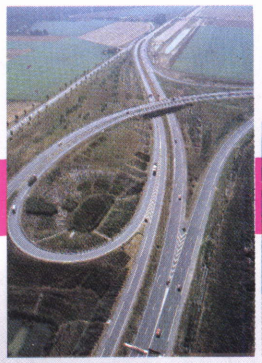
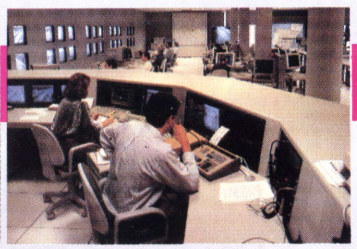
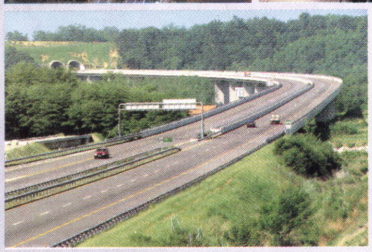
The trans-European road



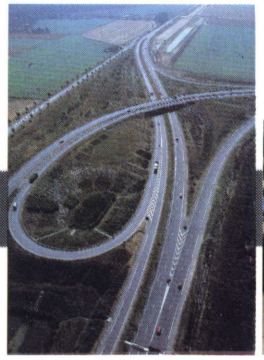


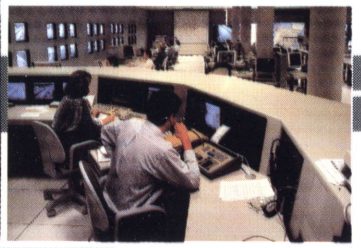


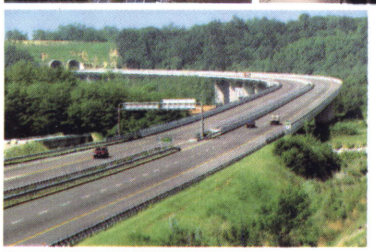
European Commission
Directorate General for Transport

1995 Version

The trans-European road







A network for Europe

Traffic management: a new challenge

What is at stake for the economy

Foreword

Transport in Europe is on the move.

For the people and businesses of the European Union, it means the possibility to travel each day more easily, more quickly and more safely in an area without internal frontiers.

The trans-European transport networks, which aim to reduce distances and eliminate physical and technical obstacles, play an essential role in this respect. It is why the new Treaty on European Union has given fresh impulses to the networks in order to develop a transport system for the 21st century.

The trans-European road network, as adopted by the Union, fits into this perspective. At a European level, the priorities are to strengthen the European dimension of the network and to improve traffic management and it is to these ends that the Community institutions are working.

Robert COLEMAN

Director General

A network for Europe

A network for Europe

TRANS-EUROPEAN NETWORKS: A PRIORITY FOR THE EUROPEAN COMMUNITY

In the nineties, the European Community has made a decisive step towards the implementation of major transport infrastructure and facilities of European scope. More specifically, if the fundamental objective of free movement of people and goods beyond national borders is to be met, transport links will have to play a major role. However, there are still missing links and, at times serious, choke points continue to persist in the transport networks of today.

The Treaty on European Union signed in Maastricht, which came into force in 1993, has expanded Community powers to include the development of trans-European networks.

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Henceforth, the Community must encourage in particular the interconnection and inter-operability of national networks as well as access to these networks. A broad discussion on the matter between European Community institutions is also called for in the Treaty, which puts the Council of Ministers and the European Parliament on equal footing in making decisions about these networks, and involves the newly created Committee of the Regions. This discussion is now under way.

To this new institutional framework is added a political determination expressed at the highest levels. At several consecutive European summits, the heads of State and of Government have particularly stressed the need for trans-European transport networks to be set up by the year 2010. In this way, these networks can help Europe resume growth, enhance the competitiveness of the economy, and develop the labour market.

The European Community has therefore made a clear political commitment to a number of major projects.

The implementation of large networks is in fact at the core of the common transport policy, as it constitutes a major activity with a direct bearing on the 370 million users of the transport system of the Europe of the Fifteen. All modes of transport are concerned: surface transport, shipping and air transport. This programme is a real financial challenge, estimated to cost a total of ECU 400 billion by 2010.

The accelerated implementation of an advanced transport infrastructure in Europe is

nonetheless difficult to reconcile with the need to consolidate national public finances required in particular for Monetary Union. This is why the private sector will be involved, more widely through public / private partnership schemes, in the financial engineering and management of such networks.

THE ROAD SYSTEM AT THE HEART OF TRANS-EUROPEAN NETWORKS

The trans-European road network plays a key role due to the particular importance of roads in the transport system: some 90% of passenger and more than 70% of goods traffic are transported by road.

By decision of the Council of Ministers of 29 October 1993, the trans-European network has become the official network of the European Community, thereby underscoring how strategically important the design, construction and operation of road links have become.

The trans-European road network connects the major European centres and helps to serve all the regions of the Community. The intention is that it should be up-to-date and of high technical performance. It has to guarantee its users a high and consistent standard of service as well as fast and safe travel.

In view of the increasing traffic problems on the major road arteries, and in particular on urban by-passes, the trans-European road network is a prime focus for the development of telematics infrastructure and services for traffic management and communicating information to the users.

Telematics can play an active role in enhancing road safety, the search for an improved balance between modes of transport, and the implementation of a sustainable transport policy.

The guidelines for the development of trans-European transport networks proposed in April 1994 by the European Commission and currently under discussion among the institutions of the European Community restore the road network in the multi-modal context, i.e. in relation to conventional or high-speed rail networks, combined transport, waterways, and port and airports. Parallel measures are still pending, es-

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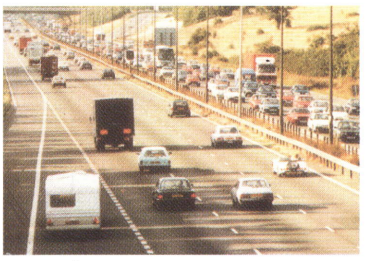

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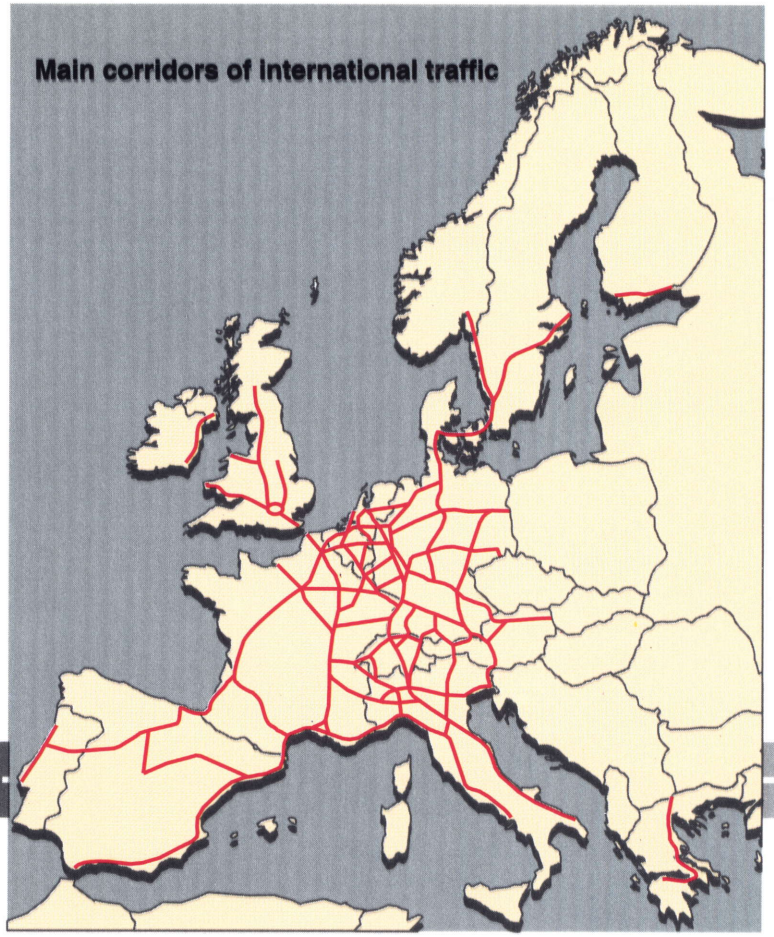
Main corridors of international traffic

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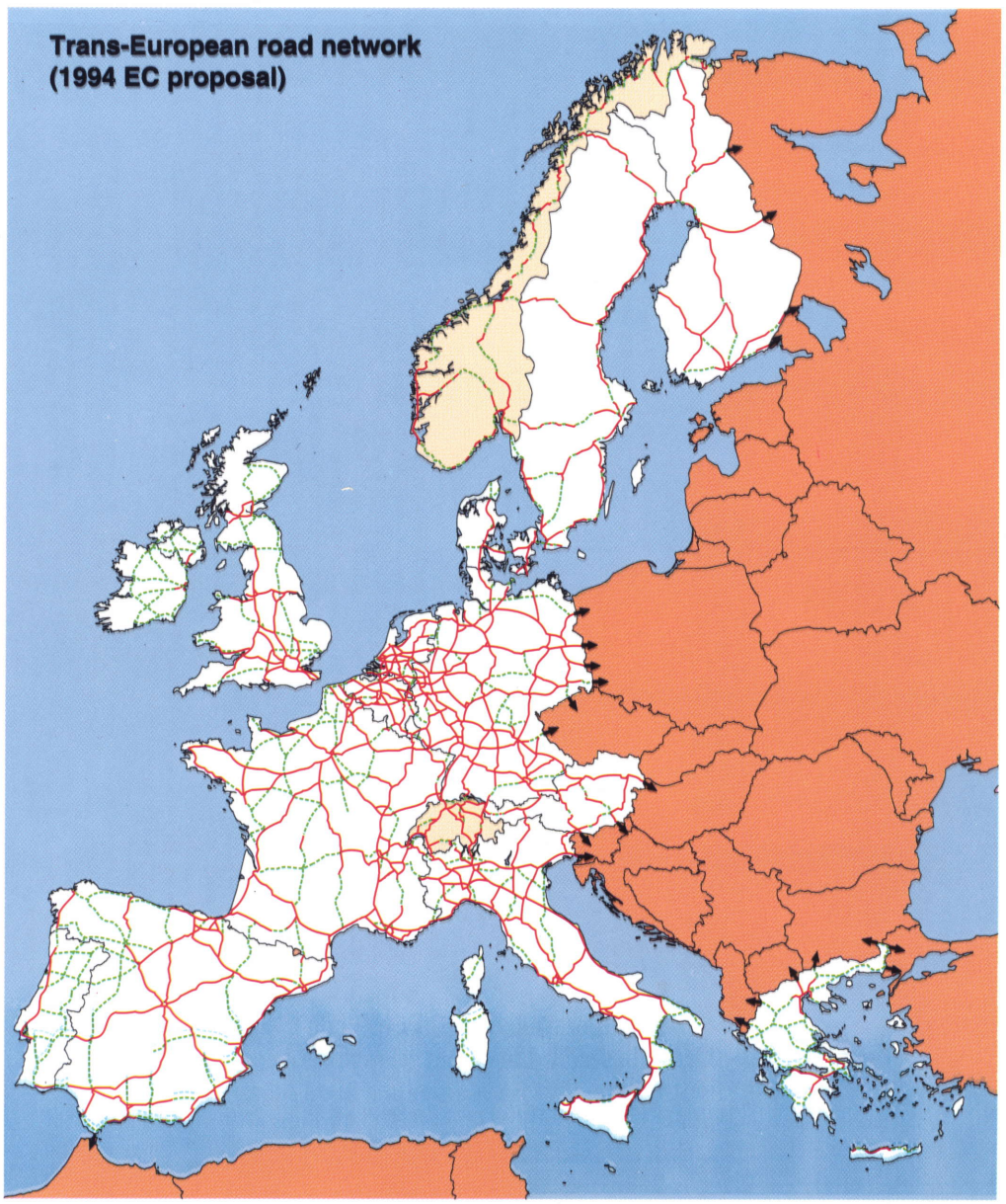
Trans-European road network
(1994 EC proposal)

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The trans-European road network will thus cut travel time considerably on many routes, while serving regions hitherto relatively inaccessible trans-European traffic.

Discussions with neighbouring countries, particularly those of Central and Eastern Europe, have given a pan-European dimension to the network. Nine principal traffic corridors have been identified for the future development of the Trans-European network.

pecially concerning inter-operability and traffic management.

THE MOTORWAY - TRANS-EUROPEAN LINK PAR EXCELLENCE

The outline of the trans-European road network provides for the establishment and operation of a network of some 67,000km of technically advanced links. The trans-European road network is therefore chiefly composed of motorways, which will ultimately comprise 90% of this system. Today, 70% of the network is already operational. In ten years or so, there will be an additional 19,000 km of motorways and high quality roads, more than 40% of which will be in peripheral countries of the Community alone. The motorways will be built either by upgrading existing links, or on new alignments. Express lanes and upgraded roads will complete this motorway network. Finally, some sections handling heavy traffic as well as urban by-pass roads will be widened.

One third of the network will comprise major international arteries (or main trans-European links), and the other two thirds inter-connecting local links or alternative roads to the major arteries.

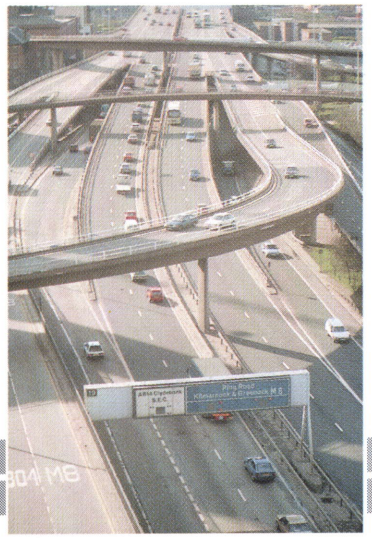
COMMON TECHNICAL SPECIFICATIONS

The Community action on networks will be first and foremost to the advantage of the citizens of the Community. For the safety and comfort of users of the European road network, the technical specifications for infrastructure and facilities as well as for their use must be homogeneous and continuous in so far as possible.

Although the trans-European road network is sufficiently inter-operable already, there is still room for improvement. Certain common specifications on the typology of inter-city roads, sign posting, road marking, traffic management systems and the services offered must nonetheless be adopted and implemented gradually to meet the needs of the users. Trans-European networks can only exist with standardised or at least highly consistent technical specifications.

CONTRIBUTION TO REGIONAL DEVELOPMENT

It is expected that the trans-European road network will have a very positive impact on the economic and social cohesion of the Community. The completion of major trans-European routes and the consequent reduction of travel time obtained will bring the major European areas closer, and in particular



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the central regions of the Community, the North Sea, the Alpine arc, the Atlantic arc, the western and eastern Mediterranean coastlines, Scandinavia or the regions facing the countries of central Europe. The networking will moreover afford greater overall accessibility to the entire territory of the Community, as it will serve all the regions of the Community.

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In metropolitan areas, trans-European links are expected to generate new competition or complementarity among cities and economic hinterlands. All cities with more than 250,000 inhabitants are already connected to the trans-European network.

In non-metropolitan areas, the network will help accelerate the process of opening up inaccessible areas, and will play an important role in getting rural areas to function properly. Parallel measures on the local level going beyond the structuring of the transport system are essential to maximise the economic and social effects of the infrastructure.

ECU 140 BILLION

The European Community works on the trans-European road network are part of prospective planning. The investment allocated for construction and renovation runs to some ECU 125 million for the next ten years. Then there are the data communication infrastructure and facilities needed for traffic management and for the development of added value services which will require an estimated investment of ECU 13 billion by the year 2010.

With an ambitious and determined policy for major networks, Europe must also pursue the rigorous reorganisation of public finances.

Consequently, alternative sources of finances must be tapped and the private sector must be more involved through innovative partnership schemes for the construction and operation of the trans-European road network. The user will therefore be called on to incur directly the costs of using the network by paying toll.

The Community financial instruments will contribute to this development. The "Networks" chapter, traditionally used for co-financing operations, will in future provide aid towards the payment of interest and loan guarantees. The European Investment Bank and the new European Investment Fund have also been instructed to facilitate the granting of loans on long term basis and loan guarantees.

Furthermore, the Community will provide substantial aid to the weaker countries and regions of the Community. The Cohesion Fund concentrates in particular on completing the trans-European road network in Spain, Portugal, Ireland and Greece. Similarly, the European Regional Development Fund (FEDER) focuses on underdeveloped regions or those undergoing industrial conversion.

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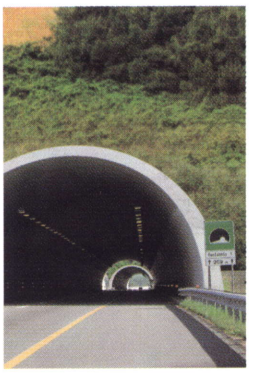

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ROADWORKS AHEAD
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Traffic management: a new challenge

ronment, some trans-European arteries are nowadays congested on a regular basis. In short, the long term efficiency of the network is under threat. Furthermore, improvements in safety and the reduction of environmental pollution are expected.

The second reason is the on-going technological revolution in road data communication. Information infrastructures are likely to have

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unprecedented repercussions on growth, economic and social progress, employment, the quality of life, and environmental protection. The evolution towards an "information society" is opening up new opportunities and considerable prospects for a certain number of sectors including transport. Telematic systems must be introduced in the networks, provided they are cost effective from the social and economic perspective.

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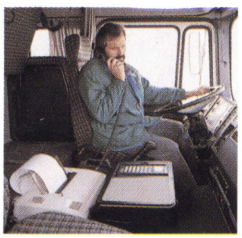

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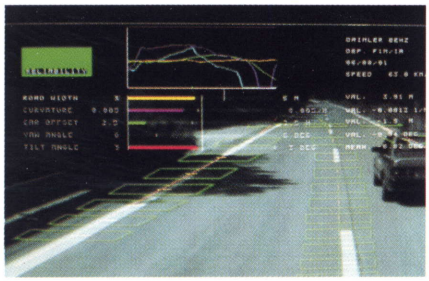

The third reason has to do with the diversity of operators in Europe. In view of the specific nature of each national organisation in operating the road system, it would be impossible to manage traffic on the trans-European network and to develop a data-communication market without Community guidelines and without consultation with the local actors.

A FRAME OF REFERENCE

Traffic management is a complicated matter. It requires a consistent and convergent approach to the:

- Quality of services for the user. Public policies and technological development require that the flow of traffic is henceforth considered in addition to the safety and comfort of users.
- Duties of operators, namely a) to keep the infrastructure available and safe, b) operate

traffic flows, and c) provide assistance and services to the users.

- Operating conditions, which are highly diversified on the trans-European road network. It cannot be operated in a copletely uniform manner, as some sections are simple links, others are part of traffic corridors, and others still are part of networks.

This is why a frame of reference is desired to ensure Community integration while taking due account of particular national features.

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This frame of reference will include data gathering and the monitoring of the network, traffic information and control, added value services, as well as related applications, for example:

- Collection and compilation of data, the monitoring of traffic, incidents, exceptional events, hazardous substances and weather conditions;
- Speed-limit regulations and the flow of traffic, bridges and tunnels, and access control to congested infrastructures;
- Information on the traffic flows, real-time information on road events, travel-planning information;

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- Added value services, such as dynamic guidance, the selection of the best route, automatic toll payment without stopping.

FROM RESEARCH TO APPLICATION

Pursuant to the Community frame of reference for the implementation of data communication systems on the trans-European network, a concerted deployment process is required. This deployment will draw in particular on information from national or Community research and development programmes such as Drive and Prometheus, and apply the results of initial pilot experiments on a large scale with a view to formulating a traffic management policy.

The Community action also aims to enhance complementarity between research and development initiatives and the application of telematics on trans-European networks. The fourth research and development programme (1995-1998) actually implements new research actions directly connected to the common transport policy, and intended to focus on demonstration projects.

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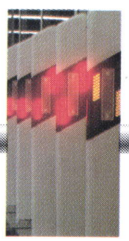

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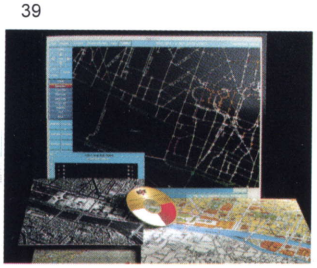

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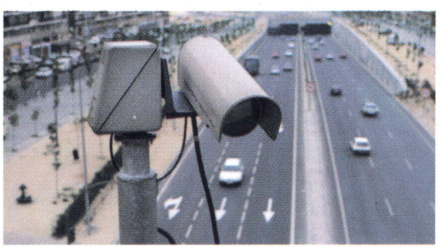

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CONCERTED DEPLOYMENT

The telematic systems is currently under way. This is admittedly only beginning, but it is expected to accelerate in view of technological advances and of the on-going standardisation process. In some cases, these intelligent infrastructures will feature an interface with vehicle equipment. This implies a wide range of such equipment: optical fibrecabling, loops and detectors, markers, emergency call stations, cameras, software, traffic information centres, traffic control centres, signboards for variable messages, traffic signals, ground telecommunication stations, on-board computers, RDS-TMC, GSM, satellites, etc.

The Community action therefore aims to optimise this deployment through consultation, the logical sequence of which could entail three stages:

- First, the deployment of a basic infrastructure, actions and services in what are considered to be saturated priority areas;
- Then, a progressive extension to the major trans-European arteries, focusing of trans-European continuity of services;
- Finally, the programmed extension of traffic management actions and services to the entire trans-European network.

Traffic management requires first and foremost the installation of a traffic data gathering infrastructure, accompanied by the requisite

organisation for processing and disseminating such data, as traffic control actions cannot be undertaken nor information to users provided without them.

The Community now has the means at its disposal, through the Trans-European Transport Network budget line, to intervene financially, if necessary, to support common projects in the field of telematics and traffic management applications. Substancial co-financing has been initiated in 1995.

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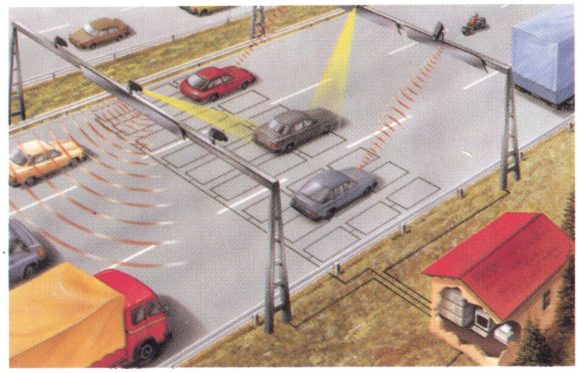
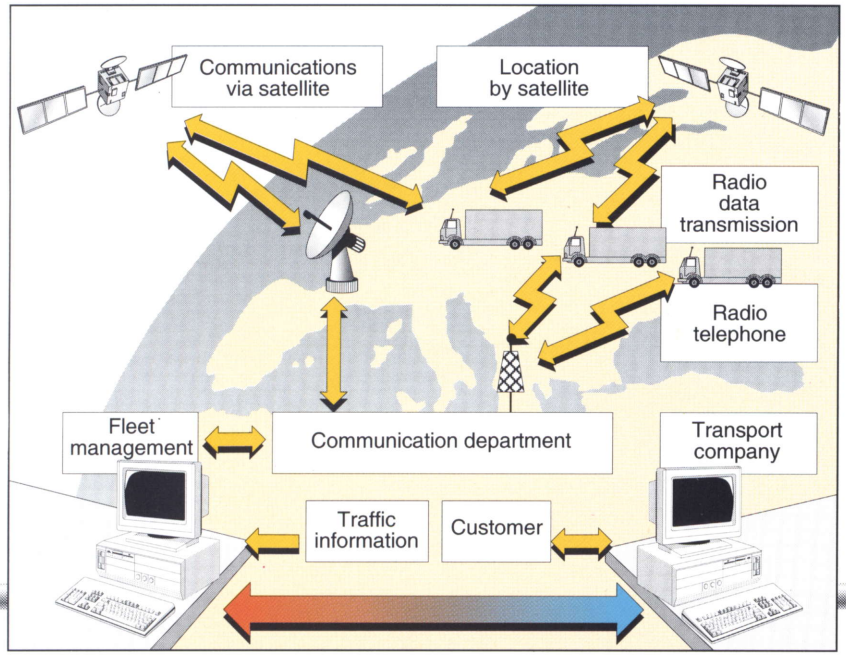


AN INTELLIGENT NETWORK

Particularly important elements of this concerted plan in the short and medium terms appears to be the implementation of:

- A European pre-travel information system. Accessible by various means, such a system would enable users to prepare their journeys in Europe more rationally, and should be multi-modal.
- Dynamic road information beyond borders. Such exchange is still exceptional, and users are often poorly informed about the state of the network and of traffic during international travels. It is therefore vital to inter-connect the national and regional information centres of the different countries. For this reason, a true network of road information centres is currently being established.
- Radio guidance services using RDS-TMC technology. This radio data system is at present technically capable of providing a quality information service on a European scale. It seems to be the first stage for introducing data-communication technologies in traffic management. With the DEFI project, the European Community aims to pursue a quick and concerted development strategy of RDS-TMC on a basic network of several thousand kilometres. This network will progressively be extended.
- A satellite-based positioning and guidance system. Such a uniform system throughout Europe would make it possible to develop the driver-guidance, the management of fleets of heavy goods vehicles, first-aid vehicles and



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taxis or to monitor the transport of hazardous substances.

- Automatic toll systems. Such toll systems not requiring drivers to stop will encourage the development of alternative forms of financing and of the coverage of the costs of using the infrastructure and facilities by the users. They will also make it possible to regulate traffic during rush hours by varying the toll levels.

Basic Trans-European network of road information services using RDS-TMC technology

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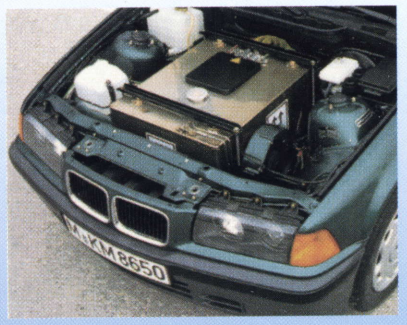

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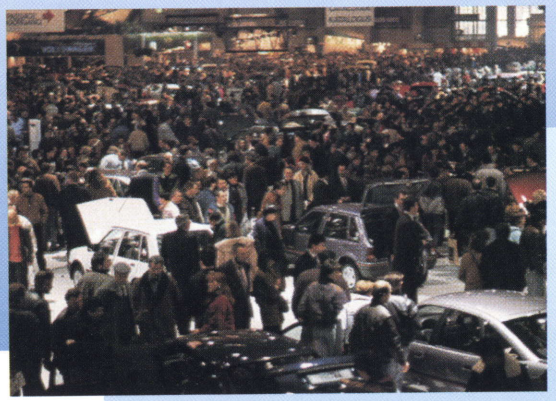

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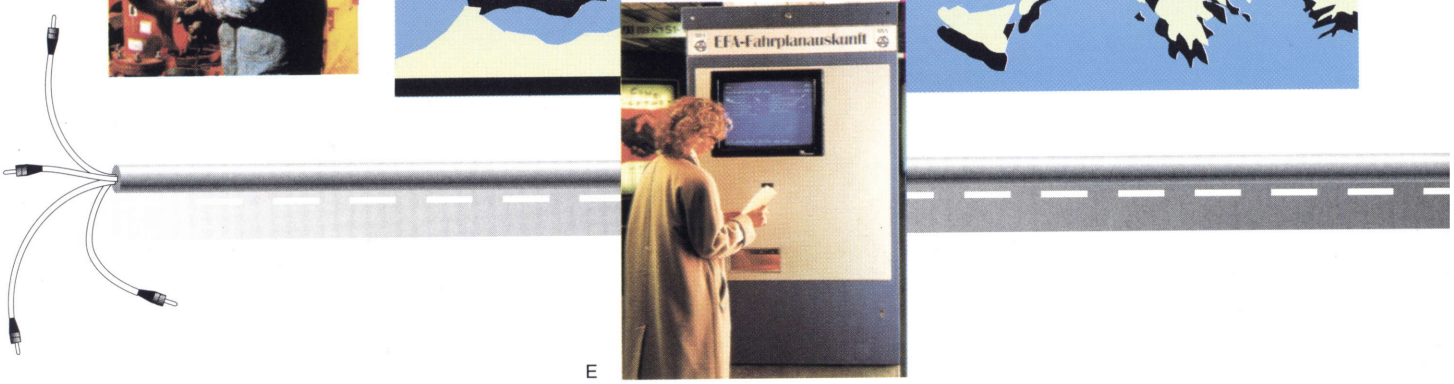

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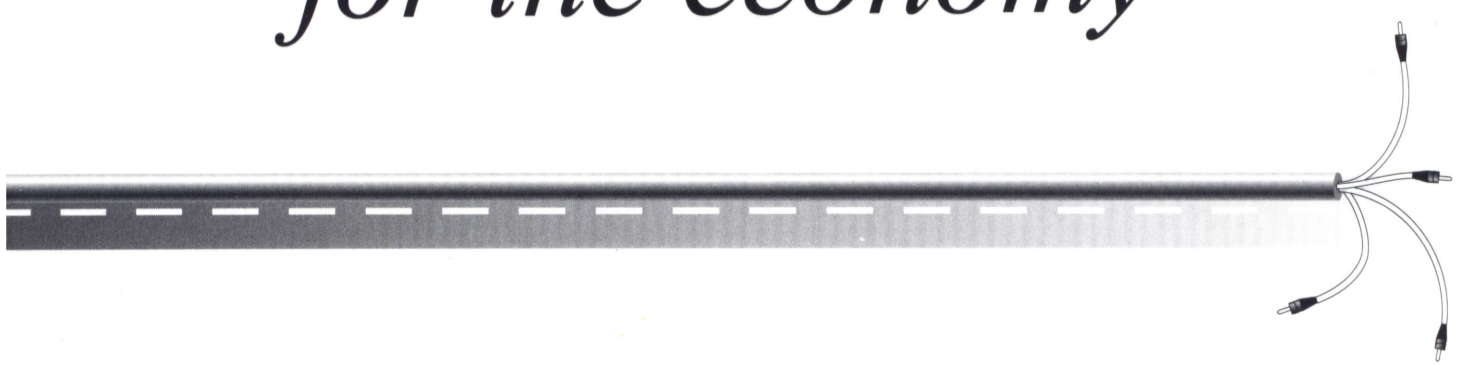
What is at stake for the economy



What is at stake for the economy

The trans-European road network is an extraordinary opportunity for several branches of European industry and services. Designing, building and operating such major infrastructure and facilities requires high level expertise and qualifications, which most often relies on innovative techniques.

EXPERTISE AND HIGH TECHNOLOGY

The expertise acquired from the construction and operation of nearly 40,000 kilometres of motorways, the technological achievements in designing exceptional projects — motorways in difficult sites, bridges or tunnels, innovations in surfacing, advances in integration within the environment, enhanced safety, the improvement of the services offered to users, the reliability and performance of operating equipment, management of flows and information for the users, are just a few of the major assets of European companies.

Europe boasts exceptional expertise in this field, based on the experience acquired and on highly efficient pre-competitive research programmes. This expertise is very widely recognised in the rest of the world, as Europe

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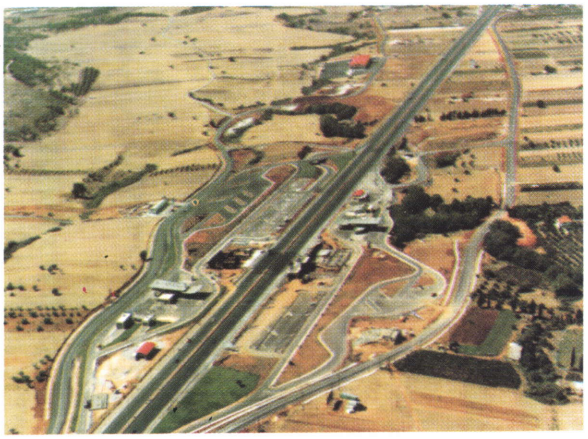

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is a major exporter in the civil engineering sector. The importance attached to continued cooperation in research and development by the European Community, is an excellent sign. It is now well established that cooperation between industries and research institutes in the Community produces particularly fruitful results.

HIGH-GROWTH INDUSTRIAL MARKETS

It is clear that the completion and operation of the trans-European road network is a particularly high-growth market for European industry. An analysis of the market has moreover shown that roads and related areas of expertise, construction and operation are growing.

The public works sector is primarily concerned with the construction of missing links, i.e. 15,000 kilometres of high-quality inter-city links, chiefly motorways. However, existing links and urban by-pass roads should also be widened accordingly, for a total investment of ECU 125 billion. Whereas most of the major road links will have been completed by the year 2005, an in-depth renovation phase of the motorway network, which is now ageing, must be foreseen. The investment need is not expected to drop in the very long term.

As far as electronics is concerned, major advances are expected in traffic management and road information. With the progressive transition from research and development to testing and through to the marketing phase, new markets are opening up, be they for infrastructure-related equipment, on-board equipment, or the provision of added value services. The electronics and automobile industries and telecommunication operators will thus play a major role as partners.

Given the high technological sophistication of such equipment which heralds the information society of tomorrow, it is clear that the field will

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regional authorities to make decisions in complete awareness of the situation. The road telematic market could then extend to urban and suburban networks currently considered as the most promising for certain applications.

Naturally, the development of this market is contingent on the capacity to advance towards satisfactory solutions for the inter-operability of systems and services, the implementation of the regulatory framework required for the development of the road data communication and, on a more fundamental level, the development

be highly competitive on the world scale. The faster that the European Community manages to deal with lingering uncertainties about the institutional and legal aspects raised by the development of data communication, the stronger European industry will be in both the internal and the world markets.

The trans-European road network will help the European market of road telematic systems reach its critical size. With a potential ECU 13 billion for telematic infrastructures and 18 billion for on-board equipment by the year 2010, it is bound to play a highly important formative role in the market. The services introduced should also generate a considerable turnover. The initial concerted applications will be decisive in this.

The decisions taken at European level for the application of telematics will enable local and

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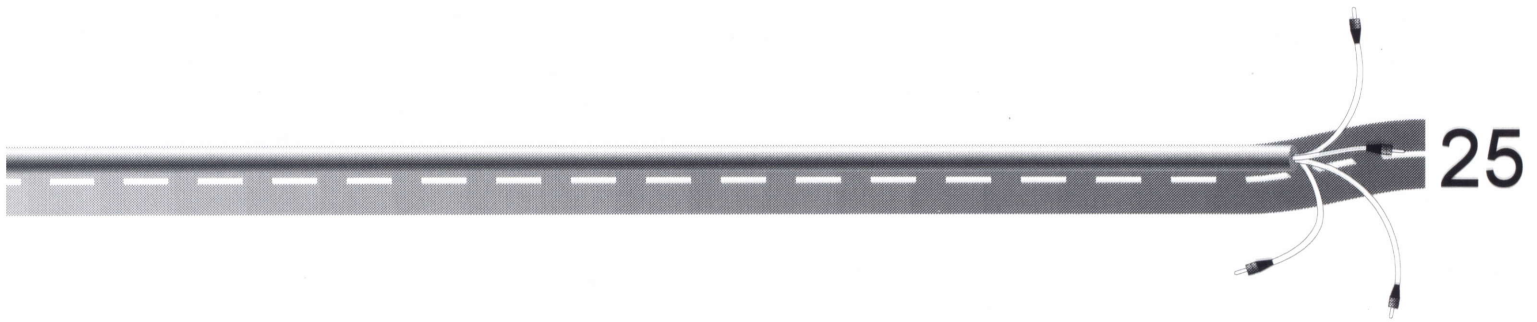
of a truly integrated transport system at European scale.

The combination of an advanced motorway network with high level services and efficient traffic information systems will contribute to the growth, competitiveness and employment in Europe, in accordance with the guidelines of the European Council.

Paving the way to the 21st century



The European road is on the move. With this advance towards higher performance, greater comfort, more information, enhanced safety, and more consideration of the environment and multi-modal complementarity, the traditional areas of expertise concerned are changing.

The Treaty on European Union lays down the foundations required to guarantee the overall consistent development and draws up common guidelines. These guidelines will offer citizens and economic agents of the Community a better transport service in a Europe in search of sustainable mobility and competitiveness.

At the core of the common transport policy, the trans-European road is an opportunity for the Europe of today, and a future for the Europe of tomorrow.

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Acknowledgements

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