

— mobility [e.g. vehicle intelligent transport system station (V-ITS-S)], and

— infrastructure [e.g. roadside intelligent transport system station (R-ITS-S)].

The system integrates multiple data from different domains and provides positioning data (e.g. position, velocity, time service implemented in the ITS-S) in a seamless manner.

Figure 1 shows the seamless positioning system.



Key

1 exchange of data between P-ITS-S and mobility containing mobility/personal data and network environment
2 exchange of data between P-ITS-S and infrastructure containing personal data and infrastructure information
3 exchange of data between mobility end and sensor-fusion positioning application
4 exchange of data between infrastructure end and sensor-fusion positioning application
5 exchange of data between P-ITS-S and sensor-fusion positioning application
6 seamless positioning calculation
7 positioning exchange use cases
a The P-ITS domain is represented by ITS-compliant nomadic devices carried by human beings.
b The V-ITS domain is represented by ITS-compliant vehicles.
c The R-ITS domain is represented by ITS-compliant roadside infrastructure devices.
d Positioning domain of all devices in P-ITS, V-ITS and R-ITS domain.
e Outcome is the integrated position, velocity and time service provision.

Figure 1 — Seamless positioning system