ICS 03.220.20, 35.240.60 PREDBEŽNÁ SLOVENSKÁ TECHNICKÁ NORMA November 2019

STN P	**Inteligentné dopravné systémy (IDS) Kooperatívne IDS Použitie komunikácie V2I a I2V na aplikácie súvisiace so svetelnými križovatkami (ISO/TS 19091: 2019)**	**STN P CEN ISO/TS 19091** 01 8665

Intelligent transport systems - Cooperative ITS - Using V2I and I2V communications for applications related to signalized intersections (ISO/TS 19091:2019)

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

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/19

Táto predbežná STN je určená na overenie. Pripomienky zasielajte ÚNMS SR najneskôr do októbra 2021.

Obsahuje: CEN ISO/TS 19091:2019, ISO/TS 19091:2019

Oznámením tejto normy sa ruší
STN P CEN ISO/TS 19091 (01 8665) zo septembra 2017

129580

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN ISO/TS 19091

July 2019

ICS 03.220.20; 35.240.60 Supersedes CEN ISO/TS 19091:2017

English Version

Intelligent transport systems - Cooperative ITS - Using V2I and I2V communications for applications related to signalized intersections (ISO/TS 19091:2019)

Systèmes intelligents de transport - Coopérative ITS - Utilisation de communications V2I et I2V pour des applications relatives aux intersections signalées (ISO/TS 19091:2019)

Intelligente Transportsysteme - Kooperative ITS - Nutzung von V2I und I2V-Kommunikation für Anwendungen bezogen auf Signalanlagen an Kreuzungen (ISO/TS 19091:2019)

This Technical Specification (CEN/TS) was approved by CEN on 14 June 2019 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. CEN ISO/TS 19091:2019 E

Contents

Page

European foreword

This document (CEN ISO/TS 19091:2019) has been prepared by Technical Committee ISO/TC 204 "Intelligent transport systems" in collaboration with Technical Committee CEN/TC 278 “Intelligent transport systems” the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN ISO/TS 19091:2017.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO/TS 19091:2019 has been approved by CEN as CEN ISO/TS 19091:2019 without any modification.

TECHNICAL SPECIFICATION

ISO/TS 19091

Second edition
2019-06

Intelligent transport systems — Cooperative ITS — Using V2I and I2V communications for applications related to signalized intersections

Systèmes intelligents de transport — Coopérative ITS — Utilisation de communications V2I et I2V pour des applications relatives aux intersections signalées

Reference number
ISO/TS 19091:2019(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents Page

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*.

This second edition cancels and replaces the first edition (ISO/TS 19091:2017), which has been technically revised.

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

Cooperative-ITS (C-ITS) is a promising and remarkable advancement of intelligent transport systems (ITS). Numerous cooperative applications are specified that open up new possibilities to make traffic safer, more efficient, and smarter. Technologies are developed and improved to realize and support those new services and applications. To enable those applications, information needs to be reliably communicated between the stationary infrastructure and mobile vehicles.

This document describes the use cases for several applications that address safety, mobility, and ecological sustainability. Each use case has information needs that communication between vehicles and the infrastructure facilitate. It then identifies the information needs for the applications and the requirements to satisfy them. In turn, it maps the requirements into data frames and data elements to fulfil the requirements within the specified message set.

ISO 22951 has a relationship to this document. PRESTO addresses its user needs through the implementation of a specific system architecture similar to that described in NTCIP 1211. This architecture includes traffic signals, message signs, routing systems, human machine interfaces, and fixed detection locations. Many of PRESTO's data value details are “left undefined to allow for discretional definition by each country.” The PRESTO architecture detects priority requesting vehicles by installing specific detection equipment at these locations.

This document uses a similar set of user needs to develop the message set between vehicles and the roadside equipment they interface. This document does not address the system architecture other than data needed to fulfil the user needs that will be managed elsewhere in the architecture. It details data values and structures in order to define the interface between these two devices. Routing information is supported in the architecture through other mechanisms and is not a need supported by the vehicle to roadside equipment information flows. The user needs also provide for priority by approach, a preconfigured strategy, and ingress/egress lane requests. This document is based on vehicles periodically broadcasting their location and trajectory information to other vehicles and the roadside infrastructure. This document complements ISO 22951 as it provides for vehicle location and request information directly from connected vehicles rather than the detection of the vehicles from other fixed sensing equipment. It does not address the architecture data flows and operations that are detailed within ISO 22951. In other terms, this document provides a connected vehicle alternative for request and status communication without impacting the back office or local intersection operations of priority management.

Intelligent transport systems — Cooperative ITS — Using V2I and I2V communications for applications related to signalized intersections

1 Scope

This document defines the message, data structures, and data elements to support exchanges between the roadside equipment and vehicles to address applications to improve safety, mobility and environmental efficiency. In order to verify that the defined messages will satisfy these applications, a systems engineering process has been employed that traces use cases to requirements and requirements to messages and data concepts.

This document consists of a single document that contains the base specification and a series of annexes. The base specification lists the derived information requirements (labelled informative) and references to other standards for message definitions where available. Annex A contains descriptions of the use cases addressed by this document. Annexes B and C contain traceability matrices that relate use cases to requirements and requirements to the message definitions (i.e. data frames and data elements). The next annexes list the base message requirements and application-oriented specific requirements (requirements traceability matrix) that map to the message and data concepts to be implemented. As such, an implementation consists of the base plus an additional group of extensions within this document.

Details on information requirements, for other than SPaT, MAP, SSM, and SRM messages are provided in other International Standards. The focus of this document is to specify the details of the SPaT, MAP, SSM, and SRM supporting the use cases defined in this document. Adoption of these messages varies by region and their adoption can occur over a significant time period.

This document covers the interface between roadside equipment and vehicles. Applications, their internal algorithms, and the logical distribution of application functionality over any specific system architecture are outside the scope of this document.

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.

NOTE As this document contains multiple profiles, the reference's associated profile(s) are listed within braces.

ISO 22951, *Data dictionary and message sets for preemption and prioritization signal systems for emergency and public transport vehicles (PRESTO) {A, B}*

ISO 26684, *Intelligent transport systems (ITS) — Cooperative intersection signal information and violation warning systems (CIWS) — Performance requirements and test procedures {B}*

SAE J2735:2016, *Dedicated Short Range Communications (DSRC) Message Set Dictionary {A, B, C}*

ARIB STD-T109, *700 MHz Band Intelligent Transport Systems {B}*

ITS FORUM RC-010, *700 MHz Band Intelligent Transport Systems — Extended Functions Guideline, published on March 15, 2012 {B}*

ETSI/TS 102 894-2 V1.3.1, *Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer; common data dictionary {C}*

