



BSI Standards Publication

Intelligent transport systems — Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2)

Part 14: Parking information application
(TPEG2-PKI)

National foreword

This Published Document is the UK implementation of ISO/TS 21219-14:2016.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2016

ISBN 978 0 580 90969 6

ICS 03.220.01; 35.240.60

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 June 2016.

Amendments/corrigenda issued since publication

Date	Text affected
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TECHNICAL
SPECIFICATION

ISO/TS
21219-14

First edition
2016-06-01

**Intelligent transport systems —
Traffic and travel information (TTI)
via transport protocol experts group,
generation 2 (TPEG2) —**

**Part 14:
Parking information application
(TPEG2-PKI)**

*Systèmes intelligents de transport — Informations sur le trafic et le
tourisme via le groupe expert du protocole de transport, génération 2
(TPEG2) —*

*Partie 14: Informations relatives aux parcs de stationnement
(TPEG2-PKI)*



Reference number
ISO/TS 21219-14:2016(E)

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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*.

ISO/TS 21219 consists of the following parts, under the general title *Intelligent transport systems — Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2)*:

- Part 1: Introduction, numbering and versioning (TPEG2-INV)
- Part 2: UML modelling rules
- Part 3: UML to binary conversion rules
- Part 4: UML to XML conversion rules
- Part 5: Service framework (TPEG2-SFW)
- Part 6: Message management container (TPEG2-MMC)
- Part 9: Service and network information (TPEG2-SNI)
- Part 10: Conditional access information (TPEG2-CAI)
- Part 14: Parking information (TPEG2-PKI)
- Part 15: Traffic event compact (TPEG2-TEC)
- Part 18: Traffic flow and prediction application (TPEG2-TFP)
- Part 19: Weather information (TPEG2-WEA)

The following parts are under preparation:

- Part 16: Fuel price information and availability application (TPEG2-FPI)
- Part 23: Roads and multi-modal routes application (TPEG2-RMR)
- Part 24: Light encryption (TPEG2-LTE)

— *Part 25: Electromobility charging infrastructure (TPEG2-EMI)*

The following parts are planned:

- *Part 7: Location referencing container*
- *Part 21: Geographic location referencing*
- *Part 22: OpenLR location referencing*

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Introduction

History

TPEG technology was originally proposed by the European Broadcasting Union (EBU) Broadcast Management Committee, who established the B/TPEG project group in the autumn of 1997 with a brief to develop, as soon as possible, a new protocol for broadcasting traffic and travel-related information in the multimedia environment. TPEG technology, its applications and service features were designed to enable travel-related messages to be coded, decoded, filtered and understood by humans (visually and/or audibly in the user's language) and by agent systems. Originally, a byte-oriented data stream format, which may be carried on almost any digital bearer with an appropriate adaptation layer, was developed. Hierarchically structured TPEG messages from service providers to end-users were designed to transfer information from the service provider database to an end-user's equipment.

One year later in December 1998, the B/TPEG group produced its first EBU specifications. Two documents were released. Part 2 (TPEG-SSF, which became ISO/TS 18234-2) described the Syntax, Semantics and Framing structure, which was used for all TPEG applications. Meanwhile, Part 4 (TPEG-RTM, which became ISO/TS 18234-4) described the first application for Road Traffic Messages.

Subsequently in March 1999, CEN TC 278, in conjunction with ISO/TC 204, established a group comprising members of the former EBU B/TPEG and this committee continued development work. Further parts were developed to make the initial set of four parts, including the implementation of a consistent service. Part 3 (TPEG-SNI, ISO/TS 18234-3) described the Service and Network Information Application, used by all service implementations to ensure appropriate referencing from one service source to another.

Part 1 (TPEG-INV, ISO/TS 18234-1) completed the series by describing the other parts and their relationship; it also contained the application IDs used within the other parts. Additionally, Part 5, Public Transport Information Application (TPEG-PTI, ISO/TS 18234-5), was developed. The so-called TPEG-LOC location referencing method, which enabled both map-based TPEG-decoders and non-map-based ones to deliver either map-based location referencing or human readable text information, was issued as ISO/TS 18234-6 to be used in association with the other applications parts of the ISO/TS 18234 series to provide location referencing.

The ISO/TS 18234 series has become known as TPEG Generation 1.

TPEG Generation 2

When the Traveller Information Services Association (TISA), derived from former forums, was inaugurated in December 2007, TPEG development was taken over by TISA and continued in the TPEG Applications Working Group.

It was about this time that the (then) new Unified Modelling Language (UML) was seen as having major advantages for the development of new TPEG Applications in communities who would not necessarily have binary physical format skills required to extend the original TPEG TS work. It was also realized that the XML format for TPEG described within the ISO/TS 24530 series (now superseded) had a greater significance than previously foreseen, especially in the content-generation segment and that keeping two physical formats in synchronism, in different standards series, would be rather difficult.

As a result, TISA set about the development of a new TPEG structure that would be UML-based. This has subsequently become known as TPEG Generation 2.

TPEG2 is embodied in the ISO/TS 21219 series and it comprises many parts that cover introduction, rules, toolkit and application components. TPEG2 is built around UML modelling and has a core of rules that contain the modelling strategy covered in ISO/TS 21219-2, ISO/TS 21219-3, ISO/TS 21219-4 and the conversion to two current physical formats: binary and XML; others could be added in the future. TISA uses an automated tool to convert from the agreed UML model XMI file directly into an MS Word document file, to minimize drafting errors, that forms the Annex for each physical format.

TPEG2 has a three container conceptual structure: Message Management (ISO/TS 21219-6), Application (many Parts) and Location Referencing (ISO/TS 21219-7). This structure has flexible capability and can accommodate many differing use cases that have been proposed within the TTI sector and wider for hierarchical message content.

TPEG2 also has many location referencing options as required by the service provider community, any of which may be delivered by vectoring data included in the Location Referencing Container.

The following classification provides a helpful grouping of the different TPEG2 parts according to their intended purpose:

- Toolkit parts: TPEG2-INV (ISO/TS 21219-1), TPEG2-UML (ISO/TS 21219-2), TPEG2-UBCR (ISO/TS 21219-3), TPEG2-UXCR (ISO/TS 21219-4), TPEG2-SFW (ISO/TS 21219-5), TPEG2-PMC (ISO/TS 21219-6), TPEG2-LRC (ISO/TS 21219-7), TPEG2-LTE (ISO/TS 21219-24);
- Special applications: TPEG2-SNI (ISO/TS 21219-9), TPEG2-CAI (ISO/TS 21219-10);
- Location referencing: TPEG2-ULR (ISO/TS 21219-11), TPEG2-GLR (ISO/TS 21219-21), TPEG2-OLR (ISO/TS 21219-22);
- Applications: Applications: TPEG2-PKI (ISO/TS 21219-14), TPEG2-TEC (ISO/TS 21219-15), TPEG2-FPI (ISO/TS 21219-16), TPEG2-TFP (ISO/TS 21219-18), TPEG2-WEA (ISO/TS 21219-19), TPEG2-RMR (ISO/TS 21219-23), TPEG2-EMI (ISO/TS 21219-25).

TPEG2 has been developed to be broadly (but not entirely) backward compatible with TPEG1 to assist in transitions from earlier implementations, while not hindering the TPEG2 innovative approach and being able to support many new features, such as dealing with applications having both long-term, unchanging content and highly dynamic content, such as Parking Information.

This Technical Specification is based on the TISA specification technical/editorial version reference:

SP13009/1.1/001.

Intelligent transport systems — Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2) —

Part 14: Parking information application (TPEG2-PKI)

1 Scope

This part of ISO/TS 21219 specifies the TPEG Parking Information application which has been designed to deliver parking information to a variety of receivers using a number of different channels, foremost of course are digital broadcasting and Internet technologies. Parking information may be presented to the user in many different ways, including text, voice, or graphics.

Today, traffic congestion has become a serious problem in urban areas. Some traffic congestion is attributed to drivers searching for parking spaces. Therefore, timely provision of parking information could help ease traffic congestion. Furthermore, parking information would be valuable for the visitor, particularly when it could be used to signal where a temporary parking facility is established for a special occasion.

2 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/TS 21219-1, *Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 2 (TPEG2) — Part 1: Introduction, numbering and versions (TPEG2-INV)*

ISO/TS 21219-3, *Intelligent transport systems — Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2) — Part 3: UML to binary conversion rules*

ISO/TS 21219-4, *Intelligent transport systems — Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2) — Part 4: UML to XML conversion rules*

ISO/TS 21219-6, *Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 2 (TPEG2) — Part 6: Message management container (TPEG2-MMC)*

3 Terms and definitions

3.1

Message Management Container

concept applied to the grouping of all message elements including Message Management Information of a TPEG-Message together in one place

Note 1 to entry: See TPEG2 MMC documents (ISO/TS 21219-6) for full details of the Message Management Container explanations.