Informal Document No. **WP29-134-16**
(134th WP29, 16-19 November 2004
agenda item 3.4.)

Proposal for a Terms of Reference of WP29/ITS Informal Group
(Revision 1)
November 10

Transmitted by the representative of Japan

1. Introduction

As a result of efforts to equip motor vehicles with artificial intelligence and information, some advanced technologies for in-vehicle Intelligent Transport Systems ("ITS") were introduced into the automobile market. The acceleration of widespread use of these technologies was desired, because they would not only contribute vehicles convenience but also bring enhanced safety into road traffic.

If used without appropriate safety considerations, however, in-vehicle ITS technologies might be rejected by the market before their full development, and it was necessary to achieve among stakeholder countries a common understanding of possible regulations and certification procedures for these technologies. There were increasing expectations that the WP29 take the initiative in the building of such a consensus.

In response the WP29 established its ITS Informal Group in June 2002, began preparation for the ITC Roundtable, and deepened its understanding of in-vehicle ITS issues. Consequently at the ITC Roundtable meeting of 18 February 2004, WP29 member and organizations reconfirmed the importance of discussing in-vehicle ITS issues at the WP29 and agreed to continue the ITS Informal Group activity.

2. Role of the ITS Informal Group

The ITS Informal Group assumes the role of a "strategic group" who, for supporting the development of new technologies for enhancing safety, works to expand the knowledge of these technologies, develops a common understanding of them, discusses the course of their handling in the regulatory framework if necessary, and reports the discussion results to the WP29.

3. Understanding on the ITS Informal Group's Discussion

(1) Scope

The technologies to be discussed by the WP29/ITS Informal Group are In-vehicle Intelligent Transport Systems (ITS) which are on-board systems for safety that utilize information that is received from direct sensing and/or telecommunications via the road infrastructure or other source. In conducting its discussion, the Informal Group observes the following understanding concerning the above-specified ITS:

- It is important to emphasize that certain ITS applications use advanced technologies to provide in-vehicle support for reducing the number of crashes and attendant injuries and deaths. Other ITS applications provide in-vehicle information for purposes other than improved safety. Whatever the primary function is, both types of ITS applications can have important unintentional influences on safety (positive and negative.)

In addition, since there are strong expectations for ITS contributions to the enhancement of vehicle safety, the following understanding is necessary at the same time.

- Certain areas of systems are expected to be discussed primarily for enhancing safety of the vehicles. They include systems that use advanced technologies for enhancing safety, and that advise/warn, and/or assist the driver with the purpose of vehicle functions and performance in driving.

In relation to the function of in-vehicle ITS for safety enhancement, the extent of system's assistance to driver's control is an important issue to be deliberated including how far the "assist" can be extended and what is the relation with "substitution." Such discussion can be based on certain actual in-vehicle ITS systems. (Please refer to Attachment 1 for the schematic of a driving assistance system.)

(2) Points to be considered

Bearing in mind that the purpose of the ITS Informal Group will include the support of development of advanced technologies for safety enhancement, and that these technologies are still at the course of their future development, the ITS Informal Group recognize to consider the following points:

- The introduction of ITS into market shall not be hindered as far as there are no clear problems on safety.

- For encouraging introduction of ITS, role of governments in the area of safety should be considered. Such role of governments may include followings.
  * If current regulations are holding back ITS from market, revisions should be studied.
  * If necessary, methodologies should be developed and applied for assessing the safety impact, estimation of effectiveness and potential safety degradation.

- Also, role of industries and other means than regulations on vehicle construction should be considered (ex. civil law, industry's guidelines).

- It is preferable to get a common understanding on advanced technologies considering the above-mentioned role of governments among members.

Because in-vehicle ITS involves sophisticated technologies for warning or assisting the driver, the following special considerations are important in discussing the future course of in-vehicle ITS:

- It is important to deal with the issues from a view point of HMI and an aspect of the driver's responsibility is duly taken into account.

- In-vehicle ITS is a newborn subject matter appearing in the WP29's agenda, and it is still difficult to predict the future course of ITS development. Accordingly, the ITS Informal Group should discuss general issues characteristic of advanced technologies and unsuitable for GRs, receiving guidance from WP29 and working in concert with GRs whenever necessary.

4. Current Situation of ITS related Activities

Concerning the new technologies included within the scope of the ITS Informal Group, attempts were made to collect information on the research and development projects, guideline formulation, and standardization and regulation discussions conducted in various countries (see Attachments 2 to 4). This information was collected to help determine the role of the WP29 and plan efficient information collection and other activities of the WP29 related to in-vehicle ITS. These schematic was produced by Japanese experts, reflecting the opinions expressed at the meetings of the ITS Informal Group till now and the ITC Roundtable of 18 February 2004.

Attachment 2 lists up the in-vehicle ITS projects in the various regions of the world. Attachment 3 introduces the categorization of in-vehicle ITS systems and their negative aspects. Attachment 4 identifies the negative factors examined in regional projects.

According to the information collected on various negative aspects(Attachment 4), guidelines on "distraction" have already been established in some regions. Although manufacturers' voluntary effort is the central approach to the issue of "reliability", there are brake by-wires and some other individual items beginning to be discussed for incorporation into ECE Regulations.

On the other hand, regarding "overtrust", “lack of trust" and "misunderstanding", attempts to qualitatively understand the concepts and organize policy are beginning in various regions. These negative aspects are issues related to driving assistance, which is one of HMI aspects (Attachment 3). What is important is to share the knowledge obtained from various projects and regions and refine it into a common understanding of issues related to driving assistance within the WP29.

Additionally, developments in in-vehicle ITS needs to be constantly monitored, and information needs to be exchanged on new ITS technologies with attention to relationships between regulations and a new ITS technology.

While IHRA is conducting research activities aiming at the harmonization of regulations and while ISO is working to formulate international technical standards, the ITS Informal Group may try to collaborate with these two organizations in striving to achieve its tasks.

5. Work Plan

Assuming the WP29/ITS Informal Group to found its activities on the Understandings on the ITS Informal Group’s Discussion defined in section 3 and on the Current Situation of ITS related Activities in section 4, the work plan below has been set for the ITS Informal Group.

(1) Information exchange

Information concerning in-vehicle ITS will be exchanged. Based on such information and if it is necessary, discussions will be made for identifying the direction to be taken by the WP29. The result of the discussions will be reported to the WP29.

(2) A common understanding of driving assistance

Based on information mentioned above, safety aspect of various driving assistance systems will be discussed for establishing a common understanding. Such common understanding may include a basic concept on safety and an estimation procedure of safety impact.

(3) Review of the work

The work will be reviewed and reported to the WP29 after two years from the adoption of the TOR.

ATTACHMENT 1

Driving Assistance

In driving a motor vehicle, it is the driver who observes the surroundings and the running condition of his/her vehicle, while making judgments for appropriate driving responses and operating the steering wheel, acceleration pedal and brake accordingly in the conventional driving system (Figure 1).

This driving system may be supported by a separate "driving assistance system" designed to assist part of the driver's recognition, decision-making and control by utilizing advanced technologies. The driving assistance including assistance for control should be distinguished from the driver "complete substitution" which means to take over the whole driver's functions.

Various research institutes are engaged in studies on the form, extent, timing, and other elements of appropriate driver assist. While some types of driver assist systems are already in practical use on vehicles, as a whole they are still at their developmental stage. Consequently it is good time for countries and regions to deepen their understandings of desirable technologies for driving assistance.

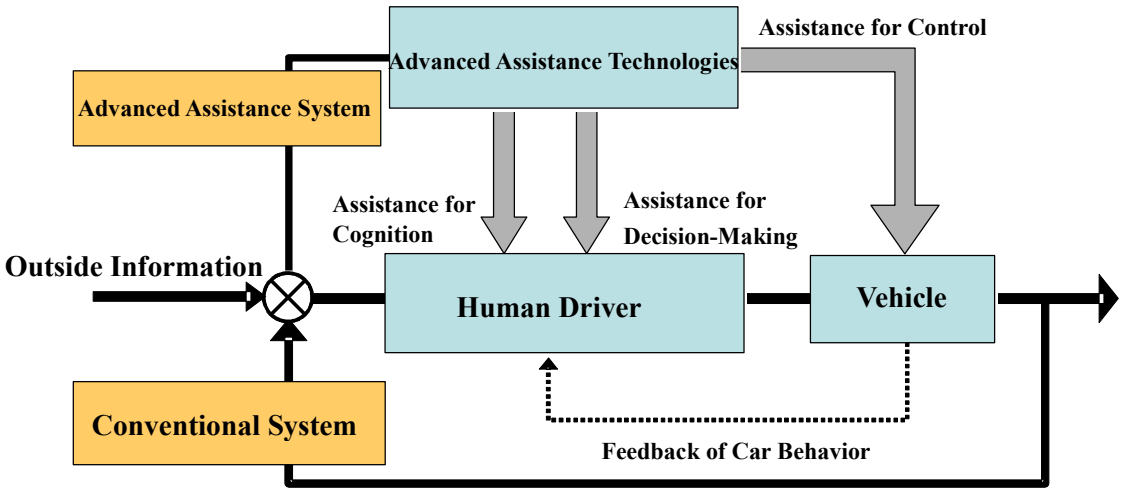
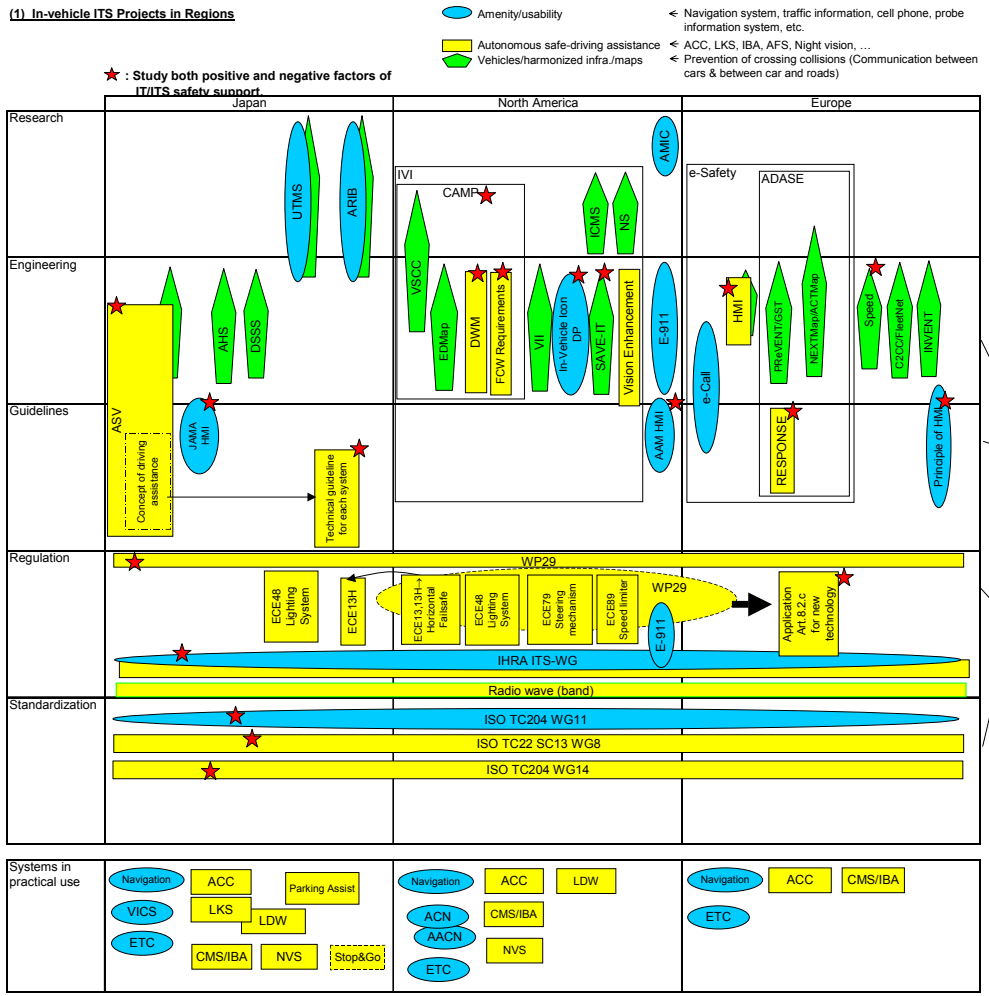


Figure 1 Block Diagram of Car Driving

(1) In-vehicle ITS Projects in Regions



Target systems
Safe use of navigation system & cell phones
Information on traffic flow (VICS)
Emergency call of accidents (e-Call, E911)
Emergency vehicle service
Probe information system
Night vision
AFS
Autonomous all-direction driving assistance (ACC, LKS)
Stop & Go
ACC, warning of distance between vehicles (FCWS)
Prevention of driving off the lane (LDW, LDP)
Decrease in collision speed (IBA)
Prevention of driving off the road while cornering
Prevention of side collisions (SOWS, etc.)
Prevention of accidents due to telecoms use on roadways
Prevention of accidents due to telecoms use at intersections
Status information on roads ahead
Assistance for drivers to use digital maps
Forced restriction of speed/in-vehicle display of speed limit (ISA)
Manual-setting vehicle speed limitation system
Platooning system
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Matters of interest (Relationship between humans and machines)
Acceptability to society & users
Driver's workload
Driver distraction
Overtrust
Misunderstanding
Lack of trust
Reliability *

* Driver can cope with the errors made by a less-than-perfect device,

Matters of interest (reliability of systems)
Failsafe
Electronics Hardware Reliability

ACTIVITY

ASV: Advanced Safety Vehicle
AHS: Advanced Cruise-Assist Highway System
DSSS: Driving Safety Support System
UTMS: Universal Traffic Management Society of Japan
ARIB: Association of Radio Industries and Businesses

IVI: Intelligent Vehicle Initiative
CAMP: Collision Avoidance Matrix Project
VII: Vehicle Infrastructure Integration
VSCC: Vehicle Safety Communication Consortium
EDMap: Enhanced Digital Maps
DWM: Driver Workload Metrics
ICMS: Intersection Collision Mitigation Study
NS: Naturalistic Study
MCAI: Multiple Collision Alarm Interference
AMIC: Automotive Multimedia Interface Collaboration

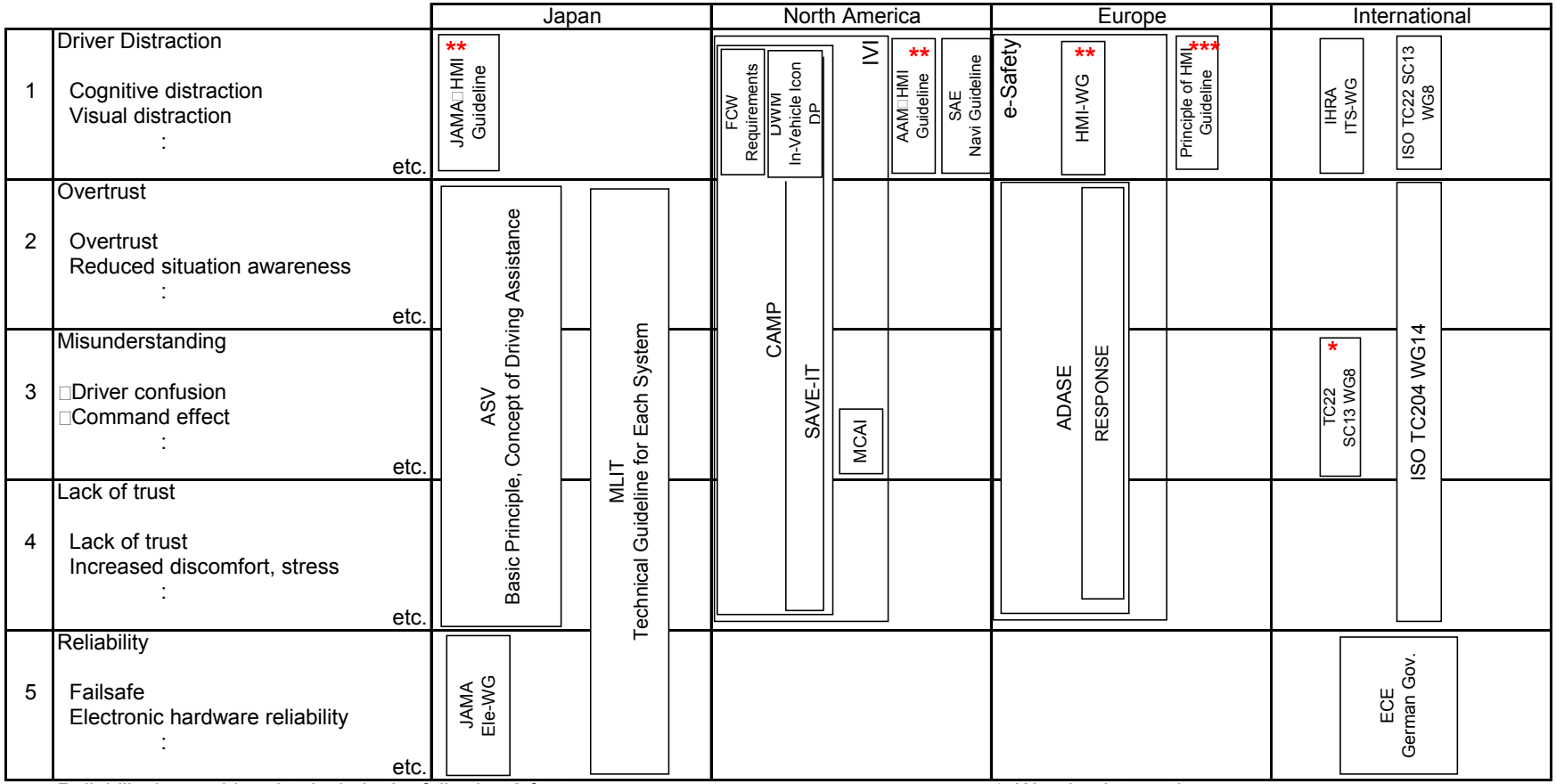
ADASE: Advanced Driver Assistance Systems in Europe
PReVENT
INVENT: Intelligent Traffic and User Friendly Technology
GST: Global Safety Telematics
C2CC: Car To Car Communication
NEXTMap
ActMap: Actual and dynamic MAP
for transport telematic applications
SARA: Short range Automotive frequency Allocation
RESPONSE:

(2) In-vehicle ITS Categories and Negative Aspects ATTACHMENT 3

Categories of ITS		Examples of systems	Examples of negative factors (concerns)
Information collection		Cell phone Internet, Navigation system, multi-media terminals etc.	Driver distraction □Cognitive distraction Visual distraction, etc. etc.
Driving assistance	Information support	Navigation system, traffic information AFS, Night Vision FCW, LDW Curving road status Warning of crossing collision Road-ahead obstacles etc.	Overtrust □Overtrust □Reduced Situation Awareness, etc. Misunderstanding □Driver confusion Command effect Lack of trust Lack of trust Increased discomfort, stress, etc. Reliability Failsafe Electronic hardware reliability, etc. etc.
	Assistance for control	ACC, LKS CMS/IBA Stop & Go etc.	
Automatic drive		Automatic drive Convoy pilot system etc.	Responsibility of the driver etc.

(3) Negative Factors Examined in Regional Projects

ATTACHMENT 4



Reliability is considered to include the following 2 factors.
* Failure does not impair safety./Back Up → (5) Failsafe
* The driver can cope with the errors made by a less-than-perfect device.
→ Included in (2), (3), and (4).

*: Warning Integration
**: Limited to telematics information devices including cell phones, navigation systems, and internet
***: Recommendation on Safe and Efficient In-vehicle Information and Communication Systems

ASV: Advanced Safety Vehicle
IVI: Intelligent Vehicle Initiative
CAMP: Collision Avoidance Matrix Project
DWM: Driver Workload Metrics
MCAI: Multiple Collision Alarm Interference

ADASE: Advanced Driver Assistance Systems in Europe