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Intelligent transport systems — Graphic data dictionary —

Part 2: Examples

Systèmes de transport intelligents — Dictionnaire de données graphiques —

Partie 2: Exemples

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

A list of all parts in the ISO 14823 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document presents examples of ASN.1 coding of a Graphic Data Dictionary (GDD) that has been developed with the intent of creating a common basis for transmitting encoded information for existing road traffic signs and pictograms. The coding system has been developed to be language independent, such that data that can be interpreted, irrespective of language or regional differences. It supports Intelligent Transport System (ITS) applications such as in-vehicle signage or in-vehicle information.

This document supports

— the efficient IT-centric encoding for ITS messaging to represent specific road traffic signs and pictograms, and

— the consistent decoding of encoded road traffic signs and pictogram data for display in ITS.

This document can support the translation of signs and pictograms with a similar purpose from the representation used in one country to the representation used in another country.

Intelligent transport systems — Graphic data dictionary —

Part 2: Examples

1 Scope

This document reports examples of ASN.1 codes based on ISO 14823-1[1)], which specifies a graphic data dictionary (GDD) including the ASN.1 coding rule for GDD.

NOTE Some of the ASN.1 codes described in this document are re-formatted based on ISO 14813-6.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
attribute
code attached to the *pictogram* (3.4) in order to clarify the meaning of the pictogram

3.2
country code
internationally recognised codes stipulated by ISO 3166-1 when referring to countries and subdivisions of countries

3.3
graphic data dictionary
GDD
catalogue of codes for *pictograms* (3.4) organised systematically

3.4
pictogram
sign or icon rendered on a display of an IT system such as a computer or VMS to inform travellers of information such as traffic regulations or public facilities

3.5
pictogram category code
codes assigned to the more detailed category of a *pictogram* (3.4) type under the service category

3.6
qualifier
parameter for an *attribute* (3.1) used to express the meaning of *pictogram* (3.4) quantitatively

1) To be published.

4 Abbreviated terms

ASN.1	Abstract Syntax Notation One
ITS	Intelligent Transport Systems
IT	Information Technology
UML	Unified Modelling Language
U.N.	United Nations
VMS	Variable Message Sign

5 Use case

A typical use case of GDD is in-vehicle signage service, which is detailed in ISO/TS 17425.

6 Examples of ASN.1 description

6.1 ASN.1 schema

The ASN.1 description of GDD consists of pictogramCode and attributes. Attributes are optionally utilised when a pictogram has quantitative factors such as time, length or angle. The ASN.1 schema of GDD is as follows.

```
GDD {iso (1) standard (0) gdd(14823) version1 (0)}
DEFINITIONS AUTOMATIC TAGS::=
BEGIN

GddStructure::= SEQUENCE{
pictogramCode        Pictogram,
  attributes           GddAttributes OPTIONAL
}
Pictogram::=SEQUENCE {
  countryCode     Pictogram-countryCode OPTIONAL,
  serviceCategoryCode     Pictogram-serviceCategory,
  pictogramCategoryCode   Pictogram-category
}

Pictogram-countryCode::=OCTET STRING (SIZE (2))

Pictogram-serviceCategory::=CHOICE {
  trafficSignPictogram     Pictogram-trafficSign,
  publicFacilitiesPictogram  Pictogram-publicFacilitySign,
  ambientOrRoadConditionPictogram  Pictogram-conditionsSign
}
Pictogram-category::= SEQUENCE {
  nature          Pictogram-nature,
  serialNumber        Pictogram-serialNumber
}

Pictogram-trafficSign::=ENUMERATED{
  dangerWarning (11),
  regulatory (12),
  informative (13),
  ...
}
Pictogram-publicFacilitySign ::= ENUMERATED {
  publicFacilities (21),
  ...
}
Pictogram-conditionsSign::=ENUMERATED{
  ambientCondition(31),
```

```
  roadCondition (32),
  ...
}
Pictogram-nature::=INTEGER (1..9)
Pictogram-serialNumber::=INTEGER (0..99)

GddAttributes::= SEQUENCE (SIZE(1..8),...) OF CHOICE{
dtm InternationalSign-applicablePeriod,
edt InternationalSign-exemptedApplicablePeriod,
dfl InternationalSign-directionalFlowOfLane,
ved InternationalSign-applicableVehicleDimensions,
spe InternationalSign-speedLimits,
roi InternationalSign-rateOfIncline,
dbv InternationalSign-distanceBetweenVehicles,
ddd InternationalSign-distinationInformation,
set InternationalSign-section,
nol InternationalSign-numberOfLane
}

InternationalSign-applicablePeriod::= SEQUENCE {
year SEQUENCE {
yearRangeStartYear Year,
yearRangeEndYear Year
} OPTIONAL,
month-day SEQUENCE {
dateRangeStartMonthDate MonthDay,
dateRangeEndMonthDate MonthDay
} OPTIONAL,
repeatingPeriodDayTypes RPDT OPTIONAL,
hourMinutes SEQUENCE {
timeRangeStartTime HoursMinutes,
timeRangeEndTime HoursMinutes
} OPTIONAL,
dateRangeOfWeek DayOfWeek OPTIONAL,
durationHourminute HoursMinutes OPTIONAL
}

MonthDay::= SEQUENCE {
month MonthDay-month,
day MonthDay-day
}
HoursMinutes::= SEQUENCE {
hours HoursMinutes-hours,
mins HoursMinutes-mins
}
Year::=INTEGER(2000..2127,...)
MonthDay-month::=INTEGER (1..12)
MonthDay-day::=INTEGER (1..31)
HoursMinutes-hours::=INTEGER (0..23)
HoursMinutes-mins::=INTEGER (0..59)
RPDT::= BIT STRING {national-holiday (0), even-days(1), odd-days(2), market-day(3) } (SIZE
(4))
DayOfWeek::= BIT STRING {unused(0), monday(1), tuesday(2), wednesday(3), thursday(4),
friday(5), saturday(6), sunday(7)} (SIZE (8))

InternationalSign-exemptedApplicablePeriod::= InternationalSign-applicablePeriod

InternationalSign-section::= SEQUENCE{
startingPointLength   Distance OPTIONAL,
continuityLength      Distance OPTIONAL
}

InternationalSign-numberOfLane::= INTEGER(0..99)

InternationalSign-directionalFlowOfLane::= INTEGER {
   sDL   (1),
   sLT   (2),
   sRT   (3),
   lTO   (4),
   rTO   (5),
   cLL   (6),
```

```
   cRI    (7),
   oVL    (8)
} (1..8)

InternationalSign-applicableVehicleDimensions::= SEQUENCE{
   vehicleHeight    Distance OPTIONAL,
   vehicleWidth    Distance OPTIONAL,
   vehicleLength   Distance OPTIONAL,
   vehicleWeight    Weight OPTIONAL
}
Distance::= SEQUENCE{
   value INTEGER(1..16384),
   unit Code-Units(2..4|6..8)
}
Weight::= SEQUENCE {
value INTEGER(1..16384),
unit Code-Units (10..12)
}

Code-Units::= INTEGER {
kmperh (0),
milesperh (1),
kilometre (2),
metre (3),
decimetre (4),
centimetre (5),
mile (6),
yard (7),
foot (8),
minutesOfTime (9),
tonnes (10),
hundredkg (11),
pound (12),
rateOfIncline (13),
durationinminutes (14)
} (0..15)

InternationalSign-speedLimits::= SEQUENCE{
speedLimitMax INTEGER(0..250) OPTIONAL,
speedLimitMin INTEGER(0..250) OPTIONAL,
unit Code-Units (0..1)
}

InternationalSign-rateOfIncline::= INTEGER(1..32)

InternationalSign-distanceBetweenVehicles::= Distance

InternationalSign-distinationInformation::= SEQUENCE{
   junctionDirection          DistinInfo-junctionDirection OPTIONAL,
   roundaboutCwDirection      DistinInfo-roundaboutCwDirection OPTIONAL,
   roundaboutCcwDirection     DistinInfo-roundaboutCcwDirection OPTIONAL,
   ioList                     SEQUENCE (SIZE (1..8,...)) OF DistinationInformationIO
   }

DistinationInformationIO::=SEQUENCE{
   arrowDirection                 IO-arrowDirection,
   destPlace                      SEQUENCE (SIZE (1..4,...)) OF DestinationPlace OPTIONAL,
   destRoad                       SEQUENCE (SIZE (1..4,...)) OF DestinationRoad OPTIONAL,
   roadNumberIdentifier          IO-roadNumberIdentifier OPTIONAL,
   streetName                     IO-streetName OPTIONAL,
   streetNameText                 IO-streetNameText OPTIONAL,
   distanceToDivergingPoint       DistanceOrDuration OPTIONAL,
   distanceToDestinationPlace     DistanceOrDuration OPTIONAL
   }

DestinationPlace::= SEQUENCE{
   destType   DestinationType,
   destRSCode  GddStructure (WITH COMPONENTS {..., attributes ABSENT}) OPTIONAL,
   destBlob   DestPlace-destBlob OPTIONAL,
   placeNameIdentification   DestPlace-placeNameIdentification OPTIONAL,
placeNameText   DestPlace-placeNameText OPTIONAL
```

```
   }

DestinationRoad::= SEQUENCE{
   derType   DestinationRoadType,
   roadNumberIdentifier   DestRoad-roadNumberIdentifier OPTIONAL,
roadNumberText   DestRoad-roadNumberText OPTIONAL
   }

DistanceOrDuration::= SEQUENCE {
value DistOrDuration-value,
unit DistOrDuration-Units
}

DistinInfo-junctionDirection::=INTEGER(1..128)
DistinInfo-roundaboutCwDirection::=INTEGER(1..128)
DistinInfo-roundaboutCcwDirection::=INTEGER(1..128)

IO-arrowDirection::=INTEGER(0..7)
IO-roadNumberIdentifier::=INTEGER(1..999)
IO-streetName::=INTEGER(1..999)
IO-streetNameText::=UTF8String

DestPlace-destBlob::=OCTET STRING
DestPlace-placeNameIdentification::=INTEGER(1..999)
DestPlace-placeNameText::=UTF8String

DestRoad-roadNumberIdentifier::=INTEGER(1..999)
DestRoad-roadNumberText::= UTF8String

DistOrDuration-value::= INTEGER(1..16384)
DistOrDuration-Units::= Code-Units (2..9)

DestinationRoadType::= INTEGER {
   none                    (0),
   nationalHighway         (1),
   localHighway            (2),
   tollExpresswayMotorway  (3),
   internationalHighway    (4),
   highway                 (5),
   expressway              (6),
   nationalRoad            (7),
   regionalProvincialRoad  (8),
   localRoad               (9),
   motorwayJunction        (10),
   diversion               (11),
   rfu1                    (12),
   rfu2                    (13),
   rfu3                    (14),
   rfu4                    (15)
   } (0..15, ...)

DestinationType::= INTEGER {
   none                (0),
   importantArea       (1),
   principalArea       (2),
   generalArea         (3),
   wellKnownPoint      (4),
   country             (5),
   city                (6),
   street              (7),
   industrialArea      (8),
   historicArea        (9),
   touristicArea       (10),
   culturalArea        (11),
   touristicRoute      (12),
   recommendedRoute    (13),
   touristicAttraction (14),
   geographicArea      (15)
   } (0..15, ...)

END
```

6.2 pictogramCode

ASN.1 codes of PictogramCode are shown below. It consists of countryCode, serviceCategoryCode and pictogramCategoryCode. A countryCode refers to the country or subdivision of country where traffic signs are used and is decided based on ISO 3166-1. serviceCategoryCode and pictogramCategoryCode are used to digitally show the meaning of a traffic sign and are decided based on ISO 14823-1:—, Tables 1 and 2.

EXAMPLE 1

Figure 1 is an example sign which indicates an "intersection where the priority is prescribed by the general priority rule (crossroads)". The ASN.1 code of this example is shown below.

```
example1 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:11,
      pictogramCategoryCode{
         nature        1,
         serialNumber 11
      }
   }
}
```

Figure 1 — Sign of example 1

EXAMPLE 2

Figure 2 shows example signs which indicate an overtaking (right hand side of Figure 2) and a parking (left hand side of Figure 2) is prohibited simultaneously. In this case, each sign's ASN.1 code shall be coded separately (example2-1 and example2-2) and encoded separately, as ISO 14823-1 does not allow a sequential structure of `GddStructures`.

```
example2-1 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:12,
      pictogramCategoryCode{
         nature        5,
         serialNumber 77
      }
   }
}
example2-2 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:12,
      pictogramCategoryCode{
         nature        5,
         serialNumber 42
      }
   }
}
```


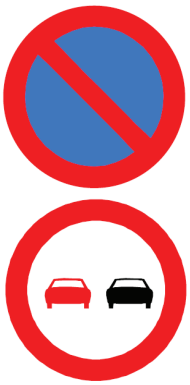

Figure 2 — Sign of example 2

6.3 Attributes

6.3.1 Basic structure

ASN.1 codes of GddAttributes consists of 10 elements that can be used selectively.

6.3.2 applicablePeriod

This attribute indicates the date/time/period status when the sign is valid.

EXAMPLE 3

Figure 3 is an example sign which indicates roadworks will start on 31 December 2017, at 0:00 a.m. and end on 1 January 2018, at 12:30 a.m. The ASN.1 code of this example is shown below.

```
example3 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:11,
         pictogramCategoryCode{
            nature          1,
            serialNumber 11
         }
      },
attributes{
  dtm {
   year {
    yearRangeStartYear 2017,
    yearRangeEndYear 2018
   },
   month-day {
    dateRangeStartMonthDate {
     month 12,
     day   30
   },
    dateRangeEndMonthDate {
     month 1,
     day   1
   }
   },
   hourMinutes {
    timeRangeStartTime{
     hours 12,
     mins  30
    },
    timeRangeEndTime {
     hours 12,
     mins  30
    }
```

```
    }
   }
  }
}
```

Figure 3 — Sign of example 3

EXAMPLE 4

Figure 4 is an example sign which indicates no entry will start from Monday to Friday, from 0:00 to 12:30. The ASN.1 code of this example is shown below.

```
example4 GddStructure ::= {
  pictogramCode {
   serviceCategoryCode  trafficSignPictogram:12,
   pictogramCategoryCode{
      nature 4,
      serialNumber 12
   }
},
attributes {
  dtm{
   dateRangeOfWeek {monday},
   hourMinutes {
    timeRangeStartTime{
      hours 0,
      mins  0
   },
    timeRangeEndTime {
      hours 12,
      mins  30
    }
   }
  }
 }
}
```

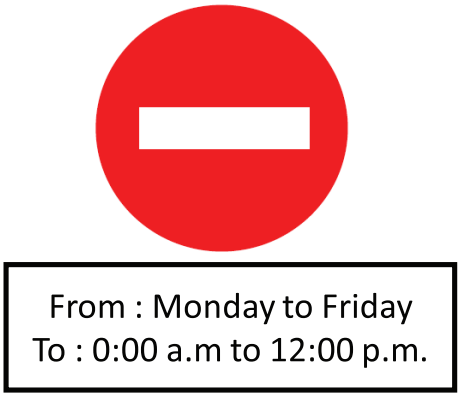

Figure 4 — Sign of example 4

6.3.3 exempted ApplicablePeriod

This attribute indicates the date/time/period when the sign is not applicable. The basic structure of ASN.1 is as follows.

EXAMPLE 5

Figure 5 is an example sign which indicates no entry is exempted on Monday and Friday, from 0:00 to 12:30. The ASN.1 code of this example is shown below.

```
example5 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode  trafficSignPictogram:12,
      pictogramCategoryCode{
         nature 4,
         serialNumber 12
      }
   },
attributes {
   edt {
      DayOfWeek "01000100",
      hourMinutes {
         timeRangeStartTime {
            hours 0,
            mins  0
         },
      timeRangeEndTime {
         hours 12,
            mins 30
         }
      }
   }
   }
}
```

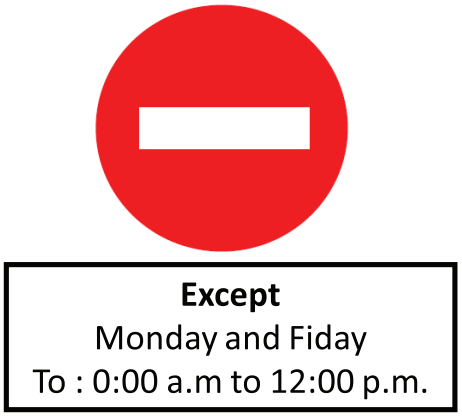

Figure 5 — Sign of example 5

6.3.4 signSection

This attribute indicates a carriageway section within which the international sign takes effect.

EXAMPLE 6

Figure 6 is an example sign which indicates the sign (road work) takes effect from the position of the sign and it will contine for 100m. The ASN.1 code of this example is shown below.

```
example6 GddStructure ::= {
  pictogramCode {
    serviceCategoryCode  trafficSignPictogram:11,
    pictogramCategoryCode{
      nature 3,
      serialNumber 48
    }
  },
  attributes {
     set {
         startingPointLength {
         value 9999,
         unit 2
       },
       continuityLength  {
         value 100,
         unit 2
       }
     }
   }
}
```

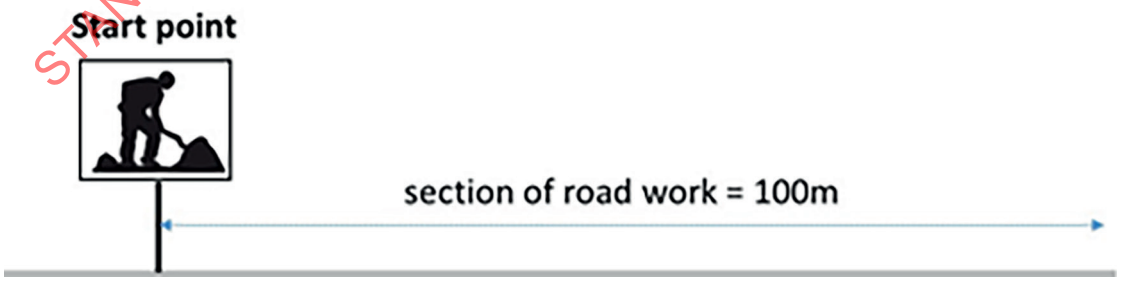

Figure 6 — Sign of example 6

EXAMPLE 7

Figure 7 indicates that the sign takes effect from 50 m upstream of the sign and will contine for 50 m. The ASN.1 code of this example is shown below.

```
example7 GddStructure ::= SEQUENCE{
   Pictogram {
      serviceCategoryCode trafficSignPictogram:11,
      pictogramCategoryCode{
         nature 3,
         serialNumber 48
      }
   },
   attributes{
      set {
       startingPoint&Length{
         value  50,
         unit  2
      }
       continuity&Length {
         value  50,
         unit  2
       }
     }
   }
 }
```

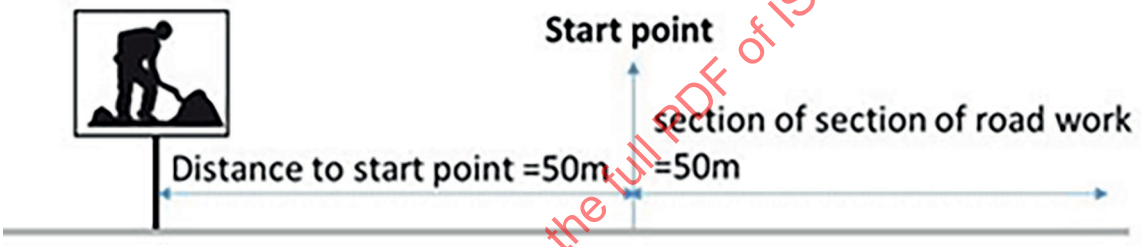

Figure 7 — Sign of example 7

6.3.5 numberOfLane and directionalFlowOfLane

Attribute numberOfLane indicates the number of lanes and lane numbers from the outer side to the inner side of the considered carriageway, the number 0 designating the outermost drivable lane in each direction.

EXAMPLE 8

Figure 8 indicates that there is only one lane ahead and its directionalFlow is straight ahead only.

```
example8 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:11,
      pictogramCategoryCode{
         nature         6,
         serialNumber   68
      }
   },
   attributes{
      nol 1,
      dfl 1
   }
}
```

Figure 8 — Sign of example 8

EXAMPLE 9

Figure 9 indicates that three lanes have a different directionalFlow. (This is an example for countries where vehicles drive on the left-hand side of the road.)

```
example9 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:13,
      pictogramCategoryCode{
         nature         6,
         serialNumber   69
      }
   },
   attributes{
      nol 3,
      dfl 2,
      dfl 1,
      dfl 5
   }
}
```

Figure 9 — Sign of example 9

6.3.6 applicableVehicleDimensions

This attribute indicates the dimensional limitations or regulations for vehicles.

EXAMPLE 10

Figure 10 indicates that no entry for vehicles having an overall height exceeding 3,5 m.

```
Example10 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:12,
      pictogramCategoryCode{
         nature         5,
         serialNumber   11
      }
   },
   attributes {
     ved {
       vehicleHeight {
         value 3.5,
         unit   2
```

```
        }
      }
    }
}
```

Figure 10 — Sign of example 10

EXAMPLE 11

Figure 11 indicates no entry for vehicles having an over-all width exceeding 2 m.

```
example11 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:12,
      pictogramCategoryCode{
         nature         4,
         serialNumber   99
      }
   },
   attributes{
     ved {
      vehicleWidth{
         value 2,
         unit    2
      }
    }
  }
}
```

Figure 11 — Sign of example 11

EXAMPLE 12

Figure 12 indicates no entry for vehicles or combinations of vehicles exceeding 10 m.

```
example12 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:12,
      pictogramCategoryCode{
         nature        5,
         serialNumber  14
      }
   },
   attributes{
      ved {
         vehicleLength{
            value 10,
            unit    2
      }
    }
  }
 }
```

Figure 12 — Sign of example 12

EXAMPLE 13

Figure 13 indicates no entry for vehicles exceeding specified 5 tons.

```
example13 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:12,
      pictogramCategoryCode{
         nature        5,
         serialNumber  12
      }
   },
   attributes{
      ved {
         vehicleWeight{
            Value 5,
            unit    10
         }
      }
   }
}
```

Figure 13 — Sign of example 13

6.3.7 speedLimits

This attribute indicates the limit values of vehicle speeds.

EXAMPLE 14

Figure 14 indicates that the maximum speed limit is 50 km/h.

```
example14 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:12,
      pictogramCategoryCode{
         nature        5,
         serialNumber  57
      }
   },
   attributes{
      spe {
         speedLimitMax   50,
         unit   0
      }
   }
}
```

Figure 14 — Sign of example 14

EXAMPLE 15

Figure 15 indicates that each of the three lanes has a different speed limit. (This is an example for countries where vehicles drive on the left-hand side of the road).

```
example15 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:13,
      pictogramCategoryCode{
         nature        6,
         serialNumber  66
      }
   },
   attributes{
      nol 3,
      spe {
          speedLimitMax   100,
          unit   0
      },
      spe {
          speedLimitMax   80,
          unit   0
      },
      spe {
          speedLimitMax   50,
          unit   0
      }
   }
}
```

Figure 15 — Sign of example 15

6.3.8 rateOfIncline

This attribute indicates the rate of incline of a road expressed as a percentage.

EXAMPLE 16

Figure 16 indicates that the rate of incline of a road is 10 %.

```
example16 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:11,
      pictogramCategoryCode{
         nature        3,
         serialNumber  46
      }
   },
   attributes{
      roi 10
    }
}
```


Figure 16 — Sign of example 16

6.3.9 distanceBetweenVehicles

This attribute indicates the distance between vehicles, i.e. vehicular gap.

EXAMPLE 17

Figure 17 indicates that the driving of vehicles less than 70 m apart is prohibited.

```
example17 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:11,
      pictogramCategoryCode{
         nature        1,
         serialNumber  1
      }
   },
   attributes {
      dbv {
         value          70,
         unit            2
      }
   }
}
```

Figure 17 — Sign of example 17

6.3.10 destinationInformation

Attributes of ASN.1 include directional information of each branch and information of each destination such as road number or street name. The directional information is the INTEGER value of each given direction combination of possible turning motions (destination): an INTEGER value and decided based on ISO 14823-1:—, Table C.1. The INTEGER value for junctionDirection, roundaboutCwDirection and roundaboutCcwDirection is determined based on ISO 14823-1:—, Table C.1.

EXAMPLE 18

This example illustrates a junction which has three branches. Each branch has destination with place name, street name and street number. The distance between the sign and the junction is 300 m.

```
example18 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:13,
      pictogramCategoryCode{
         nature        1,
         serialNumber  11
      }
   },
   attributes{
      ddd {
         junctionDirection         42,
         ioList
         {
            arrowDirection 1,
             distanceToDivergingPoint {
               value 300,
              unit 3
             }
           },
           {
             arrowDirection 3,
              destPlace {
                destType 6,
                placeNameText "Destination B"
               }
              streetName 10,
              streetNameText  "B street"
           },
           {
              arrowDirection 5,
              destPlace {
                destType 6,
                placeNameText "Destination A"
               }
               streetName 20,
              streetNameText  "A street"
           },
           {
              arrowDirection 8,
              destPlace {
                destType 6,
                placeNameText "Destination C"
              }
              streetName 30,
              streetNameText  "C street"
           }
      }
   }
}
```

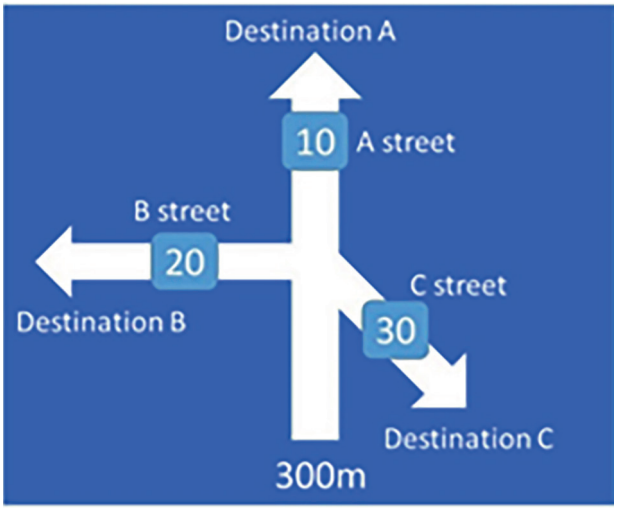

Figure 18 — Sign of example 18

EXAMPLE 19

This example illustrates a counterclockwise junction which has three branches.

```
example19 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode     trafficSignPictogram:13,
      pictogramCategoryCode{
         nature         1,
         serialNumber   11
      }
   },
   attributes{
      ddd {
         roundaboutCcwDirection  37,
         ioList {
            arrowDirection 1
         },
         {
            arrowDirection 2,
            destPlace {
               destType 6,
               placeNameText "Destination B"
            }
         },
         {
            arrowDirection 6,
            destPlace {
               destType 6,
               placeNameText "Destination A"
               }
            }
         }
   }
}
```

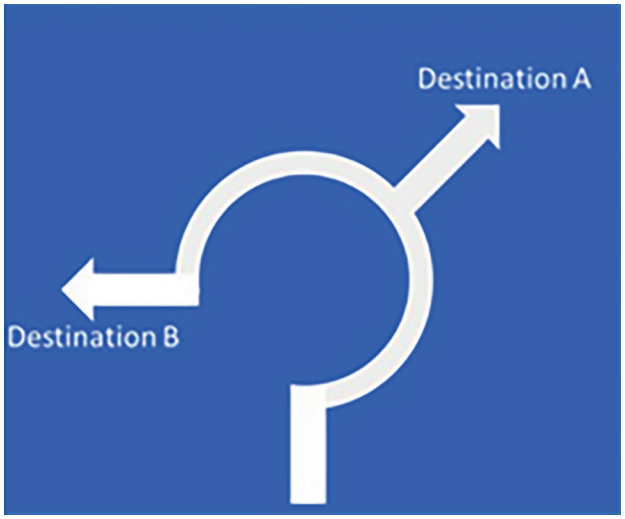

Figure 19 — Sign of example 19

EXAMPLE 20

This example illustrates a junction which has a partial clockwise junction and three branches.

```
example20 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:13,
      pictogramCategoryCode{
         nature         1,
         serialNumber   11
      }
   },
   attributes{
      ddd {
         junctionDirection          43,
        roundaboutCwDirection      37,
         ioList {
           arrowDirection 1
        }
        {
           arrowDirection 3,
            destPlace {
               destType 6,
               placeNameText "Destination B"
            }
        }
        {
           arrowDirection 5,
            destPlace {
               destType 6,
               placeNameText "Destination A"
            }
        }
        {
           arrowDirection 8,
            destPlace {
               destType 6,
               placeNameText "Destination C"
               }
            }
        }
     }
}
```

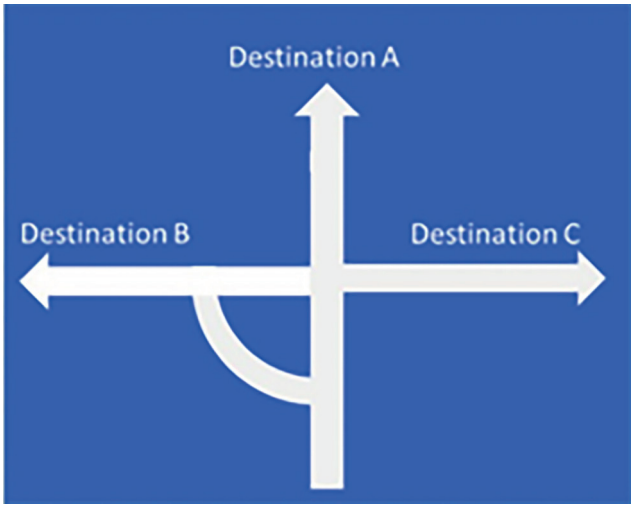

Figure 20 — Sign of example 20

EXAMPLE 21

This example illustrates a directional sign which has staggerd junctions. In this case, a sign is coded by separating one sign longitudinally (distinationInformation1 and distinationInformation2) and combining two attributes sequencially.

```
example21 GddStructure ::= {
   pictogramCode {
      serviceCategoryCode    trafficSignPictogram:13,
      pictogramCategoryCode{
         nature         1,
         serialNumber   11
      }
   },
   attributes{
      ddd {
         junctionDirection          41,
         ioList {
           arrowDirection 1
         },
         {
           arrowDirection 3,
            destPlace {
                destType 6,
                placeNameText "Destination B"
           }
         },
         {
           arrowDirection 5
         }
      }
      ddd {
         junctionDirection          41,
         ioList {
           arrowDirection 1
         }
         {
           arrowDirection 5,
            destPlace {
                destType 6,
                placeNameText "Destination A"
           }
         }
         {
           arrowDirection 5,
            destPlace {
                destType 6,
```