
**Intelligent transport systems —
Cooperative systems — Contextual
speeds**

*Systèmes intelligents de transport — Systèmes coopératifs — Vitesses
contextuelles*



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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).

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

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*.

Introduction

Traditional fixed speed limits have, in general, been set as the maximum mandatory speed that a vehicle or a category of vehicles can travel at. Such speed limits are defined by the competent authority. Some national authorities moderate mandatory speed limits when road or environment conditions change. When road or environmental conditions change, the decision as to the most appropriate speed a driver or rider should travel is, in general, left up to the individual vehicle driver. With the advent of Cooperative Intelligent Transport Systems (ITS), it has become possible to provide better guidance to vehicle drivers on what speed they should travel at when road, traffic, or environmental conditions are less than ideal. This function is known as Contextual Speed Information Service.

Delivering Contextual Speed information to road users can improve road safety, support traffic management, and reduce greenhouse gas emissions.

In a Cooperative ITS environment, Contextual Speeds are context-dependent (e.g. changed due to weather conditions), as well as time-specific and road section-specific speeds. Subject to local regulations, they can be mandatory speed limits or advisory speeds.

All Cooperative ITS Services follow the same abstract structure of detection (of an event) including pre-processing of the detected content, execution of the Service algorithm (processing of detected content) and presentation or utilization of the Service result. [Figure 1](#) summarizes and further illustrates this process.

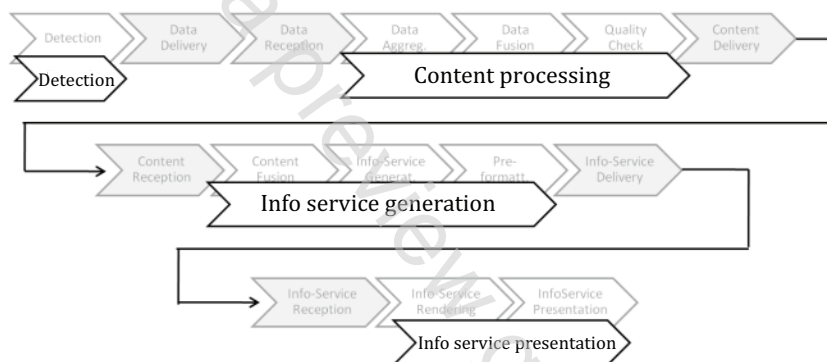


Figure 1 — General Cooperative ITS Service process (from ISO/TS 17427:2014, Figure A.6)

Based on this abstract process description, for any Cooperative ITS Service, a similar process description applies to the Contextual Speed Information Service. Every single step in the process chain can be executed by different actors or stakeholders. Execution of process elements by different stakeholders results in a large number of possible potential scenarios. Additionally, the involvement of stakeholders can be distinguished by spatial geography.

Assuming that there are two main stakeholder groups in Cooperative ITS, namely the Infrastructure and the Vehicle, multiple combinations are possible, as every step can be delivered by a different stakeholder group (see [Figure 2](#)).

	CONTENT	SERVICE	PRESENTATION		CONTENT	SERVICE	PRESENTATION
1	Vehicle	Vehicle	Vehicle	5	Infrastructure	Vehicle	Vehicle
2	Vehicle	Vehicle	Infrastructure	6	Infrastructure	Vehicle	Infrastructure
3	Vehicle	Infrastructure	Vehicle	7	Infrastructure	Infrastructure	Vehicle
4	Vehicle	Infrastructure	Infrastructure	8	Infrastructure	Infrastructure	Infrastructure

Figure 2 — Possible scenarios — Simple

The scenarios address different combinations; the basis for every scenario is one specific combination. This Technical Specification addresses the scenario where detection, content pre-processing, and information service generation is the responsibility of the infrastructure stakeholder. The direct presentation of Contextual Speed information on the driver interface of the vehicle is out of the scope of this Technical Specification. This Technical Specification therefore addresses only part of the whole process (Scenario 7).

Within the context of Scenario 7, this Technical Specification addresses Use Case 1 “Provision of mandatory speed limit information into vehicle – for driver awareness purposes” and Use Case 2 “Provision of advisory speed information into vehicle – for driver awareness purposes”.

This does not preclude other Use Cases or deployment models in later Technical Specification(s).

Intelligent transport systems — Cooperative systems — Contextual speeds

1 Scope

This Technical Specification

- specifies the Contextual Speed Information Service, namely the general requirements regarding the provision of the Contextual Speed Information Service, the data flow supporting the service, and the presentation of the service result,
- specifies the requirements to be fulfilled by the Contextual Speed Information Service,
- specifies the ITS Station (ITS-S) application processes of the vehicle ITS station, roadside ITS station, central ITS station, and personal ITS station that are required to instantiate the Contextual Speed Information Service,
- specifies sets of communication requirements and objectives (profiles) using the methods defined in ISO 17423 to select the level of performance (best effort or real-time, etc.), confidence and security (authentication, encryption, etc.) for each Contextual Speed Information Service communication flow between ITS stations,
- selects relevant functions and procedures provided by the ITS station facilities layer (see ISO 17429), and
- specifies messages, messages sets structure, content, and syntax to be used by the Contextual Speed Information Service.

This Technical Specification considers the scenario for the transmission of Contextual Speed information from the infrastructure/roadside to the vehicle, for onward presentation to the vehicle's driver. This scenario foresees that the calculation of Contextual Speed information is performed on the Infrastructure side, not within the vehicle.

Mandatory speed limits or advisory speed recommendations are output of the Contextual Speed Information Service which (in the scenario considered in this Technical Specification) is run by the Road Operator in its Traffic Control Centre or comparable infrastructure (e.g. Roadside ITS Station). To transfer this information to the vehicle (and therefore the driver) over the air (wireless communication), defined messages are required. These messages are specified in this Technical Specification.

When Contextual Speed information arrives in the vehicle, further pre-processing might be necessary before the Contextual Speed information, and, if available, additional explanations on speed limits or recommendations, can be presented to the driver. This Technical Specification specifies the requirements that need to be fulfilled when processing the messages. It does not specify how the vehicle handles the incoming messages.

The production of information supporting this application, its qualification and its relevance are out of the scope of this Technical Specification.

This Technical Specification addresses Use Case 1 "Provision of mandatory speed limit information into vehicle – for driver awareness purposes" and Use Case 2 "Provision of advisory speed information into vehicle – for driver awareness purposes".

2 Conformance

To claim conformance to this Technical Specification, all mandatory requirements shall be fulfilled by the implementation under test.

NOTE 1 Conformance testing may be different for different roles/actors. This Technical Specification identifies the requirements for a number of Protocol Implementation Conformance Statements (PICS) proforma, allowing to claim conformance to defined subsets of ISO/TS 17426 requirements.

NOTE 2 This Technical Specification adopts the ISO/IEC 9646-7 approach for conformance testing specifications (i.e. development of PICS proforma, TSS&TP, ATS, and PIXIT).

3 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 21217, *Intelligent transport systems — Communications access for land mobiles (CALM) — Architecture*

ISO 24102-3, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 3: Service access points*

ISO 24102-6¹⁾, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 6: Path and flow management*

ISO/TS 17419, *Intelligent transport systems — Cooperative systems — Classification and management of ITS applications in a global context*

ISO/TS 17423, *Intelligent transport systems — Cooperative systems — ITS application requirements and objectives for selection of communication profiles*

ISO/TS 17425, *Intelligent transport systems — Cooperative systems — Data exchange specification for in-vehicle presentation of external road and traffic related data*

ISO/TS 17427, *Intelligent transport systems — Cooperative systems — Roles and responsibilities in the context of cooperative ITS based on architecture(s) for cooperative systems*

ISO/TS 17429²⁾, *Intelligent transport systems — Cooperative ITS — ITS station facilities for the transfer of information between ITS stations*

ISO/TS 18750, *Intelligent transport systems — Cooperative systems — Definition of a global concept for Local Dynamic Maps*

ISO/TS 19321, *Intelligent transport systems — Cooperative ITS — Dictionary of in-vehicle information (IVI) data structures*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21217, ISO 24102-3, ISO 24102-6, ISO/TS 17419, ISO/TS 17423, ISO/TS 17425, ISO/TS 17427, ISO/TS 17429 and the following apply.

4.1 advisory speed

speed set by an authority which it considers appropriate to the road, traffic, or environmental conditions being experienced

1) To be published.

2) To be published.