COMMISSION OF THE EUROPEAN COMMUNITIES

COMMUNICATION FROM THE COMMISSION TO THE COUNCIL
AND THE EUROPEAN PARLIAMENT

on

TELEMATICS APPLICATIONS

FOR TRANSPORT IN EUROPE

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SUMMARY

Now that the European Single Market has been established and is beginning to function an efficient communications network is required. The White Paper on Growth, Competitiveness and Employment recognised this and proposed two major development areas: the Information Highways towards a Global Information Society and the trans-European network for transport towards a sustainably mobile society.

The marriage of information and telecommunication technology provides new systems and services, known as telematics applications, which have inspired high expectations about their beneficial application in the transport sector both for transport operators by offering better management tools, and the users of the transport systems by offering better information and value added services.

In Europe both industry and academia have invested significant efforts in the R&D phase of the technological development giving them a short-term advantage over their competitors elsewhere in the world. In addition public administrations have committed resources and offered their infrastructure for the experiments. This advantage is, however, at risk if European players still hesitate to invest in the necessary telematics infrastructure to facilitate transport management, and in particular value added services.

The responsibility for Transport Telematics investments in the Community is very diffused. The tendency is towards isolated solutions, not fully exploiting the advantages of the Single Market as a coherent economic and business area and loosing the benefits of synergies between the communication and the transport sector. This requires urgent action at Community level on standardisation and, together with the Member States, appropriate harmonisation of regulatory and legal issues, promotion of common solutions, co-ordination of regional and local efforts in implementation of telematics systems and services for the benefit of the European transport sector as a whole.

The purpose of this communication is to define measures for the development of Telematics infrastructure in all modes of transport, together with proposals for deployment which can :
- ➤ secure more efficient, safer and less polluting transport operations.
- ➤ open the transport market for telematics services and products benefiting industrial efficiency.
- ➤ encourage the promotion of new public-private partnerships for implementing telematics applications in the transport sector.

For this purpose this communication gives an overview of activities at Community level, on-going or envisaged, in the field of deployment of telematics systems and services for transport. The need for operational recommendations and for an action plan is emphasised, and a first outline of required actions by the Community is proposed.

The July Communication to the Council and the Parliament on "Europe's way to the Information Society"[1], proposes a framework for the various actions needed for the promotion of the Information Society at Community level. This Communication on Telematics for Transport is one of the first application areas on which more detailed actions are outlined.

The overall agenda for Community actions in the area of Transport Telematics is therefore targeted on:
- ➤ Development of the Telematics Infrastructure
- ➤ Defining priority telematic applications in the transport sector
- ➤ R&D activities related to Transport Telematics
- ➤ Setting up a co-ordination framework for promoting the necessary actions.

The Commission invites the Council and the European Parliament as well as the Social and Economic Committee and the Committee of Regions to debate the issues and to give political impetus to the development of this action programme.

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[1]   COM (94) 347 of 19 July 1994

I. THE CHALLENGE: TRANSPORT, TELEMATICS AND THE INFORMATION SOCIETY

The Single Market is now virtually complete. This aims at an open, decentralised economy driven by market forces, also assisting the social life of the citizens. Such an economy and society needs both proper exchange of information and knowledge and appropriate mobility of goods and persons; in other words, efficient communication throughout the Community. A more extensive use of the Information / Telecommunications networks in the future also offers new opportunities for the development of the European Transport sector.

The Treaty on the European Community provides instruments for this purpose and the White Paper on "Growth, Competitiveness and Employment" presents a European strategy for the recovery of Europe's economy[1] and identifies the means for achieving it: the investment in new technologies providing efficient information networks and the trans-European networks for transport and energy. The European Council meeting in Brussels in December 1993 therefore created two high level groups[2] for the two activity areas which presented their reports[3] to the European Council meeting in Corfu in June 1994. The Council underlined the urgency for measures to create the Information Society and for priority actions in the area of transport telematics.

The Transport issues

The White Paper on the "Future Development of Common Transport Policy"[4] presents transport in 21st Century Europe based on an integrated infrastructure network for air, waterborne, rail and road transport. Such a network shall contribute to providing for sustainable mobility for passengers and goods, meet the requirements for a sustainable quality of life in particular in urban areas, and support the development of economic and social cohesion in Europe.

Most forecasts expect that transport demand in the Community will double between now and the year 2010 increasing the problems of congestion, safety and environmental pollution. A number of actions are required if the transport sector is to meet the needs of the Internal Market, of the greater European Economic Area and eventually the connections to the Eastern part of Europe including investment in roads, railways, airports and waterways. However, land is a scarce commodity. Our citizens have become more conscious of their precious environment. Building new transport infrastructure has become a lengthy, if not impossible process, especially in the densely populated areas of the Community.

The Commission proposal on the Trans-European Networks for Transport of 7 April 1994[5] does foresee a moderate extension of the networks as reflected in the priority projects for the transport sector identified by the Christophersen group. However, an integrated infrastructure network for road, rail. waterborne and air transport can make a particular contribution to the sustainable mobility for passengers and goods.

Such an integrated transport network would meet the requirements for a sustainable quality of life in particular in urban areas, and support the development of economic and social cohesion in Europe. This requires also a more efficient use of present transport infrastructure capacity for the near future which can be accomplished best by integrating the different modes into one transport network. For this reason the Commission in its proposal emphasises the need for integration. Telematics infrastructure is the key to this providing the means for better management of the network and its traffic and enabling high quality value added transport services. Moreover, Telematics may also have a role in supporting a policy of transport substitution for environmental protection and energy conservation.

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[1] White Paper on "Growth, Competitiveness, Employment; The Challenges and Ways Forward into the 21st Century", COM(93)700, December 1993

[2] The group for the information networks was chaired by Commissioner Bangemann, the group for the transport and energy networks is chaired by Vice-President Christophersen.

[3] "Trans-European Networks", Interim report of the Christophersen group to the Summit in Corfu, "Europe and the Global Information Society", Recommendations to the European Council, Final Report of the Bangemann Group presented in Corfu.

[4] White Paper. COM(92) 494 of 2 December 1992 and Resolution A3/0390/93 of European Parliament of 18 January 1994

[5] COM(94) 106 Final, Brussels 27 April 1994, O.J. No. C220, 8 August 1994

Telecommunications and Information Technology: Telematics

In the telecommunications sector the liberalisation policy has led operators to supply new services, to compete and to invest considerable resources, particularly in the domain of advanced networks and mobile communications; GSM (mobile telephony) for example is becoming a major success story. These developments allow operators, service providers and manufacturers to offer new types of telematic services throughout Europe using this common infrastructure, including for the Transport sector. Mobile telecommunications services offer great potential to support transport requirements. However the lack of a completed regulatory framework in certain areas is delaying the emergence of such European telematic services. To cover part of this weakness, the Green paper on a Common Approach in the Field of Mobile and Personal Communications[6] draws up a frame for a future evolution of the mobile telecommunications sector, with emphasis on European-wide services.

In addition, technology today offers approaches to operations where services will be supplied irrespective of the location of the user. These "teleservices" will influence the demand for transport and physical mobility.

These developments in the communications market linked to the increasing use of electronic on-board equipment in vehicles - in particular road vehicles - have created new opportunities for telematic operations and services in the transport sector, using the "Telematics infrastructure" (see table, page 11). This has been demonstrated in the research and development and first implementation projects of the Community, EUREKA and National programmes.

The challenge now will be to guarantee at European level interoperability of these systems and to arrive at cost effective solutions which will contribute to early deployment of new services.

Industry and Markets

The European market for Telematics systems and services for transport can be estimated from the potential application in road transport. With 20 % of the value of European cars being accounted for by electronics, the French Ministry of Transport estimates an annual market of 6.5 billion ECU by 2000 for on-board telematics equipment[7]. The market for road telematics equipment in the European Community total some 120 billion ECU by 2010[8]. In addition, similar market boosts can be expected from the introduction of telematics for communication, navigation, surveillance and traffic control in air transport and control systems in rail and waterborne transport.

The multimodal approach proposed for the trans-European network for transport is an encouragement to find common applications for these products. A common use telematics infrastructure for Europe's networks for road, rail, maritime and air transport should be sought. The market for telematics services that will use it is likely to be very important as most of them are essentially value added services deliverable over telecommunications links. It will account for six times the product market by 2000.[9] These new products and services will contribute to create new jobs in industry and service sectors in line with the objectives set out in the White Paper on Growth, Competitivity and Employment and the following Bangemann group report.

By contributing to the process of implementing Europe's Common Transport Policy, but also in developing a whole set of new services for transport users at regional and city level, the diffusion of

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6   COM(94) 45 of 27 April 1994
7   This equipment includes radiotelephone, RDS-TMC, satellite and beacon receivers and toll collection devices
8
9   ERTICO Supervisory Board (15 March 1994) and European Automobile Industry estimates.
    French Ministry of Transport Report: "Gagner du Temps sur le Temps" Affaire N°87.216

Transport Telematics innovations will play an important role in the development of the telecommunications industry and Information Technologies sectors more generally.

World Competition

European industries are currently at the forefront of research and development of telematics systems and services for transport. This advantage may be short-lived. Other areas of the world - notably USA and Japan - are investing heavily and within a clear policy framework, with the strong possibility that they will come to dominate international markets in future. The window of opportunities for Europe needs to be used now. Otherwise there is a risk that European and Global markets will be served mainly by non-European products and service providers. If Europe wants to keep pace, Europeans have to accelerate the process of creating the appropriate legal and organisational framework for new service providers.

Telematics Systems and Services in Transport

To meet the transportation challenge a new approach has been taken aiming at more integrated multimodal services, which can provide "sustainable mobility" and support the development of economic and social cohesion in Europe.
A concerted action between the Telecommunications and Transport sectors has a strong potential to support these objectives. National and Community projects, although small scale today, have demonstrated this. However, there is a need to change the emphasis from technology push to implementation, with attention to market requirements and user services.

Telematics systems[10] for transport consist of two basic elements:

➢Intelligent infrastructure:	These are sensors, computer systems and telecommunications networks with interfaces to the vehicle and comprise traffic control centres and other data providing and processing centres
➢On-board electronic equipment	These are sensors, computer systems and on-board communication networks with interfaces to the pilot/driver and the infrastructure

Telematics services[11] for transport can be grouped into two broad categories:

➢ *Services for Traffic Management and Control* which satisfy the requirement mainly of the transport authorities. These services will help network operators to manage traffic. Traffic control procedures and mechanisms are provided. Planning and network maintenance functions are included. These services include Emergency Management which will help improve emergency incident notification and response times; also electronic payment of tolls and other charges which will improve traffic flows at toll points and allow recovery of other transport costs.

➢ *Value Added Telematic Services in the Transport Sector* which are provided by private actors on a commercial base for travellers, traffic and transport managers, shippers, dispatchers, carriers, tourists, tourist agencies and drivers at large. This includes services for travel and traffic information, collective transport, commercial vehicle operations, electronic payment and booking, and advanced vehicle safety.

Potential Benefits of Telematics Applications in Transport:

For Sustainable Mobility and Improved Transport Services
Information Services using telematics offer new possibilities for effective traffic management for influencing traffic demand and enhanced interconnectivity and interoperability between the modes.

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[10] For details see Attachment 1
[11] For details see Attachment 2

Their deployment will help to secure a more efficient use of the existing transport infrastructure with enhanced capacity in the air, at ports and airports and by road, rail and waterway. Multimodal transport services can become easier and more reliable with benefits for freight transport and collective passenger transport. Transport across frontiers will be simplified by establishing traffic information and control centres for cross-boundary movements. This may be complemented by a growth in teleservices, such as teleworking, which can offer alternatives to certain types of trips, thereby reducing travel demand. Finally, telematics systems can be adapted to provide efficient methods of transport user charging, including road pricing and congestion charges, which will allow a greater correspondence between what the user pays and the true social cost of transport. The result should be enhanced personal mobility, alongside less polluting, environment friendly transport services.

For Traffic Safety
Traffic safety can be significantly increased through products which check the operator's state of fitness, enhance driver/operator perception and, warn of impending danger. Eventually it may be possible to intervene with emergency control e.g. to prevent accidents from occurring and reduce driver stress by autonomous intelligent cruise control. Traffic surveillance and control systems, incident detection and management systems will improve traffic safety in all transport modes e.g. motorway control systems in Germany lead to a reduction of 30-50% of fatal accidents.
For maritime transport advanced surveillance systems which contribute to improved safety, will be essential in the densely trafficked areas of European waters. Statistics on maritime transport show the catastrophic impact of small mistakes on sea transport navigation. Improved aids for maritime navigation based on telematics tools can pave the way to enhancing safety in shipping.
Safety is also a limiting condition for the more efficient use of the European airspace and the rail network. An improved air traffic management system will allow more traffic without reducing the high safety standards of European air traffic. New command control systems for the railway network would also allow a more efficient use of the expensive rail network infrastructure without changing safety standards.

For Environmental Protection:
Emission control and noise abatement will contribute to reducing substantially the negative impact of road and air transport on the environment. Transport telematics services will play a part by more effective scheduling of journeys and freight consignments, and in parallel applications can be used in traffic management systems in order to minimise congestion. Providing better information and giving priority to environment friendly modes in these systems can also be facilitated. The contribution of transport telematics to environmental protection will be made more effective by integrating applications used in traffic management strategies with pollution monitoring systems. Experimental projects in this area are being carried out in a number of European cities supported by the Community's Telematic programme.
The transport of dangerous goods, a major threat to the environment, but unavoidable for the complex and highly sophisticated needs of our economy, can be kept under surveillance. In case of accidents the necessary measures, which depend heavily on the goods in question, can be initiated efficiently and in the shortest time possible.

For Markets and the Economy at large
The process and product innovations which will accompany the deployment of Transport Telematics in Europe will play an important role in the development of future markets and businesses.
There is considerable market potential for Europe's key sectors, through product innovations e.g. in the vehicle/carrier manufacturing industries, engineering and construction companies, information and communication technology (ICT) industries, and telecommunications services. All this will support economic development, playing a key role in the development of an European "information society".

The wider Economic Benefits
As well as the direct employment generated by the investments in telematics products and services in transport mentioned earlier, there will be wide benefits for the European economy and society. The economic returns on investment in telematics systems and services for transport are potentially large, bringing improvements in productivity and competitiveness across the economy. Short term

improvements in air traffic control, for example, could produce efficiency savings of 2 billion ECU a year[12]. Similarly, a modest 10% decrease in road traffic congestion would result in cost savings of 10 billion ECU a year to Europe[13].

Conclusions

The deployment of telematics in the transport sector holds much promise for both the public and private sectors. The benefits for users and operators of transport services are only estimated and the full market potential for new telematics products has still to be determined. Nevertheless, if the expectation of better information, greater choice and a wider range of policy options can be realised there will be major benefits all round. For the **administrations and public authorities** there will be an efficient tool for traffic management, stimulation of multimodal transport and demand control and improvement of safety; for the **Transport Operators and Transport Industry** there will be multimodal transport, interoperability, compatibility, increase of efficiency, and improved competitiveness; for the **Telecom Operators and Information and Telecommunications Industry** there will be enlarged markets for products and services based on information and communication technology; for the **Vehicle carrier manufacturers and Related Suppliers** there will be innovative products and improved competitiveness; for **Industry, Trade and Other Business** there will be an efficient, predictable and reliable logistic chain; for **drivers, passengers, crews, commuters and transport organisers** there will be reliable travel and traffic information, allowing better trip planning and mode choice as well as safer and more comfortable travel.

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[12] Association of European Airlines estimate
[13] DRIVE Infrastructure Group, Final Report February 1992.

II.   THE CONTEXT FOR DEPLOYMENT OF TRANSPORT TELEMATICS IN EUROPE

The European Community is only one of the parties involved in the implementation of Transport Telematics. The private sector, operators, consumer and industry groups, academia, and regional and local governments are important players in the implementation. It is necessary for all to have a clear understanding of their roles and the opportunities presented by these new technologies.

Recent Activities in Member States or other European organisations

Early examples have proved the flexibility of telematics for assisting different transport policies and supplying new user services. In various regions and countries individual solutions have been applied. However, creation of technology islands must be avoided. In the next phase the opportunity should be used to stimulate implementation of those systems and services across all the transport modes which are ready, ensuring that, so far as possible they are compatible with existing standards or comply with draft standards under development. Implementation should be oriented towards interoperability at European level and where required at a global level.

Examples of existing first phase actions in the Member States are:
- ➢ Driver Information and In-car Navigation systems, such as in UK, Germany and France
- ➢ First implementations and trials of Automatic Debiting Systems (ADS) in France, Germany, Italy, UK, Austria, Sweden, Norway and Finland
- ➢ POLIS: some 40 European cities have created a co-operation network for the application of Telematics Services in Transport
- ➢ CORRIDOR: about 15 European regions created a network for inter-regional co-operation for Telematics applications.
- ➢ A public/private association of more than 30 members has been created to promote the co-ordination of the implementation of Transport Telematics in Europe (ERTICO)
- ➢ Central Flow Management unit by EUROCONTROL
- ➢ Port (and coastal) information exchange systems on flows of goods (including hazardous goods)
- ➢ Computerised traffic control systems in many of the main urban areas
- ➢ Automated motorway traffic and weather surveillance (Italy, The Netherlands, Germany)
- ➢ Experiments on the use of teleworking in UK and NL; as a means to reduce the transport demand.

In some cases international agreements already permit the implementation of a common strategy. For example with the objective of increasing the efficiency of air traffic management a European strategy for the harmonisation and integration of Air Traffic Management Systems (EATCHIP) has been developed in close co-operation between EUROCONTROL and the Member States. The implementation of these goals will aim - for the short term - at promotion of the convergence of the existing Air Transport Management systems based on this strategy.

The Community's Role

The role of the Community will be to create the necessary conditions for deployment of Telematics which is appropriate to the existing social and political structures. Attention will be on the availability, compatibility, inter-connectivity, and interoperability of systems and services. This includes
- ➢ agreement on the range of transport policy targets and the scale of telematics applications required in response. Accompanying technical solutions can be developed to meet these.
- ➢ agreement on minimum requirements for service quality and management.
- ➢ proper targeting of standardisation processes, in particular, evolution of an open network architecture which can accommodate a variety of subsystems with harmonised interfaces.
- ➢ harmonisation of technical regulation - in particular covering the telematics subsystems.
- ➢ actions to lift the barriers inhibiting the implementation of telematics solutions for advanced traffic management systems and other transport services.
- ➢ providing a framework for R&D activities and for assisting the implementation of telematics applications and services in the Member States

The Community Instruments

The responsibilities for transport and telecommunications, their networks and services and their regulating framework are distributed over various administrative levels. Any actions at Community level will take account of the subsidiarity principle and leave open the way for a variety of political choices in the Member States where this is appropriate. Community action to improve interoperability will benefit all interested parties. However most of these sectors are also market oriented and therefore, the actions on Community level have to be carefully examined with respect to market distortions.

There are three types of instruments by which the Community might foster the proper functioning of the internal market : **legislation, financial support** and **co-ordination** of Member States activities. **The Community has already promoted a number of activities in these three domains. See Attachment 3.**
The following table further explains how these instruments can be applied for telematics applications in transport.

COMMUNITY INSTRUMENTS FOR TRANSPORT TELEMATICS

Legislation
Following the provisions of the Treaty, the Community shall :
- ➤ adopt legislation which will facilitate the proper functioning of the Internal Market through the development and use of Transport Telematics;
- ➤ issue legislation establishing an Internal Market for Transport Telematics services, networks and equipment;
- ➤ adopt legislation establishing guidelines for trans-European networks: A proposal for transport is presently being discussed with the Council and Parliament; similarly for advanced digital telecommunication networks and for telematic services between administrations. Guidelines for transport highlight the use of telematics systems in the various modes of transport;
- ➤ implement any measures that may prove necessary to ensure the interoperability across national frontiers of telematic applications: this includes support to the standardisation work done by the European Standardisation bodies (CEN/CENELEC/ETSI), which, where necessary, might be complemented by Community legislation;
- ➤ prepare the appropriate regulatory framework for the development of the Information Society, as recommended by the Council of Ministers meeting at Corfu .

Financial Support
The European Community may:
- ➤ support financial efforts made by the Member States for projects of common interest[14] identified in the guideline adopted under Title 12 of the EC Treaty. The Community may also contribute, through the Structural Instruments to the financing of specific projects in Member States in the area of transport, and telecommunications.
- ➤ support research, development and demonstration activities by setting up a multi-annual framework programme. As such actions on RTD activities for the development of telematic tools and services for transport are covered by the previous, current and future Community programmes.

Co-ordination
European level concertation and co-ordination of national policies[14a] has to be established to set the agenda and priorities for the implementation of Transport Telematics. This will identify where proposals for legal instruments, standards, co-financing and concertation activities, by the Community might be necessary. It will also provide a central reference point to provide assistance.

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[14] Financial regulation proposal COM (94)62 final of 2 March 1994 for support under article 129 of the Treaty, O.J. No. C89 26.3.94
[14a] See the Treaty, Article 129c concerning Trans-European Networks and Article 130h concerning Research and Development

The Role of the National, Regional or Local Authorities

Traditionally the authorities' role has been to invest in capital infrastructure for transportation (highways, railways, ports and airports) and set the regulatory framework within which transport operations can take place safely and efficiently. Member States today are encouraged to explore the role of the private sector in providing services in areas which were previously in the public domain, investigate ways to encourage greater private provision of services, and identify undesirable and unnecessary government constraints on private sector participation. This is particularly important in the case of totally new information services. The authorities will, however, continue to exert their influence on the transport sector, and the speed of take up of the new technologies will depend in part on whether they can be convinced of its potential. In addition, they may have to continue support for projects in areas socially desirable but not offering an appropriate return on investment. The technology is there to support transport operations and to give effect to policies which will promote economic efficiency, not as an end in itself.

Building on a stable regulatory framework, Member States, regional and local authorities will remain responsible for the main decisions concerning deployment of telematics. Until now it was usual for the authorities to be responsible for specifying and procuring appropriate traffic control systems. As technology is developing rapidly contracts for telematics systems will increasingly be let on a "design, build and operate" basis. Self-certification and other existing quality control procedures may therefore need strengthening to ensure satisfactory service standards and generally to safeguard the public interest. However, these safeguards must be non-discriminatory and give an equal chance for tenderers from different parts of the Community.

In addition new mechanisms have to be explored for promoting greater co-ordination among the many communities and agencies that will continue to provide transportation services. At the same time, there is a need to strengthen the technical resources of the local governments to deploy and operate new systems. The introduction of new technologies will require new and more complex skills, as well as new organisational missions.

Public-Private Partnerships

As noted above, the lines of demarcation between the public and private sector are changing. Although the authorities may retain the final responsibility for a number of transportation services, the provision of many may be contracted out. In some cases, private companies will provide these services as a franchised public utility; in other cases, they will do so without any special permission from the government concerned. The Common transport policy encourages the involvement of private companies in providing transport infrastructure and services. , whilst the Telecommunications policy has achieved major liberalisation of value added services, the private sector must be alert to the possibility of investing in telematic services for transport, perhaps in novel or unusual ways. Telematics offers the prospect of sophisticated forms of capital recovery for example by tolls, fees and different forms of automatic payments.

In future, partnerships in the fields of planning, deployment, organisation, investment, and operation of telematics applications will play a key part in the successful implementation of customer oriented services for the benefit of the users of the transport sector, by sharing the risks and reducing innovation times.

To achieve this the public sector needs to create an environment where the private sector can develop new products and services. It may also involve the authorities in innovative procurement which can serve both public and private sector objectives. Establishing favourable conditions for private sector investment was a major concern for both of the high-level groups[15] set up by the Heads of Government as a follow-up to the "White Paper on Growth, Competitiveness and Employment".

Key Issues Affecting Deployment

The Regulatory Framework

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[15] The group for the Information Society was chaired by Commissioner Bangemann; the group for the transport and energy networks is chaired by Vice-President Christophersen.

The present legislation of the Community and of Member States on a regional and local level, is in some areas not supportive of the implementation of new technologies as the recent European Conference of Ministers of Transport[16] report has recognised. An important activity will be to identify these areas and help where appropriate to remove these impediments. In addition, the extent to which issues of competition law , product liability, Intellectual Property Rights, and privacy may constrain development and deployment of Telematics applications for transport must be explored. **These matters are given further consideration in the Communication on the Information Society[17]**. The issues relevant to Telematics application for transport are further explained in part III, in particular part III.1.B, of this Communication.

Standardisation

In most areas standardisation of telematics may be sufficient to accomplish interoperability between telematics systems applied to transport. It is important, in the interests of obtaining a European coverage, that sufficient attention is given to the development of common functional specifications for services of a similar type. **The Commission will examine the results of demonstrations and user tests underway and planned, and will provide details of these functionalities.**

Financial Support

Central to the deployment of Telematics applications for transport is the issue of finance. The market for telematics systems and services for the purposes of better traffic management, whether by road, rail, air, waterway, port or airport, will very largely be led by the investment decisions of transport operators and infrastructure owners. On the other hand the market for value added services could be diverse, depending on the needs of specific users. For example there may be a commercial market for telematic services which can make use of information which is gathered primarily in support of traffic management systems e.g. congestion information from traffic management systems which can support commercial navigation systems. A joint investment by public administrations and service providers could serve both needs: traffic management and individual route guidance.

- Innovative Financing

All levels of governments need to carefully weigh the costs and benefits to the community before making investment decisions. Many non-local highway improvements are financed from user fees, especially fuel taxes and vehicle registration fees. Toll financing and other innovative financing schemes involving the private sector are receiving considerable attention. Telematics services have the technical potential to allow for direct user charges by either public agencies or the private sector for their use. This capability to generate revenues for public and private financing is an important option which telematics offers to the transport sector.

- Financing by the Community

Financial support from the Community may be available to accelerate deployment provided that the investment qualifies and respects the conditions that are attached to the particular instrument. If the project qualifies grants could be used for example to help establish the infrastructure for fee-paying services that will eventually operate on a full cost-recovery basis. Alternatively, financial support may be suitably targeted at the regions which need assistance in establishing an appropriate transport telematics infrastructure. The successful deployment of telematics systems may in some cases obviate the need for more expensive infrastructure investment. Potential investors in transport infrastructure are invited to consider the application of Telematics systems in the early stages of planning.

It should also be noted that new technology provides opportunities for a broad range of public and private revenues sources that can be available to finance the necessary investment in Telematics.

Conclusions

Transport and the telecommunications and information sectors in the European Community offer high potential and prospects and their synergy promises substantial benefits for the European economy. Information will be a key commodity in the first decades of the 21st Century. Transport Telematics

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[16] ECMT: European Conference of Ministers of Transport Report, CEMT/CM/94/ 21 of 29 April 1994
[17] "Europe's way to the Information Society. An Action Plan" COM(94) 347of 19 July 1994

services will benefit from the future European market for information services. The time is ripe to harvest the results of the extensive R&D work on Telematics applications which has been completed in recent years in the Community. Implementation will be accelerated if the Community can set guidelines for quality of service of both management systems and information services based on this experience. Guidelines and standards will help facilitate industrial development. This will put European industry in a front position in the transport sector: A number of products are ready for deployment. By combining Telematics abilities and the needs of the transport sector both sectors and society at large will benefit.

III. AN AGENDA FOR COMMUNITY ACTIONS

The White Paper on Growth, Competitiveness and Employment recognised that "the application of telematics to transport (road, maritime, air) is now becoming an important aspect of Transport infrastructures". The report submitted by the "Bangemann Group" to the European Council in Corfu supported this. The European Council meeting agreed in principle the priority action areas for the application of Telematics technologies, including road and air traffic management and other value added services for transport. In view of the importance and complexity of the issues raised by the new Information Society it urgently requested the setting up of a co-ordination instrument (one person at ministerial level per Member State). The Christophersen Group also saw the potential of co-ordinated implementation of new technologies for traffic management purposes and will study the potential for management projects in the different modes of transport based on a proposal from the Commission.

Required Actions by the Community

In response to these identified priorities the Commission has brought forward in a recent Communication its proposals for developing an appropriate framework in order to assist the implementation of telematics generally[18]. Specifically, there is a need to guarantee interoperability of the telematics applications offered for the transport market. Such a framework shall include those technical, operational, legal and institutional rules and conditions relating to the telecommunication services that can support telematics applications in the field of transport facilitating the development of a telematics infrastructure. An agreed framework will help to remove barriers for the implementation of traffic management systems and allow for the development of value added services which industry and business like to offer. The proposed actions must be precise enough to allow for European-wide market opportunities to emerge without internal frontiers while leaving options open for choices which political preferences in the different Member States require. It shall also define projects of common interest for the Community. In addition, the Commission will ensure that the innovation process is supported by appropriate Community research, development and demonstration actions. It will work towards securing a consensus specifically on the technical and organisational aspects of telematics applications through supporting appropriate organisation and participant structures.

1. Development of the Telematics Infrastructure[19]

Transport telematics technologies are only a means to an end. It is necessary first to be clear about the policy framework which the telematics applications are designed to support or which provide the context for deployment. Whatever the context the telematics options may remain very localised and severely limited unless the Member States can work together to agree a common approach on a number of technical issues and on various institutional and legal issues. It is not only a question of achieving common technical standards; the technology will require new cross boundary connections to be made, perhaps between organisations that have not previously worked together. However, the establishment of a consistent, high quality European Telematics Infrastructure for Transport will facilitate the interconnection of the Information networks and the interoperability of services. Access to available information is also of particular importance. Therefore basic Community objectives and the criteria for the information society will be served. The establishment and operation of the Telematics Infrastructure will require all three types of action by the Community: 1) legislation and standardisation, 2) projects and financial support and 3) co-ordination activities.

A. TECHNICAL CONTENT

Priority must be given to the development of an appropriate **open system architecture** allowing the different system components to interact and work together to achieve total system goals. This architecture will define the overall system operation, what each component of the system does, not how and what information is exchanged between the components. Within this framework different system designs will be implemented allowing the same service to be delivered to the user, irrespective of the particular communication bearer. This architecture shall allow flexibility accommodating local

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[18] "Europe's Way to the Information Society. An Action Plan" COM(94) 347 of 19 July 1994
[19] See box on page 11 for a description of the different levels of Telematics Infrastructure

solutions, without missing interoperability, and shall allow the build up of future generations of more advanced systems. It should also allow different levels of quality and detail within the same architecture depending on what a client is willing to pay.

THE DIFFERENT LEVELS OF TELEMATICS INFRASTRUCTURE FOR TRANSPORT

The Information Level :
This is the raw information collated in electronic form: it includes
data management and devices (data storage; data processing and advanced (mobile) informatics systems; smart cards; remote and on-board databases; computer systems, digital databases including electronic maps, networks and terminals; radar data processing; data transfer for freight and resource management)

The Information Services Level: Hardware Components and Software :
This allows the user to process this information: it includes
sensors and actuators (presence and intrusion; weather; emission and noise detectors; traffic signs including variable message signs; weigh-in-motion equipment; computer vision; radar detector and direction finder; spot transmission beacons, loops);
traffic control/management and information centres (operations and control centres, control centres for ports and air traffic, airport control towers, decision support system onboard and in compatible Vessel Traffic Services Systems (VTS), railway control centres, multimodal transport nodes) providing basic traffic services such as navigation, location, surveillance, flight plan processing, interfaces with emergency, distress and security services, remote control, maintenance and operations.

The Telecommunications Infrastructure Level :
This covers the basic **telecommunications infrastructure and transmission equipment:**
cable; radio communications equipment including high, very high and ultra high frequency communication equipment; mobile communications (GSM); digital audio broadcasting systems; paging equipment and Universal Mobile Telecommunications System (UMTS); Asynchronous Transfer Mode (ATM) equipment; digital data transmission equipment; short range communication equipment (Microwave or Infrared); display systems; communication/navigation satellites and pseudo-lites; radar transceivers; navigation beacons.

The Telecommunications Services Level :

This covers **basic transmission services** which will assist in transmitting the information and includes(electronic mail; file transfer; support for interactive teleservices; access to databases; digital image transmission; radar message and label transmission; automatic dependent surveillance tools; Secondary Surveillance Radar (SSR-Mode S); digital selective call systems)

The Applications Level : Transport Telematic Services
This is the level where the greatest effort must be made to improve the structuring and user-friendliness of presentation. It includes
(1) an enabling framework for value-added services (multimedia passenger information, reservation, booking and payment systems, mobile EDI services, fleet and crew logistics, including co-operative resource management, collection and processing of emission and noise data, baggage handling, Aeronautical Mobile Satellite Services) .
(2) the **different types of services** which the users expect (see Attachment 2): traffic and travel information, network management operation and control, collective transport and commercial vehicle operations, electronic payment and booking and advanced vehicle safety systems.
For this level the four previous levels perform the storage, processing and transmission functions, which allow users to obtain the specific services they need. This is achieved by appropriate combination of the functions/equipment described above.

Agreement at European level on measures to develop this system architecture will be the result of a systemic process where all actors can participate and finally consent: Users, Industry, Operators and Administrations. The Commission has started facilitating this process through its research and development activities. **The Commission is currently studying the overall characteristics of such**

an architecture and will make the appropriate proposal for technical harmonisation. These efforts have already identified a number of issues necessary for Community action to achieve successful implementation of Transport Telematics. **An initial Action Plan covering immediate actions on issues of standardisation, interoperability and interconnectivity is provided** as Attachment 4.

Various standardisation issues need to be finalised based on the successful results of the technical work carried out in European Community sponsored RTD activities on Transport Telematics. This agenda requires a high priority if implementation of transport telematics is to make progress. The results of this work will also contribute to the development of Community-wide markets for equipment, network and services.

The Commission intends to support or initiate action on the following topics, whenever necessary, to accelerate deployment for achieving interoperability and the free circulation of transport telematics services and equipment across Europe:

➢ For **Travel and Traffic Information Services**: to achieve the goal of interoperability and free circulation of services and equipment across Europe, the Commission will propose an agreement on the harmonisation of geographical location referencing, a data dictionary, a message exchange format and protocols for specific applications. These will be based on relevant results from the Telematics Programme projects, and the consensus of main players.

➢ In the area of **digital maps,** there needs to be a common standard agreed for each domain: road, water, rail and air, to cover the key attributes of the transportation networks. Relevant result is the European specifications for Geographic Data Files (GDF 2.1). The Commission will report on the progress made in this domain and will make appropriate proposals for technical harmonisation.

➢ The Radio Data Systems - Traffic Message Channel is now ready for implementation but requires the adoption of standard protocols for data coding and exchange. The further potential of digital audio broadcasting to support transport applications needs to be explored. The Commission will report on progress and will make appropriate proposals.

➢ A number of Transport Telematics applications depend on **Short Range Communications** and the "Comité Européen de Normalisation" (CEN) has been mandated to achieve early standards for the support of multi-purpose applications and services. Relevant contributions come from telematics projects[20]. The Commission will continue supporting activities in this domain.

➢ The Telematics Research Programme has demonstrated the potential of **Mobile Telephony** to provide data transmission for traffic and transport applications. There is a need for standardisation efforts through the European Telecommunications Standardisation Institute (ETSI) to make this available through the digital cellular network (GSM: Global System Mobil) that is now being implemented on a pan-European basis. Relevant results are available from the Telematics project: SOCRATES. The Commission will support relevant work in ETSI.

➢ The **Digital Network of Integrated Services** (Euro ISDN) will need to be used for the facilitation of ground communication exchanges ; the adoption by the Council of the recently modified Commission proposal[21] will facilitate early uptake of telematic services

➢ A study on the requirements of a **European Radio Navigation plan** has been launched recently. Pending the outcome the Commission will come up with a proposal for action. Both, satellite positioning and other radio means will be considered for setting up such a plan.

➢ Specific **Radio Frequency allocations** are needed to support some Transport Telematics applications. A start has been made on the frequency bands to be designated for road transport

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[20] ADEPT : Automatic Debiting and Electronic Payment for Transport. CASH : Co-ordination of ADS Standardisation and Harmonisation.

[21] COM(94) 128 Final O.J. No. C200 22 July 1994

purposes and the needs of other transport modes should now be assessed. The Commission will request the European Radiocommunications Office (ERO) to examine the issue.

➢ An aspect of implementation that demands close attention is to minimise the risk of **Electromagnetic Interference**. The Commission will examine the need for action with reference to Council Decision 89/366/EEC of May 3 1989.

➢ The safety of Transport will be strongly influenced by the quality of the designs and displays that are developed. A draft code of practice on **the display of information to drivers of road vehicles** demonstrates what is possible but a stronger form of standardisation or type approval will be required for certain applications. Appropriate proposals will be made.

➢ Insufficient priority to transport applications may lead to delays in implementation if timely **standardisation** is not achieved. There is already a long agenda of items for the standardisation bodies CEN, CENELEC and ETSI and their work needs to be progressed quickly, with the full support of the national standards authorities. Within the framework of the Communication on the Information Society, the overall standardisation framework will be examined for increasing its efficiency. In the meantime, the Commission will continue giving support through appropriate mandates.

➢ Electronic payment systems are increasingly being used for business and financial services. The development of **harmonised electronic payment systems** for different transport applications would ensure these systems can be implemented with fewer difficulties for the user. The adoption of appropriate payment systems will also help to stimulate the development of revenue-earning Transport Telematics services by the private sector. The Commission through the CARD-ME concerted action in the Third Framework Programme is supporting work in this area. Appropriate proposals will follow.

➢ **Smart cards** will have wide application in transport. It is therefore important that the work that CEN TC224 has started on the subject shall be accelerated in order to have common functional specifications and standards available as soon as possible. The Commission has already given a mandate and supports the relevant work.

➢ **Data exchange between administrations** integral to various supervisory tasks public administrations have to fulfil, such as hazardous goods surveillance, port exchange systems, and licence enforcement. Relevant specifications have been worked out by the telematics programme projects and systems are available. In addition, the use of EDI (Electronic Data Interchange) with standard messages between ports will facilitate various administrative processes such as customs and statistics. Member States administrations should envisage the implementation of such an exchange network for these applications which has been developed in the Third Framework Programme Telematics and taken up by the IDA[22] programme. The Commission is ready to provide the organisational and co-ordination framework. The Council is invited to adopt the Commission proposal on IDA.

➢ **System safety standards** are important in the introduction of all these new telematics systems. Their function and operation shall be guaranteed for the user. Relevant results are available from the DRIVE project PASSPORT. The Commission will examine the needs for updating type approval procedures for in-vehicle Telematics tools.

➢ The Commission adopted a Communication[23] on **Satellite Navigation** which describes the present status and action which are urgently required in order to obtain a favourable position for Europe. As a first step Satellite Systems Services shall be exploited in order to improve the accuracy,

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[22] Proposal for a Council Decision on a multiannual Community Programme supporting the implementation of Trans-European Networks for the interchange of data between administrations (IDA). COM(93) 69 of 12 March 1993, O.J. No. C105, 16 April 1993

[23] Satellite Navigation Services, A European Approach: Communication from the Commission, COM(94)248

integrity, availability and continuity of service of the existing systems (GPS[24] or GLONASS[25]) for positioning/navigation. This will involve in co-operation with ESA, EUROCONTROL and Telecom Operators the development of a European complement of the existing systems (GNSS1), by use of the navigation packages included in INMARSAT-3. In parallel a full assessment for the civil deployment of a civil Navigation Satellite System (GNSS2) shall start. The Commission is already working with the three parties to define a detailed workplan. The Telematics Programme provides for appropriate research during the 4th Framework Programme (1994-1998). The Commission currently is examining the modality for setting a co-ordination framework for these development.

The Commission will propose an integrated programme of work on the telematics infrastructure in order to ensure that all of these elements can be brought together within an overall architecture comprising harmonised standards and interfaces.

B. LEGAL AND ORGANISATIONAL ISSUES

Legal and organisational issues must inevitably be tackled if a greater deployment of Transport Telematics systems and services is to be achieved. These issues, such as product liability, competition policy, privacy, procurement, intellectual property, regulation, public/private collaboration, and co-operation between Member States will surface as the technologies progress and evolve from the laboratory to commercial markets. It is noted elsewhere[26] that public authorities will have to set new ground rules and create the right policy and regulatory environment which will allow telematics application to flourish. The Commission has already made or will make appropriate proposals in the following areas as further information becomes available.

Licensing/Franchising of Services - Public/Private Partnerships
Telematics deployment will require unprecedented levels of co-operation and co-ordination between the private and public sectors within the limit set by community law, in particular competition and the state aid rules. The private sector must work with the public sector to embed Transport Telematic technologies in the transport and telecommunications infrastructure. To accomplish this, the private sector will require a level of access to, and perhaps ownership interests in, public assets that have not been available before now. The fundamental issue of the public/private relationships required to effectively deploy a Telematics infrastructure must be studied closely through ongoing and planned projects to seek new models for public/private participation. **The Commission will examine the existing rules and the need for further guidelines.** It is possible that the same model could be applied locally too, which will have a positive effect on the further development of the Internal Market.

Development of the Information market
There is a difficulty with assigning the responsibilities for different functions between the various parties. For example, those involved in providing multi-modal transport information services will need to know what remedy is available if information and data supplied by the authorities does not match their requirements. As a first step for the Trans-European Transport and Telematics Network, **the Commission will develop a proposal defining general rules for harmonising the release of traffic relevant information by Traffic Management Centres and intermodal communication platforms to ensure the free circulation of telematics services.**

Data Protection/Privacy
The introduction of new telematic services shall guarantee respect of the privacy of citizens. Some consumers may be willing to give up some privacy in exchange for gains in travel efficiency and access to useful information, while others concerns over privacy may severely limit their willingness to use and support Telematics. Appropriate safeguards concerning data protection are needed. **A telecoms-related Directive on privacy and data protection has been proposed[26a] under the umbrella of the**

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[24] Global Positioning System (USA)
[25] Global Navigation Satellite System (former USSR)
[26] "Europe's way to the Information Society. An Action Plan" COM(94) 347 of 19 July 1994
[26a] Amended proposal for a European Parliament and Council Directive concerning the protection of personal data and privacy in the context of

related Directive on privacy and data protection has been proposed[26a] under the umbrella of the data privacy[27] framework Directive, if this is adopted, and it will be examined for satisfaction of the requirements of the Transport Telematic services.

Product Liability

Potential liability issues arising from the deployment of Telematic products may require substantial attention. Liability concerns will vary between the development of advanced traffic management and traveller information services on the one hand and the development of vehicle safety services on the other. The liability issue for information technologies are not unique to the Transport Telematics community, and application of sound engineering techniques will go a long way in addressing the issue. The migration of control functions away from the operator, however, may alter the fundamental relationships upon which product liability laws have been developed; the fundamental liability relationship between the vehicle operation and the infrastructure may be substantively altered. In the short term, proper risk assessment for the Transport Telematics technologies should be undertaken. This may lead to training and instruction in risk management. As a longer term course of action, **the Commission will support a full study on possible alternative approaches to Transport Telematics product liability, particularly in the context of automated vehicle control systems. This will require action at Community level, so that distortions in the market will be avoided.**

Procurement and Commissioning of Services

An enlightened policy and good practice in public procurement of Transport Telematics systems could greatly assist the development and deployment of these technologies. Many authorities have little experience of high technology procurement Accordingly, such issues require significant attention. **Community laws already exist for public procurement. But there are further issues which the public authorities will need to consider when they are procuring or commissioning transport telematic services:**

> Relationships between the purchaser and supplier in respect of intellectual property rights;
> cost accounting, cost certification, and auditing requirements for these new types of products and services;
> Application of competition law to the provision of transport telematics infrastructure and services.
> contractual issues between public authorities, service operators, such as liability;
> organisational conflict of interest limitations;
> project uncertainties due to the procurement process; and
> fair and reasonable public/private partnership implementation

The Commission will study these issues and, depending on the results, will make appropriate proposals.

Intellectual Property Rights (IPR)

Because of the public/private collaborative nature of much of the research and testing of Transport Telematics to date, complex intellectual property (IPR) issues have arisen. Public sector interests have traditionally held the view that public sector financing should result in the intellectual property rights remaining in the public sector. In contrast, private firms believe that companies developing Telematics technology should benefit from both intellectual property and patent protection to provide sufficient incentive to bring these products to the marketplace. **The Commission will be preparing a Green Paper on intellectual property rights in the Information Society . In the area of Transport Telematics the objective will be to achieve compromise solutions in key areas, within the parameters of existing international and Community obligations.** These issues may delay full scale deployment, unless they can be resolved.

[26a] Amended proposal for a European Parliament and Council Directive concerning the protection of personal data and privacy in the context of
digital telecommunications networks, in particular the integrated services digital network (ISDN) and digital mobile networks. COM(94) 128,
13 June 1994

[27] "The protection of individuals with regard to the processing of personal data and on the free movement of such data" COM(94)422
"The legal protection of databases" COM(93) 464, O.J. No. C308, 15 November 1993

Regulatory Barriers and Opportunities

Linking transport infrastructure, vehicles, communications, and computers may trigger a call for of economic, safety, and environmental regulations. These regulations are imposed for valid public policy reasons, but over-regulation could adversely affect the rate of Telematics deployment. It is important that the relationship between Transport Telematics and its regulatory influences be considered and understood. Safety regulations bearing on Transport Telematics may vary from country to country and co-ordination through the Community could help to accelerate deployment and avoid barriers to the proper functioning of the Internal Market. Additionally, certain **existing framework directives will have to be adapted to include telematics equipment**[27a] .

Relationships between the different level of Public authorities

One of the paramount institutional obstacles to the timely deployment of a European-wide compatible Telematics infrastructure is the multiplicity of national, regional and local governmental levels and authorities with jurisdiction over the elements of that infrastructure. Transport Telematics public and private sector participants are currently required to obtain multiple agency reviews and approvals which often involve incompatible terms and conditions for approval. In addition, the same process has often to be repeated when the investor moves from one Member State to another. **An agreement at Community level harmonising system approvals requirements as an alternative to this multi-jurisdictional model in full respect of "subsidiarity"** could ensure that the necessary governmental functions are fulfilled, while limiting or eliminating the regulatory delay in deployment.

C. FINANCING THE TRANSPORT TELEMATICS INFRASTRUCTURE

The development of the Transport Telematics Infrastructure will require concerted action on financing. The guiding principle will be that the private sector should be responsible for telematics infrastructure investment as far as possible. This will be facilitated if the costs of investment can be recovered by fees or charges collected from the user. The emerging applications of Telematics provide the means to achieve this.

In this context new institutional arrangements including partnerships between the public and the private sector will be required to mobilise capital and investment.

In certain cases public budgets could be used with the aim to speed up deployment, to provide "seed money" for launching activities and to overcome existing regional discrepancies in view of the economic and social cohesion (see chapter 2). To this end Member States, regional and local authorities should keep in mind the use of existing Community financial instruments, such as the Structural Funds, Cohesion Fund, the budget for the trans-European Networks, loans by the European Investment Bank (EIB), the European Investment Fund and other European Community Programmes for co-financing. These sources should be considered not only for the development of the hard physical infrastructure (roads, airports, bridges etc.) but also for the creation of the soft intelligent infrastructure. **However, the projects will need to qualify under the conditions that appertain to the various financial instruments. Moreover eligibility for funding from the Community may have to be linked to additional conditions concerning European standards, strengthening of competitiveness of European economy, and the promotion of public/private partnerships.**

In addition, the opportunity should be taken to extend, where needed, support schemes at national, regional and local level to cover financial resources for the development of the Transport Telematics infrastructure.

2. Development of Priority Telematics Applications in Various Modes of Transport

The agenda of issues to be considered by the Community is extensive, but their resolution must not be a reason to hold up the deployment of telematics systems and services which can provide an immediate

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[27a] Directive 92/53 on vehicle standards, O.J. No. L225, 10 August 1992

practical benefit. The Commission will promote projects in a number of key areas using appropriate financial instruments.

A. TELEMATICS SYSTEMS AND SERVICES FOR ROAD TRANSPORT

A comprehensive framework for road transport telematics infrastructure is a pre-requisite for market actors to have a clear view of their investment decisions.

Up to the year 1999, considerable resources will have to be invested by a variety of actors in this sector:-
- implementation of traffic management and control systems
- implementation of travel and traffic management and information services.
- investments by transport operators in systems which improve fleet management
- the launch of new telematics services aimed at transport operators, travellers and shippers

The consequences of these investments will go well beyond the borders of the trans-European road network where the Community transport policy has its priorities and implementation guidelines. Telematics applications will extend into the Regional and Urban networks and to new types of services where user needs and market potential are substantial. Road hauliers, bus and coach operators, commercial deliveries and other services that depend on road transport can benefit from better fleet management.

Dynamic Traffic Information is one of the basic requirements for traffic management and traveller information. Various transport policy objectives can be served by more effectively informing travellers and shippers adequately to their needs. Automatic traffic data collection, processing, and distribution is the first step to intelligent traffic management and for new value added services. Public Transport Informatics and Management systems using the base of common "Data Dictionaries" and harmonised services can be deployed in most European cities.

The Bangemann Group has suggested that, as a start, 2000km of motorways of common interest in Europe with the maximum of international traffic and 10 cities in Europe should be equipped with appropriate Telematics systems to cover the services mentioned in previous chapters by 1996 extending to the whole Trans-European network and 30 metropolitan areas by 2000. The Corfu European Council meeting agreed in principle with the application areas of the Bangemann report. As concerns the Trans-European network the Commission will work with the Committee on Infrastructure in order to specify appropriate routes most suitable for first implementation. These routes should be considered as priority routes for projects of common interest addressing road traffic management and implementing the Council Decision of 29 October 1993 on the Trans-European Road Network. The Commission will shortly submit to the Christophersen Group proposals on how to proceed with traffic management systems on the TEN (Trans-European Network).

In a further response to the Bangemann Group's report, the Commission has said it will collaborate with associations of cities and regions, such as POLIS and CORRIDOR in order to develop common networks for pilot projects, and ERTICO (which brings together more than 30 administrations, undertakings, operators and users) in order to co-ordinate the implementation of telematics systems for road transport. Within an appropriate framework user organisations, operators, industry, representatives of administrations will have to promote their co-ordinated actions, whilst also supporting the activities of the high level group on the Information Society. The Commission will need to consider the investments necessary for the effective operation of telematics services on the Trans-European Road Network, the requirements for Telematics Systems and services in towns and cities, and the needs of operators and users for new value added services.

A key to well adapted traffic management would be the establishment of traffic information centres where they do not yet exist and interconnected into a traffic information network using standard protocols and messages as defined in the Telematics Programme. Information will be broadcast to the end users by Radio Data System-Traffic Message Channel (RDS-TMC) and , where appropriate, short range communication (beacons) or mobile telephony (GSM). There is a need to facilitate the creation of organisation(s) for the provision of the updating of digital maps.

In parallel, private investment in telematics systems and services for transport will be encouraged: fleet management systems, vehicle surveillance, route guidance, traveller information, and electronic fee collection which may help to attract private operators and offer value added services to travellers.

A Trans-European Telecommunication Network for surveillance of transport of dangerous goods should be envisaged. However, at present the necessary regulations and procedures require harmonisation prior to technical solutions.

The Commission is also working on the extension of the present Directive[28] for drivers licences in order to allow for issuing the licence in form of a credit card with a possible extension to the smart card technology; on a proposal for a regulation for the introduction of a digital tachograph[28a] ; and together with Austria, on a system which will allow electronic debiting of eco-points on Austria's roads. Installations should commence before 1997.

B.   TELEMATIC SYSTEMS AND SERVICES FOR RAILWAYS

In April 1994 the Commission submitted a proposal for a Council Directive on the interoperability of the European High Speed Train Network[29]. This Directive includes provisions on Telematics tools and services for control and command, and information exchange along the railway links to be implemented on the Trans-European Railway Network.
Any project which contributes to the goals of this Directive can be considered as a project of Common Interest as identified in the proposal for the guidelines for the development of the Trans-European Network for Transport. Furthermore, the conventional part of the railway network should also gradually be equipped as appropriate in such a way that interoperability for long distance freight trains is ensured.

With regard to this objective the Commission has since 1990 initiated work on the concept, definition and development of a European Control Command System based on state of the art technologies. This new Train Control System which is a subsystem of the European rail Traffic Management System (ERTMS) involves track-side equipment and locomotive equipment both with advanced hardware and software. The Commission would welcome initiatives for the installation of test beds for this system as soon as possible on major traffic axes to be selected from the Trans-European Railway Networks.

This new European Signalling System will also be tested, validated and proven in service in particular for application at the demand of the neighbouring countries of the Community e.g. on the line Vienna-Budapest during 1996-1997.

The Commission will propose the installation of such a system in the TEN. It expects that it will be examined by the Christophersen Group.

In addition, on-line traveller information services and freight information and booking systems are required in order to increase attractiveness and competitiveness of this transport mode.

C.   TELEMATICS SYSTEMS AND SERVICES FOR WATERBORNE TRANSPORT

The development of Vessel Traffic Management and Information Systems (VTMS) is one of the major activities included in the Commission Proposal for a Trans-European Network for Transport. They will provide interlinked surveillance assistance and guidance systems that will result in improved safety (reduction of risks, collision and grounding) and efficiency (reduction of waiting times, simplification and improvement of administrative procedures, continuous flow of traffic). Moreover, they will assist in avoiding and controlling pollution at sea and in emergency situations. Port State Control, an important element in the enhancement of maritime safety and protection of the environment, will be interlinked and thus become more efficient.

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[28] Council Directive 91/439/EEC of 29 July 1991, O.J. No. L273, 24 August 1991
[28a] COM(94)323 Final, 22 July 1994
[29] COM(94)107, 15 April 1994, O.J. No. C134 17 May 1994

Port information exchange systems are in various stages of implementation or development throughout the Community and should be further promoted. This is particularly relevant to promote short sea shipping traffic.

Maritime transport and port operators will have at their disposal logistics systems based on telematics which will facilitate the cargo flows and will enhance interconnectivity.
Moreover, the he Commission will invite the forum of maritime industries to bring forward concrete proposals on the use of telematics which will reflect the requirements of economic operators.
The Commission will make appropriate proposals in order to ensure interoperability of a Trans-European VTMIS network taking into account relevant dispositions of the International Maritime organisation. A communication on the subject is under way. It is expected that the Christophersen Group will examine such a project. Following the conclusions of the Council of 28 September 1994, the Commission will also propose an evaluation of the industrial and economic impact for all user industrial sectors including the maritime industries of the Bangemann Group's Information Society activities.

D.   TELEMATICS SYSTEMS AND SERVICES FOR AIR TRANSPORT

Air traffic control is a mandatory service necessary for maintaining an acceptable level of safety in air transport. The capacity of the systems providing this service appears to day to be a limiting factor of the development of an efficient air transport network in the liberal environment opted for by the European Community. Among the number of actions to be taken to upgrade the air traffic control systems performances in order to cope with the foreseeable demand, the resort to telematics capabilities appears to be one of the most promising ways forward. New tools (such as global Navigation Satellite Systems, Aeronautical Telecommunications Network, Automated Dependant Surveillance, ground/board automated datalinks) and new concepts (such as intelligent air traffic control work positions, air traffic flow management, collision avoidance systems) largely based on telematic applications have to be developed further and introduced in an operational environment.

Such a system is suggested in the range of proposed implementation actions for the information society as suggested by the Bangemann group and confirmed by the Corfu European Council meeting . The Commission proposes that it will be supported in the framework of the Trans-European Network activities.

The Commission has already paved the way for regulation and standardisation so as to ensure interoperability and interconnectability throughout the European Community with the adoption of a Directive for the definition and use of compatible technical specification for the procurement of air traffic management equipment and systems (Directive 93/65/EEC). A mandate has been given to EUROCONTROL and to standardisation bodies to work together. The Commission will follow closely the progress made with applying the Directive.

The Community has also established a coherent approach for RTD in air traffic management called ECARDA in order to foster work in this area, particularly in favour of the telematic application so as to prepare for the future European Air Traffic Management System in Europe.

E.   TELEMATICS SYSTEMS AND SERVICES FOR INTERMODAL TRANSPORT

Combined transport
The proper implementation of combined transport (inland modes and short sea shipping) as an alternative to goods transport services on the road requires information and management tools, which can be provided best by telematics tools and services. The main task will be to create a coherent European information network to track the loading units (containers, swap bodies and semi-trailers); such a network should extend across Europe for all modes (rail/road/inland waterways/short sea shipping) based on the results of the Telematics programme; it must also be accessible on a non-discriminatory basis and for a reasonable fee for any company or private undertaking doing combined

transport. Pilot Actions for Combined Transport (PACT)[30] offers a good framework for such actions as it associates various operators (as railways, combined transport societies, port authorities) on selected major axes all over Europe, but this would require allocating to PACT a sufficient budget.

The Commission proposes that in the framework of PACT, projects applying telematics systems and services to combined transport benefit from Community support. this should apply to operations in the trans-shipment terminals, between transport operators and shippers, for rolling stock management and for goods tracking.

In the same way short sea shipping promotion activities which will be proposed by the Commission in the near future, will cover the application of telematics tools and services.

The citizen network
The idea of a Citizens Network was put forward in the White Paper on the Future Development of a Common Transport Policy. It is an optimised combination of transport modes for door to door passenger transport services using to the greatest possible extent collective type of transport services. Essential elements of this citizens network will be its information system and a proper management system for the operators. The current Telematics Programme is demonstrating a number of advanced systems that improve collective transport, where implementation could be envisaged. Such a service network will be a corner stone in the implementation of the Common Transport Policy towards sustainable mobility. Particular emphasis will need to be put on urban services and on rural services in less densely populated areas of the Community subject to economic viability.

The Commission is drafting a proposal for a promotion plan for such a network.

3. Promotion of R&D activities related to Transport Telematics

The 4th Framework Programme adopted by the Council and Parliament in April 1994 includes Telematics as a major topic of research. In addition Transport relevant research is given more prominence.

The Commission in its proposal for the Specific Programmes (COM(94)68 of 30 March, 1994) includes Telematics research for all modes of transport as a major part of the Telematics Programme. Particular attention will be given to telematics systems as a contribution to the traffic management of railways, shipping and road traffic including inter- and intra-city traffic and multi-modal transport as well as for the creation of a harmonised, and finally unified system for European air traffic management. In this framework, the need to set pilot projects to validate the technical performance, operational capability and user acceptance of telematics applications is given priority. In addition the Specific Programme "Transport" will be undertaking the necessary measures to support the development of standards and to assist the implementation of Trans-European Transport Networks.

These developments will provide the strategic planning tools to support future decision making at a European level and to improve the efficiency and safety of individual transport modes with a view to achieving its optimum integration into the future multi-modal European transport system.

Work planned under the Fourth Framework Programme will address amongst other things Telematics applications for advanced Vessel Traffic Management and Information Systems, Air Traffic Management, European Rail Traffic Management Systems and road, urban and multimodal traffic management systems together with value added Telematics services in all transport modes to support demonstration projects and future needs. The development, integration and assessment of appropriate telematics technologies will be a key element in the implementation of these new services and of traffic management systems.

The Council is invited to adopt the Specific Programme proposals in the near future.

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[30] Pilot Actions for Combined Transport, Commission decision (93/45/CEE)

4. Co-ordination of efforts of Interested Parties

There is a multitude of different parties at various administrative levels (Community, National, Regional, Local) which have responsibilities and interest in the issues described above. There is a need for convergence of the various views and an acceleration of efforts to assist deployment. Therefore **the Commission will convene fora, as appropriate, with representatives of the users, information and communications providers, industry, and the relevant public authorities and transport operators in order to promote Transport Telematics deployment in Europe** in public-private partnership as proposed by the "Bangemann Group" for road and air transport. As a follow up to the recommendations of the Corfu European Council meeting , the Commission has just adopted in the framework of its Communication on the Information Society the concept of such fora for the promotion of the various applications and the co-ordination of the different actions. Member States will be invited to nominate representatives with expertise in telecommunications and transport from administrations. Industries, operators and users will also be invited to participate. The mission of these fora will be to assist in the work set out for the new co-ordination instrument for the implementation of the information society and in preparing decisions on next steps towards deployment of Transport Telematics. (ERTICO will participate in and support the work of the forum covering implementation in the Road Transport sector).

IV. CONCLUDING REMARKS

In the field of Transport Telematics Europe needs to build quickly on the isolated and local investments which have already been made in the Member States. More coherent arrangements across the Community will stimulate the growth of products and services in this area and provide the basis for market-led investment. In addition the authorities will wish to invest in transport telematics in support of better traffic management and to implement new management systems, such as electronic tolling.

The consequences of not making progress in this area could be serious. Japan and North America are making rapid progress in this sector, and the result could be that European industry is overtaken. As an example the European car industry needs a clear framework within which it can offer in-car navigational aids, information services and other driver support systems that will provide added value from the road transport sector in future.

This communication provides a description of the actions required at the Community level for the implementation of Telematics Services for assisting the development of a more efficient, intelligent and safer transport in Europe, friendly to the environment and socially acceptable. The document highlights the key role of private-public partnership in the implementation of Telematics tools and services for transport. There is a need for a detailed action plan to be established with a timescale for adoption of the priority actions in close co-ordination with other Community actions referring to transport.

For this purpose the Council is invited to support the efforts of the Community in particular with respect to common systems and services which are also beneficial for the solution of transport issues on regional and local level.

KEY COMPONENTS OF TELEMATICS SYSTEMS

Telematics are used in transport services and for the proper functioning of infrastructure and the transport networks by applying:

unidirectional or two way communication:
> broadcasting,
> wired telecommunication and
> wireless mobile telecommunication
> (i.e. digital and analogue telephony [31], Radio Broadcasting - RDS/TMC, short range communications -microwave/infra-red, satellite systems) - these new applications being part of the evolution towards the Universal Mobile Telecommunications System (UMTS) for personal communication services and of the Future Public Land Mobile Telecommunications Systems (FPLMTS). They include new digital systems such as GSM, DCS-1800, Digital European Cordless Telecommunications (DECT), and Terrestrial Flight Telecommunications System (TFTS)

data processing and advanced informatics systems:
> data acquisition, handling, and exchange; conversion to messages; modelling
> (computer vision, smart cards, multi-sensor monitoring systems, navigation equipment etc. Future developments can be expected very soon - namely Multimedia applications).

control tools:
> automated (imposed), automatic (auto-decisive), interactive (decision responsive), supportive(optional)

computer aided management systems:
> Systems of sensors (e.g. for traffic flows), detectors (e.g. for traffic sign control), management software either for automatic control or interacting with people

This telematics network for transport applications will be a part of the common "information area" as described in Chapter 5.2 of the White Paper on Growth, Competitiveness, and Employment (COM(93) 700 of 5 December 1993). It is built up from a variety of elements:

> ➤ electronic networks
> ➤ monitoring systems
> ➤ tracking and tracing systems
> ➤ electronic distribution channels and multimedia facilities
> ➤ mobile communication and data communication systems
> ➤ data broadcasting systems
> ➤ navigation and location-fixing systems
> ➤ databases, such as digital road information
> ➤ systems based on chipcard technology
> ➤ standards for technology, messages and organisation
> ➤ legal and institutional arrangements

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[1]   including new digital systems such as GSM, DCS-1800, Digital European Cordless Telecommunications (DECT), Terrestrial Flight Telecommunications System (TFTS)

TRANSPORT TELEMATICS SERVICES

Travel and Traffic Information

These services provide information to help network operators to manage information and assist travellers to plan trips. Data on recent and forecast network performance will become more sophisticated. This will help travellers to avoid congestions and adjust their trip planning. Use of high occupancy vehicles / car sharing can be encouraged.

○Traffic Information	Is the basic information for all management and planning functions and for provision for value added services
●Pre Trip Travel Information	Provides information for selecting the best departure times, transportation modes and routes
●On Trip Information	Driver advisories and in-vehicle signing improve convenience and safety; Similarly on collective transport vehicles
○Traveller Services Information	Provides a reference directory, or "yellow pages", of service information - quick access to travel related services and facilities
○Route Guidance	Provides travellers with simple instructions on how to reach their destinations
○Ride Matching and Reservation	Makes ride sharing more convenient

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Traffic Management, Operation and Control

These services will help network operators manage traffic. Traffic control procedures and mechanisms are provided. Planning and network maintenance functions are included. Services will help improve emergency notification and response times and facilitate resource allocation.

○Incident Management	Helps officials to quickly identify incidents and implement a response to minimise negative effects on traffic
○Travel Demand Management	Supports policies and regulations designed to mitigate the environmental and social impacts of traffic congestion
●Traffic Control	Manages the move of vehicles on roads, rail, waterways, and in the air
●Vessel Traffic Management and Information systems	Communicates cargo, traffic and vessel information to port authorities, shipowners, operators
○Air Traffic Flow Management system	Facilitates integrated air traffic management
○Rail Command and Communication systems	Facilitates advanced control of railways allowing shorter distances, higher train frequencies and improved interoperability with other transport modes
●Emergency Vehicle Management	Reduces time it takes to respond to incident notification
●Emergency Notification and Personal Security	Provides immediate notification of an incident and an immediate request for assistance
●Emergency Handling	Provides support for optimisation of decisions to handle emergencies and to minimise consequences of emergency situations

Collective Transport Services

These services improve efficiency, safety, and effectiveness of collective transportation systems for providers and customers. This category of services will make collective transportation more attractive to potential customers.

▫On Trip Information	Provides information to travellers using collective transport after they begin their trip
▫Collective Transportation Management	Automates operations, planning, and management functions of collective transit systems w
▫Personalised Public Transit	Flexibly routed transit vehicles offer more convenient service to customers
▫Public Travel Security	Creates a secure environment to travellers, patrons and operators of collective transport facilities

Commercial Vehicle Operations

This bundle of services will help streamline administrative procedures, innovative safety, and help efficiently manage commercial fleets.

▫Commercial Freight and Fleet Management	Provides communications between drivers, dispatchers, and intermodal transportation providers
▫Commercial Vehicle Administrative Processes	Provides electronic purchasing of credentials for operators and drivers and automated mileage and fuel reporting
▫Commercial Vehicle Electronic Clearance	Facilitates domestic and international border clearance, minimising stops
▫Automated Roadside Safety Inspection	Facilitates roadside inspections
▫On Board Safety Monitoring	Senses the safety status of a commercial vehicle, cargo and driver
▫Hazardous Goods Incident Notification	Provides immediate notification of an incident and immediate request for assistance
▫Intermodal Transport and Terminal Management	Provides communication between intermodal operators of road, rail, waterway infrastructure

Advanced Vehicle Safety Systems

Provide various forms of collision avoidance and safety precautions for vehicles of all modes of transport (car, rail, road, waterborne). Automated vehicles remain a longer term objective.

Road Vehicles

▫Longitudinal Collision Avoidance	Helps prevent head-on and rear-end collisions between vehicles and other objects or pedestrians
▫Lateral Collision Avoidance	Helps prevent collisions when vehicles leave their lane of travel
▫Intersection Collision Avoidance	Helps prevent collisions at intersections
▫Pre-crash Restraint Deployment	Anticipates an imminent collision and activates passenger safety systems prior to collision

All vehicle types

▫Safety Readiness	Provides warnings regarding the condition of the driver, the vehicle, and the rail or road way
▫Automated Vehicle Operation	Provides a fully automated "hands off" operating environment
▫Aeroplane anti-collision systems	
▫Collision avoidance systems for high-speed boats	will increase capacity by reducing headways and
▫New generation of railway communication systems	increasing safety

Driver/Pilot/Conductor/Navigator

▫Vision Enhancement for Crash Avoidance	Improves the ability to see the way ahead and objects that are on or along the way

Electronic Payment and Booking

Electronic payment services will link all modes of transportation (inter modality) under one simple, convenient payment system. This new system will help reduce delays in fee collection and provide accurate data for systems management. It will go beyond the application only in the transport sector.

●Electronic Payment Services	Allow users to pay electronically for transportation services inter alia with "Smart Cards"
●Booking Service	Using on-line communications allow to find availability of space and reserve it (places in collective transport, parking or tourist related events)

RECENT ACTIONS BY THE COMMUNITY AFFECTING DEPLOYMENT OF TRANSPORT TELEMATICS

Information Society

Endorsing the Bangemann group report and the conclusions of the Corfu European Council meeting the Communication on the "Europe's Way to the Information Society. An Action Plan" COM(94) 347 of 19.7.94 provides the general framework for the deployment of Telematics applications.

Trans-European Networks

Council Resolution 90/C 27/05 calls for special priority to be given to the development and interconnection of trans-European networks notably, inter alia, in the area of telecommunications and transport.

- Transport

The Commission proposal on the development of a multimodal trans-European Transport Networks (COM(94) 106 of 7.9.94) recognises the importance of the use of telematic systems for the improved functioning of air, rail, waterborne and road transport. It also identifies a number of projects in these sectors as of common interest for Community support.

The Council decision (29/10/93) on the creation of a trans-European road network calls for the implementation of advanced computerised information systems and development of traffic management technical systems for the operation of this network.

- Telecommunications

Efficient communication networks already exist and have been developed to high performance (ISDN)[1]. A proposal for implementation across Europe is under discussion in the Council COM (93)347. These communication media can carry information supporting the function of a multimodal transportation service.

The Council Resolution of 22 July 1993 (93/C 213/01) provides for the general liberalisation of all Telecommunications services which will facilitate the deployment of Telematics. This will help to confirm Europe's leading position in digital mobile technologies and GSM in telematics applications, which will form the basis of the future third generation market for personal communication technologies

The provision and operation of trans-European telematic networks will rely in particular upon the provision of common frequency bands and associated standards. Following Council Resolution of 19 December 1992 and the Council conclusions of 7 December 1993 a memorandum of understanding and a framework contract for the harmonisation of frequency bands has been concluded between the Commission and the ERO (European Radio communications Office).

As regards frequencies for road transport telematics a first step has been made with the European Radio Communications Committee decision of 22 October 1992 on the frequency bands to be designated for the co-ordinated introduction of Road Transport telematic systems (ERC/Dec(92)02). Additional sectors will have to be covered including air and sea.

The Council directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility calls for avoiding harmful electromagnetic interference, which could hinder implementation of telematic systems.

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[1]   ISDN - Integrated Services Digital Network . COM (93) 347

The two proposals of Council Directives on "The Protection of Individuals with regard to the Processing of Personal Data and on the Free Movement of such data" (COM(92)422) and on "The Legal Protection of Databases" (COM(93)464) together with the amended proposal for a European Parliament and Council Directive concerning the protection of personal data and privacy in the context of digital telecommunications networks, in particular the integrated services digital network (ISDN) and digital mobile networks, COM(94) 128, 13 June 1994. .

The Green paper on Mobile Communication (COM(94)145 of 27 April 1994) makes provisions for further services development and as such will support Mobile Transport Telematic applications.

In its Communication (COM(93) 69 final of 12 March 1993) on the Trans-European data communication networks between administrations the Commission prepares a Council Decision on a series of guidelines and a Community pluriannual action supporting the implementation of such communication networks between administrations (IDA). In its communication of 10 June 1994 (COM(94)210 final) on satellite communications, the Commission intends to ensure that new satellite developments are not hampered by bottlenecks flowing from the provision of - and access to - space segment capacity.

RTD in Telematics Applications

The Community's Research and Development Programmes DRIVE 1989-1991 (Dedicated Road Infrastructure for Vehicle Safety in Europe) and Telematic Systems in Areas of General Interest 1991-1994 (Area 2: Transport) have identified requirements and options for Road Transport and Multimodal Telematic Systems and have developed systems and the relevant requirements for standardisation. The work relating to a number of telematic applications for purposes of traffic management, information and other services is already at a very advanced stage. A number of traffic information and navigation systems are now being marketed and their use will increase considerably over the next years.

The 4th Framework Programme of Research and Development 1994-1998 defines the requirement for developing telematic systems for all transport modes and facilitating inter modal operations[2].

Framework for Transport Telematics Applications

The Directive 93/89/EEC of 25 October 1993 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 demands from the Commission a proposal for an interoperable advanced system for road use charging and as such will accelerate the implementation of Transport Telematics tools and services.

The Commission's proposal on Navigation Services By Satellites: A European Approach (COM(94) 284 of 16.6.94) will provide a framework for the emergence of important transport related services.

The Commission's proposal for a Directive on the Establishment of a European System for Vessel Reporting in Maritime Zones of Member States (COM (93) 647) identifies rules for basis communication of ships transporting dangerous goods or which are above a certain tonnage.

The Communications "The European Aircraft Industry : First Assessment and Possible Community Actions" [COM(92) 164 of 29 April 1992] and "Towards the Implementation of a Comprehensive Approach for the Maritime Industries : the First Tangible Results" [COM(93) 526 of 4 November 1993] point to the contribution Transport Telematics can offer to the solution of existing problems and to achieving competitiveness in the aircraft and maritime industries.

The Communication of the future European Automobile Industry (COM(94)49) and the subsequent Council Resolution of 22 April 1994 recognises the importance of Research and Technological development, including telematics, for the future of this very important industrial sector.

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2   Council Decision 88/416/EEC on a Community Programme in the field of road transport informatics and telecommunications
     (DRIVE) and Council Decision 91/353/EEC, and Council Decision PE-CONS 3605/94

Standardisation

The Commission approved two standardisation mandates to CEN, CENELEC, and ETSI:
support to CEN TC 278 (Road Transport Telematics) covering secretarial support for the committee and technical support for the most urgent items (8 project teams); a study mandate on air-traffic management to define a standardisation programme in co-operation with EUROCONTROL in order to avoid duplication of efforts and technical divergence that could create problems to the application of the 93/65/EEC Directive.

The Council Directive 93/65/EEC of 19 July 1993 creates the framework by which the Commission, assisted by a committee of Member States' representatives, shall adopt EUROCONTROL specifications that are applied to the definition and use of compatible technical specifications for the procurement of air-traffic-management equipment and systems, in particular communication systems, surveillance systems, systems providing automated assistance to air-traffic control, and navigation systems.

The Commission's proposal for a Directive on the Interoperability of the European Network of High-Speed Trains (COM(94)107 of 17 April 1994) describes different mechanisms to be set up in order to achieve the key objective of interoperability, a pre-requisite for telematics deployment.

TRANSPORT TELEMATICS INFRASTRUCTURE

Priority must be given, as the Bangemann Group considered, to the development of an appropriate **open system architecture** for advanced Telematic services with common user interfaces, allowing the same service to be delivered to the user, irrespective of the particular communication bearer. The Commission is currently studying the characteristics of such an architecture and will make the appropriate proposal.

European Community Actions required on Standardisation, Interoperability and Interconnectivity

1 Travel and Traffic Information Services

Agreement is needed in various key areas of data exchange and interoperability for multi-modal travel and traffic information.

➤ Geographical location referencing i.e. common referencing of the locations on which traffic information is exchanged or diffused

➤ Data dictionary i.e. common set of terms used in travel and traffic messages exchanged between traffic control or information centres and diffused to travellers

➤ Message exchange formatting: standardised format for the messages exchanged between fixed modes using EDIFACT via appropriate digitalisation

➤ Application protocols (for mobile communications between service providers and end users)

The Commission will continue to support consensus and standardisation efforts in these domains and will bring forward legislative proposals as necessary.

2 Digital Maps for different Modes

A standard for Geographical Databases at a European level will be promoted by the EU. The procedures for upgrading the map shall be established. This is particularly important for road maps because of frequent modifications to road attributes.

3 Digital Broadcasting

A common declaration of intent on the introduction at European level of the Radio Data System-Traffic Message Channel (RDS-TMC) will be issued based on the communication protocols already harmonised and using the standard messages (ALERT C and ALERT+) reporting. Compatibility of location codes will be defined. Upgrading to Digital Audio Broadcasting (DAB) will allow extra services to be provided facilitating services to users in different transport modes.

4 Short Range Communication/Automatic Vehicle Identification (AVI)

The mandate already given to CEN will be followed closely in order to allow an early standard which will allow on-board units to work throughout the Community with two-way short-range communication. The application of AVI for containers and rail wagons will allow a fully intermodal land system

5 Mobile Telephony

Standardisation efforts are needed through ETSI to allow the data transmission for traffic applications (GPRS) by mobile telephony based on a cellular concept (GSM: Global Systeme Mobil). The Telematics Programme is demonstrating the potential of this solution. The same GSM system can be used for applications in rail communication and control and this needs to be assessed. The future generation of the Universal Mobile Telephone System (UMTS) and its use of Broadband Communication Networks will open the field for a single communication medium for all inland transport.

In addition the need for any further action by the Community will be examined in order to facilite further use of the Terrestrial Flight Telecommunications System (TFTS).

In the follow-up to the Green Paper on Mobile Communications (COM(94)145 of 27.4.94) these issues will be taken up.

6 Frequency Allocations

A Memorandum of Understanding and a Framework Contract has been concluded with ERC and ERO[1]. The ERC's decision of October 22, 1992 designated frequency bands to be designated for the co-ordinated introduction of Road Transport Telematic Systems (ERC/DEC(92)02). The utility of one of these frequencies (5,8GHz) for rail applications will be examined. This decision calls for rapid introduction of ETSI standards into the national type approval regime. In addition a similar decision to cover requirements of air transport has been taken. These decisions cover only a small sector of Telematics needs. The Council with its resolution of December 19, 1992 following the subsidiarity principle, requested Member States to introduce these provisions into their national systems. Additional application areas (rail transport, sea traffic) have to be developed in line with the ITU allocations and the availability frequencies of in Europe. The Commission has on 10 September 1993 presented a proposal for a Council Decision[2] setting out a new approach for the co-ordination of radio frequencies in the Community and will examine the functioning of co-operation with ERC/ERO and will report on this to Council.

7 Electromagnetic Interference

Potentially a major barrier for introduction of Telematics in Transport is the possibility of electromagnetic interference if appropriate measures and guarantees are not given. The application of Council Directive 89/366/EEC of May 3, 1989 on this subject has to be examined. Any additional measures have to be identified and appropriate action proposed.

8 Man Machine Interface and other In-Vehicle Standards/Type approval

The introduction of information displays inside the vehicles might have an impact on traffic safety. A code of practice for the way information should be communicated to the driver will have a positive impact, as the work done already in the Telematics Programme indicates. The European Conference of Ministers of Transport has positively supported such an approach. The EU will examine if an appropriate modification to the Reception Directive 92/53 which modified the framework Directive 70/156 or additional legislative tool should be introduced. The introduction of all these additional electronic devices on board vehicles need an appropriate framework to guarantee compatibility and avoid market distortions. The modifications to Directive 92/53 will reflect these needs.

9 Standardisation in CEN/CENELEC/ETSI

The Commission, using the provisions of directive 83/189, has given a mandate to the European Standardisation bodies to accelerate standardisation, particularly in view of the needs as they emerge from the setting up in global level of the ISO Technical Committee 204 on Transport Information and Control Systems. The priority items identified cover automatic fee collection and access control, traffic and traveller information, geographic road databases, dedicated short-range communications and automatic vehicle and equipment identification. However the work programme established by CEN/CENELEC/ETSI covers thirteen working items. There is a need to accelerate all this work, in response to global competition, and therefore the Commission will examine the means of supporting the whole list of work items as set up. This includes in addition; architecture and terminology, road traffic data, freight and fleet management systems, public transport, traffic control, parking management, man-machine interfaces and the subsystem and intersystem interfaces.

10 Multiservice/Multipayment

One of the technologies which can facilite integration of transport services is the use of a common payment medium for different transport applications (parking, collective transport, tolling). The work on standardisation is proceeding in CEN but further effort is required at Community level to achieve harmonisation. An early priority is the interoperability of systems to be used for electronic payments on motorways. The Commission has established a concertation framework with the Member States which will assist in defining appropriate actions at Community level, particularly in supporting requirements of Directive 93/89 of October 1993 on Tolls and Charges. Any proposal will take into account existing rules on financial transactions and clearing procedures and will be open to multipurpose applications.

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[1] European Radiocommunications Committee and European Radiocommunications Office, following Council Resolution of December 19, 1992 and the Council Conclusions of December 7, 1993

[2] A Proposal for a Council Decision on the implementation by Member States of measures concerning radio frequencies. COM(93) 382 Final, 10 September 1993

IMPACT ASSESSMENT FORM

THE IMPACT OF THE PROPOSAL ON BUSINESS
with special reference to small and medium-sized enterprises (SMEs)

Title of proposal:
Communication from the Commission to European Parliament and Council on **Telematics Applications for Transport in Europe**

Document reference number : N/A

The proposal

1. Taking account of the principle of subsidiarity, why is Community legislation necessary in this area and what are its main aims?

   This Communication outlines an action programme for the Community in the field of telematics applications for transport. Without effective technical harmonisation and a coherent legal and institutional framework as proposed here, the economies of scale offered by a European-wide market will not be fully exploited.

The impact on business

2. Who will be affected by the proposal?
   - which sectors of business?
   - which sizes of business (what is the concentration of small and medium-sized firms)?
   - are there any particular geographical areas of the Community where these businesses are found?

   Sectors affected: transport operators in road, rail, air and waterborne transport; providers of value-added services in the transport sector; suppliers of transport management and control systems; telecommunication network operators; vehicle/carrier manufacturers and car component suppliers; suppliers of information and communication technology equipment.
   Sizes of business: a wide range of industrial sectors, some of with significant numbers of SMEs
   No significant **geographical concentration** in the Union.

3. What will business have to do to comply with the proposal?

   The Communication does not require immediate action by business but follow-up measures will require compliance.

4. What economic effects is the proposal likely to have?

-   on employment
-   on investment
-   on the competitive position of businesses

The measures described in the Communication are expected to generate short-term and long-term **gains in employment**, particularly in the industrial sectors mentioned above.

The policy framework will provide stability on which to build **planning and investment decisions.** It is expected that the private sector will take up this challenge.

Key objectives of the action programme of the Community are to assist enterprises in Europe in **maintaining their leading competitive position** in a more intensive global market (USA/Japan), to improve the economies of scale, to speed up reaching of a critical mass and to allow non-discriminatory access to different market segments by all interested industrial players. The creation of private-public partnerships will be stimulated. The measures described are not expected to introduce a distortion of competition. By stimulating the application of telematics in transport the logistics conditions for all sectors of industry will be improved.

5. Does the proposal contain measures to take account of the specific situation of small and medium-sized firms (reduced or different requirements, etc)?

    The proposals take into account the situation of small and medium sized enterprises (e.g. approach on private-public partnership, licensing, franchising, public procurement policy, protection of intellectual property rights etc.) There is a relatively high rate of SME participation in pilot projects, research and validation exercises in this sector which will position them for success. The introduction of specific support schemes for SMEs in this field is being considered within the 4th Framework Programme RTD actions.

Consultation

6. List the organisations which have been consulted about the proposal and outline their main views.

    The current Communication is a response to the requirements of several hundred network operators, transport, information and communication technology companies, plus representatives of transport users who have been involved in recent Community RTD in this sector. It is consistent with the main political and strategic requests of ERTICO, the European Road Transport Telematics Implementation Co-ordination Organisation, a platform for co-operation of industrial companies, public administrations and users.