
**Intelligent transport systems —
Graphic data dictionary —**

**Part 2:
Examples**

*Systèmes de transport intelligents — Dictionnaire de données
graphiques —*

iTeh STANDARD PREVIEW
Partie 2: Exemples
(standards.iteh.ai)

ISO/TR 14823-2:2019

<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019>



iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TR 14823-2:2019](https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019)

<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	2
5 Use case	2
6 Examples of ASN.1 description	2
6.1 ASN.1 schema	2
6.2 pictogramCode	6
6.3 Attributes	7
6.3.1 Basic structure	7
6.3.2 applicablePeriod	7
6.3.3 exempted ApplicablePeriod	9
6.3.4 signSection	10
6.3.5 numberOfLane and directionalFlowOfLane	11
6.3.6 applicableVehicleDimensions	12
6.3.7 speedLimits	15
6.3.8 rateOfIncline	16
6.3.9 distanceBetweenVehicles	17
6.3.10 destinationInformation	17
6.3.11 Combination of multiple signs with an attribute	24
Bibliography	26
	https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019

Foreword

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

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

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

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation 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.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/TR 14823-2:2019](https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019)

<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TR 14823-2:2019](https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019)

<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019>

Intelligent transport systems — Graphic data dictionary —

Part 2: Examples

1 Scope

This document reports examples of ASN.1 codes based on ISO 14823-1¹⁾, 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.

(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019>
ISO/TR 14823-2:2019

```
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),

```



<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019>

<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019>

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)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TR 14823-2:2019](https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-49b784d5922/iso-tr-14823-2-2019)

<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-49b784d5922/iso-tr-14823-2-2019>

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),
    tollExpressway (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
    }
  }
}
```

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/TR 14823-2:2019
<https://standards.iteh.ai/catalog/standards/sist/385d1fb7-5b9f-4699-83ac-0e9b784d5922/iso-tr-14823-2-2019>

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
    }
  }
}
```