



Annex 3: HMI

**The eSafety High-Level Meeting with
Public Authorities**

Brussels, 27 September 2004

Summary Report

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Annex 3: Recommendations from the eSafety-HMI Working Group

INTRODUCTION	4
1 BACKGROUND	5
1.1 MEMBER STATES´ REPOSES (RECEIVED BY SEPTEMBER 2004).....	5
2 HMI ISSUES WITHIN A SAFETY CONTEXT	7
2.1 RISK AND BENEFIT	7
2.2 SCIENTIFIC EVIDENCE	7
2.3 SYSTEM TYPE.....	8
2.3.1 <i>After-Market</i>	8
2.3.2 <i>Nomadic</i>	8
2.3.3 <i>Multiple Devices and Integration</i>	9
2.4 MULTIPLE ACTOR AND VALUE CHAIN ISSUES.....	9
2.5 HMI ISSUES	10
3 SOLUTIONS ANALYSIS TOOL	12
4 ANALYSIS ACCORDING TO HMI-PRINCIPLES	13
4.1 INSTALLATION	13
4.2 DESIGN OF INFORMATION PRESENTATION.....	14
4.3 DESIGN OF INTERACTION	15
4.4 SYSTEM USE	16
5 RECOMMENDATIONS ON A REVISED EUROPEAN STATEMENT OF PRINCIPLES	17
5.1 GOALS OF A REVISED ESoP.....	17
5.2 RECOMMENDATIONS ON THE SCOPE.....	17
5.3 RECOMMENDATIONS ON PRINCIPLES.....	17
5.4 COMPARISON WITH US AND JAPANESE GUIDELINES (AAM AND JAMA)	18
5.5 SUMMARY OF DEVELOPMENT PROPOSALS.....	19
6 FOCUS SECTORS OF 3D-HMI-MATRIX	20
6.1 NOMADIC DEVICES	20
6.1.1 <i>Situation Analysis</i>	20
6.1.2 <i>Recommendations</i>	20
6.2 SERVICE PROVIDERS	22
6.2.1 <i>Situation Analysis</i>	22
6.2.2 <i>Recommendations</i>	22
6.3 FLEET OWNERS AND EMPLOYERS	23
6.3.1 <i>Situation Analysis</i>	23
6.3.2 <i>Recommendations</i>	23
6.4 AUTHORITIES	24
6.4.1 <i>Situation Analysis</i>	24
6.4.2 <i>Recommendations</i>	24
6.5 RESEARCH NEEDS	25
7 SUMMARY OF RECOMMENDATIONS	26
CONCERNING ESoP.....	26
WIDER CONTEXT.....	26

ANNEX A COMPOSITION OF WG-HMI.....	28
ANNEX B SUMMARY OF MEMBER STATE RESPONSES	30
ANNEX C EMPLOYERS RESPONSIBILITIES AND RELEVANT LEGISLATION	32
ANNEX D DEFINITIONS.....	34

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Introduction

Annex A describes the composition of the eSafety Working Group (WG) on HMI (Human Machine Interaction).

Following the publication of the European Statement of Principles (ESoP), for in-vehicle information and communication systems, responses from the Member States concerning application of the Principles have been studied by the Working Group. The WG has also compared the ESoP with similar ongoing initiatives in the USA and Japan and the main issues involving HMI relevant to development of eSafety have been elaborated. The multiple Stakeholders involved in delivering information services have been noted and the implications for the driver assessed. The increasing availability of “nomad devices” and, to a lesser extent after-market systems, give particular cause for concern as their lack of integration within the vehicle may cause additional driver workload. Although the ESoP is valuable in clarifying issues under the responsibility of manufacturers, it is recognised that other Stakeholders including system users and Authorities, have their part to play in ensuring that the benefits of eSafety systems can be safely delivered to drivers. The EC will be writing a Communication to the Parliament and Council at the end of 2004 and this report with its recommendations provides a substantial contribution based on expert consensus within the WG-HMI.

This report provides an overview of current HMI issues and then describes an HMI “Solutions Matrix” to analyse problems and focus on solutions. From this matrix the goals and recommendations for a revised ESoP as well as specific fields of actions are derived.

Additionally Specific recommendations are provided in five areas:

- Nomadic devices
- Service Providers
- Fleet Operators and Employers
- Authorities
- Research

The recommendations were presented at a preliminary open forum in June 2004 and were posted on the eSafety web site. Since June the WG-HMI has been working with other Stakeholders to refine the recommendations for resolving outstanding issues and solving the identified problems.

1 Background

The importance of a safe human machine interface (HMI) for in-vehicle information and communication systems has been stressed many times in resolutions, opinions and conclusions of several European institutions. These include the Council conclusions of 17 June 1997; the European Parliament resolution of 8 October 1998 and the Opinion of the Committee of the Regions of 14 May 1998 on Commission Communication COM (97) 223 of 20 May 1997 (related to a Community strategy and framework for the deployment of road transport telematics in Europe); and the Council Resolution of 17 June 1997 on the development of telematics in road transport. Finally, in December 1999, the Commission adopted a “Recommendation on safe and efficient in-vehicle information and communication systems: a European Statement of Principles on human machine interface” (OJ L19, 25.1.2000, p.64). The purpose of this last recommendation was to disseminate widely these principles, through the Member States, to the main actors in the field with the objective that the relevant European industry would take them into account in the design of new systems. In addition, the EC published an expansion of the Principles by its expert group (dated July 2001). A voluntary agreement from European car manufacturers to fully respect the ESoP (letter from ACEA), was issued in 2001.

1.1 Member States' responses (received by September 2004)

Following the above publications, Member States were asked to inform the EC about the knowledge and adherence to the Principles and their impact in the Member States. Up to now, Germany, Denmark, Great Britain, France and Sweden have sent their reports to the EC. The comments given in these reports are quite varied; They address different areas which can be seen from table 1:

	attitude	Scope	Content	application	remark
Denmark	Positive, but does not apply to Danish industry	-	-	-	-
France	Valuable but very general;		Valuable but very general;	Generally well followed by manufacturers; problem = nomadic devices	license for nom. Device manufac.
Germany	ESoP is applied	Include service providers;	Add precise criteria on combination of several systems during retrofit	Is applied by manufacturers	Need of research on methods and misuse potential of systems; recommendation
Great Britain	UK is more focussed on sales and service provision than on design of these systems	Include use of mobile data terminals by fleets of vehicles; clarify responsibilities (after market...)	add assessment criteria for context specific applications;	Knowledge varies,	Application was checked with checklist; EU guideline preferred
Sweden					In favour of directive

The attitude of the member states is in general positive, the scope should be extended to all responsible Stakeholders (e.g. service providers and fleet managers) . Depending on the individual member state there are specific suggestions on the content. The application by car manufacturers

and suppliers of original equipment is judged positive but should be improved for other stakeholders like nomadic device manufacturers, service providers, etc.. A brief summary of Member State responses can be found in Annex B.

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2 HMI Issues within a Safety context

2.1 Risk and Benefit

One of the goals of eSafety is to provide drivers with information and assistance to enhance safety. ADAS, in particular, are likely to change to some extent the existing dynamic relationship between drivers, their vehicles and the road environment and, at a detailed and statistical level, changes can be expected in the nature of accidents; for example, the crash scenario, severity, impact geometry, vehicle type, driver and road user groups etc. It should be noted that safety-enhancing features such as air-bags and ABS are not without their problems in specific situations. So, although an overall improvement in safety can be expected, research may reveal subtle changes in contributory factors and the nature of accidents.

Driver information, communication and assistance functions will vary in their safety potential. (Some may be negative and introduce driver distraction or inappropriate behaviour; others will be extremely beneficial.) The way the function is implemented is an important factor which has led to the existing version of the ESoP. On the other hand the implementation also depends on system type (i.e. nomadic versus OEM installed) and is also used by different manufacturers for brand differentiation. Of course, new concepts and systems should be well designed and should be thoroughly tested before market introduction to eliminate those that are clearly hazardous. However, it may be impossible, or prohibitively expensive, to undertake sufficiently large field trials to identify the full impact of system introduction. To illustrate this, there are few studies which directly link aspects of HMI design or driver distraction with safety related outcomes like accidents. Such data usually cover a broad range of distraction-related categories and the data integrity and relative contribution of distraction to the accident makes definitive conclusions very problematic. Regarding the possible safety benefit of a system, it is often also quite difficult to quantify this effect in advance.

- Thus, it is likely to be impractical to “prove” enhanced safety before market introduction. Another consequence is that lack of research on topics such as workload and driver behaviour means that policy development cannot be entirely evidence based but must draw on a wide variety of expert opinion and consensus.
- System design and implementation of driving-related services are handled differently by different manufacturers. This allows a degree of customer choice (although in-vehicle systems are often integrated within the vehicle) and for experience to be gained concerning actual use, ease of use, market preferences and, possibly, safety performance. Too much conformity would limit the opportunity for innovation, customer choice and experience.
- Clearly, functionalities not directly related to driving should also not compromise safety.

2.2 Scientific Evidence

- In general there are different approaches to scientifically evaluate the risks and benefits of driver assistance or information & communication systems.
- Analysing accident data has been useful in quantifying the safety benefit i.e. of ESP. On the other hand, the data quality is decisive as soon as the expected risks and benefits are not very large.
- Naturally the evaluation of future systems on the basis of accident data is not possible. Development in technology, design and understanding of driver needs contribute to more

mature products (at affordable prices). For example, route guidance systems are now much easier to use and, on balance, (based on research findings), offer safety advantages. If initial implementations had been excluded from the market, the current advantages offered by the systems may not have materialised. Therefore, the assumption that more information and functionality is automatically “worse” than less cannot be accepted.

Research shows that human error is a contributory factor in a high proportion of accidents. This highlights the requirement to design systems that take account of the reality of human performance and behaviour. It is also known that drivers engage in all kinds of driving behaviour that may satisfy immediate needs but which can also be considered risky (e.g. smoking, reading maps, texting on a hand-held mobile phone). Driver education is one approach to this problem. Another approach is to find appropriately optimized solutions to support the driver’s needs. As consumer products are a reality, restricting the functionality of integrated driver interfaces would not be a good solution if the result is excessive use of portable devices

Examples of current projects, from which good research evidence is arising or is expected include: AIDE, HUMANIST, ADAM, and CAMP.

2.3 System Type

European car manufacturers have self-committed to the ESoP (through ACEA) so some distinction can be made between such OEM systems and those that are subsequently fitted. This section describes after-market and nomadic devices (NDs) and also explores issues with multiple in-vehicle devices and integration.

2.3.1 After-Market

Definition: After-market systems are designed for use while driving but not by the vehicle manufacturer and are permanently installed in the vehicle. They are usually not designed for special conditions in specific vehicles.

They are not the responsibility of the vehicle manufacturer; however, some after-market systems are “approved” by them. Organisations involved in the design of after-market systems range from large multi-national groups to small single producers. Some after-market systems are custom designed for specific functions e.g. for taxis, delivery fleets and emergency vehicles.

2.3.2 Nomadic

Definition: A nomadic device is a device for information and/or communication that can be used outside and inside the vehicle by the driver while driving. It is usually not supplied or mounted by the vehicle manufacturer.

The ESoP applies as soon as the Nomadic device is intended (explicitly or implied by the design responsible organization¹) to be used by the driver while driving (by design of hardware and/or software).

Recommendations

Portable devices used by the driver while driving must be securely fixed. If the device is not securely fixed but is used, the driver is fully responsible.

¹ May be the nomadic device manufacturer but also a software or service provider. Definition refer to ... /Alan/

There is no clear definition or classification of nomadic devices but they include all types of communication and information devices that can be brought by the driver into the vehicle to be used while driving. Examples are mobile phones, portable computers, pocket PCs, and DVD players. With technological improvements, these devices are more widespread in the market, offering a diversity of functions to the user, which was not specifically designed for use while driving. These systems are able to provide useful information to the driver (navigation and guidance with GPS, traffic information) and information that would require an unacceptable and potentially unsafe amount of driver attention (e.g. movies on DVD, access to web sites). This means that it is not possible to consider nomadic device use inside the vehicle unsafe *per se*: the level of criticality is directly related to the type of function that the driver has decided to access through the nomadic system and to other aspects like the design of the function and the location in fitting of the nomadic device.

An additional problem is the physical risk linked to the device itself in case of crash in terms of the way it could injure the driver and the other passengers. Indeed, by definition, these devices are usually not securely implemented in the dashboard.

The following actors may all be involved in the market with nomadic devices

System manufacturers (ND makers producing making phones, smart phones, PDA, DVD players...

- Telecom Operators: Their basic activity is to sell “air time” and subscriptions for services that are not necessarily produced by them (e.g. contents of i-mode)
- Software providers: including navigation software for mobile phones and PDAs
- Content Providers: including Mediamobile with its Visionaute traffic info service, Via Michelin, Mapy....
- Distribution channels: These include accessory shops, car rental agencies, and car clubs.

The ESoP for HMI clearly covers all types of information systems used in the vehicle, including nomadic devices. The ESoP has been agreed by the main representatives (ACEA) of the well identified stakeholders involved in vehicle design responsible for ensuring the quality of presentation and interaction for OEM devices (e.g. the size of display screen and logic of operation). At this stage, no official voluntary agreement about respecting the ESoP has been made by the stakeholders concerned with nomadic devices. These groups may be less aware about road safety issues and may not be organised into easily identified networks.

2.3.3 Multiple Devices and Integration

Principles which describe the goals to be reached by the combination or integration of in-vehicle systems are explicitly not specified in the ESoP. Integration of systems is expected to remain an important issue for OE Manufacturers in the future.

- Integration of multiple systems in respect to HMI is of course also important for after-market and nomadic systems and even more difficult to achieve since several stakeholders are involved. With the growth in after-market and, particularly, nomadic devices, the issue of multiple but independent systems within one vehicle is also becoming more important. As noted above, there could be adverse effects if restrictions on OEM integrated devices cause increased use of nomadic ones.

2.4 Multiple Actor and Value Chain issues

A key question is “Who is responsible, or who feels responsible, for traffic safety?”

- Several parties contribute to the availability and presentation of information/services while driving:
- Systems including their HMI are provided by OEM and/or system manufacturers
- Installation of the system may be undertaken by the OEM (integrated system), dealer/supplier (after-market system) or driver (nomadic device)
- Service providers offer information/content, influence performance (response times) and presentation (e.g. running text)
- The driver or passenger who activates a certain functionality while driving.

When systems contain components from different sources (e.g. hardware, software, mapping, communications, dynamic traffic information) the individual suppliers have difficulties to influence how the system is used, even if they are aware of HMI issues. Neither the system integrator nor the purchaser (who may have specified the system functionality) may be sufficiently aware of HMI issues.

An installer of after-market system may position HMI components in such a way that safety is compromised. This may result from them being uninformed or unwilling to question the instructions given to them by a client. Furthermore, drivers may also install or use nomadic systems themselves.

The driver may be required (as part of their job) to use one or more in-vehicle systems. It is anticipated that some of the first equipped vehicles may be professional commercial ones (e.g. taxis, delivery, emergency services). Similarly, rental vehicles may be amongst the first to support new features. In both cases, the drivers may be insufficiently informed or trained to use the in-vehicle system safely.

The driver may have limited knowledge concerning the in-vehicle systems available within a vehicle; they may have recently purchased or hired the vehicle or may have limited experience of system use. The driver may use an existing in-vehicle system in a way or manner that could not reasonably have been foreseen by the manufacturer. Also, the driver may be unaware of a potential hazard involved in using a system while driving, believing it to be sufficiently safe for use, whereas wider experience suggests that there are safety problems (for example, hand held mobile phones).

A number of wider market issues also need to be noted:

- Market differences within the EU, between EU, North America and Japan/Asia (differences in traffic conditions, user preferences, driver behavior, regulation...)
- Differences in applications of HMI-principles relevant in respective markets

2.5 HMI Issues

- There is no such thing as a “safe” system; The goal of the responsible stakeholders can only be to provide a well designed system that the driver is encouraged to use in a safe manner. On the one hand the traffic situation can be extremely demanding, i.e. when making a left-turn at oncoming traffic and pedestrians crossing the road, making it difficult/risky to read the speedometer. On the other hand there are low-demanding traffic situations like driving down a long, empty road at limited speed, where the operation of secondary tasks may be regarded as safe. Two specific developments in recent years (since the ESoP was developed) have been:

- Nomadic devices (see above)
- Running text on RDS-TMC

The ESoP already applies to these cases, but the larger issue is ensuring that the principles are followed. Section 3 below concentrates on the ESoP itself before wider recommendations are made concerning the ESoP and other HMI-related matters in Section 4 and subsequent sections.

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3 Solutions Analysis Tool

It was found both convenient and useful to represent and analyse the HMI safety issues identified above within a three-dimensional matrix (figure 2). The **first dimension** is given by the system type (“systems”), because different problems were identified for nomadic systems, aftermarket systems, OEM installed systems and fully integrated systems.

The **second dimension** is given by the HMI aspect, since i.e. the responsibilities for installation, information presentation, design of interaction and use vary depending on the type of the system.

Finally the stakeholders are seen as the **third dimension** because their responsibility and contribution again depends on system type as well as on the specific HMI aspect.

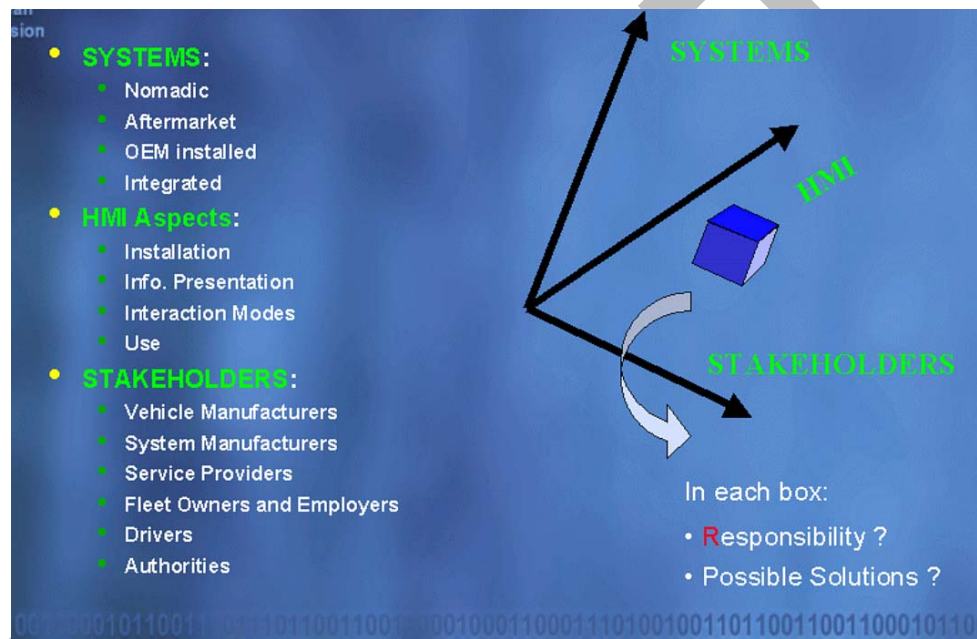


Figure 2: Idea of the 3D- Matrix on HMI as basis for identifying solutions

On the basis of this 3D-Matrix the distribution of responsibility and of potential contribution to the solution of issues can be discussed box by box. In the matrix the “R” identifies where specific Actors do have (or should have) responsibility for ensuring safety.

Example: the box “nomadic system x installation x system manufacturer” addresses the responsibility that the system manufacturer has for the correct installation of his nomadic device in a vehicle and what his contribution to the problem solution could be.

The 3D-Matrix offers the advantage that to a given question a comprehensive description of influencing factors and possible solutions can be easily obtained by “cutting out” the respective “slice” or sector of the 3D Matrix. If the question is “what can be done about the problem of nomadic devices” the sector with the two dimensions “HMI Aspects” and “Stakeholders” needs to be analysed.

Organizing the Matrix according to the HMI-Principles shows, in which respect the ESoP should be revised. Organizing it to a specific aspect reveals, which additional measures should be taken in order to address a problem.

Note that where the term “ESoP” is used, this refers to the most recent version of the ESoP i.e. a version that may be modified or extended according to the recommendations in this report.

4 Analysis according to HMI-principles

4.1 Installation

Since both system types, integrated systems and OEM installed systems, are in full responsibility of the vehicle manufacturer concerning their installation, they are combined.

Table 4-1: Installation aspects depending on system type and stakeholders

INSTALLATION	Vehicle Manufacturer	System Manufacturer	Service Provider	Fleet Owners, Employers	Drivers	Authorities
OEM installed systems including fully integrated systems	R Apply ESoP in-house	\	\	specifications according to ESoP	-	Ensure ESoP is known and used
After-Market System	may provide information on installation or installation kit according to ESoP	R Supply fitting kit according to ESoP while taking into account passive safety (i.e. ECE21 ²) Consumer information on installation	\	R installation according to ESoP	R Install systems according to installation instruction given by system manufacturer	Ensure ESoP is known and used by designers, manufacturers and fleet owners
Nomadic Device	may provide information on installation or installation kit according to ESoP	R If a system is intended by its manufacturer to be used in a vehicle, supply fitting kit according to ESoP taking into account passive safety Consumer information	\	R installation according to ESoP	R Install systems according to installation instruction given by system manufacturer while driving, no use of not securely fixed devices	Ensure secure fixing (i.e. by regular inspection of vehicles) ECE21 should apply ESoP should link to ECE21 Information to drivers

While the responsibility for System Installation is clear for OEM supplied systems, it is distributed among system manufacturers and drivers / employers.

Suggestions for revision concerning Installation Principles of ESoP

- ⇒ Since System installation is a very important aspect, the ESoP should be amended by a specific criterion and simple verification procedure. One possibility could be, to adopt the 30° rule from the current version 2.1 of the AAM-guideline for “visually intensive displays”. This would also require a precise definition of “visually intensive displays”.
- ⇒ Integrate the aspect of passive safety either by linking the relevant rule (if existing) or by explicit criteria
- ⇒ Adding a remark that the aspect of theft should also be taken into account (though not being HMI-relevant)

² ECE21 is the formal approval required for Original Equipment . It is outside the scope of this WG to check whether ECE21 is perfectly suitable in this context.

4.2 Design of Information Presentation

Again, integrated systems and OEM installed systems are combined, since there are no differences in responsibility between them.

Table 4-2: Information Presentation aspects depending on system type and stakeholders

Design of INFORMATION PRESENTATION	Vehicle Manufacturer	System Manufacturer	Service Provider	Fleet Owners and Employers	Drivers	Authorities
OEM installed systems including fully integrated systems	R Apply ESoP in-house and through sub-contracts	Apply ESoP	R, if also providing presentation Apply ESoP, e.g. running text, Internet portal; could mark pages suitable for driving	R Information/Rules for drivers	R no manipulation (e.g. of TV access)	(self-commitment of ACEA exists) Driver information
After-Market System	may supply "vehicle moving" signal or a "mute request"	R Apply ESoP switch off functions not designed for use while driving e.g. no unlimited access to Internet	R, if also providing presentation Apply ESoP, e.g. running text, Internet portal; could mark pages suitable for driving	R Specification of custom systems Information/Rules for drivers	R no manipulation (e.g. of TV access)	Identify/implement specific actions on enforcement Promote ESoP Driver information
Nomadic Device	may supply "vehicle moving" signal or a "mute request"	R Apply ESoP switch off functions not designed for use while driving e.g. no unlimited access to Internet	R, if also providing presentation Apply ESoP, e.g. running text, Internet portal; could mark pages suitable for driving	R Specification of custom systems Information/Rules for drivers	R no manipulation (e.g. of TV access, DVD)	Identify/implement specific actions on enforcement Promote ESoP Driver information

The current version of the ESoP already addresses TV and DVD use while driving.³ Although the responsibility is distributed among various stakeholders depending on system type, the driver is ultimately responsible for not manipulating or misusing the systems. Therefore it is important to inform the drivers about their responsibility and possible consequences i.e. if they watch DVD/TV while driving. Possible options of ensuring ESoP application may include the involvement of insurance company or enforcement by member states. Dynamic advertisement should be avoided inside and outside the vehicle.

Interviews with fleet owners showed that manufacturers of specific systems (i.e. medical vehicle systems, express delivery systems) are not aware about ESoP.

Suggestions for revision of current ESoP

- ⇒ Scope of ESoP should explicitly address information presentation by service providers and manufactures of specific systems (e.g. medical vehicle systems, express delivery systems)
- ⇒ provide validated procedures for the evaluation of information presentation on a single screen, i.e. by referring to an ISO-standard on the occlusion method
- ⇒ Make specific comment on the problems with running text and its high distraction potential

³ System behaviour principles: Visual information not related to driving that is likely to distract the driver significantly (e.g. TV, video and automatically scrolling images and text) should be disabled or should only be presented in such a way that the driver cannot see it while the vehicle is in motion).

4.3 Design of Interaction

Again, integrated systems and OEM installed systems are combined, since there are no differences in responsibility between them.

Table 4-3: Design of Interaction aspects depending on system type and stakeholders

Design of INTERACTION	Vehicle Manufacturer	System Manufacturer	Service Provider	Fleet Owners and Employers	Drivers	Authorities
OEM installed systems including fully integrated systems	R Apply ESoP driver information disable functions or provide driver warning, if not intended for use while driving ⁴	apply ESoP			(see "use")	(self-commitment of ACEA exists) driver information
After-Market System	may supply "vehicle moving" signal and/or accept a "radio mute" signal	R Apply ESoP disable functions or provide driver warning, if not intended for use while driving	R if providing the information presentation and interaction Apply ESoP	R for custom system Specification of custom systems	(see "use")	ensure ESoP application driver information monitoring
Nomadic Device	may supply "vehicle moving" signal and/or accept a "radio mute" signal	R Apply ESoP TV, DVD: provide an easy means to prevent misuse disable functions or provide driver warning, if not intended for use while driving	R if providing the information presentation and interaction Apply ESoP	R for custom system Specification of custom systems	(see "use")	ensure ESoP application driver information monitoring address "misuse providers" ⁵

Regarding after-market systems and nomadic devices a technical solution is needed, in order to disable functions which are not intended for use by the driver while driving or at least to provide a specific warning. One option could be that the vehicle manufacturer supplies a "vehicle moving" signal, other solutions can be found in Japan today using an electrical switch on the hand brake (if hand brake is applied, vehicle can not move).

Suggestions for revised ESoP

- ⇒ especially principle 4.3 in the final expansion of the principles stating "the system should not require long and uninterruptible sequences of interactions" should be amended by a definition of "long". Instead of using a time-based criteria, which is only valid under defined and repeatable conditions, it appears to be reasonable to define a minimum number of interactions in order to call it "long".

⁴ Because of system use by passenger

⁵ Misuse provider is somebody who facilitates misuse of a system; e.g. by providing information via the internet on how to disable the automatic TV-lock installed by an OEM

4.4 System Use

Again, integrated systems and OEM installed systems are combined, since there are no differences in responsibility between them.

Table 4-4: Aspects of System use depending on system type and stakeholders

USE	Vehicle Manufacturer	System Manufacturer	Service Provider	Fleet Owners and Employers	Drivers	Authorities
OEM installed systems including fully integrated systems	Inform provide warning or switch off functions not suitable for use while driving		-	R Information/Rules for drivers Training	R Only interact with system, if driving task permits use system according to instructions no manipulation	evaluation of use
After-Market System	-	Instructions for safe use provide warning or switch off functions not suitable for use while driving	-	R Information/Rules for drivers Training	R Only interact with system, if driving task permits use system according to instructions no manipulation	evaluation of use consumer information ⁶ Ensure non-use of e.g. TV by driver while driving
Nomadic Device	-	Instructions for safe use if device is meant to be used in a vehicle, provide warning or switch off functions not suitable for use while driving	Information concerning safe use	R Information/Rules for drivers Training	R Only interact with system, if driving task permits use system according to instructions no manipulation	R? evaluation of use consumer information Define rules (e.g. mobile phone) Ensure non-use of e.g. TV by driver while driving

Clearly the driver is ultimately responsible for system use while driving. In case an employer requires that the driver uses certain systems or functionalities as part of his work, the distribution of responsibility needs to be clarified.

Suggestions for revised ESoP

- ⇒ instruction on system use should be revised
- ⇒ Special attention should be given to use of driver information and communication systems by fleet drivers and the responsibilities of fleet managers should be better defined (See Annex C)

⁶ Consumer information: apart from consumer information by authorities there are also private organisations like EuroNCAP, Stiftung Warentest etc. who evaluate and inform about products.

5 Recommendations on a revised European Statement of Principles

5.1 Goals of a revised ESoP

First of all a revised European Statement of Principles should promote the goal of the eSafety Initiative by supporting the introduction of well designed Systems into the market and by taking into account both risks and benefits of these systems, thus not impeding innovation.

Secondly it should take into account the capabilities and constraints of all stakeholders and the market by being applicable during the development process in terms of complexity, costs and time even by small system manufacturers. Since it is the driver, who finally decides whether he buys and uses i.e. a fully integrated navigation system or a nomadic device or a paper map the intention should be to promote good HMI and less to exclude certain functionalities by simplistic pass/fail criterion.

Thirdly it is important to keep up the clear distinction between principles on installation, information presentation, design of interaction ... introduced by the ESoP, since the HMI-solution-matrix showed, that the distribution of responsibility and solutions vary according to these aspects. Moreover this clear distinction is important to maintain a logical structure easy to understand and to work with, since it helps to avoid cross references and redundancies.

5.2 Recommendations on the Scope

- ⇒ In general the distribution of responsibilities should be clarified and adequately incorporated
- ⇒ “Post-manufacture issues” including the responsibilities of Fleet Managers and Employer should be included – see Annex C for an initial draft. [eSafety WG-HMI and EC]
- ⇒ Information presentation by service providers and manufactures of specific systems should be explicitly addressed (i.e. medical vehicle systems, express delivery systems)
- ⇒ The ESoP should not extend to drivers (there are better ways to reach them) and should not extend to Authorities as there are more appropriate forums

5.3 Recommendations on Principles

In general the current version of the ESoP lacks a clear allocation of relevant standards, rules and directives to the individual principles. This causes the impression, that the principles contained in the guideline are very general and not applicable. Looking at the “Expansion of Principles” issued in June 2001 reveals, that in many cases the application of a specific principles means to comply to well defined ISO-standards, rules and directives. Therefore this Expansion of Principles should be used as a basis for a revised European Statement of Principles.

More specifically the analysis using the “HMI solution matrix” identified some cases, where existing HMI principles should be amended by specific criteria.

- ⇒ Principle 2.4 (final expansion) states, that visual displays should be positioned as close as practicable to the driver's normal line of sight. In this case it seems necessary to specify, what “as close as practicable” means. One possibility could be, to adopt the 30°-rule from the current version 2.1 of the AAM-guideline for visually intensive displays and to add a precise definition on “visually intensive displays”.

⇒ Principle 4.3 (final expansion) states “the system should not require long and uninterrupted sequences of interactions”. Here the term “long” should be defined more clearly. Since a time-based criteria would only be valid under defined and repeatable conditions, it appears to be reasonable to define a minimum number of interactions in order to call it “long”.

In addition, it may help to minimize the need of expert knowledge by linking available, scientifically well founded and accepted assessment methods to specific principles, like i.e. the occlusion technique for evaluating the complexity of visually displayed information.

Introducing additional pass/fail criteria especially on information presentation and interaction principles is regarded as problematic for several reasons: First of all these criteria do not take into account the benefit of a system or function, since they only describe a potential risk. Especially pass/fail criteria that are too simplistic (i.e. total task time) may be spurious i.e. they may exclude good HMI solutions and may not exclude bad HMI solutions /Krems et al./. Simplistic Criteria also tend to exclude certain tasks in general and this eliminates the challenge for research and industry to strive for a HMI solution which permits the performance of these tasks while the vehicle is in motion – also to avoid that the driver uses “conventional means” like a paper map. Specific interaction criteria (e.g. glance duration) and surrogate measurement methods (e.g. occlusion, lane change test) are relatively easy to describe and appear to have some face validity but their connection to safety outcomes remains to be demonstrated – validation experiments in fact show controversial results. More sophisticated measurements (e.g. driving simulator experiments, field trials) take more account of the complexity of human machine interaction, including manual, visual and cognitive demand, but are clearly very demanding in terms of resources.

From a liability perspective simplistic pass/fail-criteria for HMI may imply that it is safe to undertake those tasks which comply with the criteria while driving . But no matter how restrictively the pass/fail-criteria on HMI are chosen, there will always be traffic situations in which the operation of these tasks may cause critical situations.

Overall, therefore, the WG-HMI are cautious about accepting or defining specific criteria (beyond those already available or linked to in the Expansion of the Principles) as they may be spurious and may impede innovation – an effect contrary to the goal of the eSafety initiative.

5.4 Comparison with US and Japanese guidelines (AAM and JAMA)

Comparing the Expansions of the ESoP to the current version of the AAM-guideline reveals more or less substantial differences in spite of the fact that the ESoP and the Expansions of the ESoP clearly formed the basis for the work on the AAM Guidelines.

Some principles substantially differ as the result of small wording changes. The first ESoP Principle on Information Presentation originally addressed the visual demand associated with the presentation of a single screen, in the AAM guideline the seemingly corresponding principle addresses the complete interaction needed to complete a desired task. Thus it is not a pure principle on information presentation any more but also one on interaction.

In general the concept of task appears to be a problematic one, since the same task may substantially vary in its duration in terms of the associated number of interactions (i.e. entering a long vs. a short townname). Much more important is, that it is the driver who decides which tasks he is going to perform in which order depending on the traffic situation and other factors. If he is driving for one hour from point A to point B, he may – dependent on the traffic situation, his motivation and condition - engage in secondary task performance for ten minutes. He may use the time for one phone call, four times changing the radio station and finally for searching one title on

a CD. Consequently the effective duration of secondary task performance cannot be influenced by the system designer – but only the intensity of interaction.

5.5 Summary of Development proposals

Based on the analysis of the HMI-solution matrix and the comparison with other HMI-guidelines, the following recommendations are made by the WG-HMI in order to revise the European Statement of Principles on HMI based on their Expansions issued in June 2001:

- Careful re-wording for clarity, but no fundamental change to existing principles in terms of specific verification procedures
- Enhancing applicability by explicitly naming what needs to be done to apply a principle. Precisely link standards, rules, directives to the specific principle. In General exercise caution over specific testing criteria which may be reasonable for display position (Principle 2.4) and the definition of long interactions (Principle 4.3)
- Expansion of the scope of the principles to “post-manufacture” issues including service providers and fleet managers as described above
- Continue to monitor activities of ISO, AAM developments, research output (CAMP results are expected) and evaluate opportunities for harmonization

6 Focus Sectors of 3D-HMI-Matrix

6.1 Nomadic Devices

6.1.1 Situation Analysis

The ESoP for HMI clearly covers *any* type of information and communication system used in the vehicle, including nomadic ones. However, a nomadic device can i.e. display a movie DVD without any restrictions, while the European Statement of Principles clearly covers this situation⁷.

Because of the diversity of functions provided by nomadic devices, it is not possible to consider their use inside the vehicle per se unsafe: the level of criticality is directly related to the type of function that the driver decides to access and to the driving task (speed, road type, traffic situation etc.). A global ban of nomadic device use inside a vehicle seems unjustified. On the other hand suitable measures need to be defined in order to address nomadic device use by the driver while driving. In general, it would be difficult to control which function is currently used by the driver, if this function is or is not related to the driving task, and if this function is critical in terms of distraction.

Development of nomadic devices involves many types of widespread stakeholders who are not organised into easily identified networks and may not necessarily be aware about road safety issues.

Nomadic devices also present a physical risk in case of crashes. Indeed, these devices are usually not securely implemented in the dashboard.

6.1.2 Recommendations

Type of function and dialogue while the vehicle is moving

- If a nomadic device or a specific function is meant to be used by the driver while driving, system manufacturers and system providers should be responsible for applying the ESoP for nomadic devices and for giving clear instructions of use to drivers.
- As some functions should not be accessible to the driver while the vehicle is in motion, the system manufacturer should develop nomadic devices with the possibility of detecting when the vehicle is moving, in order to control function availability. This can be achieved i.e. by an agreement with car manufacturers, by setting up connections with the vehicle, or by using GPS information from the nomadic device itself.

Installation

- If a nomadic device or a specific function is meant to be used while the vehicle is in motion the system manufacturers should be responsible for supplying fitting kit according to ESoP for installation (comply with ECE21) and to ensure consumer information.

⁷ 8. System behaviour principles

Visual information not related to driving that is likely to distract the driver significantly (e.g. TV, video and automatically scrolling images and text) should be disabled or should only be presented in such a way that the driver cannot see it while the vehicle is in motion.

This function should not be usable while the vehicle is moving.

- Authorities should ensure secure fixing and installation for the nomadic devices referring to ESoP and i.e. to ECE21 by appropriate means (for details please see Annex)

Use

- Drivers, as well as any fleet owners and the employers, should be responsible for installing nomadic systems according to the installation instructions.
- Authorities should make information for drivers easily accessible, promoting the content of ESoP and drivers' responsibility in case of manipulation or misuse.

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6.2 Service Providers

6.2.1 Situation Analysis

In the list of Actors involved in the issue of nomadic devices (NDs) no one can be clearly identified as responsible for road safety involving their use by drivers. In the contrary case of integrated systems or OEM installed systems, it is clear that car manufacturers are identified by users and public authorities as the responsible actor ; very often they act like an “active filter”, allowing (or not) access, and integrating (or not) dedicated functions depending on their potential impact on road safety. A good, but not unique, example is the integrated smart hand free kit developed by a French car manufacturer where there is no possibility to read or write SMS while driving; this was a clear decision of the car manufacturer after evaluation of the safety impact.

The advertisement of these products often shows, that safety aspects are not taken sufficiently taken into account. Furthermore, there are no regulations applicable to nomadic devices in terms of installation and services (compared with more than 200 European Directives applicable to vehicles and vehicle equipments). In some European countries there are regulations on the use of ND – i.e. on the use of hand-held phones while driving.

Apart from the nomadic device manufacturer also the software providers and the content providers can play an active role to improve the situation in the short-term for all ND. However, for ND based on communication (and this is more and more the case) also telecom operators can play an important role, perhaps more efficiently than other actors. According to French statistics, more than 50% of mobile phone use originates from within a vehicle by drivers or passengers. Some telecommunication companies are well aware of their responsibility, others obviously try to address the full responsibility to the user. These differences can easily be identified by analysis of advertisement for certain products.

6.2.2 Recommendations

- Action plan for short-term result: **Safety Charter**
 - A limited number of key and voluntary telecom operators and software/content providers should be selected in order to develop, based on the experience of individual telecom operators, a safety charter in cooperation with the automotive industry. This initiative can be discussed and launched during the planned ERTICO workshop on ND issues.
- For medium term result (in parallel with above): **Technical Interface**
 - One solution may be a standard for interfacing between the vehicle and the ND, giving the plugged ND access to an integrated HMI (complying with E-SoP) with the capability of applying filtering criteria for access to functions depending on the driving context and the possible impact on traffic safety.

6.3 Fleet Owners and Employers⁸

6.3.1 Situation Analysis

For certain ITS services, the first vehicles equipped will be commercial ones driven by professional drivers. Some systems may be OEM supplied, but the diversity and specialist nature of the requirements involve an increasing number of after-market and custom-designed systems being used by drivers during their working day. A particular issue concerns pre-existing in-vehicle ITS systems and the compatibility, from the driver's point of view, of the different systems [Matrix: Information Presentation and Interaction].

European Health and Safety Directives apply to any employer, manager, or supervisor with staff who drive or ride a motorcycle at work, and particularly those responsible for fleet management. They include people whose main job is driving and those who drive or ride occasionally or for short distances. (However, if drivers will fully ignore instructions given to them or misuse equipment in a way that could not be foreseen by their employer, then the driver becomes fully responsible for the consequences of their misuse.)

So, the Fleet Manager/Employer has a responsibility under existing Health and Safety legislation for safety at work to ensure the safe operation of their fleet in terms of risk to drivers and other road users. Key issues are the extent to which Fleet Owners and Employers are responsible for HMI aspects of systems used by their employees and whether they are aware of these responsibilities. In outline, these are expected to cover:

1. Specification of any hardware or software purchased and their testing and acceptance – Note that ESoP already applies to their systems.
2. Installation and maintenance in accordance with the manufacturer's instructions - This may involve periodic updating of hardware and software and system re-testing.
3. Provision of both general and specific safety information in relation to the use of the in-vehicle ITS equipment provided [Matrix: Use] – This could include instructions to drivers that additional in-vehicle systems should only be installed and used by agreement with the Employer.
4. Ensuring that safety is not compromised by drivers' use of any in-vehicle systems as part of their work – This implies that training and assessment of the training are involved.

6.3.2 Recommendations

- 1. Develop ESOP to include “post-manufacture issues” including the responsibilities of Fleet Managers and Employer – see Annex C for an initial draft. [eSafety WG-HMI and EC]
- 2. Clarify the extent to which existing Health and Safety Directives include all drivers who drive as part of their work activities and include in-vehicle ergonomic safety considerations [EC Legal experts].
- 3. Undertake Europe-wide information dissemination to Fleet Managers and Employees. As a first step, this can be undertaken through European and National Member representative bodies. [EC and Member States, eSafety WG-Outreach and Industry]

⁸ Note that many of the issues raised are also applicable to the duty of care that Hire Companies and Point-of-Sale Organisations have towards their Customers, although these responsibilities and relationships have not been explicitly developed here.

- 4. depending on second recommendation: Enforce existing Health and Safety legislation through inspection [Member States]

6.4 Authorities

6.4.1 Situation Analysis

Authorities have been identified as a key actor in the implementation of eSafety systems. Authorities include both the EC and Member States and the role that each will play will depend on existing Directives and laws in specific areas.

There appears to be a lack of knowledge concerning the ESoP, and HMI principles, more generally, in some sections of the industry. Therefore, wider dissemination and use of the ESoP could be beneficial along with continued monitoring of its impact.

To encourage more responsible use of in-vehicle information and communications devices, the provision of consumer information concerning the safety and usability of in-vehicle devices may be helpful [Matrix: Use/After-Market and Nomadic Devices].

Manufacturers of integrated and OEM-installed systems are well informed concerning HMI, so the existing ACEA-self-commitment for ESoP compliance is an efficient route [Matrix: Information Presentation, Design of Interaction]. For after-market and nomadic device manufacturers, however, there are examples of systems that appear less well designed. Consequently there should also be a self-commitment of these design responsible organisations covering systems and functionalities which they intend implicitly and/or explicitly for in-vehicle use. Moreover these systems are sometimes poorly secured within the vehicle, which may pose a safety threat in case of an accident. For such devices, it also appears necessary to take measures to ensure secure fixing. One possibility is to use ECE R21 which is required to apply to OEM fitments. [Matrix: Installation/After-market and Nomadic devices]

Specific current areas of concern for HMI safety include the use of hand-held devices and visual entertainment systems (e.g. TV, DVD) by drivers while driving. [Matrix: Installation/Nomadic devices and Information Presentation/After-Market and Nomadic devices and Interaction/Nomadic devices]. This is an area of driver behaviour that could be addressed by suitable legal measures and enforcement actions to improve safety.

6.4.2 Recommendations

Communication

- ⇒ Actively ensure ESOP is effectively disseminated, known and used by designers, installers, manufacturers and fleet managers⁹
- ⇒ Provide general information to drivers on safe use of in-vehicle information and communication systems e.g. by means of safety campaigns, mass media etc.

⁹ The language used should be chosen according to the addressee (company/rental company/driver)

- ⇒ Promote self-commitment of ESOP compliance for after-market systems and nomadic devices and support provision of consumer information concerning the safety implication and usability of in-vehicle devices (via consumer organisations, EURO-NCAP etc.) [remark: ACEA already signed a self-commitment of ESOP compliance, which is only effective for integrated systems and factory installed systems]

Monitoring and Enforcement¹⁰

- ⇒ Ensure regularly updated information on the definition and dynamics of the market for aftermarket and nomadic devices
- ⇒ Continue evaluation and monitoring of the impact of the ESOP
- ⇒ evaluate and monitor the safety-impact of in-vehicle information and communication systems especially of aftermarket systems and nomadic devices (accident data analysis/collection)
- ⇒ Take measures to ensure secure fixing of aftermarket systems and nomadic devices according to ECE R21, or equivalent
- ⇒ Continue to actively enforce existing Health and Safety legislation concerning at-work driving practices
- ⇒ Take measures to ensure no-hand-held-use of nomadic devices by the driver while driving
- ⇒ Identify and take necessary actions on the unintended use or misuse¹¹ of visual entertainment systems by drivers while driving (i.e. movies, TV, video games)

6.5 Research Needs

To assess if some of the goals which are formulated in the ESoP are met by a certain HMI solution requires the availability of scientifically well founded and accepted assessment methods, which may also be efficiently used during the design process. Whereas for a number of areas covered by the ESoP a good deal of work has been done by international standardisation, the definition of criteria and methods to assess aspects of drivers' interaction with the system may be regarded as incomplete. Driver workload and the various facets of this concept have turned out to be key variables for this assessment because they define the "linkage" between HMI design and safety-related aspects of driving behaviour. For this reason there is an urgent need of research for a workload assessment and testing methodology which provides valid and reliable results and is economically applicable already in early phases of the HMI design process. Since some functions may also provide a benefit and moreover a "critical" workload depends very much on the driving task, these methods are especially valuable for relatively comparing and selecting the best from different HMI solutions.

A certain level of driver workload can be induced by numerous sources inside and outside the car and depends at the end also from drivers' behavioural responses and individual performance limitations. On the other hand the acceptable workload is largely defined by the driving task. For this reason the suggested development of an assessment and testing methodology has to be accompanied by further research on correlations with safe driving behaviour and human performance limitations in dependence of the driving task to complete the picture.

¹⁰ Enforcement on Driver Behaviour is a matter of Member States, not the EC. Therefore the EC should recommend to take appropriate measures. The choice of measure is up to the individual Member State.

¹¹ Since the TV/DVD lock can be defeated (information on internet), it may be necessary to carry out regular inspections or to take actions against the information providers

7 Summary of Recommendations

Concerning ESoP

- Careful re-wording for clarity but no fundamental changes to existing principles
- Exercise caution over additional specific testing criteria
- Extend ESoP to include “post-manufacture” issues of safety including Fleet Managers/Employers
- Continue to monitor standardization activities, EC-funded projects, AAM developments and evaluate opportunities for collaboration

Wider Context

- Authorities to seek self-commitment of Nomadic providers to ESoP
- New Regulations for Nomadic devices concerning physical construction and secure vehicle fixing
- Nomadic devices should incorporate the possibility of detecting when the vehicle is moving; on option is a vehicle moving signal supplied by the vehicle manufacturer
- Development of a standard for interfacing between the vehicle and the ND, giving the plugged ND access to an integrated HMI
- Service providers to develop “Safety Agreement” concerning presented information
- Clarify the extent to which existing Health and Safety Directives includes in-vehicle ergonomic safety considerations and remind Fleet owners and Employers of their responsibilities
- Authorities to undertake market surveys and continue monitoring of ESOP and distraction related accidents
- Authorities responsible for dissemination of HMI guidelines, consumer information, monitoring and enforcement
- Authorities to identify and implement specific enforcement actions. Two areas are use of hand-held devices and use of visual entertainment systems by drivers while driving
- Continue research on quantitative measures of driver behaviour and on the evidential basis for safety impacts of in-vehicle information systems as a function of the driving task

¹² System behaviour principles: Visual information not related to driving that is likely to distract the driver significantly (e.g. TV, video and automatically scrolling images and text) should be disabled or should only be presented in such a way that the driver cannot see it while the vehicle is in motion).

¹³ Because of system use by passenger

¹⁴ Misuse provider is somebody who facilitates misuse of a system; e.g. by providing information via the internet on how to disable the automatic TV-lock installed by an OEM

¹⁵ Consumer information: apart from consumer information by authorities there are also private organisations like EuroNCAP, Stiftung Warentest etc. who evaluate and inform about products.

¹⁶ Misuse provider is somebody who facilitates misuse of a system; e.g. by providing information via the internet on how to disable the automatic TV-lock installed by an OEM

¹⁷ 8. System behaviour principles

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- Visual information not related to driving that is likely to distract the driver significantly (e.g. TV, video and automatically scrolling images and text) should be disabled or should only be presented in such a way that the driver cannot see it while the vehicle is in motion.
 - This function should not be usable while the vehicle is moving.

¹⁸ * i-mode is a language that gives access to content; it is analogous to Orange World , Vodafone Life, etc.

¹⁹ Note that many of the issues raised are also applicable to the duty of care that Hire Companies and Point-of-Sale Organisations have towards their Customers, although these responsibilities and relationships have not been explicitly developed here.

²⁰ consumer information: apart from consumer information by authorities there are also private organisations like EuroNCAP, Stiftung Warentest etc. who evaluate and inform about products.

²¹ misuse provider is somebody who facilitates misuse of a system i.e. by providing information via the internet, how to disable the automatic TV-lock installed by OEM

ANNEX A Composition of WG-HMI

The Working Group was established in February 2003, initially for the period of 2 years (February 2003- January 2005). The participants consist of two groups and the Commission.

The Expert Group consists of a small number of participants, to promote efficient group working. The membership is:

Expert (Core Group)	Organisation
Daniel Augello	Renault (F)
Stefan Becker	Ford (Ge)
Replaced by Ander Hallen (since March 2004)	Volvo (Sweden)
Lutz Eckstein	Daimler-Chrysler (Ge)
Winfried Koenig (since June 2004)	Bosch
Annie Pauzie	INRETS (F)
Christhard Gelau	Bast (Ge)
Alan Stevens	TRL (UK)

The Ring Group consists of a wider group of interested experts

Expert (Ring Group)	Organisation
Michel Fond	Orange France (France)
Sylvia Gotzen	FIGIEFA (Belgium)
Christophe Guillaneuf	FIGIEFA (France)
Paul Piamonte	Volvo Technology Corporation (Sweden)
Lennart Palmqvist	Volvo Technology Corporation (Sweden)
Martin Rowell	Navtech (Netherlands)
Vincent Godec	Navtech (Netherlands)
Jean-Pierre Cheynet	UTAC (France)
Angelos Bekiaris	CERTH – HIT (Greece)

²² The language used should be chosen according to the addressee (company/rental company/driver)

²³ Enforcement on Driver Behaviour is a matter of Member States, not the EC. Therefore the EC can only recommend to take appropriate measures. The choice of measure is up to the individual Member State.

²⁴ Since the TV/DVD lock can be defeated (information on internet), it may be necessary to carry out regular inspections or to take actions against the information providers

Joachim Scholten	BMW (Germany)
Bernard Favre	Renault VI (France)
Oliver Carsten	Leeds University (UK)
Cathy Jenkins	UK Dot (UK)
JanPaul.Peters	yamaha-motor(nl)
Christopher Patten	SNRA (Sweden)
Patrice Reilhac	VALEO

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ANNEX B Summary of Member State Responses

The comments received from the Member States are quite varied. All of them recognise interest in the principles but also its lack of details. They are waiting for a more elaborated document, stating that the subject is of importance. As for industry, it is quite favourable to the principles in order to stabilise the market. Nevertheless, it is also sceptical about rules which constrain too much that might affect competition between the brands.

Position of Denmark:

Such a recommendation is welcome but as there are practically no car manufacturers or equipment suppliers in Denmark, **the European Statement of Principle does not really apply to Danish industry.**

Position of Great Britain:

A large number of organisations were contacted and where appropriate, provided information about the recommendation. Moreover, in-depth interviews were held with individuals involved in the design or manufacture of in-vehicle information systems. The feedback received suggests that only a relatively small number of in-vehicle information communication and entertainment systems are designed and manufactured in the UK. The UK indeed is more focused on distribution sales and service provision. Knowledge about the recommendation among those who do the design and manufacture these systems in the UK varied considerably.

- The motor manufacturing companies appeared well informed and stated that they apply the principles during the design process. Others (who?) have little or no knowledge of the recommendation, relying instead on input from academic institutions, ergonomic literature and consultant ergonomists, or simply trial and error, for their design information.
- 23 systems have been evaluated to assess the extent of their compliance with the European principles. A national safety checklist was utilised to provide an initial assessment of whether or not a system complies with the principles.
- The UK approach of checklist assessment has proved extremely valuable as a method of providing a consistent and swift account of compliance with the European Commission.
- **The survey has identified a number of areas where the recommendation could be strengthened.** These include the use of mobile data terminals by fleets of vehicles, the 3 responsibilities of individuals involved with after market devices and multiple component systems, and assessment criteria for context specific applications.
- To conclude, the results of the survey and evaluation show that the future Statement of Principles should be an important issue within Europe and internationally. **The format of the future document remains open but there is no explicit willingness for a directive. European guidelines seem preferable.**

Position of Germany:

A survey was driven with a questionnaire directed at the German car industry and component supply industry, and completed with on site visits to important international manufacturers. In parallel, an investigation was conducted into the criteria applied for the safety assessment of HMI. The conclusions were:

- German car manufacturers and suppliers of original equipment use the following procedures for ensuring that use of the HMI of information and communication systems remain compatible with the driver's task of driving the vehicle.
- Compliance with the recommendation is ensured by integrating the principles in the quality management systems of the relevant manufacturers.

- Even prior to publication of the principles, national guidelines and company internal design criteria for HMI were being applied as precursors to the European statement of principles.
- The market must be considered as a controlling factor.
- There is still a substantial need for research on the methods available and their scientific foundation.
- There is a need for research and action on the misuse potentials of information and communication systems.
- It is proposed to include service providers on a EU wide basis as a target group in the Recommendation of the European Commission
- There is a need for more precise details in the statement of principles about the combination of several systems during a retrofit
- Finally, the principles should retain their character of recommendation. It is not considered as necessary to take legislative measures with the exception of a regulation dealing with the installation of retrofit equipment.

Position of Sweden:

The progress made in respect of the EC requirement is as follows:

- A memorandum of understanding has been drafted, involving all of the major car manufacturers in Sweden, but remains unsigned up to now. This is because the Swedish manufacturers seek a European-wide solution to the HMI European Statement of principles rather than purely national agreements. The main reason for not signing the MoU is a matter of fair play and equal competition between European Union members. **The Swedish authorities support this view and are favourable to a European directive uniformly applicable to all Member States.**

Position of France:

A large survey has been completed and a second one which especially concerns especially professional drivers is in progress. The results of the first survey were: The recommendation is valuable but very general. The principles are generally well followed by the actors but a problem remains unsolved for nomadic devices;

- From the point of view of the French authorities, one of the potential solutions is to create a licence for authorising the implementation in the market of on board devices. Any product that has not received this agreement could be taken out of the market by the authorities. In that context the Statement of principles would be a basis both for the designers of the tools and for the evaluators. No position regarding the European format of the next document to be issued is given, neither willingness nor reluctance.

ANNEX C Employers Responsibilities and Relevant Legislation

Guidelines for Employers

- Employers requiring or expecting their staff to use in-vehicle systems should ensure that the safe operation of the vehicle is not compromised by the system and that the driver or other road users are not put at risk.
- Employer should ensure that the system is maintained in accordance with the manufacturer's instructions.
- Adequate training should be given on all systems that drivers are required to use. There should be a clear distinction between systems or functions that are intended (by the employer) to be used while driving and those that are not. Training should be recorded and its effectiveness assessed.
- Employers should ensure that anyone required to use an in-vehicle system whilst driving is capable of doing so without endangering themselves or other road users.
- A copy of the manufacturer's user instructions should be provided (and remain) in every equipped vehicle.
- Company procedures should not cause or encourage the driver to misuse any system (such as listening to, or reading, complex information while driving, or even being required to make difficult business decisions 'live' on the phone etc). Similarly, company reward (incentive) or punishment schemes should not encourage system misuse.

Legislation

Many aspects of vehicle design, especially those related to safety, are highly regulated. In addition, there are industry Codes and design recommendations, including the European Statement of Principles (ESOP) relating to the design and use of in-vehicle information and communication systems.

The EC Road Safety Charter has been introduced to provide a framework for specific and voluntary undertakings in support of the eSafety goals. Many of the general provisions are relevant to Fleet Managers and Employers including, for example:

- Safety performance measurement ... in the ...organisation of professional activities
- Initial and continuous driving training and information...
- High quality actions in motor-vehicle equipment and ergonomics
- Technologies for reducing the consequences of road traffic accidents
- Monitoring ... compliance with traffic rules by persons acting in my name

European Health and Safety Directives apply to any employer, manager, or supervisor with staff who drive or ride a motorcycle at work, and particularly those responsible for fleet management. They include people whose main job is driving and those who drive or ride occasionally or for short distances.

Legislation and its application varies throughout the EU but basically makes employers responsible for managing health and safety effectively and for assessing the risks to health and

safety of their employees. For example, UK guidance makes it clear that this includes ergonomic considerations and use of mobile telephones. So, by extension each person or organisation involved in supplying or using electronic systems within a vehicle has responsibilities to ensure that systems do not compromise either the safety of the users themselves - or of other road users.

A number of Directives have been established to protect the health and safety of workers at work. First there was a Framework Directive and then a series of individual Directives on different topics, including, for example transport activities. The essence of these Directives are then enacted within National legislation.

Framework Directive:

- Council Directive 89/391 of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work, Official Journal n° L 183, 29.06.1989, p. 1.
- URL: <http://europe.osha.eu.int/legislation/directives/a1.php3>

Individual Directive:

- Amended proposal for a Council Decision concerning the minimum safety and health requirements for transport activities and workplaces on means of transport - Individual Directive within the meaning of Article 16 of Directive 89/391/EEC /* COM/93/421FINAL - SYN 420 */ , Official Journal C 294 , 30/10/1993 p. 0004

Specific National Legislation and Guidance (UK):

- Health and Safety at Work etc Act 1974 Ch 37 (ISBN 0 10 543774 3)
- The Management of Health and Safety at Work Regulations 1999 SI 1999/3242 (ISBN 0 11 085625 2)
- Driving at Work - Managing work-related Road Safety. UK Health and Safety Executive September 2003 (ISBN 0 7176 2740 3)

ANNEX D Definitions

nomadic system: are often not specifically designed for in-vehicle use and brought into the vehicle by the driver, i.e. hand-held telephone, PDA, MP3-Player ... rework

aftermarket system: system specifically designed for in-vehicle use but not sold by the vehicle manufacturer; rework according to text

OEM installed system: system which can be ordered with the vehicle from its manufacturer and is factory installed (from classic radio to MB COMAND, BMW i-Drive ...)

System Integration: ... rework physically fully integrated, brand specific system which often comprises many applications like audio, telephone, navigation, i.e. Mercedes-Benz COMAND, BMW i-Drive, Audi MMI

Service Provider: Service Provider is a person or organisation supplying information e.g. geographical or congestion information but may also provide the information presentation (running text, web portals) ... t.b.d.

Fleet Owners and Employers: including Car rental Companies, Taxi Companies