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Standardisation, including industrial aspects of electronic commerce

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STANDARDISATION MANDATE FORWARDED TO THE EUROPEAN STANDARDISATION BODIES IN THE FIELD OF ROAD TRANSPORT TELEMATICS

1. TITLE

Standards for Road Transport Telematics (RTT) including interfaces with other means of transport for passengers and freight.

2. RATIONALE

2.1 Potential of Telematics Applications for Transport

Telematics brings together two powerful new technologies - information and telecommunications. It offers the prospect of significant improvements to the safety, efficiency and convenience of modern transport and a counter to the destructive effects of traffic congestion and accidents, environmental pollution and unreliable journeys. New applications and pilot projects have shown how Road Transport Telematics can, as part of an intelligent transport system, serve transport policy objectives, including the Common Transport Policy and support the development of the Trans European Transport and Telecommunications Networks and the Information Society.

More specifically, Road Transport Telematics will benefit individual citizens by making driving safer and easier with fewer delays. It can help transport service providers and fleet managers by providing logistical and management support. Road operators can use RTT to manage traffic more effectively and reduce congestion, and by allowing a more efficient use of infrastructure, RTT gives in many cases policy makers an alternative to road building. RTT can also have a positive effect on the environment by encouraging the use of public transport, helping to secure a more balanced and improved modal mix, reducing pollution and securing a more efficient use of energy sources. At the same time market opportunities for industry and "added value" service providers will be created as part of the growing Information Society. The potential of RTT has been recognised by

the European Commission, the Council of the European Union, the European Parliament and the Economic and Social Committee.¹

2.2 Need for European Standardisation

The Information Society is coming to affect almost all sectors of the economy, as well as the lives of European citizens, through the provision of new products and services, and improved access to already existing ones. One sector of the economy where better access to timely and reliable information has an immediate impact on our daily lives is transport: efficiency and safety gains from a better knowledge of how transport networks perform and how to manage them more effectively are proven; on-line travel and traffic information provide opportunities for new “added value service” businesses for the benefit of people and transport operators; tele-services will affect mobility; and finally the automotive and transport industries will benefit from the market demand for new products. The Information Society and intelligent transport infrastructures will benefit each other by addressing common issues such as interoperability, security, liability and privacy. The importance of technical harmonisation for the development of the global information society has been recognised by the Council Resolution 96/C 376/01(5) of 21 November 1996 on new policy-priorities regarding the information society.

In its recent Communication to the Council and the European Parliament on a Community strategy and framework for the deployment of road transport telematics in Europe (COM(97) 223 final of 20.05.97), the Commission has clearly identified that technical harmonisation, including standardisation, publicly available specifications, protocols, reference position documents, etc, and the development of Memoranda of Understanding by the actors involved, are vital in order to ensure an appropriate level of interoperability between infrastructures and services so as to provide an optimum service to users. The Communication identifies five priority areas, namely RDS-TMC (Radio Data System - Traffic Message Channel), Electronic Fee Collection (EFC), Traffic Data Exchange, Human/Machine Interface and System Architecture, where specific initial actions need to be taken in order to facilitate the implementation of RTT in Europe.

The priorities identified in the Communication have been supported by European industry and users in the forum that was held by the Commission services in January 1997. At the meeting, the participants also requested urgently strong support for standardisation activities (European and International) and RTD activities from the Commission and national governments.

Furthermore, in its Resolution of June 1997 on the deployment of Road Transport and Electronic Fee Collection, the Council of Ministers calls on the Commission and

¹ Council Resolution 94/C 309/01 of 24.10.94 on telematics in the transport sector, Commission Communication COM(94) 469 of 4.11.94 on telematics applications for transport in Europe, Resolution of the European Parliament PE 212.659/fin of 29.6.95 on COM(94)469, Council Resolution 95/C 264/01 of 28.9.95 on the deployment of telematics in the road transport sector, Opinion of the Ecosoc CES 1160/95 of 25.10.95 on COM(94) 469, Council Resolution 97/C 194/03 of 17.06.97 on electronic fee collection / road transport telematics) and Commission Communication COM(97) 223 final of 20.05.97 on a community strategy & framework for the deployment of road transport telematics in Europe.

Member States to take action to promote the acceleration of the standardisation process on the basis of the strategy for the deployment of telematics applications for road transport, as defined in the Communication, taking into account the views of industry and users. The Council also calls for the development of a strategy for the convergence of EFC systems in Europe, based on already existing systems and the work in the European standardisation bodies.

Last but not least, in the area of Heavy Goods Vehicles taxation and tolling, EC Directive 93/89² clearly refers to the desirability of achieving interoperability between electronic toll and/or user-charge systems. In its current proposal for a new Directive³ intended to replace Directive 93/89, the Commission, in line with its conclusions in the Green Paper on Fair and Efficient Pricing in Europe, puts forward a more refined Community framework for charging heavy goods vehicles. Interoperability is again one of the requirements that Member States introducing electronic charging systems need to satisfy.

2.3 Relationship with Electronic Commerce

In the area of transport it is expected that two major forms of electronic commerce will emerge: business to business and business to consumer. One of the most important objectives in this sector is the creation of “one stop shopping” and multi-modal transport both for freight and for passengers. The use of smart cards and electronic purses for transport payment, both static and “on the move”, needs a consistent and secure architecture, where a number of key “horizontal” issues affecting the entire electronic activity, like data security and privacy, are very important. The Commission Communication on Intermodal Freight Transport COM(97)243 highlights the need for a common architecture for real time intermodal information and transaction systems.

Areas of application may include, but are not limited to, standards and solutions for the provision of services like the creation of “one-stop shopping” for multimodal travel and traffic information, reservation and ticketing.

2.4 The International Picture

The establishment of CEN TC278 and the good start of RTT standardisation in Europe was the incentive for creating ISO TC204 on Transport Information and Control Systems in 1993. However, the European participation in ISO TC204 activities has always been low.

Due to the fact that the work programmes of CEN TC278 and ISO TC204 are very similar, a co-operation agreement, based on the Vienna agreement, has been established in order to avoid duplication of effort. According to the agreement, for each work item, one of the “corresponding” Working Groups either from CEN or from ISO is given the lead. For the work items where there is no overlap, responsibility is with the originating committee.

² Council Directive 93/89/EEC of 25.10.93 on the application by Member States of taxes on certain vehicles used for the carriage of goods by road and tolls and charges for the use of certain infrastructures.

³ Proposal for a Council Directive COM(96)331 Final, OJ C 59, 26.2.1997 on the charging of heavy goods vehicles for the use of certain infrastructures

In 1993, as part of the Intermodal Surface Transport Efficiency Act the US Administration funded a \$38 million programme (100% funding) that resulted in 1996 in the development of a US National ITS Architecture. This architecture provides a framework for the design of Transport Telematic Systems and has a substantial impact regarding standardisation as it identifies and specifies the requirements for the interface standards needed to support national and regional interoperability as well as product standards needed to support economy of scale considerations for equipment supply. In addition, since 1996 the US DOT finances standardisation activities through the relevant US bodies with a budget of \$16 million for a period of 5 years with a very tight schedule of priorities and deliverables.

In Europe, as user needs and priorities are different, a co-ordinated European action is needed in order to define a European Transport Telematics Architecture, based on European user needs, including European results and taking account of what already exists in Europe. This way, a European view on RTT Architecture can be promoted in ISO.

2.5 Links with European Union RTD Programmes

The definition and agreement of common specifications as an input to standardisation bodies have always been one of the key objectives of the EU RTD Programmes dealing with Transport Telematics. The first such programme, called DRIVE, facilitated in 1991 the setting up of the CEN TC278 Committee on “Road Transport and Traffic Telematics” and promoted the award of mandates to the European Standards bodies. In fact, as early as 1992 and with the support of the DRIVE Programme, a joint CEN/CENELEC/ETSI “Transport Expert Team (TET)” produced a Work Programme in this field with work items ranging from Applications (e.g., Automatic Fee Collection and Access Control, Travel and Traffic Information, Traffic Control, Public Transport), to Databases (e.g., Road, Traffic and Geographic Databases), Interfaces (e.g., Intersystem, air and user interface), and Basic Concepts (e.g., terminology and architecture). The majority of the proposed work was allocated to CEN TC278, with contributions in their fields from CENELEC (TC 214, although this Committee has been dormant until recently) and ETSI (mainly STC/RES08).

A close link has been maintained between the RTD Programmes and the standardisation world. The RTD projects have set up task forces which contribute to the standardisation work of different working groups of CEN TC278. Inputs from the projects to the standardisation process include recommendations for the creation of Working Groups and Sub-Groups and the definition of Work Items. Significant contributions have been made towards open system architectures, design, process and performance standards and detailed functional specifications.

3. PREVIOUS STANDARDISATION ACTIVITIES

As mentioned above, development of European standards for Road Transport Telematics started in 1991 with the creation of CEN TC278 on Road Transport and Traffic Telematics. In 1993, in order to accelerate harmonisation, the European Commission forwarded to the European Standardisation bodies the mandate M/018 to produce European standards (pre-standards in the first phase) in order to ensure pan-European interoperability of Road Transport and Traffic Telematics. In 1995 the mandate M/210 followed, which referred specifically to the preparation of a work programme for the development of voluntary European harmonised standards for automatic toll collection systems. Later the same year, a third mandate (M/211) addressed the elements involved in the use of IC cards in automatic road toll collection systems in Europe.

As of September 1997, twelve European Pre-standards (ENV's) have been produced (see Annex). In addition, more than 40 documents have reached committee stage and 12 Internal Technical Reports (ITR) are available.

4. PURPOSE OF THE MANDATE

Since the Transport Expert Team reported and the TC278 programme of work was drawn up, obviously the markets and technology involved have undergone a rapid evolution, although perhaps not quite as rapid as might have been thought. It therefore seems appropriate, after half a decade, to examine the market in this field, to ensure that the standardisation programme is in line with current requirements, and in particular that there are no gaps nor any ongoing work which the market has passed by.

Main objectives are to achieve interoperability and to avoid non-compatible in-vehicle units.

4.1 Phase 1 - Evaluation of the global situation on RTT standardisation

The European Standardisation bodies are therefore invited to study and assess the global situation in the area of RTT standardisation, in order to identify:

1. the current typical European dimension in terms of markets and technologies, including systems in operation, in the area of RTT;
2. the implications for European industry, including the investments made in existing systems and its prospects outside Europe;
3. the situation with regards to international/European/national standards, publicly available specifications, etc, which are currently published or in the process of being drafted;
4. the present level of participation of European manufacturing and service industries and users in standardisation activities;
5. actions that need to be taken by the different actors involved in European standardisation in terms of new and modified standardisation requirements.
6. missing links with ongoing RTD programmes, and actions which are necessary to improve the cooperation between RTT standardisation and RTD projects.
7. a suitable deadline for the adoption of European Standards in the area of RTT.
8. which ENV's should be transposed into EN's.
9. a framework system architecture, including the definition of critical interfaces.

A report on the above items shall be presented as result of this Phase to the Commission, who will inform the Member States through the SOGITS and the 83/189 Committees.

This Phase will start no later than 1 month after the signature of the contract. This study should be carried out within 3 months, in order to provide a base document for the Phase 2.

4.2 Phase 2 - Elaboration of a revised common work programme

The European Standardisation bodies are invited to develop a revised common work programme in the area of RTT, on the basis of the current assessment of the global situation and the priorities established in the Commission Communication COM(97) 223 of May 1997 and the Council Resolution of June 1997. Specifications and consensus documents resulting from the EU RTD Programmes should also be taken into account.

The work programme shall list all work items to be standardised, indicating lead responsibility, priority, deliverable and timetable. It will show the involvement of automotive manufacturers, network providers and users. It is desirable that these parties and the relevant European Standardisation Bodies sign a Memorandum of Understanding in which they commit to contribute to the development of European standards, and to implement them as soon as they are available. The programme shall be presented to the Commission, who will inform the Member States through the SOGITS and the 83/189 Committees.

All interested parties like ERTICO, ACEA, UITP, IRU, ASECAP, POLIS, etc., will be consulted before the finalisation of the work programme, with a view to ensure acceptance and support. A specific Workshop will be organised for this purpose.

This Phase will start at the end of Phase 1 and will last 3 months.

4.3 Phase 3 - Elaboration and adoption of European standards

Following successful completion of Phases 1 and 2, including the consultation of the Commission and of the relevant Committees, the European Standards Bodies shall develop and take the necessary steps for formal adoption of a set of European Standards (EN's) as well as for transposition, where relevant, of ENV's into EN's on the basis of the work programme defined in Phase 2.

It is important to take full advantage of international standardisation and to use all necessary instruments to ensure European participation at international level.

4.4 Necessity for close collaboration

While carrying out all three phases, appropriate co-ordination and liaison with relevant activities (e.g. automotive manufacturers, service and network providers, etc.) should be established, both at international and regional levels, to achieve the necessary level of coherence and interoperability.

Liaison has to be established with other areas of ICT standardisation, and due account also has to be taken of requirements in domains such as transport policy.

Within the ICT standardisation domain co-ordination shall be ensured, through existing or dedicated machinery, with relevant ISO, CEN, CENELEC and ETSI activities. Adequate liaison should also be established with RTD programmes such as ESPRIT, ACTS, the Telematics Applications for Transport Programme, the Transport Research Programme and, in the future, the Fifth Framework Programme.

4.5 Follow-up of the three phases

Elaboration and implementation of the work programme will be subject to a follow-up by the national authorities through the SOGITS and the 83/189 Committee. Therefore progress reports on the execution of this mandate shall be presented by the three European Standards Bodies to these committees every six months.

If necessary, the Commission will organise, during the ongoing process, public meetings with all interested parties, to verify whether the activities carried out in the programme will meet the real needs of the market and policy objectives.

4.6 Evaluation report

Four years after the adoption of the standards, an evaluation report shall be presented by the European standards bodies to the Commission on the use of these standards in real implemented systems, on their economic impact on the transport ICT industry and on the impact on the transport sector itself.

The terms of reference of the report shall be agreed between the three European standards bodies and the Commission services.

5. EXECUTION OF THE MANDATE

For the execution of the different phases of the mandate, all relevant market players need to be involved. Special attention should be given to user participation as well as consumer involvement.

Relevant problems and suggestions for changes in the execution of this mandate shall be communicated in time to the Commission services.

5.1 Report on the global situation

The report on the global situation shall be submitted to the Commission within 3 months from the start of Phase 1.

5.2 Elaboration of the work programme

The common work programme shall be submitted to the Commission, after consultation with interested bodies, within 3 months from the completion of Phase 1.

5.3 Elaboration of the standards

Acceptance by the European Standard Bodies of the programme shall, for all items on this programme, start the standstill clause referred to in Article 7 of Directive 83/189/EEC of 28 March 1983 (OJ n° L 109 of 26 April 1983), amended most recently by directive 94/10/EEC (OJ n° L 100 of 19 April 1994).

CEN, CENELEC and ETSI shall co-operate closely at all necessary levels to produce and adopt a coherent and complete set of European standards in conformity with the work programme.

Within 6 months after their adoption, the standards shall be transposed into national standards and diverging national standards shall be withdrawn from the catalogues of the nation of standards organizations in the Member States of the European Union.

5.4 Final Report

A final report shall be submitted to the Commission for approval on completion of the Work Programme. The final report will summarise the work carried out, the results obtained and will contain an assessment of the use of these standards in real implemented systems, on their economic impact on the transport ICT industry and on the impact on the transport sector itself.

6. STANDSTILL

For the terms of Article 7 of the Directive 83/189/EEC, the standstill applies for the standards developed under this mandate.

7. ALIGNMENT WITH OTHER INTERNATIONAL WORK

Proposals for Road Transport Telematics standardisation shall be based on existing standards. Account shall be taken of relevant work done in ETSI/CEN/CENELEC. As Road Transport Telematics is of interregional interest alignment with equivalent activities in other regions and in ISO should be ensured.

ANNEX. ACHIEVEMENTS TO DATE

CEN Stage 66 (ENV available)

ENV ISO 14904	Automatic Fee Collection (AFC) - Interface specification for clearing between operators.
ENV 12896	Public transport - Reference data model.
ENV 12315-2	Traffic and Traveller Information (TTI) - TTI Messages via Dedicated Short-Range Communication - Part 2: Data specification - Uplink (vehicle to roadside).
ENV ISO 14825	Geographic Data Files.
ENV 12834	Dedicated Short-Range Communication - Application layer.
ENV 12795	Dedicated Short-Range Communication (DSRC) - DSRC Data link layer: Medium Access and Logical Link Control.
ENV 12314-1	Automatic vehicle and equipment identification - Part 1: Reference architectures and terminology.
ENV 12315-1	Traffic and Traveller Information (TTI) - TTI Messages via Dedicated Short-Range Communication - Part 1: Data specification - Downlink (roadside to vehicle).
ENV 12694	Public transport - Road vehicles - Dimensional requirements for variable electronic external signs.
ENV 12796	Public transport - Road vehicles - Validators.
ENV 12313-2	Traffic and Traveller Information (TTI) - TTI Messages via traffic message coding - Part 2: Event and information codes for Traffic Message Channel (RDS-TMC).
ENV 12253	Dedicated Short-Range Communication - Physical layer using microwave at 5.8 Ghz.
ENV 12313-1	Traffic and Traveller Information (TTI) - TTI Messages via traffic message coding - Part 1: Coding protocol for Radio Data System - Traffic Message Channel (RDS-TMC) using Alert C.

ETSI draft Standards

draft EN 300 674 (RES08): Radio Equipment and Systems (RES) - Road Transport and Traffic Telematics (RTTT) - Technical characteristics and test methods for data transmission equipment operating in the 5.8 Ghz Industrial, Scientific and Medical (ISM) band

Draft standards passed CEN Stage 31

Stage 32

- ENV Public transport road vehicle scheduling and control systems - On board data transmission between equipment inside a vehicle - Part 2: Cabling
- ENV ISO 14907 Electronic Fee Collection - Test Procedures for user and fixed equipment - Part 1: Description of test procedures

Stage 44

- ENV 15625 Dedicated Short-Range Communication (DSRC) - DSRC Profiles for RTTT applications.
- ENV Freight and Fleet Management Systems - Reference architecture and terminology - Part 1: high level architecture and terms.
- ENV DATEX - Net Specifications for Interoperability
- ENV DATEX Dictionary
- ENV 15626 Dedicated Short-Range Communication - Physical layer using infrared at 850mm.
- ENV 12313-3 Traffic and Traveller Information (TTI) - TTI Messages via traffic message coding - Part 3: Location Referencing for Alert C
- ENV 12313-4 Traffic and Traveller Information (TTI) - TTI Messages via traffic message coding - Part 4: Coding protocol for Radio Data System - Traffic Message Channel (RDS-TMC) using Alert C with Alert Plus
- ENV 12314-2 Automatic vehicle and equipment identification - Part 2: Numbering and data structures.
- ENV 12314-3 Automatic vehicle and equipment identification - System parameters.
- ENV ISO 14813-3 Road Transport and Traffic Telematics (RTTT) - RTTT Reference Architecture - Data Presentation in ASN.1.

Stage 49

- ENV ISO 14813-2 Road Transport and Traffic Telematics - Architecture and Terminology - Requirements for Architecture Description in TICS Standards.
- ENV ISO 15006-1 Road Vehicles - Man Machine Interfaces - Auditory information presentation
- ENV ISO 15007-1 Road Vehicles - Man Machine Interfaces - Measurement of driver visual behaviour - Definitions and metrics

ENV ISO 15008-1 Road Vehicles - Man Machine Interfaces - Visual presentation of information

Stage 61

ENV Public transport road vehicle scheduling and control systems - On board data transmission between equipment inside a vehicle - Part 1: Definition of the transmission bus and general application rules.

ENV 12313-1 Review of ENV 12313-1: Traffic and Traveller Information (TTI) - TTI Messages via traffic message coding - Part 1: Coding protocol for Radio Data System - Traffic Message Channel (RDS-TMC) using Alert C.

ENV 13093 Public transport - Road vehicles - Driver's console mechanical interface requirements - Minimum display and keypad parameters.

ENV 13106-1 Traffic and travel data dictionary - Part 1: General definitions, entities, attributes.

ENV ISO 14906 Electronic Fee Collection - Application interface definition for Dedicated Short-Range Communication