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Intelligent transport systems — Use cases for sharing of probe data

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CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
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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 204, *Intelligent transport systems.*

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.

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Introduction

When discussing transportation systems, much attention has been paid to safety, comfort, impacts on the environment and energy efficiency. The use of probe data (specified in ISO 22837) is a key factor in dealing with the above issues.

Probe vehicle data are collected through various vehicles in an ITS system, but the data are typically used only for a specific application by the service provider. To boost efficiency, it is recommended that the vehicle probe data be shared by various service applications through common databases.

Current probe vehicle systems collect and use data, but do not share data with other ITS service applications. Vehicle probe data are valuable for all related services and limiting the use of such data to within one service only ought to be avoided for efficient data use. Sharing probe data among service providers enhances quality of service, as the probe data collected through the sensors and other sources can be utilized by other service providers.

As an example, shared common database can be used for new services, such as an advanced notification safety information provision service, by utilizing roadside sensor data collected by a road authority. Many other new services can be added as the number of CAV (connected and automated vehicle) increases.

This document describes probe data sharing use cases so that additional service can be developed by sharing probe data collected by various probe vehicle systems.

The functionalities of a probe vehicle system (PVS) can be implemented in an ITS station unit according to ISO 21217 and support application protocols specified in other standards. Examples of such protocols are the local dynamic map (LDM) specified in ISO/TS 18750, and generic ITS station facilities layer services specified in ISO/TS 17429. The service architecture classifies ITS services including PVS, and this classification also defines service domains for cooperation between PVSs.

It is noted that this document does not prescribe a physical communication medium for transmitting data/information to or from vehicles. This document is intended to be independent of any communication medium and to be compatible with any medium that is selected by the system developers.

In addition, this document focuses only on the framework for vehicle probe data sharing use cases.

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Intelligent transport systems — Use cases for sharing of probe data

1 Scope

This document describes various use cases for the sharing of probe vehicle data as a common platform for smart city instantiation. When modernizing a city towards a smart city, it is necessary for information flows across various fields, such as transportation, healthcare, energy, water and other government services, to be effectively managed and shared. Despite efforts from many cities, integrating all databases related to all services has proven to be a cumbersome task. One challenge is the lack of a systematic way that can be modelled for data sharing. The ITS data sharing model for vehicle probe data can serve as the basis for instigating this type of work. To elaborate how vehicle probe data work can be applied to achieve this objective, this document:

— gathers use cases and examples of vehicle probe data sharing around the world, and

— provides use cases for data sharing that are appropriate for smart city ITS mobility solutions.

By examining these use cases and current and planned data sharing practices around the world, this document demonstrates how this mechanism can help implement many smart city applications.

This document also shows that by combining the vehicle probe data with roadside sensor data, and other important public and private data sources, the services can be operated more effectively.

Data collection methods and data or information provisioning are beyond the scope this document. Specifically, this document does not describe items related to the vehicle probe data collection nor the vehicle probe data provision activities as specified by other existing standards such as ISO 19414.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14812:—[1)], *Intelligent transport systems — Vocabulary*

ISO 19414, *Intelligent transport systems — Service architecture of probe vehicle systems*

ISO 22837, *Vehicle probe data for wide area communications*

ISO 24100, *Intelligent transport systems — Basic principles for personal data protection in probe vehicle information services*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14812, ISO 19414, ISO 22837, ISO 24100 and the following apply.

ISO and IEC maintain terminology 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/

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