

Corrigendum for:

**ISO/TS 21219-4:2015**

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

### **Erratum**

In this specification the complete XML Schema Definition (XSD) for the TPEG data types is not included.

### **Correction**

Add, at end of the document, an Appendix B as follows on the next page:

## Annex B (normative)

### TPEG Data Types, tpegML Representation

#### B.1 General

This annex provides the tpegML representation of the TPEG Data Types.

#### B.2 XML Schema Definition of the TPEG Data Types:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns="http://www.tisa.org/TPEG/TPEGDataTypes_2_0"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.tisa.org/TPEG/TPEGDataTypes_2_0" elementFormDefault="qualified"
attributeFormDefault="qualified">
  <!--TPEG Abstract Data Types-->
  <xs:simpleType name="BitArray">
    <xs:annotation>
      <xs:documentation>list of boolean values</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
      <xs:pattern value="^(0|1)*"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="Boolean">
    <xs:annotation>
      <xs:documentation>boolean values [true|false]</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:boolean"/>
  </xs:simpleType>
  <xs:simpleType name="DateTime">
    <xs:annotation>
      <xs:documentation>provides date and time information in UTC</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:dateTime"/>
  </xs:simpleType>
  <xs:complexType name="DaySelector">
    <xs:annotation>
      <xs:documentation>allows selection of one or multiple of week day [Monday | Tuesday |
Wednesday | Thursday | Friday | Saturday | Sunday]</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="Monday" minOccurs="0"/>
      <xs:element name="Tuesday" minOccurs="0"/>
      <xs:element name="Wednesday" minOccurs="0"/>
      <xs:element name="Thursday" minOccurs="0"/>
      <xs:element name="Friday" minOccurs="0"/>
      <xs:element name="Saturday" minOccurs="0"/>
      <xs:element name="Sunday" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
  <xs:simpleType name="DistanceMetres">
    <xs:annotation>
      <xs:documentation>distance in whole metres [0..4294967295]</xs:documentation>
    </xs:annotation>
  </xs:simpleType>
</xs:schema>
```

```

</xs:annotation>
<xs:restriction base="xs:unsignedInt"/>
</xs:simpleType>
<xs:simpleType name="DistanceCentimetres">
  <xs:annotation>
    <xs:documentation>distance in whole centimetres [0..4294967295]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedInt"/>
</xs:simpleType>
<xs:simpleType name="Duration">
  <xs:annotation>
    <xs:documentation>temporal duration in whole seconds [0..4294967295]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedInt"/>
</xs:simpleType>
<xs:simpleType name="FixedPercentage">
  <xs:annotation>
    <xs:documentation>percentage value in whole precents [0..100]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedByte">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="100"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="FixedPointNumber">
  <xs:annotation>
    <xs:documentation>value with a precision of 2 decimals [-2147483648.99 ..
2147483648.99]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:decimal">
    <xs:minInclusive value="-2147483648.99"/>
    <xs:maxInclusive value="2147483648.99"/>
    <xs:fractionDigits value="2"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="Float">
  <xs:annotation>
    <xs:documentation>number with decimal precision</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:float"/>
</xs:simpleType>
<xs:simpleType name="IntSiTi">
  <xs:annotation>
    <xs:documentation>(Integer Signed Tiny) signed integer value of fixed size [-128 ..
127]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:byte"/>
</xs:simpleType>
<xs:simpleType name="IntSiLi">
  <xs:annotation>
    <xs:documentation>(Integer Signed Little) signed integer value of fixed size [-32768 ..
32768]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:short"/>
</xs:simpleType>
<xs:simpleType name="IntSi24">
  <xs:restriction base="xs:int">
    <xs:minInclusive value="-8388608"/>
    <xs:maxInclusive value="8388607"/>
  </xs:restriction>

```

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</xs:simpleType>
<xs:simpleType name="IntSiLo">
  <xs:annotation>
    <xs:documentation>(Integer Signed Long) signed integer value of fixed size [-2147483648 ..
2147483647]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:int"/>
</xs:simpleType>
<xs:simpleType name="IntSiLoMB">
  <xs:annotation>
    <xs:documentation>(Integer Signed Long MultiByte) signed integer value of variable size [-
2147483648 .. 2147483647]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:int"/>
</xs:simpleType>
<xs:simpleType name="IntUnTi">
  <xs:annotation>
    <xs:documentation>(Integer Unsigned Tiny) unsigned integer value of fixed size [0 ..
255]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedByte"/>
</xs:simpleType>
<xs:simpleType name="IntUnLi">
  <xs:annotation>
    <xs:documentation>(Integer Unsigned Little) unsigned integer value of fixed size [0 ..
65535]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedShort"/>
</xs:simpleType>
<xs:simpleType name="IntUn24">
  <xs:restriction base="xs:unsignedInt">
    <xs:maxInclusive value="16777215"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="IntUnLo">
  <xs:annotation>
    <xs:documentation>(Integer Unsigned Long) unsigned integer value of fixed size [0 ..
4294967295]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedInt"/>
</xs:simpleType>
<xs:simpleType name="IntUnLoMB">
  <xs:annotation>
    <xs:documentation>(Integer Unsigned Long MultiByte) unsigned integer value of variable size [0 ..
4294967295]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedInt"/>
</xs:simpleType>
<xs:simpleType name="ShortString">
  <xs:annotation>
    <xs:documentation>sequence of up to 255 characters</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:maxLength value="255"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="LongString">
  <xs:annotation>
    <xs:documentation>sequence of up to 65535 characters</xs:documentation>
  </xs:annotation>

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    <xs:restriction base="xs:string">
      <xs:maxLength value="65535"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="LocalisedShortString">
    <xs:annotation>
      <xs:documentation>sequence of up to 255 characters accompanied with a language
code</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="languageCode" type="typ001_LanguageCode"/>
      <xs:element name="value" type="ShortString"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="LocalisedLongString">
    <xs:annotation>
      <xs:documentation>sequence of up to 65535 characters accompanied with a language
code</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="languageCode" type="typ001_LanguageCode"/>
      <xs:element name="value" type="LongString"/>
    </xs:sequence>
  </xs:complexType>
  <xs:simpleType name="MajorMinorVersion">
    <xs:restriction base="xs:string">
      <xs:pattern value="([0-9]|1[0-5])\.[0-9]|1[0-5]"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="Probability">
    <xs:annotation>
      <xs:documentation>probability value with a precision of two degits</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:decimal">
      <xs:minInclusive value="0.00"/>
      <xs:maxInclusive value="1.00"/>
      <xs:fractionDigits value="2"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="ServiceIdentifier">
    <xs:annotation>
      <xs:documentation>three part numeric value [SID_A.SID_B.SID_C]</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="SID_A" type="xs:unsignedByte"/>
      <xs:element name="SID_B" type="xs:unsignedByte"/>
      <xs:element name="SID_C" type="xs:unsignedByte"/>
    </xs:sequence>
  </xs:complexType>
  <xs:simpleType name="TimeInterval">
    <xs:annotation>
      <xs:documentation>temporal duration</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:duration"/>
  </xs:simpleType>
  <xs:simpleType name="TimePoint">
    <xs:annotation>
      <xs:documentation>point in time in format 'YYYY-MM-DDThh:mm:ss'</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">

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    <xs:pattern value="^\d{4}-(0[0-9]|1[012])-([0-2][0-9]|30|31)T([0-1]\d|2[0-3]):[0-5]\d:[0-5]\d"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="TimeToolkit">
  <xs:annotation>
    <xs:documentation>data structure for TimeToolkit</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="startTime" type="TimePoint" minOccurs="0" />
    <xs:element name="stopTime" type="TimePoint" minOccurs="0" />
    <xs:element name="duration" type="TimeInterval" minOccurs="0" />
    <xs:element name="specialDay" type="typ002_SpecialDay" minOccurs="0" />
    <xs:element name="daySelector" type="DaySelector" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
<xs:simpleType name="Velocity">
  <xs:annotation>
    <xs:documentation>velocity in integer units of metres per seconds [0 .. 255]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedByte"/>
</xs:simpleType>
<xs:simpleType name="Weight">
  <xs:annotation>
    <xs:documentation>weights in integer units og kilogrammes [0 ..
4294967295]</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:unsignedInt"/>
</xs:simpleType>
<!--TPEG Standard Table Definition-->
<xs:complexType name="typ001_LanguageCode">
  <xs:annotation>
    <xs:documentation>language code, based on the 2-alpha codes of ISO 639</xs:documentation>
  </xs:annotation>
  <xs:attribute name="table" type="xs:string" use="required" fixed="typ001_LanguageCode"/>
  <xs:attribute name="code" use="required">
    <xs:simpleType>
      <xs:restriction base="xs:unsignedByte">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="186"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="typ002_SpecialDay">
  <xs:annotation>
    <xs:documentation>lists special types of the days</xs:documentation>
  </xs:annotation>
  <xs:attribute name="table" type="xs:string" use="required" fixed="typ002_SpecialDay"/>
  <xs:attribute name="code" use="required">
    <xs:simpleType>
      <xs:restriction base="xs:unsignedByte">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="10"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="typ003_CurrencyType">
  <xs:annotation>
    <xs:documentation>currency type</xs:documentation>

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</xs:annotation>
<xs:attribute name="table" type="xs:string" use="required" fixed="typ003_CurrencyType"/>
<xs:attribute name="code" use="required">
  <xs:simpleType>
    <xs:restriction base="xs:unsignedByte">
      <xs:pattern value="^[1-9]!\d|1([0-6]\d|7[0-2])|255)/>
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
<xs:complexType name="typ004_NumericalMagnitude">
  <xs:annotation>
    <xs:documentation>the numerical magnitude "numag"</xs:documentation>
  </xs:annotation>
  <xs:attribute name="table" type="xs:string" use="required" fixed="typ004_NumericalMagnitude"/>
  <xs:attribute name="code" type="xs:unsignedByte" use="required"/>
</xs:complexType>
<xs:complexType name="typ005_CountryCode">
  <xs:annotation>
    <xs:documentation>lists countries as defined by ISO 3166-1</xs:documentation>
  </xs:annotation>
  <xs:attribute name="table" type="xs:string" use="required" fixed="typ005_CountryCode"/>
  <xs:attribute name="code" use="required">
    <xs:simpleType>
      <xs:restriction base="xs:unsignedByte">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="244"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="typ006_OrientationType">
  <xs:annotation>
    <xs:documentation>compass orientation used in TPEG</xs:documentation>
  </xs:annotation>
  <xs:attribute name="table" type="xs:string" use="required" fixed="typ006_OrientationType"/>
  <xs:attribute name="code" use="required">
    <xs:simpleType>
      <xs:restriction base="xs:unsignedByte">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="8"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="typ007_Priority">
  <xs:annotation>
    <xs:documentation>typ007_Priority of messages</xs:documentation>
  </xs:annotation>
  <xs:attribute name="table" type="xs:string" use="required" fixed="typ007_Priority"/>
  <xs:attribute name="code" use="required">
    <xs:simpleType>
      <xs:restriction base="xs:unsignedByte">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="3"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="typ008_OptionalBoolean">

```

```
<xs:annotation>
  <xs:documentation>represents optional booleans</xs:documentation>
</xs:annotation>
<xs:attribute name="table" type="xs:string" use="required" fixed="typ008_OptionalBoolean"/>
<xs:attribute name="code" use="required">
  <xs:simpleType>
    <xs:restriction base="xs:unsignedByte">
      <xs:minInclusive value="0"/>
      <xs:maxInclusive value="2"/>
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:schema>
```