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Intelligent transport systems - Urban ITS - Communication interfaces and profiles for traffic management

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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Intelligent transport systems - Urban ITS - Communication interfaces and profiles for traffic management

Systèmes de transport intelligents - Systèmes de gestion du trafic - Interfaces et informations sur la MT

Intelligente Verkehrssysteme - Verkehrsmanagement-Systeme - TM-Schnittstellen und Informationen

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European foreword

This document (CEN/TS 17466:2020) has been prepared by Technical Committee CEN/TC 278 "Intelligent transport systems", the secretariat of which is held by NEN.

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Introduction

General deployment of Intelligent Transport Systems (ITS) in the field of road transport and for interfaces with other modes of transport is demanded by the Directive 2010/40/EU [3] of the European Parliament. ITS means “applying information technology and communications technology (ICT) for improving traffic, especially road traffic”.

Urban Intelligent Transport Systems (U-ITS) is a term indicating the provisioning of ITS services applying ITS technologies in an urban context. Development of standards dedicated to U-ITS is supported by the European Commission's mandate M/546 [2] with technical details identified in the final report [1] of project team PT1701. U-ITS standards will complement those for cooperative ITS (C-ITS) developed under the European Commission's mandate M/453, see [4].

NOTE Basic ITS technologies applied for U-ITS can be the same as those applied for C-ITS.

Provisioning of ITS services typically may require communications between ITS station units (ITS-SU) specified in ISO 21217:2014. Diverging requirements for communications and limitations of capabilities of available communication channels led to the concept of Hybrid Communications providing multiple communication protocol stacks with different access technologies and communications protocols for localized communications and networked communications together with the capability of handover, specified in a series of standards, e.g. ISO 21217:2014, ISO 21218 [30], EN ISO 17423 [20], ISO 24102-6 [31], ISO 21215 [29], ISO 17515-3 [22], ISO 21210 [28], ISO 29281-1 [32], and others.

A major characteristic of C-ITS is the sharing of data between ITS applications in the same ITS-SU and in different ITS-SUs. A major service domain of C-ITS is the domain of road safety and traffic efficiency, with a certain focus on wireless communications between ITS-SUs installed in vehicles, also referred to as Vehicle ITS-SU (V-ITS-SU), and wireless communications between V-ITS-SUs and ITS-SUs installed at the roadside, also referred to as Roadside ITS-SU (R-ITS-SU).

Although there are differences between U-ITS and C-ITS with respect of target service domains (data and procedures necessary for the provisioning of dedicated urban ITS services), data and procedures developed for C-ITS might also be beneficially applied in U-ITS.

Whilst C-ITS currently largely focuses on the road safety domain, U-ITS deals with the ITS service domains

— Multimodal Information Systems;

— Traffic Management;

— Urban Logistics;

see [1].

A major goal to be achieved with U-ITS standards is to assist urban administration to implement U-ITS, and removing barriers for implementing U-ITS, see CEN/TR 17143 [1].

A precise definition of the borderline between U-ITS and ITS for other target domains, e.g. ITS on highways, is impossible. However, this document aims on identifying and specifying ITS issues that are relevant for urban administrations. It is important to understand that ITS issues developed for urban areas also may be applicable outside of urban areas.

Development of standards for U-ITS has to consider automated and autonomous vehicles [1], and the work on data and message specifications performed under the name of DATEX for data exchange between central stations and between a central station and a service provider.

The present document was developed by project team PT1710 funded by the European Commission under grant agreement SA/CEN/GROW/EFTA/546/2016-10 'Urban ITS Traffic Management data

models' (M/546 [2]). The scope of the present document results from the High Level Recommendation "1701-HLRd Traffic Management Data Models and interfaces" identified in CEN/TR 17143 [1].

The present document is about communications interfaces and profiles applicable for U-ITS with a focus on communications between central stations, i.e. Central ITS-SUs (C-ITS-SUs). Such C-ITS-SUs can be part of e.g. central traffic management centres, centres from authorities, centres from service providers. The communication profile definitions presented in this document are based on the methodology being specified in ISO/TS 21185.

Data definitions are outside the scope of this document and are developed within other PTs funded under M/546 [2].

1 Scope

This document identifies traffic management interfaces between central stations and specifies related ITS communication profiles enabling standardized data exchange over these communication interfaces, applicable for a variety of platforms including ITS station units (ITS-SUs) compliant with ISO 21217:2014. This document further specifies requirements on encoding of data.

These traffic management interfaces enable

— the provision of appropriate and relevant traffic information, e.g. congestion and travel times, to users across a variety of platforms;

— exchange of data such as:

  — network performance data, e.g. traffic conditions, travel times, and

  — planned and unplanned events and incidents, e.g.

    — roadworks,

    — closures of roads, bridges, and tunnels,

    — bad weather,

    — road surface conditions.

This document recognizes specifications from DATEX II in order to avoid duplicate specifications. In doing so, this document aligns with existing products of CEN/TC 278/WG 8 and the additional work being undertaken within the DATEX community.

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/TS 21177, *Intelligent transport systems — ITS station security services for secure session establishment and authentication between trusted devices*

ISO/TS 21185, *Intelligent transport systems — Communication profiles for secure connections between trusted devices*

ISO 21217:2014, *Intelligent transport systems — Communications access for land mobiles (CALM) — Architecture*

EN 16157-1:2018, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 1: Context and framework*