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Inteligentni transportni sistemi - Komunikacija med vozili - Opredelitev geografskega območja

Intelligent Transport Systems (ITS) - Vehicular Communications - Geographical Area Definition

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Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Intelligent Transport System (ITS).

National transposition dates	
Date of adoption of this EN:	19 July 2011
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Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2012
Date of withdrawal of any conflicting National Standard (dow):	30 April 2012

Introduction

The present document specifies a method for location referencing. This method defines geographical areas by means of geometric shapes, i.e. circle, rectangle and ellipse. Furthermore, the present document introduces a function that can be used determine the geospatial relation of a point to the geographical area (at the centre, inside, at the border, outside).

1 Scope

The location referencing method enables ITS stations to exchange location-related information [i.1] and [i.3]. It facilitates communication protocols [i.2] and [i.4] to address geographical areas and to disseminate information in these areas.

The location referencing method is designed to minimize overhead and computational complexity.

Encoding and decoding of the geospatial information is beyond the scope of the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

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2.1 Normative references

The following referenced documents are necessary for the application of the present document.

Not applicable.

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI TR 102 638: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Definitions".

[i.2] ETSI TS 102 637-3: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service".

[i.3] ETSI TS 102 636-3: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 3: Network architecture".

[i.4] ETSI TS 102 636-4-1: "Intelligent Transport System (ITS); Vehicular communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality".

3 Definitions and symbols

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

location referencing: method for referencing a location to facilitate the exchange of location-related information

3.2 Symbols

For the purposes of the present document, the following symbols apply:

a	the distance between the center point and the short side of a rectangle (perpendicular bisector of the long side) or the length of the short semi-axis of an ellipse
b	the distance between the center point and the long side of a rectangle (perpendicular bisector of the short side) or the length of the long semi-axis of an ellipse
F	function to determine the spatial characteristics of a point P(x,y) relative to a geometric shape
P(x,y)	point in a Cartesian coordinate system
r	radius of a circle
x	abscissa of a Cartesian coordination system with the origin in the centre of the geographical area and parallel to the long side of a geometric shape
y	ordinate of a Cartesian coordination system with the origin in the centre of the geographical area and parallel to the short side of a geometric shape
θ	azimuth angle of the long side of a rectangle or the long semi-axis of an ellipse
φ	zenith angle of the long side of a rectangle or the long semi-axis of an ellipse

4 Definition of geographical areas

4.1 Overview

Geographical areas shall be specified by geometric shapes. The following geographical areas are defined:

- circular area;
- rectangular area; and
- elliptical area.

Figure 1 depicts all shapes in a single drawing. The shapes are detailed in the following clauses.

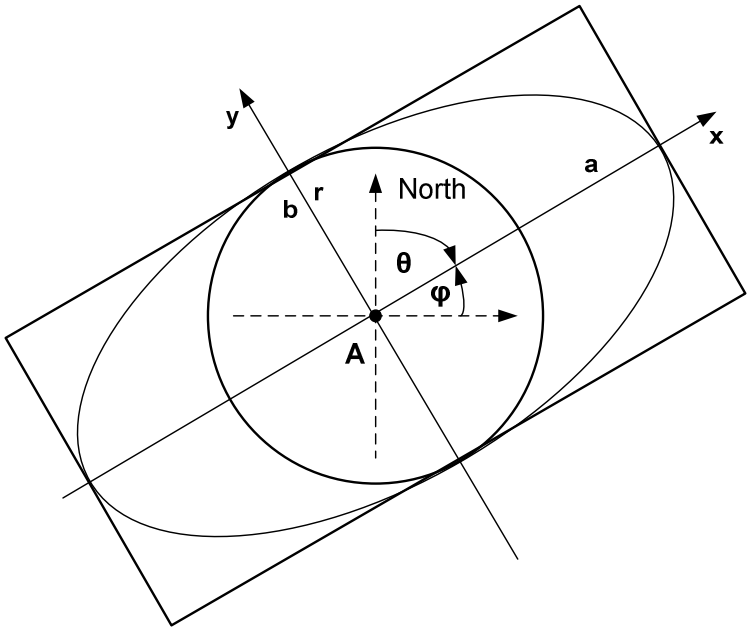

Figure 1: Overview of geometric shapes for the definition of geographical areas

4.2 Definition of a circular area

The circular area shall be described by a circular shape with a single point *A* that represents the center of the circle and a radius *r* as shown in figure 2.

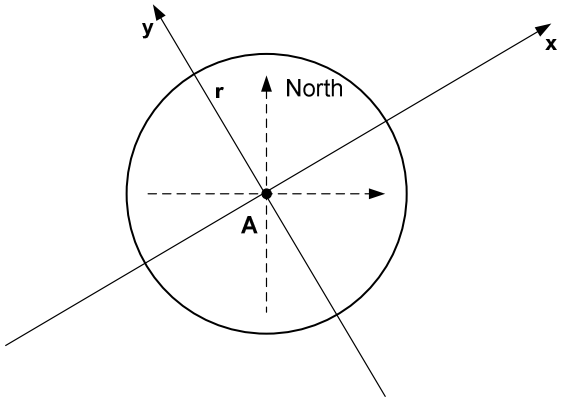

Figure 2: Circular area

4.3 Definition of a rectangular area

The rectangular area shall be defined by a rectangular shape (figure 3) with point *A* that represents the center of the rectangle and the following parameters:

a the distance between the center point and the short side of the rectangle (perpendicular bisector of the short side);

b the distance between the center point and the long side of the rectangle (perpendicular bisector of the long side);

θ azimuth angle of the long side of the rectangle.

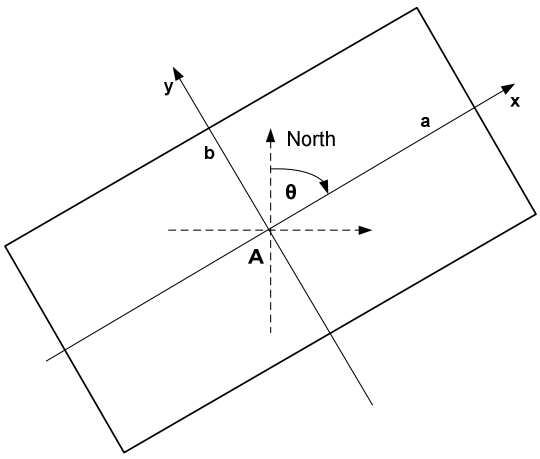

Figure 3: Rectangular area