



## **DRAFT BUSINESS PLAN**

### **ISO/TC 204**

#### **Intelligent transport systems**

### **EXECUTIVE SUMMARY**

ISO/TC 204 addresses the newly emerging worldwide market that has come to be known as Intelligent Transport Systems (ITS). ITS is the application of information technology, communications technology, and sensor technology, including the internet (both wired and wireless), to the general challenges and opportunities of surface transportation.

As urbanization and traffic congestion impact the quality of life in many cities, ITS holds the promise of improving traffic management and vehicle safety. ITS enables both government and private industry to improve safety, mitigate traffic congestion and reduce fuel consumption and emissions, as well as increase traveller mobility and convenience via the use of vehicle and infrastructure probe data to provide location-based telematics services.

The major trends are:

- integrating vehicles with roadway networks through the use of on-board wireless communications ;
- conversion of vehicle and infrastructure data to provide timely location based services to drivers and roadway operators ;
- to improve advanced safety applications such as automatic crash notification, secure freight transport and crash avoidance ;
- an improved environment through reduced fuel consumption

To be successful, low cost communications equipment needs to be incorporated into passenger and public transport vehicles. ISO/TC204 is developing standards to ensure the global integration and interoperability of such technologies, as well as allow the data from these devices to be successfully translated into useful information for location-based services such as automatic crash notification, traffic notification and alternative routing. Successful standards development is key to turning this potential into reality.

## 1 INTRODUCTION

### 1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

### 1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: [ISO](#) (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of [IEC](#) (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of [ITU](#) (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 140 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the [International Standard](#).

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its [Technical Committees](#) are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

## 2 BUSINESS ENVIRONMENT OF THE ISO/TC

### 2.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this ISO/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

The work of ISO/TC 204 encompasses standardization of information, communication and control systems in the field of urban and rural surface transportation, including intermodal and multimodal aspects, traveller information, traffic management, public transport, commercial transport, emergency services and commercial services, generally referred to as “Intelligent Transport Systems (ITS).”

The following aspects of intercity rail are included in the work of ISO/TC 204: intermodal movement of passengers and freight, information systems relating to passenger and freight rail transport, and the use of ITS technology at the intersection of roads and rails (“grade crossings” or “level crossings”). Other aspects of intercity rail are not included in the work of ISO/TC 204.

ISO/TC 204’s work does *not* include ITS systems which are completely self-contained in the vehicle and which do not interact with other vehicles or the infrastructure (responsibility of ISO/TC 22).

ISO/TC 204 is responsible for the overall system and infrastructure aspects of ITS as well as the coordination of the overall ISO work programme in this field including the schedule for standards development, taking into account the work of existing international standardization bodies.

ITS enables both government and private industry to improve safety, mitigate traffic congestion and reduce fuel consumption and emissions, as well as increase traveler mobility and convenience via the use of vehicle and infrastructure probe data to provide location-based telematics services.

### ***ITS MARKET OVERVIEW***

ITS is a world market, with producers seeking to sell into global markets and buyers seeking products and services from a global vendor community. Some ITS products are aimed at specific local markets or must operate under particular local regulatory or social constraints. However, many ITS products are intended for installation or use in passenger cars, buses, ferries, trains, and commercial vehicles, which are built and sold globally. The ability for first and second tier suppliers to build and distribute consistent products worldwide is already a significant market stimulus.

In addition, many ITS products, especially those that are communications-enabled, are aimed at travelers who want consistent access to ITS services wherever they go. Consistency in operation, wireless interfaces, and user interfaces, including mobile use of the internet, are important, especially where there are safety considerations.

There are five primary market targets for ITS:

- Builders and operators of the roadway, public transport, rail, and ferry infrastructure. This is predominantly the public sector, but with a growing private sector presence, especially for toll roads.
- Vehicle manufacturers, who incorporate ITS technology into the automobiles, trucks, and buses they sell
- Commercial fleet operators (passenger and freight) who use ITS to better manage vehicles, loads and routing
- End users, as consumers of ITS products and services
- Public sector regulators of transportation and enforcement entities

Major ITS Stakeholders include, but are not limited to:

- National and regional agencies and sub-national departments and ministries of transport
- Industry and Trade Associations
- Automotive manufacturers
- Consumer Electronics, Public Transport Electronics, and Automotive Electronics manufacturers
- Telecommunication companies
- Public Transport and Roadway Infrastructure System Developers and Operators Software and database developers
- Universities, research establishments, and consultancies

These markets are frequently linked. Vehicle manufacturers, for example, incorporate the technology that they feel will appeal to and be bought by their own customers. The electronic toll collection / road use charging technology deployed by the public sector will be successful only if the general public acquires and uses toll tags in sufficient numbers.

In addition, manufacturers of in-vehicle devices and suppliers of ITS information services and content are themselves customers for ITS products and services. For example, manufacturers of in-vehicle route guidance products, who sell both to consumers and vehicle manufacturers, are themselves customers for GPS units, sensors, LCD displays, etc.

Public sector agencies, which organize and deploy much of the ITS infrastructure, have been the largest initial investors in ITS. However, commercial opportunities are rapidly developing as technically and commercially viable products and services become available. Within the next 25 years, the private sector market is expected to become four times larger than the public sector market.

## ***2.2 Quantitative Indicators of the Business Environment***

The business environment for ITS must still be characterized as emerging, although significant revenues and values have been created over the past few years. Take as one example the still emerging satellite navigation business. The two companies that provide digital map databases, both of which were startups in the early days of ITS, today have an aggregate market capitalization in excess of US\$12 billion, based on recent acquisition activity. The two leading providers of portable navigation devices, neither of which existed a few years ago, have an aggregate market capitalization of approximately \$15B.

According to a Consumer Electronics Association study ("Automotive Electronics—What Consumers Have and What They Desire", Feb. 2008), sales of in-vehicle consumer electronics in the U.S. alone will grow at a rate of 13% in 2008 to more than \$12.8 billion, according to a recent study released by the Consumer Electronics Association (CEA). The study, Automotive.

According to the 2007 Urban Mobility Study conducted by the Texas Transportation Institute, the cost of urban congestion in the U.S. is approximately \$78 billion annually in the form of 4.2 billion lost hours and 2.9 billion gallons of wasted fuel. Mitigation congestion through better traffic management and crashes reduction is a major target of ITS technology.

Every year, over 40,000 traffic fatalities are recorded in Western Europe, a similar number in the U.S., over 6,000 in Japan, and over a million worldwide. An enormous economic loss accompanies the human loss. Diminishing this death toll is a major focus of ITS efforts throughout the world.

Some specific ITS business opportunities include:

- Opportunities for suppliers who can adapt rapidly to the changing ITS market landscape
- New markets for the delivery of transport-related goods and services
- New information and service offerings that have not historically been readily available to the traveler
- ITS services utilizing wireless networks can be readily deployed in developing nations without the need to invest in capital intensive infrastructure

### **3 BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC**

The primary social, political, and economic benefit offered by ITS is increased safety: fewer and less severe crashes. Standards are a primary enabler of the widespread dissemination of ITS technologies and their safe and consistent use worldwide.

#### **For customers:**

- Potential for increasing the level of service to travelers, increasing the efficiency of current infrastructure, and improving safety, convenience, and cost-efficiency for travelers.
- Falling costs for computing and communications technology coupled to the internet are putting very sophisticated ITS capabilities within the financial reach of more and more consumers and business users.
- ITS provides public sector agencies with new approaches to delivering services, including increased opportunities for privatization of services

#### **Technological changes and major product innovations:**

- With new, improved, and less costly hardware capabilities providing a foundation, software is adding levels of capability and flexibility to transport-related devices, across the spectrum of potential uses: in vehicles, among vehicles, and between vehicles and the infrastructure.

#### **Social changes:**

- In many places, travel distances continue to increase as population growth and urbanization cause housing patterns expand and jobs move from one place to another. Travel times for trips by automobile increase correspondingly, worsening congestion, and new travel patterns between home and work. ITS offers means both to reduce/load-level/eliminate travel (in combination with telecommuting), to make necessary travel quicker and more productive, and to enable physical infrastructure to more efficiently cope with traffic volumes, increasing return on investment.
- The move toward communications-enabled vehicles, especially private automobiles, has the potential to change the way that people work and for their leisure activities as well.

**Political changes:**

- The introduction of ITS technology and the internet in newly and rapidly developing parts of the world (e.g., east and south Asia) may allow more rapid deployment of some facilities by offering automated and wireless technology as an alternative to traditional infrastructure.
- ITS represents an opportunity for developing countries to eliminate or minimize the problems of transport and transportation logistics that arose in traditional “steel-and-asphalt” environments, and to move along the technology learning curve faster, unburdened by an existing, aging infrastructure.
- Application of ITS for access control, road pricing, law enforcement and environmental control presents an opportunity for fairer and more reliable enforcement and the harmonization of applicable regulations and legal practices.

## **4 REPRESENTATION AND PARTICIPATION IN THE ISO/TC**

### **4.1 Countries/ISO members bodies that are P and O members of the ISO committee**

Major market forces in ISO/TC 204 are currently represented by national and regional agencies and sub-national departments and ministries of transport. These representatives are drawn from the following member nations:

Participating “P” Member Nations:

- + Austria
- + Australia
- + Belgium
- + Canada
- + China
- + Czech Republic
- + France
- + Germany
- + Hungary
- + India
- + Italy
- + Japan
- + Korea
- + Malaysia
- + Netherlands
- + Norway
- + Russian Federation
- + South Africa
- + Spain
- + Sweden
- + Switzerland
- + United Kingdom
- + United States

Observer “O” Member Nations:

- + Brazil

- + Chile
- + Colombia
- + Croatia
- + Cuba
- + Denmark
- + Egypt
- + Finland
- + Greece
- + Indonesia
- + Iran
- + Ireland
- + New Zealand
- + Pakistan
- + Philippines
- + Poland
- + Romania
- + Serbia
- + Singapore
- + Slovakia
- + Sri Lanka
- + Thailand
- + Trinidad and Tobago
- + Turkey
- + Uruguay

Industry and Trade Associations:

- + ERTICO (ITS Europe)
- + ITS America
- + ITS Australia (AU)
- + ITS Canada (CA)
- + ITS Korea
- + ITS Mexico
- + ITS Sweden
- + ITS United Kingdom (UK)
- + ITS Japan (J)
- + Telecommunications Industry Association (US)
- + Asia-Pacific Economic Cooperation Transportation Working Group

Automotive manufacturers. Representatives from:

- + BMW (D/US)
- + DaimlerChrysler (D/US)
- + Fiat Group (I/SP)
- + Ford Premier Group (US/UK/S)
- + General Motors (US/D/S)
- + Honda (J)
- + Hyundai (K)
- + Mitsubishi (J/NL)
- + Peugeot/Citroen (F)
- + Renault / Nissan (F/J)
- + Rover (UK)
- + Toyota Group (J/UK)
- + Volvo (S)

Consumer Electronics, Public Transport Electronics, and Automotive Electronics manufacturers.  
Representatives from:

- + Alcatel (F)
- + Alpine (J)
- + AMP, Inc. (US)
- + Blaupunkt (D)
- + Bosch (D)
- + Delphi-Delco (US)
- + Denso (J)
- + EFKON (A)
- + Hitachi (J)
- + Intermec/Amtech (US)
- + Kyosan Electric Manufacturing Co. (J)
- + Marconi (UK)
- + Mark VI (CA)
- + Mitsubishi Electric Industries (J)
- + Motorola (US)
- + NEC Corporation (J)
- + Oki Electric Industry (J)
- + OMRON Corp. (J)
- + Panasonic Matsushita (J)
- + Q-Free ASA (N)
- + Siemens Automotive (D)
- + Sumitomo Electric Industries (J)
- + VDO (D)

Telecommunication companies

- + Debis (D)
- + Korea Telecom (K)

Public Transport and Roadway Infrastructure System Developers and Operators:

- + Associacao Brasileira de Concessionarias de Rodovias (BR)
- + Hanshin Expressway Public Corporation (J)
- + Highways Agency (UK)
- + Houston Transtar (US)
- + IRD International (CA)
- + Japan Highway Public Corporation (J)
- + Korea Highway Corporation (K)
- + Mark IV
- + Orbital Transportation Management Systems (US)
- + Q-Free (N)
- + SAPRR (F)
- + Siemens Intelligent Traffic Systems (D)
- + Swedish Road Administration (SE)
- + Traffic Supervision Systems A/S (DN)
- + TransCore, Inc. (US)

Software and database developers. Representatives from:

- + Bentley Systems, Inc. (US)
- + Microsoft (US)



- + NAVTEQ (US, NL)
- + Tele Atlas / Etak (B, US)

Universities, research establishments, and consultancies. Representatives from:

- + Aachen Technical University (D)
- + Ajou University (K)
- + Commonwealth Scientific & Industrial Research Organisation (Aus)
- + Consultancy Services International Ltd (UK)
- + Dartmouth College (US)
- + Hitech International Ltd (Project SET) (UK)
- + Highway Research Institute of China, Ministry of Communications (CN)
- + Japan Automotive Research Institute (J)
- + Keio University (J)
- + Kyoto University (J)
- + Korea Automotive Technology Institute (K)
- + Oak Ridge National Laboratory (US)
- + SINTEF (N)
- + Technical University of Sydney (Aus)
- + Transport Research Laboratory (UK)
- + University of California (US)
- + University of Central England (UK)
- + University of Michigan (US)
- + University of Tennessee (US)
- + University of Toyo (J)
- + Yokohama National University (J)

#### ***ISO/TC 204 – Intelligent Transport Systems (ITS): Leadership Roles***

Chairperson : Mr. M. Noblett

Secretary : Mr. Tyler Messa

ISO Member responsible : American National Standards Institute (ANSI)

Vice Chair: Dr. Hironao Kawashia

ISO Member responsible: Japanese Industrial Standards Committee (JISC)

##### *Working Group 1- Architecture*

Convenor : R. K. Williams

Editor: A. Schoka

ISO Member responsible : British Standards Institution (BSI)

##### *Sub-Working Group - Data Modelling for Transport Information and Control Systems (TICS)*

Sector (Data Dictionary)

Convenor : T. Kurihara

##### *Working Group 3 – TICS Database Technology*

Convenor : J. Shibata

Rapporteur : T. Lydon

ISO Member responsible : Japanese Industrial Standards Committee (JISC)

##### *Sub-Working Group 3.1 – Extended Geographic Data Files*

Convenor : R. Van Essen

##### *Sub-Working Group 3.2 – Data Delivery Structures and Protocols*

Convenor : H. Tanaka

*Sub-Working Group 3.3 – Location Referencing*  
Convenor : R. Duckeck

*Sub-Working Group 3.4 – API*  
Convenor : C. Goodwin

*Working Group 4 – Automatic Vehicle Identification*  
Convenor : K. Evensen  
Rapporteur: D. Schnacke  
ISO Member responsible : Norges Standardiseringsforbund (NSF)

*Sub-Working Group 4.1 14814 Reference model architecture for generic AVI/AEI*  
Convenor : R. Williams

*Sub-Working Group 4.2 14815 Road transport and traffic telematics -- Automatic vehicle and equipment identification -- system specifications*  
Convenor : K. Evensen

*Sub-Working Group 4.3 14816 Road transport and traffic telematics -- Automatic vehicle and equipment identification -- Numbering and data structure*  
Convenor : P. J. Furnes

*Sub-Working Group 4.4 17261 AVI/AEI -- Intermodal Goods Transport Architecture and Terminology*  
Convenor : R. Williams

*Sub-Working Group 4.5 17262 AVI/AEI -- Intermodal goods transport numbering and data structures*  
Convenor : P. J. Furnes

*Sub-Working Group 4.6 17263 AVI/AEI -- Intermodal goods transport system parameters*  
Convenor : K. Evensen

*Sub-Working Group 4.7 17264 AVI/AEI -- Intermodal Goods Transport Interfaces*  
Convenor : J. Moeller

*Working Group 5 – Fee and Toll Collection*  
Convenor : Jesper Engdahl  
ISO Member responsible: Swedish Standards Institute (SIS)

*Sub-Working Group 5.1 – Architecture, security and information exchange*  
Convenor : Mr. Trond Foss

*Sub-Working Group 5.2 – DSRC-based EFC*  
Convenor : Mr. Jean-François Jouen

*Sub-Working Group 5.5 – GNSS-based EFC*  
Convenor : Mr. Ian Catling

*Sub-Working Group 5.6 – Compliance checking and location augmentation*  
Convenor : Mr. Wolfgang Beier  
*Working Group 7 – General Fleet Management and Commercial/Freight*  
Convenor : R. L. Sabounghi  
Rapporteur: J. W. Johnson

ISO Member responsible: Standards Council of Canada (SCC)

*Sub-Working Group 7.1*

Convenor : R. L. Sabounghi

Editor: L. Armstrong

*Working Group 8 – Public Transport/Emergency*

Convenor : K. Olyai

Rapporteur: G. Fernandez

ISO Member responsible : American National Standards Institute (ANSI)

*Sub-Working Group 8.1 TCIP*

Convenor : P. Okunieff

*Sub-Working Group 8.2 VAN*

Convenor : B. Kronenberger

*Sub-Working Group 8.3 PRESTO*

Convenor : M. Yamaguchi

*Sub-Working Group 8.4 Stop Numbering*

Convenor : G. Glazebrook

*Working Group 9 – Integrated Transport Information, Management and Control*

Convenor : D. Zabrieszach

ISO Member responsible : Standards Australia

*Working Group 10 – Traveller Information Systems*

Convenor : P. Burton

ISO Member responsible : British Standards Institution (BSI)

*Sub-Working Group 10.1 TTI messages via Traffic Message Coding*

Convenor : R. Duckeck

*Sub-Working Group 10.3 TTI messages via Cellular Networks*

Convenor : S. Vieweg

*Sub-Working Group 10.4 TTI Messages via DSRC Beacons*

Convenor : I. Fraser

*Sub-Working Group 10.5 TTI Messages via Stationary Dissemination Systems*

Convenor : R. Kitamura

*Sub-Working Group 10.6 TTI User Services Integration*

Convenor : J. Wang

*Sub-Working Group 10.7 TTI Messages via High data-rate Digital Broadcast Bearers*

Convenor : B. Marks

*Working Group 14 – Vehicle/Roadway Warning and Control Systems*

Convenor : Y. Furukawa

Rapporteur: E. Kosaka

ISO Member responsible : Japanese Industrial Standards Committee (JISC)

*Working Group 15 – Dedicated Short Range Communications for TICS Applications*

Convenor : C. H. Rokitansky

Rapporteur: D. Schnacke

ISO Member responsible : Deutsche Institut für Normung (DIN)

*Sub-Working Group 15.1 DSRC Layer 2 (linked with L7)/DSRC RM*

Convenor : L. Armstrong

*Working Group 16 – Wide Area Communications/Protocols and Interfaces*

Convenor : T. Russell Shields

Rapporteur: A. Ujj

ISO Member responsible : American National Standards Institute (ANSI)

**List of Outreach Activities of ISO/TC204**

Date	Place	Workshop Title
1995/3	Seoul, Korea Beijing, China Kuala Lumpur, Malaysia Singapore, Singapore Manila, Philippines Jakarta, Indonesia	Visit to relevant organizations in each country to become members or to encourage active participation of members
1996/9/8-12	Washington, USA	Workshop on Standards for the use of models that define the data and processes of information systems
1997/7/28-30	Reston, USA	ISO/TC204 Data Dictionary Workshop
1998/9/1-2	Bologna, Italy	TICS Standards for handling and storing digital images
2000/10/25-26	Paris, France	A Workshop to establish a path to develop standards to determine rules and guidelines for defining information models in an ITS/TICS data registry
2002/10/12	Chicago, USA	1st APEC ISO Workshop
2004/5/17	Vancouver, Canada	2nd APEC TPT/ISO TC204 Workshop on ITS
2004/10/12-14	Beijing, China	EU-China ITS Conference
2005/1-/10-11	Beijing, China	ITS Seminar
2006/2/27-28	Kuala Lumpur, Malaysia	ITS Seminar
2006/3/2-3	Bangkok, Thailand	ITS Seminar
2006/4/24	Busan, Korea	3rd ISO TC204 Workshop Best Practice on ITS/ Telematics Standards
2006/8/17	Bangkok, Thailand	ITS Forum Special Seminar on ISO/TC204
2006/10/2	Cape Town, South Africa	ISO/TC204 WG1 Workshop XML & Web service
2006/10/3	Cape Town, South Africa	ISO/TC204 Outreach Workshop
2007/3/7	Geneva, Swiss	ITU, ISO, IEC Workshop: "Fully Networked Car"
2007/3/12	Tokyo, Japan	ISO/TC204 WG1 Workshop XML & Web service
2007/6/28	Madrid, Spain	Workshop on TS Architecture, WG13 of CEN/TC278, Wg1 of ISO/TC204
2007/20/17	Qingdao, China	ISO/TC204 Outreach Symposium

## 5 OBJECTIVES OF THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

### 5.1 *Defined objectives of the ISO/TC*

ISO/TC 204 creates and promulgates international standards within its scope. Notably, ISO/TC 204 has system-level responsibility for international ITS standardization, including the responsibility for setting the overall agenda and schedule across ISO in this area. In particular, ISO/TC 204 has responsibility for subject matter, which crosses the boundary between the vehicle and its environment, the increasingly typical situation as vehicles continue to incorporate sensors and communications capabilities and links to external systems including other vehicles.

More specifically, ISO/TC 204's objectives are:

- 1) Elaboration of standards deliverables to provide architecture, taxonomy, terminology, data and general technology support framework for ITS development and integration
- 2) Elaboration of standards enabling the interchangeability and interoperability of media-specific map databases and other location-related information; and for consistent location referencing across systems and databases.
- 3) Elaboration of standards for automatic vehicle and equipment identification
- 4) Elaboration of standards for secure interoperable transactions and money flow management in multioperator services (road toll collection, public transport fare collection, other paying services)
- 5) Elaboration of standards to facilitate the movement of people and freights across national boundaries and across multiple transport modes.
- 6) Elaboration of standards for commercial (freight and public transport) in-vehicle information exchange with multiple types of onboard equipment
- 7) Elaboration of standards addressing the intermodal handling of freight
- 8) Elaboration of standards for message sets and protocols for the connection of traffic management centers with field equipment and other traffic management centers; and for the connection of multiple kinds of centers (traffic management, public transport management, emergency response, rail operations, etc.) with one another
- 9) Elaboration of standards for Reference Data Models to allow easy exchange of information between different applications (for example for Public transport Management applications)
- 10) Elaboration of standards for message sets and protocols for the delivery of traffic and other travel related information from public and private information gathering facilities to public and private information dissemination facilities.
- 11) Elaboration of standards for the performance of driver assistance systems which interact with the vehicle's environment; for related sensing devices; and for the reliable integration of multiple driver assistance functions.
- 12) Elaboration of standards for message sets and protocols for wireless communications to and from vehicles and portable devices for:
  - Traffic and traveler information and other wireless ITS services to vehicles
  - Fleet management

- Emergency notification and response
- Electronic toll collection / road use charging
- Commercial vehicle border crossing, load monitoring (especially hazardous cargo), safety monitoring, and credentials verification

13) Elaboration of standards for the operating characteristics and human-machine interfaces of ITS systems that are not entirely self-contained in road vehicles.

## **5.2 Identified strategies to achieve the ISO/TC's defined objectives**

1. ISO/TC 204 has well-established liaisons with ISO/TC 22,, ISO/TC 104 ("Freight Containers") and ISO/TC 211 ("Geographic Information Systems"). The TC has a well used liaison with CEN TC278 (Road Traffic and Transport Telematics) to the point that many of the working groups meet jointly and, where appropriate, there are joint deliverables. TC204 is in the process of establishing a similar liaison with ETSI TC ITS, and works with IEEE under the umbrella of the recently agreed cooperation agreement between ISO and IEEE.

ISO/TC 22 has responsibility for ITS-related standards related to technology and human factors completely self-contained in road vehicles, and ISO/TC 204 has responsibility for all other ITS-related standards within ISO, including system level concerns and overall time frames. In several areas of standardization where both TC 204 and TC 22 have clear interests, the two Technical Committees have formed joint working groups (JWGs). The TC 204-TC 22 relationship is regularly reviewed and updated, especially since industry trends toward portable technology, multimedia, the internet, and multi-user approaches are so rapidly evolving.

2. ISO/TC 204's Chair has for some years convened a Strategic Planning Group to guide him on the TC's activities in line with market needs, industry trends, and economic impacts. This Group plays an important role in guiding the TC and particularly assisting the efficient time management of the Convenors and Heads of Delegation (CHOD) Meeting and the TC Plenary meeting..
3. ISO/TC 204 regularly re-examines its programme of work and cancels work items that are not well-supported and making suitable forward progress. ISO/TC 204 will review the timing and frequency of its plenary meetings with respect both to ISO-CS guidelines and the needs of its programme of work.
4. ISO/TC 204 maximises use of electronic document development and circulation at both the TC and Working Group level to advance work as rapidly as possible while decreasing the requirement for personal travel wherever possible.will The TC will use remote conferencing technologies within Working Groups as these technologies become cost effective and efficient.
5. ISO/TC 204 will periodically consider restructuring its Working Groups to better focus resources on high priority needs and to maintain as simple and transparent a working structure as possible. This will be done in close consultation with CEN/TC 278 in consideration of the liaison and joint working group structure between the two TCs.
6. The TC has instructed its Working Groups to consider the use of ISO Fast Track mechanisms and to employ them whenever appropriate.
7. The Strategic Planning Group and the relevant Working Groups of ISO/TC 204 track and review the evolution of the wireless internet and other technology advances relevant to TC 204's scope and objectives, propose relevant work items, and establish appropriate liaisons with external bodies active in this sector.

## Risk analysis

*[This section has greatly benefited from the observations and insights in the CEN/TC 278 Business Plan].*

### **Competition from De Facto Standards and Industry Consortia**

Sectors that strongly depend on information technology and electronics often show a preference for *de facto* standards over consensus-based standards, whether domestic or international. Such *de facto* standards are typically promulgated by an industry leader or developed by an industry consortium. The primary argument in favor of these *de facto* standards is the speed at which their standards are developed, even at the expense of robustness. For ISO/TC 204 (and similarly situation ISO TCs) to succeed, the TC must demonstrate that it can move swiftly and effectively where the marketplace requires it, and still produce high quality standards that will stand the test of time.

### **Maintaining Focus**

ITS is interdisciplinary, drawing on experts from many fields and to some extent overlapping the interests of other standards development bodies. At the same time, ITS has its own unique perspective and focus, which is not completely addressed by other groups or fields of activity.

The challenge to ITS and to ISO/TC 204 is keeping its focus on system-level and crosscutting issues and technologies such as: interoperability, communications, interfaces, etc.

ISO/TC 204 actively avoids undertaking work that belongs elsewhere. At the same time, it must not lose an overall integrated approach to the ITS field among the separate and often disjoint interests of other interest groups.

### **Availability of Experts**

An additional challenge of being interdisciplinary is that the volunteer experts on whom ISO/TC 204 relies generally have at least collateral, sometimes primary, interests in other fields. Therefore, in addition to the ordinary difficulty of securing volunteer experts for international standards, ISO/TC 204 must often attract experts with interests in other disciplines as well. In the current business climate, and in view of the protracted time between the recognition of a concept and its implementation, the availability of resources and experts for ISO work is always an issue. "Donor fatigue" on the part of industry also presents a risk on the availability of experts.

### **Rapidly Changing Environment**

ITS remains subject to rapid and radical change both technologically and politically, requiring mechanisms for speeding and increasing the responsiveness of standards development. Much of ITS technology is based in information and communications technology (ICT) which changes and evolves rapidly, as witness the swift arrival and expansion of the wireless internet. In addition, as an emerging field with significant potential impacts on every day life (both commercial and personal), structural approaches to ITS also change rapidly. The issue that vehicle life spans are considerably longer than ICT development cycles creates particular problems; these issues are addressed by TC204.

Issues include the division of responsibilities between public agencies and private sector companies, centralized vs distributed approaches, changing perceptions of interoperability and where it is needed, etc.

### **Complex Relationships**

Most ISO Technical Committees are focused on a particular area of technology. ISO/TC 204 must necessarily interact with and, to be successful, work cooperatively with other committees both within ISO and elsewhere. The division of responsibility, for example between ISO/TC 204 and ISO/TC 22, and between ISO/TC 204 and CEN/TC 278 is critical.

Other bodies have legitimate concerns that their area of interest may be encroached upon; ISO/TC 204 has legitimate concerns that the special and cross-cutting needs of ITS not be lost in the gaps between other standards-developing groups with particular, more narrowly focused technical or geographical interests.

### **Outreach Activities**

ITS represents an opportunity for developing countries to eliminate or minimise the problems of transport and transportation logistics that arose in traditional “steel-and-asphalt” environments, and to move along the technology learning curve faster, unburdened by an existing, aging infrastructure. Recognizing the importance of this observation to the ISO/TC, ISO/TC204 has planned and conducts various Outreach Activities to invite non-members to the ISO/TC and to introduce the developed standards of this ISO/TC to wider audiences. (See Annex 2)

## **6 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME**

Factors affecting completion and implementation of the ISO/TC204 Work Programme have been outlined throughout this business plan, negating any need to further elaborate here.

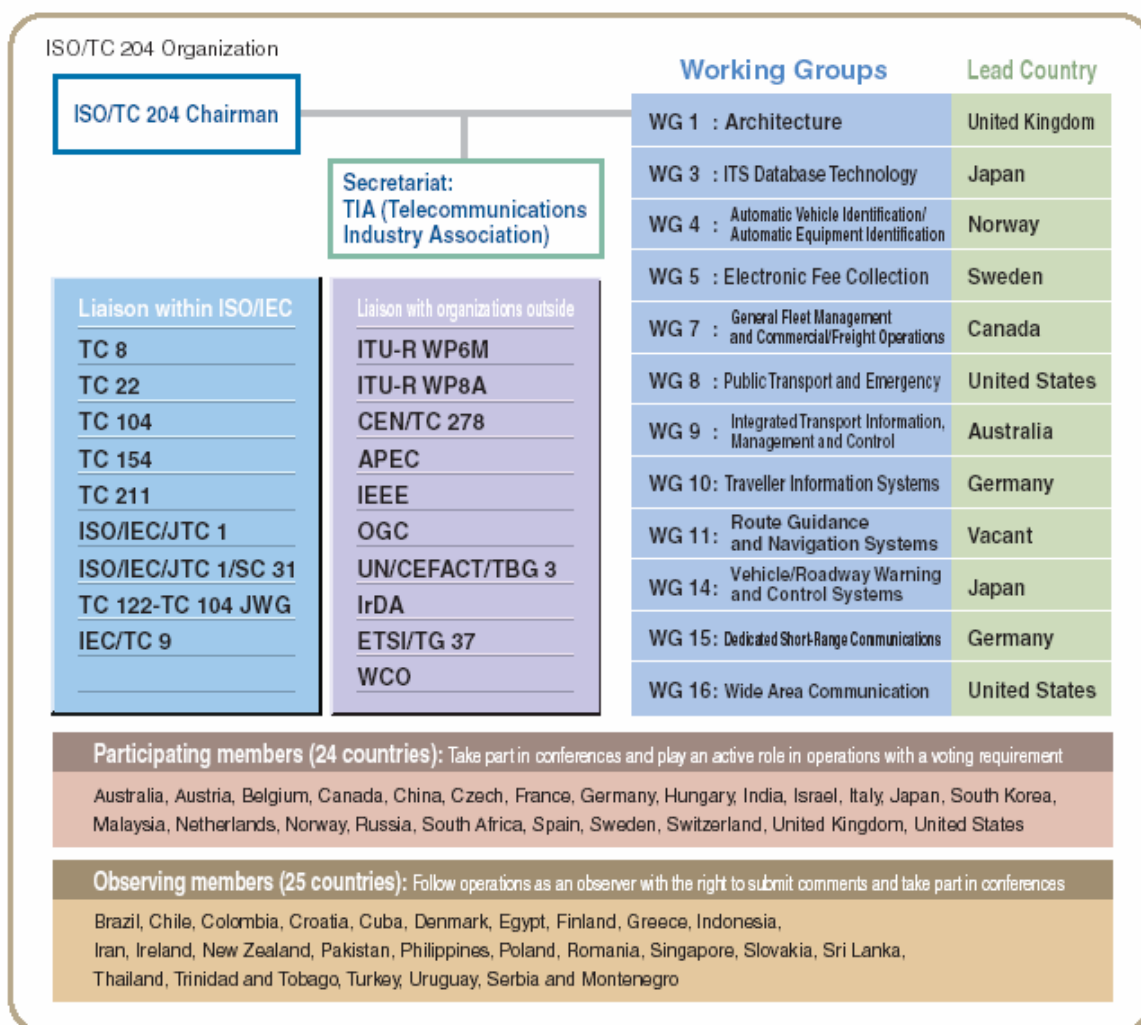
## **7 STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC**

This section gives an overview of the ISO/TC’s structure, scopes of the ISO/TCs and any existing subcommittees and information on existing and planned standardization projects, publication of the ISO/TC and its subcommittees.

### **7.1 Structure of the ISO committee**

TC 204, a technical committee for standardization for ITS within ISO, was established in 1992 and went into operation the following year. In ISO, subcommittees (SC) are often founded under technical committees (TC) and working groups (WG) under subcommittees. In TC 204, working groups are directly under the jurisdiction of the TC. During the ten years that TC 204 has been in operation, some working groups have been suspended or integrated, and new working groups have started up, and there are now a total of 12 active working groups.





\* A new working group, \*Working Group 17, "Nomadic and mobile devices in ITS systems" was formally established at the 30<sup>th</sup> meeting of ISO/TC204 in Qingdao, China in October 2007. This new working group is led by Korea and is preparing its work programme.

\*\*Note: The official name of WG5 is "Fee and Toll Collection."

## 7.2 Current projects of the ISO technical committee and its subcommittees

### List and Description of Work Items

#### WG1 Architecture

ITS is a large-scale sector with many application areas, and a large number of people have been involved in its development and evolution over more than two decades. The sector continues to evolve and becomes more complex, yet at the same time, technology convergence is also an important factor. Therefore, it is important to establish architecture to ensure interoperability, compatibility and expandability. WG1 is preparing standards related to information and methods to be shared within the ITS sector—common use of terms, sharing of concepts, and unification of methods to describe documents and data.

WORKING GROUP 1: ARCHITECTURE		
ISO Number	Title	Contents
ISO/DIS: 14813-5	System architecture — Part 5: Requirements for architecture description in ITS standards	Specification of fundamental services, core architecture and descriptive requirements of such, to be referenced in the development and comparison of new architectures.
ISO/DIS 14813-6	System architecture — Part 6: Data Presentation in ASN.1	Specification of fundamental services, core architecture and descriptive requirements of such, to be referenced in the development and comparison of new architectures.
ISO/NP 26999	Rules and guidance for the use of Process (Functional) Orientated Methodology in ITS Standards, Data Registries and Data Dictionaries	To stipulate the rules for Process (function) Oriented Methodology for ITS Standards, data registries and dictionaries
ISO/WD 25103	Business justification for ITS Architecture	Provision of guidelines for costs, benefits and risks associated with the implementation of ITS
ISO/CD 24097	Using Web Services (machine-machine delivery) for ITS service delivery	Guidelines for the use of designed to support collaboration among internet-based systems
ISO/NP 26682	Crash and Emergency Notification Reference Architecture	Reference architecture for crash and emergency notification systems
ISO/TR 28682	World Report for ITS Standards (WRITTS)	A joint APEC-ISO study of progress to develop and deploy ITS Standards

### ITS reference model architecture (TS 14813)

System architecture is, in a sense, a conceptual design of a whole system. In establishing ITS, a large-scale and long-term system, system architecture is important to make all the people concerned share a picture of the whole system and to ensure interoperability, compatibility and expandability of the system. The ITS reference architecture has been established to serve as reference materials for architectural development in various countries and WGs in TC 204, and as a reference model for comparison of different architectures, such as the OSI layer model.

TS 14813 consists of six parts as follows. Each part is currently undergoing revision. 14813-1 was approved as a full Standard in December 2006. As this is an evolving sector, the WG will start the preparatory work for future revisions in 2008. Parts 5 and 6 have been updated and revised and at the time of this issue of the Business Plan, are passing through the voting system for consideration for adoption as full ISO Standards.. The revision of parts 2 and 3 are under consideration, and TC204 has requested that ISO make part 4, a tutorial Technical Report, freely available.

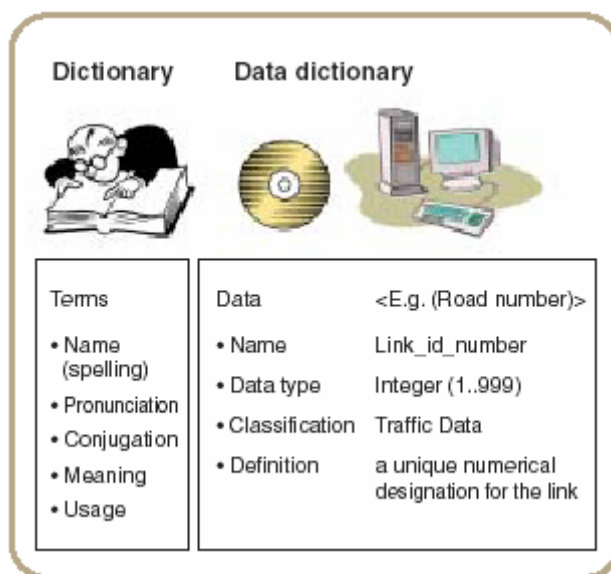
TS 14813

Part	Titles	Outline
1	Fundamental services	Definition of service classes (categories, groups)
2	Core reference architecture	Description of abstract object-oriented system architecture
3	Example elaboration	Description of a specific example of reference architecture with emphasis on traffic management
4	Reference model tutorial	Explanation of basic terms and modeling views in defining object-oriented architecture
5	Requirement for architecture description	Terms and forms to be used for documentation or reference of architecture
6	Data presentation in ASN.1	Description of ASN.1 to be used for normal syntax notation

### Requirements for ITS central data registry and data dictionaries (ISO 14817)

It is extremely important that data with the same contents have the same name and that with different contents have different names, in terms of increased efficiency and reliability of system development through common use of data.

But it is easier said than done. Data dictionaries are designed to manage definitions and expressions of data subject to common use. In the data dictionary prepared for each functional area, the mechanism that aims to register and manage interdisciplinary data used among various areas is called a data registry. In developing a new system, it is efficient to study the use of common data stored in the data registry.



ISO 14817 provides the procedures to operate an ITS data registry and covers the items required to describe the contents of registered data (including names, definitions, data types and value ranges), the procedure for management of data features and quality, and operational systems. Additionally, the registered information is required to clarify the system architecture and data models upon which the information is based in order to identify its meaning as clearly as possible. (Parallel to, and consistent with this activity, standardization of concrete specifications concerning the management and operation of data registries for Crash and Emergency Notification system is in process by WG16.5)

"User Guide for data concept harmonization", "ITS 'Use Case' pro forma template", and "Training Requirements for ITS System Architecture" have recently been approved and published as Technical Reports. A high level architecture is being prepared for Crash and Emergency notifications.

"Business case justification for ITS Architecture" is under preparation, and a new work item "Business Integration Architecture". was adopted in the spring of 2008. These deliverables are intended to bridge the gap between standards and architecture specialists, and the realities of justification, implementation and the management processes in the commercial world.

### Use of CORBA, XML, UML and web services

TC 204 uses UML and ASN.1 as standard languages to describe information models and data contents subject to standardization. In recent system implementations, CORBA and XML have been increasingly used to send and receive data between subsystems.

Furthermore, use of the web service consortium standard is increasing as the standard procedure for collaboration between web-based systems.

These languages have their own advantages and should be used in the right places, while rules for their appropriate use must be worked out in order to guarantee compatibility for the whole ITS. WG 1 is working to standardize the necessary rules and guidance when using each language in standard documents and data registries.

While the WG1 activity on description of system architecture mainly relies on object-oriented methodology, "Utilization of process-oriented methodology in ITS standard" (work item 17) newly became PWI in 2006, as it is the other systems development methodology applicable at present.

## Utilization of ITS system architecture

Architecture describing a whole picture of ITS has been formulated in such leading countries and regions as Europe, Japan and the United States, followed by the establishment of similar architecture in Australia, China, South Korea and Taiwan. In the next phase, Europe, Japan and the United States prepared standard procedures for ITS deployment, such as selection of services to be implemented, development from logical architecture to physical architecture and sharing of roles among related entities, on the basis of system architecture. However, it is not appropriate to develop a global standardized ITS architecture, because:

- a) ITS architecture evolves and develops over time, and quite rapidly
- b) Architectures vary from country to country.

The series of "user guides", the theme of much of the work of WG1, is therefore prepared to provide assistance to the development and implementation of ITS architectures and systems.

## Data Privacy and Data Protection in the ITS Sector.

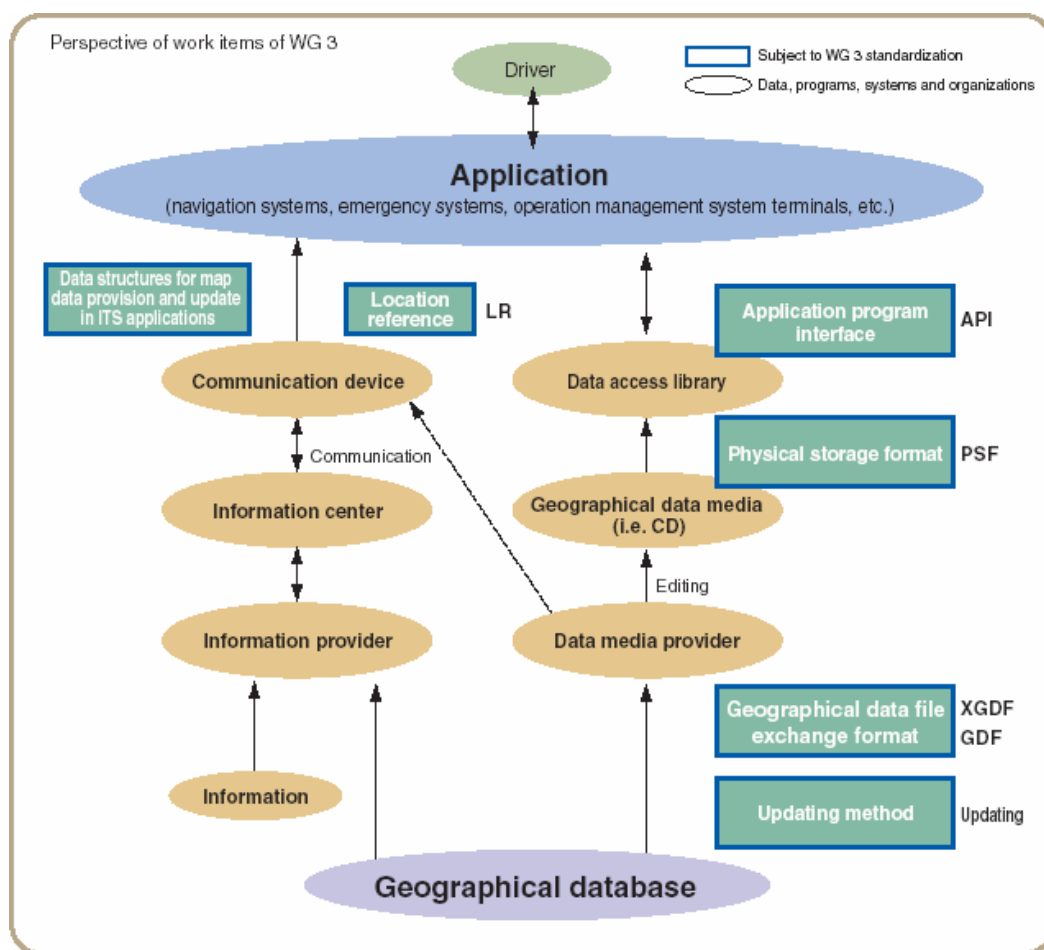
In any complex ICT sector there are always concerns about data privacy and data protection. Also there is extensive and powerful legislation around the world which seeks to regulate data management and dissemination. Designers, engineers and businesspersons in the ITS sector and in standards development concentrate their efforts on what is desirable for client systems and what is technically achievable. It is also important that this is also achieved within a framework of what is allowed by law, and what privacy rights need to be respected. A new work item "Data Privacy Aspects of ITS" was adopted in the spring of 2008 and it is hoped to quickly produce a technical report providing advice in this area. Consideration of needs for full standards in this area will be considered as a later phase.

## WG3 ITS Database Technology

Many ITS services use geographical information. In particular, geographical information is of critical importance for the ever-growing field of car navigation services. In other services, geographical information is often necessary to give information and instructions. For this reason, WG 3 is studying standard plans for interfaces to exchange geographical information, considering various situations.

WORKING GROUP 3: ITS DATABASE TECHNOLOGIES		
ISO Number	Title	Contents
ISO/WD 24099	Navigation Data Delivery Structures and Protocols	Standardization of data structures and protocols to transmit map data
ISO/DIS 17572 - 1	Location referencing for geographic databases -- Part 1: General requirements and conceptual model	Standardization of location reference in the event of information exchanges between different applications and geographical databases
ISO/DIS 17572 - 2	Location referencing for geographic databases -- Part 2: Pre-coded location references (pre-coded profile)	Standardization of location reference in the event of information exchanges between different applications and geographical databases
ISO/DIS 17572 - 3	Location referencing for geographic databases -- Part 3: Dynamic location references (dynamic profile)	Standardization of location reference in the event of information exchanges between different applications and geographical databases
ISO/CD 17267	Navigation System API Standard ( API )	Standardization of the application program interface (API) for navigation and other location-based services targeted at transportation and mobile applications.
ISO/WD 22953	Extended Geographical Data Files (XGDF)	Extended and updated version of Geographical Data Files

\* As of May 2008, XGDF has been temporarily removed from the list of TC204 active projects, but it is anticipated that this work item will be restored to active status in the fall of 2008.



### Geographic data files (ISO 14825) and extended geographic data files (WD 22953)

This is the standard for exchange of data from geographical databases serving as the basis for map data used for navigation.

As the file is not used directly for navigation, emphasis is placed on ease of editing—genre-by-genre compilation of data—rather than compactness and speed in comparison with physical storage. In other words, emphasis is given to the production side. Regarding XGDF, however, consideration will also be given to methods for providing information.

As for GDF, work was implemented in consideration of the Japan digital road map database standard and others, on the basis of CEN-GDF studied in Europe. Thanks to the preceding work for standardization by CEN, work proceeded relatively smoothly compared with other items, and GDF was announced as ISO 14825 in February 2004.

The entire volume of GDF is huge. As discussions went on, new ideas were proposed, requiring a lot of time to complete drafts. However, work went smoothly compared with other items. In the wake of the completion of the WG drafts, a proposal to begin studying the next standard was launched immediately, and a new PWI was approved at the TC 204 conference in November 2000. The purpose was to revise the current GDF and accommodate the latest developments in information exchange, such as the internet. The work entered the NP phase in August 2004 after compiling requests for improvement.

Discussions on XGDF got underway with themes on required performance and models. As of May 2008, XGDF has been temporarily removed from the list of TC204 active projects, but it is anticipated that this work item will be restored to active status in the fall of 2008.

Japan for its part has made a proposal based on KIWI+\*, a new standard of Japan. KIWI+ has evolved from KIWI, which has been widely used in Japan and served as a basis for the proposed physical storage. After appropriate consultation with TC 211, which handles geographical information on a comprehensive basis, TC 211 decided to adopt UML for the concept model. The latest model has been circulated in TC 211 for hearing.

### **Location Referencing (LR, DIS 17572)**

This is subject to methods for location referencing when information is exchanged between different applications and geographical databases. It is designed to find out location on a different map databases when traffic information is exchanged between systems.

Initially, it was decided that a method based on coordinate systems and road descriptors would be adopted as options, pending the results of demonstration experiments in Europe and the United States. However, activities in this field were stalled for some time because the results were not readily available.

During the stalemate, the need for standardization of general-purpose LR grew sharply as the information community moved rapidly toward standardization. Therefore, WG 3 decided to stop insisting only on the coordinate system and road descriptor, and to aim at establishment of a more comprehensive standard. In 2000, WG 3 launched discussions on drafts for two methods: Profile 1 (Pre-Coded Location References: a referencing method assuming common pre-coded location tables like VICS or TMC), and Profile 2 (Dynamic Location References: a method which varies in real-time. DIS was approved in February 2008. FDIS voting is currently under preparation. Profile 2 evolved from the European proposal (AGORA-C) and incorporated the Japan proposed method of using coordinates.

### **Items where agreement was not reached for standardization**

Discussions on drafts for Physical Storage (NP 14826), API Standard (NP 17267) and Updating (NP 17517) were delayed, and work on these items had to be finished in compliance with the new ISO rules.

As for NP 14826, NP has been proposed and approved to register agreements on standardization as official documents, and resulted in TS 20452 that was approved in April 2005. A new PWI was approved for NP 17267 in October 2003, and CD was approved in October 2007. DIS voting is currently under preparation. Interfacing with priority more on the applications side than previously thought is considered.

### **New proposals (Navigation Data Delivery Structures and Protocols, WD 24099)**

Under recent discussion are the updating of map data and the transmission of map data in some cases, if a need arises, in the navigation field. Japan proposed studying data structures to address these ideas, and NP was approved at the TC conference in April 2006.

### **WG4 Automatic Vehicle Identification/Automatic Equipment Identification**

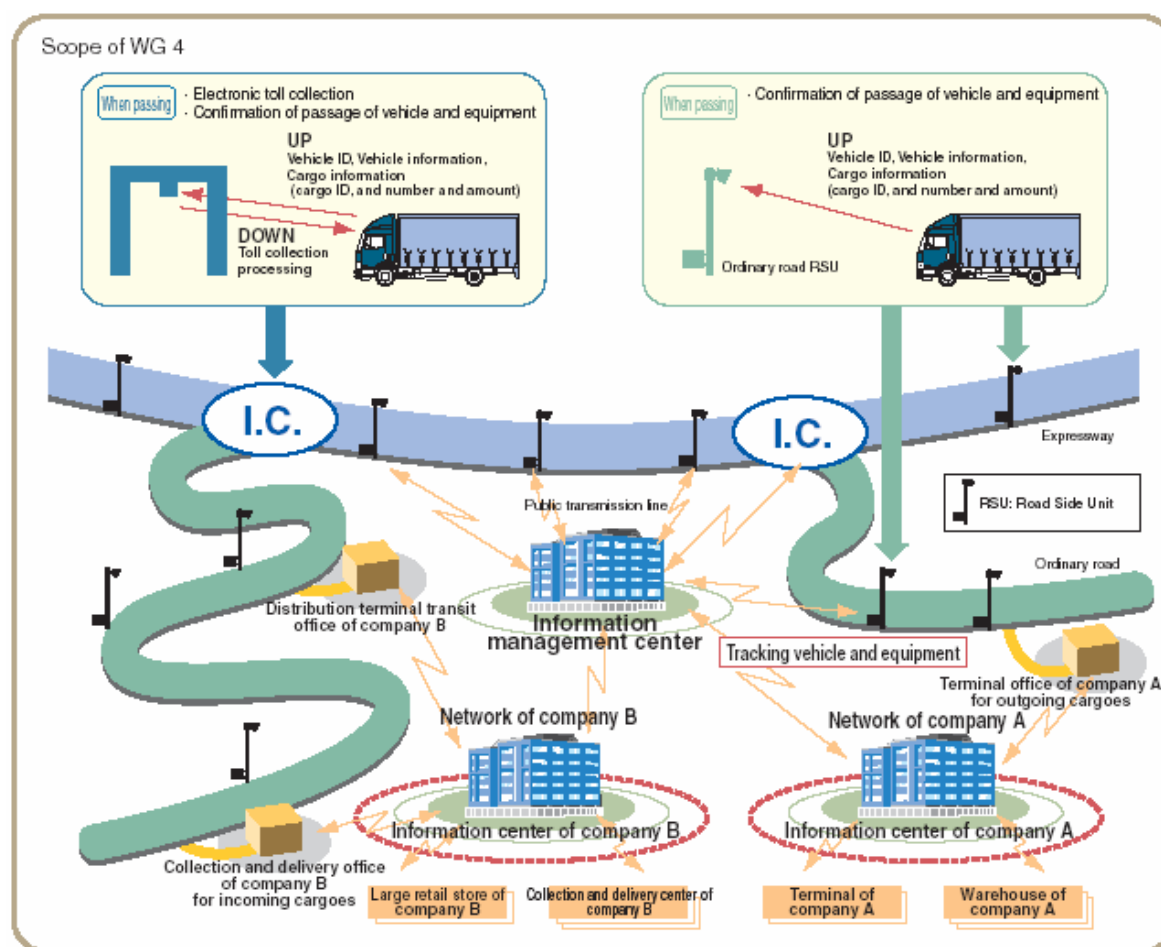
WG 4 is in charge of standardization of items necessary for interoperability between systems regarding AVI/AEI, an automatic identification system for vehicles and equipment through such



simple media as tags. First, it discussed standardization themes on surface transportation like trucks, and then added an intermodal AVI/AEI system as a theme.

Initially, WG 4 did not discuss standardization based on specific applications. In 2001, however, deliberations began on ERI (Electronic Registration Identification) standards as an AVI/AEI applied system designed for environment protection in the wake of a proposal from CEN. ISO designated this as an official discussion item. In 2007, Basic ERI has approved at FDIS vote and Fully secured ERI part 1 through 5 are now on TS stage and going on to DIS vote stage within this year.

WORKING GROUP 4: AUTOMATIC VEHICLE/EQUIPMENT IDENTIFICATION		
ISO Number	Title	Contents
ISO/NP 17264	Road transport and traffic telematics -- Automatic vehicle and equipment identification -- Interfaces	Standardization of interface specifications of intermodal AEI systems
ISO/NP 24534-1	Automatic vehicle and equipment identification -- Electronic Registration Identification (ERI) for vehicles -- Part 1: Architecture	Standardization of a system where roadside equipment reads vehicle data electronically registered using on-board equipment
ISO/NP 24534-2	Automatic vehicle and equipment identification -- Electronic Registration Identification (ERI) for vehicles -- Part 2: Operational requirements	Standardization of a system where roadside equipment reads vehicle data electronically registered using on-board equipment
ISO/NP 24534-3	Automatic vehicle and equipment identification -- Electronic Registration Identification (ERI) for vehicles -- Part 3: Vehicle data	Standardization of a system where roadside equipment reads vehicle data electronically registered using on-board equipment
ISO/NP 24534-4	Automatic vehicle and equipment identification -- Electronic Registration Identification (ERI) for vehicles -- Part 4: Secure communications using asymmetrical techniques	Standardization of a system where roadside equipment reads vehicle data electronically registered using on-board equipment



## Numbering and data structure for AVI/AEI system (ISO 14816)

With the purpose of ensuring reciprocal compatibility of the system for automatic identification of moving vehicles and equipment, this standard defines the minimum data item requirements for AVI/AEI as well as the standard concerning the description method for this data. The minimum data is shown in Table 1. However, it is not anticipated that all of the minimum data items are to be transmitted. Instead, the system operator will select and use only the necessary items among these minimum data items. ASN.1, which was standardized on the basis of ISO numbers 8824 and 8825, is employed for the data description method. Table 2 shows the concepts of the ASN.1 data description structures. Employing this standard will give each country the expandability to use its exclusive data.

Coding structure identifier number	TC 204 coding structure
0	Reserved for CEN/ISO
1	AVI/AEI for use in TC 204 applications
2	TC 204 manufacturer serial number
3	TC 204 validity limitation (time and place)
4	Licence plate
5	Vehicle (VIN) chassis number
6	Reserved for CEN/ISO
7	Freight container numbering
8	Tax authority code
9	Reserved for CEN/ISO
...	...
30	Reserved for CEN/ISO
31	Reserved for CEN/ISO (extension)

Note: The system operator can select or add the necessary CSI.

ASN.1 Data Structures				
Object identifier	Length	Coding scheme identifier	Length	Data element
iso (1) standard (0) iso 14816 (14816)				
iso (1) <ul style="list-style-type: none"> <li>standard (0)</li> <li>registration-authority (1)</li> <li>member-body (2)</li> <li>identified-organization (3)</li> </ul> ISO direct subordinate object identifier		CSI 1		RTTT AVI/AEI application
		CSI 2		
		CSI 3		
		.		
		CSI 31		

## Electronic Registration Identification (ERI)

Under ERI, roadside equipment communicates with on-board equipment for electronic vehicle identification. Two kinds of standards are being established: ERI for complex operation, and ERI for relatively simple identification. Originally, CEN made a proposal to ISO/TC 204/WG 4 for technical measures to Directive 2000/53/EC of the European Commission and to "end of life" (a management program from manufacture to disposal of vehicles for environment protection) of September 2000. In June 2003, the proposal was approved as an official work item at a plenary session of ISO/TC 204.

The scopes of ERI systems are (1) to give a unique identification number to each vehicle, (2) to make it possible to choose the performance of on-board equipment through ERI application systems, and (3) to guarantee minimum compatibility between on-board and roadside equipment. Discussions on standards have been taken place, the subject being divided into two, Basic ERI using simple RF tags and Fully ERI including data coding and the like. As for Basic ERI, it was determined to make the IS which will be announced soon. As for Fully ERI, TS was approved at the TC 204 plenary meeting in October 2006 on five parts, including a proposal from Japan. In establishing this standard, ERTICO began to conduct questionnaires on the operation of ERI systems in February 2003 under a request from the EC. The questionnaires were carried out to reflect the results in international standards, and the reports were published. In the report, areas for possible applications of ERI systems are: (1) anti-theft vehicles, (2) access control, (3) road pricing, (4) vehicle registration, (5) vehicle tax management, (6) traffic flow control, (7) traffic rules and their observance, (8) environment protection from manufacturing to disposal of vehicles, and (9) hazardous material management.

## Liaison activities of TC 204/WG 4

TC 204/WG 4 has a liaison relationship with ISO/IEC JTC 1 SC 31/WG 4 (Standardization for automatic identification and data acquisition technology/RFID) both internationally and domestically. TC 204/WG 4 is deliberating on specifications designed to maintain interoperability



between AVI/AEI systems, and on system architecture, data structure and standards for international registration for data exchange regarding ERI systems as an application area of AVI. In the meantime, SC 31/WG 4 is discussing RF tags and standards for compatibility between RF tags and roadside equipment. In other words, the areas handled by TC 204 include applications using RF tags or roadside equipment corresponding to RF tags, which are defined by SC 31/WG 4, and TC 204/WG 4 is leading applications of AVI/AEI systems. In this fiscal year, harmonization amongst WG's has been taken place including the additional proposal of the Intermodal AEI system related standards from TS 17261 to TS 17264 which were developed at WG 4, in partnership with WG 7 on data structure to facilitate the movement of freight and its intermodal transfer being studied by them.

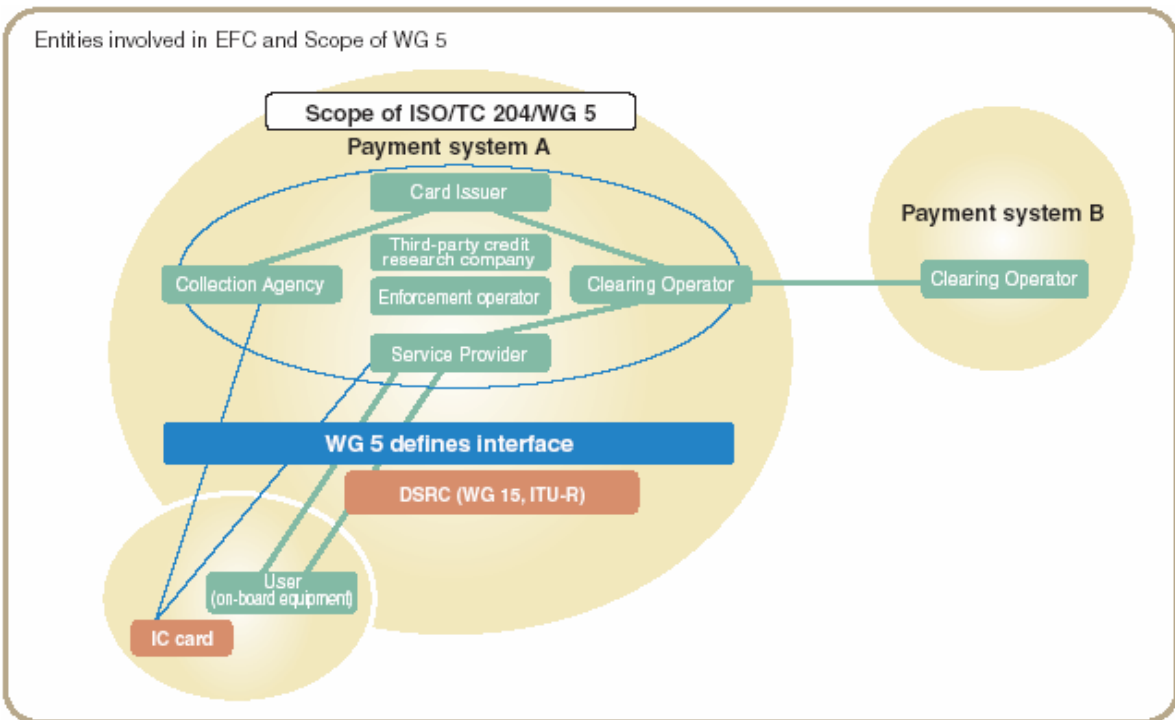
### WG5 Electronic Fee and Toll Collection

WG 5 is working on standardizing Electronic Fee Collection (EFC: term defined by TC 204) including ETC and other fee collections, to cover the entire field of charging and settlement of tolls for roads, fees for parking lots and ferries, and the like. Emphasis has been placed mainly on Electronic Toll Collection (ETC). Communication between vehicles and roadside equipment is implemented through DSRC (Dedicated Short Range Communication) or GNSS/CN (Global Navigation Satellite Systems/Cellular Network) using GNSS and cellular networks.

WORKING GROUP 5: ELECTRONIC FEE COLLECTION		
ISO Number	Title	Contents
ISO/DTS25110	Electronic Fee Collection (EFC): Interface definition for on-board account using ICC	Specification of interfaces between roadside equipment and on-board equipment using IC cards that enable reading and writing of EFC information and account information on IC cards
ISO/DTS17573	System architecture for vehicle related tolling	Definition of reference architecture for the entire EFC system and the prescription of frameworks of various EFC-related conditions
ISO/AWI 17575 (Parts 1-4)	Application Interface Definition for CN/GNSS based EFC	Description of data structure, commands, etc., to insure the interoperability of EFC applications using Global Satellite Navigation Systems and Cellular Networks (GNSS/CN)
ISO/PWI	Compliance checking of GNSS/CN systems over DSRC	Specification for compliance of GNSS/CN using dedicated short range communications (DSRC)
ISO/PWI 14906	Application interface definition for dedicated short-range communication (DSRC) (Revision of ISO/14906: 2004)	System to enable interoperability between EFC systems on an EFC-DSRC application interface level
ISO/PWI 14907	Test procedures for user and fixed equipment – Part 2: Conformance test for the onboard unit application interface (Revision of ISO/TS 14907: 2006)	Specification to enable groups of operators to determine common specific performance levels and operating conditions, and to enable regional variation where appropriate for EFC using standardised dedicated short-range communications (DSRC)
ISO/PWI 17574	Guidelines for EFC security protection profiles (Revision of ISO/TS 17474: 2004)	Project description unavailable

### Entire structure of EFC and scope of WG 5

EFC-related entities include Users, Card Issuers, Service Providers, Clearing Operators, and Collection Agents with the relationship shown in the figure below. WG 5 is working on standardization of the EFC application interface (data elements and command definition, etc.) both for DSRC and GNSS/CN, which are means of communication between Service Providers and Users, and of the test procedures and data security. ISO TC 204 WG 15, CEN TC 278 WG9 and ITU-R SG 8 are working on standardization of DSRC.



### WG7 General Fleet Management and Commercial/Freight Operations

Initially, WG 6 (General Fleet Management) and WG 7 (Commercial/ Freight) carried out work on standardization separately. In November 1999, WG 6 and WG 7 were integrated at a meeting in Montreal into a new WG 7. At this meeting, approval was also given to launch work on standardization for a new item related to the transportation of hazardous materials. The new item was proposed by Canada at the preceding meeting in Amsterdam in June 1999.

WORKING GROUP 7: GENERAL FLEET MANAGEMENT AND COMMERCIAL/FREIGHT OPERATIONS		
ISO Number	Title	Contents
ISO/NP 24533	Data dictionary and message set to facilitate the movement of freight and its intermodal transfer -- Road transport information exchanges	Definition of data dictionary and message sets necessary for monitoring functions to manage all processes in international freight transport, specifically focusing on international air cargo movement using various intermodal freight transport methods
ISO/PWI 26683	Freight conveyance content identification and communication architecture -- Application profile	Definition of cargo information transfer architecture and data structure (utilizing RFID) that combines existing international standards to enable visualization of cargo using integrated international transportation

### SWG 7.1 Standardization of Data Dictionary and Message Sets for Electronic Identification and Monitoring of Hazardous Materials/Dangerous Goods Transportations

Subject to this standardization are the data dictionary and message sets for supporting exchange of information on hazardous materials, and automatic identification and monitoring. This standard can possibly be applied to various forms of communication media, such as DSRC and cellular phones.

Cited below are the effects of standardization.

1. Real-time information collection (identification of vehicles, information on hazardous materials)
2. Support for cooperation between control center operator and emergency responders on site (police, fire fighters, etc) when an accident occurs during hazardous material transport
3. Monitoring of physical conditions (temperature and pressure, etc.) during hazardous material transport

In Europe and the United States, intermodal transport involving ships, railways and trucks is common in hazardous material transport. These standardization items are considered effective for one-stop services at borders.

## **SWG 7.2 Standardization of Data Dictionary and Message Set to Facilitate the Movement of Freight and its Intermodal Transfer - Road Transport Information Exchanges**

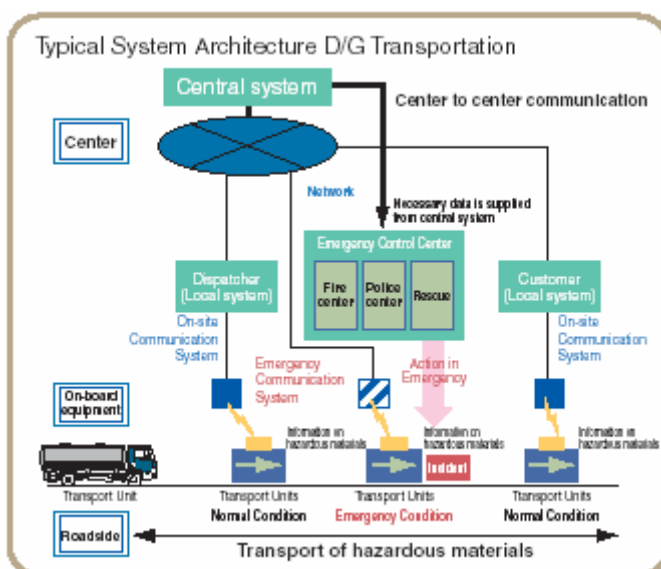
### **SWG 7.3 Freight Conveyance Content Identification and Communication Architecture-Application Profile and Security Profile**

The purpose of this standardization is to create a standard independent from modes of transport or individual systems, by systematically arranging information exchanged amongst a consignor and multiple transport organizations for international integrated transportation. Standardization of SWG7.2 and that of SWG7.3 are closely related.

SWG7.2 defines “data dictionary” and “message sets” both of which are necessary for exchange. Specifically, it involves standardization of data elements used for electronic data interchange (EDI) and messages (clusters of data elements) necessary in supply chains.

SWG7.3 standardizes on architecture and data structure, assuming specific situations in the international integrated transportation where “data dictionary” and/or “message sets” are utilized. Door-to-door transport requires international integrated transport involving trucks, railways, ships and airplanes. A different EDI is used for each transport organization. It will take a great deal of time and effort to unify data standards that differ according to each country and organization, and to introduce rules for standard information exchange. For the time being, standardization work is limited to air cargoes and study is being made on an Electronic Supply Chain Manifest (ESCM) to be exchanged among airports and airlines, and on procedures for exchange of information. The study is also designed to realize traceability of door-to-door cargoes, while pursuing compatibility with existing data exchange rules and systems for data exchange.

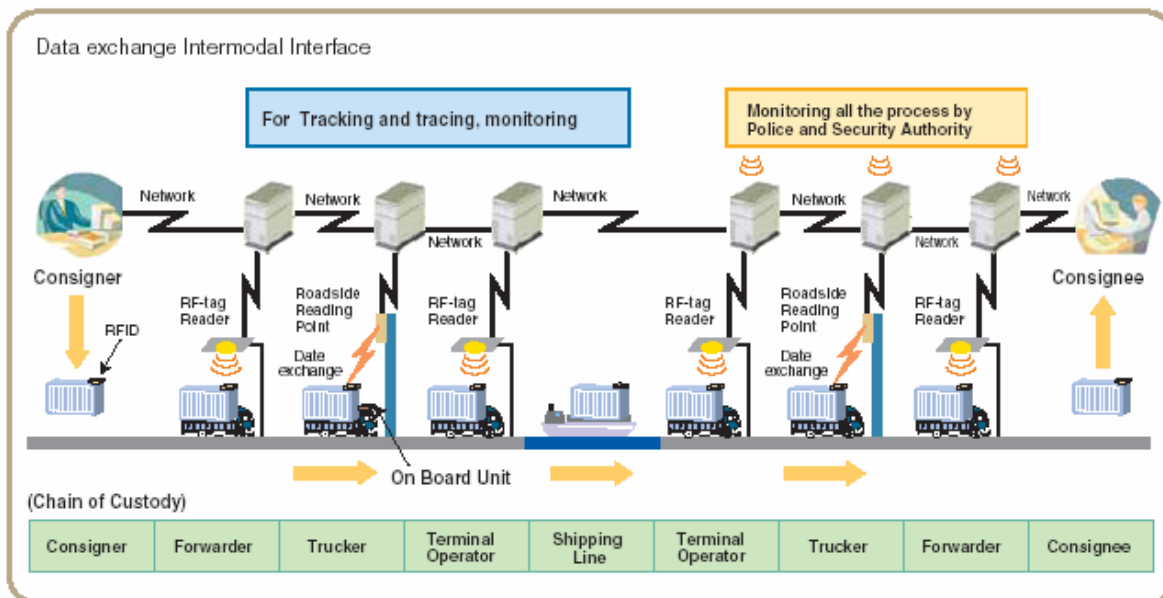
Developed so far under SWG7.2 have been four messages – registration of cargo data, changes in carriers, update of cargo data and conclusion of transport – and 62 data elements. At the Paris



meeting in April 2005, Japan also suggested the necessity of a system architecture utilizing RFID in order to facilitate the use of message sets (CD 24533) in the management of international integrated transportation. Subsequently at the Portland meeting in November 2005, Japan proposed standardization of the data transfer architecture for cargo and specialization of cargo transport information, and the proposal was approved as PWI. It has been positioned as SWG7.3 at Busan meeting in South Korea.

Proposals for RFID and architectures utilizing RFID are being investigated by ISO TC 204 WG 4 (Automatic vehicle identification/Automatic equipment identification), ISO/IEC JTC1 SC31 (standardization concerning automatic identification and data acquisition technology) and ISO TC 122/104 JWG (joint working group for containers and packing) among others.

This standardization is designed to utilize these existing standards, and as an ISO standard to develop a profile of an application and security with the use of RFID to enable cargo management in international integrated transportation. This standard is considered as a way to dramatically improve the security and efficiency of international integrated transportation. This standardization work has been promoted in cooperation with UN/CEFACT (UN/Center for Trade Facilitation and Electronic Business), WCO (World Customs Organization), IMO (International Maritime Organization), other technical committees of ISO (containers and packing), IATA (International Air Transport Association), and SMDC (User Group for Shipping Lines and Container Terminals).



## WG8 Public Transport and Emergency Services

WG 8 is working on standardization of information related to public transport. Public transport includes buses, trains and trams.

Ongoing standardization items include "Interoperable Fare Management System (IFMS)", which is being studied under the leadership of CEN and "Data Dictionary and Message Sets for Preemption and Prioritization Signal Systems for Emergency and Public Vehicles (PRESTO)" proposed by Japan.

WORKING GROUP 8: PUBLIC TRANSPORT AND EMERGENCY		
ISO Number	Title	Contents
ISO/FDIS 22951	Data Dictionary and Message Sets for Pre-emption and Prioritization Signal Systems for Emergency and Public Transport Vehicles (PRESTO)	Standardization of data dictionary and message sets for traffic signal pre-emption and prioritization for emergency and public transport vehicles
ISO/NP 24014-2	Interoperable fare management system — Part 2: Recommended Business Practices for Set of Rules	This Technical Report (TR) provides a guidance for the interested parties who want to cooperate and implement an Interoperable Fare Management System (IFMS) compliant with the Part 1 of IFMSA(ISO 24014).

## Importance of Public Transport

The reason why WG 8 has adopted public transport as an important standardization theme is that excessive dependence on automobiles for passenger and cargo transport is causing serious harm to our society and lives, and damages sustainability. To reduce the dependence on automobiles, it is necessary to increase the density of cities and make cities compact, and then to change transport modes from automobiles to foot, bicycles and public transport. However, automobiles provide door-to-door transport and comfort, and direct costs borne by drivers is considered generally lower than that of public transport.

It is effective to enhance the attractiveness of public transport in order to promote a shift to public transport. Toward that end, information has an extremely important role to play.

Progress in information technology has made it possible for people to get information on routes, transfers, operations, travel and fees of public transport before and during traveling, and to choose an optimum route. In order to dramatically enhance the attractiveness of public transport, it is of course necessary not only to apply advanced information technology but also to implement measures systematically and comprehensively, such as the removal of physical barriers during transfers, inexpensive and easy-to-understand fares as well as simple payment methods, and land use that gives priority to the convenience of users of public transport.

The working group is also working on three white papers:

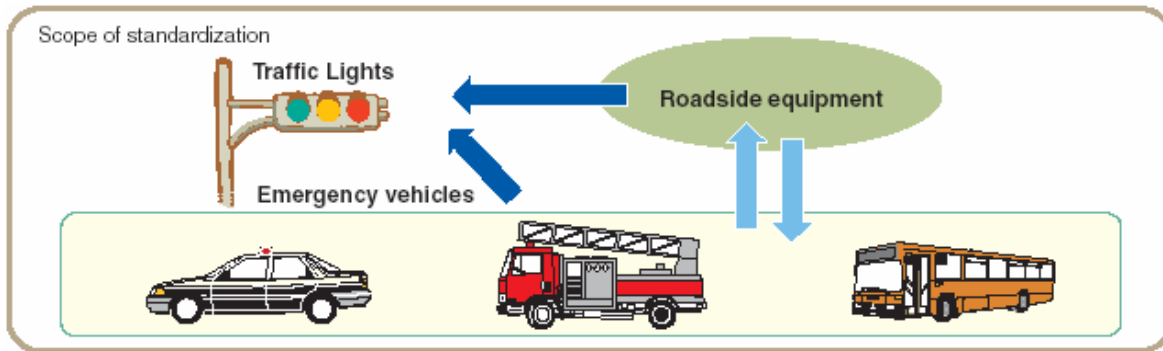
- Banking and Fare Management
- Security in Public Transport
- Public Transport for the World Traveler

## Data Dictionary and Message Sets for Pre-emption and Prioritization Signal Systems for Emergency and Public Vehicles: PRESTO (FDIS 22951)

PRESTO is designed to exchange data efficiently for traffic signal preemption and prioritization so that such public transport vehicles as emergency vehicles, buses and trams can pass intersections preferentially over other vehicles. Data is in principle exchanged between vehicles and roadside equipment. The standardization scope includes data dictionaries and message sets in wireless communication fields.

Specifically, traffic signals are controlled (by prolonging green lights or shortening red lights) on the basis of information on the location of emergency vehicles, running speed, destination and the direction of travel at an intersection so that emergency vehicles can pass an intersection quickly.

At the same time, passage of emergency vehicles is informed to other vehicles and pedestrians to prevent collision. Signal control is the work item subject to standardization for the time being. 22951 unanimously passed DIS ballot in October 2007 and its publication is anticipated by June 2008.



## Public Transport-Interoperable Fare Management System: IFMS (ISO/IS 24014-1 & ISO/NP 24014-2 )

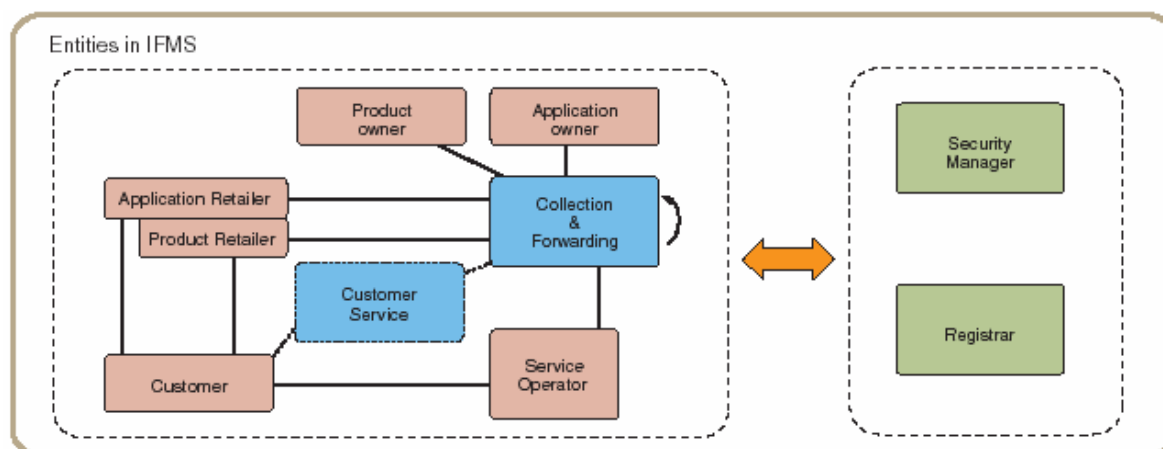
Interoperable fare management systems (IFMS) encompass all systems and processes designed to manage the distribution and use of fare products in an interoperable public transport environment.

Such systems are called interoperable when they enable the customer to use a portable electronic medium (e.g. a contact/contactless smart card) with compatible equipment (e.g. at stops, with retail systems, at platform entry points or on board vehicles). IFMS concepts can also be applied to fare management systems not using electronic media.

The overall architecture is the subject of this part one of IFM, ISO 24014-1, which recognizes the need for legal and commercial agreements between members of an IFM, but does not specify their form.

In Europe, CEN/TC 278/WG 3 is leading the standardization of the system. In view of the social significance of IFMS, WG 8 decided to standardize IFMS in cooperation with CEN, with the project being approved as a preliminary work item (PWI) in October 2003 and was subsequently published as an international standard (IS) in late 2007.

Part 2, 24014-2 is a technical report (TR) which provides a guidance for the interested parties who want to cooperate and implement an Interoperable Fare Management System (IFMS) compliant with Part 1. 24014-2 was approved as an NP in October 2007 and is currently under development with an anticipated committee draft (CD) vote anticipated in late 2008.



## WG9 Integrated Transport Information, Management and Control

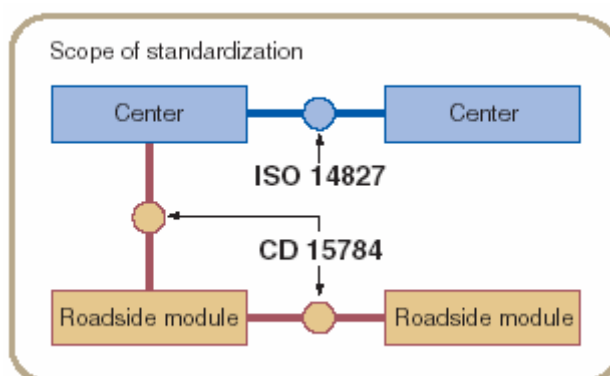


Subject to study by WG 9 is working on standardization for traffic management (transport information and control, etc.). Specifically, it is working on the systematization of information and standardization of communication systems in order to exchange data efficiently between traffic management centers, centers and roadside modules, and between roadside modules themselves, and to provide information for outside organizations.

WORKING GROUP 9: INTEGRATED TRANSPORT INFORMATION, MANAGEMENT AND CONTROL		
ISO Number	Title	Contents
ISO/AWI 10711	Interface Protocol and Message Set Definition between Traffic Signal Controllers and Detectors (IPMSTSCD)	Standardization of message sets that contain data collection and control protocols for three different types
ISO/DIS 15784 - 1	Data exchange Involving Roadside Module Communication - Part 1 General principles and documentation framework of application	Application profiles and framework for documentation for communication between ITS systems
ISO/DIS 15784 - 3	Transport Information and Control Systems - Data exchange Involving Roadside Module Communication - Part 3 Application Profile - DATEX	Application profile based on DATEX-ASN (ISO 14827) for communications between ITS centers and roadside modules
ISO/DTR 21707	Quality of Input Data for Intelligent Transport Systems	Definition of data quality for ITS

## Activities

The scope (inter-centers, centers and roadside modules, inter-roadside modules) of standardization that WG 9 is working on is shown in the figure. Centers refer to transport management centers. Roadside modules refer to signal control devices, information boards and sensors installed on the roadside.



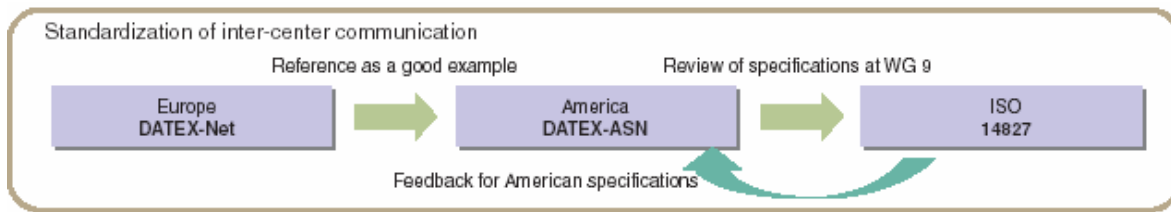
One of the advantages for promoting standardization of information and communication between centers, and centers and roadside modules is inter-connectivity. It will be easy for module procurers to purchase modules from multi-vendors, while it will be possible for module suppliers to reduce development burdens and risks.

## Standardization for communication between centers (ISO 14827)

Communication between centers means communication between traffic management centers. Under this communication, information that a transport management center collects is exchanged with a neighboring center to make possible implementation of extensive transport management. WG 9 has stipulated definition forms of messages and protocol for exchange of messages when information is exchanged between centers.

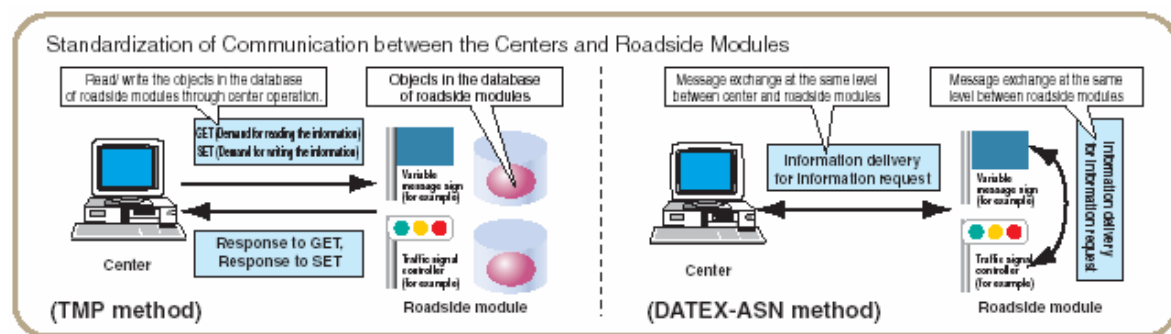
Definition forms of messages refer to what should be described when a message is defined. For example, the name of a message, a text and a form (data type). This standard specifies a communication protocol called DATEX-ASN for information exchange. DATEX-ASN is a protocol developed in the United States for inter-center communication in the ITS domain. This protocol is based on DATEX-Net (a standard protocol for inter-center communication in Europe), which is considered to satisfy various requirements for inter-center communication in the ITS domain and adopts ASN.1 as a description language, which is the standard notation method in TC 204. Therefore, DATEXASN conforms to international standards.

This standard was approved in FDIS ballot, and published as an ISO standard (November 2005).



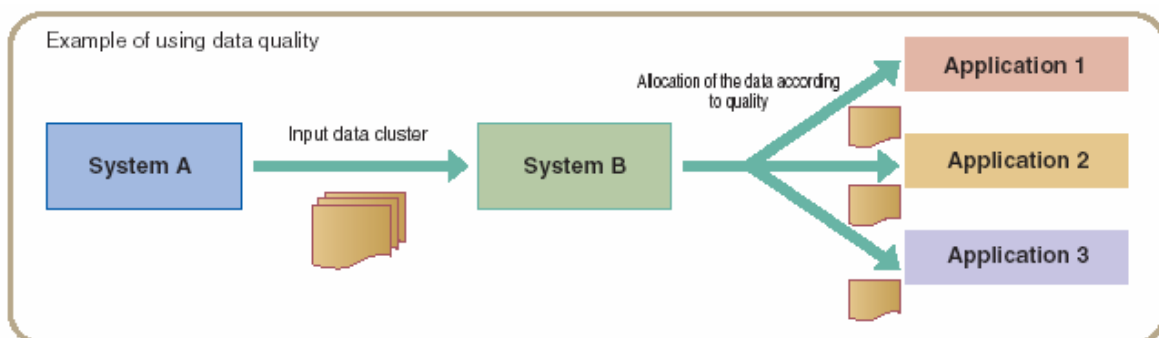
### Standardization of communication between centers and roadside modules (DIS 15784 Parts 1 & 3)

Communication between centers and roadside modules means exchange of information between central modules of a transport management center and modules installed on the roadside and between these roadside modules. WG 9 plans to prescribe this communication in the form of an application profile. This application profile designates a set of base standards regarding three upper layers of OSI to meet the requirements of communication between a center and roadside modules and prescribes how to use base standards. Designated under the initial version will be Transportation Management Protocols (TMP), a part of the National Transportation Communication for ITS Protocol (NTCIP). It is a communication standard for the ITS range in the United States, and DATEX-ASN of ISO 14827, an international standard for communication between transport management centers. How to use them will also be stipulated.



### Data Quality in ITS Systems (DTR 21707)

This standard specifies the format for defining the quality of quantitative data being exchanged between systems (including users) in a transport information application. In recent years, many users have wished to allocate obtained data to their own system. This is not possible unless the quality of the data is specified. The standard is intended to define the standard for 10 items, including accuracy, reliability and timeliness, regarding transport information. For this proposal, the United Kingdom plays the leading role, revising the materials. It was determined to go TR voting (as of November 2006).





## **Communications interface protocol between traffic controllers and data collection devices (NP10711)**

This work item was proposed as a PWI from Korea at the Cape Town conference in October 2006. It was subsequently approved as an NP after the required number of countries identified their willingness to help during the Qingdao meeting in October 2007.

In light of the background that “wireless communication between roadside modules” to reduce construction costs and/or keeping better appearance is in progress, this item was proposed under the scope of standardizing “Wireless interface protocol between vehicle detectors and traffic signal controllers.”

The scope has been clarified by Korea and work continues by WG9 on this proposed standard with comments from a number of member countries. Note that an opinion from Japan has been submitted that the standardization of the physical layer of wireless communication should be outside of TC 204/WG 9's work domain.

## **WG10 Traveller Information Systems**

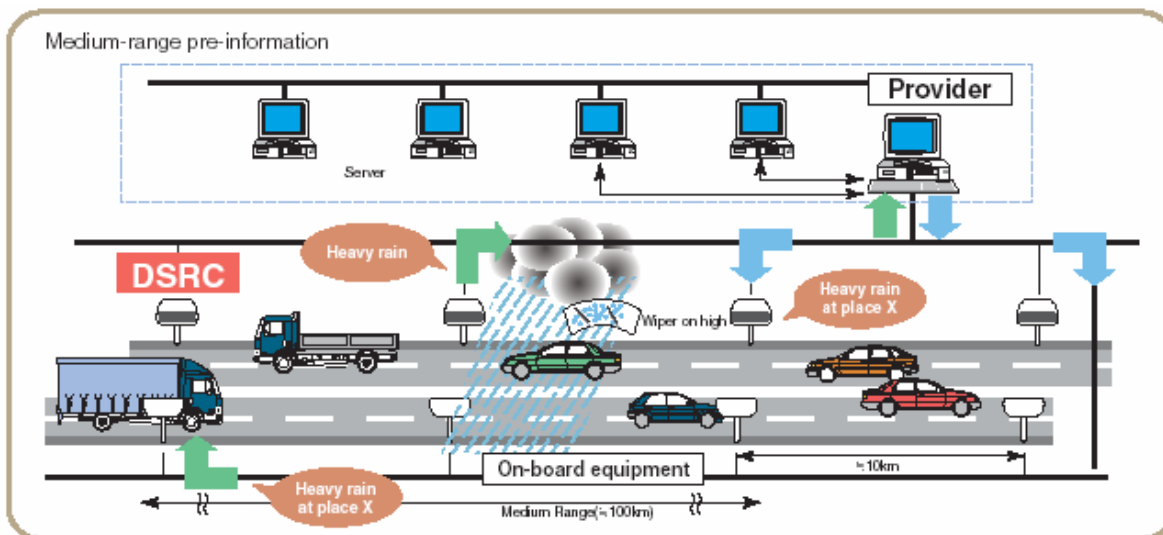
Traveller information systems, subject to standardization by WG 10, constitute a core part of ITS. This working group has work items designed to study data dictionaries and message sets to provide information for drivers through various media, such as FM broadcasting, DSRC, cellular phones and digital broadcasting.

Recently, many activities have been seen in integration of user services led by North America and Japan, and XML standardization of TPEG (Transport Protocol Expert Group) led by Japan.

<b>WORKING GROUP 10: TRAVELLER INFORMATION SYSTEMS</b>		
<b>ISO Number</b>	<b>Title</b>	<b>Contents</b>
ISO/NP 18234 (Parts 7-10)	Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams	Standardization of Transport Protocol Expert Group (TPEG) through digital broadcasting
ISO/NP 24530 (Parts 5-7)	Traffic and Traveller Information (TTI) -- TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML)	Standardization of Transport Protocol Expert Group (TPEG) for XML
ISO/DTS 14823	Traffic and travel information -- Messages via media independent stationary dissemination systems -- Graphic data dictionary for pre-trip and in-trip information dissemination systems	Specification of pictogram data diction codes

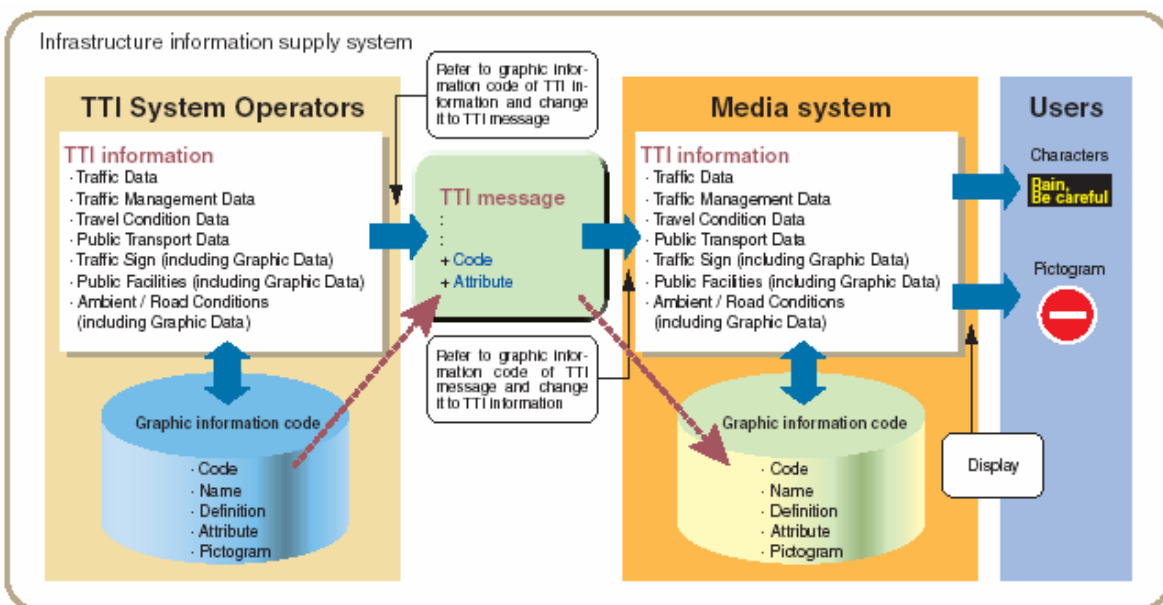
## **Medium-Range Pre-Information (CD 14822)**

This work item is designed to study standardization of medium-range pre-information (MRPI) using DSRC. Standardization plans have been submitted on the basis of demonstration tests in Europe for downlink of information on rain and accidents from DSRC installed on expressways and for uplink of wiper operation information to DSRC. The Japanese working group suggested that the draft should include a statement in the scope to the effect that Application Identification (AID) standardized in ISO15628 is international standardization of the service equivalent to 8 (Traffic information service), which was accepted.



### Infrastructure Information Supply System (CD 14823)

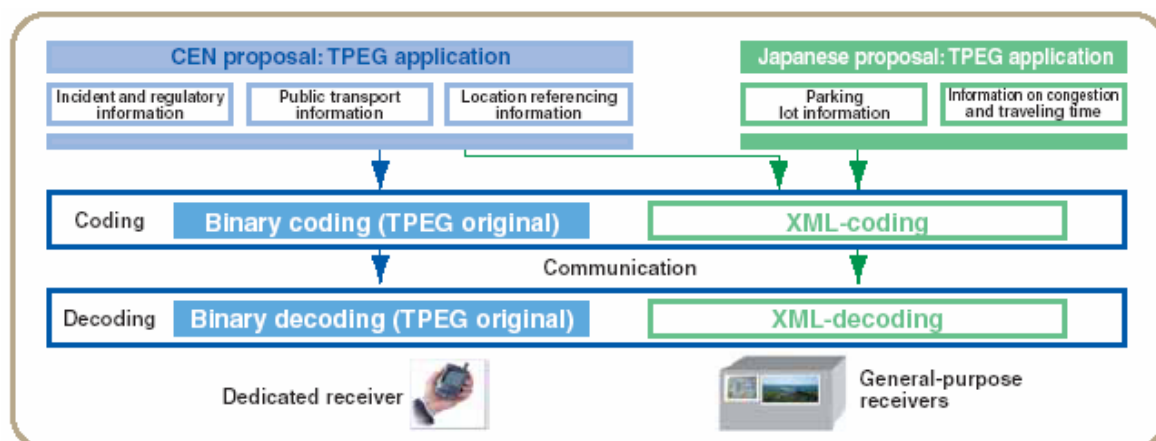
This work item involves the standardization of a graphic data dictionary (GDD) of pictograms including signs for road transport guidance and designs. This is intended to display pictograms corresponding to GDD codes on variable information boards and on-board equipment through transmission. As pictograms vary from country to country, only codes signified by the pictograms, not the actual pictograms or designs, are subject to standardization. Japan is taking the leadership by becoming a convener, and standardization work is in progress under the leadership of CEN.



### TTI Messages Using Broadcasting-Type Digital Media (TS/NP 18234-1 to 10, NP 24530-2, -7)

TPEG is a standardization plan regarding a transport information supply system using high-speed digital data broadcasting, which is proposed by CEN TC 278 WG 4 SWG 4.7 (hereinafter referred to as CEN). The next-generation TPEG business team submitted two standardization plans for parking lot information, and for information on congestion and traveling time as TPEG applications from ISO TC 204 WG 10. In September 2002, PWI was approved at a general meeting of ISO TC 204. Almost all the comment circulation of WD on parking lot information has been completed, and now the plan is waiting for TS voting. Discussions have been launched on

information on congestion and traveling time, and Japan is promoting study mainly on link methods.

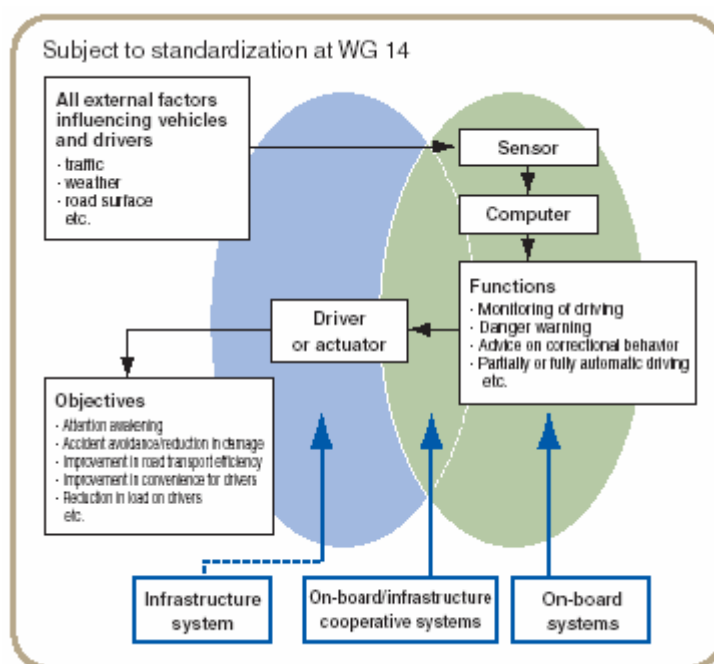


## WG14 Vehicle/ Roadway Warning and Control Systems

### Activities of WG 14

“Driver support systems control” means control technology on vehicles directly linked to drivers, and forms a central part of ITS. The purpose of this area is to reduce driver workload, improve convenience, and arouse awareness of dangers, as well as to avoid accidents and decrease damage by the use of advanced technologies. Examples of systems already on the market include adaptive cruise control (ACC) and forward vehicle collision warning. Subject to standardization are contents regarding “vehicle/roadway warning and control systems” with a view to international uniformity of systems. Specifically, the work covers wide-ranging areas from vehicle control, sensing of and communications with external information and interface with drivers.

WG 14 is chaired by Japan. With its work going smoothly, WG 14 is widely recognized as one of the most active groups in ISO/TC 204 with a large number of participating countries.



WORKING GROUP 14: VEHICLE/ROADWAY WARNING AND CONTROL SYSTEMS		
ISO Number	Title	Contents
ISO 15623	Forward Vehicle Collision Warning Systems (FVCWS)	System that prompts the driver to take an advance maneuver by activating a warning system whenever the vehicle in front is too close, to prevent rear-end collision. Specification of the detection range, detection performance and evaluation method for the vehicle in front.
TS 15624	Roadside Traffic Impediment Systems (TIWS)	System that identifies obstacles in turns ahead of the vehicle through roadside sensors, and informs the driver using roadside message boards. To be established as TS without progress to IS as the infrastructure depends on the unique situation in each country.
ISO 17386	Maneuvering Aid for Low Speed Operation (MALSO)	System to provide information on obstacles found at the rear end and at the corners of the vehicle when backing up and turning at low speed. Prescription of classification based on detection areas, system operation conditions and test methods.
ISO 17361	Lane Departure Warning Systems (LDWS)	System to warn a driver of an actual or possible departure from a lane due to carelessness. Prescription of definition of lane departure, conditions for warnings and test methods.
ISO/DIS 22179	Full Speed Range Adaptive Cruise Control Systems - Performance requirements and test procedures	System to expand following functions of ACC for stopping control. Prescription of the definition of the vehicle running in front, how to restart, and operation limit of the system.
ISO 17387	Lane Change Decision Aid Systems (LCDAS) — Performance requirements and test procedures	System to provide information on a vehicle located in another driver's blind spot, or a vehicle approaching from behind when a driver attempts to switch lanes. Provides classification based on areas covered above, as well as conditions for warning and test methods.
ISO/DIS 22178	Low Speed Following Systems (LSF)	System to control vehicles following one-another during low speed traffic congestion. In addition to common terms of FSRA, studies of control methods for cases where the target has switched.
ISO/CD 22840	Extended Range Backing Aids Systems (ERBA)	System to provide information on obstacles at the rear end of the vehicle when backing up for a relatively long distance. Studies of the scope, obstacles concerned, detection areas and system operation conditions, in comparison with MALSO.
ISO/NP 22839	Forward Vehicle Collision Mitigation Systems (FVCM)	System that carries out an automatic emergency stop and reduces collision damages in the likelihood of a collision with a preceeding vehicles in front of the vehicle concerned. Studies of concepts, system requirements and test methods.
ISO/NP 26684	Intersection Signal Information and Violation Warning Systems	System based on roadside and vehicle cooperation that displays current traffic light information using on-board equipment and activates a warning system using on-board equipment when the driver is about to ignore a red light. Studies of the central features, such as basic functions, standardization terms and information contents.
ISO/NP 15662	Adaptive Cruise Control Systems (ACC) - Performance requirements and test procedures	System to keep a certain distance with the vehicle running in front. Prescription of classification according to the extence of a clutch and an automatic brake, control strategy and characteristics of the driver's intervention.
WORKING GROUP 14: VEHICLE/ROADWAY WARNING AND CONTROL SYSTEMS CONTINUED...		
ISO Number	Title	Contents
ISO/PWI 11270	Lane Keeping Assist Systems (LKAS)	Systems which aid the driver to keep a vehicle inside its current lane via the use of information about the location of the subject vehicle inside the current lane. Studies of scope, system definition and requirements etc.

## Recent Activities

### Themes with draft discussions underway

With Japan serving as the leading nation, discussions on LDWS have been completed, approved for establishment, and now the document is published as ISO. Smooth progress has been seen in discussions on LCDAS as Japan made a great contribution to test methods, and now the document is published as ISO. FSRA and LSF, moved in the DIS draft stage, and was approved for voting of IS publication. As for ERBA, the international discussion is actively conducted in CD stage. For FVCM, comments are being actively submitted from Japan in view of ASV guidelines

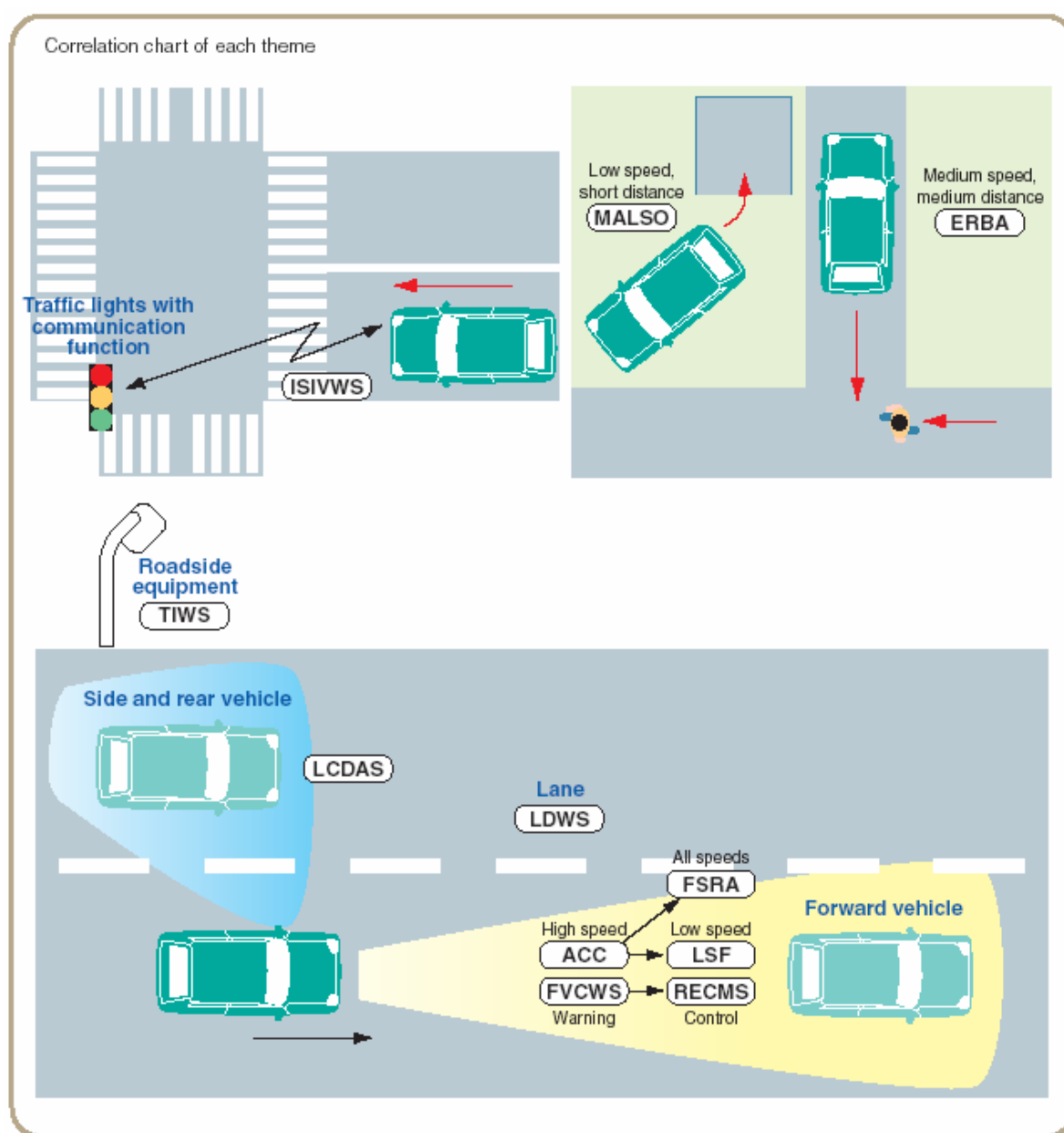
and product commercialization situation in Japan. ISIVWS is discussed basically in the view point of the appropriate direction and scope of standardization, because the research and development activities in Japan is leading.

### Themes with new PWI discussions underway

LKAS, ISIVWS and CSWS was approved as a new theme, and discussion has begun on a draft outline proposal. ACC and MALSO were approved for revision activities, and after the discussed in CD stage, are waited for DIS balloting. FVCWS is also approved for revision activities and are awaiting CD balloting.

### Candidate PWI themes for next term

Road Departure Warning Systems (RDWS) and Cooperative systems are discussed as candidates for a future PWI.



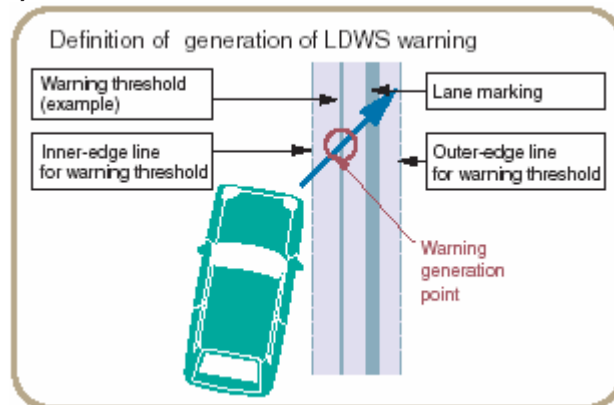
### Future challenges

Standardization is designed to realize an effective and realistic system in draft form. Toward this end, experimental proof is essential, while it is necessary to carry out activities to gain consensus from each country through logical discussions. The human machine interface (HMI) is very important to realize effective and safe driver support systems. Concerning standardization of HMI, liaison activities with TC 22/SC 13/WG 8 are being promoted more actively.

## Introduction of major work items

### Lane Departure Warning Systems (LDWS)

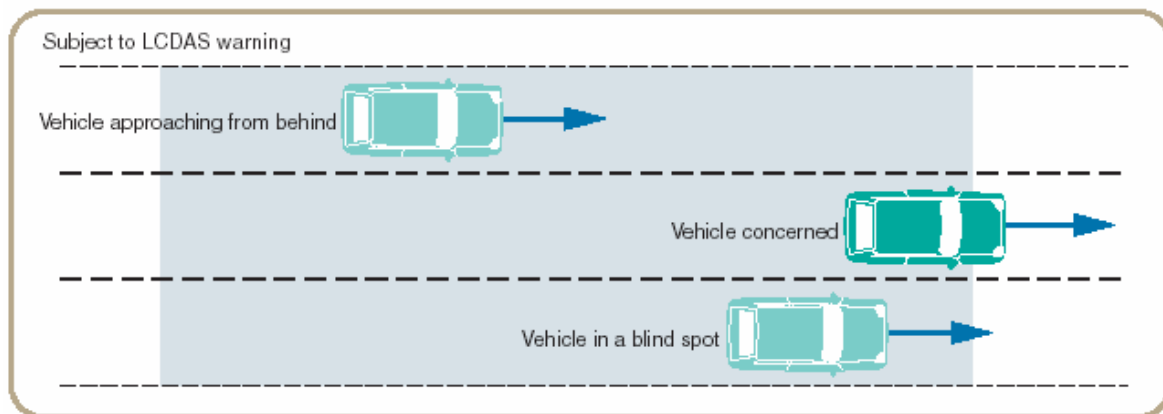
LDWS is a system to warn the driver of departure or of its possibility in consideration of the lateral location of the vehicle concerned in a lane, as measured with a lane location detection sensor. Standardization work covers departure itself, not judgment of the possibility of a collision with vehicles running in an adjacent lane or the content of avoidance control. Japan serves as a leader in draft preparation, the discussions have been finished.



lane  
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### Lane Change Decision Aid Systems (LDCAS)

LDCAS is a system to give a warning to vehicles running in a blind spot or vehicles approaching from behind. Deliberations are going on regarding detailed warning conditions, such as the areas in which vehicles subject to warnings exist, approach speeds, and warning timings (in the case of a vehicle approaching from behind). This area has many new tasks, such as testing environment and standard targets. Japan proposes test methods and collects basic data.

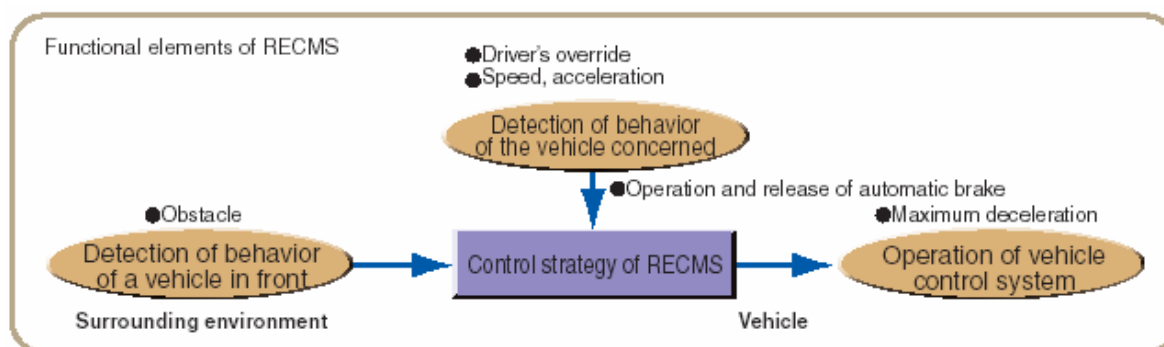


### Rear-End Collision Mitigation Braking Systems (RECMS)

The conventional classification based on collision mitigation and avoidance was replaced by Type 1 (collision mitigation that minimizes interference between the driver's intention and the system action, as proposed by Japan) and Type 2 (collision mitigation that has an earlier automatic braking timing not guaranteeing collision avoidance, as proposed by the US). Type 1 and Type 2 are classified using TTC (time to collision) as the threshold for activation of automatic braking. Accordingly, the draft title was changed. RECMS is drawing great attention due to its direct effects

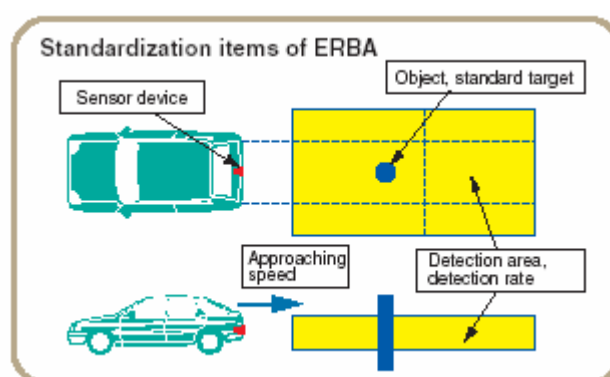


on traffic safety, and accordingly early international standardization is anticipated. Comments are being made considering the domestic concepts and requirements, and also the trend in ASV and other related bodies.



### Extended Range Backing Aid Systems (ERBA)

ERBA is designed to give a warning of obstacles at the rear end of the vehicle when it backs up for a relatively long distance. Japan will submit specific proposals on required specifications like detection range and rate, on test methods and standard targets on the basis of radar reflection data of various obstacles.

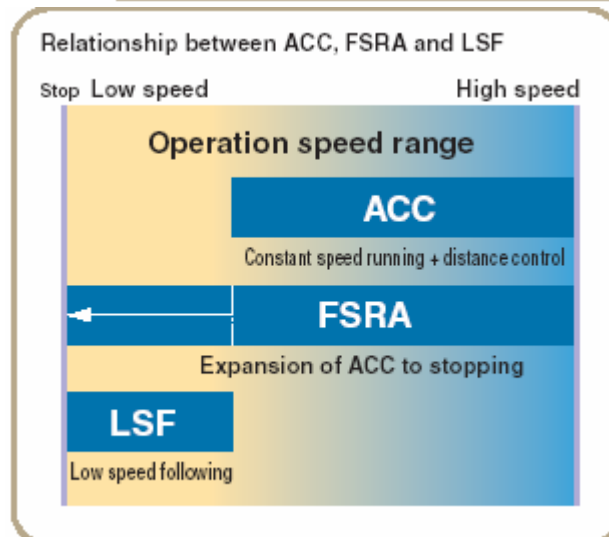


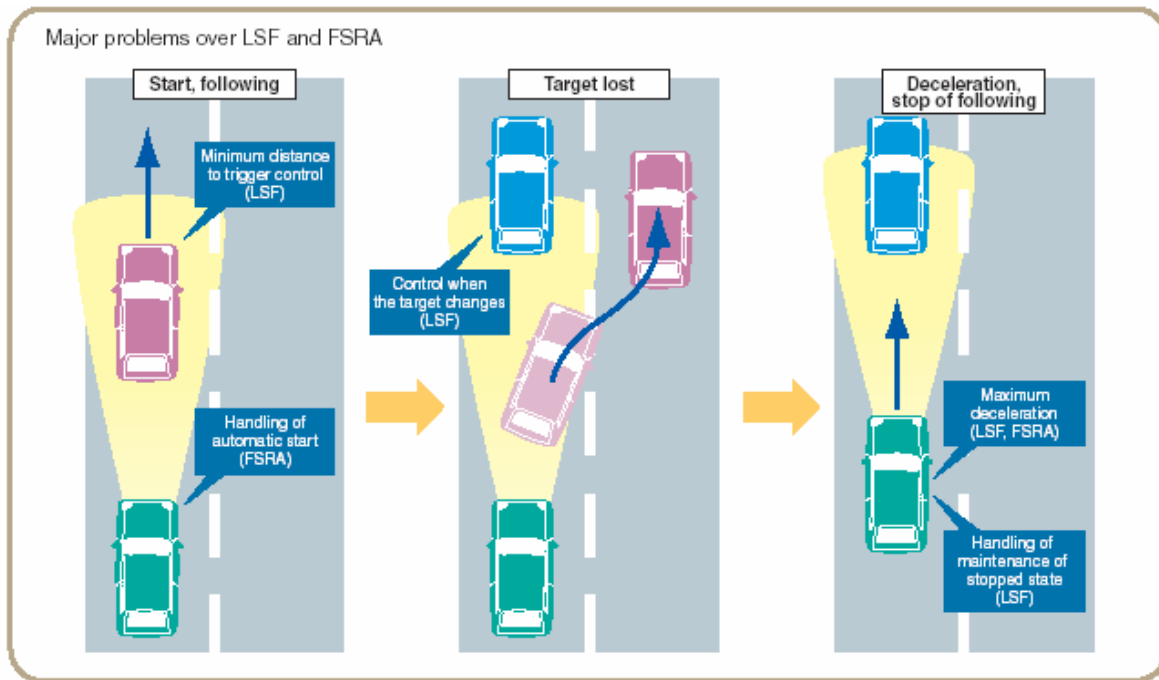
### Low Speed Following Systems (LSF)

LSF is a system that allows the vehicle concerned to follow the vehicle in front in lane, and it principally operates in congested conditions where there are repeated start-following-stop processes. Japan serves as a leader country in draft preparation, and is promoting study of detail requirements in CD draft.

### Full Speed Range Adaptive Cruise Control Systems (FSRA)

FSRA is a system to extend the operation speed of ACC to the full speed range and keep a distance with the vehicle running front. When the target vehicle stops, the vehicle concerned also comes to a stop. Japan is submitting problems related to functional requirements necessary for expansion, while considering its transport situation.





### WG15 Dedicated Short Range Communications

WG 15 is working on the standardization of radio short range communications to be used for ITS applications, such as ETC. This is called Dedicated Short Range Communications (DSRC). The work area is limited to 'spot' type roadside-to-vehicle communications, and the seventh and second layers (LLC sub layers) in the Open Systems Interconnection (OSI) Seven-Layer Model are subject to standardization.

Standardization of the radio communication method equivalent to the Physical Layer has been handled by ITU-R, and recommendations on methods, including those of Japan and Europe, have been approved.

#### WORKING GROUP 15: DEDICTATED SHORT RANGE COMMUNICATIONS

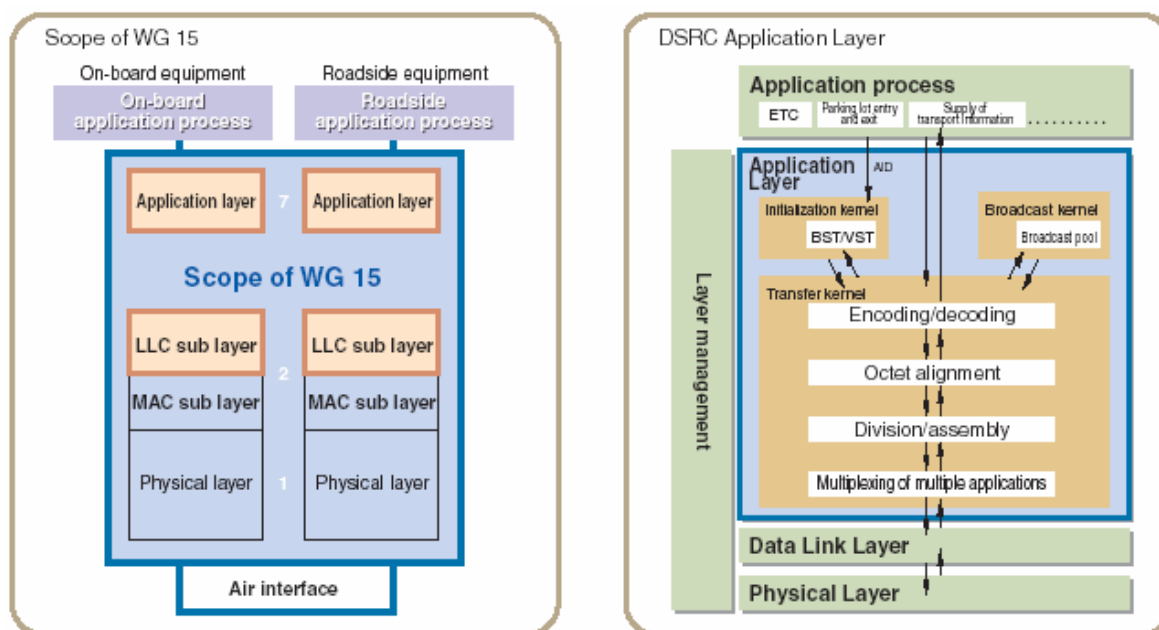
Working Group is currently dormant

### Progress in standardization of DSRC

In parallel with international standardization, progress has been made in standardization for DSRC in each country and region.

In Europe, 5.8 GHz passive-system DSRC (CEN system) has been adopted as a European standard (EN), while 5.8 GHz active-system DSRC (ARIB STD-T75) has been formulated in Japan. In North America, study is being made on 5.9 GHz standardization, and DSRC with IR also exists. Many countries are also studying the introduction of these types of DSRC, whereas some adopted their own DSRC like Italy. South Korea have standardized partial modification of Japanese DSRC. As DSRC is a key technology for ITS, it is considered that priority might have been given to the situation of each country. DSRC protocol generally consists of the Physical Layer, the Data Link Layer and the Application Layer. In Japan, technical specifications on the Application Sub Layer (ASL) and the basic application interface have been created as upper layers.





### DSRC Application Layer (ISO 15628)

Under DSRC, Layers 3- 6 are usually omitted so that a vehicle running at a high speed can carry out direct communication with roadside equipment within a limited communication area. Functions necessary in these layers are included in the Application Layer. Various applications are available in DSRC, and an application identifier (AID) identifying applications is stipulated in the Application Layer. Roadside or onboard application processes designate this AID, and carry out communication with the other (on-board or roadside) application processes by way of the Application Layer and lower layers.

Communication functions are performed mainly by transfer kernel. The functions include encoding and decoding of information, division and assembly of given frames and multiplexing of application information.

Japan prepared a working draft for this item and completed a draft for committee after incorporating requests from various regions and countries. Through long term discussion it was approved to become an ISO in 2006.

### WG16 Wide Area Communications

#### WG 16 Standardization themes

Seven SWGs (16.0, 16.1, 16.2, 16.3, 16.4 16.5 and 16.6) are working on standardization at WG 16. Work items consist of CALM (Communications Air-Interface, Long and Medium Range) areas and probe areas.

WORKING GROUP 16: WIDE AREA COMMUNICATIONS		
ISO Number	Title	Contents
ISO 15662	ITS - Wide Area Communication Message Management Information	Message management information of ITS applications using wide area communication systems between a service center and a user terminal (SWG 16.4)
ISO/DIS 21217	CALM Architecture	Presentation of architecture of CALM. Positioning of non-CALM medium (SWG 16.0)
ISO/CD 24102	CALM Management	Functionality to manage the OSI communication protocol stack of a CALM station including means to support a distributed implementation (Inter-CCK communication) (SWG 16.0)
ISO/PWI 11915	CALM using 802.11	Protocols and parameters for high speed communications in ITS using WLAN Communications, excluding IEEE802.11p/WAVE (SWG 16.1)
ISO/DIS 21212	CALM using 2G Cellular Systems	Protocols and parameters for long range, medium speed wireless communications in the ITS sector using 2nd and 3rd generation cellular communications (SWG 16.1)
ISO/DIS 21213	CALM using 3G Cellular Systems	Protocols and parameters for long range, medium speed wireless communications in the ITS sector using 2nd and 3rd generation cellular communications (SWG 16.1)
ISO 21214	CALM Infra-red Systems	Application interface using infrared medium and wide area communication systems for ITS (SWG 16.1)
ISO/NP 21215	CALM Microwave 5.9 GHz	Communication interface for ITS communication related to protocol 5 GHz band; Actual study by IEEE 802.11 Task Group (SWG 16.1)
ISO/NP NP 21216-1	CALM Millimetre, Physical Layer	Millimetre wave communication used for ITS (SWG 16.1)
ISO/PWI 21216-2	CALM Millimetre, MAC-related Parameters	Millimetre wave communication used for ITS (SWG 16.1)
ISO/FDIS 21218	CALM Networking - Lower Layer SAPs	Functionality to connect a communication interface to the CALM networking layer via C-SAP and to the CALM management via N-SAP. General handling of communication interfaces. (SWG 16.1)
ISO/DIS 24103	CALM MAIL	DSRC adopting ISO15628 (DSRC L-7) including ARIB STD-T75 and T89 ASL (Application Sub Layer) for CALM (SWG 16.1)
ISO/CD 25111	CALM -- ITS using Public Wireless Networks - General requirement	Requirements for wireless broadband and use of WiMAX and HC-SDMA (SWG 16.1)
ISO/CD 25112	CALM MWB using IEEE 802.16e/IEEE 802.16g	Requirements for wireless broadband and use of WiMAX and HC-SDMA (SWG 16.1)
ISO/CD 25113	CALM MWB using HC-SDMA	Requirements for wireless broadband and use of WiMAX and HC-SDMA (SWG 16.1)
ISO/PWI 29283	CALM Applications using 802.20	Requirements for wireless broadband and use of WiMAX and HC-SDMA (SWG 16.1)
ISO/PWI 29282	CALM Applications using Satellite	Communication interface in case where satellite communication is utilized for ITS communication (SWG 16.1)
ISO/DIS 21210	CALM Networking	Functionality for IPv6 networking including T-SAP, C-SAP and N-SAP handling. Functionality to register IP based applications at the CALM management via A-SAP. (SWG 16.2)

WORKING GROUP 16: WIDE AREA COMMUNICATIONS CONTINUED		
ISO Number	Title	Contents
ISO/DIS 22837	Vehicle Probe Data for Wide Area Communication	Standards of information transmitted from a vehicle to an information processing centre (SWG 16.3)
ISO/CD 24100	Basic Principles for Personal Data Protection in Probe Vehicle Information Services	Basic principles of protecting personal information in probe information services (SWG 16.3)
ISO/CD 25114	Probe Data Reporting Management	Control command for probe car (SWG 16.3)
ISO/PWI 29284	Event based Probe Vehicle Data	Standard concerning event based probe information (SWG 16.3)
ISO/DIS 24101	CALM Application Management – Part:1 General requirements	Standards related to the installation of applications on ITS radio communication units (SWG 16.4)
ISO/PWI 24101-2	CALM Application Management – Part:2 Conformance test	Standard specifying test configuration for verifying the function of the CALM application management (SWG 16.4)
ISO/DIS 24978	ITS Safety and Emergency Notifications using any Available Wireless Media - Data Registry	Standard on rules and operations of radiocommunication based Emergency Messages Data Registry (SWG 16.5)
ISO/NP 29281	CALM non-IP Communication Mechanisms	Functionality for non-IP networking including T-SAP, C-SAP and N-SAP handling. Functionality to register applications at the CALM management via A-SAP for FAST service advertisement. Functionality to support legacy ISO 15628 communication interfaces and applications (SWG 16.6)
ISO/PWI 11766	Lawful Interception in ITS and CALM	Requirements for Lawful Interception (LI) in ITS networks using CALM as an example technology (SWG 16.7)
ISO/PWI 11769	Data retention for law enforcement in ITS and CALM	Requirements for Data Retention (DR) in ITS networks using CALM as an example technology (SWG 16.7)

## What is CALM?

CALM stands for "Communications Access for Land Mobiles" and a set of ISO standards specifying an infotainment communications platform for Intelligent Transport Systems.

The CALM standards provide a standardized set of air interface protocols and parameters for seamless mobile communications using one or more of several media, including existing communication technologies, CALM specific communication technologies, and enabling future communication technologies, networking protocols and upper layer protocols, in order to enable efficient ITS communications services and applications.

Beside mobile IPv6 networking, dedicated non-IP networking protocols were available, e.g. GeoNetworking for "Road Safety and Traffic Efficiency Applications" and CALM FAST networking for efficient, low protocol overhead communications, single-hop communications and FAST service operation.

CALM resolves a major problem of existing ITS tools. The problem is that these tools are dedicated to and optimized for a single nowadays communication technology which might be out of date already "tomorrow". Thus a continuous costly re-design of ITS tools is needed. This, first of all, affects the equipment installed in vehicles, but also eventually large parts of the infrastructure equipment - including software. Typically the lifetime of such ITS tools is smaller than the lifetime of cars.

CALM provides a framework with unlimited lifetime, within which the continuous evolution of communication technologies and user applications is enabled in a smooth way. Applications and

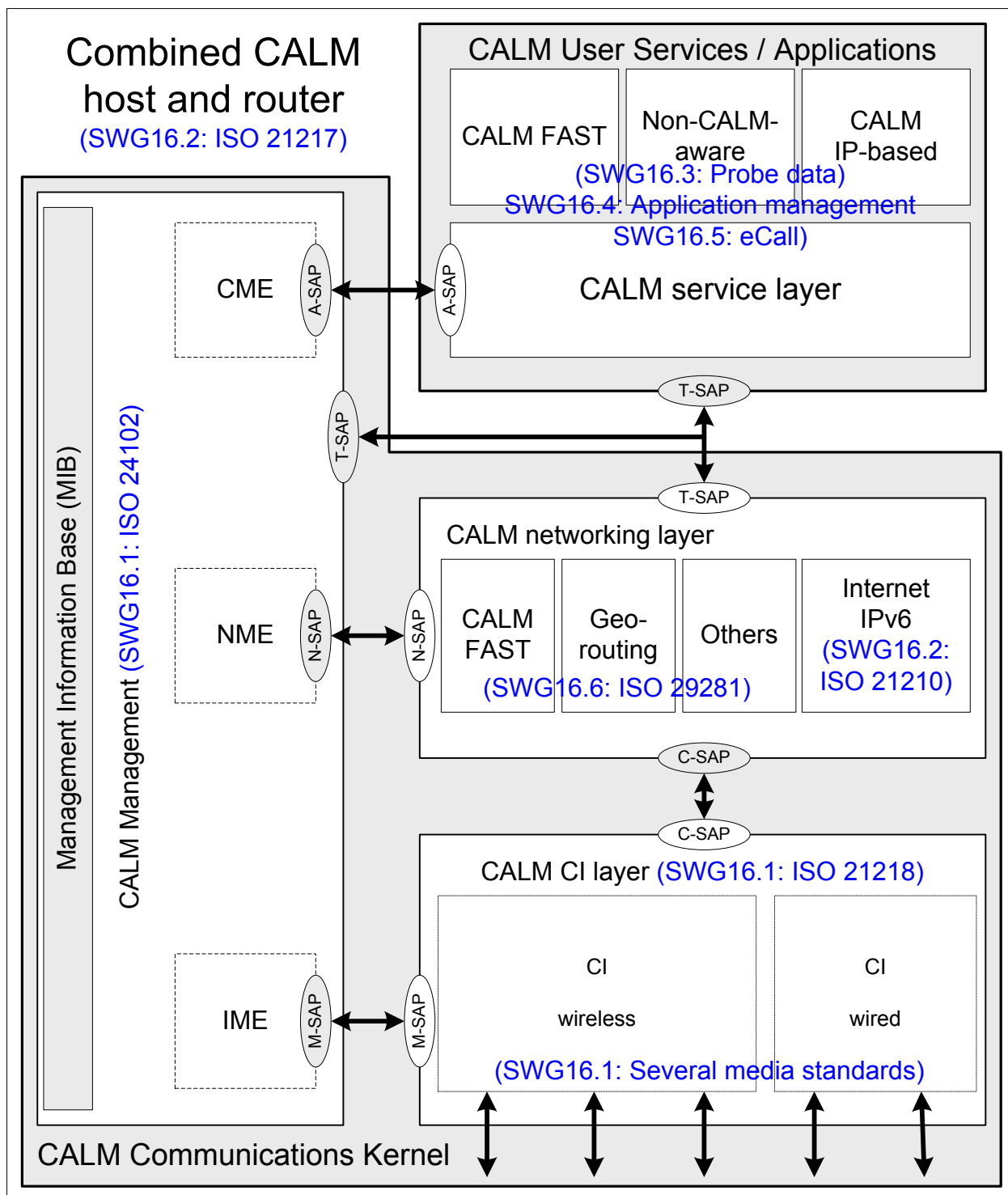
communication interfaces (CIs) need to be designed for CALM. Replacement of a CI even will not be identified by CALM applications due to the mechanisms that make CALM. New applications may be loaded "on the fly" in a secure way.

Availability of different communication technologies and automatic route selection provides best communication routes between CALM stations - having in mind that also fixed relations between applications and dedicated CI technologies, e.g. for road safety applications, are supported. CALM offers a larger effective bandwidth to an application than single-CI ITS tools can do. Availability of various CI technologies in CALM stations reduces congestion in the wireless channels and simplifies distributed congestion control.

### **SWG 16.0: CALM architecture**

CALM architecture (DIS 21217) was launched initially as internal work in CALM discussions in order to clarify each work item and term of CALM. As work items of CALM have increased, CALM architecture has become a new standardization work item. The first version of 21217 is targeted for 2008.

### **General structure of CALM**



### SWG 16.1: CALM media (lower layer)

CALM is based on multiple media (communication interfaces), either existing ones adapted to CALM, or newly developed CALM-aware media. FDIS 21218 enables to connect any medium to the CALM network layer.

### CALM-M5 (NP 21215)

Among the dedicated CALM-aware media, M5 using wireless LAN technology based on IEEE 802.11 is expected to play a central role.

In November 2004, work of IEEE 802.11p was launched as an official task group of IEEE 802.11. The work done there is considered for CALM M5.

#### **CALM-IR (ISO 21214)**

The dedicated CALM-aware medium is being standardized under the leadership of Austria and Germany. In Germany, CALM-IR is an integral part of the GNSS/CN road tolling system for charging of heavy vehicles.

#### **CALM-MM (NP 21216)**

CALM MM is a dedicated CALM-aware medium to be standardized. Through studies of related system and studies of the characteristics of millimeter wave communication and applications, development of the CALM CI layer (OSI layers one and two) is in progress.

#### **CALM-2G, 3G (DIS 21212, DIS 21213)**

The existing media were studied in cooperation with ITU-R and ETSI with a view to be used in CALM.

#### **CALM Management(CD 24102)**

Originally designed as a standard for the management of communication interfaces only, CD 24102 now is dedicated to the management of the whole OSI communications protocol stack, supporting also distributed implementations of a station by means of management communications via a local area network in a station. Further basic CALM functionalities specified are automatic route selection, groupcasting management, distributed congestion control

#### **CALM-MAIL (DIS 24103)**

DSRC was developed as a medium for the 5 GHz band for ITS, and DSRC in the 5.8 GHz band is used in various countries and regions, including Japan with ARIB TD-T75. Standardization of the 7th layer (application layer) of DSRC has been published as ISO 15628.

SWG 16.1 is standardizing the method of utilizing this DSRC as a CALM communication media while considering ARIB STD-T88 (ASL: Application Sub-Layer) as CALM-MAIL (Media Adapted Interface Layer). Its operation has already been verified as a dedicated communication for ITS, and DSRC can be applied to CALM with the goal of wider utilization of CALM.

#### **CALM-WBB (CD 25111, CD 25112, CD 25113, PWI 29283)**

Wireless broadband communication capable of quickly processing large amounts of data in IP bases has started to come under the spotlight. To utilize its performance and functions in ITS, a new PWI was proposed at the TC 204 Plenary meeting in 2005.

•	CALM	WBB	–	General	Support
	General requirements for wireless broadband				
•	CALM	WBB	–		WiMax
	Use of WiMAX (IEEE 802.16e)				
•	CALM	WBB	–	Existing	System
	Use of existing wireless broadband radio communication (iBurst)				
•	CALM	WBB	–		802.20
	Use of IEEE 802.20				

In contrast with conventional mobile communication, wireless broadband communication achieves its functions and performance, including high speed, large capacity and constant connection, using the IP network.

Studies on the requirements for wireless broadband and which CALM applications can be enabled were conducted. Concrete specifications, functions and performance of these two categories of communication means will be investigated. As frequency allocation for wireless broadband communications is expected to expand dramatically in Japan and other countries of the world, it is planned to swiftly improve CALM WBB as a new CALM media.

### **CALM Applications using Satellite (PWI 29282)**

This standardization is to utilize satellite communications in CALM. Studies made in SISTER project of Europe is likely to be the base for the standard.

### **SWG 16.2: CALM IPv6 networking (DIS 21210)**

This standard will specify the means to achieve mobile IPv6 communications in CALM. Basic IPv6 work will be conducted at IETF in a joint approach.

DIS 21210 will enable to use selected routing paths. Optimum paths will be identified by the "Route Selection Manager" specified in CD 24102 with specific requirements presented in DIS 21210. The "Route Selection Manager" will compare communication requirements of applications with capabilities of communication interfaces. Based on a set of dynamically defined rules, optimum routes will be selected.

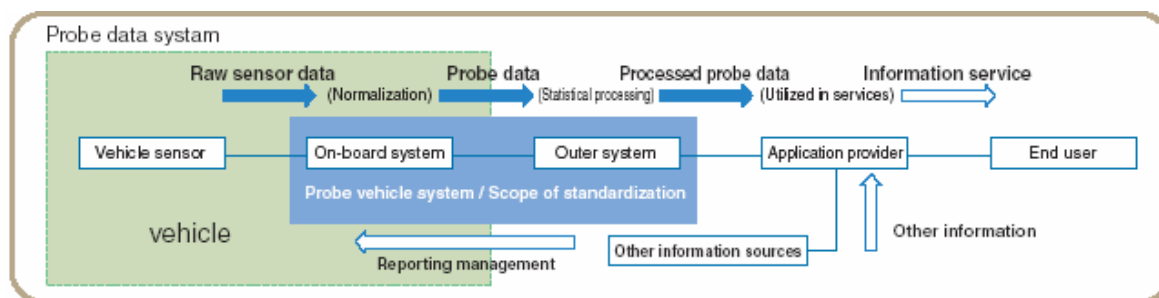
### **SWG 16.3: Probe data**

#### **What is standardization of probe data ?**

A system that consists of a group of vehicles that collect and transmit various types of data using medium and wide area radio communications, and center functions for statistical processing of the received data to acquire information concerning traffic, road and environment is called a "probe vehicle system." Probe data is the data sent from on-board systems in vehicles to centers and other external systems.

The speed and other basic data elements in the probe data are called "probe data elements," and a compilation of multiple data elements is called a "probe message." Probe messages always contains position and time stamps.

This SWG is in charge of standardization of the probe data themselves, standardization of the instructions for the probe data reporting management that is sent from the center side to the group of vehicles when collecting probe data, and standardization further on personal data protection in probe data services.



### **Vehicle probe data for wide area communications (DIS 22837)**

For probe data, standardization of the following is in progress:

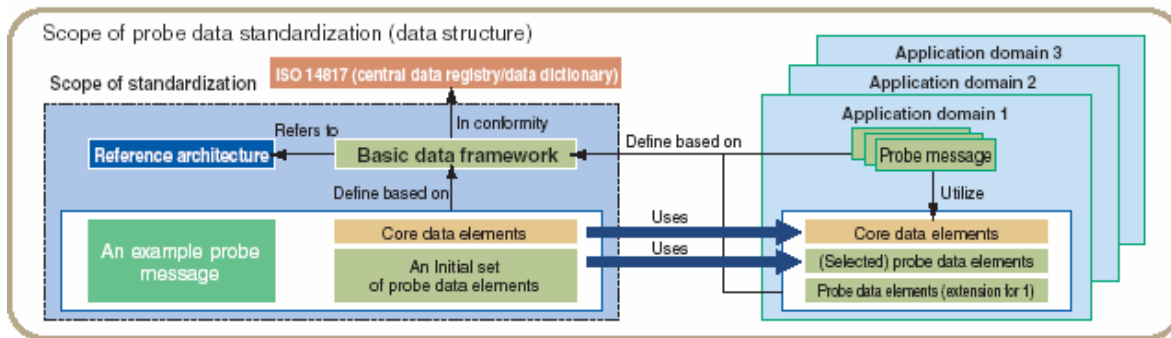
- Basic work frame: Specifies the methods of defining probe data elements and probe messages. Expansion and revision of the standard will be performed in accordance with this framework.
- Reference architecture: Defines the structure of the probe data system covered by this

standard and the semantic structure of probe data.

- Core data element: Defines a group of probe data elements showing the position and time stamps included in all probe messages.
- Initial set of probe messages: Defines a group of typical probe messages.

### Event-based Probe Data (PWI 29284)

DIS 22837 deals centrally directly obtained data from vehicle sensors. Studies also on event-based probe data such as traffic congestion, which would be obtained through in-vehicle process based on multiple sensor values, have been initiated.



### Probe data reporting management (CD 25114)

Reporting management is a set of instructions regarding transmission of probe data to the group of vehicles, including the following:

- Instruction to start and stop transmission of probe data
- Specification of the type of probe data to be transmitted
- Adjustment of the threshold value to determine the necessity of transmission

By transmitting these instructions from the center side to the vehicle side, unnecessary transmission of data can be controlled, and detailed reports can be obtained on the desirable data in order to achieve effective data collection. The instructions are sent without identifying individual vehicles, and therefore the instructions can be sent to a group of vehicles in a specified region. Standardization of the report instruction message, which directs a reporting management, is being studied.

### Basic principles for personal data protection in probe vehicle information Services (CD 24100)

- In probe information services, the relationship between the usefulness of probe information and the handling of personal data is an extremely important problem for all the stakeholders concerned, such as probe data suppliers, probe vehicle information service providers and information users. Personal data cannot be handled too carefully.
- The following is considered personal data handled by probe vehicle information services: “contract registration information with probe data suppliers,” “communication IDs,” “passwords for certification,” “communication logs” and “personal data included in probe data itself.”
- Items being pursued are “preparation of guidelines to be followed by the stakeholders concerned” and “standardization of design guidelines necessary for its achievement” in addition to observance of laws concerning personal data protection, so that probe data suppliers can provide probe data without worry.
- For standardization, considering different legislation system of each country, firstly threat analysis on personal data in the probe data system is made, and then the internationally



required common part is selected, and finally based on the result basic principles is to be described. "Defining probe data system as object," "Threat analysis on personal data protection in the probe data system," "Specifying items which require the basic principle (international common rules) on personal data protection in the probe data system"

## SWG 16.4: Application Management

### What is application management (DIS 24101) ?

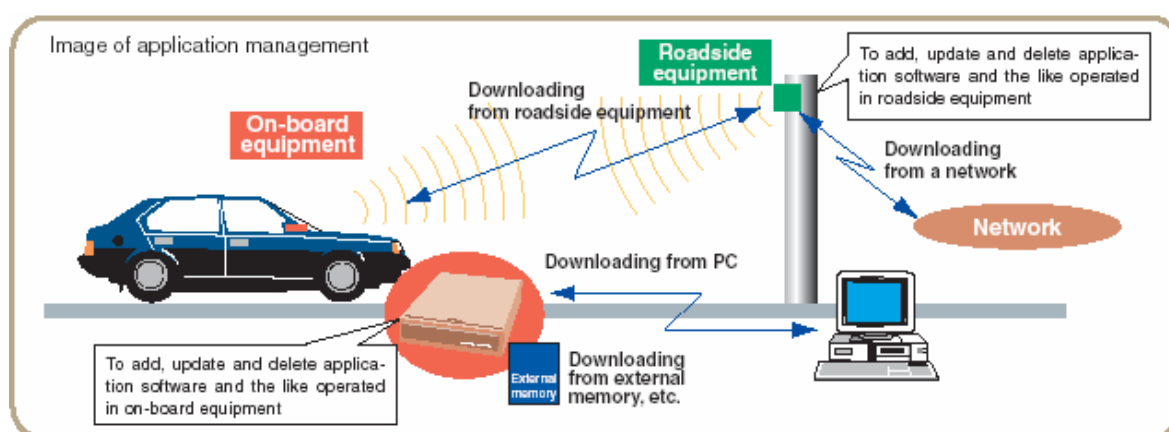
It is a scheme to download application software and the like from outside sources and realize new application services for equipment with ITS radio communication functions (roadside equipment and on-board equipment for ITS applications).

### Objective and scope of standardization

The objective of standardization is to standardize how to realize the installation of applications on equipment related to ITS radio communications. Subject to standardization are systems, structures and methods to add, update and delete applications.

### Conformance test (NP 24101-2)

The standard provides the conformance test, which verifies the function of the developed application management complies with the requirements specified by ISO 24101-1.



## TICS Wide Area Communication Message Management Information (ISO 15662)

Information items necessary when data is exchanged using wide area communications in ITS applications are described. The information is designated as meta-information (attribute information) of a message defined by each WG of TC204, and serves as a check list designed to realize a system to process the message.

- Selection of communication systems (responsiveness, directivity, environment, service area, service times, band width, connection cost)
- Application identifier (message ID, message number, message transmission)
- Address (origin and destination)
- Priority (interrupt handling queue control)
- Security (mutual authentication, data authentication, concealing)
- Application execution (valid time, time stamp, target area)

As of December 2006, established as "ISO 15662 Intelligent transport systems - Wide area communication – Protocol management information."

## SWG 16.5: Emergency Communications

At TC 204 Paris conference in April 2005, the following two standardization themes were proposed as PWI, and SWG 16.5: eCall (chair: United Kingdom) was established to deal with these standardization efforts.

- Emergency call using cellular network (CD 24977)
- ITS safety and emergency notifications using any available wireless media - data registry (DIS 24978)

Both systems are designed to notify vehicle collision using position coordinates and related information and to notify the centralized professional call center management called PSAP (Public Service Answering Point) through radio communications. The former is a manual or automatic notification system covering the cellular phone network. It defines messages called Minimum Set Data (MSD) transmitted when a voice call is established, and uses these messages to provide position coordinates, times, vehicle information, communication parameters and other minimum data. On the other hand, the latter is an automatic system covering all available wireless data communication media. It provides specified position coordinates and related data (with no particular limitations on data length).

Standardization covers specification of the MSD data structure, message sets and protocols for 24977, as well as specification of management and operation methods including registration of emergency notification data and update rules for 24978.

After the Paris conference, both proposals became NP in September 2005, and subsequently approved for CD ballot at the Portland conference in November. As shown above, the chairperson is demonstrating leadership in carrying forward standardization efforts at a very fast pace.

However, the CD ballot in February 2006 rejected both. As the reason for rejection, on top of fewer number of votes from voting countries, the theme being too early, less than enough discussion and the like have been accounted. Particularly for 24977, it has been revealed that the opinion was not settled even within Europe such that some countries from Europe, the proposing entity, disagreed.

At present, 24977 is suspended for discussion at WG16 (in a tendency that discussion not taken place in ISO but ETSI). For 24978 the title is changed to "Emergency Messages Data Registry" because it concerns the contents of rules and operations of emergency notification message registry, and the discussion is to be continued.

### **SWG 16.6: CALM - non-IP Networking (NP 29281)**

NP 29281 specifies all communication details for non-IP routing.

A dedicated network/transport protocol CALM FAST will enable efficient communications with limited protocol overhead, mainly for single-hop communications, but also supporting n-hop broadcast.

Road safety and traffic efficiency applications demand for a dedicated Geonetworking protocol, which will be developed in a joint approach with ETSI TC ITS.

Legacy communication interfaces built on ISO 15628 are incorporated as CALM media.

Legacy applications built on ISO 15628 will be enabled to operate over any dedicated CALM-aware medium such as CALM M5, CALM IR, and CALM MM.

### **SWG 16.7: ITS Communications Security and Lawful Intercept**

This sub working group, which was created at the meeting in San Antonio, TX, USA in December 2007, is responsible for:

- Conducting studies leading to deliverables on Security;
- Assuring ITS solutions conform to regulatory requirements for privacy, data protection, lawful interception and data retention;

NOTE: Detail development in these areas may require coordination with regional SDOs.

- Management and co-ordination of the development of security specifications for ITS communication and data;
- Identify the integration of CALM/ITS security capabilities to other elements of CALM/ITS;
- Investigation of security services and mechanisms required for providing ITS services over the Internet;
- Development of security analyses of candidate protocols and network elements to be used within the ITS framework to implement capabilities e.g., EMTel aspects, IPv6 migration, keying strategies and methods;
- Tracking ongoing worldwide security activities of interest to ITS

NOTE: The security group will ensure coordination of CALM/ITS technical specifications with other CALM/ITS working groups to provide sufficient mechanisms to mitigate risk to the users of CALM/ITS systems.

The TC204 SG16 security group shall undertake activities including, but not restricted to:

- Determine and document the objectives and priorities for ITS security taking into account the needs and aspirations of users, operators, regulators and manufacturers (primarily building a secure Service Capability invocation and protection model).
- Accommodate, as far as is practicable, any regional regulatory requirements in security objectives. This includes regional regulatory requirements that are related to the processing of personal data and privacy.

NOTE: Detail development in these areas may require coordination with regional SDOs.

- Ensure that a threat analysis for ITS is conducted and maintained as the feature set being standardised grows.
- Detail the security requirements for ITS to include, but not necessarily be limited to, security requirements for services, user access to services, billing and accounting, operations and maintenance, and fraud control.
- Detail the security requirements for the physical elements of ITS deployments to include, but not necessarily be limited to, security requirements for the access network, the core network and its interfaces to legacy networks and terminals.
- Define a security architecture for ITS which will satisfy the security requirements and align with the ITS system architecture.
- Produce specifications for:
  - All the elements in the security architecture.
  - Operations and management of the security elements.

- Any cryptographic algorithms needed for the security elements.
- Ensure the availability of any cryptographic algorithms which need to be part of the common specifications.

NOTE: Detail development in these areas may require coordination with regional SDOs.

- Define how the specifications for the security elements are to be integrated into the access network, core network, terminal, O&M and other relevant specifications produced for ITS, and to assist with that integration.
- Detail the requirements for lawful interception in ITS, and produce all specifications needed to meet those requirements.

NOTE: Detail development in these areas may require coordination with regional SDOs.

- Produce a time and milestones plan for the introduction of the various elements of the security architecture which is in line with the development of other relevant elements of ITS.
- Produce guidelines on the use of the ITS security elements, including any requirements for operator specific algorithms.
- Produce guidelines on the limitations of ITS security, and of the implications of not activating the security elements that are provided.

In addition, security services and mechanisms for providing services over the Internet will continue to be investigated. It is important to realize that security for open networks and for interoperability is challenging.

### **7.3 Publications of the ISO technical committee and its subcommittees**

#### **International Standards of the ISO/TC**

This section gives a list of International Standards that have been published by the ISO/TC

*Reference:* ISO 15622 (October 2002)

##### **Adaptive Cruise Control Systems (ACC)**

*Comments:* Stipulation of the minimum and recommended headway time and automatic brake performance on the basis of transport surveys in Japan, the range of detection of a vehicle running in front in view of man's response time. Prescription of evaluation and standards in detail for performance of actual systems in various driving environments.

*Reference:* ISO 15623 (October 2002)

##### **Forward Vehicle Collision Warning Systems (FVCWS)**

*Comments:* Stipulation of system performance after the study on scope of detection of a vehicle in front, in view of human's response time and warning issue accuracy on the basis of the draft prepared by Japan.  
Wrong warnings are reflected in evaluation and standards in various driving environments. Detailed description of items regarding human interface, such as display of warnings.

*Reference:* ISO 14817(December 2002)

##### **Requirements for an ITS/TICS central Data Registry and ITS/TICS Data Dictionaries**

*Comments:* Stipulation of a system to register and manage, as a common dictionary, definitions of standard data used widely among ITS systems. In future, this standard is

expected to be helpful in ensuring reciprocal operability and achieving more efficient development.

*Reference:* ISO 14819-1 (June 2003)

**TTI messages via traffic message coding-Part 1: coding protocol for Radio Data System**

*Comments:* Stipulation of introduction of the RDS-TMC system. It is possible for drivers to receive transport information in their native tongue with use of a virtual language even when they pass a border.

*Reference:* ISO 14819-2(June 2003)

**TTI messages via traffic message coding-Part 2: Event and information codes for Radio Data System**

*Comments:* Compilation of traveler information messages used for the RDS-TMC system. Stipulation of how to codify event information. A central standard in the 14819 series, it has made great contribution to ensuring interoperability of message exchange between different systems.

*Reference:* ISO 14819-3 (March 2004)

**TTI messages via traffic message coding-Part 3: Location referencing for Alert-C**

*Comments:* Specification of the method of coding location referencing information, including road names, street names, urban areas, and the like, for the traveler information to be used in the RDS-TMC system. This standard contributes to ensuring reciprocal operability along with ISO 14819-1 and ISO 14819-2.

*Reference:* ISO 14819-6 (December 2002)

**TTI Message via Traffic Message Coding-Part 6: Location Referencing Method**

*Comments:* Rules coding method of location referencing data such as name of highway, name of street, urban area, etc. regarding traveller information used for RDS-TMC. Contributes to securing interoperability together with ISO14819-1, ISO14819-2 and ISO14819-3.

*Reference:* ISO 15075(December 2003)

**In-vehicle navigation systems-Communications message set requirements**

*Comments:* Stipulation of necessary items for a message set handled by an on-board navigation system. Prepared on the basis of existing standards in Japan and North America, it has specifications applicable to the route guidance system.

*Reference:* ISO 14825(February 2004)

**Geographic Data Files (GDF)**

*Comments:* Standard for data exchange of geographical database used for navigation systems. Map data prepared all over the world can be distributed as data for navigation systems among map vendors.

*Reference:* ISO 17386 (July 2004)

**Manoeuvring Aids for Low Speed Operation (MALSO)**

*Comments:* Research was made into system performance evaluation tests and test subjects used to reflect back sonar and other equipment now being put on the market in Japan in the initial standard draft.

*Reference:* ISO 14906 (September 2004)

**Electronic fee collection-Application interface definition for dedicated short-range communication**

*Comments:* Regulation of EFC application interfaces under the DSRC method. This standard has been adopted for ETC on-board equipment and roadside equipment in Japan and many European countries.

*Reference:* ISO 14815 (July 2005)

**Automatic vehicle and equipment identification - System specifications**

*Comments:* Definition of the standard for the passing speeds of applicable vehicles and equipment in automatic vehicle and equipment identification systems in order to ensure consistency between the ordering and order receiving parties and to facilitate reciprocal operations.

*Reference:* ISO 14816(November 2005)

**Automatic vehicle and equipment identification - Numbering and data structures**

*Comments:* Specification of data structures for IDs of vehicles communicating with the roadside, vehicle information, and equipment information (equipment ID, quantity) in automatic vehicle and equipment identification systems to maintain reciprocal operability.

*Reference:* ISO 14827-1(November 2005)

**Data interfaces between centres for transport information and control systems - Part 1: Message definition requirements**

*Comments:* Specification of the format of traffic information (messages) when being exchanged between traffic flow management centers, and specification of the procedure (protocol) for exchanging messages in order to ensure reciprocal operability.

*Reference:* ISO 14827-2

**Data interfaces between centres for transport information and control systems**

*Comments:* Establishment of a common international standard for the US, Europe and Japan by specifying the DATEX-ASN protocol as the procedure for exchanging information between traffic flow management centers.

*Reference:* ISO 21214 (June 2006)

**CALM - IR**

*Comments:* Specification of the application interface and protocol when infrared radiation is used in CALM.

*Reference:* ISO 14814(February 2006)

**Reference architectures and terminology for automatic vehicle and equipment identification**

*Comments:* Reference architectures and terminology for automatic vehicle and equipment identification

*Reference:* ISO 15662 (December 2006)

**TICS wide area communications - Protocol management information**

*Comments:* Standardization of checklists concerning messages of ITS applications in medium and wide area radio communication between service centers and the user's terminal.

*Reference:* ISO 15628 (January 2007)

**Application layer for dedicated short range communication - DSRC Layer 7**

*Comments:* Specification of the 7th layer of DSRC. Japan edited the draft standard, which conforms to the Japanese DSRC standard specifying the 7th layer (ARIB STD-T75). This standard has been adopted for ETC on-board equipment and roadside equipment in Japan and many European countries.

*Reference:* ISO 17361(January 2007)

**Lane Departure Warning Systems (LDWS)**

*Comments:* LDWS is the standard for a system that generates warnings whenever the position of the applicable vehicle has deviated or is likely to deviate from its lateral position within the lane as measured by sensors.

*Reference:* ISO 14904 (2002)

**Electronic fee collection (EFC) -- Interface specification for clearing between operators  
(Revision of ISO/TR 14904:1997)**

*Reference:* ISO 17574 (2004)

**Electronic fee collection (EFC) -- Guidelines for EFC security protection profiles**

*Reference:* ISO 14907-1 (2005)

**Electronic fee collection -- Test procedures for user and fixed equipment -- Part 1:  
Description of test procedures**

*Reference:* ISO 14907-2 (2006)

**Electronic fee collection -- Test procedures for user and fixed equipment -- Part 2:  
Conformance test for the onboard unit application interface**

*Reference:* FDIS 14813-1

**ITS Reference Architecture: ITS Service Domain, Service Group, and Service**

*Comments:* Defines basic service groups and service/application domains of ITS which should be referenced when developing new architectures and/or comparing each country's architecture, etc.

*Reference:* FDIS 17687

**Data Dictionary and Messages for the Electronic Recognition and Monitoring of Harmful  
Material/Dangerous Article Movement**

*Comments:* Creating the data dictionary and message sets to support information exchange of dangerous articles and/or automatic recognition/monitoring. Any objective communication media is assumed, but RFID tag, Cellular telephone, DSRC are thought valid.

*Reference:* FDIS 24014-1

**Public Transportation Interoperable Fare Management System Part 1: Architecture**

*Comments:* Rules on the basic conceptual architecture to design public transportation fare management systems responding multiple services.

**Reference information**

**Glossary of terms and abbreviations used in ISO/TC Business Plans**

**Annex1: Glossary of terms and abbreviations for the ISO/TC Business Plan**

*NB: This glossary gives the full name and status of terms used, in abbreviated form or in full, in the above "Business Plan for ISO/TCs". The glossary also gives the source of the information provided. Glossary intends to help with the understanding of the terms used. Whenever any of these terms are used by contributors to this Business Plan, they are requested to use them coherently as foreseen in the glossary.*

Term	Abbrev.	Definition
standardization	---	Activity of establishing, with regard to actual or potential problems, provisions for common and repeated use, aimed at the achievement of the optimum degree of order in a given context.
		NOTES
		1. In particular, the activity consists of the



		<p>processes of formulating, issuing and implementing standards.</p> <p>2. Important benefits of standardization are improvement of the suitability of products, processes and services for their intended purposes, prevention of barriers to trade and facilitation of technological cooperation.</p>
standard	---	<p>Document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.</p> <p>NOTE Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits.</p>
package of standards	---	<p>A group, as small as possible, of inter-related standards in the scope of one or more ISO/TCs which are usually developed simultaneously to one another as parts of one standard, or standards that must be developed simultaneously.</p>
consensus	---	<p>General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments.</p> <p>NOTE - Consensus need not imply unanimity</p>
ISO/TC International Standardization Deliverables:		
International Standard	IS	<p>A normative document, developed according to consensus procedures, which has been approved by the ISO membership and P-members of the responsible committee in accordance with Part 1 of the ISO/IEC Directives as a draft International Standard and/or as a final draft International Standard and which has been published by the ISO Central Secretariat.</p>
ISO Technical Specification	ISO/TS	<p>A normative document representing the technical consensus within an ISO committee, approved by 2/3 of the P-members of the ISO/TC or SC.</p>
ISO Public Available Specification	ISO/PAS	<p>A normative document representing the consensus within a working group, approved</p>



		by a simple majority of the Pmembers of the TC/SC under which the working group operates.
ISO Technical Report	ISO/TR	An informative document containing information of a different form from that of normally published in a normative document.
Amendment	Amd	An amendment alters and/or adds to previously agree technical provisions in an existing standard.
Technical Committee	ISO/TC	A technical body responsible for the programming and planning of technical work and the monitoring and execution of this technical work. The ISO/TC is also responsible for the consensus building process among its members for individual work items.
Subcommittee	SC	A technical body reporting to an ISO/TC, which, within its scope, which is covered by the scope of its parent ISO/TC, is responsible for the monitoring and execution of the technical work. The SC is also responsible for the approval and consensus building process among its members for individual work items.
ISO/TC Working group and ISO/SC Working group	WG	A technical body, appointed by the ISO/TC or ISO/SC and composed of experts, responsible for the drafting of standards, in accordance to the ISO rules and the clear specifications set by the ISO/TC or ISO/SC.
Editing Committee	---	A committee set up by a technical body (ISO/TC or SC) at the beginning of its work, which represents the three official languages of ISO. It is responsible for the correct formulation and presentation of the standard(s) prepared by the technical body (ISO/TC or SC) and the equivalence of the texts in the three official languages.
Participating member	P-member	A member body participating actively in the work of a TC or SC, with an obligation to vote on all questions formally submitted for voting within the TC or SC on enquiry drafts and final draft international standards and, wherever possible, to participate in meetings.
Work Item number	WI	The identification number given to a standards project in a standards work programme. It is intended that the standards project leads to the issue of a new, amended or revised standard, an ISO/PAS, ISO/TS or other ISO product.
Vienna Agreement	VA	Agreement on technical cooperation between ISO and CEN.
VA ISO lead (5.1)	---	Technical cooperation between ISO and CEN under the VA, where the work is done by the ISO/TC, where a formal notification of interest was received by ISO from CEN, and where

		parallel synchronized procedures are applied in ISO and CEN for the approval processes.
VA CEN lead (5.2)	---	Technical cooperation between ISO and CEN under the VA, where the work is done by the CEN/TC or SC, where a formal notification of interest was received by CEN from ISO, and where parallel synchronized procedures are applied in ISO and CEN for the approval processes.
ISO stakeholders	---	Individuals, institutions, organizations or enterprises who have a direct or indirect interest in the ISO System, its activities and products and who have a specific interest in the effective programming of ISO work items and their adequate resourcing.