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

**Part 19:  
Weather information (TPEG2-WEA)**

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

*Partie 19: Renseignements météorologiques (TPEG2-WEA)*

**PROOF / ÉPREUVE**

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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)).

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*, in cooperation with the Traveller Information Services Association (TISA), TPEG Applications Working Group through Category A Liaison status.

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 versions*
- *Part 2: UML modelling rules*
- *Part 3: UML to binary conversion rules*
- *Part 4: UML to XML conversion rules*
- *Part 5: Service framework*
- *Part 6: Message management container*
- *Part 10: Conditional access information*
- *Part 18: Traffic flow and prediction application*
- *Part 19: Weather information*

The following parts are under preparation:

- *Part 9: Service and network information*
- *Part 14: Parking information*
- *Part 15: Traffic event compact*
- *Part 16: Fuel price information and availability application*

## ISO/TS 21219-19:2016(E)

The following parts are planned:

- *Part 7: Location referencing container*
- *Part 11: Universal location reference*
- *Part 21: Geographic location referencing*
- *Part 22: OpenLR location referencing*
- *Part 23: Road and multimodal routes application*
- *Part 24: Light encryption*
- *Part 25: Electromobility information*

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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/WG 4, in conjunction with ISO/TC 204/WG 10, established a group comprising members of the former EBU B/TPEG and this working group continued development work. Further parts were developed to make the initial set of four parts, enabling 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 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 Parts 2, 3, 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.

## ISO/TS 21219-19:2016(E)

TPEG2 has a three container conceptual structure: Message Management (ISO/TS 21219-6), Application (many ISO/TS 21219 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-MMC (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-ETL (ISO/TS 21219-20), 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, 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:

SP13002/1.1/001



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

## Part 19: Weather information (TPEG2-WEA)

### 1 Scope

This part of ISO/TS 21219 defines the TPEG Weather (WEA) application for reporting weather information for travellers. It provides general weather-related information to all travellers and is not limited to a specific mode of transportation.

This application does not provide specific weather-related safety warnings to drivers; these are provided as Safety Related Messages as part of the TPEG2-TEC application.

The WEA application provides weather-related forecasts and status information over multiple time periods and for multiple, possibly linked, geographical areas.

**NOTE** The presentation of the information is dependent of the specific HMI of the receiving device. This part of ISO/TS 21219, therefore, does not define any prerequisites for the HMI of the device.

### 2 Terms and definitions

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

#### 2.1

##### **service**

collection of different information streams (applications) logically bound together and delivered from a service provider to the end user

#### 2.2

##### **service component**

information stream (application) that is part of a *service* (2.1)

Note 1 to entry: A TPEG stream is logically divided into parts known as service components. Each service component carries an application instance. A service component is effectively a “channel” within the multiplex of a TPEG stream. Each stream comprises a number of these “channels” which are identified by the component identifier in TPEG2-SFW and linked to the COID and AID in the TPEG2-SNI application.

#### 2.3

##### **message management container**

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

#### 2.4

##### **location referencing**

means to provide information that allows a system to accurately identify a location

Note 1 to entry: The content of a location reference allows the location to be presented in a graphical or textual manner to the end-user (e.g. coloured network graphs), as well as to be used for navigational systems purposes.

## 2.5

### location referencing container

concept applied to the grouping of all the *location referencing* (2.4) elements, of a TPEG-Message, together in one place

## 3 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

ACID	Application and Content Identifier
ADC	Application Data Container
CEN	Comité Européen de Normalization
EBU	European Broadcasting Union
LRC	Location Reference Container
MMC	Message Management Container
n.a.	Not available
OSI	Open Systems Interconnection
SFW	TPEG Service Framework: Modelling and Conversion Rules
TISA	Traveller Information Services Association
TPEG	Transport Protocol Expert Group
TTI	Traffic and Traveller Information
UML	Unified Modelling Language
TEC	Traffic Event Compact
WEA	TPEG Weather
WMO	World Meteorological Organization

## 4 Application specific constraints

### 4.1 Application identification

The word “application” is used in the TPEG specifications to describe specific subsets of the TPEG structure. An application defines a limited vocabulary for a certain type of messages, for example, parking information or road traffic information. Each TPEG application is assigned a unique number, called the Application IDentification (AID). An AID is defined whenever a new application is developed and these are all listed in TPEG2-MMC.

The application identification number is used within the TPEG2-SNI application to indicate how to process TPEG content and facilitates the routing of information to the appropriate application decoder.

### 4.2 Version number signalling

Version numbering is used to track the separate versions of an application through its development and deployment. The differences between these versions may have an impact on client devices.

The version numbering principle is defined in TPEG2-INV.

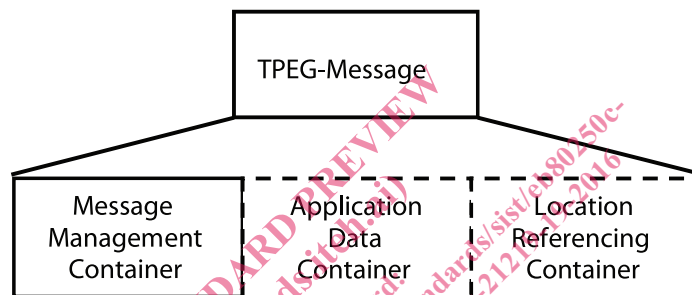
[Table 1](#) shows the current version numbers for signalling WEA within the SNI application.

**Table 1 — Current version numbers for signalling of WEA**

Major version number	1
Minor version number	1

### 4.3 Ordered components

TPEG2-WEA requires a fixed order of TPEG components. The order for the WEA message component is shown in [Figure 1](#); the first component shall be the **Message Management Container**. This shall be the only component if the message is a cancellation message. Otherwise, the MMC component shall be followed by the one or more **Application Data Container** component(s) which includes the application-specific information.



**Figure 1 — Composition of TPEG messages**

### 4.4 Extendibility

The requirement of a fixed component order does not affect the extension of WEA. Future application extensions may insert new components or may replace existing components by new ones without losing backward compatibility. That means a WEA decoder shall be able to detect and skip unknown components.

### 4.5 TPEG service component frame

WEA makes use of the “Service Component Frame with dataCRC and messageCount” according to TPEG2-SFW.

## 5 WEA structure

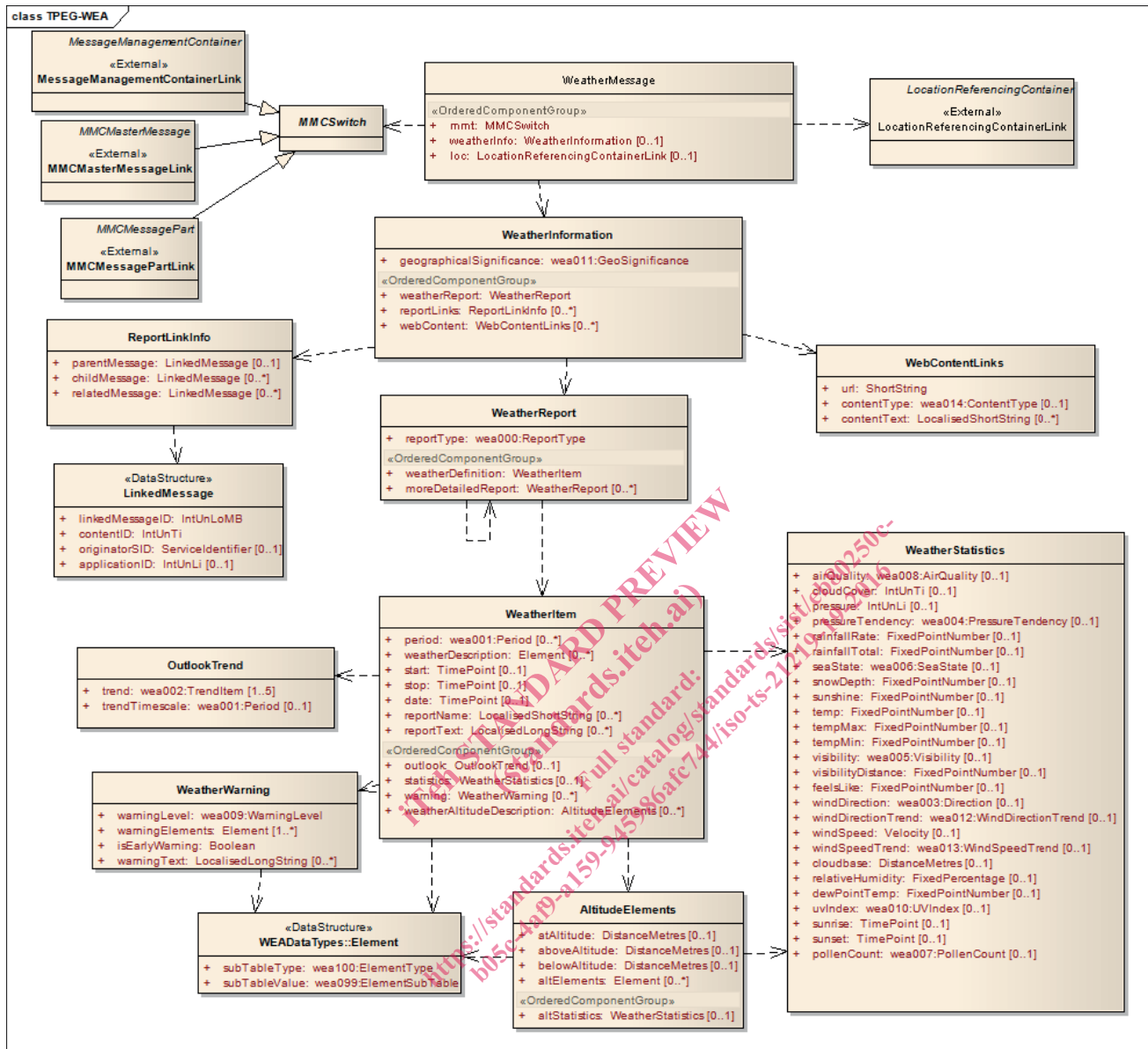


Figure 2 — WEA message structure

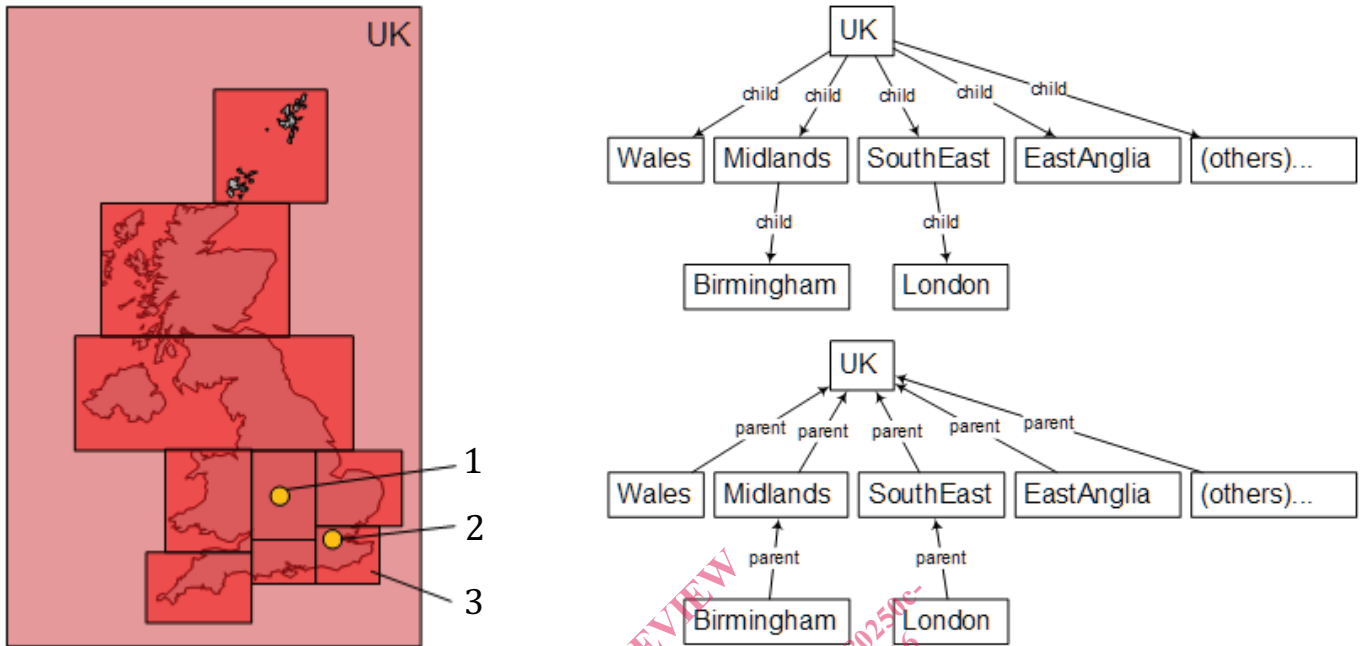
## 6 WEA message components

The WEA application provides a flexible message interface for distribution of weather information.

To enable multiple levels of detail to be signalled, WEA provides two different hierarchal structures to allow messages to cover multiple geographical areas and also to cover different time periods. Messages may be linked to each other to provide a geographical hierarchy of the weather reports which may be exploited by receivers to help users find the messages they need.

**EXAMPLE** A UK service may provide a national overview, with regional reports and individual city reports.

Individual messages are linked by child and parent message IDs, as shown in [Figure 3](#).



**Key**

- 1 Birmingham
- 2 London
- 3 SouthEast

NOTE This is provided by linking individual messages in a child/parent relationship. A message may have 1 parent, but may have multiple child messages.

**Figure 3 — Location hierarchy**