SVENSK STANDARD
SS-ISO 17572-1:2019

**Vägtrafikinformatik – Platsreferenser för geografiska databaser –
Del 1: Allmänna krav och begreppsmodell (ISO 17572-1, IDT)**

**Intelligent transport systems (ITS) – Location referencing for geographic databases –
Part 1: General requirements and conceptual model (ISO 17572-1, IDT)**

Svenska Institutet för Standarder

Språk: engelska/English
Utgåva: 2

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Standarden är framtagen av kommittén för Vägtrafikinformatik, SIS/TK 255.

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Europastandarden ISO 17572-1 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 17572-1.

Denna standard ersätter SS-ISO 17572-1:2009, utgåva 1.

The European Standard ISO 17572-1 has the status of a Swedish Standard. This document contains the official version of ISO 17572-1.

This standard supersedes the SS-ISO 17572-1:2009, edition 1.

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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 17572-1 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

ISO 17572 consists of the following parts, under the general title *Intelligent transport systems (ITS) — Location referencing for geographic databases*:

— *Part 1: General requirements and conceptual model*

— *Part 2: Pre-coded location references (pre-coded profile)*

— *Part 3: Dynamic location references (dynamic profile)*

Introduction

A Location Reference (LR) is a unique identification of a geographic object. In a digital world, a real-world geographic object can be represented by a feature in a geographic database. An example of a commonly known Location Reference is a postal address of a house. Examples of object instances include a particular exit ramp on a particular motorway, a road junction or a hotel. For efficiency reasons, Location References are often coded. This is especially significant if the Location Reference is used to define the location for information about various objects between different systems. For Intelligent Transport Systems (ITS), many different types of real-world objects will be addressed. Amongst these, Location Referencing of the road network, or components thereof, is a particular focus.

Communication of a Location Reference for specific geographic phenomena, corresponding to objects in geographic databases, in a standard, unambiguous manner is a vital part of an integrated ITS system in which different applications and sources of geographic data will be used. Location Referencing Methods (LRM, methods of referencing object instances) differ by applications, by the data model used to create the database, or by the enforced object referencing imposed by the specific mapping system used to create and store the database. A standard Location Referencing Method allows for a common and unambiguous identification of object instances representing the same geographic phenomena in different geographic databases produced by different vendors, for varied applications, and operating on multiple hardware/software platforms. If ITS applications using digital map databases are to become widespread, data reference across various applications and systems must be possible. Information prepared on one system, such as traffic messages, must be interpretable by all receiving systems. A standard method to refer to specific object instances is essential to achieving such objectives.

Japan, Korea, Australia, Canada, the US and European ITS bodies are all supporting activities of Location Referencing. Japan has developed a Link Specification for VICS. In Europe, the RDS-TMC traffic messaging system has been developed. In addition, methods have been developed and refined in the EVIDENCE and AGORA projects based on intersections identified by geographic coordinates and other intersection descriptors. In the US, standards for Location Referencing have been developed to accommodate several different Location Referencing Methods.

This International Standard provides specifications for location referencing for ITS systems (although other committees or standardization bodies may subsequently consider extending it to a more generic context). In addition, this edition does not deal with public transport location referencing; this issue will be dealt with in a later edition.

Intelligent transport systems (ITS) — Location referencing for geographic databases —

Part 1:
General requirements and conceptual model

1 Scope

This International Standard specifies Location Referencing Methods (LRM) that describe locations in the context of geographic databases and will be used to locate transport-related phenomena in an encoder system as well as in the decoder side. This International Standard defines what is meant by such objects, and describes the reference in detail, including whether or not components of the reference are mandatory or optional, and their characteristics.

This International Standard specifies two different LRMs:

— pre-coded location references (pre-coded profile);

— dynamic location references (dynamic profile).

This International Standard does not define a physical format for implementing the LRM. However, the requirements for physical formats are defined.

This International Standard does not define details of the Location Referencing System (LRS), i.e. how the LRMs are to be implemented in software, hardware, or processes.

This part of ISO 17572 specifies the following general LRM related sections:

— requirements of a Location Referencing Method;

— conceptual Data Model for Location Referencing Methods;

— inventory of Location Referencing Methods;

— examples of Conceptual Data Model Use;

— description of selected UML Elements;

— comparison of Definitions with ISO/TC 211;

— introduction to the TPEG Physical Format.

It is consistent with other International Standards developed by ISO/TC 204 such as ISO 14825, *Intelligent transport systems — Geographic Data Files (GDF) — Overall data specification*.

2 Terms and definitions

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

2.1 General terms [1)]

2.1.1
accuracy
measure of closeness of results of observations, computations or estimates to the true values or the values accepted as being true

2.1.2
area
two-dimensional, geographical region on the surface of the earth

NOTE An area can be represented as an implicit area or an explicit area.

2.1.3
area location
two-dimensional location, representing a geographical region on the surface of the earth

2.1.4
attribute
characteristic property of an entity like a real-world feature

NOTE It allows the identification of that feature by the sum of its attributes. An attribute has a defined type and contains a value. Attributes can be either simple, i.e. consisting of one atomic value, or composite (see composite attribute).

2.1.5
coordinate
one of an ordered set of N numbers designating the position of a point in N-dimensional space

2.1.6
complex intersection
intersection that consists at least of two or more junctions and one or more road elements

2.1.7
composite attribute
complex attribute
attribute consisting of two or more atomic values and/or attributes

2.1.8
datum
set of parameters and control points used to accurately define the three-dimensional shape of the earth

NOTE The corresponding datum is the basis for a planar coordinate reference system.

2.1.9
descriptor
characteristic of a geographic object, usually stored in an attribute

EXAMPLE Road names or road numbers.

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1) As part of the general intent to harmonize this International Standard with the ISO/TC 211 family of Geographic Information Systems standards, a comparison of terms and definitions between this International Standard and ISO/TC 211 standards is included as Annex E.

2.1.10
digital map database
structured set of digital and alphanumeric data portraying geographic locations and relationships of spatial features

NOTE Typically, such structures represent, but are not limited to, the digital form of hard copy maps. For example, drawings may be imported into a Geographic Information System (GIS) and considered as a form of digital map.

2.1.11
dynamic location reference
location reference generated on-the-fly based on geographic properties in a digital map database

2.1.12
explicit area
two-dimensional face on the surface of the earth, with a specified outline either being a simple geometric figure or an irregular outline/polygon

2.1.13
face
two-dimensional element bounded by a closed sequence of edges not intersecting themselves

NOTE The face is the atomic two-dimensional element.

2.1.14
implicit area
selection of road segments to be referenced belonging to a certain area (subnetwork)

NOTE One implicit area can be built up of multiple subnetworks that are geographically connected.

2.1.15
international terrestrial reference frame
ITRF
realization of the ITRS

NOTE The ITRF94 reference frame is consistent with WGS84 at the 5 cm level, and therefore is equivalent to WGS84 for ITS applications.

2.1.16
international terrestrial reference system
ITRS
reference system for the earth derived from precise and accurate space geodesy measurements, not restricted to GPS Doppler measurements, which is periodically tracked and revised by the international earth rotation service

2.1.17
intersection
crossing and/or connection of two or more roads

NOTE 1 In GDF, an intersection is a Level 2 representation of a junction which bounds a road or a ferry. It is a complex feature, composed of one or more Level 1 junctions, road elements and enclosed traffic areas. The definition is different from GDF because the location referencing system refers to real-world objects rather than a database definition as defined in GDF.

NOTE 2 Crossings can be at-grade or grade-separated. Crossings that are grade-separated where no connection between the road segments exist, are excluded from this definition.

2.1.18
junction
elementary element in the road network, connecting two or more road elements

NOTE In GDF terms, it is a Level 1 feature that bounds a road element or ferry connection. Junctions that represent real crossings are at least trivalent (having three roads connected). A bivalent junction may only be defined in case an attribute change occurs along the road (e.g. road name change). A junction is also coded at the end of a dead-end road, to terminate it.