TECHNICAL SPECIFICATION

ISO/TS 24530-4

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Traffic and Travel Information (TTI) — TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML) —

Part 4: tpeg-ptiML

Informations sur le trafic et le tourisme (TTI) — Messages TTI via le langage de balisage extensible (XML) du groupe d'experts du protocole de transport (TPEG) —

Partie 4: tpeg-ptiML

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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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years with a view to deciding whether it should be confirmed for a further three years, revised to become an International Standard, or withdrawn. In the case of a confirmed ISO/PAS or ISO/TS, it is reviewed again after six years at which time it has to be either transposed into an International Standard or withdrawn.

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/TS 24530-4 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 204, *Intelligent transport systems,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European pre-Standard..." to mean "...this Technical Specification...".

ISO/TS 24530 consists of the following parts, under the general title *Traffic and Travel Information (TTI) — TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML)*:

— *Part 1: Introduction, common data types and tpegML*

— *Part 2: tpeg-locML*

— *Part 3: tpeg-rtmML*

— *Part 4: tpeg-ptiML*

Introduction

TPEG in XML (tpegML) provides a solution for diverse requirements for the ultimate delivery of TPEG applications (potentially simultaneously) via for example ARIB, ATSC, DAB, DVB and the Internet. This will solve the minimal adaptation layers requirement and without doubling up on message carousels, which are handled at different layers of the protocol stacks.

The original TPEG technology uses a byte-oriented stream format, which may be carried on almost any digital bearer with an appropriate adaptation layer. TPEG messages are delivered from service providers to end-users, and are used to transfer application data from the database of a service provider to an end-user's equipment.

TPEG binary was initially designed to meet a particular brief, from the EBU's Broadcast Management Committee; to develop a new protocol for Traffic and Travel Information, for use in the multimedia broadcasting environment. TPEG applications were developed with service and transport features, which enable travel-related messages to be coded, decoded, filtered and understood both by humans (visually and/or audibly) and by agent systems. This brief was also endorsed by the EBU TTI Broadcast Strategy Team, who recognized the vital importance of a bearer independent TTI protocol.

The development of TPEG binary technology is excellently matched both technically and economically to DAB and possibly to internet bearers, where of the order of up to 10 kbits/s is considered acceptable. However other bearers such as ARIB, ATSC and DVB may be able to offer much higher data rates with economic and technical utility. Nevertheless these bearers are highly structured (layered) in their ability to handle transparent data services and they include mechanisms suitable for carousel delivery, which would require a considerably different TPEG data structure before real transparency could be achieved.

Another potential use of tpegML is provided to Service Providers who would have a standardised message generation interface, yet be able to develop systems suited to their own requirements. This will enable Service Providers to exchange pre-edited information regardless of their message generation systems and be substantially language independent.

tpegML has been developed using the DTD approach, which allows the use of different language entity files to easily provide a truly language independent service. This approach has the advantage that tpegML files can be rendered in any language, provided the language entity file is available to the internet browser. This document provides English language entity files only. For other languages the entity files in this document only require direct translation.

The development of this ISO/TS 24530 series was undertaken jointly with European Broadcasting Union B/TPEG Group, which has evolved into the TPEG Forum Standards Task Force. Attention is drawn to the EBU sponsored TPEG Forum development principles, which require all inputs containing IPR to be declared during drafting work. No such declarations have been made.

Traffic and Travel Information (TTI) — TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML) —

Part 4: **tpeg-ptiML**

1 Scope

This document establishes the XML encoding of the method of the Public Transport Information application.

The Public Transport Information Application is intended to cover all modes of public (ie collective) transport as well as inter-urban and intra-urban travel. The application itself is designed to allow the efficient and language independent transmission of public transport information either directly to an end-user, be it the public or another service provider, such as broadcasters, service operators or other information disseminating points or centres for onward transmission.

TPEG-PTI aims at describing “legs” of a journey also described as “rides” by other methodologies. However, it is important to note that TPEG-PTI is not limited to describing single services, because it also allows the more general description of route, service and area wide problems.

Public (or collective) transport information is usually consumed in one of four principle ways, and in TPEG-PTI these are labelled views, they are somewhat an analogue to:

— Leader board information as used at stations or terminals

— A report on the state of a network

— The description of an individual service

— As a news flash report

While the elements needed to produce information for any one of these four “views” are largely germane across the presentations, the end-user focus of TPEG applications is seen as useful to be able to mimic presentations, to which end-users are accustomed.

TPEG-PTI views are intended to present information to end-users in a way that they are accustomed. TPEG-PTI messages can therefore group data elements to present one of the following views:

— Incident Report View

— Station/Terminal View

— Route View

— Individual Service View

It is important to bear in mind that these “views” are merely presentational aides; they have little to do with the content in the individual data elements. They do, however, indicate how data elements must be grouped if a presentation in any of these views is intended. Unlike the TPEG-RTM application, TPEG-PTI benefits from the nodal structure of public transport, making use of its discrete start, end and stopping points as well as being limited to fixed, be it real or virtual, routes.

It is vital, for further understanding of this document, to have more than a passing understanding of the TPEG-PTI Binary specification which describes, among other things, in a step-by step approach: Message Management, Report views and how they are structured hierarchically to provide a full Public Transport Information message together with the TPEG Location Referencing system.

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/TS 24530-1, *Traffic and Travel Information (TTI) — TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML) — Part 1: Introduction, common data types and tpegML*

ISO/TS 24530-2, *Traffic and Travel Information (TTI) — TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML) — Part 2: tpeg-locML*

ISO/TS 18234-1, *Traffic and Travel Information (TTI) — TTI via Transport Protocol Expert Group (TPEG) data-streams — Part 1: Introduction, Numbering and Versions*

ISO/TS 18234-2, *Traffic and Travel Information (TTI) — TTI via Transport Protocol Expert Group (TPEG) data-streams — Part 2: Syntax, Semantics and Framing Structure (SFF)*

ISO/TS 18234-5, *Traffic and Travel Information (TTI) — TTI via Transport Protocol Expert Group (TPEG) data-streams — Part 5: Public Transport Information application*

ISO/TS 18234-6, *Traffic and Travel Information (TTI) — TTI via Transport Protocol Expert Group (TPEG) data-streams — Part 6: Location Referencing for applications*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

3 Abbreviated terms

For the purposes of this document, the following abbreviations apply.

3.1
ARIB
Association of Radio Industries and Business (Japan)

3.2
ATSC
American Television Standards Committee (USA)

3.3
DAB
Digital Audio Broadcasting

3.4
DTD/dtd
Document Type Definition - lower case used for file naming

3.5
DVB
Digital Video Broadcasting

3.6
EBU
European Broadcasting Union

3.7
IPR
Intellectual Property Right(s)

3.8
PTI
Public Transport Information

3.9
TPEG
Transport Protocol Experts Group

3.10
tpegML
tpeg XML applications - use lower case to distinguish them from the TPEG binary applications which use upper case

3.11
TPEG-Loc
Location Referencing for applications

3.12
TTI
Traffic and Travel Information

3.13
WGS84
World Geodetic System 1984

3.14
XML
Extensible Markup Language

4 Format of this document

This document is divided into Sections, each describes an XML element used in tpegML. Each element has an introduction explaining what it is for, the DTD definition relevant to it, guidelines “extending” the DTD and an example. The complete .dtd and .ent files are contained in Annexes A and B.

4.1 Tables

A large number of attributes used in elements in tpegML are based on tables in the TPEG specifications. To encode this in XML there are defined general entity references for all the table entries. In this Technical Specification series these entities are taken from the TPEG tables defined in the equivalent part of ISO/TS 18234.

For display in other languages these entity files only need to be replaced by directly translated equivalents.

These are named, for example `ptiX_Y`, where X is the table number and Y is the row number (e.g. "`pti01_1`" is the entry in the PTI `mode_of_transport` table for `railway service`). The DTD does not restrict the entity references that can be used in an attribute so the 'guidelines' sections indicate which entities/tables should be used for which attributes.

Table numbers use a leading zero below 10, whereas the row number within a table does not use a leading zero. Table numbers are random and entries within a table are random – no priority order is implied.

4.2 Example XML

This example shows the following message: *"Security alert at King's Cross – all services disrupted"* expressed as a single tpegML message using elements from tpeg-locML and tpeg-ptiML.

```
<tpeg_message>
        <public_transport_information message_id="1234" version_number="2"
            message_generation_time="2004-06-11T11:21:00"
            start_time="2004-06-11T11:30:00"
            message_expiry_time="2004-06-11T13:10:00"
            severity_factor="&pti26_5;"
            unverified_information="&pti32_255;">
            <location_container language="&loc41_30;">
                <!-- nodal area -->
                <location_coordinates location_type="&loc01_2;">
                    <location_point>
                        <mode_type_list>
                            <!-- coach, bus and taxi -->
                            <mode_of_transport mode_of_transport="&loc05_3;"/>
                            <mode_of_transport mode_of_transport="&loc05_6;"/>
                            <mode_of_transport mode_of_transport="&loc05_12;"/>
                        </mode_type_list>
                        <WGS84 longitude="-0.123028" latitude="51.531917"/>
                        <location_descriptor descriptor_type="&loc03_18;" descriptor="King's Cross"/>
                        <location_descriptor descriptor_type="&loc03_24;" descriptor="London"/>
                    </location_point>
                </location_coordinates>
            </location_container>
            <!-- All services -->
            <transport_mode transport_mode="&pti01_17;"/>
            <!-- security alert, very serious disruption -->
            <service_information>
```

This example shows the following message: *"Individual service information about the Hogwart's Express"* using the tpegML document format containing a single message with multiple aspects affecting this service.

```
    <tpeg_document generation_time="2002-02-11T11:00:00+0">
    <tpeg_message_set>
        <tpeg_message>
            <originator country="UK" originator_name="BBC Wizard Travel"/>
            <summary xml:lang="en">Wizard Rail's Hogwards Express is delayed by an hour because of hail.</summary>
            <multimedia/>
            <public_transport_information message_id="1234" version_number="2" message_generation_time="2002-02-
11T11:21:00" start_time="2002-02-11T11:30:00" message_expiry_time="2002-02-11T13:10:00" severity_factor="&pti026_4;"
unverified_information="&pti32_255;">
                <location_container language="&loc41_30;">
                    <location_coordinates location_type="&loc01_3;">
                        <!-- From... -->
                        <location_point>
                            <WGS84 longitude="-0.123028" latitude="51.531917"/>
                            <location_descriptor descriptor_type="&loc03_3;" descriptor="London"/>
                            <location_descriptor descriptor_type="&loc03_18;" descriptor="King's Cross"/>
                        </location_point>
                        <!-- To... -->
                        <location_point>
                            <WGS84 longitude="-2.188690" latitude="53.951803"/>
```

```
                    <location_descriptor descriptor_type="&loc03_4;" descriptor="Hogwarts"/>
                    <location_descriptor descriptor_type="&loc03_18;" descriptor="Hogwarts Terminus"/>
                </location_point>
            </location_coordinates>
        </location_container>
        <!-- Cross Country Railway service, brand: Wizard School -->
        <transport_mode transport_mode="&pti01_1;" transport_submode="&pti02_14;">
            <brand_name brand_name="Wizard School"/>
        </transport_mode>
        <!-- Service description -->
        <service_information>
            <!-- Service identification, type, -->
            <transport_service_identification>
                <transport_service_id transport_information_type="&pti14_3;" transport_service_id="666"/>
                <transport_service_id transport_information_type="&pti14_1;" transport_service_id="Stream Train"/>
                <transport_service_name transport_service_name="Hogwarts Express"/>
                <operator_name operator_name="Wizard Rail"/>
            </transport_service_identification>
            <!-- Service Condition - disrupted -->
            <service_condition service_condition_type="&pti13_6;"/>
            <!-- Snacks service and free seating -->
            <facilities facilities_type="&pti23_2;"/>
            <facilities facilities_type="&pti23_11;"/>
            <!-- Disruption due to severe hail -->
            <event_reason event_reason_type="&pti18_4;" event_reason_subtype="&pti22_11;"/>
            <!-- Route Description -->
            <route_description>
                <!-- Location of start point -->
                <route_description_type route_description_type="&pti15_1;">
                    <location_container language="">
                        <location_coordinates location_type="&loc01_2;">
                            <mode_type_list>
                                <mode_of_transport mode_of_transport="&loc05_2;"/>
                                <mode_of_transport mode_of_transport="&loc05_6;"/>
                                <mode_of_transport mode_of_transport="&loc05_12;"/>
                            </mode_type_list>
                            <location_point>
                                <WGS84 longitude="-0.123028" latitude="51.531917"/>
                                <location_descriptor descriptor_type="&loc03_18;" descriptor="King's Cross"/>
                                <location_descriptor descriptor_type="&loc03_24;" descriptor="London"/>
                            </location_point>
                        </location_coordinates>
                    </location_container>
                    <!-- Scheduled departure time -->
                    <time_type time_type="&pti28_2;" planning_status_type="&pti16_1;">
                        <time_instance local_time="2002-09-01T11:30:00+1"/>
                    </time_type>
                    <!-- Timetable -->
                    <timetable_type timetable_type="&pti33_4;"/>
                    <!-- Scheduled Platform -->
                    <service_delivery service_delivery_point_type="&pti17_1;" planning_status_type="&pti16_1;"
service_delivery_point_name="9 3/4"/>
                </route_description_type>
                <!-- Not stopping at... -->
                <route_description_type route_description_type="&pti15_5;">
                    <location_container language="&loc41_30;">
                        <location_coordinates location_type="&loc01_2;">
                            <mode_type_list>
                                <mode_of_transport mode_of_transport="&loc05_2;"/>
                            </mode_type_list>
                            <location_point>
                                <WGS84 longitude="" latitude=""/>
                                <location_descriptor descriptor_type="&loc03_24;" descriptor="Slitherin"/>
                            </location_point>
                        </location_coordinates>
                    </location_container>
                </route_description_type>
                <!-- Destination -->
                <route_description_type route_description_type="&pti15_2;">
                    <location_container language="">
                        <location_coordinates location_type="&loc01_2;">
```

```
                                    <!-- Railway and school boat -->
                                    <mode_type_list>
                                        <mode_of_transport mode_of_transport="&loc05_2;"/>
                                        <mode_of_transport mode_of_transport="&pti07_16;"/>
                                    </mode_type_list>
                                    <location_point>
                                        <WGS84 longitude="" latitude=""/>
                                        <location_descriptor descriptor_type="&loc03_18;" descriptor="Hogwarts Station"/>
                                        <location_descriptor descriptor_type="&loc03_24;" descriptor="Hogwarts"/>
                                    </location_point>
                                </location_coordinates>
                            </location_container>
                            <!-- Scheduled arrival time -->
                            <time_type time_type="&pti028_1;" planning_status_type="&pti16_1;">
                                <time_instance local_time="2002-09-01T17:45:00+1"/>
                            </time_type>
                            <!-- Predicted arrival time -->
                            <time_type time_type="&pti028_1;" planning_status_type="&pti16_2;">
                                <time_instance local_time="2002-09-01T18:45:00+1"/>
                            </time_type>
                            <!-- Scheduled platform number -->
                            <service_delivery service_delivery_point_type="&pti17_1;" planning_status_type="&pti16_1;"
service_delivery_point_name="1 A"/>
                            <service_delivery service_delivery_point_type="&pti17_1;" planning_status_type="&pti16_2;"
service_delivery_point_name="2 B"/>
                        </route_description_type>
                    </route_description>
                </service_information>
                <!-- Individual service information -->
                <message_report_type message_report_type="&pti27_4;"/>
            </public_transport_information>
        </tpeg_message>
    </tpeg_message_set>
</tpeg_document>
```

5 tpeg-ptiML

This is defined fully in the tpeg-ptiML.dtd and tpeg-ptiML.ent files (see Annexes A and B)

5.1 public_transport_information

```
<!-- pti_table 26: severity type -->
<!ENTITY pti26_0 "unknown">
<!ENTITY pti26_1 "very slight">
<!ENTITY pti26_2 "slight">
<!ENTITY pti26_3 "normal">
<!ENTITY pti26_4 "severe">
<!ENTITY pti26_5 "very severe">
<!ENTITY pti26_6 "no impact">
<!ENTITY pti26_255 "normal">

<!-- pti_table 32: verified type -->
<!ENTITY pti32_0 "unknown">
<!ENTITY pti32_1 "unverified ">
<!ENTITY pti32_255 "verified">


<!ELEMENT public_transport_information ((location_container | transport_mode | service_information | message_report_type |
additional_information | cross_reference)*)>
<!ATTLIST public_transport_information
    message_id %intunli; #REQUIRED
    version_number %intunti; #REQUIRED
    message_generation_time %time; #IMPLIED
    start_time %time; #IMPLIED
    stop_time %time; #IMPLIED
    message_expiry_time %time; #IMPLIED
    severity_factor CDATA #IMPLIED
    unverified_information CDATA #IMPLIED
>
```

public_transport_information: This represents public transport information from TPEG-PTI. It is intended to convey information to public transport users. The information provided relates to event and some status information on the public transport network and on the associated infrastructure affecting any “leg” of a public transport journey. PTI has a 'fairly flat' structure, with only some hierarchical elements to allow for the creation of messages from a set of PTI tables, which are essentially word-oriented and cover most needs.

The severity_factor attribute shall use entity references of the form `pti26_x`. The unverified_information attribute shall use entity references of the form `pti32_x`.

Example:

```
<public_transport_information message_id="1234" version_number="2"
    message_generation_time="2001-02-22T13:31:13+0"
    start_time="2001-02-22T14:00:00+0"
    stop_time="2001-02-22T14:30:00+0"
    message_expiry_time="2001-02-22T14:45:00+0"
    severity_factor="&pti26_2;"
    unverified_information="&pti32_1;">
    …
</public_transport_information>
```

5.2 transport_mode

```
<!-- pti_table 01: modes_of_transport -->
<!ENTITY pti01_0 "unknown">
<!ENTITY pti01_1 "railway service">
<!ENTITY pti01_2 "coach service">
<!ENTITY pti01_3 "suburban railway service">
<!ENTITY pti01_4 "urban railway service">
<!ENTITY pti01_5 "metro service">
<!ENTITY pti01_6 "underground service">
<!ENTITY pti01_7 "bus service">
<!ENTITY pti01_8 "trolleybus service">
<!ENTITY pti01_9 "tram service">
<!ENTITY pti01_10 "water transport service">
<!ENTITY pti01_11 "air service">
<!ENTITY pti01_12 "ferry service">
<!ENTITY pti01_13 "telecabin service">
<!ENTITY pti01_14 "funicular service">
<!ENTITY pti01_15 "taxi service">
<!ENTITY pti01_16 "self drive">
<!ENTITY pti01_17 "all services">
<!ENTITY pti01_18 "all services except">
<!ENTITY pti1_255 "undefined public transport service">

<!-- pti_table 02: railway_type -->
<!ENTITY pti02_0 "unknown">
<!ENTITY pti02_1 "high speed rail service">
<!ENTITY pti02_2 "long distance trains">
<!ENTITY pti02_3 "inter regional rail service">
<!ENTITY pti02_4 "car transport rail service">
<!ENTITY pti02_5 "sleeper rail service">
<!ENTITY pti02_6 "regional rail">
<!ENTITY pti02_7 "tourist railway">
<!ENTITY pti02_8 "rail shuttle (within complex)">
<!ENTITY pti02_9 "suburban railway">
<!ENTITY pti02_10 "replacement rail service">
<!ENTITY pti02_11 "special train service">
<!ENTITY pti02_12 "lorry transport rail service">
<!ENTITY pti02_13 "all rail services">
<!ENTITY pti02_14 "cross-country rail service">
<!ENTITY pti02_15 "vehicle transport rail service">
<!ENTITY pti02_16 "rack and pinion railway">
<!ENTITY pti02_17 "additional train service">
<!ENTITY pti02_255 "undefined rail service">

<!-- pti_table 03: coach type -->
<!ENTITY pti03_0 "unknown">
<!ENTITY pti03_1 "international coach service">
```

```
<!ENTITY pti03_2 "national coach service">
<!ENTITY pti03_3 "shuttle coach service">
<!ENTITY pti03_4 "regional coach service">
<!ENTITY pti03_5 "special coach service">
<!ENTITY pti03_6 "sightseeing coach service">
<!ENTITY pti03_7 "tourist coach service">
<!ENTITY pti03_8 "commuter coach service">
<!ENTITY pti03_9 "all coach services">
<!ENTITY pti03_255 "undefined coach service">

<!-- pti_table 04: urban railway type -->
<!ENTITY pti04_0 "unknown">
<!ENTITY pti04_1 "metro service">
<!ENTITY pti04_2 "underground service">
<!ENTITY pti04_3 "urban railway service">
<!ENTITY pti04_4 "all urban railway services">
<!ENTITY pti04_255 "undefined underground service">

<!-- pti_table 05: bus type -->
<!ENTITY pti05_0 "unknown">
<!ENTITY pti05_1 "regional bus service">
<!ENTITY pti05_2 "express bus service">
<!ENTITY pti05_3 "stopping bus service">
<!ENTITY pti05_4 "local bus service">
<!ENTITY pti05_5 "night bus service">
<!ENTITY pti05_6 "post bus service">
<!ENTITY pti05_7 "special needs bus">
<!ENTITY pti05_8 "mobility bus service">
<!ENTITY pti05_9 "mobility bus for registered disabled service">
<!ENTITY pti05_10 "sightseeing bus service">
<!ENTITY pti05_11 "shuttle bus service">
<!ENTITY pti05_12 "school bus service">
<!ENTITY pti05_13 "school and public service bus service">
<!ENTITY pti05_14 "rail replacement bus service">
<!ENTITY pti05_15 "demand and response bus service">
<!ENTITY pti05_16 "all bus services">
<!ENTITY pti05_255 "undefined bus service">

<!-- pti_table 06: tram type -->
<!ENTITY pti06_0 "unknown">
<!ENTITY pti06_1 "city tram service">
<!ENTITY pti06_2 "local tram service">
<!ENTITY pti06_3 "regional tram service">
<!ENTITY pti06_4 "sightseeing tram service">
<!ENTITY pti06_5 "shuttle tram service">
<!ENTITY pti06_6 "all tram services">
<!ENTITY pti06_255 "undefined tram service">

<!-- pti_table 07: water transport type -->
<!ENTITY pti07_0 "unknown">
<!ENTITY pti07_1 "international car ferry service">
<!ENTITY pti07_2 "national car ferry service">
<!ENTITY pti07_3 "regional car ferry service">
<!ENTITY pti07_4 "local car ferry service">
<!ENTITY pti07_5 "international passenger ferry service">
<!ENTITY pti07_6 "national passenger ferry service">
<!ENTITY pti07_7 "regional passenger ferry service">
<!ENTITY pti07_8 "local passenger ferry service">
<!ENTITY pti07_9 "post boat service">
<!ENTITY pti07_10 "train ferry service">
<!ENTITY pti07_11 "road-link ferry service">
<!ENTITY pti07_12 "airport-link boat service">
<!ENTITY pti07_13 "car high-speed ferry service">
<!ENTITY pti07_14 "passenger high-speed ferry service">
<!ENTITY pti07_15 "sightseeing boat service">
<!ENTITY pti07_16 "school boat">
<!ENTITY pti07_17 "cable-drawn boat service">
<!ENTITY pti07_18 "river bus service">
<!ENTITY pti07_19 "scheduled ferry service">
<!ENTITY pti07_20 "shuttle ferry service">
<!ENTITY pti07_21 "all water transport services">
<!ENTITY pti07_255 "undefined water transport">

<!-- pti_table 08: air service type -->
<!ENTITY pti08_0 "unknown">
```

```
<!ENTITY pti08_1 "international air service">
<!ENTITY pti08_2 "domestic air service">
<!ENTITY pti08_3 "intercontinental air service">
<!ENTITY pti08_4 "national scheduled air service">
<!ENTITY pti08_5 "shuttle air service">
<!ENTITY pti08_6 "intercontinental air charter service">
<!ENTITY pti08_7 "international air charter service">
<!ENTITY pti08_8 "round-trip air charter service">
<!ENTITY pti08_9 "sightseeing air service">
<!ENTITY pti08_10 "helicopter air service">
<!ENTITY pti08_11 "domestic air charter service">
<!ENTITY pti08_12 "Schengen-area air service">
<!ENTITY pti08_13 "airship service">
<!ENTITY pti08_14 "all air services">
<!ENTITY pti08_255 "undefined aircraft service">

<!-- pti_table 09: telecabin type -->
<!ENTITY pti09_0 "unknown">
<!ENTITY pti09_1 "telecabin service">
<!ENTITY pti09_2 "cable car service">
<!ENTITY pti09_3 "elevator service">
<!ENTITY pti09_4 "chair lift service">
<!ENTITY pti09_5 "drag lift service">
<!ENTITY pti09_6 "small telecabin service">
<!ENTITY pti09_7 "all telecabin services">
<!ENTITY pti09_255 "undefined telecabin type">

<!-- pti_table 10: funicular type -->
<!ENTITY pti10_0 "unknown">
<!ENTITY pti10_1 "funicular service">
<!ENTITY pti10_2 "all funicular services">
<!ENTITY pti10_255 "undefined funicular">

<!-- pti_table 11: taxi type -->
<!ENTITY pti11_0 "unknown">
<!ENTITY pti11_1 "communal taxi service">
<!ENTITY pti11_2 "water taxi service">
<!ENTITY pti11_3 "rail taxi service">
<!ENTITY pti11_4 "bike taxi service">
<!ENTITY pti11_5 "licensed taxi service">
<!ENTITY pti11_6 "private hire vehicle service">
<!ENTITY pti11_7 "all taxi services">
<!ENTITY pti11_255 "undefined taxi service">

<!-- pti_table 12: self-drive vehicle type -->
<!ENTITY pti12_0 "unknown">
<!ENTITY pti12_1 "hire car">
<!ENTITY pti12_2 "hire van">
<!ENTITY pti12_3 "hire motorbike">
<!ENTITY pti12_4 "hire cycle">
<!ENTITY pti12_5 "all self-drive vehicles">
<!ENTITY pti12_255 "undefined self-drive vehicle">

<!ELEMENT transport_mode ((brand_name)*)>
<!ATTLIST transport_mode
    transport_mode CDATA #REQUIRED
    transport_submode CDATA #IMPLIED
>
```


transport_mode: This element is used to indicate which mode of transport is affected by the message. It contains transport_mode and transport_submode. These elements allow the description of the mode of transport. The mode can be refined by use of the submode descriptor. For example, it might be a rail service that is affected, but only sub-urban trains are affected. Long distance trains would pass unhindered.

The transport_mode attribute shall use entity references of the form `pti01_x`. The transport_submode attribute should use entity references of the form shown in Table 1, (if there is no subtype then this attribute should not be present).

Table 1

transport_mode	transport_submode
pti01_0 “unknown”	<none>
pti01_1 “railway service”	pti02_x
pti01_2 “coach service”	pti03_x
pti01_3 “suburban railway service”	<none>
pti01_4 “urban railway service”	pti04_x
pti01_5 “metro service”	<none>
pti01_6 “underground service”	<none>
pti01_7 “bus service”	pti05_x
pti01_8 “trolleybus service”	<none>
pti01_9 “tram service”	pti06_x
pti01_10 “water transport service”	pti07_x
pti01_11 “air service”	pti08_x
pti01_12 “ferry service”	<none>
pti01_13 “telecabin service”	pti09_x
pti01_14 “funicular service”	pti10_x
pti01_15 “taxi service”	pti11_x
pti01_16 “self drive”	pti12_x
pti01_17 “all services”	<none>
pti01_18 “all services except”	<none>

Example:

```
<transport_mode transport_mode=”&pti01_1;” transport_submode=”&pti02_9;”/>
```

5.2.1 brand_name

```
<!ELEMENT brand_name EMPTY>
<!ATTLIST brand_name
    brand_name %short_string; #REQUIRED
>
```

brand_name: In recent years many services have been identified less by mode of transport than by “brand”, this attribute allows the use of the same identification to which the traveller is accustomed. It is given as a short string.

Example:

```
<brand_name brand_name=”City Flyer”/>
```

5.3 service_information

```
<!ELEMENT service_information ((transport_service_identification | service_condition | facilities | booking_status |
ticket_restrictions | event_reason | timetable_type | route_description)*)>
```

service_information: This element is used to describe the service in further detail as well as what is happening. It contains transport_service_identification, service_condition, facilities, booking_status, ticket_restrictions, severity, event_reason, timetable_type and route_description. All these elements can be used as and when needed to describe the services and its status.

Example:

```
<service_information>
        …
</service_information>
```

5.3.1 transport_service_identification

```
<!ELEMENT transport_service_identification ((transport_service_id | transport_service_name | operator_name |
operator_subsidiary_name)*)>
```

transport_service_identifier: This element is used to identify a particular service. It contains service_id and service_name. These elements allow the use of either a Service Number, such as a flight number or a Service Name, such as the name of a vessel, or a particular route. They can also be used in combination. The information is provided as short strings, which should reflect what users are likely to see on local signs.

Example: The airport rail link in Munich, may be shown as this:

```
<transport_service_identification>
        …
</transport_service_identification>
```

5.3.1.1 transport_service_id

```
<!-- pti_table 14: transport information type -->
<!ENTITY pti14_0 "unknown">
<!ENTITY pti14_1 "type of conveyance">
<!ENTITY pti14_2 "service number">
<!ENTITY pti14_3 "train id code">
<!ENTITY pti14_255 "undefined transport information type">

<!ELEMENT transport_service_id EMPTY>
<!ATTLIST transport_service_id
    transport_information_type CDATA #REQUIRED
    transport_service_id %short_string; #REQUIRED
>
```

transport_service_id: This identifies the public transport service. The transport_information_type attribute shall use entity references of the form `pti14_x` and identifies the type of information given here. The transport_service_id attribute gives the actual information identifying the service.

Example:

```
<transport_service_id transport_information_type=”&pti14_2” transport_service_id=”BA2723”/>
```

5.3.1.2 transport_service_name

```
<!ELEMENT transport_service_name EMPTY>
<!ATTLIST transport_service_name
    transport_service_name %short_string; #IMPLIED
>
```

transport_service_name: This gives the name of the service.

Example:

```
<transport_service_name transport_service_name="Flughaven Linie"/>
```

5.3.1.3 operator_name

```
<!ELEMENT operator_name EMPTY>
<!ATTLIST operator_name
    name %short_string; #REQUIRED
>
```

operator_name: One way of identifying a service is by who is running it. This element identifies the provider/operator of a service. The information is provided as short strings, which should reflect what users are likely to see on local signs.

Example:

```
<operator_name operator_name="Connex"/>
```

5.3.1.4 operator_subsidiary_name

```
<!ELEMENT operator_subsidiary_name EMPTY>
<!ATTLIST operator_subsidiary_name
    operator_subsidiary_name %short_string; #IMPLIED
>
```

operator_subsidiary_name: This element identifies a subsidiary of a provider/operator in the case of code sharing, or where a parent company provides different services through different subsidiaries. The information is provided as short strings, which should reflect what users are likely to see on local signs.

Example:

```
<operator_subsidiary_name operator_subsidiary_name="South Eastern"/>
```

5.3.2 service_condition

```
<!-- pti_table 13: service condition type -->
<!ENTITY pti13_0 "unknown">
<!ENTITY pti13_1 "altered">
<!ENTITY pti13_2 "cancelled">
<!ENTITY pti13_3 "delayed">
<!ENTITY pti13_4 "diverted">
<!ENTITY pti13_5 "no service">
<!ENTITY pti13_6 "disrupted">
<!ENTITY pti13_7 "additional service">
<!ENTITY pti13_8 "special service">
<!ENTITY pti13_9 "on time">
<!ENTITY pti13_10 "normal service">
<!ENTITY pti13_11 "intermittent service">
```

```
<!ENTITY pti13_12 "short formed service">
<!ENTITY pti13_13 "full length service">
<!ENTITY pti13_14 "extended service">
<!ENTITY pti13_15 "splitting train">
<!ENTITY pti13_16 "replacement transport">
<!ENTITY pti13_17 "arrives early">
<!ENTITY pti13_18 "shuttle service">
<!ENTITY pti13_19 "replacement service">
<!ENTITY pti13_255 "undefined service information">

<!ELEMENT service_condition EMPTY>
<!ATTLIST service_condition
    service_condition_type CDATA #REQUIRED
>
```

service_condition: This describes the status of the service, whether it is a cancellation, a report of a delay, an alteration, etc. The service_condition_type attribute shall use entity references of the form `pti13_x`.

Example:

```
<service_condition service_condition_type="&pti13_6;"/>
```

5.3.3 facilities

```
<!-- pti_table 23: facilities type -->
<!ENTITY pti23_0 "unknown">
<!ENTITY pti23_1 "restaurant service">
<!ENTITY pti23_2 "snacks service">
<!ENTITY pti23_3 "sleeper">
<!ENTITY pti23_4 "couchette">
<!ENTITY pti23_5 "special seating">
<!ENTITY pti23_6 "first class">
<!ENTITY pti23_7 "second class">
<!ENTITY pti23_8 "third class">
<!ENTITY pti23_9 "economy class">
<!ENTITY pti23_10 "business class">
<!ENTITY pti23_11 "free seating">
<!ENTITY pti23_12 "reclining seats">
<!ENTITY pti23_13 "baby compartment">
<!ENTITY pti23_14 "audio services">
<!ENTITY pti23_15 "video services">
<!ENTITY pti23_16 "suitable for wheel chairs">
<!ENTITY pti23_17 "bike carriage">
<!ENTITY pti23_18 "bar">
<!ENTITY pti23_19 "food not available">
<!ENTITY pti23_20 "beverages not available">
<!ENTITY pti23_21 "telephone">
<!ENTITY pti23_22 "toilet">
<!ENTITY pti23_23 "no toilet">
<!ENTITY pti23_24 "mobile phone free zone">
<!ENTITY pti23_25 "business services">
<!ENTITY pti23_26 "bistro">
<!ENTITY pti23_255 "undefined service facility">

<!ELEMENT facilities EMPTY>
<!ATTLIST facilities
    facilities_type CDATA #REQUIRED
>
```

facilities: This element allows adding details of facilities available on a particular service, e.g. if there is a restaurant available. The facilities_type attribute shall use entity references of the form `pti23_x`.

Example:

```
<facilities facilities_type="&pti23_6;"/>
```

5.3.4 booking_status

```
<!-- pti_table 24: booking status type -->
<!ENTITY pti24_0 "unknown">
<!ENTITY pti24_1 "available ">
<!ENTITY pti24_2 "limited">
<!ENTITY pti24_3 "very limited">
<!ENTITY pti24_4 "full">
<!ENTITY pti24_5 "waiting list">
<!ENTITY pti24_6 "no booking required">
<!ENTITY pti24_7 "booking required">
<!ENTITY pti24_8 "booking optional">
<!ENTITY pti24_255 "undefined booking information">

<!ELEMENT booking_status EMPTY>
<!ATTLIST booking_status
    booking_status_type CDATA #REQUIRED
>
```

booking_status: With this element is it possible to describe the level of availability of a service, e.g. if there is space available. It is important to remember that tpeg-ptiML is aimed at a large provider base. The booking_status_type attribute shall use entity references of the form `pti24_x`.

Example:

```
<booking_status booking_status_type="&pti24_1;"/>
```

5.3.5 ticket_restrictions

```
<!-- pti_table 25: ticket restriction type -->
<!ENTITY pti25_0 "unknown">
<!ENTITY pti25_1 "all ticket classes valid">
<!ENTITY pti25_2 "full fare only">
<!ENTITY pti25_3 "certain tickets only">
<!ENTITY pti25_4 "ticket with reservation">
<!ENTITY pti25_5 "special fare">
<!ENTITY pti25_6 "only tickets of specified operator">
<!ENTITY pti25_7 "no restrictions">
<!ENTITY pti25_8 "no off-peak tickets">
<!ENTITY pti25_9 "no weekend return tickets">
<!ENTITY pti25_10 "no reduced fare tickets">
<!ENTITY pti25_255 "unknown ticket restriction">

<!ELEMENT ticket_restrictions EMPTY>
<!ATTLIST ticket_restrictions
    ticket_restrictions_type CDATA #REQUIRED
>
```

ticket_restrictions: This permits the description of ticket restrictions which may apply to a service. The ticket_restrictions attribute shall use entity references of the form `pti25_x`.

Example:

```
<ticket_restrictions ticket_restrictions_type="&pti25_1;"/>
```

5.3.6 event_reason

```
<!-- pti_table 18: event reason type -->
<!ENTITY pti18_0 "unknown">
<!ENTITY pti18_1 "miscellaneous event reason">
<!ENTITY pti18_2 "personnel event reason">
<!ENTITY pti18_3 "equipment event reason">
<!ENTITY pti18_4 "environment event reason">
<!ENTITY pti18_255 "undefined event reason">
```

```
<!-- pti_table 19: miscellaneous event type -->
<!ENTITY pti19_0 "unknown">
<!ENTITY pti19_1 "incident">
<!ENTITY pti19_2 "bomb explosion">
<!ENTITY pti19_3 "security alert">
<!ENTITY pti19_4 "fire">
<!ENTITY pti19_5 "vandalism">
<!ENTITY pti19_6 "accident">
<!ENTITY pti19_7 "overcrowded">
<!ENTITY pti19_8 "insufficient demand">
<!ENTITY pti19_9 "lighting failure">
<!ENTITY pti19_10 "leader board failure">
<!ENTITY pti19_11 "service indicator failure">
<!ENTITY pti19_12 "service failure">
<!ENTITY pti19_13 "operator ceased trading">
<!ENTITY pti19_14 "operator suspended">
<!ENTITY pti19_15 "congestion">
<!ENTITY pti19_16 "route blockage">
<!ENTITY pti19_17 "person on the line">
<!ENTITY pti19_18 "vehicle on the line">
<!ENTITY pti19_19 "object on the line">
<!ENTITY pti19_20 "animal on the line">
<!ENTITY pti19_21 "route diversion">
<!ENTITY pti19_22 "road closed">
<!ENTITY pti19_23 "roadworks">
<!ENTITY pti19_24 "special event">
<!ENTITY pti19_25 "bridge strike">
<!ENTITY pti19_26 "overhead obstruction">
<!ENTITY pti19_255 "undefined problem">

<!-- pti_table 20: personnel problem -->
<!ENTITY pti20_0 "unknown">
<!ENTITY pti20_1 "staff sickness">
<!ENTITY pti20_2 "staff absence">
<!ENTITY pti20_3 "staff in wrong place">
<!ENTITY pti20_4 "staff shortage">
<!ENTITY pti20_5 "industrial action">
<!ENTITY pti20_6 "work to rule">
<!ENTITY pti20_255 "undefined personnel problem">

<!-- pti_table 21: equipment event type -->
<!ENTITY pti21_0 "unknown">
<!ENTITY pti21_1 "points problem">
<!ENTITY pti21_2 "points failure">
<!ENTITY pti21_3 "signal problem">
<!ENTITY pti21_4 "signal failure">
<!ENTITY pti21_5 "derailment">
<!ENTITY pti21_6 "engine failure">
<!ENTITY pti21_7 "break down">
<!ENTITY pti21_8 "technical problem">
<!ENTITY pti21_9 "repair work">
<!ENTITY pti21_10 "construction work">
<!ENTITY pti21_11 "maintenance work">
<!ENTITY pti21_12 "power problem">
<!ENTITY pti21_13 "fuel problem">
<!ENTITY pti21_14 "swing bridge failure">
<!ENTITY pti21_15 "escalator failure">
<!ENTITY pti21_16 "lift failure">
<!ENTITY pti21_17 "gangway problem">
<!ENTITY pti21_18 "closed for maintenance">
<!ENTITY pti21_19 "fuel shortage">
<!ENTITY pti21_20 "de-icing work">
<!ENTITY pti21_21 "wheel problem">
<!ENTITY pti21_22 "luggage carousel problem">
<!ENTITY pti21_255 "undefined equipment problem">

<!-- pti_table 22: environment event type -->
<!ENTITY pti22_0 "unknown">
<!ENTITY pti22_1 "fog">
<!ENTITY pti22_2 "rough sea">
<!ENTITY pti22_3 "heavy snow fall">
<!ENTITY pti22_4 "heavy rain">
<!ENTITY pti22_5 "strong winds">
<!ENTITY pti22_6 "tidal restrictions">
<!ENTITY pti22_7 "high tide">
```

```
<!ENTITY pti22_8 "low tide">
<!ENTITY pti22_9 "ice">
<!ENTITY pti22_10 "frozen">
<!ENTITY pti22_11 "hail">
<!ENTITY pti22_12 "high temperatures">
<!ENTITY pti22_13 "flooding">
<!ENTITY pti22_14 "waterlogged">
<!ENTITY pti22_15 "low water level">
<!ENTITY pti22_16 "high water level">
<!ENTITY pti22_17 "fallen leaves">
<!ENTITY pti22_18 "fallen tree">
<!ENTITY pti22_19 "landslide">
<!ENTITY pti22_255 "undefined environmental problem">

<!ELEMENT event_reason EMPTY>
<!ATTLIST event_reason
    event_reason_type CDATA #REQUIRED
    event_reason_subtype CDATA #IMPLIED
>
```

event_reason: This gives a broad reason why something is happening. There are four types and these are further specified in the event_reason_subtype. The event_reason_type attribute shall use entity references of the form `pti18_x`. The event_reason_subtype attribute should use entity references of the form shown in Table 2, (if there is no subtype then this attribute should not be present).

Table 2

event_reason_type	event_reason_subtype
pti18_0 “unknown”	<none>
pti18_1 “miscellaneous_event”	pti19_x
pti18_2 “personnel_event”	pti20_x
pti18_3 “equipment_event”	pti21_x
pti18_4 “envirorment event”	pti22_x
pti18_255 “undefined event reason”	<none>

Example:

```
<event_reason event_reason_type="&pti18_1;" event_reason_subtype="&pti19_17;"/>
```

5.3.7 timetable_type

```
<!-- pti_table_33: timetable type -->
<!ENTITY pti33_0 "unknown">
<!ENTITY pti33_1 "winter ">
<!ENTITY pti33_2 "spring">
<!ENTITY pti33_3 "summer">
<!ENTITY pti33_4 "autumn">
<!ENTITY pti33_5 "special">
<!ENTITY pti33_6 "emergency">
<!ENTITY pti33_255 "undefined timetable type">

<!ELEMENT timetable_type EMPTY>
<!ATTLIST timetable_type
    timetable_period_indicator CDATA #REQUIRED
>
```

timetable_type: This element indicates on what timetable the information is based, i.e. summer, winter, special, etc. The timetable_period_indicator attribute shall use entity references of the form `pti33_x`.

Example:

```
<timetable_type timetable_period_indicator="&pti33_1;"/>
```

5.3.8 route_description

```
<!ELEMENT route_description ((service_delivery | time_type | route_location)*)>
```

route_description: These elements are used to describe the route of a service.

Example:

```
<route_description>
    …
</route_description>
```

5.3.8.1 service_delivery

```
<!-- pti_table 16: scheduled predicted type -->
<!ENTITY pti16_0 "unknown">
<!ENTITY pti16_1 "scheduled">
<!ENTITY pti16_2 "predicted">
<!ENTITY pti16_255 "undefined">

<!-- pti_table 17: service delivery point type -->
<!ENTITY pti17_0 "unknown">
<!ENTITY pti17_1 "platform number">
<!ENTITY pti17_2 "terminal gate">
<!ENTITY pti17_3 "ferry berth">
<!ENTITY pti17_4 "harbour pier">
<!ENTITY pti17_5 "landing stage">
<!ENTITY pti17_6 "bus stop">
<!ENTITY pti17_255 "undefined service delivery point ">

<!ELEMENT service_delivery EMPTY>
<!ATTLIST service_delivery
    service_delivery_point_type CDATA #REQUIRED
    planning_status_type CDATA #REQUIRED
    service_delivery_point_name %short_string; #REQUIRED
>
```

service_delivery: This element further refines the location reference by specifying either a platform, terminal or berth number or name - should information be available. The service_delivery_type attribute shall use entity references of the form `pti17_x` and planning_status_type attribute shall use entity references of the form `pti16_x`.

Example:

```
<service_delivery service_delivery_point_type="&pti17_1;" planning_status_type="&pti16_1;"
service_delivery_point_name="3a"/>
```

5.3.8.2 time_type

```
<!-- pti_table 16: scheduled predicted type -->
<!ENTITY pti16_0 "unknown">
<!ENTITY pti16_1 "scheduled">
<!ENTITY pti16_2 "predicted">
<!ENTITY pti16_255 "undefined">

<!-- pti_table 28: time type -->
<!ENTITY pti28_0 "unknown">
```

```
<!ENTITY pti28_1 "arrival">
<!ENTITY pti28_2 "departure">
<!ENTITY pti28_3 "event start time">
<!ENTITY pti28_4 "event end time">
<!ENTITY pti28_5 "interval in years">
<!ENTITY pti28_6 "interval in months">
<!ENTITY pti28_7 "interval in days">
<!ENTITY pti28_8 "interval in hours">
<!ENTITY pti28_9 "interval in minutes">
<!ENTITY pti28_255 "undefined time type">

<!ELEMENT time_type ( (time_instance | interval_time | service_day_type)* )>
<!ATTLIST time_type
    time_type CDATA #REQUIRED
    planning_status_type CDATA #REQUIRED
>
```

time_type: This element is used to give a time to an event. The time_type attribute shall use entity references of the form `pti28_x`. The planning_status_type attribute shall use entity references of the form `pti16_x`.

Example:

```
<time_type time_type="&pti28_2;" planning_status_type="pti16_1;">
    …
</time_type>
```

5.3.8.2.1 time_instance

```
<!ELEMENT time_instance EMPTY>
<!ATTLIST time_instance
    time %time; #REQUIRED
>
```

time_instance: This gives the actual time in ISO 8601 “complete representation basic format”.

Example:

```
<time_instance time=”2002-02-11T20:45:00+0”/>
```

5.3.8.2.2 interval_time

```
<!ELEMENT interval_time EMPTY>
<!ATTLIST interval_time
    interval_time %intunti; #REQUIRED
>
```

interval_time: This describes a time event that repeats at regular intervals. This is used in association with the time_type attribute in the time_type element.

Example:

```
<interval_time interval_time"7"/>
```

5.3.8.2.3 service_day_type

```
<!-- pti_table 34: service day type -->
<!ENTITY pti34_0 "unknown">
<!ENTITY pti34_1 "monday ">
<!ENTITY pti34_2 "tuesday">
```

```
<!ENTITY pti34_3 "wednesday">
<!ENTITY pti34_4 "thursday">
<!ENTITY pti34_5 "friday">
<!ENTITY pti034_6 "saturday">
<!ENTITY pti34_7 "sunday">
<!ENTITY pti34_8 "weekdays">
<!ENTITY pti34_9 "weekends">
<!ENTITY pti34_10 "holiday">
<!ENTITY pti34_11 "public holiday">
<!ENTITY pti34_12 "religious holiday">
<!ENTITY pti34_13 "federal holiday">
<!ENTITY pti34_14 "regional holiday">
<!ENTITY pti34_15 "national holiday">
<!ENTITY pti34_16 "monday to friday">
<!ENTITY pti34_17 "monday to saturday">
<!ENTITY pti34_18 "sundays and public holidays">
<!ENTITY pti34_19 "school days">
<!ENTITY pti34_20 "every day">
<!ENTITY pti34_255 "undefined service day type">

<!ELEMENT service_day_type EMPTY>
<!ATTLIST service_day_type
    service_day_type CDATA #REQUIRED
>
```

service_day_type: This represents a specific day or set of days. The service_day_type attribute shall use entity references of the form `pti34_x`.

Example:

```
<service_day_type service_day_type="&pti034_8;"/>
```

5.3.8.3 route_location

```
<!-- pti_table 15: route_point_type -->
<!ENTITY pti15_0 "unknown">
<!ENTITY pti15_1 "start point">
<!ENTITY pti15_2 "destination">
<!ENTITY pti15_3 "stop">
<!ENTITY pti15_4 "via">
<!ENTITY pti15_5 "not-stopping">
<!ENTITY pti15_6 "temporary stop">
<!ENTITY pti15_7 "temporarily not-stopping">
<!ENTITY pti15_8 "exceptional stop">
<!ENTITY pti15_9 "additional stop">
<!ENTITY pti15_10 "request stop">
<!ENTITY pti15_11 "front train destination">
<!ENTITY pti15_12 "rear train destination">
<!ENTITY pti15_13 "through service destination">
<!ENTITY pti15_14 "not via">
<!ENTITY pti15_15 "altered start point">
<!ENTITY pti15_16 "altered destination">
<!ENTITY pti15_255 "undefined route point">

<!ELEMENT route_location (location_container)>
<!ATTLIST route_location
    route_description_type CDATA #REQUIRED
>
```

route_location: This defines a location on a route. The route_description_type indicates the type of location and the location is then described through the use of the <location_container>. The route_description_type attribute shall use entity references of the form `pti15_x`.

Example:

```
<route_description route_description_type="&pti15_1;">
    ...
</route_description>
```

5.4 message_report_type

```
<!-- pti_table 25: ticket restriction type -->
<!ENTITY pti25_0 "unknown">
<!ENTITY pti25_1 "all ticket classes valid">
<!ENTITY pti25_2 "full fare only">
<!ENTITY pti25_3 "certain tickets only">
<!ENTITY pti25_4 "ticket with reservation">
<!ENTITY pti25_5 "special fare">
<!ENTITY pti25_6 "only tickets of specified operator">
<!ENTITY pti25_7 "no restrictions">
<!ENTITY pti25_8 "no off-peak tickets">
<!ENTITY pti25_9 "no weekend return tickets">
<!ENTITY pti25_10 "no reduced fare tickets">
<!ENTITY pti25_255 "unknown ticket restriction">

<!ELEMENT message_report_type EMPTY>
<!ATTLIST message_report_type
    message_report_type CDATA #REQUIRED
>
```

message_report_type: This element is mainly for presentation purposes. It allows the indication of the type of presentation the service provider had in mind when the message was generated. The message_report_type attribute shall use entity references of the form `pti25_x`.

Example:

```
<message_report_type message_report_type="&pti025_4;">
        …
</message_report_type>
```

5.5 additional_information

```
<!-- pti_table 30: additional information type -->
<!ENTITY pti30_0 "details not known">
<!ENTITY pti30_1 "internet link">
<!ENTITY pti30_2 "telephone number">
<!ENTITY pti30_3 "text calling number">
<!ENTITY pti30_4 "voice calling number">
<!ENTITY pti30_5 "data calling number">
<!ENTITY pti30_6 "price information">
<!ENTITY pti30_7 "ticketing information">
<!ENTITY pti30_255 "undefined additional information">

<!ELEMENT additional_information EMPTY>
<!ATTLIST additional_information
    function_type CDATA #REQUIRED
    language_code CDATA #IMPLIED
    additional_information %short_string; #REQUIRED
>
```

additional_information: The element is used to provide further details to the end-user, including perhaps such things as “hypertext links”. The function_type attribute shall use entity references of the form `pti30_x`. The language_code attribute shall use entity references of the form `loc41_x`.

Example:

```
<additional_information function_type="&pti30_2;" additional_information="08457 484950"/>
```

5.6 cross_reference

```
<!-- pti_table 31: cross reference type -->
<!ENTITY pti31_0 "unknown">
<!ENTITY pti31_1 "connection ">
<!ENTITY pti31_2 "replacement">
<!ENTITY pti31_3 "alternative">
<!ENTITY pti31_4 "connection not held">
<!ENTITY pti31_5 "connection held">
<!ENTITY pti31_6 "status of connection undecided">
<!ENTITY pti31_255 "undefined cross reference information">

<!ELEMENT cross_reference EMPTY>
<!ATTLIST cross_reference
    cross_reference_type CDATA #REQUIRED
    sid_a %intunti; #IMPLIED
    sid_b %intunti; #IMPLIED
    sid_c %intunti; #IMPLIED
    scid %intunti; #IMPLIED
    mid %intunli; #REQUIRED
    ver %intunti; #IMPLIED
>
```

cross_reference_type: The element is intended to link to other messages that may be relevant to the event described in this message. The cross_reference_type attribute shall use entity references of the form `pti31_x`.

- The “sid_a”, “sid_b” and “sid_c” attributes are an optional service ID of the service to which it is linked.
- The “scid” attribute is an optional service component ID of the service to which it is linked.
- The “mid” attribute is the ID of the relevant message to which it is linked.
- The “ver” attribute is the optional version number of the relevant message to which it is linked.

Example:

```
<cross_reference cross_reference_type=“&pti031_1;” mid=”1334” />
```

Annex A
(normative)

DTD for tpeg-ptiML — TPEG Public Transport Information application (tpeg-ptiML.dtd)

```
<?xml version="1.0" encoding="Unicode_ISO_IEC10646_UTF-8"?>
<!--=======================================-->
<!—tpeg-ptiML TPEG Public Transport Information application DTD v1.0-->
<!--2004_07_06-->
<!-- PUBLIC"-//EBU//DTD tpeg-ptiML//EN-->
<!--=======================================-->
<!ENTITY % ptiML_ent SYSTEM "ptiML.ent">
%ptiML_ent;
<!-- public_transport_information: Message from TPEG-PTI application
     severity_factor uses pti26_x
     unverified_information uses pti32_x
-->
<!ELEMENT public_transport_information ((location_container | transport_mode | service_information | message_report_type |
additional_information | cross_reference)*)>
<!ATTLIST public_transport_information
     message_id CDATA #REQUIRED
     version_number CDATA #REQUIRED
     message_generation_time %time; #IMPLIED
     start_time %time; #IMPLIED
     stop_time %time; #IMPLIED
     message_expiry_time %time; #IMPLIED
     severity_factor CDATA #IMPLIED
     unverified_information CDATA #IMPLIED
>
<!-- transport_mode element
     transport_mode uses pti01_x
     transport_submode uses pti02_x, pti03_x, pti04_x, pti05_x, pti06_x, pti07_x, pti08_x, pti09_x, pti10_x, pti11_x, pti12_x,
-->
<!ELEMENT transport_mode (brand_name*)>
<!ATTLIST transport_mode
     transport_mode CDATA #REQUIRED
     transport_submode CDATA #IMPLIED
>
<!-- brand_name element -->
<!ELEMENT brand_name EMPTY>
<!ATTLIST brand_name
     brand_name %short_string; #REQUIRED
>
<!-- service_information element -->
<!ELEMENT service_information ((transport_service_identification | service_condition | facilities | booking_status |
ticket_restrictions | event_reason | route_description)*)>
<!-- transport_service_identification element -->
<!ELEMENT transport_service_identification ((transport_service_id | transport_service_name | operator_name |
operator_subsidiary_name)*)>
<!-- transport_service_id element
     transport_information_type uses pti14_x
-->
<!ELEMENT transport_service_id EMPTY>
<!ATTLIST transport_service_id
     transport_information_type CDATA #REQUIRED
     transport_service_id %short_string; #REQUIRED
>
<!-- transport_service_name element
-->
<!ELEMENT transport_service_name EMPTY>
<!ATTLIST transport_service_name
     transport_service_name %short_string; #REQUIRED
>
<!-- operator_name element
```

```
-->
<!ELEMENT operator_name EMPTY>
<!ATTLIST operator_name
    operator_name %short_string; #REQUIRED
>
<!-- operator_subsidiary_name element
-->
<!ELEMENT operator_subsidiary_name EMPTY>
<!ATTLIST operator_subsidiary_name
    operator_subsidiary_name %short_string; #REQUIRED
>
<!-- service_condition element
    service_condition_type uses pti13_x
-->
<!ELEMENT service_condition EMPTY>
<!ATTLIST service_condition
    service_condition_type CDATA #REQUIRED
>
<!-- facilities element
    facilities_type uses pti23_x
-->
<!ELEMENT facilities EMPTY>
<!ATTLIST facilities
    facilities_type CDATA #REQUIRED
>
<!-- booking_status element
    booking_status_type uses pti24_x
-->
<!ELEMENT booking_status EMPTY>
<!ATTLIST booking_status
    booking_status_type CDATA #REQUIRED
>
<!-- ticket_restrictions element
    ticket_restrictions_type uses pti25_x
-->
<!ELEMENT ticket_restrictions EMPTY>
<!ATTLIST ticket_restrictions
    ticket_restrictions_type CDATA #REQUIRED
>
<!-- event_reason element
    event_reason_type uses pti18_x
    event_reason_subtype uses pti19_x, pti20_x, pti21_x, pti22_x
-->
<!ELEMENT event_reason EMPTY>
<!ATTLIST event_reason
    event_reason_type CDATA #REQUIRED
    event_reason_subtype CDATA #IMPLIED
>
<!-- route_description element-->
<!ELEMENT route_description ((route_description_type | time_type | timetable_type | service_delivery)*)>
<!-- route_description_type element
    route_description_type uses pti15_x
-->
<!ELEMENT route_description_type (location_container, (time_type | timetable_type | service_delivery)*)>
<!ATTLIST route_description_type
    route_description_type CDATA #REQUIRED
>
<!-- service_delivery element
    service_delivery_point_type uses pti17_x
    planning_status_type uses pti16_x
-->
<!ELEMENT service_delivery EMPTY>
<!ATTLIST service_delivery
    service_delivery_point_type CDATA #REQUIRED
    planning_status_type CDATA #REQUIRED
    service_delivery_point_name %short_string; #REQUIRED
>
<!-- time_type element
    time_type uses pti28_x
    planning_status_type uses pti16_x
-->
```

```
<!ELEMENT time_type (time_instance? | interval_time? | service_day_type?)>
<!ATTLIST time_type
    time_type CDATA #REQUIRED
    planning_status_type CDATA #REQUIRED
>
<!-- time_instance -->
<!ELEMENT time_instance EMPTY>
<!ATTLIST time_instance
    local_time %short_string; #REQUIRED
>
<!--interval_ time -->
<!ELEMENT interval_time EMPTY>
<!ATTLIST interval_time
    interval %intunti; #REQUIRED
>
<!-- service_day_type element
    service_day_type uses pti34_x
-->
<!ELEMENT service_day_type EMPTY>
<!ATTLIST service_day_type
    service_day_type CDATA #REQUIRED
>
<!-- timetable_type element
    timetable_type uses pti33_x
-->
<!ELEMENT timetable_type EMPTY>
<!ATTLIST timetable_type
    timetable_type CDATA #REQUIRED
>
<!-- message_report_type element
    message_report_type uses pti25_x
-->
<!ELEMENT message_report_type EMPTY>
<!ATTLIST message_report_type
    message_report_type CDATA #REQUIRED
>
<!-- additional_information element
    function_type uses pti30_x
     language_code uses loc41_x
-->
<!ELEMENT additional_information EMPTY>
<!ATTLIST additional_information
    function_type CDATA #REQUIRED
    language_code CDATA #IMPLIED
    additional_information %short_string; #REQUIRED
>
<!-- cross_reference element
    cross-reference_type uses pti31_x
-->
<!ELEMENT cross_reference EMPTY>
<!ATTLIST cross_reference
    cross_reference_type CDATA #REQUIRED
    sid-a %intunti; #IMPLIED
    sid-b %intunti; #IMPLIED
    sid-c %intunti; #IMPLIED
    scid %intunti; #IMPLIED
    mid %intunti; #REQUIRED
    ver %intunti; #IMPLIED
>
```