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**Vägtrafikinformatik – Datalexikon och meddelandeuppsättningar för företrädesrätt och prioritering hos signalsystem för utryckningsfordon och kollektivtransporter (PRESTO) (ISO 22951:2009, IDT)**

**Data dictionary and message sets for preemption and prioritization signal systems for emergency and public transport vehicles (PRESTO) (ISO 22951:2009, IDT)**



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 22951 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

## **Introduction**

It is very important that police cars, fire engines, and other emergency vehicles arrive at the scene to which they are dispatched as soon as possible in order to improve crime prevention rate, lifesaving rate etc. Therefore, various countries are using, or developing, preemption signal-systems to support the smooth travelling of such vehicles. In addition, some countries use these priority signal-controls for buses and other public transport vehicles to provide punctual and more convenient service. This International Standard standardizes communication messages in these preemption signal-systems for emergency and public transport vehicles, aiming to promote system introduction through developing a common infrastructure.

# Data dictionary and message sets for preemption and prioritization signal systems for emergency and public transport vehicles (PRESTO)

## 1 Scope

This International Standard relates to systems that use priority signal control functions to help emergency vehicles operate. This type of system, as shown in Figure 1, is composed of a traffic management centre, in-vehicle units, roadside communication units, and roadside units. Public transport vehicles such as buses are also targeted to receive priority signal control service.

The scope of standardization includes message sets and data dictionary related to the communications as follows:

- between a roadside communication unit and each in-vehicle unit,
- between a roadside communication unit and other roadside units,
- between in-vehicle units and roadside units.

This International Standard concerns only information related to priority signal control and does not deal with information provision such as that of the situations at scenes. Since it is necessary to handle public transport vehicles in accordance with the conditions of individual cities and regions, the section in the messages and the data dictionary that are concerned with priority signal control for the vehicles are treated as an option. Furthermore, the standardization does not depend on the type of communication medium used.

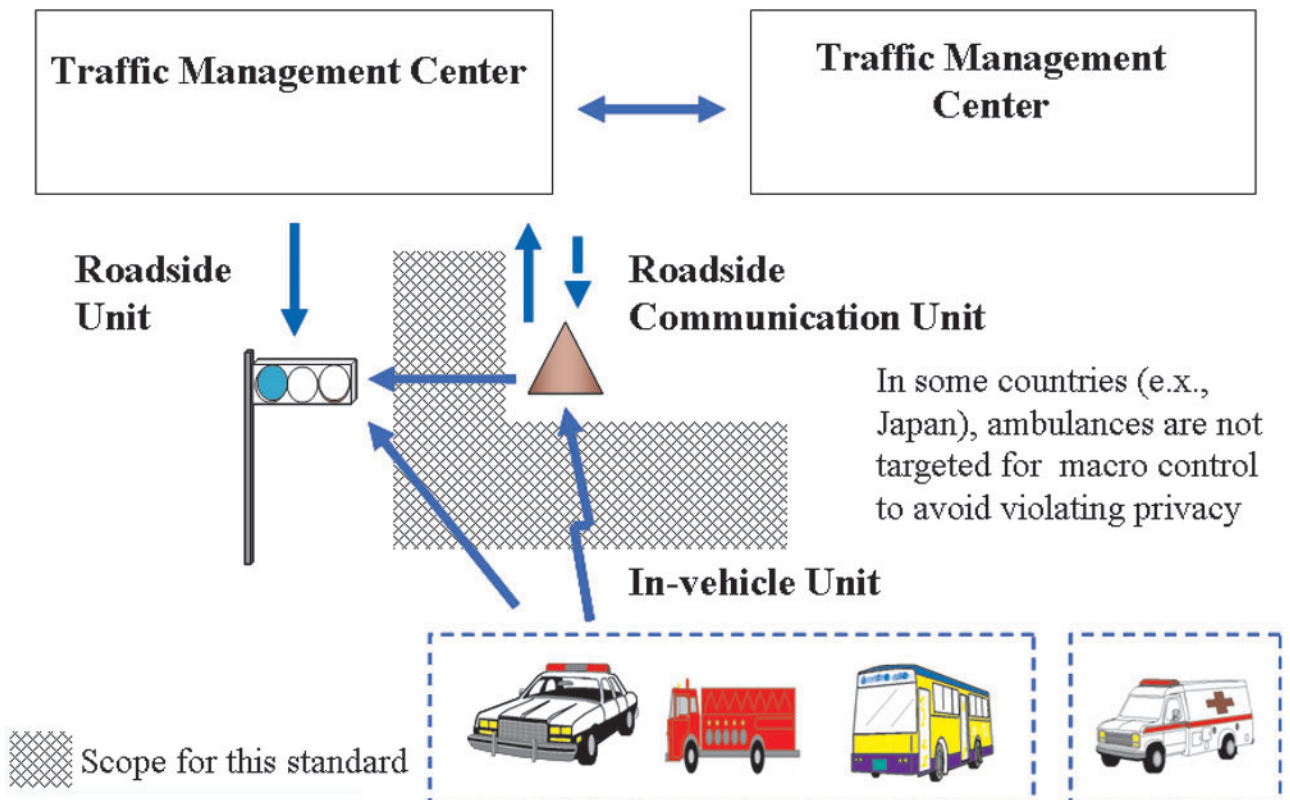


Figure 1 —Scope of standardization work

## 2 Normative references

The following referenced documents are indispensable for the application 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 14817, *Transport information and control systems — Requirements for an ITS/TICS central Data Registry and ITS/TICS Data Dictionaries*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14817 and the following apply.

**3.1 antenna**  
roadside equipment that communicates with the roadside units such as signal controllers and the in-vehicle units using radio signals

**3.2 beacon**  
roadside equipment that communicates with the roadside units such as the signal controllers and the in-vehicle units

**3.3 data dictionary**  
listing of data elements (and their characteristics) that meets the information and functional needs of a system

**3.4 data element**  
atomic element of information

NOTE A data element is a syntactically formal representation of some information of interest (such as a fact, proposition, observation, etc.) about some entity of interest (e.g. a person, place, process, property, object, concept, association, state, event).

**3.5 in-vehicle unit**  
in-vehicle equipment that transmits/receives information to/from the roadside communication units and, in some cases, outputs information, for example, on its screen

**3.6 message sets**  
set of basic messages that are normally used in business-oriented applications

**3.7 roadside communication unit**  
roadside equipment that communicates with the in-vehicle units and the roadside units, e.g. beacons and antennas

**3.8 roadside unit**  
roadside equipment that controls signals and provides information, e.g. the signal controllers and the information board controllers

**3.9 signal controller**  
roadside equipment that controls the lighting timings of traffic lights



**3.10**

**traffic management centre**

central system that controls the functions of traffic data collection, signal control, and information service based on collected data, etc.

**3.11**

**vehicle ID**

identification number used for the identification of emergency and/or public transport vehicles

**4 Symbols and abbreviated terms**

PRESTO data dictionary and message sets for preemption and prioritization signal systems for emergency and public transport vehicles

**5 Data dictionary and message sets for PRESTO**

Tables 1 and 2 give the list of data dictionary and message sets within the scope of the standardization, in-line with the data concept specified in ISO 14817. Further details are given in Annex C.

**5.1 Data dictionary**

**Table 1 — Data dictionary within the scope of the standardization**

Data concept type	ASN.1 object identifier	ASN.1 name	Descriptive name
Data element concept	{iso standard presto concepts dec 1 10}	PSC.authority-classification	PSC.authorityClassification
Data element	{iso standard presto concepts de 1 20}	PSC.vehicle-code	PSC.vehicleCode
	{iso standard presto concepts de 1 30}	PSC-transport-mode	PSC.transportMode
	{iso standard presto concepts de 1 40}	PSC-priority-signal-request-flag	PSC.prioritySignalRequestFlag
	{iso standard presto concepts de 1 50}	PSC-request-intersection id	PSCrequestIntersectionID
	{iso standard presto concepts de 1 60}	PSC-direction-at-intersection	PSC.directionAtIntersection
	{iso standard presto concepts de 1 70}	PSC-spot-id	PSC.spotID
	{iso standard presto concepts de 1 80}	PSC-spot-passing-time	PSC.spotPassingTime
	{iso standard presto concepts de 1 90}	PSC-vehicle-speed	PSC.vehicleSpeed
	{iso standard presto concepts de 1 100}	PSC-vehicle-acceleration	PSC.vehicleAcceleration
	{iso standard presto concepts de 1 110}	PSC-travel-distance	PSC.travelDistance
	{iso standard presto concepts de 1 120}	PSC-transmission-time	PSC.transmissionTime
Data frame	{iso standard presto concepts df 1 130}	PscVehicleID	PscVehicleID:frame
	{iso standard presto concepts df 1 140}	PscPrioritySignalRequest	PscPrioritySignalRequest:frame
	{iso standard presto concepts df 1 150}	PscVehicleCurrentLocation	PscVehicleCurrentLocation:frame
	{iso standard presto concepts df 1 160}	PsctravelInformation	PsctravelInformation:frame
	{iso standard presto concepts df 1 170}	PscSpotLocation	PscSpotLocation:frame
	{iso standard presto concepts df 1 180}	PscSpotPassingPoint	PscSpotPassingPoint:frame

## 5.2 Message sets

**Table 2 — Messages sets within the scope of the standardization**

<b>Data concept type</b>	<b>ASN.1 object identifier</b>	<b>ASN.1 name</b>	<b>Descriptive name</b>
Message	{iso standard presto concepts mes 1 190}	PscVehicleInformation	PscVehicleInformation:message
	{iso standard presto concepts mes 1 200}	PscVehicleData	PscVehicleData:message
	{iso standard pi 11}	PiSchedAdherenceOffSched	PiSchedAdherenceOffSched:message

## Annex A (informative)

### The concept of PRESTO

#### A.1 Purpose

PRESTO allows emergency vehicles such as police cars, fire engines and so forth to speedily and accurately respond to emergencies by carrying out traffic signal control with the highest priority and guiding optimal routes for these vehicles. In addition, this system draws the attention of general vehicles and pedestrians by indicating the approach of emergency vehicles on message boards. This system carries out priority signal control for public transport vehicles such as buses and trams. By providing travelling support to emergency vehicles and public transport vehicles in this way, the system intends to achieve the realization of the following effects.

- a) Reduction in the response time of emergency vehicles:
  - early resolution of accidents and improvement of arrest rates;
  - support for speedy rescue activity and improvement of lifesaving rates.
- b) Reduction of the number of traffic accidents associated with en-route emergency vehicles.
- c) Improvement of convenience of public transport vehicles such as buses and trams by securing the regular time operation of them.

#### A.2 Basic function

This system has the functions of

- priority signal control,
- route guidance, and
- safety support.

The priority signal control function includes macro control function and micro control function.

The macro control function transmits signal parameters beforehand, for example, giving maximum green time in the direction of emergency vehicles and public transport vehicles to the group of traffic signals at intersections from the traffic management centre, so it is possible to reduce traffic jams and lines of vehicles waiting for a green signal, which are hindrance factors to a priority traffic route.

The micro control function extends the green time or reduces the red time by having the vehicle sensor detect approaching emergency vehicles and public transport vehicles in order to let those vehicles pass through the green light.

The route guidance function effectively supports an early arrival of emergency vehicles at the scene of an accident by guiding the emergency vehicles from their current position to the scene of the accident through the recommended route. The macro control function, as explained above, links to the route guidance function and minimizes disadvantages suffered by general vehicles and pedestrians.

The safety support function draws attention of the general vehicles and pedestrians to the approaching emergency vehicle via the message board.