TECHNICAL REPORT

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Intelligent transport systems — Framework for green ITS (G-ITS) standards —

Part 1: General information and use case definitions

Systèmes de transport intelligents — Cadre pour les normes relatives aux systèmes de transport intelligents écologiques —

Partie 1: Informations générales et définitions des cas d'utilisation

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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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

Introduction

The nomadic and portable devices for ITS services in ISO/TC204 are defined to facilitate the development, promotion and standardisation of the use of nomadic and portable devices to support ITS service provision and multimedia use such as passenger information, automotive information, driver advisories and warning systems, and entertainment system interfaces to ITS service providers and motor vehicle communication networks. This document fosters the introduction of multimedia and telematics nomadic devices in the public transport and automotive world.

This document provides the framework guidelines to identify cost-effective technologies and related standards required to deploy, manage and operate sustainable “green” intelligent transport systems (ITS) technologies in surface transportations with eco-mobility.

Intelligent transport systems — Framework for green ITS (G-ITS) standards —

Part 1: General information and use case definitions

1 Scope

This document provides the framework guideline for identifying cost-effective technologies and related standards required to deploy, manage and operate sustainable "green" intelligent transport systems (ITS) technologies in surface transportations with eco-mobility. These ITS technologies can increase operational efficiencies and unlock enhanced transportation safety and eco-mobility applications.

The green ITS standard framework builds on the existing standards and best practices of transport operation and management systems, as well as ITS applications, and aims to accommodate to the specific needs of eco-mobility in either mega cities or developing countries.

The G-ITS standards would expect to focus on the use of data exchange interface standards to enable the deployment of cloud-based multi-modal mobility solutions using wireless networks and nomadic devices. These forward-looking solutions are "infrastructure light" and thus can impact developing regions with little or no legacy transportation infrastructure.

The framework described in this document includes:

— G-ITS standard common framework including gap analysis of existing ITS standards;

— Guidance documents to facilitate the practical implementation of identified standards by policy makers and engineers including related use cases.

This document includes the identification of existing International Standards for ITS in ISO/TC 204 and existing vehicle communication network access standards.

2 Normative references

There are no normative references in this document.

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
nomadic device
ND
personal ITS station which provides communication connectivity via equipment such as cellular telephones, mobile wireless broadband (WIMAX, HC-SDMA, etc.), WiFi etc. and includes short range links, such as Bluetooth, Zigbee, etc. to connect portable devices to the motor vehicle communications system network

3.1.2
personal ITS station
P-ITS-S
ITS station in a personal ITS subsystem

3.1.3
roadside ITS station
R-ITS-S
system that receives and processes vehicular and pedestrian information within a certain zone and determines the situation, in order to provide the safety warning and parking guide service to vehicles and pedestrians, and that is installed at the road side

3.1.4
green ITS
G-ITS
new-concept transportation system, which is expected to arise following the paradigm shift toward eco-friendly, low-carbon green growth in the transportation sector, as a global policy

3.1.5
eco-mobility
eco transport systems and services based on eco vehicles and their related facilities

3.2 Abbreviated terms

AEI	automatic equipment identification
CALM	communication access for land mobile
CAN	controller area network
DMB	digital multimedia broadcasting
DSRC	dedicated short range communication
DTG	digital tachograph
ERI	electronic registration and identification
ETC	electronic toll collection
EV	electric vehicle
FCEV	fuel cell electric vehicle
HMI	human machine interface
IP	internet protocol
ITS	intelligent transport systems
MaaS	mobility as a service

MaT	mobile all transit
MoD	mobility on demand
MOST	media oriented systems transport
MVCI	modular vehicle communication interface
ND	nomadic device
OBE	on-board equipment
ODX	open diagnostic data exchange
OSGi	open services gateway initiative
TCP	transport control protocol
PDA	personal digital assistant
PHEV	plug-in hybrid electric vehicle
P-ITS-S	personal – intelligent transport system – station
PM	personal mobility
RSE	road side equipment
UDP	user datagram protocol
V-ITS-SG	vehicle – intelligent transport system – station gateway
WAVE	wireless access for vehicular environment
WiFi	wireless fidelity
WIMAX	worldwide interoperability for microwave access
XML	extensible mark-up language

4 Document overview and structure

This document provides all documents and references in order to support the implementation of the applications related to standardized access to framework for green ITS (G-ITS) personal ITS station. This document consists of the following documents.

— Part 1: General information and use case definitions

This part provides an overview of the document set and structure along with the use case definitions and common set of resources (definitions, references), which are used for all subsequent parts.

— Part 2: Integrated mobile service application and specification

This part specifies all technical guidelines related to the integrated mobile service application for G-ITS to be used on the personal ITS station and to be interfaced with central ITS station, vehicle ITS station, and roadside ITS station. The guidelines will reflect the user services from the use cases as specified in this document. The protocol will be defined according to the requirements as specified in ISO 14817-1 and ISO 14817-2.

5 General information about this document

5.1 Purpose

This document:

— identifies the requirements of application level framework for green ITS (G-ITS) services, that can be frequently inserted, modified and deleted;

— identifies the method to describe the general information for all subjects related to G-ITS services on the personal ITS station interfaced with central ITS station, vehicle ITS station, and roadside ITS station;

— specifies the general use cases that should be included for the G-ITS services.

5.2 Overview of G-ITS services

Conceptual aspects of the green ITS (G-ITS) services should be considered as illustrated in Figure 1.

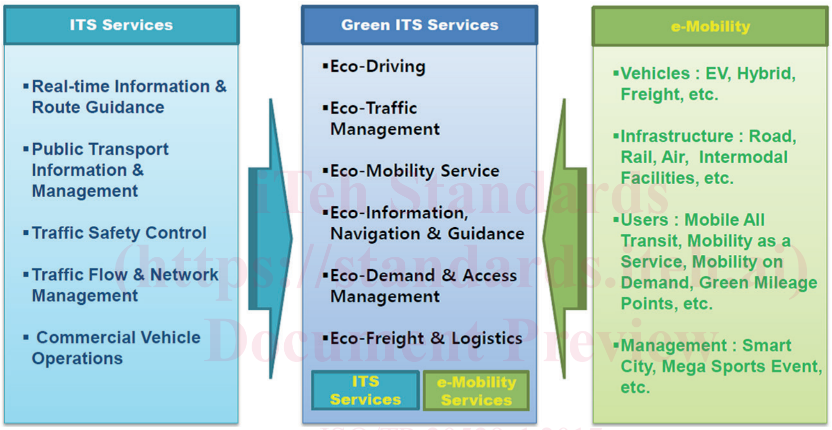

Figure 1 — G-ITS service concept

ISO/TC 204 plans to develop standards, specifications and informational reports for central and local government officials who intend to manage and operate green ITS in their respective cities with eco-mobility.

Examples include the delivery and management of ITS services using wireless networks and personal nomadic devices, as well as the use of commercial off-the-shelf technologies and services such as smartphone apps for public transit route planning and obtaining road congestion information for use by traffic management centres and personal route planning.

The green ITS standard framework will build on the existing standards and best practices transport operation and management systems and ITS applications, but will be customized to accommodate specific needs of eco-mobility in countries and cities. This includes:

— survey and identification of appropriate ITS technologies and corresponding standards required to deploy eco-mobility systems, services and infrastructure in the cities;

— identification of gaps and proposed revisions/amendments to existing standards where appropriate;

— development of a standard framework for the deployment and management of green ITS standards.

The background and challenges of G-ITS standards are:

— as increased urbanization and traffic congestion contribute to climate change, impact the quality of life and economic activities in many cities, Intelligent Transport Systems (ITS) hold the promise of a better future;

— creation of a mobility ecosystem where consumers can avail themselves of various mobility services through the use of mobile applications or web interfaces through nomadic devices that can allow them to plan, travel and pay for mobility services that best fit their needs;

— evolution of transportation in regions from an isolated, stove-piped network of public transit, toll, parking, taxi, and other transportation services to a more integrated, multi-modal, convergence of publicly delivered and privately delivered mobility services;

— addressing the new mobility ecosystem in grass roots partnerships between public transport and shared mobility services, as well as through mobile mobility and demand management application providers that provide multi-modal trip planning, targeted traveller information, and mobile payment.

The issues for the proposition of G-ITS standards are as follows:

— **Vehicles**:

Vehicles which rely on plug-in electricity for their primary energy, whether or not they have an auxiliary internal combustion engine for range extension or for keeping the battery charged up (electric vehicles, plug-in hybrid electric vehicles, and fuel cell electric vehicles), and which is not necessarily limited to cars, but embraces power-two-wheelers, vans, quadricycles (personal mobility), etc.

— **Infrastructure**:

Roadway facilities related to eco-mobility vehicles, users, and management, i.e. charging stations, parking zones, eco-mobility designated roadway for driving, carbon free zones, etc.

— **Management**:

Transportation management by national authorities and local municipalities for supporting the introduction of such eco-mobility, giving them specific fiscal treatment or favouring their use over conventional cars (parking facilities, access to restricted urban areas, access to bus lanes, etc.), with respect to eco-mobility performance measures and evaluation methods, business models and use cases, services, operation and management, and interfaces between centers, infrastructure, vehicles, and users.

— **Users**:

Seamless traveller eco-mobility services with traveller information, open payment system with green “points”.

— **Commercial/Public transport vehicles**:

Green functions, green measures, green services and interfaces between infrastructure, mobile, centers, and public and commercial vehicles.

6 Use case overview and definitions

The main purpose for developing standards is to define the service platform with the related use cases.