
**Traffic and travel information —
Messages via media independent
stationary dissemination systems —
Graphic data dictionary for pre-trip and
in-trip information dissemination
systems**

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*Informations sur le trafic et le tourisme — Messages par systèmes de
dissémination stationnaire indépendants du support — Dictionnaire de
données graphiques pour les systèmes de dissémination d'informations
avant le trajet et durant le trajet*

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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.

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 14823 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Road transport and traffic telematics*, 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).

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Introduction

This Technical Specification presents a Graphic Data Dictionary (GDD) which has been developed with the intent of creating a common basis for transmitting graphic information data that can be, irrespective of language or regional differences, decoded and understood by the users who obtain TTI (pre-trip and in-trip information) service through TTI system operators such as traffic management centres (TMCs), traffic information centres (TICs) and value-added service providers (VASPs) which add value to the TTI. Adopting unified graphic data is expected to improve the understandability of the graphic information by the user and thereby increase the convenience of TTI systems.

The purpose of GDD is, in order to facilitate the data exchange between media, to catalogue graphic images like traffic signs and pictograms specified and used uniquely in each country and to assign them a certain code.

Elements of Graphic Data

These include:

- full name of the pictogram,
- definition of the pictogram,
- code for the pictogram,
- attribute(s) of the pictogram, and
- pictogram itself.

Normative items in this document are the coding scheme involving the full name, definition and attributes to define each graphic image. It is not intended to create and specify a common design of graphic images.

Application of Graphic Data

Graphic data shall be stored in advance as a database by TTI system operators (such as TMC, TIC etc.), VASP, or in media systems, and then used as a part of TTI for data exchange among these entities. "The GDD" is a database that registers the codes and attributes of a set of graphic data in a systematic manner.

Message Creation

Data elements to be stored in the database of a TIC shall be those created by using TTI collected in the TIC. Similarly, graphic data shall be those coded beforehand and registered into the database. Messages to be dealt with in this Technical Specification are to be generated basically with data elements registered in the database of the TIC.

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1 Scope

This Technical Specification presents a system of standardized codes for existing signs and pictograms used to deliver traffic and traveller information (TTI). The coding system can be used to form messages to be handled by respective media systems, graphic messages on on-board units, and media system information on TTI dissemination systems (VMS, PC, PAT, etc.) (including graphic data). These types of information are required by travellers for their pre-trip planning as well as their in-trip plan modification based on information obtained through media systems.

As shown in Figure 1, a system handling graphic messages generally comprises TTI system operators, media systems and communication networks interconnecting these systems.

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- TTI systems operators which include
 - Traffic Management Centres (TMC),
 - Traffic Information Centres (TIC),
 - Parking Information Centres (PIC),
 - Public Transport Centres (PTC),
 - Value-Added Service Providers (VASP), and
 - others;
- media systems which include
 - On-board Units (OBU),
 - Variable Message Signs (VMS),
 - Personal Computers (PC),
 - Public Access Terminals (PAT), and
 - others.

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 9735, *Electronic data interchange for administration, commerce and transport (EDIFACT) — Application level syntax rules*

ISO 3166 (all parts), *Codes for the representation of names of countries and their subdivisions*

CEN prENV/278/8/15 RTTT — *Traffic and Travel Data Dictionary — Part 1: General Definitions, Entities, Attributes*

3 Terms and definitions

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

3.1

traffic and traveller information

TTI

generic term for traffic and travel-related information such as road traffic information, transfer information, or public transit information

3.2

traffic information centre

TIC

one of the TTI system operators

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NOTE Each TIC is connected to TMC, PIC, PTC and some other TICs to collect and process information generated at each of the said centres. The TIC disseminates information periodically in accordance with procedures as agreed with the corresponding VASP or from time to time on request from the VASP.

3.3

value added service provider

VASP

each VASP requests information from the corresponding TTI system operators in accordance with procedures as agreed with the TTI system operators and stores the received information in its database, then edits/processes and disseminates information requested from users in accordance with appropriate procedures as agreed with any media systems

3.4

traffic management centre

TMC

one of the TTI system operators

NOTE Each TMC manages systems for traffic surveillance and controls by collecting and processing traffic information.

3.5

parking information centre

PIC

one of the TTI system operators

NOTE PIC disseminates information such as the location, capacity, vacancy and other information related to the status of service/parking facilities.

3.6**public transport centre****PTC**

one of the TTI system operators

NOTE PTC disseminates information about public transport such as regular routes, travel time, fares and transfer points.

3.7**variable message sign****VMS**

one of the TTI display systems

NOTE Each VMS provides travellers with dynamic information by words and possibly with simple graphics.

3.8**on-board unit****OBU**

unit fitted in a vehicle to display TTI messages

3.9**personal computer****PC**

each PC functions as the man-machine interface for travellers and requests/receives information in accordance with procedures as agreed with the corresponding VASP

NOTE Each PC processes and presents received information according to the purpose of the request.

3.10**public access terminal****PAT**

equipment installed in public places (e.g. airport terminals, shopping centres or service areas) to provide ondemand information requested by travellers

3.11**graphic data dictionary****GDD**

compilation of all relevant graphic data, such as full names, definitions, and attributes of pictograms

4 System Architecture

A TTI dissemination system to any kind of media system is generally composed of TTI system operators such as TMCs, TICs, PICs and PTCs, VASPs which intervene between each of the TTI system operators, media systems as the end users, and communications networks interconnecting the TTI system operators and media systems. A schematic presentation of the system architecture is given in Figure 1 — TTI Dissemination System Architecture.

4.1 Alpha (α) Interface:

The α (alpha) Interface shall have two functions as a communications interface: one is to exchange data locally among TMCs and TICs, and the other is for a TMC or TIC to collect data from PICs and PTCs.

4.2 Beta (β) Interface:

The β (beta) Interface shall function as a communications interface between each TTI source and a VASP connected with a communications network

4.3 Gamma (γ) Interface:

The γ (gamma) Interface shall function as a communications interface that enables secure and direct dissemination of information to the media system as the end user, as requested by the media system by collecting, processing, and storing the information from TTI system operators.

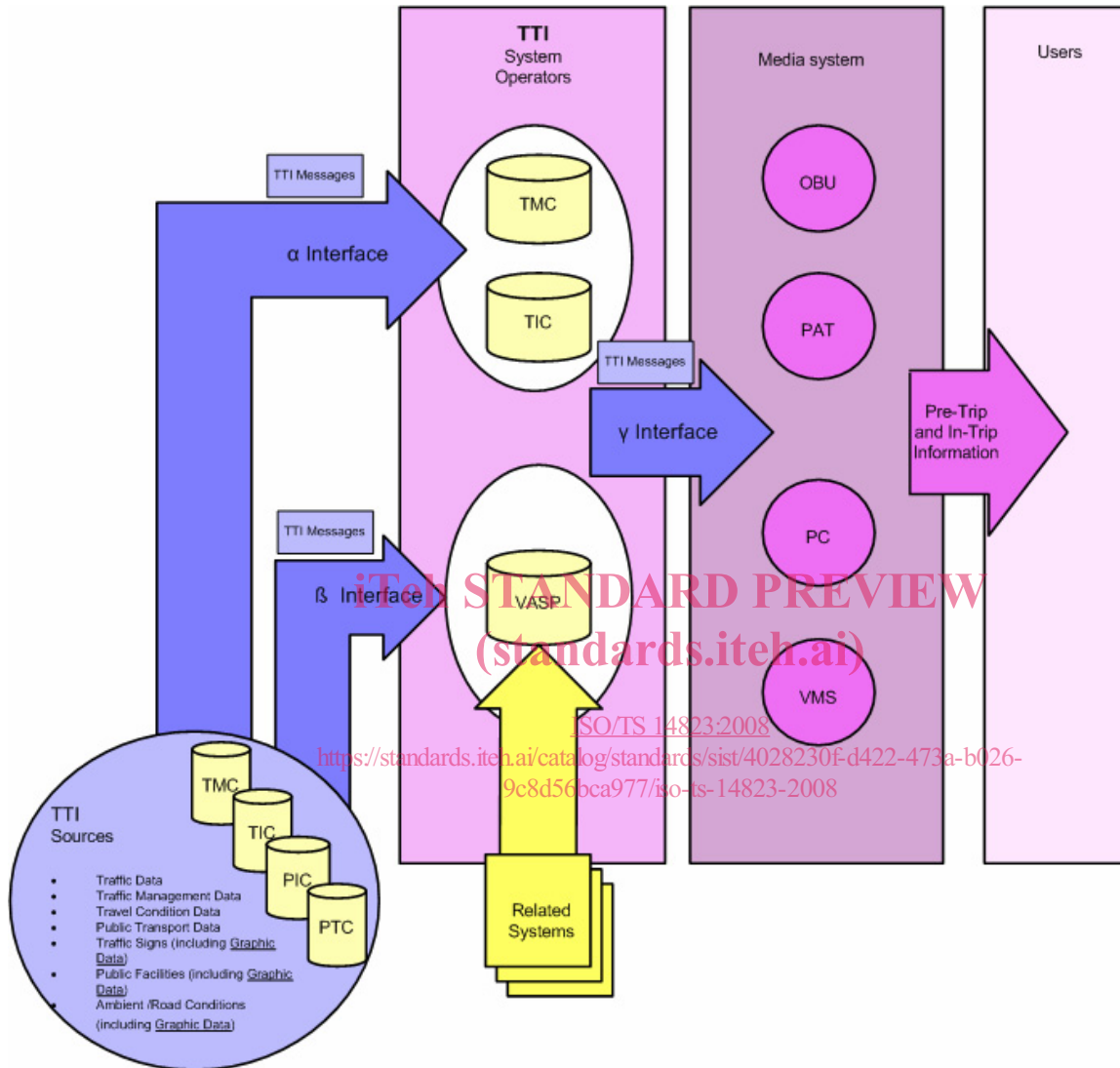


Figure 1 — TTI Dissemination System Architecture

5 Document Structure

This standard is divided into a main part and several appendices. The main part explains the concepts of graphic data information service to the users who need TTI information service, and presents an overview of the user service.

5.1 Main Part

This section provides a structural overview of the GDD (Graphic Data Dictionary).

Graphic Data: There exist graphic data that have been obtained by coding information on traffic signs, public facilities, ambient/road conditions, etc. as a part of TTI messages at TMCs and TICs. The data elements of such information consist of country code, service category code, pictogram category code, and attribute indicator code, organized as communication data.

Section 8 provides Items Subject to Standardisation which are needed to facilitate communications with the users which includes: full names; definitions; attributes; and pictograms which are listed as data to be provided to users.

5.2 Annexes

The Annexes provide examples of configurations and services that fall within the scope of this standard.

The Annexes consist of the following four parts:

5.2.1 Annex A (Normative)

This annex provides pictogram attributes as data elements for traffic sign pictograms in the categories of – warning signs, regulatory signs and guide signs.

5.2.2 Annex B (Informative)

This annex provides relationships among the full name, definition, code, and pictogram designs from U.N. and selected countries.

5.2.3 Annex C (Informative) (standards.iteh.ai)

This annex provides examples of data coding and the description of attributes for traffic sign pictograms.

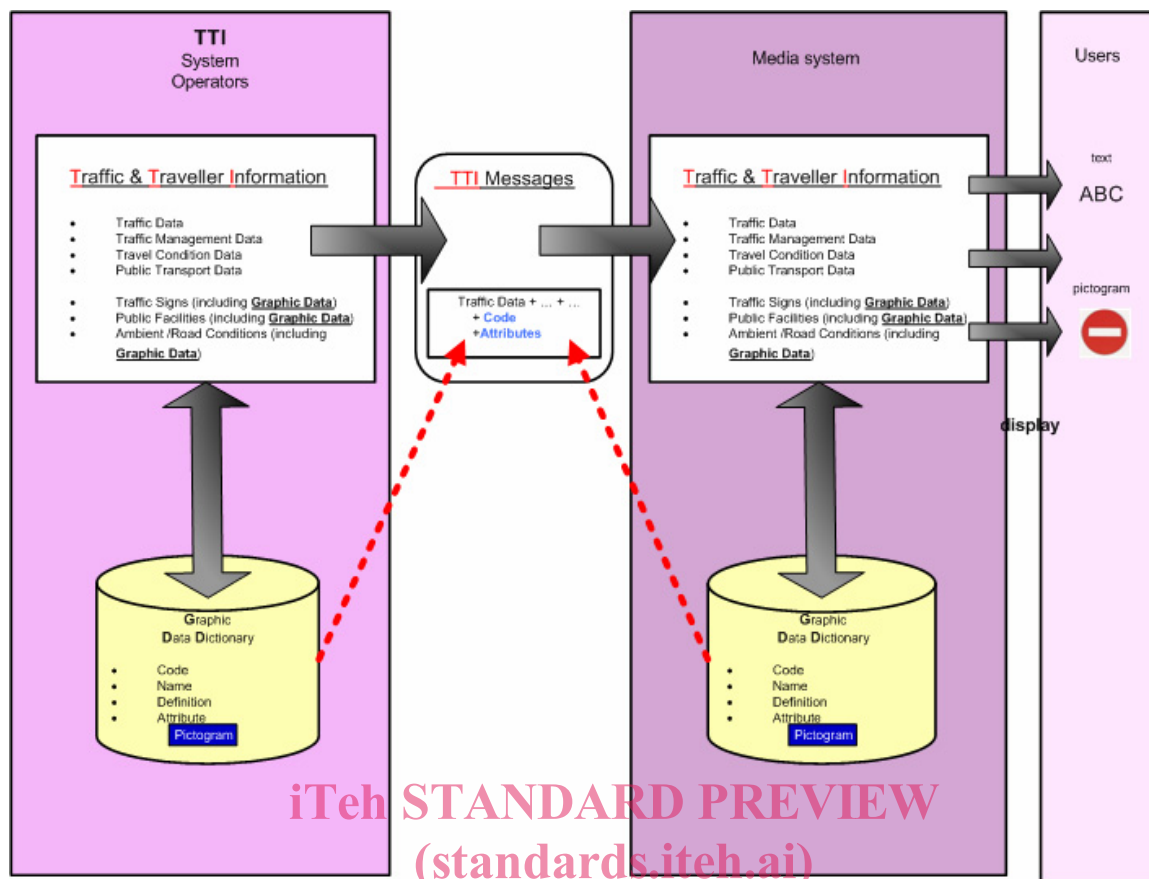
5.2.4 Annex D (Normative)

The coding scheme that applies to complex configurations of roadway intersections is presented in this annex as part of the coding system for traffic sign pictograms.

6 Graphic Data Dictionary

6.1 General

The flow of graphic data and the roles of the graphic data dictionary are illustrated in Figure 2 — Flow and Content of Graphic Data in TTI Messages based on Figure 1 — TTI Dissemination System Architecture



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Figure 2 — Flow and Content of Graphic Data in TTI Messages

Graphic data are conveyed as part of TTI messages issued by TMCs or TICs. The graphic information in a TTI message is coded and according to the Graphic Data Dictionary used by both the TTI system operator and media system. Information elements to be prescribed by the Graphic Data Dictionary concern Traffic Sign Information, Public Facilities Information, and Ambient/Road Condition Information as described in Section 7.2. Data elements consist of communication data, including the country code, service category code, pictogram category code and attribute indicator code, and user service data, including full name, definition, attributes, and pictogram itself as described in Section 7.3.

6.2 Information Elements

Information elements (IEs) contained in messages provided by pre-trip and in-trip information services can be broadly divided into these types. This classification conforms to the “Final Act and Related Documents” enacted by the “United Nations Conference on Road Traffic (UNCRT).”

Table 1 — Information Elements

Type of Service (Division)	Subdivision	Nature
1) Traffic Sign Information	a) Danger warning	Warning / Priority sign information
	c) Regulatory	Priority sign information
		Prohibitory or restrictive sign information
		Mandatory / End sign information
	c) Informative	Advance direction sign information
		Direction sign information
		Road/ Place identification sign information
		Confirmatory sign information
		Pedestrian crossing sign information
		Other sign information providing information useful to the drivers of vehicles
Lane affectation		
2) Public Facilities Information	a) Public facilities	Information giving notice of public facilities which may be useful to road users
3) Ambient/Road Condition Information	b) Ambient conditions	Information indicating ambient conditions which may be useful to the drivers of vehicles
	c) Road conditions	Sign information indicating road conditions which may be useful information for drivers of vehicles

The ‘Traffic Sign Information’ is subdivided into three categories, each of which defines information for each traffic sign established in each member country (see Section 7.5.1 ‘Country Code’). Each subcategory may be divided further based on its properties. The Public Facilities Information indicates the existence of certain public facilities and their service details (e.g., toilets, restaurants, first aid facilities, etc.). The “Ambient/ Road Condition Information” is concerned with the ambient condition of a roadway or local condition which may affect the flow of road traffic (such as bad weather and traffic congestion). IEs are all defined with their full names and are provided in the form of pictograms easily recognizable by the users. Pictograms to be used for information display may vary from country to country, from political jurisdiction to political jurisdiction, or from system operator to system operator.

6.3 Data Elements

Used as a “Pictogram Code” when transmitting IEs (described in Section 6.2) as communication data is a combination of the following four Data Elements (DEs): country code data, service category data pictogram category data, and attribute indicator code. When these “Communication Data” (consisting of pictogram code and attributes) are provided to the users, they are served with four components: the unified full name, and definition of a pictogram, details of its attributes if any, and the pictogram itself. They are called User Service Data. The data configuration of the IEs (described in Section 6.2) is as follows:

6.3.1 Communication Data:

Pictogram Code

Country code data	DE 1 (the code number assigned to the country to which the system operator belongs);
Service category data	DE 2 (the code number assigned to the category of IE);
Pictogram category data	DE 3 (the code number assigned to the category of a pictogram type under the service category);
Attribute indicator code data	DE4 (the code number indicating whether any attributes are attached to the pictogram);

Attributes

Attributes When any attributes are needed for details, one or more of the eight attributes are added.

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6.3.2 User Service Data:

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Full name
Definition
Attributes
Pictogram

6.4 Data Structure

Each of the four DEs described in Section 6.3 has its own data field. By combining these data fields, the IEs described in Section 6.2 can be represented in various ways. Each data field is coded in units of DEs to create a certain IE. As a rule, every data field in every DE is represented by one integer or one letter. See Section 7.5 for details of the coding rule, and Section 7.7 for the attributes.

The coded data structure is as follows:

	Data Element (DE) 1: Country Code (ISO/3166)		DE 2: Service Category Code		DE 3: Pictogram Category Code			DE 4: Attribute Indicator Code
Data Field	X8	X7	X6	X5	X4	X3	X2	X1

6.5 Coding Rules

This section describes the coding rules for storing DEs in a database for the provision of graphic data to the users as accurate information. See 'Table 2.

6.5.1 Data Element 1: Country Code (X8 X7)

The numeric value of each 'Country Code' shall be assigned according to the ISO 3166 (Alpha 2-code country name notation).

Bit length = 16 bits

Value range = X8: A to Z

X7: A to Z

Field	X8	X7
Value & Description	A to Z	A to Z

6.5.2 Data Element 2: Service Category Code (X6 X5)

Bit length = 16 bits

Value range = X6: 1-9

X5: 1-9

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Field	X6	X5
	Division Code	Class Code
Value & Description	1: Traffic Sign Pictogram	1: Danger Warning
		2: Regulatory
		3: Informative
		4:
	2: Public Facilities Pictogram	1: Public Facilities
		2:
	3: Ambient/Road Condition Pictogram	1: Ambient Condition
		2: Road Condition
	4:	1: