



BSI Standards Publication

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

Part 16: Fuel price information and
availability (TPEG2-FPI)

National foreword

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

**Part 16:
Fuel price information and availability
(TPEG2-FPI)**

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

*Partie 16: Disponibilité et informations sur le prix du carburant
(TPEG2-FPI)*



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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
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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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL www.iso.org/iso/foreword.html.

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 notations* [Technical Specification]
- Part 2: *UML modelling rules* [Technical Specification]
- Part 3: *UML to binary conversion rules* [Technical Specification]
- Part 4: *UML to XML conversion rules* [Technical Specification]
- Part 5: *Service function network* [Technical Specification]
- Part 6: *Message management container* [Technical Specification]
- Part 9: *Service and network information* [Technical Specification]
- Part 10: *Conditional access information* [Technical Specification]
- Part 14: *Parking information* [Technical Specification]
- Part 15: *Traffic event compact* [Technical Specification]
- Part 16: *Fuel price information and availability application* [Technical Specification]
- Part 18: *Traffic flow and prediction application* [Technical Specification]
- Part 19: *Weather information* [Technical Specification]
- The following Parts are planned:
- Part 7: *Location referencing container* [Technical Specification]
- Part 11: *Universal location reference* [Technical Specification]

- Part 21: *Geographic location referencing* [Technical Specification]
- Part 22: *OpenLR location referencing* [Technical Specification]
- Part 23: *Road and multimodal routes application* [Technical Specification]
- Part 24: *Light encryption* [Technical Specification]
- Part 25: *Electromobility information* [Technical Specification]

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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, the 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 Modeling 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 realised 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 minimise 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);
- 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: 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 has been developed to be broadly (but not totally) backward compatible with TPEG1 to assist in transitions from earlier implementations, whilst 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:

SP12009/2.0/002

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

Part 16: Fuel price information and availability (TPEG2-FPI)

1 Scope

This Technical Specification specifies the TPEG application: Fuel price information and availability (FPI). The FPI application has been specifically designed to support information of fuel stations, their location, fuel types offered and fuel pricing and availability information.

The standardized delivery, via TPEG technology, of fuel price information has the following benefits to end users of a TPEG service:

- a) cost savings to driver, through improved ease of access to price information;
- b) improved ease of access to price information that may lead to significant cost savings for fleet operators;
- c) environmental benefits from drivers not having to drive around to find the cheapest fuel prices;
- d) safety improvements for highways authorities, as drivers are less likely to run out of fuel if they are well informed of local availability and prices;
- e) as availability of new fuels become more common and more vehicles use them (e.g. biofuels, hydrogen, etc.), drivers will be better informed about availability of fuelling stations.

The TPEG application Fuel price information and availability, as add-on service component next to, for example, traffic information, is laid out to support large numbers of fuel stations and fuel prices with only modest bandwidth requirements.

When the objective is to inform electric vehicles on the location of charging stations and the availability of charging points, the TPEG application TPEG2-EMI (Electro Mobility Information) shall be chosen. TPEG2-FPI contains rudimentary support for electric charging stations. However, a TISA investigation revealed that a simple extension/differentiation of TPEG2-FPI would not be sufficient to address the evolving market needs of the electric vehicle market. Hence, a separate TPEG application was created to serve the information needs of Electric Vehicles and their operators: TPEG2-EMI.

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.

ISO 17572-2, *Intelligent transport systems (ITS) — Location referencing for geographic databases — Part 2: Pre-coded location references (pre-coded profile)*

ISO/TS 18234-11, *Intelligent transport systems — Traffic and Travel Information (TTI) via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 11: Location Referencing Container (TPEG1-LRC)*