



19133 Geographic information – Location based services – Tracking and navigation

This standard addresses the modeling and definition of types and interfaces needed to support the specification of web services and applications in the field of tracking and navigation within a linear network. The prime example is car navigation within a road network, but the standard covers all networks within which standard navigation algorithms work.

There are several existing specification or standards that cover all or part of this scope, but there is no unifying model to bind them together and aid in the definition of applications that must address more than a limited subset of this functionality. This standard documents the current best engineering practice and organizes the disparate models into a unified whole so that interoperability between applications can be achieved in a semantically consistent manner.

The model within the standard contains definitions of networks, combined networks, linear reference systems, addresses, location transformation (geocoding and inverse geocoding), tracking and navigation services. These submodels (represented as packages in a harmonized UML model) are needed and used in practice to support functionality for tracking and navigation.

Combined network definitions are given to allow for the combination of 19133 compliant networks for the use in more complex navigation services. The primary intended use of this functionality is for the combination of networks from different sources, but the same techniques are to be used to combine networks of different types to form multimodal navigation systems.

Linear reference systems (LRS) are used in navigation to describe positions along curves which do not necessarily fall on intersection or can otherwise be described as objects in a network topology. LRS is used extensively in car navigation, and in road maintenance. The LRS model in 19133 was harmonized with TC 204 standard through liaison with TC 204 / WG1.

Location transformations are the various techniques to change from one form of expressing position to another. The most common use of this is geocoding, the transformation from postal address to coordinate reference system (as defined in ISO 19111). Reverse geocoding is the transformation from coordinates to address. Other mechanisms for location definition are telephone numbers, street intersections, named places, and points of interest. The location transformation model covers these various mechanisms and builds a framework for the definition of new mechanisms, and the supplying of services to support the needed transformations such a mechanism.

The network package leverages the 1-dimensional topological and geometric complexes defined in ISO 19107 and augments it with information specific to network navigation, including constraints on the traveler in such networks, both legal (“no U-turns) and physical (turning radius), and the definition of navigation subprocedures (“maneuvers”).

The address package defines an international street-addressing framework as needed for car, pedestrian and other navigation services. This package is loosely defined to allow for localization to national standards on addressing and to allow for cultural differences in the expression of addresses.. All addressing standards consistent with international postal addressing standards could be cast as a profile of this package.

The tracking package covers both self-tracking appliances (such as those equipped with GPS receivers), network-tracked appliances (such as cell phones whose position is determined through methods associated to the network receivers with which they communicate), and passively tracked devices such as packages equipped with RFID tags. By constructing a common tracking interface to all types of appliances, this standard aids in the application of common location based services (such as navigation or yellow pages) based on these common interfaces.

The navigation package puts all of this functionality together and uses it for the basis of route determination and execution services.



Project information

FACT SHEET 19133

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The standard is of particular relevance to the following sectors:

Sector	Of particular interest
Developers of GIS products	Address and network package
Developers of GIS application systems	All packages
Producers/ suppliers of geographic data	Network and address package
Users of geographic data and GIS	Tracking and navigation packages
Developers of standards	All packages

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