

ICS

English Version

Intelligent transport systems - Data interfaces between  
centres for transport information and control systems -  
Platform independent model specifications for data  
exchange protocols for transport information and control  
systems (ISO/TS 19468:2019)

Systèmes de transport intelligents - Interface de  
données entre centres pour les systèmes de commande  
et d'information des transports - Spécification du  
modèle indépendant de plateforme pour les protocoles  
d'échange de données pour les systèmes de commande  
et d'information des transports (ISO/TS 19468:2019)

Intelligente Verkehrssysteme - Datenschnittstelle  
zwischen Transportinformationszentren und  
Steuerungssystemen - Plattformunabhängige  
Modellspezifikation für Datenaustauschprotokolle für  
Transportinformationen und Steuerungssysteme  
(ISO/TS 19468:2019)

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## European foreword

This document (CEN ISO/TS 19468:2019) 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.

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## Endorsement notice

The text of ISO/TS 19468:2019 has been approved by CEN as CEN ISO/TS 19468:2019 without any modification.

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**Intelligent transport systems —  
Data interfaces between centres for  
transport information and control  
systems — Platform independent  
model specifications for data exchange  
protocols for transport information  
and control systems**

*Systèmes de transport intelligents — Interface de données entre centres pour les systèmes de commande et d'information des transports — Spécification du modèle indépendant de plateforme pour les protocoles d'échange de données pour les systèmes de commande et d'information des transports*



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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](http://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](http://www.iso.org/patents)).

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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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent transport systems (ITS)*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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](http://www.iso.org/members.html).

## Introduction

This document defines a common set of data exchange specifications to support the vision of a seamless interoperable exchange of traffic and travel information across boundaries, including national, urban, interurban, road administrations, infrastructure providers and service providers. Standardisation in this context is a vital constituent to ensure interoperability, reduction of risk, reduction of the cost base, promotion of open marketplaces and many social, economic and community benefits to be gained from more informed travellers, network managers and transport operators.

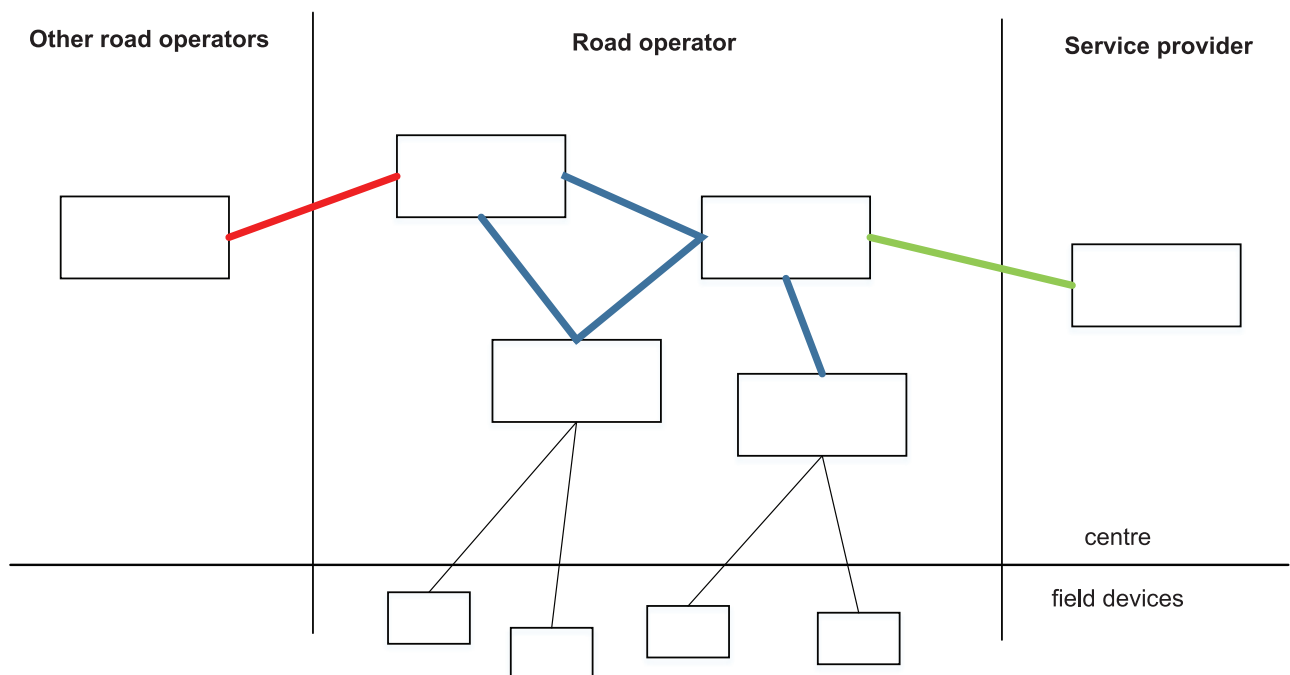
Especially in Europe, delivering transport policy in line with the White Paper issued by the European Commission requires co-ordination of traffic management and development of seamless pan European services. With the aim to support sustainable mobility in Europe, the European Commission has been supporting the development of information exchange mainly between the actors of the road traffic management domain for a number of years.

This document supports a methodology that is extensible.

To be able to successfully connect systems and start exchanging data, in an interoperable and easy way, there is a need to describe and agree on how the exchange should be done. This is set out in a data exchange specification. Data exchange in different scenarios can have different needs and requirements. Therefore, several data exchange specifications can be needed.

Data exchange specifications need to address two main issues. First, they model the stakeholders and actors involved in data exchange, each potentially in different roles, as well as abstract exchange patterns for their interactions. Second, they select a suitable implementation platform and clearly specify how the abstract scenarios and patterns are effectively implemented on this platform.

The following diagram in [Figure 1](#) shows such an abstract communication scenario from the perspective of a road operator who requires data exchange interfaces between the different components of its own operational systems, either between centre side components or between centre and field devices, but also to exchange information with other road operators or service providers.



**Figure 1 — Abstract communication scenario**

While the black links between centre side components and field devices may use a variety of communication protocols, mostly depending on the physical link conditions, the vast majority

of other coloured links between centre-side components, internal to one organisation or external to others, is based on an IP network and mostly use the TCP transport layer protocol (UDP is also possible in a few cases).

Nevertheless, as the different colours indicate, they can very well have significantly different requirements. Internal links (blue) can reside in one domain of trust, hence do not require protocols compatible with security gateways. This can already be different for links to other road operators (red) and will certainly not hold for links to other types of organisations, like service providers, via the Internet (green).

While different security requirements offer the most striking and obvious example, there are more criteria that can lead to different preferences on different types of links, e.g. scalability, robustness, integration complexity.

In broad terms, the colours blue – red – green form a hierarchy from more internal, closely-coupled, well-integrated systems towards external, loosely-coupled, and non-integrated systems. The world of *information and communication technology* (ICT) offers a broad range of solutions for these different scenarios, offering different advantages and disadvantages. It is obvious that the *one-size-fits-all* principle will not provide the most efficient way of working here. Even on the highest level of abstraction and inside the ICT domain itself, we already find a well-known battle of paradigms between *remote-procedure-call* (RPC) type service specifications and *RESTful* architectures. The same clusters of options are found in the domain of ITS standards, where for example the European standard for the real-time information interface relating to public transport operations (SIRI – EN 15531 series) introduces both concepts as complementary options: *Publish-Subscribe* and *Request-Response*.

As well, the ITS station architecture is not in contradiction with this document but is complementary of what is defined in this document. According to the principles and the taxonomy defined in ISO 21217, this document defines a conceptual notion of:

- How 2 central ITS (sub) stations could communicate to:
  - deliver (*application data units*) information,
  - negotiate functional service behaviour for collaborating traffic management functions (even if this use case could not directly be matched to ISO 21217 as it is not about information delivery).
- How a Central ITS (sub) station could communicate to deliver information (*application data units*) to another ITS station with the characteristics of a central ITS station.

This document specifies the process of defining the exchange characteristics by use case-driven feature selection of relevant parameters for the relevant OSI layers as defined in ISO 21217. Two exchange schemas are considered: *Information delivery* and *Functional service negotiation* between central ITS stations.

The drafting of this document was guided by the following principles:

- Interoperability, such that different implementations can successfully engage in a data exchange process;
- Support legacy implementations which are based on existing (exchange) specification, in order to maximize investments already made by stakeholders;
- Address other user profiles, not only road operators, and thus make this document available to a broader audience;
- Reuse of existing (communications) standards, in order to reduce implementation complexity and take benefit of proven and already existent solutions for common ICT problems;
- Clear separation between the payload content and the exchange model.

The informative [Annex A](#) details the adopted methodology for defining this exchange Platform Independent Model.

# Intelligent transport systems — Data interfaces between centres for transport information and control systems — Platform independent model specifications for data exchange protocols for transport information and control systems

## 1 Scope

This document defines and specifies component facets supporting the exchange and shared use of data and information in the field of traffic and travel.

The component facets include the framework and context for exchanges, the data content, structure and relationships necessary and the communications specification, in such a way that they are independent from any defined technical platform.

This document establishes specifications for data exchange between any two instances of the following actors:

- Traffic Information Centres (TIC);
- Traffic Control Centres/Traffic Management Centres (TCC/TMC);
- Service Providers (SP).

This document can be applied for use by other actors, e.g. car park operators.

This document includes the following types of information:

- the use cases and associated requirements, and features relative to different exchange situations;
- the different functional exchange profiles;
- the abstract elements for protocols;
- the data model for exchange (informational structures, relationships, roles, attributes and associated data types required).

In order to set up a new technical exchange framework, it is necessary to associate one functional exchange profile with a technical platform providing an interoperability domain where plug-and-play interoperability at technical level can be expected. The definition of such interoperability domains is not part of this document but can be found in other standards or technical specifications, e.g. ISO 14827-3. This document is restricted to data exchange. Definition of payload content models is beyond the scope of this document.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.