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STN	**Inteligentné dopravné systémy Geografické dátové súbory (GDF) GDF5.1 Časť 1: Aplikačne nezávislé mapové dáta zdieľané medzi viacerými zdrojmi (ISO 20524-1: 2020)**	**STN EN ISO 20524-1 01 8550**

Intelligent transport systems - Geographic Data Files (GDF) GDF5.1 - Part 1: Application independent map data shared between multiple sources (ISO 20524-1:2020)

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Systèmes de transport intelligents - Fichiers de données géographiques (GDF) GDF5.1 - Partie 1: Données cartographiques partagées entre sources multiples et indépendantes des applications (ISO 20524-1:2020)

Intelligente Transportsysteme - Geografische Dateien (GDF) - GDF5.1 - Teil 1: Anwendungsunabhängige Kartendaten, die zwischen verschiedenen Quellen geteilt werden (ISO 20524-1:2020)

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European foreword

The text of ISO 20524-1:2020 has been prepared by Technical Committee ISO/TC 204 "Intelligent transport systems" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 20524-1:2022 by Technical Committee CEN/TC 278 "Intelligent transport systems" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2023, and conflicting national standards shall be withdrawn at the latest by June 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 20524-1:2020 has been approved by CEN as EN ISO 20524-1:2022 without any modification.

INTERNATIONAL STANDARD

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Intelligent transport systems — Geographic Data Files (GDF) GDF5.1 —

Part 1: Application independent map data shared between multiple sources

Systèmes de transport intelligents — Fichiers de données géographiques (GDF) GDF5.1 —

Partie 1: Données cartographiques partagées entre sources multiples et indépendantes des applications

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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).

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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 20524 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

GDF5.1 (the ISO 20524 series) is an evolution of GDF5.0 that introduces the concept of Sharable Features, takes cooperative ITS (Cooperative ITS) needs into account and is harmonized with the European public transportation standard EN 12896:2012 (TRANSMODEL). This last harmonization was made in the framework of the European Opticities project.

GDF5.1 consists of two parts:

- GDF5.1 Part 1 (this document) contains GDF5.0 specification except Public Transport Theme specification which has been revised and is now described in Part 2.

- GDF5.1 Part 2 (ISO 20524-2) is dedicated to Sharable Features, Cooperative ITS and Public Transport.

This document presents the specification for GDF5.1 Part 1. GDF5.0 entities are unchanged but Public Transport Theme entities have been removed and corresponding sections and figures are deprecated and refer to GDF5.1 Part 2 (ISO 20524-2). In order to ensure the consistency between GDF5.0 and GDF5.1 Part 1 (this document), the numbering of common figures in both versions has been conserved. GDF5.1 Part 1 (this document) is divided into several parts.

After the introductory clauses, the overall conceptual data model is specified. In it, the basic building blocks of GDF and their interrelations are explained. It contains a specification of the different types of topology supported by this document. It furthermore describes how database representations of real world objects, referred to as Features, are defined. It describes the characteristics of Features, called Attributes, and the topological and non-topological interrelations between Features. Finally, it describes the organization of the Features in GDF. Semantically, Features are organized in different Feature Themes. Logically and physically, Features are organized in Sections by area or in Layers by contents.

In the Feature Catalogue, the different Features supported by this document are defined. A special case is the Features from the Services Feature Theme. Because the requirements for this Feature Theme are highly market-oriented, the Services Feature Theme does not contain any normative Features, but contains an annex comprising an informative list of service definitions to assist users of this document (see Annex C).

In the Attribute Catalogue, the different characteristics of Features, called Attributes, are defined. A usage matrix outlines applicability of Attributes per Feature Theme and per Relationship.

In the Relationship Catalogue, the different non-topological (i.e. semantic) Relationships which Features have been defined. Relationships may relate Features of different Feature Themes, or those from the same or different Section and/or Layer.

In the Feature representation rules, the possible geometrical ways in which the individual Features may be represented are specified for each topology type. This document supports zero-, one- and two-dimensional primitives and up to four-dimensional coordinates.

The specification of Features, Attributes and Relationships by no means dictates mandatory inclusion. The actual contents of GDF, apart from a minimum set of metadata elements as specified in the delivery formats, is not specified by this document since this is considered to be an issue between clients and vendors. This document allows the introduction of user-defined Features, Attributes and Relationships.

In certain cases, different alternative ways of modelling and representation are offered. Representing Features in different geographical areas also may require the use of different basic representation mechanisms, e.g. character sets, projection systems. It is important that all of these individual choices associated with GDF are specified. Furthermore, GDF should essentially be self-contained and be readable without any external specification. In order to make this possible, this document specifies ways of describing GDF by means of metadata, captured by the Metadata Catalogue.

Apart from providing a standard for the definition of geographic road databases, this document also specifies mechanisms for data exchange and delivery. In order to facilitate the definition and exchange of data, a logical view of the data organization is important. This logical view is presented in the Logical Data Structures. The data structures are specified using the data description language ESN.

Two physical implementations for data exchange and delivery are specified: the Media Record Specifications (ASCII flat file) and the XML schema specifications. These physical implementations are limited to the data specification present in GDF5.1 Part 1 (this document).

These specifications support the explicit registration of updated information, thereby allowing map databases to continue to reflect ground truth over time.

Features, Attributes and Relationships appear in the physical GDF as codes. These codes are specified in Annex A. Codes used in the metadata are given in Annex B, which is an informative part of this document. In order to access the most up-to-date information, the user is referred to the original source organization. Annex C contains the specification of Features of the theme Services as an informative part of this document. In Annex D, the syntax for specifying temporal aspects of geographic information is described. The specific rules for organizing GDF in different spatial subdivisions (Sections) is described in Annex E. As informative parts of this document, guidelines for the formation of Level 2 Features from the Feature Theme Roads and Ferries are given in Annex F. A list of local Administrative Area names in different countries is provided in Annex G, as well as illustrative examples for the description of the (non-hierarchical) geopolitical structures and their components in a number of countries. Finally, the use of notation and phonetic Attributes for character strings are illustrated in the informative Annex H. Annex H provides a range of examples showing how the different notation- and phoneme-related Attribute properties may be used to qualify name strings, in both their written and their pronounced form.

INTERNATIONAL STANDARD **ISO 20524-1:2020(E)**

Intelligent transport systems — Geographic Data Files (GDF) GDF5.1 —

Part 1: Application independent map data shared between multiple sources

1 Scope

This document specifies the conceptual and logical data model and physical encoding formats for geographic databases for Intelligent Transport Systems (ITS) applications and services. It includes a specification of potential contents of such databases (data dictionaries for Features, Attributes and Relationships), a specification of how these contents shall be represented, and of how relevant information about the database itself may be specified (metadata).

The focus of this document is on ITS applications and services and it emphasizes road and road-related information. ITS applications and services, however, also require information in addition to road and road-related information.

EXAMPLE 1 ITS applications and services need information about addressing systems in order to specify locations and/or destinations. Consequently, information about the administrative and postal subdivisions of an area is essential.

EXAMPLE 2 Map display is an important component of ITS applications and services. For proper map display, the inclusion of contextual information such as land and water cover is essential.

EXAMPLE 3 Point-of-Interest (POI) or service information is a key feature of traveller information. It adds value to end-user ITS applications and services.

Typical ITS applications and services targeted by this document are in-vehicle or portable navigation systems, traffic management centres, or services linked with road management systems, including public transport systems.

The Conceptual Data Model has a broader focus than ITS applications and services. It is application independent, allowing for future harmonization of this document with other geographic database standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 690, *Information and documentation — Guidelines for bibliographic references and citations to information resources*

ISO 639-2, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

NOTE 1 Codes are available at http://www.loc.gov/standards/iso639-2/

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

NOTE 2 Codes are available at https://www.iso.org/obp/ui

