EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT

XXII

NINETEENTH ANNUAL REPORT AND RESOLUTIONS OF THE COUNCIL OF MINISTERS

YEAR 1972

LONDON, 14th JUNE 1972
PARIS, 8th DECEMBER 1972

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NINETEENTH ANNUAL REPORT

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Chapter I

GENERAL REVIEW OF THE PROCEEDINGS OF THE CONFERENCE AND OF ITS EXTERNAL RELATIONS

1. As in previous years, the Council of Ministers of the Conference held two meetings in 1972, the first (35th session) took place in London on 14th June; the second (36th session) in Paris on 8th December.

2. The Officers of the Conference were the United Kingdom Minister for Transport Industries (Chairman), the Netherlands Secretary of State for Transport and Water Control (first Vice-Chairman) and the Austrian Minister of Transport (second Vice-Chairman). New Officers were elected at the end of the 36th session for the coming year.

The new Officers are the Netherlands Secretary of State for Transport and Water Control (Chairman), the Austrian Minister of Transport (first Vice-Chairman) and the Danish Minister of Public Works (second Vice-Chairman).

3. During 1972, the Committee of Deputies held six sessions, two of which immediately preceded the Council meetings, which they prepared.

The Committee was assisted by the following Standing Committees:

- the Investment Committee which, with the help of three Sub-committees (for railways, roads and inland waterways) carries out a series of practical studies in the field of transport economics, dealing in particular with forecasting and transport infrastructure networks. Each year it produces a report on Member countries' investment in their transport systems and the output of those systems (see Part 2);
- the Railways Committee;
- the Road Transport Committee, the setting up of which was mentioned in the last Report;
- the Road Safety Committee;
- the Urban Transport Committee;
- the Economic Research Committee.

The Noise Abatement Committee did not meet in 1972, but its Chairman has been instructed to keep personally in touch with the work of other international organisations working in this field and to report to the Committee of Deputies whenever he considers that it would be useful for the Conference's work.

The Committee of Deputies was assisted by three groups, one with general and two with limited membership. The first of these is the General Policy Group, whose task is to co-ordinate the ECMT's work so as to bring about the gradual integration of national transport policies; the other two are the Combined Transport Group and the High-Speed Transport Group.

An ad hoc Group sponsored by the Railways Committee was also appointed to study the financing of automatic coupling.

Generally speaking, the Conference's various Committees, as in previous years, made much use of the work of Groups of Rapporteurs, composed of representatives of four or five countries. Earlier reports have drawn attention to the value of such Groups, by means of which working documents can be drawn up without over-burdening national delegations or the Secretariat.

4. Some structural changes occurred in 1972. Because of the increasing importance attached to trunk lines of communication, the membership of the Investment Committee (limited to five delegations for many years, although its Sub-Committees were not restricted) was made open to all Member countries.

In Inland Waterways Committee, ranking with the Railways and Road Transport Committees, was set up to deal with questions of inland water transport policy; hitherto, for lack of a body of appropriate status, such questions fell to the Inland Waterways Sub-Committee of the Investment Committee. Terms of reference have been drawn up in such a way that the boundaries between the fields of competence of these two bodies concerned with waterway transport are carefully traced.

Lastly, at the 35th Session, all Member countries expressed their interest in the Conference's work on road traffic and traffic signs. As a result, Restricted Group "B", previously consisting of 14 countries, ceased to be a Restricted Group within the meaning of Article 8 of the Protocol by which the Conference was founded, and became an ordinary Committee.

5. There thus remains only one Restricted Group, Restricted Group "A", comprising the Ministers of Transport of the European Communities (EEC), the function of which is to maintain liaison within the ECMT between the Member countries of the Communities and the other countries. As in previous years, this Group met immediately before each session of the Council of Ministers to approve the report which its chairman presents to the Council's plenary session on the activities of the EEC since the last report.

In order to promote more fruitful discussion between Member countries of the Communities and the other countries, the drafts of those reports have, since 1971, been examined by the Committee of Deputies.

6. The organisation chart of the ECMT is shown in Annex I.

7. Relations with other international organisations proceded most satisfactorily in 1972.

8. As in previous years, the OECD made available to the ECMT the practical working facilities provided for in the agreements concluded between the OEEC and the ECMT in 1954, and renewed in 1961 when the OECD was set up.

The ECMT wishes to express its special gratitude to the OECD for its support in 1972. The OECD/ECMT Liaison Committees, appointed to examine matters of joint interest, had no need to meet in 1972. The same applies to the Scientific Liaison Group, set up in 1968 as a subsidiary to those Committees in order to save duplication of work and organise co-operation between the two organisations in matters of scientific research in transport, road construction and road safety.

As mentioned in the ECMT's XVIIIth report, a study on inter-city passenger transport, known as "Project 33", is to be carried out during the next few years by the OECD, the ECMT and the EEC, acting jointly. Nine Member countries of the ECMT are taking part in this study, and its Steering Committee held its first meeting in December 1972, to lay down the first practical guide-lines for its work.

9. The ECMT's relations with the Council of Europe remain close; the staffs of both organisations are in regular contact on a basis of mutual confidence. In particular, the two bodies' programmes of work are carefully examined and compared each year so as to avoid duplication of work and co-operate in matters of joint interest.

Foremost among these are matters of regional planning, with special reference to the creation of a network of European main trunk routes, political responsibility for which rests with Ministers of Transport. These matters will be on the agenda of the Second Conference of Ministers responsible for Regional Planning, due to be held in the autumn of

1973. Preparations for that conference involved a number of meetings in 1972, at all of which ECMT was represented.

In the same field, the Committee on Regional Planning and Development, an organ of the European Conference of Local Authorities, held three meetings in 1972 to discuss links between the central and peripheral areas of Europe. Our organisation was invited to attend them.

Since, in future, annual reports of the ECMT's proceedings are to be discussed in the Council of Europe's Consultative Assembly only every other year, the results of the Conference's work and the lines on which it is moving will not be submitted to Members of Parliament until 1973.

10. The Director of the Transport Division of the Economic Commission for Europe took part in the ordinary meetings of the Commission of Deputies, and was represented at a number of meetings of subordinate bodies. The ECMT, for its part, attended the annual meeting of the Inland Transport Committee of the Economic Commission for Europe, as well as some meetings of specialised working parties. It was also a member of the World Conference on Combined Transport, organised jointly by the United Nations and IMCO. Active co-operation of this kind enables the ECMT to make use of various basic studies for its own consolidated reports or for decisions to be taken by its Council of Ministers.

11. The Secretariat of the ECMT and the Directorate General of Transport of the European Communities are in constant touch. As announced in the last report, the Chairman of the ECMT and the Commission Member responsible for transport met in Paris on 7th February 1972. Since then, the Director General of Transport has been invited to ordinary meetings of the Committee of Deputies. He attended most of them in person, or else sent his representative.

12. An Administrative Officer of the ECMT regularly attended meetings of the Central Commission for Rhine Navigation in 1972.

13. Although the ECMT has no responsibilities as far as air transport is concerned, it is faced, to an ever-increasing extent, with questions in which the impact of air transport must be taken into account if an overall view of the transport system is to be reached. In every case where the operations of air transport and of inland transport overlap, the ECMT has sought the co-operation of the European Civil Aviation Conference (ECAC) and also of the Institute of Air Transport (ITA), of which it is itself a member.

14. Co-operation with non-governmental international organisations has always been a matter of importance to the Conference. Practical effect is given to it by the participation of the organisations immediately concerned in certain meetings of technical committees, working parties or groups of rapporteurs.

In addition, all the organisations were brought together at general hearings on a number of occasions.

Specifically, these hearings dealt with: combined transport; the new road safety programme; and the conclusions of the seminar which was instructed to draw up practical proposals to follow up the results of research into the influence of existing transport infrastructures on the choice of techniques for modern urban and suburban services.

As in previous years, the Officers of the Conference invited all non-governmental international organisations with which the ECMT has working relationships to a hearing, immediately before the Council's 36th session, so as to ascertain their views and suggestions on matters listed on the agenda for that session, and generally on the whole range of the Conference's activities and topical issues calling for Ministers' attention. These hearings have proved very useful and the views expressed there are always most carefully considered.

The ECMT co-operates systematically with the Prévention Routière Internationale and sponsors its most important functions. Under the auspices of the ECMT the Prévention Routière Internationale has mounted a European campaign against drunken driving - the cause of a high percentage of road accidents - and has prepared a new campaign to encourage the wearing of seat belts.

Chapter II

GENERAL TRANSPORT POLICY

A. ACTION TAKEN BY THE ECMT

15. The ECMT is well aware of its role as a political and economic co-ordinating body in the transport field, and that its aim should be the gradual attainment of a general policy which all member countries can accept.

16. Reference to earlier reports will show how the ECMT's work in this area has developed. Attention was first concentrated upon general discussion of principles; it then became clear that, having regard to the difficulties arising from different basic approaches and different geographical and economic conditions, the best way to obtain effective results was to take concrete measures, even with limited aims, provided that those measures were constantly co-ordinated at the highest level, that is, at political level.

To provide for this co-ordination, the Ministers have been asked, since 1969, to lay down two-year action programmes involving periodical reconsideration of the main guidelines for the Conference's work.

17. Action taken in 1972 was in pursuance of the programme adopted in 1971 at Madrid; the last report set out its main contents. The items to which priority was given may be summarised as follows:

a) Seeking a sound basis for government/railway relationships, with particular reference to normalization of accounts, public service obligations and managerial freedom.

b) Promotion of international trade by the most rational use of different modes of transport.

c) The creation of conditions favourable to the smooth working of combined transport within the transport chain.

d) Harmonization of the terms of competition, which some delegations regard as a pre-requisite of progress towards liberalisation.

e) Pursuit of opportunities for greater liberalisation of international transport.

f) Gradual building up of European trunk lines in networks. Qualitative and quantitative changes in demand lend special importance to this item.

Generally speaking, it will be necessary for the Conference to have the fullest possible regard to what is done by the European Communities so as to avoid excessive disparities between situations in all member countries.

Lastly, conclusions which might be drawn from too narrow a regard for the economic optimum will henceforward have to be tempered to some degree by special attention to human factors, particularly the quality of life and people's health.

In this connection, the Council of Ministers has strongly supported the noise abatement and pollution control.

16. The following is a brief account of progress made last year in the above fields; certain points are dealt with at greater length in the chapters devoted to specific subjects:

(1) A first report on the normalization of railway accounts, bringing an earlier study up to date, was submitted to the Council of Ministers. This was merely the first step in the planned study, and mainly consisted in taking stock of the current situation.

It brought out the point that the work done in the Communities has led to co-ordination of their Member countries' policies and implementing measures.

Lively discussion in the Council showed how interested Ministers are in this subject. It turned mainly upon the two purposes which normalization can serve:

a) to clarify government/railway relationships;

b) to fit the railways into a market economy.

The general conclusion reached was that the ECMT should now seek to bring its Member countries to a common approach on this matter.

There was also a preliminary exchange of views about public service obligations. Further studies are to be conducted on this subject in 1973.

(2) The ECMT has concerned itself for the last two years with measures to promote international rail traffic, which has not grown in step with international trade in recent years. The 18th annual report recorded the encouragement given by the Conference in 1971 to standardization of reduced fares for children in international railway tariffs.

Last year, the Council of Ministers adopted a resolution on the reciprocal delegation, between railway administrations, of authority to negotiate reductions in international freight rates. Such delegations of authority are indeed subject to certain restrictions but in many cases they do enable the railway user to negotiate with a single railway spokesman.

For road transport, a study designed to promote international traffic was started last year: its first stage is to consist in taking stock of the existing obstacles to this traffic.

The recently appointed Inland Waterways Committee has included the promotion of international waterway transport in its study programme.

(3) At its 35th session the Council of Ministers considered the report drawn up by the Combined Transport Working Party on developments concerning this class of transport and the problems confronting governments in seeking to foster its growth, especially with an eye to general transport policy. The Chapter on combined transport, below, deals more fully with this subject.

(4) During 1972, the harmonization of the terms of competition (apart from what is achieved by the normalization of railway accounts) made further progress in connection with the coming into operation of the multilateral quota for road haulage. We are able to record that the pre-requisite conditions for that operation will be progressively fulfilled by Member countries of our Organisation in the course of the year.

(5) The ECMT's work in the field of liberalisation concerned occasional passenger transport services (the implementation of Resolution No. 20) besides the multilateral quota for road haulage. Fuller information on the subject is given in Chapter V below.

(6) The ECMT has always considered the creation of trunk communications networks in Europe an important task. It is sufficient to recall that it was the Conference which, in the first years of its existence, designated the network of inland waterways of European interest, specifying its main characteristics by reference to those of the various classes of vessel which ply on it; that the Conference worked in close co-operation with the Economic Commission for Europe in bringing about a system of European international routes, both the classification standards and the structure of which are now being radically reviewed; and lastly, that it is now drawing up, with the help of the International Union of Railways, a map of the main international railway lines.

The fact must be faced that a variety of factors has brought about profound changes in this field: the growth of trade, entailing sharply increased needs; the demand for quality of service - especially as to speed - becoming daily more evident, and accompanied by ever more urgent concern with the quality of life and the environment; and lastly, the fact that, in future, investment will have to be increasingly selective and will increasingly call for a multi-modal approach.

In the first chapter of this report, the passage dealing with relations between the ECMT and the Council of Europe emphasised the interest which political circles have displayed in trunk lines of communication. Consequently, our Conference devoted much thought to this matter in 1972, in a variety of ways. In particular, general discussions were started with the object of working out general guide lines and, more specifically,

some practical arrangements, now under consideration, for the exchange of information about national investment projects.

The end of last year saw the beginning of our organisation's co-operation in Project 33 (see Chapter I), the aim of which is to provide governments taking part in it with basic data which will be of help to them in reaching decisions on intercity passenger transport.

On a related subject, the Conference's Group on High-Speed Transport has continued its efforts to provide a connecting link between research projects concerning both conventional and new transport technologies, take stock of the position as a whole and ensure that the adoption of new systems does not lead to national developments which are mutually incompatible, and thus detrimental to European interests.

(7) To complete this review, it is important to mention the Council of Ministers' resolution at its 35th session urging the adoption of stricter noise limits for motor vehicles.

Social questions

19. For some years it has been customary for the annual report to make special reference to social questions, as evidence of the importance which the ECMT attaches to them. It is out of the question, of course, for ECMT to deal with those questions as distinct issues, as in this form they fall within the competence of the international Labour Office.

Nevertheless, this special section of the chapter on general transport policy is a suitable point at which to state that the Conference is particularly mindful of human problems and of the way in which contemplated courses of action may affect employees. Relevant examples which may be quoted are the work done on combined transport, on automatic coupling, and on the working conditions of vehicle crews in international road transport, in all of which the social aspect has been an important factor. The same will apply to the current inquiry into the modernisation of inland waterways.

The ECMT has long-standing working relations with the World Federation of Labour (CMT) and the International Transport Workers Federation (ITF) and, since 1972, with a new organisation, the International Federation of Transport Executives (FICT).

Their representatives were invited to attend the hearing, held on the eve of the 36th session, of international, non-governmental organisations, and were thus given an opportunity to inform Ministers of their views on the general lines of thinking in the ECMT's programme of work to put forward any suggestions they thought desirable.

They are also asked to attend other general hearings in the course of the year, particularly those held before Seminars.

Problems concerning the environment and the quality of life

20. Discussions in the Council of Ministers of the ECMT have made clear the Ministers' desire that the issues dealt with by ECMT bodies should be considered with an eye to their impact on the quality of life.

Guidelines to this effect were given to the Chairman of Committees and Working Parties early in 1972.

The aim here is not to duplicate the work of other organisations engaged in studies concerning the environment, but to make use of these studies and ensure that when proposals for policy decisions are formulated, all the factors helping to improve the quality of life are taken as fully as possible into account.

Developments since the beginning of 1972 have further strengthened the Conference's determination to give special attention to matters concerning the environment.

It is also appropriate at this point to recall that, at its 35th session, the Council adopted a Resolution aiming to reduce the maximum permitted noise levels for motor vehicles.

B. ACTION AT NATIONAL LEVEL

21. As in previous years, it is useful to take stock of the most important measures of general transport policy at national level by Member countries. This is a means of assessing trends and seeing how far the multilateral action of the ECMT or of other international organisations is followed up in each country.

22. In the Federal Republic of Germany, a law passed on 28th February 1972, increases the financial resources available for investment in transport infrastructures. Commercial vehicles of over 7 tons are subject to higher taxation as from 1st April 1972, and fuel tax was increased by 4 pfennigs per litre. Three pfennigs of this increase are allotted to local authorities to help them to cope with their urgent transport problems. The appropriation for expenditure on short-distance public passenger transport is raised from 45 % to 50 %. The proceeds of the remaining 1 pfennig tax are allocated to the construction of Federal trunk roads.

An Order imposing a speed limit of 100 km/h. on vehicles outside built-up areas came into effect on 1st October 1972 and is to remain in force until 31st December 1975. It does not apply to motorways, nor to roads on which separate lanes are marked out for traffic moving in each direction. On certain high standard roads, the limit may be increased to 120 Km/h. A decision on a general speed limit will be taken in the light of the results of these tests.

In September 1972, the Bundestag ratified the treaty of 26th May 1972 between the Federal Republic and the German Democratic Republic on transport. For the first time, passenger and goods transport are placed on a legal footing. Traffic has improved.

The agreement reached, under Four-Power sponsorship, between the Government of the Federal Republic and the German Democratic Republic on 4th June 1972 has already eased the flow of transit traffic between the Federal Republic and West Berlin.

A law dated 23rd June 1972, provides that traffic to or from Berlin must be carried in sealed vehicles.

23. In Austria, an important development in 1972 was the signature of the "Agreement between the Republic of Austria and European Economic Community" and the "Agreement between the Republic of Austria, on the one hand, and the European Coal and Steel Community and the Member States of that body, on the other hand". The first of these Agreements contains a joint declaration by the Contracting Parties on freight transport in transit and the second provides, inter alia, for adequate transparency of transport prices for deliveries of goods falling within the competence of the European Coal and Steel Community.

The European Economic Community and the Republic of Austria also signed an agreement on the application of the Regulation concerning Community transit. This Agreement has not yet come into force.

No transport policy measures of basic significance were taken in 1972; efforts were focused on the planning of a number of important decisions to be made during the current year.

In this connection, the Federal Ministry of Transport's "Standing Committee for Transport Policy" was engaged in preparatory proceedings for amending the legislation on occasional (unscheduled) road passenger services and on road freight transport.

Other preparatory studies were conducted on Value Added Tax, which was introduced in Austria on 1st January 1973. This new levy supercedes the transport tax which had hitherto acted as a co-ordinating factor in competition between rail and road. The abolition of the tax imposed on long-distance road haulage will affect the terms of competition between these two modes to the detriment of rail.

As from 1st March 1972, the Austrian Federal Railways' rates and fares were raised, the increases ranging from 5% to 32%. The new goods rates are intended to take fuller account of actual costs and to trim down the ad valorem tariff structure in favour of tariffs based on weight. The number of tariff categories has accordingly been reduced from five to four. These measures are broadly in line with the tariff policy applied by European railway managements to compete with other modes, road haulage in particular.

As regards rail/road co-operation in the field of international piggy-back transport, a Cologne-Verone (via Kufstein-Brenner) piggy-back service was introduced on 28th May 1972. Despite the very attractive terms offered at the start by the Austrian Federal Railways and the other railways concerned, this service had some teething troubles but the outlook now seems promising.

With reference to motor vehicles and road safety, two of the Orders amending the Implementing Order of 1967 concerning the legislation on Motor vehicles (5th and 6th Amendments) were laid down in 1972. The object was, inter alia, to give effect to various decisions made by international organisations on this subject.

The main purpose of the 5th Amendment was to bring the rules into line with ECE Regulations numbers 1 to 8, 19 and 20, which Austria has already adopted.

The 6th Amendment contains provisions shaped in the light of various ECMT Resolutions:

- knowledge of first-aid (Resolution No. 13 of 5th October 1960);
- seat belts and crash helmets (Resolution No. 16 of 29th - 30th May 1962);
- technical inspection and surveillance of motor vehicles (Resolution No. 10 of 20th October 1959);
- new speed limits on motorways for buses and certain goods vehicles (Resolution No. 14 of 30th - 31st May 1961);
- power of vehicle engines (with or without trailer) (Resolution No. 15 of 29th - 30th May 1962).

The rules concerning type approval of vehicles with regard to emission of pollutant gases are based on ECE/ONU Regulation No. 15.

24. In Belgium the following may be noted:

- Ministerial Order of 20th July 1972 fixing fares to be charged as from 1st August by the Belgian State Railways on bus services other than those to which railway fares apply;
- Royal Decree of 28th December 1971 concerning the application of Article 3 of the regulations for the carriage of dangerous goods on the Rhine;
- Ministerial Order of 30th November 1971 concerning loans and rates of hire for all charter-parties or hiring contracts concluded through the Office Régulateur de la Navigation Intérieure (Board of Control for Inland Water Transport).

Second class railway passenger fares were increased from Frs. 1,163 to Frs. 1.28; First class fares are 50% higher than second class.

"All line" season tickets went up by 10%, and those for the Brussels area by 7.25%.

The age limit for children's half-fares was raised from 10 years to 12 years.

Belgium ratified the new Berne CIV and CIM conventions on international carriage of passengers and goods.

25. In Spain, the chief measures of transport policy taken in 1972 may be classified as follows:

a) Legal provisions affecting <u>access to the market:</u>

- the Order issued by the Minister of Public Works on 31st December 1971, imposing a temporary quota on the issue of new licences in 1972 for vehicles of maximum laden weight exceeding 6 tons used for nation-wide unscheduled public haulage;
- the Decree of 5th July 1972 on the fixing of a quota for new licences for local unscheduled public haulage;
- the Order of 31st December 1972, which provides for the licensing of unscheduled road passenger services in 1975.

b) Measures concerning the harmonization of terms of competition:

- by an Order dated 31st December 1971, the Minister of Public Works provided for a temporarily more lenient application of the Order dated 26th April 1971, which prescribed the tax payable by road transport services on routes also served by rail (the "duplicate service" tax);
- the Decree dated 29th June 1972, which specifies the tax payable by road hauliers when they duplicate an international rail service;
- the Order dated 27th October 1972, which exempted Spanish vehicles provided with way-bills for the operation of unscheduled international passenger services from payment of the duplicate service tax during the period spent outside Spain;
- the European Agreement on Working Conditions of Vehicle Crews in International Road Transport (AETR) was ratified on 3rd January 1973.

c) Measures concerning market organisation:

- Decree No. 382/72 of 18th February on the normalization of the Spanish State Railways (RENFE).

d) As to combined transport:

- the Decree of 9th May 1972, prescribing construction standards in compliance with the TIR Convention for containers used for international carriage of goods under Customs seal.

e) As to the environment:

- the Decree of 6th May 1972, on the approval of motor vehicles as regards noise emission.

f) Finally, mention should also be made of the law passed on 10th May 1972, approving the Third Plan for Economic and Social Development. Like its predecessors this Development Plan is binding on the public sector, particularly as regards investment, and indicative for the private sector.

26. In Denmark, the main task in 1972 consisted in preparing for the country's adhesion to the EEC.

Danish transport legislation was amended to make it come into line, at the beginning of 1975, with the Community regulations specifying the minimum age and working conditions of drivers of certain categories of vehicles in international traffic. Other new legislation or administrative orders concern the EEC regulations governing passenger transport and certain categories of freight transport within the Community.

27. In France, the SNCF has continued its structural re-organisation and its policy of improvement of its services in accordance with the new regulatory arrangements made in 1971 (the supplementary provisions of 27 January 1971 to the Agreement of 30th August 1937; new "Schedule of Conditions" brought into force by Decree of 23rd December 1971).

A Decree and two Orders of 30th December 1972 provide for the installation and use of a special device for the better enforcement of requirements as to hours of work and rest periods in public and private road transport.

A Ministerial Order dated 4th February 1972, freed all short-distance haulage zones from quota restrictions with effect from 1st October 1973.

In addition, a Ministry of Transport Circular of 10th October 1972 sets out the code of rules which will apply as from 1st January 1973 to regular services, special regular services and shuttle services operated within the European Economic Community.

Lastly, the Finance Act for 1973 provides for the reduction of the VAT on freight rates, where subject to that tax, from 23% to 20% of the standard rate.

28. In Greece, legislation relating to the corporate status of the railways was amplified by the ratification and publication of Decrees complementary to the Act by which the Greek Railways Authority was set up, and the approval of its constitution.

The "economic agreement" between the State and the Railways Board, governing economic relations between the two signatories, was also approved and ratified.

General regulations were made concerning the Railway Authority's staff.

Legislation on staff pensions and social security was complemented by two Decrees.

Special fares and rates for passenger and goods traffic on domestic routes were increased by an average of 10%.

29. In Ireland, in October 1970, the Minister for Transport and Power set up a Committee consisting of representatives of the Department of Transport and Power, the Department of Finance and Coras Iompair Eireann (the national transport undertaking) to investigate the deterioration in CIE's financial position with a view to identifying possible corrective measures. The Committee retained the firm of McKinsey and Co. Inc. to assist them in their task. A report entitled "Defining the Role of Public Transport in a Changing Environment" was published in October 1971. This matter was covered more extensively in the material furnished for the 18th Annual Report of ECMT.

Decisions have not yet been taken on the recommendations in the McKinsey Report. In the examination of this matter full account is being taken of the various regulations of the Common Transport Policy of the European Economic Community.

Railway and road transport undertakings were brought within the scope of the Prices Acts in July 1972 and became subject to general price control measures. This has resulted in a deferment of increases in fares and rates proposed by CIE and has worsened still further the financial position of the railways.

30. In Italy, the Government has drawn up a railway financing programme amounting to 440, 000 million lire to be spent as follows:

- 267, 000 million for fixed installations;
- 133, 000 million for rolling stock.

This appropriation is intended to ensure the continuity of railway investment pending the longer-term programme now being planned.

The main items affected by this recently approved financing procedure are marshalling yards, short-distance passenger services and works connected with the completion of the new Rome-Florence line.

31. In Luxembourg, further progress was made with the co-ordinating exercise begun in 1967.

The government has now drawn up a Bill to set up a "National Co-ordinating Council for Transport Policy", the aim being to avoid harmful competition between modes of transport and ensure that their use matches the requirements of the national economy.

32. In Norway, Parliament approved, in May 1972, an agreement between the Norwegian State Railways, the Norwegian Truck and Bus Owners' Association and a private forwarding agency concerning the establishment of a national goods transport system. The system, which will be carried out through Linjegods A/S, will cover the whole country and co-ordinate regular services by rail, road and sea (local transport). These new arrangements came into force on 1st January 1973.

33. In Portugal, the aim has been to re-structure the transport market by means of a policy which covers:

- harmonization of the terms of competition;
- the need to put government/railway relationships on a sound footing, particularly with regard to the normalization of accounts, public service obligations and managerial freedom;
- the re-modelling of the railways;
- co-ordination between different modes of transport;
- regulation of international transport;

- structural reform of urban transport system.

The following steps have been taken:

- the railways' contract of concession has been revised, particularly as respects relations between the State and the concession-holder;
- the legal basis for re-modelling the railways has been settled;
- agreements on international road haulage have been negotiated with Germany, the Netherlands and Switzerland and the agreement with Spain has been revised;
- adjustments have been made to urban transport planning methods and machinery;
- studies have been conducted on the allocation of infrastructure costs.

34. In the United Kingdom the major development in 1972 was legislation to enable the accession of the United Kingdom to the European Communities. The European Communities Act 1972 gives force of law to the EEC, EURATOM and ECSC Treaties and to Community legislation adopted in accordance with Treaty procedures.

Changes in the transport sector specifically mentioned in the Act concern the minimum ages and the working conditions of drivers of certain categories of road vehicles in international journeys, and Community rules on inter-State passenger transport. These changes will come into effect during 1973.

35. In Sweden, road vehicle taxes have been gradually reshaped so as to make the heaviest vehicles pay a much higher share, and ease the tax burden on vehicles in the middle range.

In recent years, passenger traffic by buses and coaches not licensed for scheduled services has grown, in competition with established services by road and rail. This comment applies particularly to long-distance road services, and most of all to week-end services running under licences, freely granted, for non-regular services.

Provisions have now been introduced requiring all firms which now operate week-end services by bus or coach to submit an official application, before 1st November 1972, for the issue of a licence appropriate to regular services.

A State Committee, with instructions to carry out a study of transport policy in depth, was set up on 1st December 1972, its membership comprising Members of Parliament and representatives of parties having an interest in the transport market. This Committee is to examine problems connected with the costs which each mode of transport should bear, and to recommend rules for practical action.

The Committee is instructed to examine the following four subjects:

- the impact of liabilities imposed by transport policy, in particular with a view to a fairer balance between rail and road;
- the revision of rules for the assessment of compensation payable to the SJ by the State in respect of unremunerative railway traffic;
- the revision of rules for road haulage licensing. Where licences for new, long-distance, haulage services are concerned, due regard must be paid, inter alia, to availability of railway transport as an alternative;
- the SJ's rate structure.

Where the revision of railway charges is concerned, the cost structure, market conditions and the scope for services should be taken into account. It is important that rates and fares for the longest distances should be so arranged as to further the general aim of the State's regional and industrial policy, and thus make the railways better able to compete for passenger traffic.

36. In Switzerland, study and research are directed towards the solution of current and prospective problems of transport policy. To this end, a Commission of 62 members was set up in 1972 to produce a policy programme integrating transport planning in its economic and social context. It has begun its work on the long-range traffic forecasts by submitting a report on "The transport outlook in Switzerland" produced in consultation with a specialised team from the University of St. Gall. This report does not set out to quantify the

future volume of traffic in firm figures, but to show how, on certain assumptions, transport demand is likely to develop.

A report on "Railway tunnels through the Alps" has been put before the Federal Council with a view to submitting the following three proposals to Parliament:

- doubling the track for the whole length of the Berne-Lötschberg - Simplon line;
- the driving of a tunnel through the St. Gothard between Erstfeld and Biasca;
- the construction of a railway in the Eastern Alps.

The Federal Council approved this report, subject to the reservation that the building of a railway in the Eastern Alps can only be put in hand if genuinely needed, on economic and transport policy grounds alike, and on condition that neighbouring countries concerned provide means of access. The Federal Council invited the German and Italian governments to give their views to the planned development of trans-Alpine railways in Switzerland. In its reply, the German Government argued that, in the interests of rational operation, transit traffic by rail should be concentrated on a few lines. The line along the Rhine to Bâle and its continuation via the St. Gothard is the one which should be given priority for traffic with Italy. The Italian Government has not so far made its view known.

Chapter III

ECONOMIC RESEARCH

37. Since 1967, the ECMT has been engaged in transport economics research, the aim being to provide Ministers with objective data in the light of which to reach their policy decisions.

This activity has been gradually amplified and put on a more systematic basis. Its main features are, first, the organisation of two-yearly Symposia bringing together some three hundred participants from academic, government and business circles, besides representatives of the trade press and of international organisations concerned with transport, to discuss a general topic; secondly, Round Table meetings at which fifteen or twenty people, chosen for their special qualifications, carry out expert studies on specific subjects.

The choice of subjects to be discussed rests with the Economic Research Committee, to whom it also falls, under the guidance of the Committee of Deputies, to ensure general consistency and pay due regard to areas where general transport policy needs further refinement.

38. In 1972, this Committee drew up the Conference's programme of work for the 1973 Symposium and the Round Tables to be held in 1974.

39. The 1973 Symposium will be held at Athens, at the invitation of the Greek Government. The general subject chosen is "Transport in the 1980-1990 decade". It is sub-divided into five sub-topics. They are:

a) The impact of changes in society on the demand for passenger and freight transport.

b) The impact of innovation on the supply of passenger transport, having regard to conventional and new techniques.

c) The impact of innovation on the supply of freight transport.

d) Changes in the planning, organisation and financing of transport required for the eighties.

e) The impact of transport on the quality of life.

It has also been decided to present a general introduction to the Symposium by experts from the host country (Greece).

The drafting of introductory reports on each sub-topic has been assigned to authors selected by the Committee in the light of all the proposals put forward by national delegations.

To ensure that the introductory reports, taken together, are suitably related to each other - which is vital to the success of the Symposium - the Economic Research Committee arranged an exploratory discussion between the Rapporteurs and some Committee members in July 1972. In this way, the areas to be dealt with by each author were more clearly determined by joint agreement.

The Committee also judged that the "panel" system was a much improved Symposium procedure as it helps to focus more clearly some of the issues discussed in plenary session, and hence to sum up conclusions. At the 1973 Symposium there will be three panel discussions after each plenary discussion.

Early in 1973 the Committee will make its final decision on the membership of the panels, in the light of proposals by delegations.

40. Preparatory arrangements for Round Tables must be made well in advance as time must be allowed for choosing the Rapporteur and Chairman, and for drafting and translating the Report. For this reason, the Committee has already selected the following topics for Round Tables in 1974:

a) Impact of infrastructural investment on industrial development.

b) Effect of productivity and technological progress on transport workers.

c) General transport plans: methods, gaps and prospects.

d) Impact of the structure and extent of urban development on the choice of modes of transport.

41. To pave the way for translating the results of theoretical studies by Symposia and Round Tables into practical action, the ECMT has so far made use of Seminars, that is, meetings of senior civil servants whose responsibility it is to draft any conclusions or policy decisions. The Seminars' status thus stands between the bodies responsible for research and the Committee of Deputies with whom it lies, in the final instance, to formulate proposals to the Council of Ministers.

In 1972, it was decided to hold a Seminar on the following topic in 1973: "The influence of existing transport infrastructures on the choice of techniques for providing modern urban and interurban services".

42. In the light of their experience at the ECMT's general Round Tables, some experts expressed the view that the problems confronting their respective countries were substantially different from those encountered elsewhere, either because of the country's level of development, or because of its population density, or, again, because of its outlying geographical situation.

These countries' Deputies proposed that the subject-matter of certain Round Tables be discussed afresh at regional level with an eye to the problems peculiar to certain countries. Hence, only a few countries would take part. The work would be based on what the general Round Tables had done, but would be preceded by introductory commentaries by experts from the countries concerned.

Two requests (from Spain and Yugoslavia) for the organisation of regional Round Tables have been submitted to the Economic Research Committee. The Committee has agreed, on the understanding that the work genuinely covers the same ground as the original Round Table did.

In actual practice, two regional Round Tables have been arranged in accordance with this agreement. The first will be held at Madrid in May 1973, to deal with the following subjects:

a) The influence of existing transport infrastructures on the choice of techniques for providing modern urban or suburban services (subject dealt with at the 17th general Round Table).

b) Study of the social costs of urban transport by road (subject dealt with at the 18th general Round Table).

Another regional Round Table has been fixed for December 1973, at Belgrade, its subject being "The impact of infrastructural investment on development". (Subject dealt with at the 4th and 25th general Round Tables).

43. The foregoing account mainly concerns the preparation of future work. As for studies carried out in 1972, five Round Tables were convened to consider the following subjects:

a) Studies (particularly by use of the econometric approach) of factors determining demand for freight transport.

b) The influence of existing transport infrastructures on the choice of techniques for providing modern urban and inter-urban services.

c) A study of the social costs of urban road transport (noise and pollution).

d) The influence of cost, quality, and organisation of terminal transport and interchanges on the choice of mode by passengers.

e) Demand for goods transport - Practical results of studies of the operation of the market.

As with previous Round Tables, booklets containing the conclusions, with the introductory reports appended, will be published and widely circulated. It must be pointed out, however, that these conclusions, which are the outcome of free discussion among experts, cannot at this stage be regarded in any way as representing the ECMT's policy.

44. Two Seminars were held in 1972. A hearing of the non-governmental organisation preceded each of them.

The subjects were:

a) The choice of investments in transport infrastructures.

b) The railways' share in a market economy.

The conclusions of these Seminars were laid before the Committee of Deputies.

45. The procedure for setting up an integrated, international documentation service was finalised in 1972: documentalists from official bodies in Member countries co-operated closely in these technical preparations.

Hitherto, the ECMT's documentation department had served two purposes:

a) To keep the Secretariat abreast of publications and research concerning transport economics;

b) To provide the various research bodies with information by means of a six-monthly bulletin on research currently in hand.

These two functions needed to be capped with a third activity - the operation of an international system of documentary information covering all important publications in Member countries. In the event, the arrangements are that each Member country will assemble information concerning its own territory and send it to the ECMT, which will publish it for the benefit of all those taking part in the scheme. This arrangement is clearly more efficient and less costly than a situation where each country relies on its own devices to obtain desired information from foreign sources.

The integrated documentation system will come into operation on a limited scale in 1973, and will be progressively extended thereafter.

Chapter IV

RAILWAY PROBLEMS

a) General activities

46. It is relevant to point out here that, as shown in the Investment Committee's report set out below, the railways' out-put in 1971, as compared with 1970, reveals a situation which cannot be considered satisfactory. The number of passengers carried fell on average by 0.1%, whilst passenger-kilometres showed a slight increase (0.9%). But goods traffic declined by 4.9% in tonnes carried and 5.2% in tonne-kilometres.

47. These figures fully justify governments' concern, and the studies already undertaken or planned.

48. Last year's report gave an account of initial work aimed at increasing international railway traffic. It could be clearly seen that the performance of the railways, unlike that of competing modes, was not keeping pace with the growth of international trade, and that efforts must consequently be made to enable the railways to hold their ground.

In this connection, there is still scope for improvements so that railway users may be offered a better service, and these improvements are very largely in railway managements' own hands. Government action has been centred mainly on encouragement, more particularly in the two following directions: (a) delegation of authority from one railway to another to grant reductions in freight rates for international traffic, and (b) development of the concept of common interests, in order to induce managers to view their commercial strategy more from a European angle rather than confine their attention too narrowly to the immediate interests of their own railway administrations. This involves a difficult process of change, which the UIC is now trying to foster.

As a further step in promoting international railway traffic, the Council of Ministers decided that national delegations to the Council of Europe should press for a significant simplification of formalities at frontiers.

49. In a number of countries in recent years, railways have been given a more independent status involving greater freedom. A recent Seminar devoted to the part played by the railways in a market economy is particularly relevant to this state of affairs. The Seminar's views will be considered by the Council of Ministers.

50. Developments in railway management, in some countries at least, make it all the more important that the studies on railway deficits should be resumed. It will be remembered that a detailed examination, based on the out-turn for the years 1957-1965, was published by the ECMT in 1967. The Council of Ministers decided that a similar study, simplified so as to deal with essentials, should be undertaken in 1973, in order to bring to light the trends and causes of any change in the situation.

51. The concern displayed over all these matters highlights the importance of government/railway relationships. Bearing in mind the rules concerning normalization of accounts and public service obligations, these relationships must be revised to enable the railways to compete on the market like an ordinary commercial undertaking.

b) Normalization of accounts

52. The object of this exercise in clarification of accounts is to retrace the railways' position if they were on the same footing as other commercial undertakings in the countries concerned by bringing to light those liabilities upon them which are not an integral part of their operation.

53. Since it began some fifteen years ago, it has developed considerably, and what is said on this subject in the foregoing chapter on general transport policy shows clearly the usefulness of working out a common system for the ECMT countries generally.

The six Member countries of the European Communities have already co-ordinated their points of view by means of Regulations 1191/69 and 1192/69 of the Council of the European Communities.

54. In these circumstances, the pattern of developments shown in the following table (drawn up by the UIC) is not surprising. It records the ratio between normalization payments granted by governments and the amounts assessed by the railways on the basis of ECMT Resolution No. 10.

	1967	1968	1969	1970	1971
Germany	0.45	0.45	0.57	0.63	0.74
Austria	0	0	0.51	0.57	0.53
Belgium	0.60	0.57	0.50	0.47	1.00
France	0.65	0.62	0.60	0.82	0.99
Great Britain	-	-	-	-	1.00
Italy	0.67	0.48	0.52	0.31	0.39
Luxembourg	-	-	-	-	1.00
Netherlands	0.56	0.99	0.96	0.98	0.98
Sweden	0.88	0.85	0.87	0.81	1.31
Switzerland	-	-	-	-	1.00
Yugoslavia	-	-	0.20	0.20	-

55. Detailed particulars showing how normalization of accounts was applied in 1972 by various Member countries of the Conference are set out in the following paragraphs.

56. In the Federal Republic of Germany, the State paid compensation in the sum of DM. 113 million to the Bundesbahn which, unlike its competitors, is responsible for payment of children's allowances to its active staff. Apart from DM. 484.5 million allocated in respect of "repatriated persons, West Berliners and the war-disabled", the Federal Government also paid the railways DM. 1,063 million, in compliance with Community Regulation No. 1192/69, towards retirement and other pensions, the cost of which is excessively high by reason of the railways' staff structure. Further, partial compensation of DM. 61 million was granted, for the first time and pursuant to the same Community Regulation, in respect of supplementary life insurance benefits for railway workers and staff. An appropriation of DM. 275 million was paid to the Bundesbahn to cover half the cost of maintenance and operation of level crossings. The State, as owner of the Bundesbahn, took over in 1972 the servicing of certain loans contracted between 1962 and 1969 to finance railway investment expenditures. (DM. 182.5 million in interest and 16.7 million for redemption). The Bundesbahn was allotted DM. 20.6 million in respect of certain "support rates", for the benefit of the Saar, sanctioned by the Communities.

In 1972 the State, in accordance with Community Regulation No. 1191/69, took over for the first time financial responsibility for the costs of short-distance passenger transport, up to a limit of DM. 1,692 million. As a result, the former payment in respect of the shortfall in receipts from certain concession fares has ceased.

Lastly, the Bundesbahn was paid DM. 3.4 million, under the heading of equality of treatment with its competitors, for the care of staff (or wives and children of staff) suffering from tuberculosis.

57. In Austria, in accordance with the legislation governing the Federal railways, the State allocates to them the following amounts each year as partial compensation in respect of normalization of accounts:

- 1,700 million schillings for staff pension liabilities;
- 350 million schillings for loss of revenue incurred as a consequence of various fare concessions on social grounds or for subsidy purposes.

As these are fixed grants of limited duration (up to 1973 for pensions and up to 1974 for "social" and "subsidy" tariffs) new provisions are to be introduced as from 1974 and 1975 respectively.

As in previous years, the State took over the servicing of interest on the capital investment credits which it had allocated to the Federal railways.

Efforts to solve the problems concerning branch railways continued in 1972.

58. In Belgium, effect is given to Council Regulation No. 1191/69 of the Council of Ministers of the European Economic Communities (dated 26th June 1969) concerning the action of Member states as regards obligations inherent in the concept of public service in the field of transport by rail, road and inland waterway. The same applies to Regulation No. 1192/69, of 26th June 1969, concerning common rules for the normalization of railway accounts.

The following steps have been taken as a result:

a) Active Staff.

Financial compensation was allocated in respect of social security costs which bear more heavily on railways than on other undertakings, more particularly as regards:

Industrial accidents
Health services
Family allowances
Staff benefits imposed as measures of national gratitude.

b) Retirement and other pensions: compensation was allocated in respect of liabilities differing from those laid upon by other modes of transport.

c) Taxes and levies: certain liabilities from which the railways are exempt attract negative compensation - i.e. in favour of the State.

d) The share of bridge and level crossing costs properly attributable to other forms of transport. Compensation was awarded in respect of this share.

e) Other financial liabilities: the State has assumed the following financial liabilities:

- liabilities resulting from lack of normalization in the past,
- charges related to loans for financing the initial cost of works and equipment.

f) Reduced fares and rates:

Compensation was allocated in respect of the following price reductions:

- passenger traffic:
  a) concession fares for certain social groups,
  b) compulsory prices for full fare tickets and ordinary season tickets.
- freight traffic:
  rates made obligatory by international agreements.

g) In addition, compensation was allocated for part of the infrastructure costs borne by the SNCB, but not by other modes of transport, and for obligations imposed as to the carriage of passengers on ancillary bus services.

59. In Denmark, in consequence of the country's accession to the European Communities, action is now being taken to put the normalization of railway accounts into effect, in compliance with EEC Regulation No. 1192/69 of 26th June 1969, and to apply the provisions of Regulation No. 1191/69, on public service obligations.

60. In Spain, a particularly important development was the enactment of the Decree on the normalization of the accounts of RENFE, dated 18th February 1972. This Decree brings into force the provision already laid down in Article 73 of RENFE's statute:

"Items which, in the light of the normalised operating accounts, are shown to be not attributable to normal operation shall not be deemed to be part of the deficit, notwithstanding that the corresponding amount shall be paid to the RENFE at the same time as the deficit payment itself."

The Decree lays down the main guidelines for its application and deals in detail with items related to the continued operation of unremunerative lines.

The rules envisaged in Article 3 of this Decree are in course of preparation. Reference to the RENFE's plan suggests that the following will be accepted as costs not attributable to normal operation:

- 4% of the social security contribution (the amount by which the RENFE's contribution exceeds the standard rate in Spain);
- level-crossing manning costs: half these costs will be refunded to the RENFE, which has hitherto borne them entirely;
- costs of personnel surplus to requirements and retained for reasons of social policy;
- duty on diesel fuel used by the RENFE;
- the operation of unremunerative lines or services.

61. In France, the rules for the normalization of accounts in the financial year 1972 were the same as those of 1971, which took account of the supplementary provisions of 27th January 1971 to the Agreement of 1937, by which the financial relationships between the State and the SNCF were amended.

62. In Greece, the new economic agreement between the State and the railways provides for :

a) State participation in expenditure on modernisation, maintenance and inspection of lines to an extent equivalent to the advantage enjoyed by public road transport, so as to equalise the terms of competition between modes of inland transport;

b) The State to meet operating and maintenance expenditure for uneconomic lines, or expenditure due to public works and public services;

c) Payment by the State to the Railways Authority of compensation for losses due to rate controls;

d) The State to pay amortisation charges for ten years;

e) The State to make good the operating deficits of the system for eight years.

63. In Ireland, the railways do not at present prepare normalised accounts, but this is under review in connection with relevant EEC regulations.

64. In Italy, in accordance with the provisions of EEC Regulation No. 1192/69, the FS received the following compensation in 1972 (unit: million lire):

5,085 : exceptional liabilities concerning family allowances;

14,098 : exceptional liabilities concerning staff pensions;

7,964 : 50% of level-crossing maintenance and replacement costs;

4,337.9 : financial charges in respect of loans raised for the repair and replacement of war-damaged equipment.

In accordance with domestic legislation on this matter, the FS also received from the State the following financial compensations (unit: million lire):

87,812.5: reimbursement of costs in respect of Government-imposed tariff concessions and postal services;

58,722.8: losses on lines the closure of which the FS had applied for.

65. In Luxembourg, the estimates calculated in accordance with EEC Regulation No. 1192/69 amounted to Frs. 759, 355, 000, subdivided as follows:

a) active staff	180, 000
b) retirement and other pensions	705, 907, 000
c) infrastructures and installations used jointly with other modes of transport	18, 887, 000
d) financial charges	10, 364, 000
e) other items qualifying for normalization	24, 017, 000
Total	759, 355, 000

The Government Commission which judges the railways' claims having rejected these assessments, the Minister of Finance made an arbitral award of Frs. 679, 837, 000 on 28th June 1972, as compensation to the railways.

66. The Norwegian State Railways submitted to the Government a 10-year modernisation plan in which several problems connected with normalization are raised.

67. In the Netherlands in 1972, the Government paid Fl. 107.4 million to the railway pensions fund. The corresponding appropriation for 1973 is Fl. 110.1 million.

The Netherlands' Government contribution to cover costs in respect of level crossings and structures used jointly by rail and road was Fl. 20 million in 1972. The corresponding appropriation for 1973 is Fl. 23, 6 million.

The draft legislation on the restructuring of the railways' financial situation, which had been submitted in 1971, failed to go through in 1972. It provides for writing off the NS cumulative deficits as at 31st December 1972.

Approval was given in 1972 to the draft legislation covering the Government's guarantee for loans (interest and principal), raised or to be raised by the railways before 1st July 1973, with a ceiling of Fl. 565 million.

Lastly, the Netherlands' Government paid Fl. 265 million as compensation for obligations to maintain public passenger transport services.

68. Various matters concerning normalization feature in the draft amendments to the Portuguese railways' contract of concession included in the Development Plan.

69. In the United Kingdom, the Railways Board agreed to conform with the voluntary price restraint policy introduced by the Confederation of British Industry in July 1971. This policy was to avoid price increases for 12 months or, where this was impossible, to restrict any price increases to 5% and to raise prices only once. The Government made a grant of £27 million to enable them to meet their statutory financial obligations.

70. In Sweden, the railways have been granted no compensation in respect of retirement and other pensions since 1971, when it was decided to limit contributions to such pensions to 24% of the wage bill. The railways applied for, and were granted, S.Kr. 12 million in respect of annual expenditure on level-crossings.

The Swedish Railways received S.Kr.296.7 million to meet the deficit on unremunerative lines.

On the other hand, the Government rejected the claims for expenditure in respect of military requirements and the employers' contribution on health insurance.

71. In Switzerland, during the period 1965-1970, the Federal railways were able to meet the annual instalments of Frs. 450 million for their long-term investment programme from their own resources. As the situation worsened during the past two years owing to rising costs, the CFF will no longer be able to finance installations which are essential to meet increased traffic needs. To raise the capacity of the system to the level of traffic forecast, heavy investment will be required, and help from the French Government will thus be needed.

Normal replacement and improvement of installations can be met by appropriations from the Ordinary Budget but the financing of a long-term programme to create reserve capacity and to put in hand important special works, such as branch lines to airports, urban services, new plans for freight traffic, etc., will need support through special allocations voted by Parliament from time to time.

The CFF receive Frs. 100 million yearly for the services they provide for the benefit of the general economy. This sum partly fills the gap between costs and receipts for commuter traffic (workers and schoolchildren holding season-tickets) and sundries traffic. As this gap has widened, compensation will have to be recalculated.

As for the private railways, the compensation granted to them for services for the benefit of the general economy was placed on a new footing as from 1972. It is assessed as follows:

a) Frs. 17.35 per 1,000 passenger-kilometres by season-ticket holders;

b) compensation according to transport output, expressed in passenger-km and ton-km per kilometre of line operated. These are measured against the corresponding figures for the CFF, and the resulting ratio governs the level of compensation, which varies between 1.9% and 4.% of operating costs;

c) a grant of 1.1% on track investment costs. Total payments to private, standard gauge or narrow gauge railways on these new bases amounts to Frs. 27.5 million, as compared with 12.8 million previously.

72. In Turkey, although the Government keeps no detailed normalized accounts, railway operating deficits are partly financed by the State.

In 1972, the State disbursed T.L. 358 million for track maintenance, repair and replacement.

c) Steps taken to put the railways on a more commercial footing and to reduce their public service obligations

73. Broadly speaking, action by Member countries in this field may be said to have concerned chiefly the closure of uneconomic lines or installations, the easing of public service obligations or greater flexibility in tariff structures. More detailed information concerning most Member countries of the ECMT is given below.

74. In the Federal Republic of Germany, 132 Km. of main and branch lines were closed to traffic, and passenger services were withdrawn from a further 236 Km. Substitute bus services were introduced, preferably operated by the Bundesbahn itself. The general authority granted to the railways to set rates and fares at their own discretion, within a given framework, was renewed. The Bundesbahn is thus enabled to shape its tariffs on its own commercial initiative in the light of market conditions.

75. In Austria, freight traffic was withdrawn from a 13 Km. section of line already closed to passenger traffic.

76. In Belgium, 80.6 Km. of single-line track and various installations were closed to traffic.

77. In Denmark some installations were closed and a number of stations converted to sidings or unmanned halts.

78. In Spain, an investigatory programme providing for the closure of 2,600 Km. of line was drawn in 1971. IN RENFE's plan for 1972-1975, it is intended to widen this programme to cover all unremunerative branch lines, in which case it would involve 4,200 Km. of line. The 1972 series of investigations covered about 700 Km. If, for any reason, the Government should decide against adopting RENFE's proposals as to a given line or service, RENFE would be compensated through the normalization of accounts procedure.

Sixty installations were closed or down-graded. New legislation on railway charges, based on the principle of relating rates and fares to costs, allows the RENFE's Board of

Directors to settle prices within fixed maxima, with consequent flexibility in the management of the railway.

79. In France, in 1972, bus services were substituted for stopping passenger services on 15 lines with a total length of 837 Km.; three other lines (144 km.) were closed without providing alternative services. During the same year, freight traffic ceased on 31 lines, comprising 442 Km. On two of those routes (24 Km.), the SNCF arranged road haulage services in lieu. Moreover, 155 installations were closed to goods traffic, 33 to passenger traffic and 6 to both. These figures include installations on the above-mentioned lines.

One hundred and ninety-one road haulage services operated under contract with the SNCF in 1972, 46 of them being provided by SCETA (a subsidiary company). A central depot for road haulage services was built at Langon. This brings the number of goods depots on which substituted road haulage services are centred to 109.

On 1st May 1972, there was a general increase of about 5.1% in main-line fares. On the same date, flat rates for sleeper supplements were introduced, those for domestic routes being 23 francs for 1st class and 18 francs for 2nd class.

On 1st April 1972, freight rates were increased generally by 3.8% on average.

On the same date the SNCF introduced the new nomenclature fares for different types of accommodation being for the classification of goods (NCM) which has been adopted by member railways of the UIC. The structure and presentation of wagon-load rates was recast at the same time, and the minimum rateable distance, previously 40 Km., was reduced to 6 Km. to take account of the special position of industrial and commercial installations located close to ports and the frontiers of Common Market countries.

Whilst the principle of a supplementary charge over and above the cost of the ticket has been retained, the new fare structure for sleeping cars ("voiture-lit" category) abolishes distance gradations and the supplement is charged according to a "ready-reckoning table", the ratios between fares for different types of accommodation being as follows: Tourist: 2; Double: 3; Special: 4; Single: 6.

What this new charging structure seeks to achieve is a situation where the supplement on any given run is paid by the night, irrespective of the length of the passenger's journey.

The first stage, which was linked with a 6% average price increase, was introduced on 28th May 1972; the second, which mainly consisted in reducing the number of steps in the distance-scale for each run, took effect on 1st November 1972; a final stage will be needed to bring the new fare structure fully into operation.

80. In Greece, studies have begun for a general reform, rearrangements and harmonization of legal, executive and pricing measures, together with other measures concerning pricing policy, co-ordination of activities and co-operation with other transport organisations and undertakings, national and international, so as to enable traffic to be carried in a manner consistent with the railways' role. More specifically, as regards rates and fares, it is now laid down that only general scales are subject to approval by the Minister of Shipping, Transport and Communications; special charges need only approval by the Board of Directors or, in exceptional and urgent cases, the Governor.

81. In Ireland, a general scheme of substantial fare reductions, marketed as the "Great Train Robbery", was introduced by the Railway Administration on 1st January 1972, on all mainline rail services. Aimed at improving public awareness of rail services during the valley traffic period, the scheme was very successful and up to its termination on 20th March 1972 resulted in a 70% increase in passenger carryings by comparison with the previous year and with a marginal improvement in revenue.

The Railway Administration continued with different sales promotions geared to take account of spare capacity and the available market, with variations in pricing to meet the circumstances at different periods of the year.

From the railways' experience with fares structures in 1972, it appears that a flexible fares policy is necessary to achieve the maximum commercial benefits.

82. The Castelvetrano-Salaparuta line (29 Km.) which was showing very heavy losses, was closed during the year.

83. In Luxembourg, the Government has asked the railways' Managing Board to consider the construction of a new line to replace the Pétange-Belval-Usines stretch as part of its land-use planning programme.

Studies for the rationalisation of marshalling yards are proceeding in close co-operation with experts from the SNCF.

Centralised Traffic Control came into operation on the Luxembourg-Wasserbillig line on 1st October 1972. This will in due course dispense with intermediate signal boxes and, hence, save staff.

Four stations have been converted to unmanned halts.

As a move towards co-ordinating replacement services by road with State-franchised road services, a working party has been appointed to prepare the necessary documents for setting up a co-ordinating and controlling body for public passenger transport.

84. In Norway, 10 stations were closed, and 218 Km. of line were closed to part-load traffic; replacement road services were provided.

Passenger fares, including registered luggage, were increased by approximately 10% as from 1st June 1972. At the same time the rate for children travelling 2nd class was changed (half of the adult fare instead of one third). From the same date some systems of reduction were cancelled, whilst others were simplified and made more practical.

From 1st July the freight rates for wagon-load traffic were increased by 8% and the rates for part-load traffic, including express parcels, by 12%.

Improvements in passenger services include the introduction of new suburban train sets in the Oslo area and new trial schedules on intermediate distances.

The NSB container service is developing rapidly. A range of new vehicles and a large number of containers for special purposes have been put into service.

85. In the Netherlands, in 1972, 314 Km. of unremunerative railway lines were closed. At the end of 1972 the total length of the network was 2, 834 Km. Various installations were also closed, while three stations were opened to passenger traffic.

Pursuant to the provisions of EEC Regulation No. 1191/69, freight carrying and operating obligations were abolished by the Government as from 1st January 1972.

86. In the United Kingdom, nine passenger services were withdrawn, although one is now being operated as a commercial concern by a private railway company. In the case of four passenger services the provision of additional bus services was required. As for tariffs, it is pointed out that British Railways are under no tariff obligations nor, generally speaking, any obligation to operate.

87. In Sweden, 125 Km. of line, including 25 Km. of narrow gauge line, were closed entirely. Passenger traffic ceased on a further 135 Km. It may also be noted that 83 Km. were sold by the State Railways to the Storstockholms Lokaltraffic Company. In addition, 120 installations were closed to traffic. The substitution of road services for unremanurative railway services has proceeded, where economically justified.

88. In Turkey, rates and fares are published.

Freight transport operations are performed on the basis of the documents produced by stations and depots. These documents are checked by the railways' General Directorate and statistics are drawn up on this basis.

d) Activities of the Eurofima Company

89. Broadly speaking, Eurofima's activities in 1972 were much as in the previous year, even though the monetary situation remained uncertain.

90. Finance was raised by the following methods:

a) Long-term issues

In March 1972, Eurofima launched its first issue of redeemable stock on the Belgian market, on the following terms:

Nominal amount	B. Frs. 500 million
Nominal rate	7%
Maturity	12 years
Issue price	Par

In April, the Company made its 16th issue of redeemable stock on the Swiss market. Its terms were:

Nominal amount	Sw. Frs. 70 million
Nominal rate	5 1/2 %
Maturity	17 years
Issue price	99%

In August, the 5th issue of Eurofima redeemable stock on the German market took place. The terms of this issue were:

Nominal value	DM. 50 million
Nominal rate	6 1/4 %
Maturity	15 years
Issue price	97 1/2 %

Lastly, in October, Eurofima was again able, as in 1971, to launch a second issue of redeemable stock on the Swiss market, on the following terms:

Nominal amount	Sw. Frs. 50 million
Nominal rate	5 3/4 %
Maturity	15 years
Issue price	100.6%

b) Medium-term loans and credits

In January, a first medium-term loan of Sw. Frs. 40 million was raised at 6 3/4 % nominal interest, for a period of 8 years.

In February, there was an issue in Netherlands florins, its form being:

Nominal amount	Fl. 50 million
Nominal rate	7%
Maturity	7 years
Issue price	Par

Also during February, and subsequently in March and September, three further medium-term loans were raised, amounting in all to Sw. Frs. 150 million, at interest rates of 6% and 6 1/4 %; repayable in 8 years.

In August there was a second issue in Netherlands florins, its terms being:

Nominal amount	Fl. 50 million
Nominal rate	5 3/4 %
Maturity	7 years
Issue price	99 3/4 %.

The Company also arranged a special transaction based mainly on export credits in French francs. The amount was approximately Frs. 27 million, for five years, at a rate of 7%. The arrangement is expected to be fully effective by the end of 1972 or the beginning of 1973.

Finally, the balance of the export credit in French francs, obtained to finance flat bogie wagons, amounting to some Frs. 71 million, became available in the course of 1972.

In 1972, therefore, Eurofima raised new finance to a total value equivalent to Sw. Frs. 604 million.

91. The resulting resources made it possible to negotiate 65 hire-purchase agreements or credit sales with 8 member railways of Eurofima.

The rolling stock involved in these contracts is made up as follows:

French National Railway Company (SNCF):

37 2,400 h.p. diesel locomotives
1,444 flat bogie wagons
650 open bogie wagons
392 2-axle, gravity discharge wagons

Italian State Railways (FS):

1,505 flat bogie wagons
180 open bogie wagons

Belgian National Railway Company (SNCB):

4 electric 2-car units
500 open bogie wagons
128 2-axle covered wagons

Netherlands Railways S.A. (NS):

54 electric 2-car units

Spanish National Railway System (RENFE):

5 restaurant cars
34 2nd class TALGO coaches
24 1st class TALGO coaches
1 TALGO van
9 sliding-roof wagons
41 telescopic-bodied bogie wagons

Yugoslav Railways (JZ):

29 1,650 h.p. diesel locomotives
6 600 h.p. diesel locomotives
3 diesel multiple units
5 2nd class passenger coaches
190 flat bogie wagons
106 open bogie wagons
247 covered bodie wagons
3 sleeping cars

Austrian Federal Railway (Oe.BB):

8 4,850 h.p. electric locomotives
3 1,500 h.p. diesel locomotives
35 passenger coaches for domestic traffic
200 2-axle covered wagons with sliding doors
169 covered bogie wagons

Portuguese Railway Company (CP):

2 2,000 h.p. diesel locomotives

Thus, excluding contracts still under negotiation, current orders involve 8 electric locomotives, 77 diesel locomotives, 58 electric multiple units, 3 diesel multiple units, 107 coaches and 5,761 wagons (5,032 of them bogie wagons).

92. In 1972, Eurofima undertook large-scale, international bulk ordering. This involved:

a) European standard coaches

In response to invitations to tender issued in the second half of last year, Eurofima was asked to place the order in question with an international consortium of firms in four different countries. The order comprises:

- design studies for standardised rolling stock in consultation with a team of specialists appointed by the railways;
- the construction of a small series of prototypes;

- the supply of an initial series of 500 standard coach chassis for delivery to six railway systems.

A separate order will be placed for bogie vehicles.

Delivery of the series of 500 coaches is expected to be complete towards mid-1976. When the standardised design studies are completed, it will be considered whether the production run should be lengthened.

Under the terms of this order, participating railways will also receive full rights to use the drawings of the standard coach for their own requirements. These standard designs will also be available to other railways belonging to the UIC, on terms yet to be settled.

It has been arranged that Eurofima will give financial priority to the stock involved in this order.

b) Tourist class sleeping cars

The international sleeping-car pool requested Eurofima to place a bulk for a series of about 100 air-conditioned sleeping-cars with two-berth compartments, for delivery to the following railways:

German Federal Railways
Danish State Railways
Italian State Railways
Swiss Federal Railways
French National Railway Company
Netherlands Railways S.A.

Invitations to tender for this contract were invited, and the examination of tenders should be practically complete by the end of 1972.

c) Automatic coupling

As part of the process of inviting tenders, preliminary inquiries were sent during November to about 100 firms, in and outside Europe, having the capacity to supply the main component of the automatic coupler.

Some ancillary components suitable for mass production by specialised firms will be dealt with by separate inquiries and invitations to tender.

e) Automatic coupling

By adopting Resolution No. 18 at Florence on 11th June 1970, the Council of Ministers approved the introduction of the automatic coupler designed by the International Union of Railways (UIC) and fixed the main steps in the timetable for bringing it into use.

93. The UIC was invited to negotiate with railways belonging to the OSJD on technical issues and, above all, to seek joint agreement with that organisation on the timetable for the introduction of automatic coupling. These negotiations were pressed ahead in 1972. They led to agreement in principle on the following basic points:

1) On and after a date in April 1981, wagons must be fitted with automatic coupling if they are to be accepted for use in international traffic, though their side buffers will remain;

2) As from a date to be specified later, but which will be at the latter end of 1985, wagons fitted with side buffers will no longer be accepted in international traffic.

94. Problems involved in financing automatic coupling arose during these negotiations. Some railway managements' anxieties on this subject finally led the ECMT to consider these questions, and to set up an ad hoc group whose conclusions will be drawn up by the Spring of 1973.

Chapter V

PROBLEMS CONCERNING ROADS AND ROAD TRANSPORT

A. ROAD TRANSPORT

95. The Road Transport Committee, set up in 1971, devoted most of its efforts in 1972 to moving forward in two areas of transport liberalisation: one was the implementation of Resolution No. 20; the other was the setting-up of a multilateral quota for international road haulage.

96. It will be remembered that the 1969 the Council passed (and confirmed in 1971) a Resolution, No. 20, on the liberalisation of occasional (non-regular) passenger services involving an outward journey under load and an empty return run. Practical difficulties arose, mainly over control documents, and the entry into force of this Resolution was postponed several times as a result, but thanks to the efforts made in the meantime, it was possible to report at the 36th session that the recommended measures had become operative on 1st April 1972. Yugoslavia's reservation having been withdrawn, only France and Turkey, who had reserved their positions at the outset, are not taking part in the arrangement.

Discussions were started on the extension of liberalisation to occasional passenger services involving an outward journey unladen and a return journey under load. There was some progress towards agreement on certain special and specific cases.

Despite these prospects, however, there is not yet enough common ground to justify a Resolution in the immediate future, but further efforts are being made in this direction.

97. Previous reports have dealt at length with the introduction of a multilateral quota for international road haulage. Since the Resolution passed in Florence in 1970, which approved the quota and specified how licences were to be allocated amongst participating countries, efforts have been focussed on the fulfilment of the terms laid down by that Resolution as prerequisites for putting the system into practical effect. These prior conditions concerned taxation (reduction of duty-free fuel allowance; abolition of refunds of vehicle tax) or working conditions (ratification of AETR - the agreement on working conditions and rest periods of vehicle crews in international road transport).

98. At the 36th session of the Council, Ministers found that for all practical purposes the taxation requirements were met, and that there were very firm prospects of ratifications of AETR during 1973. In view of this, they decided in principle that the multilateral quota should take effect on 1st January 1974, as between countries which had met all the above conditions by then. During the 27th session they will take stock of how matters have actually developed.

It should be noted that the Republic of Ireland, which had previously remained outside the scheme because of its geographical position and the nature of its trade with the Continent, declared its intention to join. It was allotted a share of the quota, the original total, which had already been allocated, being correspondingly increased.

99. The ECMT called a number of meetings of its Group on the Standardization of Weights and Dimensions of Motor Vehicles. There is no doubt about the difficulty this problem presents as the standards to be selected have implications of many kinds (road safety, terms of competition with other modes of transport, international trade, the motor industry) and because of the differences in basic attitudes, especially as regards maximum weight per single axle. So far, despite all its efforts, the European Economic Community has failed to reach a compromise between its Member countries. The ECMT has kept in touch with these efforts; in its own discussions on the subject, the Conference carefully reviewed the whole position concerning vehicle weights and dimensions as it stood at present and the extent of the concessions which each country felt able to make. It has not yet proved possible to reach agreement, but a document is now available which can be used as a firm basis of discussion for political negotiations.

B. EUROPEAN ROAD NETWORK

100. A reminder of the ECMT's work in revising the European trunk road network (E routes) is appropriate in this chapter. It was dealt with under the heading of trunk lines of communication.

C. CO-ORDINATION OF ROAD TRAFFIC RULES AND ROAD SIGNS AND SIGNALS

101. The ECMT's work on the co-ordination of road traffic rules and road signs and signals has hitherto been handled by Restricted Group "B", comprising 14 countries. As the countries which did not belong to that Group also expressed the wish to take part in its work, it has been reconstituted since June 1972 as a full Committee, called the Committee on Road Traffic and Road Signs and Signals.

This Committee continued the studies on road markings. It should be remembered that ratification of the Vienna Convention and the Geneva Agreements on road traffic rules and road signs and signals by governments had been delayed pending the conclusion of an additional agreement on this subject.

That point has now been reached, and the Protocol drawn up by the Economic Commission for Europe was opened for signature by the governments concerned as from March 1973.

For the rest, the Committee is continuing with the threefold task which the Ministers assigned to it:

- to ensure the uniform application and interpretation of the Vienna and Geneva Conventions and Agreements;
- to strive for closer co-ordination in the field of road traffic and road signs and signals;
- to keep in touch with developments in those fields in order to be able to adjust existing international and national rules.

D. ROAD SAFETY PROBLEMS

102. Previous annual reports have repeatedly stressed that road safety is a matter of special and constant concern to Ministers, as responsible politicians, and each of the various measures of accident prevention undertaken by the Conference were reported at the time. This work went on in 1972, and during that year fresh impulse was given to all the Conference's activities in this sector.

103. The ECMT takes the view that factual knowledge is basic to the choice of sound road safety measures. Every two years, therefore, the Conference carries out an analysis of road accidents occurring in all Member countries. This involves considerable research and statistical effort which, notwithstanding some difficulties over the availability of basic data, has been intensified over the years. The most recent reports, giving the results of the 4th survey of this kind, was laid before Ministers at the Council's 35th session in June 1972. It is mainly concerned with the accident figures for the period 1969 to 1970, but also examines that situation in the light of longer-term developments since 1961.

104. Despite attempts to base the analysis on statistical data which are as comparable as possible, it is still difficult to infer conclusions which are valid for all countries. The reason is that the geographical, meteorological and economic conditions of ECMT Member countries form too variegated a pattern, and discrepancies between their levels of development are too wide to justify straightforward overall comparisons. Moreover, some basic definitions still involve distorting factors, the definition of "road deaths" being a

notable example; even when correction factors are applied, the figures must still be interpreted with circumspection.

105. Nevertheless, this analysis, much more varied in its range than previous reports, brings out many points of interest. Besides giving figures for road deaths and other casualties per 100, 000 inhabitants and in proportion to the number of motor vehicles and vehicle mileage, it includes the percentage distribution of killed and injured by class of road user (pedestrians, cyclists, motorcyclists, moped-riders, private cars and other vehicles), the degree of severity of accidents in each of those classes of user, the distribution of road deaths by age-group, the percentage of killed and injured inside and outside built-up areas, and so on.

106. It seems right to draw attention here, with all due caution, to a few particularly striking features. The first is that in 1970 road deaths in the 18 Member countries reached the appalling total of 80, 000, and some 2 million people were injured. This being so, there is little consolation in the fact that accident and casualty rates have risen less quickly than the vehicle population. The report also shows that pedestrians are generally most at risk, the 6 to 9 age group being most vulnerable, followed by those aged 65 and over.

107. Another trend revealed by available statistics underlines the relative importance of human error in accident causation. Although the proportion of cases in which it was a contributory factor varies from country to country, it is still high enough to emphasize the need for a stronger effort to influence road users' behaviour. The attitude taken by the ECMT in this matter is that action to convince and persuade road uses is preferable to increased regulation with heavier penalties. The State, in fact, cannot take over the individual's own responsibility in road traffic; its duty is to make him better aware of it. This consideration makes the education and information of road users the king-pin of accident prevention.

108. In this connection, the Council had a wide exchange of views in the light of a report which dealt comprehensively with the various aspects of road-user education. Its conclusions, offered as a basis for concerted action, are as follows:

- in choosing the techniques to be applied, road users cannot nowadays be treated as a single homogeneous category; a better approach is to differentiate between them according to their age-groups and the characteristics of their involvement in traffic;
- for each category of road-user, a suitable "behaviour model" should be provided for guidance on how to respond to various conceivable situations, and motorists should be confronted with the prototype image of "the good driver";
- any campaign should start from a scientifically prepared basis, including the findings of modern public relations psychology; the widest possible use should be made of modern mass media such as broadcasting and television, so that all sections of the population are effectively and constantly provided with information and guidance;
- as a matter of organisation, it is most important that all action taken in this field, whether by public authorities or by various private bodies concerned with the prevention of road accidents, should be co-ordinated.

109. The ECMT itself observed the last-mentioned principle in the close working relations which it maintains with international organisations concerned, and particularly the Prévention Routière Internationale. Joint action with that body in 1972 was mainly centred on the preparation of an international campaign to encourage motorists to wear seat belts. A poster competition, open to artists in all Member countries, was organised and an international jury including representatives of both bodies awarded a prize given by the ECMT to the winning design.

110. As stated at the beginning of this chapter, 1972 was a milestone in the Conference's work in the road safety field: at their 36th session the Council of Ministers adopted a new road safety programme, no longer concerned with isolated efforts, but with planning a coherent, overall strategy which makes use of the entire armoury of road accident prevention.

It is designed as a medium-term programme, and is set out in the second part of this report. Its components may be summarised as follows.

111. The first part comprises a selection of priority areas for future political action, chosen according to the basic features of road accidents and the classes of road user which form the higest proportions of casualties involved. This selection was made in the light of the statistical analysis discussed above.

The counterpart consists of systematic, detailed descriptions of the whole range of expedients which are available in theory for road accident prevention. In Anglo-Saxon parlance, these fall under three main heads, called "the three Es":

- Engineering, i.e. technical measures affecting road and vehicle construction;
- Education, already discussed above; and
- Enforcement, which covers regulation, surveillance and penalties for offences.

Having set the list of priority areas against the list of possible remedies, what must be sought is a judicious combination of measures which will yield the best results in each case.

The programme also stresses the need for an increase in knowledge through the most extensive use of scientific research - knowledge which should not stop at the symptoms, but should deepen understanding of the complex interaction of the multiple factors at work in accident causation. Lastly, it emphasizes the importance of better co-ordination in this field between inter-governmental organisations. There seems, in fact, to be a need for systematically concerted action to that end, not only in order to avoid diffusion of effort and resources, but also to ensure more effective contributions towards solving present problems.

The Conference's new programme of work lists the following as the most urgent of those problems:

- pedestrian safety;
- safety of young drivers and beginners;
- safety of riders of two-wheeled vehicles;
- safety of occupants of private cars;
- training of learner-drivers; issue and withdrawal of drivers' licences;
- speed limits.

It is, of course, always open to the ECMT to widen this programme to cover further matters which later developments in one country or another might show to be urgent.

Chapter VI

INLAND WATERWAY TRANSPORT PROBLEMS

112. The annual report dealing with the 1971 figures gives, as in previous years, an account of investment in inland waterway infrastructures and craft, together with information on the output of the fleet in that year. It appears in Part II of this report.

113. During 1972, the ECMT pursued the investigations referred to in the 18th annual report.

Its first task was to draw practical conclusions from the proceedings of the Seminar held in 1971 to discuss "Economic criteria for determining the capacity of the inland waterways fleet with a view to obtaining an optimum balance between supply and demand." The interim report laid before Ministers on this subject gave rise to various discussions, especially on the future of chartering procedures (roster system) and on financial measures in connection with the scrapping of economically or technically obsolete tonnage.

The resulting difficulties led the Council of Ministers to refer further study to the new Inland Waterways Committee, the appointment of which was announced in Chapter I of this report.

114. At its 36th session the Council of Ministers approved a report on the capacity of the inland waterways fleet and the trend of demand; this report falls into two parts:

- the first half shows the fluctuations in fleet capacity throughout 1969 and 1970, weighted by a suitable coefficient for each type of craft according to its output.

  As can be seen in Part II, where this report is reproduced, it was found that, arithmetically speaking, there was no over-capacity. This may, as in 1969, have been attributable to favourable navigating conditions, which did not recur in 1971 and 1972.

  The report also mentions the actual growth of available capacity recorded for 1971 and part of 1972.

- the other half gives forecasts of the growth of demand up to 1980, based on national investigations carried out in Germany, Belgium, France and the Netherlands.

  These investigations were believed to give a fair reflection of the growth of Member countries' fleets as a whole.

  Although the forecasts for 1972, when cyclical conditions were exceptional, were not borne out, they can nevertheless be held valid for medium-term prospects.

  On the basis of the forecasts of demand, together with two, fuller investigations carried out by Germany and the Netherlands, the report concludes by estimating the fleet capacity which will be needed in 1980 to meet it.

115. The new Inland Waterways Committee was constituted at the end of 1972; until then economic studies on waterway transport were carried on by the Inland Waterways Sub-Committee of the Investment Committee. A definition of the roles devolving upon each of these bodies in future was therefore necessary.

It has been agreed that the Inland Waterways Committee is to consider policy questions and matters concerning the promotion of inland water transport, as aspects of general transport policy, and with particular reference to harmonization of the terms of competition.

The Investment Committee will, however, retain its responsibility for drafting the report on investment trends, and for all matters related to the forecasting and co-ordination of investment.

116. The Inland Waterways Committee will begin by drawing up, early in 1973, a full programme for carrying out its terms of reference.

Chapter VII

COMBINED TRANSPORT PROBLEMS

117. Previous annual reports have borne repeated withness to the close attention which the Conference pays to the development of combined transport and the problems which its growth presents. In fact, combined transport in its various forms (large containers, roll-on/roll-off, piggy-back, barge-carrier ships) has shown a striking - in some cases, very swift - rate of development in recent years, both on intercontinental and, latterly on intra-European routes. The operation of a continuous (door-to-door) transport chain has thus become more widespread, and the resulting process of mechanisation in the transport system brings about a new relationship between co-existing modes of transport, making them complementary to each other. Combined transport has thus become an important factor of transport policy to which the Council of Ministers is very much alive.

118. Work on this subject produced a report which, as planned, was submitted to the Council at its 35th session. It reviewed features of recent developments in combined transport and described current difficulties of all kinds with a view to ascertaining what governments in Member countries can do to solve them. In this connection it must be remembered that governments, although anxious to promote combined transport, nevertheless start from the basic principle that this new technology should be applied in those fields where it has true advantages, economic and technical, and for the protection of the environment. With these considerations in mind, the report deals with numerous specific points, having previously discussed them with international organisations concerned at a hearing in the Spring of 1972.

119. On large containers in particular, the report expresses the importance attached to forecasting on a scale wider than domestic markets, so that a more general view can be formed of the scope for developing this system in traffic between Member countries of the Conference, or at least between areas in Europe with common features from the point of view of containerisation and market structures. At all events, it would be appropriate for Member countries of the Conference to make it their practice in future to disseminate the results of any specific inquiries into this subject as widely as possible.

120. Another matter which has a vital bearing on container transport is the weights and dimensions of road vehicles, and particularly the regulations as to gross laden weights and maximum permitted lengths of articulated vehicles. Harmonization of the provisions in this respect, which vary widely from one country to another, would certainly encourage containerisation, but it must be borne in mind that these points cannot be considered with an eye to containerisation alone. When deciding on specific figures due regard must obviously be paid also to the impact on road safety and on the environment and to the wear and tear of road surfaces that may result. The problem of weights and dimensions is at present being studied in its general context, both in the European Communities and by the Conference.

121. Another aspect of the development of containerisation is bound up with its social implications. These are mainly felt in seaports and, to a lesser degree, in inland transport. It is not possible to determine exactly the impact of containerisation on the employment situation in the transport sector, as the effect can be positive or negative, depending on the qualitative and quantitative situation on the labour market at a given place and time. However, if containerisation leads to redundancies, government effort should be directed to retraining measures which will give those concerned access to better and more highly paid jobs.

122. Inquiry into investment finance for the development of containerisation suggests that, in principle, development should be self-financed, and that, apart from some measure of help in initial stages, there is no economic justification for support by public authorities.

123. Piggy-back transport, too, has expanded rapidly in Europe. However, its international development is still hampered by technical and administrative situations which are not altogether satisfactory. Efforts to solve some current problems by international co-operation would help the future development of this technique. Its competitiveness for long-distance hauls has been confirmed by experience in the United States.

124. International piggy-back transport is affected by one problem of general transport policy in particular - differences from country to country in the control of access to the road transport market. Under some systems of control, national authorities treat piggy-back transport as a road haulage operation, which must be licensed accordingly. Yet the essential characteristic of this method is that it combines road and rail transport. The Conference intends, therefore, to try to find an answer to this problem which will be compatible with general transport policy and at the same time meet the specific needs of combined transport.

125. The report to the Council of Ministers also took note of a special system involving the use of swop-bodies. This system (and its variants) may be regarded either as an improvement in operating techniques in road haulage as such, or as a form of road/rail combined transport. In view of its growing development in some countries, the Conference will include it in future work on combined transport.

126. Lastly, turning to barge-carrying ships, the report draws attention to policy issues which arise when ship-borne barges ply on inland waterways in competition with conventional craft. The Council's basic attitude on this matter is that, from the technical and economic points of view alike, the distortion of competition should be avoided. The Council will certainly keep the development of this system under review.

127. In conclusion, reference must be made to an important event concerning international container transport: the United Nations/IMCO held a World Conference in the Autumn of 1972. Eighty-three states took part, and various conventions and recommendations concerning transport by large containers were drafted. Draft international conventions on the Customs treatment of containers and on container safety were drawn up for signature by contracting parties. The third important topic was carriers' liability and the social and economic aspects of containerisation policy. Further consideration is to be given to these questions, and a Conference will be held in 1975 to draw up a Convention on liability.

Resolutions were also passed on the following:

- phyto-sanitary and veterinary inspection as applied to container transport;
- standard marking and coding of containers;
- proposed future work on standardization in container transport;
- a standard system of labelling dangerous goods;
- container traffic with land-locked countries;
- Customs conventions on the international carriage of goods (ITI).

The ECMT was one of many international organisations associated in the preparation and the proceedings of this Conference, where it was represented by the Secretariat.

Chapter VIII

URBAN TRANSPORT PROBLEMS

128. Previous reports have drawn attention to the increasingly urgent problems of vehicular and passenger traffic in city centres. There is a widely-held view that the encouragement of urban public transport could markedly improve the present critical situation besides having very beneficial effects on the quality of life for city-dwellers. But such a development postulates a better quality of service in frequency, extent and comfort.

129. The financing of this development must have high priority. The creation of new infrastructures or the improvement of existing ones has very substantial financial implications, which it is beyond the capacity of most municipal authorities to face by themselves, without help from the State. In a market economy, however, the granting of State assistance entails difficulties through the variety of forms it can take, each with attendant advantages and drawbacks. These linked problems led the Urban Transport Committee of the ECMT to examine the current position in Member countries and to reach conclusions which could offer solutions applicable both at local and at national level.

130. That approach was adopted in a report drawn up in 1972 and approved by the Council. Part II gives its full text. It is entitled "The Financing of Urban Public Transport". It first examines objectives and the means of achieving them and then recalls some measures recommended by the Urban Transport Committee in an earlier study of the co-ordination of urban transport with a view to making public transport more attractive by comparison with private motoring. The general aim advocated in the report is to provide public transport with operating conditions, both internal and external, that will enable it to offer attractive prices and an attractive quality of service.

The report also examines the situation in five ECMT countries (Germany, Spain, Great Britain, Japan and the Netherlands) as regards the arrangements governing public urban transport undertakings, public financing procedures, subsidies, loans and private finance, if any. In the light of this information, it sets out the advantages and disadvantages of different forms of financial support. The final chapter sums up the conclusions drawn from the report as a whole.

131. These conclusions must be read in full, as they are carefully qualified. In consequence, all attempts to convey the essence of the recommendations in practical rules in a resolution failed; in any precis of the conclusions, balance was forfeited, and this was unacceptable to delegations. Accordingly, reference to the actual text is advised and no summary is attempted here.

132. Good progress is being made with the inquiry into the promotion of public urban transport, in accordance with the programme for 1972-1973. It is expected to be finished in the Autumn of 1973.

133. The Urban Transport Committee intends to draw up a new programme for its work in 1973-1974. National delegations have been invited to put forward any suggestions they wish to make as to its contents, and a choice will be made in the light of practical priorities.

134. Other work on urban transport goes on in the Conference, side by side with the proceedings of the Urban Transport Committee; in particular, theoretical studies are carried out at Round Tables and Seminars.

During 1972, Round Tables discussed the following subjects:

a) "Influence of existing infrastructures on the choice of techniques for the provision of modern urban and suburban services." (17th Round Table).

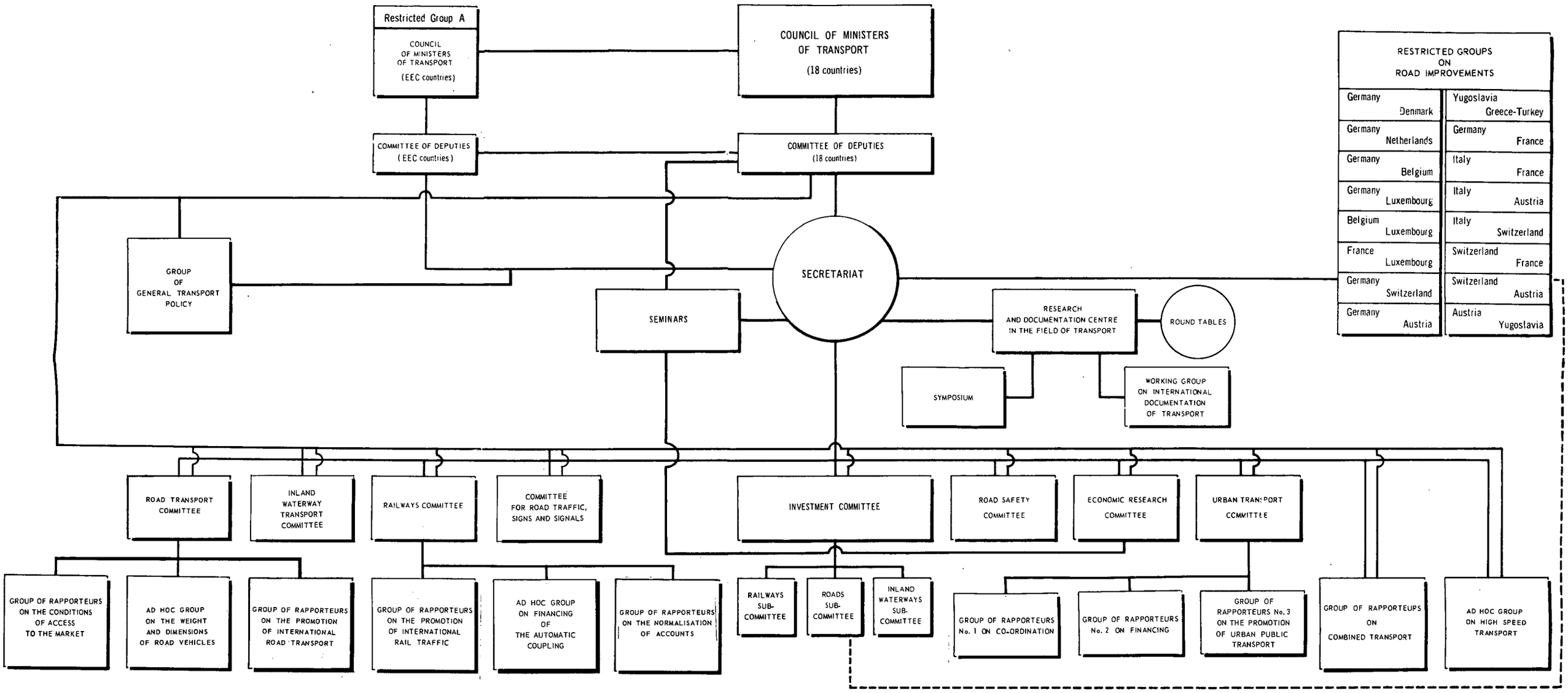
b) "Study of the social costs of urban road transport (noise and pollution)." (18th Round Table).

c) "Influence of cost, quality and organisation of terminal transport and interchanges on the choice of passenger transport mode." (19th Round Table).

Taking the report of the 17th Round Table as its starting point, a Seminar will be held in early 1973 to draw up practical conclusions for consideration by the Committee of Deputies. A preparatory hearing of the international organisations interested in this subject took place in the Autumn of 1972.

Annex I

ORGANISATION CHART OF THE ECMT FOR 1972



Part Two

RESOLUTIONS

RAIL TRANSPORT PROBLEMS

RESOLUTION No. 20 ON THE DELEGATION OF AUTHORITY BY ONE RAILWAY ADMINISTRATION TO ANOTHER

/CM(72)5/

The Council of Ministers of Transport, meeting in London, on 14th June 1972,

Referring to the Report on promotion of rail traffic which it approved in December 1970 /CM(70)25/;

Considering that the railway administrations are at present considering problems relating to international goods rates;

Considering that the measures likely to improve the commercial and competitive position of the railways at present include the mutual delegation of authority, without prior consultation, as regards the rates applicable to the entire length of international freight hauls, with special reference to the margins within which reductions can be granted;

Considering that no time should be wasted in complicated tariff negotiations between railway commercial services before granting reductions applicable to "medium-scale" contracts;

Considering that delegations of authority should specify an overall maximum percentage and that the reduction as such should be made on a case by case basis in the light of market requirements;

Considering that the definition of a strategy based on the railways' common interest is of vital importance in this connection, and that a study should be undertaken on this connection, and that a study should be undertaken on this shortly in the context of the promotion of international rail traffic;

Noting that some railway administrations have already made agreements on delegation of authority to each other as regards tariffs;

Judging that governments cannot but encourage closer co-operation between railways in this respect;

Bearing in mind that in some countries, delegation of authority as to the margins within which tariff reductions can be made are entirely left to the discretion of the railway commercial services concerned;

Endorses the principle of the railways' delegating authority to each other as widely as possible for the reduction of tariffs applicable to international freight transport;

Invites the Member countries to take such measures as may be needed to eliminate any administrative or regulatory difficulties which might hamper delegation of authority from one railway to another as regards tariffs;

Instructs the Committee of Deputies to report back on the action taken in accordance with this Resolution.

REPORT OF THE COMMITTEE OF DEPUTIES ON THE DELEGATION OF AUTHORITY BY ONE RAILWAY ADMINISTRATION TO ANOTHER

[CM(72)5]

1. Aim of proposed action

At its 31st Session, on 17th December 1970 in Paris, the Council of Ministers approved the report on promotion of international traffic by rail [CM(70)25].

One of the measures recommended in this report concerns the delegation of authority by one railway administration to another to enable each to grant, on the other's behalf, reductions on goods rates for the entire haul in order to meet competition.

The railways, being organised on a purely national basis, are heavily handicapped in competing with road hauliers and inland waterway transport operators. An international haul by rail involves the co-operation of at least two railway administrations. Inland waterway and road transport operators are in a position to offer a "through" rate promptly for the whole of an international run. The railways, on the other hand, in order to co-operate usefully, must consult each other to bid a price for international traffic.

To give the railways a better chance of competing for international traffic, an administration must be able in the case of "medium-scale" contracts of carriage to offer the customer tariff reductions for the entire length of an international journey promptly without consulting the other administrations concerned beforehand. (The delegation of authority should specify an overall maximum percentage; the reduction as such being dealt with on a case by case basis in the light of market requirements and cost margins.)

2. Existing agreements

In this connection, it must be pointed out that an Agreement on the mutual delegation of authority for granting tariff reductions already exists within the framework of the so-called "Conference of Officials responsible for commercial problems relating to international goods traffic". This Agreement, designed to enable the railways to compete effectively with other transport operators by making quick bids involving a binding commitment, embraces the railway administrations of the following countries: Germany (DB), Austria (OBB), Belgium (SNCB), France (SNCF), Great Britain (BR), [Italy (FS - to a limited extent], Luxembourg (CFL), the Netherlands (NS) and Switzerland (CFF and BLS). The maximum reduction is 23%; some administrations limit the reduction to 15% for the lower scales of their tariffs. The granting of reductions is subject to certain conditions, in particular:

- the tonnage involved must not be less than 500 tons nor exceed 24,000 tons;
- the object must be to meet competition from other modes of transport;
- reductions may be granted only in respect of administrations on whose networks a distance of at least 40 km is charged for;
- deduction may not be granted for periods exceeding one year.

A similar delegation of authority also exists for specific tariffs applicable to the following routes:

- Portugal/Spain/Germany
  (in transit through France);
- Portugal/Spain/Switzerland
  (in transit through France).

In both the foregoing cases, reductions are limited to 15%.

- Portugal/Spain/Italy
  (maximum reduction 10%).

Reference must also be made to the "Franco-Nordic" international tariff which enables each participating administration to grant reductions of up to 15% without consulting the others beforehand.

The conclusion to be drawn from these arrangements for delegation of authority is that the railway administrations of the ECMT are not all parties to agreements of this kind, and it follows that those which do participate in an agreement on delegation of authority can apply it on certain routes only.

It lies with the railways to see how the widest possible system of delegation of authority can be extended to cover all international routes.

3. Barriers - de jure or de facto

According to the replies to the Secretariat's enquiries on delegation of authority in the ECMT countries, there are no problems arising from direct government intervention.

However, if the position is considered in actual practice, the background appears in a somewhat different light.

Various difficulties arise in practice. Some are due to factors extraneous to railway management, others to factors that are intrinsic to railway commercial attitudes.

Without question, the railways are subject to special constraints often involving the obligation to have their tariffs approved and to publish them. Some tariffs for transit traffic are indeed exempt from this procedure and individual contracts are most commonly subject to easier rules than those applicable to tariffs. But the fact remains that there are still cases where the railways are obliged to publish their international goods tariffs and this sometimes even applies to individual contracts. Whatever the procedures for obtaining the approval of, or for notifying, the controlling authority, they entail in practice both complications and delay.

Moreover, in some cases, government authorities are inclined to use railway goods rates for the pursuit of social or regional policy objectives - a practice which does not seem notably to affect other competing modes of transport. Furthermore, in some countries, international tariffs are determined by adding up the separate domestic tariffs for each part of the journey, and this detracts from an international approach to the determination of international rail freight rates and to a uniform delegation of authority for tariff reductions.

4. Conclusions

It is desirable to develop an international tariff system which pays due regard to the special aspects of international rail traffic.

Delegation of authority for tariff reductions could be a first step towards a new European railway policy aiming at optimal performance of international traffic operations.

The enquiry into the practical aspects of delegation of authority has shown clearly how differences in commercial policy are essentially due to each administration's concern to optimize profitability on its own domestic routes. In itself, this is a perfectly sound objective in a self-administration and market economy context. In future, however, consideration should be given to a commercial policy for international rail traffic that would be based not only on profitability on domestic routes but also on profitability over the entire international haul.

In order to go forward on these lines, the railways, in consultation with the government authorities and with their support, should agree on the application of a strategy based on their common interest. This problem is indeed being studied by the UIC and it is difficult to settle it quickly, but if it were solved the obstacles to a good many measures for promoting international rail traffic would be removed.

For present purposes, the most realistic attitude for the ECMT is this: whilst drawing attention once more to the importance of this problem, to endorse the idea of widest possible delegation of authority and invite the Member countries to eliminate, at government level, any measures which may impede this process.

ROAD TRANSPORT

RESOLUTION No. 27 ON EDUCATION AND INFORMATION OF ROAD USERS

[CM(72)9]

The Council of Ministers of Transport, meeting in London, on 14th June 1972,

- Considering the disquieting trend of road accidents,

- Considering that most traffic offences are due to non-observance of the basic rules of the Highway Code,

- Being convinced, that in the final instance, such offences cannot be stopped by heavier penalties or more regulations, and that it would be better to make intensive and well-directed efforts for information and education,

- Considering that the State cannot relieve road users of their personal responsibility for avoiding accidents but that it has a duty to make them more aware of their responsibilities.

- Having regard to its previous resolutions on the information of road-users [see CM(60)9 (Final) of 17th September 1960, Resolution No. 11 of 5th October 1960 - CS/SR(70)1 and the Resolutions adopted at the First and Second International Conferences on Road Safety Education in Schools held on 1st-4th October 1963, and 21st-25th June 1971],

Recommends the following measures:

I.

1. Action taken for road safety information and education should, in principle, combine the information and behaviour motivation aspects; methods based on advertising psychology should be used for this purpose. Suitable models or examples of behaviour should be set for each category of road-user.

2. Any action to improve road safety should aim to integrate road safety information and education with legislation, traffic technology and enforcement.

3. Information campaigns should be scientifically prepared and pay due regard to research findings in the field of advertising psychology. Such campaigns are particularly recommendable before the coming into force of new traffic rules or instructions in order that road users may see more clearly why they have been taken and what they are intended to achieve. This is a rational procedure at national and international level alike.

4. Information campaigns of this kind should be preceded by representative tests and their impact on the public should be measured scientifically.

II.

1. Road safety education should begin at the earliest possible stage in the home and in nursery schools. Better training for kindergarten teachers and suitable teaching aids and games equipment for kindergartens and nursery schools are particularly relevant in this respect.

2. Whether for junior or senior pupils, road safety training should be practical and attractive. For instance, it should be possible for them to take moped or tractor driving tests during their years at school and, in the senior classes, to prepare themselves to qualify for a car driving licence (e. g. so-called "car in the school playground" scheme).

3. Facilities for training and advanced training of teachers enabling them to dispense road safety education in a suitable manner should be provided by organising seminars, appointing lecturers to senior colleges of education and other teacher training establishments, and by creating professorships in education primarily relating to road traffic.

4. To ensure full information and education of all sections of the public on a continuing basis, more use would be made of television and radio.

III.

1. Systematic co-ordination of all the action taken in the field of road safety information and education is most important. To this end it seems advisable to set up special bodies comprising both the competent authorities and the private organisations concerned.

2. In view of the heavy economic losses suffered as a consequence of road accidents in the Member countries, and having regard to the ascertainable benefits obtainable from road safety information campaigns the State and local government authorities should spend more money on road safety information and education than they have done in the past. The responsibility of the State cannot be limited to the introduction and enforcement of rules and instructions, nor to keeping technical standards in line with progress in technology and design; information and education of all sections of the public are also part of the tasks incumbent on government.

3. Bearing in mind that the public funds available are necessarily limited, optimal allocation of resources should be ensured by applying the principles of cost/benefit analysis.

REPORT OF THE COMMITTEE OF DEPUTIES ON EDUCATION AND INFORMATION OF ROAD USERS

[CM(72)9]

A. INTRODUCTION

1. The two topics under review, education and information of road users, were dealt with by the then "Working Party on Road Safety" in 1960 [see CM(60)9(Final)] of 17th September 1960 and Resolution No. 11 of 5th October 1960 included in CS/SR(70)1.

On 22nd May 1963 the Council of Ministers drew up a general programme of measures for improving road safety [CM(63)6(2nd Revision)].

Items C3 and C4 of this programme provided for the education and information of road users.

In the light of the report on the recent trend of road accidents in Member countries of the ECMT, the Council of Ministers decided, at its meeting on 11th June 1970 in Florence, to look into the question of education and information of road users [see CM/M(70)1].

2. After a discussion on this subject at its 40th meeting on 29th and 30th September 1970 [CS/SR/M(70)2], the Road Safety Committee drafted a questionnaire which was approved, with minor amendments, at its 41st meeting on 9th and 10th December 1970. The German Delegation was appointed as Rapporteur.

This report is based on the replies of the 13 following Member countries:

Austria
France
Germany
Greece
Italy
Luxembourg
Netherlands
Norway
Portugal
Sweden
Switzerland
Turkey
United Kingdom.

3. The effect of road safety education and information in the Member countries should be to influence road users in such a way that their behaviour responds to traffic conditions in order than the problem of road accidents may be suitably dealt with, especially by trying to reduce the number of such accidents.

The education and information of road users in the ECMT countries is handled partly by the State and partly by private organisations. Often with the help of various other interested parties. Firms in the private sector, road safety organisations, automobile clubs, trade associations, transport operators organisations and, in some cases, religious bodies and various other institutions are directly or indirectly concerned with the improvement of road safety. Each country uses a wide range of media for this purpose (leaflets, brochures, posters, conferences, films, radio and television broadcasts, articles in daily papers and specialized journals) and also applies a wide variety of methods.

The information in this paper is based on the reports sent in by 13 Member countries and therefore gives only a very general outline of their essential contents. However, a comparative analysis of these procedures at international level leads to useful findings as a preliminary for joint - or at least concerted - action of a practical kind by the Member countries in this vitally important field.

B. INFORMATION BASED ON MEMBER COUNTRIES' REPLIES

I. GENERAL

1. Data on statistics and organisation

The information given on population and numbers of vehicles in the Member countries from 1960 to 1970 plainly shows that while the increases in population in the reporting countries between those two dates was relatively slight, the number of motor vehicles rose extremely fast.

2. Jurisdiction

In the Member countries which replied to the questionnaire, responsibility for the education of road users falls mostly within the competence of the Central Government (eight countries) and very seldom (two countries only) within that of local authorities. In some cases there is a combination of both, that is systems involving co-operation between the Central Government and regional or local authorities. Road safety organisations and other bodies belonging to the transport industry or the insurance sector very frequently co-operate with the competent authorities in this field.

3. Legal basis

In most of the Member countries which replied, road safety education is not based on legislation or other regulations. In a few countries only, there are, for instance, provisions to the effect that road safety education and information is a compulsory subject in school curricula.

With one exception, in all the Member countries which replied the State provides financial and moral support for the education of road users. In the majority of these countries, the corresponding action is taken by the State itself, or at least in co-operation with road safety organisations. Another Member country among those which replied will also be adopting this procedure in future.

4. Action taken by non-governmental road safety organisations

In all Member countries, road safety organisations (including automobile clubs) conduct road safety education campaings.

5. Co-ordination

In most of the Member countries which replied, the co-ordination of road safety education and information measures is suitably catered for by a continuing exchange of information, more particularly between government services and non-governmental road safety organisations.

However, co-ordination between non-governmental road safety organisations as regard the measures under review is still not altogether satisfactory in certain countries.

Special co-ordinating bodies have been set up in very few countries.

At international level, adequate facilities exist for exchanging experience through the ECMT, OECD and other international organisations, in particular the PRI. Experience is also exchanged within narrower country groupings (e. g. Scandinavia).

II. DETAILS CONCERNING ROAD SAFETY EDUCATION MEASURES

1. Measures directed to children in nursery schools (or kindergartens)

In several (i. e., seven) of the Member countries which replied, special encouragement is given to road safety education for young children, for instance by giving proper training for teachers and providing ample documentary material for the schools concerned.

In spite of all this, it has to be admitted that the measures for road safety education of young children are, taken as a whole, still inadequate.

2. Measures directed to other school children

In all the Member countries which replied, road safety education is dispensed in primary schools and, to a much lesser degree, in secondary and vocational training schools. In some countries, pupils in the senior classes can take proficiency tests with bicycles or mopeds and also pass the test for a tractor driving licence. In very few countries, pupils in this category have facilities for learning to drive a car, and can even take the corresponding test.

3. Training and advanced training for teachers

Training and advanced training for teachers of road safety education in schools is provided, in most of the Member countries which replied (ten countries), by seminars, symposia or courses.

However, it has to be admitted that, on the whole, there is still a scarcity of teachers suitably trained for this purpose, especially in secondary schools.

4. Road safety education material

In most of the reporting countries, schools are provided with road safety education material by the Ministry of Transport and/or educational authorities' administrative departments and private institutions concerned with road safety.

5. School patrols

Most of the reporting countries have a school patrol service. As a general rule, its members are aged between 11 and 13. They are usually designated and trained on a joint basis by school and police authorities and by road safety organisations.

6. School traffic training grounds and road safety education for young people

In practically all the reporting countries, road safety education is centred on primary schools; in some countries, it applies to all age-groups (nursery schools, primary and secondary schools).

7. Road safety education for adults

Most of the reporting countries take steps for the education of adults at national and international level alike. Such action includes projects extending over fairly long periods (several weeks or months), e. g. "safe tyre" and "safe lighting" weeks, publicity campaigns for safer driving and behaviour, campaigns against drunken driving, measures to promote the use of seat belts, to inform foreign workers about traffic rules in the host country,

lectures for adults - often with projections or various other visual aids, appeals to the public, etc. As a general rule, they apply to town and country dwellers alike.

8. Road safety education for elderly people

Relatively few of the reporting countries provide for road safety education specially directed to elderly people.

9. Special provision for road safety education of cyclists

Road safety training for cyclists is generally provided as part of road safety education at school within the 10 to 14 age group (proficiency tests for cyclists).

10. Pedestrians

Only a few of the reporting countries encourage road safety education and information for pedestrians by special measures. Such measures include press, radio and television campaigns, and pedestrian safety measures in urban areas, more especially those involving traffic engineering and control operations and the provision of pedestrian precincts.

11. Road safety education for motorists

Besides the mandatory training needed for a driving licence, motorists in a good many reporting countries are able to improve their skill on a voluntary basis by attending courses or doing practical exercises on special training grounds.

Road safety organisations, especially automobile clubs, appeal to motorists through publications or by other means. In some Member countries, fairly big campaigns have been organised to pursuade motorists to adjust their behaviour more closely to traffic conditions.

As young drivers account for a fairly high percentage of road accidents as compared with other age groups, a few Member countries are planning campaigns specially designed for this group in the light of scientific studies and sample surveys.

12. Miscellaneous

Special measures have been adopted for moped drivers in one of the reporting countries, and for motor cycle drivers in another. They consist mainly in designing training programmes to serve as a basis for practical exercises.

13. Special measures and events

At national level, and to some extent at international level, the reporting countries carry out road safety education operations of various kinds, dealing with different fields and directed to different road-user groups (see B II 6 to 12). Only a few countries take education and information measures in each of the fields mentioned.

Some countries take measures of regional scope which may sometimes be extended to the country as a whole.

Some road-user education measures cover a single specific topic, others of regional scope cover the entire road safety armoury (e. g. information, technology and design, traffic rules).

III. METHODOLOGY FOR THE INFORMATION OF ROAD-USERS

a) The methodology for education and information of road-users depends not only on the message content but also largely on the type of media used to convey it. The range

of media runs from plain leaflets and booklets to brochures lavishly illustrated with photographs, posters (displayed indoors or in public transport vehicles, and street placards), lectures (usually illustrated with film or slide projections), press reports (motoring columns in dailys, specialized journals), radio and television broadcasts (sometimes in colour). The application of these resources depends on a good many factors, sometimes on the funds available, on previous experience with various types of mass media and, to some extent, on national attitudes.

Having regard to the discernible tendency towards an increasing use of mass media, more especially television, enquiries in various countries show that a bigger percentage of the population gets its knowledge of road signs and signals and rules of road behaviour from radio and television than from newspapers, leaflets and brochures.

Before passing judgement on the various kinds of mass media, it must be borne in mind that the direct personal approach (e. g. lectures with slide and/or film projections for the theoretical teaching of road safety education at school) has a far greater impact than any other information medium, and, furthermore, that visual aids and, even more so, audio-visual aids (such as talking films and television) are obviously most effective because of their "hold" on the public, in contrast to cold print which is far less captivating. Against the advantage of reaching very wide sections of the public, the drawback of radio and television lies in their one-way and short-lived "contact", the hearer or spectator having no possibility of discussing what is shown or said. This disadvantage of mass media can be largely offset, however, if broadcasts are designed on a less ambitious scale and centred on a specific topic: a series of broadcasts of this kind can have as much impact on the general public as a best-seller. Where information campaigns are concerned, frequent "spots" can have a more striking effect and make a deeper impression than "once-only" broadcasts of greater length.

b) Another point which has a bearing on methodology is that in trying to attract the interest of road-users, they can no longer nowadays be regarded as a single homogenous entity: a different approach is needed according to age group and traffic category (e. g. pedestrians, car drivers, pedal cyclists and motor cyclists). This can be an important consideration in the choice of media and psychological strategy to be applied in each case. In this connection, it would be useful to apply the knowledge obtained by research and surveys in this field before and after each information campaign.

c) With reference to the methodology of road-user information, it is also important to bear in mind that exercises aiming to influence behaviour in traffic should be as nearly as possible co-ordinated with administrative and legislative action at fairly long term. Thus, the aim should be to achieve a well-balanced combination of measures in the following fields:

a) education,

b) traffic and vehicle technologies,

c) enactement of rules, monitoring of their observance, and enforcement by the police and by the courts.

The reasons for this are as follows: the application of audio-visual mass media for the information of road-users increasingly calls for recourse to modern advertising and psychological techniques involving subconscious motivations. Fairly recent psychological and advertising techniques are based on the principle that users are more sensitive to praise than to censure and that objectively informative publicity is better than strict regulations. In some quarters, it is even considered that a co-operative attitude cannot be obtained from road-users by deep psychology conditioning if administrative rules and their enforcement by the courts are made more severe.

However, it is reasonable to assume that the main body of road-users who are inclined to observe traffic rules think that information which is well designed, especially from a psychological angle, is quite compatible with careful monitoring of traffic and with rules of readily understandable meaning and significance. Thus, the merging of these two aspects (i. e. information designed with an eye to psychological, advertising

and scientific criteria on the one side, and a carefully balanced administrative and enforcement set-up on the other) should be a feasible (though, admittedly, not easy) proposition. Information campaigns should precede the promulgation (or, at least, accompany the entry into force) of any regulation involving strict obligations for users, in order that the public may grasp the meaning of such measures. The combination of these two factors is of vital importance for achieving the assigned objective, namely: that users should accept and observe the rules. Traffic rules are sometimes criticized for being excessive, but it must be borne in mind that traffic is a "mass phenomenon" and that its smooth flow is quite unfeasible nowadays without some channelling and regulation.

d) Another element of very special importance in the methodology of road-user information is the behaviour model set for each category of user. The object is to simplify the individual's choice of behaviour in a given situation by enabling him to refer to previous decisions, in other words, to shape his attitude according to the basic pattern of the model. Co-ordinating bodies in some Member countries have recently been doing preliminary work on behaviour models designed to motivate individual attitudes to road traffic. As regards methods, full use is made of previous experience with psychological techniques for advertising purposes. From a practical angle, the basic principle still remains that the majority of drivers are happy to have a steering wheel in their hands and that most of them think they drive extremely well whereas in many cases they overrate their abilities and have a misguided inclination to show off. As these personality characteristics are not easily changed, everything must be done to harness them to match the purposes of road safety campaigns.

The basic idea is that it is not enough to provide users with practical and objective information on how to deal with road traffic problems. An attempt must also be made to change their attitudes. There are, of course, many ways of approaching this problem; the right one is a matter for experts to advise on in the particular circumstances at the time.

One method used in road safety propaganda in the Federal Republic of Germany is the creation of an "ideal image" (or example of the safe driver) who is a cool and competent type who never flusters, who gives others a chance, "the man of the 1970s" who takes his time, the skilled driver who avoids "bunching-up", the man who has "reached the top" and takes no risks. By appealing to users in this considerate and flattering manner it is possible to obtain their active co-operation and their acceptance of collective responsibility for the smooth flow of traffic. Thus, besides serving the interests of road safety generally, this approach indirectly instills in road-users a respect for others and makes them feel that they are all in the same boat. In conclusion, the action taken to influence road-user behaviour is chiefly based on a positive and an exemplary approach designed to awaken a spirit of emulation.

Alternatively, in some circumstances it might be considered best to use as a model someone who is obviously a bad, inconsiderate driver, so that the road-user can draw his own conclusions.

In this connection, the findings of the OECD expert group in its report entitled "road safety campaigns - design and evaluation" are particularly relevant. They include the following recommendations:

a) no safety campaign should be launched without preparatory research and pre-tests;

b) adequate funds should be provided for research on road safety campaigns, possibly on the basis of a fixed percentage of the total cost of road accidents, or by reference to the funds allocated for research in comparable fields;

c) campaigns designed to change road-user behaviour should pay due regard to research findings on the causation of accidents and to the lessons of present-day advertising psychology as a means of shaping user behaviour by means of mass media;

d) adequate communication media should be carefully selected in each case; where necessary, several of them can be combined; new channels of communication should be explored and their effectiveness evaluated;

e) the cost/effectiveness of different safety campaigns should be compared; the same applies to alternative means of promoting road safety (e. g. driver education, changes in legislation, enforcement, traffic engineering);

f) an inventory should be made of car advertisements to see whether they have an adverse impact on behaviour from a road safety angle; if necessary, action should be taken to inform those concerned so as to obviate such harmful effects.

IV. EFFECTIVENESS OF MASS MEDIA

The reporting countries register hardly any difference in the effectiveness of the various mass media; they simply emphasize the influence of television.

In all Member countries in recent years, mass media - and more especially newspapers, radio and television - have played an increasing part in road-user information.

V. PARTICIPATING ORGANISATIONS, AUTHORITIES AND INSTITUTIONS

In most of the reporting countries, the authorities directly concerned are not alone in working for the education and information of road-users; the police, the armed forces, educational establishments and, to a lesser extent, the churches also play a part. The most active elements are the road safety organisations((Prévention Routière, Automobile Clubs, professional associations, etc.), various industries and trades and the corresponding associations.

VI. FINANCING

In the reporting countries, the necessary finance is provided partly by the authorities concerned and partly by non-governmental road safety associations; in some cases it is provided jointly by the public and private sectors (insurance companies, industry).

VII. CHECKING THE EFFECTIVENESS OF VARIOUS MEASURES

Checks on the effectiveness of road-user education campaigns have been carried out recently. Attempts have been made to develop reliable methods for measuring the success of such campaigns, but this process is still at the experimental stage. Systematic before and after studies are conducted in only a few countries.

Studies were made of the effectiveness of three publicity campaigns held in Britain in Summer 1971. The first, a campaign to launch a new code to teach children to cross the road was run for three months at a cost of £624,000. At the end of the campaign, child pedestrian casualties were about 1,250 (11%) lower than the level expected, a saving in monetary terms of £730,000 within the campaign period. No analysis has yet been possible on the effects of the publicity on child casualties beyond the end of the campaign.

The second, a regional campaign on the use of seat belts cost £94,000 and was associated with an increase in the amount of wearing from 16% to 28% of all front seat occupants. No data are yet available on the effects on casualties. The third campaign (also a regional one) on overtaking, which cost £184,000 has had no measurable effect.

C. CONCLUSIONS

1. Education given by parents and in nursery schools

Road safety education should begin to be given by parents when their children reach the age of two and then continue in nursery schools or kindergartens.

Nursing schools should be supplied with suitable documentary material and games equipment. Special attention should be given to increasing the number of specially trained kindergarten teachers.

2. Education of school children

It would be desirable to teach children in primary schools how to behave as pedestrians and cyclists.

They should be provided with facilities for measuring their ability as cyclists and taking a suitable test.

In the senior classes of secondary schools, it should be possible, for instance, to take moped or tractor driving tests. Some countries are at present engaged in so-calles "car in the school yard" experiments designed to provide - with the help of a qualified instructor - preparatory training for obtaining a car driving licence. Such experiments should be kept carefully under review to see how far they deserve more financial and other support.

3. Training and advanced training of teachers

Training and advanced training of teachers to enable them to dispense road safety education in a suitable manner should be developed, more particularly by having more seminars and by creating road safety teaching lectureships in senior colleges of education and other teacher training colleges. Teacher trainees should attend one or two-week courses during their studies and the same should apply to teachers already in employment.

4. Teaching aids

It would be desirable to make as much use as possible of audio-visual aids (slides, films and television cassettes).

5. School patrols

The introduction of school patrols has given good results as regards both the safety of children entrusted to their care and the education of a young generation of road-users aware of their responsibilities. Depending on circumstances, it may be found necessary to have these patrols manned by adults.

The introduction of school patrols should not dispense the authorities from their obligation to do everything they can to save child casualties by providing suitable equipment (traffic lights and underpasses).

6. School traffic training grounds and other off-the-road facilities

More use should be made of school traffic training grounds both for demonstration and practical exercises.

7. Road safety information for adults

Many information campaigns for adults are directed to motorists, pedestrians and elderly people.

It would be appropriate in this connection to make more use of mass media, especially radio and television.

It seems necessary to make preliminary tests before launching such campaigns and to check their impact on the public when they are completed.

8. Advanced training for driving-licence holders

Road safety organisations and driving schools should encourage voluntary advanced training by providing suitable training grounds.

9. Co-operation and co-ordination

As a general rule, the following contribute to the education and information of road-users: government authorities concerned, road safety organisations, trade and industry and the armed forces.

In very few reporting countries is there systematic co-ordination of all measures relating to education and information of road-users (see section 1.5). Such co-ordination seems all the more essential in view of the many departments -Transport, Home Affairs, Labour and Finance, for instance) and private institutions concerned with education and information of road-users.

10. Cost/benefit analysis

It would be useful, as a general rule to apply the principles of cost/benefit analysis (or similar procedures) to all road safety education measures.

11. Financing

Member countries should, as a matter of policy, allocate more funds for education and information of all sections of the public, as the efforts made so far are quite inadequate, and as it is impossible nowadays to have an impact on the public as a whole without recourse to expensive mass communication media and to recurrent information campaigns.

12. Methodology for road-user education

- communication media should be carefully selected and, if appropriate, used in combination;
- it should be borne in mind that mass media (press, radio and television) can have a more effective and lasting impact on the individual with a brief repeated message than with longer once-only articles or broadcasts;
- in planning specific campaigns designed to influence road-user behaviour, due regard should be paid to communication and motivation techniques based on present-day advertising psychology;
- behaviour models should be selected to suit each category of user;
- the aim should be to integrate road safety information and education with administrative action, legislation, enforcement and traffic technology.

GENERAL PROBLEMS

RESOLUTION No. 25 CONCERNING VEHICLE NOISE LEVELS

[CM(72)8 final]

The Council of Ministers of Transport, meeting in London on 14th June 1972,

Recalling the concern they have shown during the past ten years to promote international agreement on measures to reduce noise caused by vehicles;

Having regard to the views expressed at their 34th session, in December 1971, both about the importance in general of considering the impact that transport matters may have on the quality of life and about the possible need for action at policy level concerning vehicle noise in particular;

Considering

1) that noise from vehicles constitutes a major environmental nuisance,
2) that the imposition of strict limits on the maximum noise level of new vehicles is one of the principal means of abating this nuisance,
3) that technical developments, fostered by suitable government policies, can enable maximum permitted noise levels to be progressively lowered;
4) that regulatory measures must be accompanied by improved control and enforcement action if progress is to be realized in practice.

Commends the establishment of maximum permitted noise levels for new vehicles which will ensure the greatest possible abatement of the nuisance of traffic noise;

Urges the governments of Member States to adopt and to pursue vigorously a policy of

a) replacing existing standards by stricter standards, reviewing and further amending such standards periodically, to the extent that lower maximum levels are technically achievable and consistent with international obligations;
b) advocating the adoption in international standard-setting organisations of stricter standards found to be technically achievable;
c) carrying out or promoting research into means of achieving further reductions in vehicle noise and into methods of measuring noise levels of road vehicles for enforcement purposes during road checks or in testing stations;
d) taking all practicable steps to strengthen the enforcement of the standards laid down.

Instructs the Committee of Deputies to keep the matter under review and to report to the Council in due course.

REPORT OF THE COMMITTEE OF DEPUTIES ON THE VEHICLE NOISE LEVELS

[CM(72)8]

Document CM(71)25 summarized the replies of Member States to the questionnaire on vehicle noise abatement. It showed that all Member States would agree to a review of ECE Regulation No. 9, and that attitudes towards lower permissible noise levels would depend on what is technically feasible in future. At the Council of Ministers meeting on 16th December 1971, the British Minister for Transport Industries spoke of the need to press forward action against the nuisance of vehicle noise, and received support from several other Ministers. The Council envisaged possible action at policy level in the light of developments.

It is now some years since the noise levels in ECE Regulation No. 9 were determined. A review undertaken in the United Kingdom has shown, after detailed consultation with the industry, that the technical knowledge already exists to enable substantial reductions in those levels to be achieved. The Government of the United Kingdom has accordingly decided to lower its maximum permissible noise levels for most classes of vehicle by amounts ranging up to 4 dB(A). At a cost estimated to be of the order of only some £8 m. a year in higher vehicle prices, this will bring about a substantial reduction in the maximum noise potential of new vehicles, an important improvement in the urban environment. Details of the new levels are given in Appendix A.

These developments in the United Kingdom have been fostered by a clearly expressed Government policy of reducing maximum permitted noise levels as rapidly as feasible; in pursuance of that policy research is also under way into the development of techniques for further reduction in noise levels, particularly those of heavy goods vehicles. The United Kingdom Government believes that the adoption of a similar policy by the other ECMT governments would make possible similar rapid progress in their countries and proposes that the Council of Ministers should be invited to adopt a resolution to this end as drafted at Appendix B.

Appendix A

NEW UNITED KINGDOM NOISE LEVELS

CLASS OF VEHICLE	ECE LEVEL	PRESENT UK LEVEL	NEW UK LEVEL	OPERATIVE DATE: FIRST USE ON OR AFTER
Private cars:				
i) Diesel-engined	84	84	82	1.10.1974
ii) Petrol-engined over 200 h. p.	84	84	83	1.10.1973
iii) Other	84	84	80	1.10.1973
Commercial vehicles:				
i) Under 3.5t. gross weight	85	85	82	1.10.1974
ii) Other:				
a. Up to 200 h. p.	89	89	86	1.10.1974
b. Over 200 h. p.	92	89	89	1.10.1974

NOTE: Motor-cycles are not listed as no reduction below ECE levels has yet been found possible.

Part Three

REPORTS APPROVED BY THE COUNCIL OF MINISTERS

REPORT ON THE STANDARDIZATION OF RAILWAY ROLLING STOCK

[CM(72)6]

The present report on progress in the standardization of railway rolling stock from 1968 to 1970 is submitted to the Council of Ministers in pursuance of the conclusions in document CM(69)4 in Volume XIX of the Resolutions.

TABLE OF CONTENTS

I. INTRODUCTION

At its 29th Session, held in Stockholm on 9th June 1969, the Council of Ministers considered the report CM(69)4 on the standardization of railway rolling stock (Diesel and electric locomotives, and freight wagons). Its conclusion referred to a further report to be prepared in due course, dealing with progress made and difficulties encountered in this field.

The present report deals with developments from 1968 to the end of 1970, and thus falls within the series of ECMT reports on the unification and standardization of rolling stock:

CM(59)9	on the standardization of locomotives and freight wagons;
CM(60)15	on the standardization of locomotives and freight wagons;
CM(64)7	on the standardization of freight wagons;
CM(65)3	on the standardization of locomotives;
CM(67)19	on the standardization of freight wagons;
CM(69)4	on the standardization of railway rolling stock.

Annexes 1 to 3 reproduce extracts from the Member countries' replies to the questionnaire CS/SC1(71)1.

British railways, and Irish, Spanish and Portuguese railways, cannot in general acquire standard or unified vehicles, the first because of their different loading gauge and the others because of their wider track gauge. The figures of their wagon fleets have accordingly not been taken into account in calculating the percentages, but the work done by their administrations on unification and standardization is referred to in Chapters II to V below.

In general, the tables in the report distinguish between EEC countries* and the other ECMT countries excepting Great Britain, Ireland, Spain and Portugal.

The UIC stresses in its report the fact that its Board of Management had earlier decided to create in 1969 a post of Secretary for Standardization in the Secretary-General's office and to set up a Pushing Group on the standardization of railway rolling stock.

This Group laid down definitions, in its first report dated December 1970, of the following terms which will also, for the sake of clarity, be used as far as possible in the present draft report:

Unification

The laying down of common characteristics to be possessed by equipment, which may differ in other respects. (Wagons marked "RIV St" - see RIV, Vienna Edition, paragraph 34, No. 2. 2. 2.)

Interchangeability

The property that is sought for certain parts and components which maintenance services are required to replace when carrying out running repairs.

Normalization

The setting of norms of quality of dimension for the various products or components used in the construction of railway equipment.

* Figures in brackets refer to the six countries hitherto forming the EEC.

Standardization

The requirement for railway equipment to be constructed from identical plans. (Wagons marked "RIV St UIC" - see RIV, Vienna Edition, paragraph 34, No. 2. 2. 3 and UIC Code sheet No. 582).

The UIC, recalling its understanding that standardization was the requirement for railway equipment to be constructed from identical plans, pointed out that this was essential in order to be able to group orders internationally and thus enable the railways to benefit from the economic advantages of mass production.

Referring to future organisational developments, the UIC said that the main task of the high-level Pushing Group was to give the weight of its authority to studies on standardization undertaken by the various organs of the UIC; to use its influence with the railways to accelerate work and mitigate the main difficulties; and finally to see that decisions, once taken, were effectively carried out.

The Pushing Group decided to set up the following two Study Groups:

1) Study Group on international research contracts and patents

The tasks of this Group are as follows:

- to draw up a standard international research contract, in collaboration with representatives of the industry, which should provide for free use of standard designs within the UIC;
- to work out a common point of view among the railways on patents questions;
- to make contact with industry.

2) Study Group on standardization of components

This Group is responsible for preparing and facilitating the standardization of entire vehicles by drawing up a standardization programme indicating priorities for bringing individual components and sets of components into general use.

In addition, the Pushing Group decided to revive the former ad hoc Group on bogie wagons and to make it responsible, as a Group on two-axle wagons, for laying down specifications for the future construction of two-axle wagons in the light of the introduction of automatic coupling.

II. WAGONS

As was already mentioned in the Report CM(69)4, an ad hoc Group of the UIC has been made responsible for studying the expansion of the fleet of bogie wagons. This ad hoc Group had made a report laying down which types of bogie wagons should be unified and standardized, and the procedure and order of priority for the studies. The report was approved by the Board of Management in March 1970.

Work has since been continuing on the unification and standardization of the following new types of bogie wagons:

- covered wagons with sliding doors;
- common type covered wagons 50 m2 in area;
- 75 m3 low wagons with bulk discharge on both sides;
- 48 m3 high wagons with controlled discharge on both sides;
- 48 m3 sliding-roof wagons with controlled discharge;

- 80 m3 high wagons with controlled discharge on both sides;
- wagons with telescopic hoods for transporting coils of cold rolled steel sheet;
- sliding-roof low wagons with bulk discharge;
- 80 m3 sliding-roof wagons with controlled discharge.

The specifications of the 48 m3 high wagons with controlled discharge on both sides, and the 48 m3 sliding-roof wagons with controlled discharge, have already been laid down.

On another proposal by the ad hoc Group, standardization has begun on the following types of bogie wagon which were formerly unified:

- sliding-roof wagons;
- open wagons.

Specifications have also been drawn up for a new type of unified, high capacity refrigerated bogie wagon.

Finally, standardization is going on of two types of container wagon:

- 60' bogie container wagons for unit trains;
- 80' articulated container wagons for unit trains;

and trials of prototypes have already begun.

In practice, the rate of progress has been as follows:

The total wagon fleet in the ECMT countries (excluding Great Britain, Ireland, Spain and Portugal) has been fluctuating from year to year, mainly owing to rationalization measures; the numbers were 914,442 (704,144) in 1968, and fell to 905,258 (697,340) at the end of 1970. The percentages of standard and unified wagons have steadily increased, although the trend has not been the same in all countries. The percentages increased from 38.3% (40.7%) or 349,536 (286,442) wagons at the end of 1968 to 40.9% (43.3%) or 370,178 (303,014) wagons at the end of 1970 (see Tables 1 and 2).

The figures in Table 2 showing the proportions of standard and unified wagons in the fleet of each administration show that they ranged from just under 40% to just over 50% in nine countries (Germany, France, Italy, Luxembourg, Netherlands, Austria, Denmark, Greece and Switzerland).

The numbers of standard and unified wagons in each of the main categories are as follows:

CATEGORY	TYPE	
	STANDARD [1]	UNIFIED [2]
Covered	73,079 (63,592)	52,456 (27,431)
Open	69,316 (58,058)	50,910 (42,052)
Flat	48,869 (47,385)	22,860 (18,792)
Other	13,230 (12,138)	39,458 (33,566)
Total	204,494(181,173)	165,684(121,841)

1. Wagons marked RIV St UIC

2. Wagons marked RIV St

Table 3 gives a breakdown of these fleets for each country, by principal categories.

For the Member countries whose railways have a wide gauge and/or do not apply the Technical Unity loading gauge, the following may be noted:

a) British Railways had at the end of 1970 393 two-axle covered wagons meeting the UIC requirements for unified wagons and able to work on continental lines. The future construction of wagons for international transport will depend on the decisions taken in the context of Channel Tunnel transport. It is unlikely that British Railways will adopt automatic coupling for domestic traffic.

b) Ireland has pointed out that its railway system is isolated from the continental systems and has a different track gauge. It was therefore unnecessary for it to take part in the work of unification and standardization of rolling stock.

c) Portuguese Railways give the following figures for 1970:

575 two-axle covered wagons
200 two-axle open wagons } of unified type
100 two-axle flat wagons

These wagons are built to UIC specifications but for a wider gauge.

d) Spanish Railways had a total fleet of 48,386 wagons at the end of 1970, of which 3,100 were of the UIC unified two-axle type but for broad gauge, 2,500 of these being covered wagons and 600 flat wagons. They intend to acquire further wagons meeting the UIC requirements.

Deliveries of new wagons in the years 1968-1970 (see Table 4) were between 17,000 and 23,000 annually (excluding Great Britain, Ireland, Spain and Portugal). Of the total of approximately 60,000 wagons delivered during those years some 6,900, or 11.5%, were standard and 23,000, or 38%, were unified, showing that approximately 49.5% of all new wagons delivered corresponded to UIC standards.

To these entirely new wagons supplied by the manufacturers must be added those modernized by conversion in the railway workshops, in particular by the DB and SNCF. In all, such conversions provided 19,700 wagons in new condition, approximately 2,400 of which were standard and 1,100 were unified, during the years under review (see Tables 4 and 5).

Seven railway administrations which are also members of the EUROP Pool (Austria, Belgium, France, Germany, Italy, Luxembourg, Switzerland) have declared themselves in favour in principle of greater use of bogie wagons once automatic coupling has been introduced; for the two other countries belonging to the EUROP Pool the question has either not yet been clarified (Denmark) or is not at present under consideration (Netherlands). Despite its different track gauge, Spain is not unwilling to consider the possibility.

Five countries have a reserved or negative position on the question of further conversions to bogie wagons (Great Britain, Norway, Portugal, Sweden, Turkey), the three remaining ECMT countries (Greece, Ireland, Yugoslavia) leaving the question in suspense. The attitude of these eight countries is justified by their geographical situation (island or peripheral) or by their different track gauge.

The railway administrations of seven countries have decided in favour of the type Y 25 bogie, though with reservations in some cases (Austria, Denmark, France, Germany, Italy, Netherlands, Turkey), while three administrations will not use it (Norway, Sweden, Switzerland). Spain points out that this type of bogie must be considered in the light of gauge changes at the frontier. In the remaining seven countries (Belgium, Great Britain, Greece, Ireland, Luxembourg, Portugal, Yugoslavia) the problem does not arise or has not yet been resolved.

The proportion of bogie wagons at the end of 1970 was 4.72% (4.83%) for standard wagons, 8.8% (10.6%) for unified wagons, and 6.53% (7.16%) for both groups taken together (see Table 6).

Table 1. FREIGHT WAGONS

Total fleets, numbers and percentages of standard and unified wagons at 31.12.1968

COUNTRY	TOTAL	OF WHICH			
		STANDARD		UNIFIED	
		1	%	2	%
Germany	271,697	83,298	30.7	57,513	21.2
Belgium	43,162	5,841	13.4	1,698	3.8
France	254,138	40,767	16.0	48,360	19.0
Italy	113,697	38,423	33.8	977	0.8
Luxembourg	3,426	200	5.8	980	28.6
Netherlands	18,024	8,106	44.9	279	1.5
EEC Countries	704,144	176,635	25.1	109,807	15.6
Austria	33,666	602	1.8	11,134	33.1
Denmark	10,390	4,643	44.7	50	0.5
Greece	7,309	1,225	16.8	896	12.3
Norway	10,089	-	-	1,728	17.2
Sweden	47,555	-	-	12,455	26.2
Switzerland	25,632	20	0.08	9,294	36.2
Turkey	16,768	-	-	1,477	8.8
Yugoslavia	58,889	14,248	24.0	5,322	9.0
Other countries*	210,298	20,738	9.9	42,356	20.1
Total*	914,442	197,373	21.6	152,163	16.7

* Excluding Great Britain, Ireland, Spain and Portugal.

1. Wagons marked RIV St
   UIC
2. Wagons marked RIV St

Table 2. FREIGHT WAGONS

Total fleets, numbers and percentages of standard and unified wagons at 31.12.1970

COUNTRY	TOTAL	OF WHICH			
		STANDARD		UNIFIED	
		1	%	2	%
Germany	277,660	86,916	31.3	58,849	21.2
Belgium	44,651	5,839	13.1	3,788	8.4
France	240,716	41,167	17.1	54,666	22.7
Italy	112,953	39,358	34.8	2,874	2.5
Luxembourg	3,751	260	6.9	1,385	36.9
Netherlands	17,609	7,633	42.4	279	1.5
EEC countries	697,340	181,173	26.0	121,841	17.4
Austria	33,925	602	1.8	12,733	37.5
Denmark	10,130	4,691	46.3	100	1.0
Greece	7,309	1,225	16.8	2,096	28.7
Norway	9,714	-	-	1,828	18.8
Sweden	47,432	-	-	12,308	26.0
Switzerland	25,707	20	0.07	9,847	38.3
Turkey	16,080	-	-	1,777	11.0
Yugoslavia	57,621	16,783	29.0	3,154	5.0
Other countries*	207,918	23,321	11.2	43,843	21.1
Total*	905,258	204,494	22.7	165,684	18.3

* Excluding Great Britain, Ireland, Spain and Portugal.

1. Wagons marked RIV St
   UIC
2. Wagons marked RIV St

Table 3. FREIGHT WAGONS

Distribution of standard and unified wagons by main categories at 31.12.1970

COUNTRY	STANDARD [1]				UNIFIED [2]			
	COVERED	OPEN	FLAT	OPEN	COVERED	OPEN	FLAT	OTHER
Germany	37,295	15,638	31,405	2,578	5,302	35,361	-	18,186
Belgium	-	4,226	1,513	100	98	-	2,563	1,127
France	13,158	10,893	11,922	5,194	19,718	6,491	14,554	13,903
Italy	9,510	24,537	1,698	3,613	1,874	-	900	100
Luxembourg	-	-	-	260	410	200	775	-
Netherlands	3,629	2,764	847	393	29	-	-	250
EEC countries	63,592	58,058	47,385	12,138	27,431	42,052	18,792	33,566
Austria	-	202	400	-	7,811	3,980	352	590
Denmark	3,064	698	829	100	100	-	-	-
Greece	1,225	-	-	-	896	-	-	1,200
Norway	-	-	-	-	883	-	-	945
Sweden	-	-	-	-	8,208	-	994	3,106
Switzerland		-	-	20	5,326	2,508	2,013	-
Turkey	-	-	-	-	809	518	450	-
Yugoslavia	5,198	10,358	255	972	992	1,852	259	51
Other countries*	9,487	11,258	1,484	1,092	25,025	8,858	4,068	5,892
Total*	73,079	69,316	48,869	13,230	52,456	50,910	22,860	39,458

* Excluding Great Britain, Ireland, Spain and Portugal.

1. Wagons marked RIV St
   UIC
2. Wagons marked RIV St

Table 4. WAGONS

Numbers of wagons delivered by manufacturers

COUNTRY	TOTAL			OF WHICH					
				STANDARD [1]			UNIFIED [2]		
	1968	1969	1970	1968	1969	1970	1968	1969	1970
Germany	1,510	4,399	6,221	27	980	1,364	306	564	856
Belgium	1,406	990	1,247	-	-	-	1,104	467	1,014
France	7,765	7,107	8,277	-	-	-	3,755	3,179	2,792
Italy	761	1,962	2,616	235	350	400	426	774	697
Luxembourg	260	-	465	200	-	405	60	-	60
Netherlands	68	187	344	18	-	70	-	-	-
EEC countries	11,770	14,645	19,170	480	1,330	2,239	5,651	4,984	5,419
Austria	1,532	1,377	922	-	-	-	1,532	1,377	908
Denmark	321	117	105	151	67	-	30	50	-
Norway	326	118	70	-	-	-	114	75	1
Sweden	1,074	339	541	-	-	-	621	-	98
Switzerland	794	373	474	-	-	-	594	343	267
Turkey	803	320	-	-	-	-	-	300	-
Yugoslavia	797	1,944	2,036	325	1,725	583	-	200	1,453
Other countries*	5,647	4,648	4,148	476	1,792	583	2,891	2,345	2,727
Total*	17,417	19,293	23,318	956	3,122	2,822	8,542	7,329	6,966

* Excluding Great Britain, Ireland, Spain, Portugal.

1. Wagons marked RIV St
   UIC
2. Wagons marked RIV St

Table 5. WAGONS

Numbers of wagons converted in railway workshops

COUNTRY	TOTAL			OF WHICH					
				STANDARD [1]			UNIFIED [2]		
	1968	1969	1970	1968	1969	1970	1968	1969	1970
Germany	3,306	1,743	1,501	1,200	408	768	-	-	-
Belgium	392	323	89	-	-	-	-	-	-
France	2,824	3,263	3,553	-	-	-	726	369	-
Italy	483	628	725	-	-	-	-	-	-
Luxembourg	-	-	-	-	-	-	-	-	-
Netherlands	-	-	210	-	-	-	-	-	-
EEC countries	7,005	5,957	6,078	1,200	408	768	726	369	-
Austria	254	245	244	-	-	-	-	-	-
Denmark	83	125	65	-	-	-	-	-	-
Norway	28	36	45	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	-	-
Turkey	-	-	-	-	-	-	-	-	-
Yugoslavia	-	-	-	-	-	-	-	-	-
Other countries*	365	406	354	-	-	-	-	-	-
Total*	7,370	6,363	6,432	1,200	408	768	726	369	-

* Excluding Great Britain, Ireland, Spain, Portugal.

1. Wagons marked RIV St
   UIC
2. Wagons marked RIV St

Table 6. FREIGHT WAGONS

Numbers of standard and unified bogie wagons at 31.12.1970

COUNTRY	BOGIE WAGONS							
	COVERED		OPEN		FLAT		OTHER	
	1	2	1	2	1	2	1	2
Germany	-	-	-	-	7,315	-	-	-
Belgium	-	-	-	-	150	2,563	-	-
France	-	-	-	6,489	1,295	2,563	-	-
Italy	-	-	-	-	-	900	-	-
Luxembourg	-	-	-	-	-	425	-	-
Netherlands	-	-	-	-	-	-	-	-
EEC countries	-	-	-	6,489	8,760	6,451	-	-
Austria	-	-	-	-	-	352	-	-
Denmark	-	-	-	-	80	-	-	-
Greece	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-	-
Switzerland	-	-	-	-	-	716	-	-
Turkey	-	-	-	-	-	-	-	-
Yugoslavia	550	42	-	436	255	-	-	-
Other countries*	550	42	-	436	335	1,068	-	-
Total*	550	42	-	6,925	9,095	7,519	-	-

* Excluding Great Britain, Ireland, Spain, Portugal.

1. Wagons marked RIV St
   UIC
2. Wagons marked RIV St

The difficulties of extending the joint operation of wagons other than two-axle covered and open wagons (EUROP Pool) and two-axle flat wagons (POOL), have already been stressed on several occasions. Firstly, some railways did not have wagons of a type likely to be put into the common pool and did not plan to build any in the near future, as would have been necessary to comply with the principle of immediate reciprocity; and secondly, the railways owing the wagons were reluctant, because of the shortage of specialized wagons, to provide permanent facilities on too big a scale to the railways using them.

While still functioning satisfactorily, the EUROP Pool was nonetheless threatened in the short term by the increasingly intensive use of specialized wagons. It accordingly became urgent to include in the Pool - in a way which would not necessarily be in conformity with the present regulations - at least those types of specialized wagons for which traffic flows are approximately in balance.

The delicate and complex work on this question is now completed and the decision was taken in September 1970 to extent the EUROP Pool in a first stage, to:

- two-axle open automatic gravity discharge wagons;
- two-axle high-capacity covered wagons;
- type 1 bogie flat wagons;
- two-axle sliding-roof wagons.

In all, nearly 70,000 wagons are affected.

The nine members of the EUROP Pool signed an agreement to this effect on 15th December 1971, thus raising the size of the EUROP fleet to 310,000 freight wagons. This measure must be regarded as an important step forward for the future of the Community.

It also appears from certain comments made by the ECMT Member countries that more intensive use of specialized wagons and bogie wagons, and the decline in traditional covered and open wagons, have raised the question of the future of the EUROP Pool. The study made by the EUROP Working Party to determine what other types of wagon might be suited to joint operating have resulted in the following sub-division by groups:

The first group consists of the following wagons:

Ed/Eds open hopper wagons with automatic gravity discharge;

Gbs high-capacity covered wagons;

Rs bogie flat wagons;

T/Ts sliding-roof wagons.

Considerable use is made of these wagons in international transport. On the whole, exchanges may be considered to be in balance.

The second group consists of the Ea/Eas, Gas and Rmms bogie wagons (open, covered and flat).

The third group comprises several types of Td wagons (sliding-roof wagons with automatic discharge). These wagons are used only for internal transport and for certain international links. The conditions are therefore not present for joint working.

The fourth group comprises wagons of the following types:

Hbis high-capacity covered wagons with sliding sides;

Tbs high-capacity wagons with sliding roof;

Tbis high-capacity wagons with sliding roof and sliding sides.

As traffic flows are by no means in balance, the EUROP Working Party was of the opinion that joint working of these wagons was not desirable.

On the basis of this study, the efforts made to expand the EUROP fleet led to the decision to include the wagons of the first group (Ed/Eds, Gbs, Rs, T/Ts) in the common fleet. The arrangements made for this purpose have now come into force. The possibility is also being considered of including the pool "k" wagons (short flat wagons) in the EUROP fleet.

An essential condition of achieving a better organisation of the EUROP system lies in the planned international flow of information (supply, storage and processing of data concerning the availability of freight wagons on all networks), on which special studies are being made. It is still necessary to consider, however, whether partial solutions to the extension of the EUROP system with the help of pooling of wagons for regular traffic flows are possible and worthwhile.

It will undoubtedly be necessary to look for new ways in which the EUROP fleet can be extended. The main considerations involved are rationalization of the number of types, uniform methods of construction, and the risk of making wagons available for traffic flows that are not in balance.

III. PASSENGER COACHES

Unification of passenger coaches is less advanced than that of freight wagons, for the following reasons:

The rolling stock is much more complicated, and has equipment (electric power and lighting, heating, ventilation and windows) developed separately by the main industrial countries; their actual design greatly depends on national habits and requirements. It is therefore not surprising that when starting in 1958 with the unification of coaches for international routes the UIC was obliged to accept two separate series of unified coaches: type X, 26.4 metres in length, with six seats per second-class compartment and 1.737 metre between compartments, and type Y, 24.5 metres in length, with eight seats in a second-class compartment 1.9 metre in length. With such dual specifications for unified stock, the question of standardization hardly arose. The Motive Power Committee of the UIC did, however, when developing the two types side by side, try to introduce a maximum of unification in components (doors, flexible corridor connections, toilets), while technical problems of common interest, such as heating, air conditioning, structural strength, and stability at high speed, were actively studied by the specialized committees of the ORE.

Part of the work of the Pushing Group on future international passenger traffic was to lay down the features of future coaches of types A9, B11 and A4B6. An ad hoc Group was asked to draw up a specification for these types, known as "standard European coaches". This specification will be used in the competitive tender being invited from the principal European firms.

The following are the characteristics of the future UIC A9 and B11 passenger coaches:

They will be 26.4 metres long with nine first-class compartments each of 2.306 metres and 11 second-class compartments each of 1.883 metre, with a corridor 0.785 metre wide giving space for occasional seats in the second class.

There have been many requests for improved access, with four steps (instead of the present three) and it has been left to the technicians of the Motive Power Department to overcome the difficulty of fitting such steps and the accompanying doors.

Access and intercommunicating doors will be power-assisted. Access doors will be secured when in motion.

The coaches will be built with a view to the possibility of supplying conditioned air throughout the train (leaving open the question of energy conversion: the fitting of each coach with an individual converter, or the fitting of locomotives).

In July 1971 an international invitation to tender was issued by the EUROFIMA Company. Its aims are to:

- standardize new coaches internationally, i. e. with standard working drawings;
- acquire such standard European coaches in large numbers by grouping orders from the railways concerned;
- obtain favourable prices with the help of international competition, rational organisation and reductions in costs made possible by standardization and hence large-scale production.

It was in this way that EUROFIMA arranged the first joint international purchase of standard coaches with the collaboration of the coach and wagon building industry (23 firms) in six European countries. The orders are for 500 coaches, for the railways of Austria, Belgium, France, Germany, Italy and Switzerland. The choice of models will depend on the result of the invitation to tender issued by EUROFIMA. The coaches will be capable of speeds of 200 km/h and will provide a maximum of comfort, including air conditioning; they will be built in close collaboration between industry and the railway administrations. Delivery is planned for 1975; the latest date for submission of tenders was 17th January 1972.

Standardization of these coaches will be arranged by the UIC. It already seems likely that EUROFIMA will invite tenders for a further 500 coaches.

Total numbers of passenger coaches at the end of 1970 were 54,060 (37,618) units, of which 6,169 (5,517) or 11.4% (14.7%) were unified coaches or unified couchette coaches of the X or Y types (see Table 7).

Among these coaches,

- 732 (732) are capable fo speeds of 200 km/h;
- 430 (382) are fitted for air conditioning;
- 2,948 (1,544) have access doors secured when in motion;
- 850 (40) have four-step entrances (see Table 8).

During the three years 1968-1970 inclusive the industry delivered 3,283 (2,222) coaches, of which 1,269 (1,100) or 38.7% (49.5%) were of unified type. During the same period the railway workshops converted 611 (432) coaches (see Tables 9 and 10).

IV. DIESEL LOCOMOTIVES

The difficulties encountered by the UIC were in the first place due to the fact that this is a rapidly changing field, particularly where engines are concerned. The system of classification originally based on engine power had to be replaced during the course of the work by a system based on the number of driven axles and their weight, in order to obtain a basis with sufficient comparable and consistent characteristics.

In practice, however, progress in technology has been more rapid than was originally expected and this has upset all the efforts made to introduce a systematic classification. The UIC accordingly abandoned, in 1960, its intention of adopting new standard types in order to take the fullest advantage of the possibilities offered by the regulations worked out by the ORE, in consultation with the industry, for its acceptance trials on locomotives.

Table 7. PASSENGER COACHES

Total numbers and breakdown into unified X and Y type coaches and couchette coaches

COUNTRY	TOTAL	UNIFIED COACHES OF TYPE				UNIFIED COUCHETTE COACHES OF TYPE**			
		X	%	Y	%	X	%	Y	%
Germany	17,934	4,013	22.0	-	-	385	2.1	-	-
Belgium	2,403	-	-	-	-	45	1.9	-	-
France	7,510	-	-	377	5.0	-	-	254	3.4
Italy	9,265	250	2.7	24	0.3	160	1.7	1	-
Luxembourg	106	-	-	8	7.5	-	-	-	-
Netherlands	400	-	-	-	-	-	-	-	-
EEC countries	37,618	4,263	11.5	409	1.1	590	1.5	255	0.7
Austria	3,780	60	1.6	-	-	3	0.1	-	-
Denmark	1,148	-	-	257	22.4	-	-	-	-
Greece	225	20	8.9	50	22.2	-	-	12	5.3
Norway	1,062	-	-	-	-	-	-	-	-
Sweden	1,958	-	-	-	-	-	-	-	-
Switzerland	3,421	139	0.5	-	-	38	0.1	-	-
Turkey	1,230	-	-	-	-	-	-	-	-
Yugoslavia	3,618	-	-	-	-	-	-	73	2.0
Other countries*	16,442	219	1.3	307	1.8	41	0.2	85	0.4
Total*	54,060	4,482	8.3	716	1.3	631	1.0	340	0.6

* Excluding Great Britain, Ireland, Spain and Portugal.

** See sheet No. 567 of the UIC Code.

Table 8. PASSENGER COACHES

Number of coaches with certain features

COUNTRY	SPEED 200 KM/H	AIR CONDITIONING	DOORS LOCKED WHEN IN MOTION	FOUR-STEP ENTRY	COMPARTMENT COACHES	NON-COMPARTMENT COACHES
Germany	602	174	50	40	5,476	12,458
Belgium	-	-	1,135	-	325	-
France	130	191	165	-	6,544	850
Italy	-	17	194	-	9,071	194
Luxembourg	-	-	-	-	18	88
Netherlands	-	-	-	-	-	-
EEC countries	732	382	1,544	40	21,434	13,590
Austria	-	2	-	-	501	3,279
Denmark	-	-	-	10	830	318
Greece	-	-	-	-	135	-
Norway	-	11	4	800	322	740
Sweden	-	35	1,400	-	-	-
Switzerland	-	-	-	-	-	-
Turkey	-	-	-	-	679	-
Yugoslavia	-	-	-	-	-	-
Other countries*	-	48	1,404	810	2,467	4,337
Total*	732	430	2,948	850	23,901	17,927

* Excluding Great Britain, Ireland, Spain and Portugal.

Table 9. PASSENGER COACHES

Number of coaches delivered by manufacturers

COUNTRY	TOTAL			OF WHICH UNIFIED TYPE**		
	1968	1969	1970	1968	1969	1970
Germany	207	234	296	173	201	244
Belgium	-	-	-	-	-	-
France	211	186	238	99	84	114
Italy	301	139	384	55	48	82
Luxembourg	-	-	-	-	-	-
Netherlands	26	-	-	-	-	-
EEC countries	745	559	918	327	333	440
Austria	77	75	54	-	-	-
Denmark	22	34	33	22	34	33
Greece	-	-	-	-	-	-
Norway	13	25	16	-	-	-
Sweden	32	15	-	-	-	-
Switzerland	110	105	77	40	29	11
Turkey	52	42	16	-	-	-
Yugoslavia	107	75	105	-	-	-
Other countries*	414	362	285	62	63	44
Total*	1,159	921	1,203	389	396	484

* Excluding Great Britain, Ireland, Spain and Portugal.

** See sheet No. 567 of the UIC Code.

Table 10. PASSENGER COACHES

Number of coaches converted by railway workshops

COUNTRY	TOTAL			OF WHICH UNIFIED TYPE **		
	1968	1969	1970	1968	1969	1970
Germany	150	123	146	-	-	-
Belgium	-	-	-	-	-	-
France	-	-	-	-	-	-
Italy	3	4	6	-	-	-
Luxembourg	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-
EEC countries	153	127	152	-	-	-
Austria	10	-	-	-	-	-
Denmark	41	57	43	-	-	-
Greece	-	-	-	-	-	-
Norway	1	3	5	-	-	-
Sweden	2	10	7	-	-	-
Switzerland	-	-	-	-	-	-
Turkey	-	-	-	-	-	-
Yugoslavia	-	-	-	-	-	-
Other countries*	54	70	55	-	-	-
Total*	207	197	207	-	-	-

* Excluding Great Britain, Ireland, Spain and Portugal.

** See sheet No. 567 of the UIC Code.

The UIC explains that the Office for Research and Testing (ORE) is continuing to study questions of maintenance of Diesel engines and continues, in liaison with the CELTE (Constructeurs Européens de Locomotives Thermiques et Electriques), and to concern itself with the approval of engines and the unification of conditions of testing.

Table 11 below gives details of the total Diesel locomotive fleet in the ECMT Member countries subdivided into power categories.

The figure of 17,630 Diesel locomotives - including shunting locomotives - represents approximately 52% of the total number of locomotives (Diesel, electric and steam). It should be pointed out, however, that only some 10,700 Diesel locomotives are of more than 350 CV; this does however give an idea of the economic repercussions of the work of the ORE.

Table 11. DIESEL LOCOMOTIVES [1]

Total numbers at 31.12.70, broken down by power groups (including light motor tractors)

POWER	1970	
	UNITS	PER CENT
Up to 150 CV	4,263 (2,945)	24.2
150-350 CV	2,602 (1,230)	14.8
351-1,000 CV	4,382 (3,308)	24.8
1,001-2,000 CV	4,762 (2,244)	27.0
Above 2,000 CV	1,621 (283)	9.2
Total	17,630 (10,010)	100.0

1. Including Great Britain, Ireland, Spain and Portugal.

The use of gas turbines for railway traction initially gave rise to an exchange of information in the UIC.

Because of the experience already acquired by several railways it has just been decided to set up a working party on gas turbines for railway traction, with the task of drawing up a UIC file on rules for the use of gas turbines in railway vehicles.

V. CONCLUSIONS*

During the three years end 1968 - end 1970, with a total fleet of 905,000 wagons, approximately 60,000 new wagons were delivered and approximately 20,000 converted in railway workshops to new condition, showing that the average requirement for renewals calculated on the basis of a 34-year life for this equipment was fully satisfied.

The proportions of standard and unified wagons increased over the period from 38.3% to 40.9% of the total fleet, although in 1970 the proportion of new wagons delivered by the

* The figures in this chapter do not include Great Britain, Ireland, Spain or Portugal.

industry and wagons converted in the railway workshops which were of standard or unified types was only 36%.

The decline in the proportion of such wagons illustrated by this percentage is a consequence of the more intensive use of specialized wagons, i. e. freight wagons which are not really suited to unification or standardization because of their special construction or use.

Railways which cannot acquire standardized wagons because of their different loading or track gauges have (with the exception of Ireland) aligned their vehicles as far as possible on the UIC specifications.

The planned introduction of automatic coupling has already been taken into consideration in good time in connection with the construction of standard and unified wagons. It will call for a still further degree of standardization and unification of rolling stock in order to create the conditions for economical and trouble-free operation, particularly in international transport.

The present low percentage of unified wagons - 11. 4% (4. 7%) - on the various railways will increase considerably as soon as the measures announced or already taken by the UIC and EUROFIMA take full effect.

There have been no further developments in unification, normalization or standardization of Diesel locomotives since the previous report CM(69)4. It has already been mentioned that the situation developed differently from what had been expected in 1957. Although the work of the UIC and the ORE has not resulted in the use of internationally standardized locomotives over the whole of Europe, as is the case for example with freight wagons, the results so far obtained must nonetheless be regarded as satisfactory inasmuch as they have made a sizeable contribution to the working out of uniform conditions for testing, purchase, fitting out and operating. It is especially in those countries which do not have their own industry for building Diesel locomotives that the possibility has been created of benefiting from the wealth of experience of the larger railway administrations.

It will still be necessary to pay constant attention to question of unification, interchangeability, normalization and standardization of railway rolling stock. Measures of this kind are particularly valuable in keeping the cost of acquiring and maintaining vehicles as low as possible and enabling the best use to be made of them.

Annex 1

EXTRACTS FROM THE MEMBER COUNTRIES' REPORTS ON THE STANDARDIZATION OF WAGONS

1. Germany

The Federal Railways plan to purchase in future only wagons of types indicated by the UIC. This does not however exclude the possibility of purchases of non-unified or non-standardized wagons to meet immediate needs or for specialized purposes.

The DB intends to increase its fleet of bogie wagons as far as possible with a view to the introduction of automatic coupling.

It has been found that with the present pattern of freight transport over its system, 65% of full wagon-loads can be carried in bogie wagons. A fleet of approximately 74,000 bogie wagons of the various types would suffice to meet this demand, while for other freights a fleet of 172,000 two-axle wagons would be needed, which implies that the DB at present plans a ratio of three to seven between bogie wagons and two-axled wagons.

The various international working parties are at present examining, in connection with automatic coupling, the questions of running performance and the closely connected problem of preventing derailment. The requirements for construction that were still valid a few years ago for freight wagon wheel assemblies and bogies have been amended in a few respects. Thus it has been found necessary to reduce lateral thrusts which, with the higher axle loads and speeds which are planned, will make greater demands on the track. If these conditions can be met at reasonable cost with a bogie of the type Y 25 C, the DB will have no objection to these being fitted to the bogie wagons which it intends to acquire.

2. Belgium

In Belgium the programme of future acquisitions is as follows:

By the types in the table in item (3) of the questionnaire:

Covered wagons:	
two-axle (type 1)	2,700
(type 3)	200
Open wagons:	
bogie	6,425
Flat wagons:	
two-axle	600*
bogie (type 1)	200
(type 2)	1,325

* Standard type, other wagons unified type.

two-decker car transport wagons	100
Sliding-roof wagons:	
type 2, (two-axle)	240
type 3, (bogie)	410
automatic gravity discharge wagons with sliding roof	345

By types other than those in the table in item (3) of the questionnaire:

18.50 m flat bogie wagons with drop sides:	2,000
Special container wagons with friction-type shock absorbers:	300
Flat bogie wagons for transporting:	
hot rolled coils	50
cold rolled coils, without roof	270
cold rolled coils, with roof	200
Bulk discharge bogie wagons	100
Ore transport bogie wagons	125
Two-axle covered wagons with sliding roof and sides:	
ordinary type	160
train-ferry type	50
Two-axle pneumatic discharge wagons for transport of powdered products:	100
Bogie tank wagons:	105

The Belgian Railways are aware that in principle the use of bogie wagons should be made general and that the type should be considered as the wagon of the future.

During a transitional period, however, which will probably extend to several years, it will be necessary to retain a large number of two-axle wagons in service to cope with demand. All the European railways are faced with the same problem, and study groups have been set up in the UIC to study standardization of two-axle wagons which are suitable for automatic coupling.

In principle, all the RIV wagons in common use should be incorporated in a EUROP wagon fleet in future.

This fleet should also, in a more distant future, include special wagons in fairly general use such as those for transporting containers, coils and motor vehicles, and pneumatic discharge wagons.

3. France

France reports the following intentions concerning future acquisitions of 23,900 new or converted wagons, for which orders have already been placed or are planned, for delivery between 1971 and 1974:

a) 11,700 are on order or will be ordered, of types corresponding to the present standard and unified wagons, made up as follows:

3,400 open bogie wagons
1,600 type 1 flat bogie wagons
5,300 type 2 flat bogie wagons

200 mechanically refrigerated and refrigerator bogie wagons
1,200 automatic gravity discharge wagons with sliding roof.

b) 12,200 wagons of other types are on order or will be ordered, but with standardized Y 25 SNCF bogies, as for the wagons under (a). These 12,200 wagons are either of specialized types or of types in process of being unified by the UIC.

The new or converted SNCF wagons delivered since 1938 and for delivery between now and 1974 are almost all bogie wagons suited for automatic coupling.

When automatic coupling is introduced the SNCF bogie wagons will almost all be mounted on standardized Y 25 bogies or, in a few cases, on bogies of a type derived from the Y 25.

The EUROP wagon fleet should in future be made up entirely of modern wagons:

less than 15 years old;

of common types (covered, open or flat) as well as a large number of specialized types;

of standard, unified or interchangeable construction (wagons already built);

with two axles (existing wagons) and with bogies (existing wagons and those to be built).

4. Italy

The Italian railways intend in principle to bring bogie wagons into general use when automatic coupling is introduced. Approximately 3,000 wagons are at present equipped with the standardized Y 25 bogie.

5. Luxembourg

In Luxembourg, both the numbers and types of equipment which the CFL will acquire in future years will greatly depend on how the EUROP and POOL exchange systems develop.

In principle only standard or unified wagons are being bought.

It is planned to replace 740 two-axle open wagons by 1980. As far as possible these wagons will be replaced by more specialized wagons, preferably bogie wagons. At present the CFL have not decided which type or types should replace these open wagons.

The situation is the same for covered wagons, 300 of which, with two axles, are to be replaced.

Other wagons to be acquired are 100 two-axle flat wagons, 100 two-axle sliding roof wagons, and 50 type Eads bogie hopper wagons with controlled discharge.

In principle the CFL intend to bring these wagons into general use, although operating requirements will make it necessary to retain certain types of two-axle wagons.

The CFL are of the opinion that the RIV scheme should be replaced by the EUROP scheme or a similar one, for all standard or unified wagons, for reasons of international integration and the rational use of equipment.

6. Netherlands

The intentions of the Netherlands railways concerning future wagon acquisitions are as follows:

	1971	1972	1973
Wagons with sliding sides (new type)	62	288	250
Wagons with automatic discharge and roof (modified construction)	50	-	-
Container wagons (new construction)	510	-	-
Four-axle wagons for transport of coils (new construction)	50	-	-

Wagons with standardized Y 25 bogies will not be introduced before 1974. No changes are proposed for the future EUROP wagon fleet.

7. Austria

Austria plans the following acquisitions for future years:

TYPE	NUMBER
High-capacity covered wagons	500
Flat wagons type 1	398 [2]
Flat wagons type 2	250 [1]
Two-decker car transport wagons (car-sleeper trains)	50
Automatic gravity discharge wagons	400
Silo wagons for powdered substances	200
Wagons with sliding roofs and sides	300
Wagons with sliding sides	920

1. Standard type.
2. Unified type.

The last type referred to is still fitted with two axles; all the other types will be fitted with standardized Y 25 bogies.

8. Denmark

No decisions have yet been taken in Denmark concerning future developments in the EUROP fleet or concerning bogies.

9. Spain

The policy of the RENFE concerning future acquisition of wagons is as follows: it is planned to construct standard and unified wagons, as following the adoption of the type Y 21 Cse bogies suitable for changing axles at the frontier, and the conversion, when completed, of vacuum brakes to air brakes, it is felt to be essential to adapt all wagons to international

traffic, and for this reason the whole of the future fleet will be unified according to UIC norms except wagons used for special purposes.

In 1968 the RENFE decided to construct bogie wagons, with some small exceptions.

The RENFE intends to equip all bogie wagons built this year and subsequently with the Y 21 Cse bogie, derived from the standard Y 21 Cse bogie, which will make it possible to expand international traffic by changing axles.

In view of the special Spanish track gauge no opinion can be given on the future EUROP wagon fleet.

10. Great Britain

Three hundred and ninety-three wagons in Great Britain are unified out of a total of 301,000. It is not intended to build standard or unified types of wagons in the immediate future; the new covered and open flat wagons built for internal transport can be converted for international traffic at moderate cost if the need arises.

11. Norway

The orders which Norway intends to place up to 1980 are for:

900 combined open and flat wagons of unified types;

1,000 wagons of other types.

The use of bogie wagons will not be made general. In 1980 the number of these will only be 8% of the total fleet. They will not be fitted with standardized Y 25 bodies.

12. Portugal

A contract was awarded in 1971 for the acquisition for 330 wagons, as follows:

80 ore-carrying wagons;
100 grain-carrying wagons;
120 bogie flat wagons;
30 other wagons.

13. Sweden

Apart from special wagons such as tank wagons, the SJ plan to acquire bogie flat wagons of the SJ type (slightly longer than the unified UIC type because of the dimensions of Swedish timber loads) and two-axle covered wagons with sliding sides, over the next few years.

The two-axle wagons will be retained after the introduction of automatic coupling, and some new two-axle wagons will even be purchased between now and then. Wagons of these types will be supplied, for example, when Swedish customers consider the bogie wagons to be too large.

14. Switzerland

Switzerland reports the following orders placed between 1965 and 1970:

1,800 standard or unified wagons;
2,080 wagons of other types,

of which two-thirds are bogie wagons and one-third two-axle wagons.

15. Turkey

There are 300 two-axle flat wagons of unified types in Turkey suited to the introduction of automatic coupling.

In 1969 a start was made on the building of standard type wagons in the railway workshops. All these wagons will be suitable for automatic coupling.

It is intended to build bogie wagons, to cater for the introduction of automatic coupling, in 1975.

In 1977 the number of wagons fitted with standard Y 25 bogies will be approximately 1,700.

The TCDD has not joined the EUROP wagon pool.

16. Yugoslavia

The intentions of Yugoslavia concerning future acquisitions of rolling stock are connected with the five-year plan and require further study.

Annex 2

EXTRACTS FROM THE MEMBER COUNTRIES' REPORTS ON THE STANDARDIZATION OF PASSENGER COACHES

1. Germany

The requirements of the Deutsche Bundesbahn for the next five years will be of the order of 800 coaches annually. Financial considerations will, however, prevent more than 500 coaches from being acquired each year, and approximately one-third of these will probably be designed as RIC coaches for international traffic. Most of these RIC coaches are expected to resemble the future international coach if this is built as the DB hopes.

2. Belgium

During the next few years the SNCB intends to give priority to renewing its fleet of international coaches and to this end is prepared to acquire 80 standard UIC coaches as a result of the contract awarded by EUROFIMA.

For all its passenger rolling stock on international services, the SNCB intends to base itself on the standard European coach. The modernization of the fleet for internal services will proceed as the work of electrification progresses by the acquisition of self-propelled electric units which will replace the present locomotive-drawn trains.

The SNCB will thus have in 1975 a fleet of approximately 460 two-car units and 32 four-car units. The study begun on modernization of the services in the Brussels area will lay down the type of equipment which should be used for medium-distance trains (regional métro or railcar-type coaches).

The effect of carrying out these programmes will be to modernize the whole of the SNCB fleet.

3. France

Future requirements in France will be between 300 and 350 coaches annually.

4. Italy

In Italy, between 1968 and the date of the present report, orders have been placed for a total of 1,170 passenger coaches mainly corresponding to the present types. The RIC coach fleet of the FS totals some 2,000 coaches; it is not at present planned to modify this stock in the direction of the future international coach.

5. Luxembourg

For internal traffic, Luxembourg does not plan to acquire any new coaches in the next few years, the present stock still being very recent.

For international traffic, studies of the advisability of pooling rolling stock with one of the large neighbouring railways are not yet completed.

6. Netherlands

In the Netherlands the question of the future international coach will be of some importance to the NS in the next few years; the requirements for coaches will be met by participation in the DB fleet.

7. Austria

The following are the developments concerning coaches:

It is planned to acquire a large number of RIC coaches (compartment coaches of the A, AB, B and Bc types).

The question of future composition of the coach fleet is under study.

Concerning future coaches, the intention is to conform to international standardization.

8. Denmark

In Denmark, the international prototypes of new coaches are being studied. The policy of the DSB has not yet been formulated and will depend on the result of the studies.

9. Spain

The intention of the RENFE concerning the coach fleet is not very clear at present, since it will be largely influenced by the future development of passenger traffic. In any case it is planned to increase the number of couchette coaches in our fleet, in view of the fact that the normal use of conventional coaches of this type is necessarily at night and they must be replaced by self-propelled coaches by day.

Concerning future international coaches the RENFE will adopt the same position as in regard to wagons, namely it will do its best to see that future coaches correspond to the UIC standard, with the minimum of changes made necessary by the different track gauge, so that they can be adapted to international traffic. To this end a study is being made on the adoption of a new type of bogie to facilitate changing of axles or bogies at the frontiers, or the use of variable-gauge axles.

10. Great Britain

There are no unified coaches in Great Britain. The total fleet numbers 6,614 coaches, of which 4,491 are compartment coaches and 2,123 non-compartment coaches. Acquisitions planned between now and the end of 1973 will be of the existing standardized type IID coach with corridor connection. From 1974 onwards, the new coaches will be 75 feet long and capable of operating at 200 km./h., and will be operated in multiple-unit Diesel trains. New sleeping cars and restaurant cars of similar length will be built. The possibility of using international coaches will depend on the result of the discussions going on concerning the various types of equipment likely to be used in the traffic through the Channel tunnel.

11. Norway

One hundred and fifty coaches will be acquired by Norway between 1971 and 1980.

These coaches will inter alia have central corridors and will be capable of operating at 130 km./h. Air-conditioning will be fitted in restaurant cars only. It is not intended to take the future international coach into account.

12. Portugal

In Portugal, the following acquisitions of coaches are planned:

28 10-compartment first-class Y type coaches;
20 couchette coaches;
83 non-compartment coaches;
33 second-class compartment coaches.

The future coach fleet will consist of:

a) long-distance compartment coaches;
b) non-compartment coaches for other services.

The future international coach will have to be an air-conditioned compartment coach.

13. Sweden

The coaches of the SJ are rarely entirely compartment or non-compartment coaches, but are usually mixed with, for example, five compartments and two saloons. The question cannot therefore be answered precisely. The SJ trains have more saloon than compartment space, however.

The result of an inquiry now going on will decide whether the SJ should acquire high-speed trains and if so, whether they should be self-propelled or locomotive-hauled.

Since SJ coaches are wider than those of continental railways and because the traffic between Sweden and the continent is very small, the SJ coach fleet consists with a few exceptions of wide coaches designed for operating within the country.

Coaches of the standard UIC type will only be acquired in future for the limited requirements for through coaches to continental destinations. The requirement for such coaches may increase a little if bridges are built to the continent.

14. Switzerland

Swiss acquisitions will be of:

standardized European type coaches for the RIC traffic;

unified coaches and suburban multiple-unit trains for internal traffic.

The fleet of coaches used for international traffic will in future consist of unified or standardized stock with automatic couplings. For the future international coach, the SBB are taking part in the acquisitions made by the EUROFIMA Company.

15. Turkey

The number of coaches to be made by Turkey is 350 from 1973 to 1977, and the coach fleet will be as follows in that year:

100 unified couchette coaches,
200 unified non-couchette coaches,
600 other coaches

900

The TCDD intends to increase the number of coaches used for international transport to 30.

16. Yugoslavia

Yugoslavia regrets that it is impossible for the time being to take the measures which had been envisaged.

Annex 3

EXTRACTS FROM THE MEMBER COUNTRIES' REPORTS ON THE STANDARDIZATION ON DIESEL LOCOMOTIVES

1. Germany

The Deutsche Bundesbahn reports that its Diesel locomotives are adequate in the small and medium-power categories but that it is short of high-powered locomotives. Planning in this matter depends on the progress made in developing engine techniques. Maximum horsepower is at present provided by a 12-cylinder engine developing 2,500 to 3,000 h. p. which can still be mounted on a 4-axle locomotive, and by a 16-cylinder engine developing 3,200 to 3,400 h. p. It is thus possible to build 4-axle locomotives of up to 3,400 h. p. and 6-axle locomotives of up to approximately 6,000 h. p.

Experiments with gas turbines offer some possibility of progress in another direction; it may be possible to use them as a main source of motive power or as an additional source, and vehicles thus equipped have a very high horsepower. The DB is experimenting with gas turbines on Diesel locomotives and railcars, and it has still to be seen whether this system will be satisfactory.

All the DB's Diesel locomotives are fitted with hydraulic transmission. If the trials being made by the BBC/Henschel company on electric transmission using three-phase current are successful, a system of transmission comparable in weight to hydraulic transmission would be available for the first time. The major advantage of this technique will however be for high-powered, high-speed railcars, and it is not at present planned to abandon hydraulic transmission for locomotives of the main fleets, though the three-phase electric transmission system is being followed with interest.

All the newly-built Diesel locomotives have electric train-heating systems using between 360 and 400 kW. Only the relatively old types of Diesel locomotives are still equipped with steam heating plant.

The DB is using gas turbines on Diesel locomotives and railcars. In the first case, they are being used as auxiliary motive power, and in the second as the main power plant. They have not yet been in use long enough for it to be possible to judge whether they are suitable for railway operation without restriction. The DB is following the development of high-powered gas turbines with interest, although this type of motive power is not yet operational.

2. Belgium

The SNCB fleet of main-line locomotives is made up as follows:

	Electric transmission	
	Cockerill-ACEC	GM
1750 h. p.	53	40
1950 h. p.	93	41
1400 h. p.	106	134
	Hydraulic transmission	
	Cockerill-Voith	GM-Voith
1400 h. p.	6	6

- in all, 479 main-line locomotives fitted for double-heading.

This number will tend to diminish in the next few years in view of the plan for electrification over a 10-year period.

A 4000 h. p. Cockerill-ACEC power unit is however being developed, and a number of 4000 h. p. locomotives will probably be brought into service in the next few years.

The main types of shunting locomotives are shown in the following table:

NUMBER	H.P.	TYPE	MAX. SPEED km./h.	OBSERVATIONS
60	240-280	B	45	known as light motor-tractors, being re-equipped with series 71 V1 Gm engines developing 335 h. p.
25	350	C	45	with SEM Diesel engine 1350 rpm (also used on railcars)
120	550	C	50	with 3 types of slow-running Diesel engines - 680 and 950 rpm (ABC, SEM and Cockerill)
68	650	C	60	with Maybach Diesel engine
90 in service 60 on order	650-750	C	60	with 2 types of slow-running Diesel engines (ABC and Cockerill)

The 68 locomotives with Maybach engines are identical to the V60 locomotives of the DB, but were built under licence in Belgium.

The 25 + 120 + 150 other C locomotives (with 3 coupled axles) have or will have the same wheel assemblies and connecting rod bearings.

Only the types B and C engines (650-750 h. p.) will be built in future as the need arises.

There is also a series of locomotives of a comparatively old model with 4 coupled axles, which will finally be replaced by standardized 650-750 h. p. locomotives.

The fleet also comprises prototype locomotives, a few of each of which were built, and which will be re-engined as a suitable occasion arises with standardized engines.

Most of the transmissions are of the Voith hydraulic type.

As a step towards standardization, the main-line locomotives will be fitted with electric transmission and shunting locomotives with hydraulic transmission.

For the light motor-tractors, use will be made of inexpensive transmission systems widely available on the market, while trying to standardize as far as possible.

With a few exceptions, all the main-line Diesel locomotives are fitted with a Vapor-Heating steam generator. There is no reason to change this system, at least in the immediate future.

There are two exceptions to this rule:

i) For international traffic on the non-electrified Maastrich-Liège-Gouvy line, 3000-volt DC electric heating is provided by vans fitted with Diesel alternators and rectifiers. Six similar vans are now being built.

ii) The prototype 4000 h. p. locomotive is also fitted with 3000-volt DC electric heating.

In addition, if electric heating were made necessary by external conditions with existing locomotives, the installed power would have to be increased for some of the fleet.

Theoretically this can be done in either of two ways:

i) by increasing the power of the Diesel engine: replacing a 1400 h. p. engine by a 1750-1950 h. p. engine or a 1750-1950 h. p. engine by a 4000 h. p. engine;

ii) by retaining the existing motive power plant and replacing the steam generator by a gas turbine alternator.

The high-speed lines (120-140 km. /h.) are electrified. Diesel traction is only employed on secondary lines. Gas turbines are not needed under this system.

3. France

Steam traction is to disappear from the SNCF system in 1972; orders for new Diesel locomotives will therefore be limited to the constitution of a reserve fleet. For this purpose it is planned to order a further 30 main-line locomotives in 1972 and possibly the same number in 1973.

The most powerful SNCF locomotive has a 3600 h. p. engine. It is planned to build 92 locomotives of this type; 63 were already delivered by September 1971.

It is not planned to introduce a new series of more powerful locomotives; experimentally, however, one of these locomotives will be fitted with a new engine developing 4200 h. p. in 1972.

All the modern locomotives have three-phase AC/DC electric transmission.

All the modern locomotives supply electric heating to trains, the power being taken from the motive power unit.

The SNCF already has 10 gas turbine trains in commercial operation and 20 others are being built.

The turbo-trains make appreciably better timetables possible on non-electrified main-lines.

It is planned to continue ordering this equipment at a rate of 10 trains per year.

Two turbo-trains of a different design will be carrying out very high speed trials in 1972.

Test-bed trials should also be carried out in 1972 of a high-power turbine developing approximately 6000 h. p.

4. Italy

The following are the plans of the FS concerning Diesel locomotives:

delivery of the 105 locomotives recently ordered and a subsequent order for a further 40 locomotives under a plan covering the next few years;

UIC ratings of 1,500 CV and 1,500 rpm for locomotives of up to 15 tonnes axle weight;

electric transmission in all cases;

electric train heating (maximum power obtained by the Diesel engines used for electric heating: 400 CV) only for high-powered locomotives (2,250 CV UIC at 1,500 rpm).

The FS are at present following, with due caution, the studies being made by Italian firms that are traditional manufacturers of railway equipment, in order to begin work as soon as possible on an experimental vehicle (turbo-train, not permanently coupled, or rail-cars, permanently coupled or otherwise).

5. Austria

The acquisition programme includes branch line and shunting locomotives.

The acquisition of locomotives of 1,500 CV for main-line work and 600 CV for shunting duties is continuing. It is planned to acquire one locomotive of 1,200 CV for shunting purposes.

Hydraulic transmission is used exclusively.

Provision has been made for electric heating of trains and to this end, locomotives are being equipped with 240 kW diesel generators.

There are at present no plans for using gas turbines.

6. Denmark

Twenty new locomotives of the type MZ were ordered in March 1971.

Their power will be raised from 3,300 to 3,900 h. p.

The use of electric transmission is unchanged.

Electric and steam heating are used.

The DSB are at present closely following the experiments carried on by French Railways on gas turbine trains.

7. Spain

The RENFE plans to increase the fleet of Diesel locomotives until steam traction is completely abolished; allowing, however, for the lines which it is planned to electrify, involving a large number of Diesel locomotives, the future increase in the fleet will be a little slower than over the last five years, though it is still planned to acquire 50 main-line Diesel locomotives in order to achieve a total fleet of the order of 760 main-line and shunting Diesel locomotives by 1975.

The present fleet consists of 363 fairly modern main-line Diesel locomotives averaging 2,000 CV, with individual locomotives ranging between 1,370 and 4,000 CV. The Diesel engines of these main-line locomotives vary between 1,370 and 2,170 CV.

The railways are at present taking advantage of the general improvement in Diesel traction to acquire locomotives of a minimum power of 3,300 CV with a single Diesel engine.

Eighty-seven per cent of the main-line Diesel locomotives are of American origin with electric transmission. The more powerful locomotives with two Diesel engines are of German manufacture, with hydraulic transmission.

Until three years ago heating was solely by steam. When electric traction became general, electric heating was introduced at 1,500 or 3,000 volts on the electrified lines, depending on the voltage of these. As the voltage of the lines is to be unified at 3,000 volts, heating on electrified lines will be exclusively at 3,000 volts DC., except for rolling stock equipped for changing of bogies or of variable gauge for crossing the French frontier, which will be equipped to the specifications laid down by the UIC.

Steam heating is used at present on trains hauled by Diesel locomotives. A comprehensive plan is being prepared to convert the present Diesel locomotive fleet so that it till be possible to install 3,000 volt electric heating on all trains hauled by Diesel locomotives.

Newly acquired Diesel locomotives will be fitted with a 3,000-volt generator for heating passenger trains.

In order to increase speeds on Spanish railways by increasing the power-to-weight ratio of trains with internal combustion locomotives, a trial is going on with a prototype consisting of three vehicles equipped with a gas turbine, and if, as is hoped, this gives positive results, future trains will be hauled by gas turbine locomotives replacing Diesel locomotives.

8. Great Britain

The British railways' fleet of Diesel locomotives is at present being reduced, but there are new developments in the sector of locomotives for high-speed passenger trains and heavy freight trains.

The maximum power of Diesel engines is at present 2,750 h.p., and it is proposed to raise this to 3,750 h.p. and 2 x 2,250 h.p.

Electric transmission is general, and the hydraulic transmission units still in use are to be withdrawn shortly.

It is planned to equip all locomotives to provide electric heating either taken from the main power source or supplied by a separate gas turbine generator.

Gas turbines are already in use in the advanced passenger train (APT). The most important use of large gas turbine units is likely to be for high-speed trains insofar as it is possible to test them in a way enabling their overall economic performance to be measured exactly.

9. Norway

All the main lines of the NSB are electrified, Diesel locomotives being used only for shunting, branch lines, and lines with little traffic.

Locomotives meeting these requirements have been acquired and are operating.

Their power varies with the type of engine, from approximately 200 to 600 h. p. for shunting and 1,900 h. p. for branch line work.

Hydraulic transmission is used for shunting locomotives and electric transmission for the others. Special 200 kW. Diesel-electric units are fitted to locomotives to provide train heating.

The use of gas turbines will not be of interest to the NSB in the near future.

10. Portugal

It is planned to acquire 15 Diesel locomotives to expand the fleet in 1973.

The power of Diesel locomotives is to be increased.

There is a tendency to prefer electric transmission.

11. Sweden

Developments during the past three years and those expected during the next ten years may be summarized as follows:

Acquisition of approximately 35 new locomotives and snowploughs.

Purchase of locomotives of various power categories for shunting and freight haulage, partly to replace old locomotives and partly to expand the existing fleet. The timetable for acquisitions may be delayed by financial difficulties.

The total number of locomotives will not increase greatly, as new acquisitions are offset by scrapping.

Automatic control has for some time been an important factor governing acquisitions, and will continue to be so in the future. Other considerations also kept in mind are the need for minimum maintenance, materials to reduce vibration and noise, and good after-sales guarantees.

Older locomotives will be modernized, if possible so as to meet the requirements mentioned above.

The new locomotives will be more efficient than those to be replaced. This means that although the increase in the number of locomotives is small, there will be a much greater increase in the available tractive effort.

In addition, there will in future be only one engine to each locomotive. This will be an engine running at moderate speed and with a moderate compression ratio.

Future shunting locomotives will have hydraulic transmission, usually with hydraulic reversing gear and brakes and an articulated driving shaft.

In general, electric transmission will be preferred for future main-line locomotives with higher power and a larger number of axles.

Existing Diesel-electric locomotives are on the DC-DC system. Five new prototype locomotives are equipped with the AC-DC system. A trial may be made of the AC-AC system after it has been developed further.

Diesel trains are at present rarely heated, and this will still be so in the future. Train heating equipment usually consists of Diesel generators in special vans. These will be modernized very shortly. It will be necessary to acquire more such vans in view of replacement needs and the need to increase efficiency.

There are no precise plans for using gas turbines. Research on high-speed trains has however shown that gas turbines are an alternative to electric and even to Diesel traction.

Even with a requirement for high-efficiency locomotives with a comparatively low axle weight, gas turbines may provide a reasonable alternative.

Equipment must be developed, however, which can run for longer periods between maintenance, and a fully satisfactory solution be found to the noise problem of gas turbines.

12. Switzerland

The question is being studied whether the fleet should be supplemented by the acquisition of approximately 266-axle Diesel locomotives. These locomotives would be of approximately 2,000 CV.

It is intended that they should have electric transmission as is the case for the Diesel locomotives now in service.

As these locomotives are intended for shunting purposes, equipment for train heating is not a consideration.

The CFF have no plans at present for building gas turbine locomotives.

13. Turkey

The following increase in the fleet of locomotives is comprised in the third Five-year Development Plan:

230 main line locomotives	2,400 CV CoCo
60 shunting locomotives	350-360 CV C

Transmission on new locomotives acquired to enlarge the fleet will be electric for main-line locomotives, and hydraulic for shunting locomotives.

Steam heating is at present used for trains hauled by Diesel locomotives. The question of whether to heat trains by equipment on locomotives or by separate heating vans is being studied, to determine which is the more economical solution.

No work has been done by the administration on gas turbine locomotives.

Fourth Report

ON RECENT TRENDS IN ROAD ACCIDENTS

[CM(72)10]

Part I

INTRODUCTION

As directed by the Council of Ministers at its June 1965 Session, a report on recent trends in road accidents in Member countries is compiled every two years.

The three previous reports were submitted in May 1966, June 1968, and March 1970. They covered the period 1955-1964, 1965-1966, and 1967-1968.

The present report is based on a standard questionnaire to which 17 Member countries replied. The Delegate for Belgium was appointed Rapporteur.

The questionnaire was much the same as before in order that existing tables may be brought up to date, and it also included the principal presumed causes of accidents (behavioural causes).

Month-by-month accident figures, seasonally adjusted, together with a list of the road safety measures taken in each country, were the new feature introduced in the previous report.

Corresponding figures have no longer been drawn up as the Report commented that even with seasonal adjustment the index seems to show some considerable variability (presumably due to chance elements such as weather, etc.

The fourth report comprises two chapters:

- Chapter I: Accident trend and casualty breakdown.
- Chapter II: Principal presumed causes of accidents (behavioural causes).

In Chapter II, an attempt is made to outline briefly the line of thinking which emerges from a study of the human factors that have a bearing on the occurrence of road accidents.

It is regrettable that a wider range of information was not available, as this would have undoubtedly provided the basis for closer analysis.

Chapter I

ACCIDENT TREND AND CASUALTY BREAKDOWN

I. 1. GENERAL

The problems involved in comparing statistics from different countries are well familiar but it may be useful to recall the main difficulties encountered in an analysis such as this:

Definition of "persons killed" (road deaths)

The standard definition recommended by the United Nations Economic Commission for Europe (death within 30 days of the accident) is not yet applied in all countries, but with a view to comparison from country to country, the available figures have been adjusted to the standard definition by applying correction factors (see Annex 13).

The correction factors for 1969 and 1970 are as follows:

		Definition of "killed" (road deaths)
Belgium	2	killed on the spot
Portugal	2	killed on the spot or dead before reaching hospital
Spain	1.3	dead within 24 hours of accident
Austria	1.15	dead within 3 days
France	1.09	dead within 6 days
Italy	1.07	dead within 7 days.

Definition of "casualities"

For the purposes of this report, "Casualties" means persons killed plus persons injured.

As there is no precise definition of "persons injured", the interpretation of this term varies widely. Some countries take into account only those seriously injured, others also include those, whose injuries are apparently slight but who reserve the right to make a future claim.

Annex 12 (Numbers of persons killed per 1,000 casualties in 1961 and 1970), highlights this difference of approach. Even when correction factors have been applied, considerable differences still remain, for instance:

United Kingdom	21	killed per 1,000 casualties
Sweden	56	" " " "
Turkey	179	" " " "

The high figures are largely due to a very narrow interpretation of "casualties", as a result of which only seriously injured persons are taken into account. It follows that the differences in the figures are not mainly accounted for by the relative severity of accidents as might be assumed at first sight.

Comparisons from country to country cannot therefore be based on the number of casualties. The effects of accidents can be compared only by reference to the number of persons killed, after adjustment to the standard definition.

Types of vehicles

The classification adopted for vehicles in the questionnaire gave rise to misunderstanding. The item "other vehicles" has not yet been plainly specified, hence the uncertainty of the figures for 4-wheeled road vehicles other than private cars, i.e. coaches, buses, goods vehicles and tractors. Some countries have included agricultural tractors and/or special vehicles under this heading.

On these grounds, it was decided to refrain from taking into account motor vehicles as a whole and to refer to the number of private cars as these, in any event, account for the main bulk of 4-wheeled motor vehicles.

Categories of road users

Some countries do not have all the data needed for a complete breakdown under this heading.

IMPORTANT NOTE

There can be no straightforward and simple comparison between E.C.M.T. countries as they cover too wide a range of geographical, economic and other conditions and as they differ too widely in their respective stages of development.

Overall conclusions for all countries combined necessarily entail the loss of specific information. The tables provide information for each country taken singly. Thus, each country can see how it stands in relation to the others and try to ascertain the reasons for its own performance.

I. 2. CHANGES IN NUMBERS OF CASUALTIES AND NUMBERS OF VEHICLES BETWEEN 1961 AND 1970

Graphs 1, to 17

Table 1: Number of persons killed (road deaths) and casualties and number of private cars in 1970 (index 1961 = 100).

The comparative trends of the number of persons killed and casualties and of the number of vehicles are best shown by graphs. These are just as explicit as lengthy comments.

The graphs shown are on a semi-logarithmetic scale. One advantage of this procedure is that it maintains the relationship between two magnitudes. The origin of the axes is 1961.

In graphs 1 to 17, the trends for previous years are confirmed in 1969 and 1970. There are, however, two exceptions:

- Germany, where the number of persons killed and casualties show a sharp increase in 1970;
- The United Kingdom, where the figures began to rise once more after a substantial fall in 1967 and 1968.

The 1970 curves and indices show that the increase in the number of persons killed fell short of the increase in the number of vehicles in all countries. The fall in the number of killed per thousand vehicles is no consolation for the disquieting growth in the number of killed per thousand inhabitants - a clear token of the risks confronting road users.

Except in Norway and Yugoslavia, the number of persons killed rose slightly more steeply than the number of casualties. Annex 12 underlines this trend.

The respective trends of the index for vehicles and for persons killed are somewhat different:

Example	Killed	Vehicles	
Germany	132	261	"normal" trend
United Kingdom	109	190	highly industrialised countries
France	156	199	disquieting trend
Yugoslavia	306	923	characteristic of developing motorisation (at various stages)
Spain	232	659	
Turkey	206	262	
Portugal	192	275	

In the light of the figures in Table 1, a distinction might be drawn between highly-industrialised countries and countries were industrialisation is recent or expanding with, in the latter case, all the advantages and disadvantages of a high standard of living.

It should be noted that the number of persons killed in the United Kingdom in 1970 was only 9% than in 1961 and is still below the figure for 1964.

In Switzerland and Sweden too, the increase is relatively small (19% and 21% respectively). In Switzerland, however, there is a continuing increase whereas in Sweden the number of persons killed remains constant at the 1965 level.

An outstanding feature of the "expanding" countries (Spain, Portugal, Turkey and Yugoslavia) is the spectacular increase in the number of persons killed. Their figures under this head have doubled or even trebled.

Table 2: Number of persons killed per 100, 000 inhabitants, 100, 000 private cars, 100 million car-km (1970)

Annex 9: Number of km travelled i.e. "mileage" (in million vehicle x km) by category of vehicle.

Annex 10: Links of road network (km) - area in km^2.

Countries can be ranked according to their "safety performance" with eye-catching diagrams but this is rather pointless because of the lack of a criterion which is both true and simple (traffic characteristics and conditions vary too widely from country to country, e.g. density of the road network, urban development along the roadside, etc.).

Notwithstanding these reservations, attention may be drawn to the good scores of the United Kingdom and Sweden on all three counts.

Note

Graphs showing the trend in numbers of each type of vehicle and the corresponding number of casualties could not be produced for inclusion in this report. A supplementary paper will be issued to cover this point.

Annex 1 (Number of motor vehicles by category of vehicle in 1970) (index 1961 = 100) gives only an incomplete picture because a trend cannot be truly illustrated by indices (1961 = 100) unless the variable is a linear function of time. The trend of the number of mopeds and motor cycles is not as straightforward as that of the number of cars, the latter having risen linearly. The index for 1970 in Annex I does however make it possible to compare the situation in 1970 and 1961. It shows that in the highly industrialised countries there were far fewer motor cycles in 1970 than in 1961 (the 1970 indices ranging from 13 to 58).

Table 9 (Number of mopeds and motor cycles per thousand private cars in 1970) (index 1961 = 100) shows the composition of the vehicle fleet from a different angle, and confirms the relative decline in the number of motor cycles and, to a lesser degree, mopeds.

It is still too early to judge the consequences of the new craze for motor-cycles, especially for high-powered models.

I. 3. DISTRIBUTION OF DEATHS AND CASUALTIES BY CATEGORY OF ROAD USER

3.1 When considering the distribution of deaths and casualties by category of road user, due regard must be paid to the composition of the vehicle population. Expert opinion has indeed repeatedly stressed the important bearing of this on the number of casualties, moped and motor cycle drivers being more especially at risk. The decline in the number of such vehicles has had a favourable effect on the total number of casualties (see R.J. Smeed - 9th OTA week - Munich 1968).

See also paragraph I. 2. above.

Annex 2: Number of killed by category of road user 1970 (index 1961 = 100).

Annex 3: Number of casualties by category of road user in 1970 (index 1961 = 100).

Comparison between 1970 and 1961:

- the number of pedestrians killed in 1970 is generally higher than in 1961, but has increased more slowly than the number of cars;
- the increase in the number of pedestrians killed remains below 10% in the United Kingdom and Sweden;
- the number of cyclists and motor cyclists killed from 1961 to 1970 does not follow a uniform trend in all countries;
- the figure for motor cyclists killed is declining in most countries. The exceptions are Portugal, Yugoslavia and Turkey;
- the number of motorists killed is increasing. This increase is of course related to the trend of car ownership (Annex 1).

	Index killed	Index cars
E.g. Netherlands	341	406

Table 3: Percentage of killed by category of road user (1970).

Table 4: Percentage of casualties by category of road user (1970).

Table 5: Severity of accidents by category of road user (1970).

Table 3 is a most useful source of information for each country taken singly. It enables road safety efforts to be directed to specific groups. Each country can see how it stands in relation to the others and try to ascertain the reasons for its own performance. The following is a case in point:

Motor cyclists killed :	United Kingdom	0.8 per cent
	France	17.6 per cent
	Netherlands	17.0 per cent
	Portugal	20.1 per cent.

The most vulnerable categories of road users (pedestrians and drivers of two-wheeled vehicles) account for a very high percentage of road deaths in all countries (from 40 to 60%, and as much as 69% in Portugal). The percentage of pedestrian deaths ranges from 19 to 41% and that for users of two-wheeled vehicles, from 12.9 to 35.8%.

- The breakdown for casualties is not the same as for deaths, as the coefficient of the severity of accidents (base = unity for all road-users combined in each country) varies with the category of road-user. Thus, if a breakdown for casualties alone were taken into account, the "pedestrians" problem would be less striking.
- The coefficient of severity is generally very high for pedestrians; a noteworthy point is the very low coefficient of severity for moped accidents in the Netherlands (coefficient 0.48 - 70% of deaths - 35% of persons injured) which occur in large cities where speeds are very low.

Table 6: Percentages of killed and casualties accounted for by car drivers and passengers (1970).

- The percentage of drivers killed as compared with car passengers killed ranges from 45 to 60% except in Turkey (31%). These percentages depend on the rate of occupancy of cars.

Table 7: Number of killed, for each category, per thousand vehicles in that category in 1970.

This table plainly shows that the death toll for motor cyclists is high in nearly all countries.

The figure for motor cyclists killed is even well above that for moped riders. Several factors may account for this: higher speeds, longer average mileage and a greater proportion of this mileage outside built-up areas.

3.2 Table 8: Number of mopeds, motor-cycles and private cars per thousand inhabitants in 1970.

Table 9: Number of mopeds and motor cycles per thousand private cars in 1970 (index 1961 = 100).

- These figures give some idea of the composition of the motor vehicle population and the degree of motorisation in each country. These must be borne in mind when considering the percentage of deaths and casualties by category of road-user.
- The Netherlands, France and Switzerland have more than 100 two-wheeled vehicles per thousand inhabitants.
- The number of cars per thousand inhabitants, ranging as it does from 35 to 296, brings out clearly the differences in stages of development of the E.C.M.T. countries.
- In the following countries, there are 500 or more two-wheeled vehicles per thousand cars: Austria, France, the Netherlands, Portugal, Switzerland and Yugoslavia.

I. 4. PEDESTRIAN ACCIDENTS

4.1 Table 3: Percentage of killed by category of road-user (1970), already referred to, draws attention to the number of pedestrians killed.

Table 5: Coefficient of severity of accidents by category of road-user (1970) plainly shows the severity of accidents involving pedestrians.

Table 10: (a) Number of pedestrians killed and pedestrian casualties in 1970 (index 1961 = 100).

(b) Number of pedestrians killed per 100, 000 cars (1970).

(c) Number of pedestrians killed per 100, 000 inhabitants (1970).

- The number of pedestrians killed per 100, 000 cars is under 30 in Sweden (13 !), the Netherlands, the United Kingdom and Norway;the rate is particularly high in countries where motorisation is slight, such as Turkey (1, 141 !), Portugal and Yugoslavia.
- The figures in Table 10 (b) and 10 (c) once again show the relative significance of accident rates which cannot be validly compared unless traffic conditions are themselves comparable; it follows that such rates are not a suitable criterion for comparing the "road risk level" from country to country.

4.2 Table 11: Number of pedestrians killed in 1970, by age group, per 100, 000 inhabitants in each group.

Table 12: Number of pedestrian casualties in 1970, by age group, per 100, 000 inhabitants in each group.

In order that the vulnerability of pedestrians by age group may be more easily compared from country to country, these tables have been converted into three other sets of figures as follows:

Table 13: Fatal accident risk (coefficient) to pedestrians by age group (1970).

Table 14: Death or injury accident risk (coefficient) to pedestrians by age group (1970).

Table 15: Severity (coefficient) of accidents involving pedestrians by age group (1970).

It follows from Table 14 that the risk of a pedestrian being involved in an accident reaches its peak in the 6-9 age group, next the age group 65 and over and, thirdly, the 0-5 age group (this ranking of course depends on the age-ranges selected.

However, a different pattern emerges from the table for pedestrians killed (Table 13); here the figure for the age group 65 and over is extremely high.

The vulnerability of elderly people is again highlighted by Table 15 which shows the severity of accidents involving elderly pedestrians.

Annex 4: Population by age group.

Annex 5: Total population and percentage distribution by age group (latest year available).

The differences between groups of countries as regards the percentage of the population aged between 0 and 5 years and 65 years and over, is particularly worthy of note (e.g. Turkey).

Annex 6: Number of pedestrians killed by age group (1970).

Annex 7: Number of pedestrian casualties by age group (1970).

I. 5. DISTRIBUTION OF ACCIDENTS ON A TIME SCALE

Graph 18: Percentage of accidents involving
Annex 11: casualties for each month of the year (1969-1970).

- The number of accidents rises between May and November, with sharp peaks in the Summer in Austria, Spain, Portugal, and Yugoslavia (countries where there is a considerable influx of tourists).
- A noteworthy point is the even distribution of accidents in the United Kingdom throughout the year.

Table 16: Severity (coefficient) of accidents by month (1970).

The coefficient of severity of accidents is usually higher in November and December.

I. 6. PERCENTAGE DISTRIBUTION OF ACCIDENTS ACCORDING TO SITE (Inside or outside built-up areas)

Table 17: (a) Percentage of killed and percentage of casualties in built-up areas as compared with total number of killed and casualties (1969).

(b) Number of killed per thousand casualties inside and outside built-up areas (1970).

(c) Severity (coefficient) of accidents outside built-up areas as compared with accidents inside built-up areas (1970).

- Any comparison would be most difficult because of the wide differences in interpretation of the term "built-up area".
- Table 17 (c) highlights the greater severity of accidents outside built-up areas.

I. 7. ADDITIONAL DATA

Annex 8: Number of fatal accidents and accidents involving casualties (in 1970).

Table 18: (a) Number of killed per fatal accident (1970).

(b) Number of casualties per accident involving casualties (1970).

Chapter II

THE MAIN PRESUMED CAUSES OF ACCIDENTS
(behavioural causes)

II. 1. BACKGROUND OF THE SURVEY

Following an exchange of views at the Committee's 42nd Session [CS/SR(71)12 Project] a draft was submitted by the Luxembourg Delegation in connection with the new programme of work relating to road safety.

It contained practical proposals for study at some future date.

One of the main points was a survey of accident trends during the years 1969 and 1970 with special reference to the following aspects:

(a) which causes of accidents showed a particularly striking increase in the period under review as compared with the corresponding periods in 1967 and 1968?

(b) are any specific factors responsible for the increase in accidents, particularly serious accidents?

Thirteen countries: Germany, Austria, Belgium, Spain, France, Italy, Luxembourg, Norway, the Netherlands, Portugal, Sweden, Switzerland and Yugoslavia, replied to the questionnaire.

Of these, the Netherlands, Sweden and Norway did not give a precise breakdown by cause.

The figures given by Portugal, except those relating to pedestrians, cannot be compared with those for other countries.

As a consequence, the figures for nine countries out of thirteen are taken into account for purposes of analysis.

II. 2. FOREWORD

An accident may be defined as the final stage in a chain of circumstances some of which may be remote.

Only a through-going enquiry can bring these circumstances to light.

It is common knowledge that routine accident reports are generally made by the police officers who put most stress on the offences committed. Hence, there can be no question

of comparing human factors, road factors and technical factors since physical or technical defects leading to accidents are not given due weight.

Nevertheless, it is possible to have a certain degree of confidence in the reliability of the figures submitted where comparisons between a few countries are limited to the human factors in accidents, assuming of course that reports are prepared by police officials capable of assessing the human factors accurately.

Despite their limitations, statistics are therefore useful in as much as they enable preventive action to be concentrated on the human factors.

In any event, the much disputed problem of the causes of accidents is at issue. It is easily conceivable that human factors play a part in nearly all accidents.

It would, however, be absurd to limit preventive action to human factors alone.

If preventive action is to be effective, it must take account of two sets of factors, i.e. the human and the technical (roads and vehicles).

Human and technical factors are inevitably intertwined and any well-structured system of road safety must allow for this.

This line of reasoning ought to be carried a stage further (but this would be beyond the scope of this paper) by showing that an accident consists of three stages: "before", "during" and "after", each of which is matched by a corresponding safety measure: prevention, safeguard and remedy.* **

Let us take a concrete example in which the apparent failure is a human one:

(a) the facts:	an accident takes place at a crossroads - bad visibility;
(b) human error:	failure to give way;
(c) remedy:	redesigning of the crossroads - better visibility;
(d) result:	fewer accidents at this point.

As it is difficult to get somewhere near the exact truth about road accidents, it may well seem a daring enterprise to attempt to quantify the causes of accidents in real figures or percentages and rank them in descending order.

It would be pointless to dwell upon the difficulties of summarising data comprising both similarities and differences, sometimes even with gaps.

However, it is important to stress that the figures must be interpreted with caution and that it would be hazardous to draw hasty conclusions.

As the analysis of the figures is somewhat artificial and as the basic data are not recorded by uniform methods it is advisable to show circumspection.

The percentages shown below for the main presumed causes of accidents (behavioural causes) as reported by the police in the nine countries referred to above (II. 1), must therefore be considered in the light of these specific reservations.

* Haddon W. "A logical framework for categorising highway Safety phenomena and activity - O.T.A. - A.I.C.P.R. - September 1970, Rotterdam".

** Onser Pilot Study - Rationalisation des Choix Budgétaires (Planning, Programming, Budgeting System).

II. 3. PERCENTAGE DISTRIBUTION OF MAIN CAUSES OF ACCIDENTS (behavioural causes - 1970)

	EXCESSIVE SPEED	FAILURE TO GIVE WAY	UNLAWFUL OVERTAKING	DRUNKEN DRIVING	PEDESTRIANS AT FAULT
Germany	18.6	11.4	10.9	15.0	9.2
Austria	-	6.7	6.2	6.9	6.9
Belgium	14.0 + 8.0 (loss of) steering control)	24.0	6.0	5.0	10.0
Spain	20.6	15.4	4.4	35.0 (estimate)	-
France	23.2	16.2	6.2	-	9.4
Italy	14.3	15.4	4.6	0.6(?)	8.0
Luxembourg	32.7	10.0	4.1	6.6	7.8
Portugal					15.0
Switzerland	17.3	19.8	5.7	6.6	-
Yugoslavia	23.0	9.6	8.3	10.4	19.3

In the light of the figures for 1970 submitted by the nine countries referred to above, it seems that the main presumed causes of accidents involving casualties (killed and injured) expressed as a mean percentage (unweighted) may be classified in the following order:

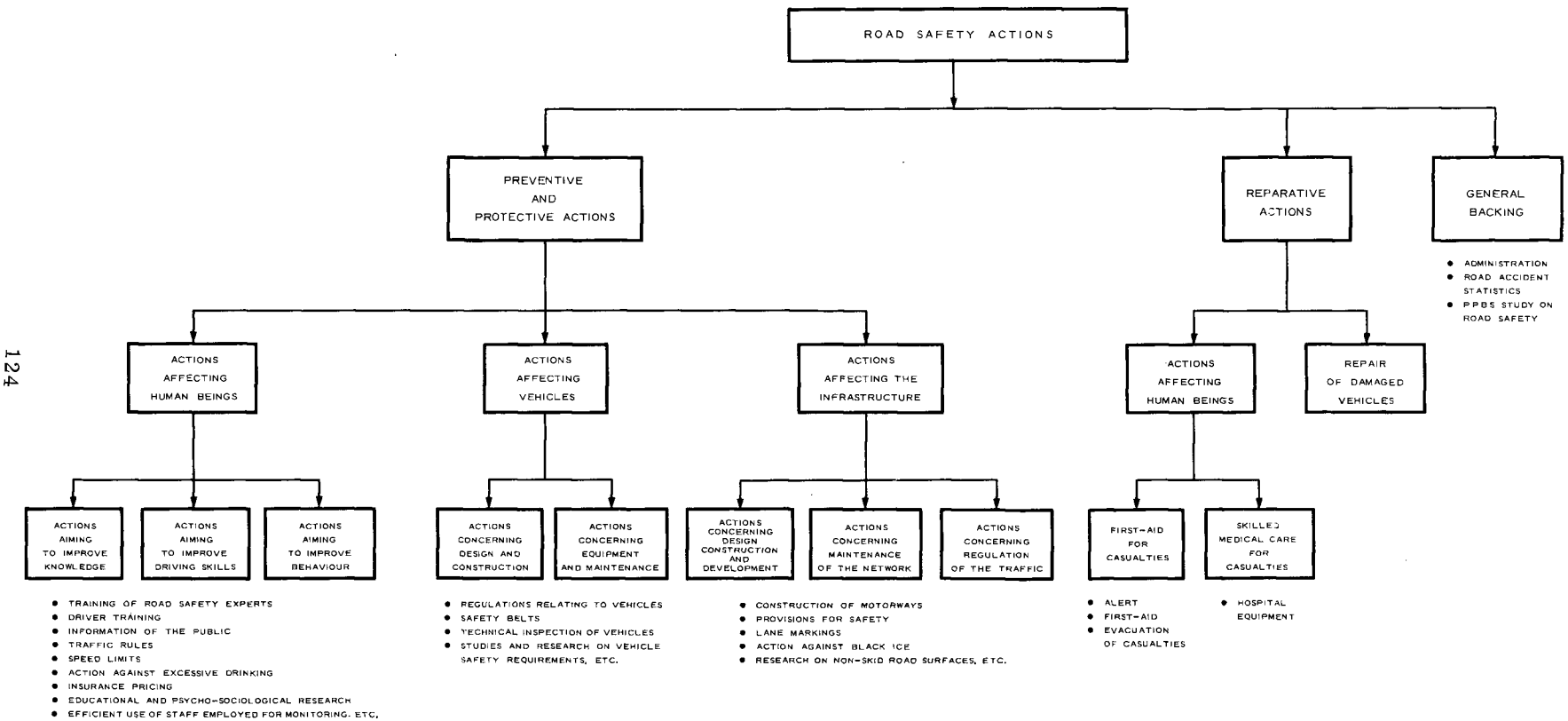
	PERCENTAGE	RANGE OF PERCENTAGE
1. Unsafe speed	21.4	14.0 to 32.7
2. Failure to give way	14.2	6.7 to 24.0
3. Pedestrians at fault	10.7	6.9 to 19.3
4. Drunken driving	8.4	5.0 to 15.0
5. Unlawful overtaking	6.2	4.1 to 10.9

N. B.

During the period 1969 and 1970 Austria deliberately deleted the item "excessive speed" from the report sheet to induce the police to make a fuller investigation of other accident factors. As a result of this constraint the profile of causes was somewhat altered and other factors (such as worn tyres etc.) were highlighted.

This approach is similar to the French line of thinking to the effect that there is too much inclination to put the main stress on excessive speed especially when the police report involves high-powered cars or young drivers - these being notoriously fond of "racing".

ROAD SAFETY PROGRAMME STRUCTURE



In connection with the interesting experiment carried out in Austria it would, however, seem that there was a substantial increase in the number of cases classified under "miscellaneous" during the period referred to.

II. 4. OTHER CONSIDERATIONS BASED ON ANALYSIS OF DATA

4.1 Constant pattern of causes

The figures for Switzerland illustrate the constant distribution of causes.

SWITZERLAND

CAUSES	FATAL ACCIDENTS			ACCIDENTS INVOLVING INJURIES		
	1968	1969	1970	1968	1969	1970
1. Unsafe speed	24.7	24.5	24.2	17.5	17.4	17.3
2. Failure to give way	10.7	10.6	10.2	19.0	19.3	19.8
3. Alcohol - physical incapacity	9.9	9.1	9.9	6.6	6.7	6.6
4. Overtaking	6.1	5.7	6.6	5.8	5.8	5.7

The figures for fatal accidents in 1968, 1969 and 1970 show a very constant pattern in the distribution of causes.

A similar regularity is apparent in the figures for accidents involving bodily injuries.

The following examples for Austria and Luxembourg, confirm this.

AUSTRIA

Main causes of road accidents involving casualties

PRESUMED CAUSES	1969	1970
Failure to give way	7.0%	6.7%
Drunken driving	6.9%	6.9%
Pedestrians at fault	6.7%	6.9%
Nose-to-tail collisions	6.4%	6.6%
Head-on collisions - overtaking - vehicles turning left	5.9%	6.2%

PRESUMED CAUSES	1969	1970
Excessive speed, having regard to surrounding conditions	32.2%	32.7%
Failure to give way	10.0%	10.0%
Infringement of the regulations for overtaking	3.5%	4.1%
Influence of alcohol	6.9%	6.6%
Driving on wrong side	4.6%	5.2%
Worn tyres	5.5%	5.1%

CONCLUSIONS

For valid comparison between two or more countries of the breakdown of the main presumed causes of accidents it is not essential to take the same year for all the countries concerned.

The 1969 figures for a given country may perfectly well be compared with the 1970 figures for another.

For present purposes, the 1970 figures were chosen for all countries as they were the most recent.

4.2 Causes scaled according to their bearing on the severity of the accidents

In the light of the data submitted by the Federal Republic of Germany and Switzerland, the figures (1969) for fatal accidents can be compared with those for accidents involving casualties (killed or injured) as follows:

	GERMANY		SWITZERLAND	
	PERSONS KILLED %	PERSONS KILLED + PERSONS INJURED	PERSONS KILLED %	PERSONS KILLED + PERSONS INJURED
Excessive speed	22.5	18.3	24.5	17.4
Influence of alcohol	14.3	9.5	9.1	6.7
Pedestrians at fault	12.8	9.0		
Refusal to give way			10.6	19.3
Unlawful overtaking	9.8	11.0	5.7	5.8

The importance of certain causes varies with the severity of the accident:

(a) excessive speed, influence of alcohol and "pedestrians at fault" are a more frequent cause (percentagewise) of fatal accidents than of accidents involving non-fatal injuries;

(b) the reverse is true for refusal to give way;

(c) the influence of "unlawful overtaking" is fairly constant.

The foregoing points are borne out by the 1969 figures for Belgium (see Table X).

BELGIUM

(1969)

"FAULTS" PER 100 ACCIDENTS IN EACH CATEGORY

	ACCIDENTS INVOLVING PERSONS KILLED ON THE SPOT *	ACCIDENTS INVOLVING SERIOUS INJURIES *	ACCIDENTS INVOLVING SLIGHT INJURIES *	ACCIDENTS INVOLVING MATERIAL DOMAGE ONLY
1. "Faults" by drivers:	65.4	63.0	76.0	91.1
- unlawful overtaking	6.6	5.8	6.1	10.5
- excessive speed having regard to traffic conditions	17.5	13.2	14.0	16.9
- loss of steering control	11.3	9.3	7.5	7.5
- failure to observe right of way	9.8	16.1	25.1	22.0
- turning left or right without sufficient care	3.4	6.7	10.3	11.0
- driving on wrong side	7.4	4.3	3.4	4.4
- other "wrong practices" by drivers	9.4	7.6	9.6	17.8
2. "Faults" by cyclists and moped riders:	10.3	15.7	11.6	1.5
3. "Faults" by pedestrians:	19.6	15.4	8.3	0.3
4. Other causes (vehicles, road, weather, etc.):	9.8	8.4	6.6	9.3
TOTAL:	105.1	102.5	102.5	102.2
Accidents due to driving under influence of drink (percentages); (additional cause)	9.7	6.0	4.0	2.9

* N.B. "Faults which caused accidents involving, e.g. both persons killed on the spot and persons seriously injured are counted in the column "persons killed".

II. 5. DETAILED ANALYSIS OF SELECTED CAUSES (behavioural causes)

5.1 Excessive speed

	ACCIDENTS INVOLVING CASUALTIES
Germany	18.6%
Austria	...
Belgium	14.0 + 8 (loss of steering control)
Spain	20.6%
France	23.2%
Italy	14.3%
Luxembourg	32.7%
Switzerland	17.3%
Yugoslavia	23.0%

The very high figure for accidents involving a single vehicle outside built-up areas confirms the heavy blame to be put on "excessive speed".

However, the foregoing figures should be interpreted with caution and not as if they were absolutely accurate.

As the police are specially alerted to the problem of speed, they may well be sometimes inclined to put the emphasis on "excessive speed" in their reports when other apparent causes are missing.

CONCLUSION:

The severity of accidents is mainly determined by speed and reaches an appalling degree at speeds of 90-100 km/h.

Speed - an important feature of transport from a commercial angle - enhances the difficulties of the driver's task. It becomes particularly dangerous when no longer suited to situations arising from constantly chancing inter-relationships between driver, vehicle, and road characteristics, traffic conditions and the environment.

Drivers must be persuaded to take a mature-minded attitude to the problem of speed.

The effectiveness of a speed limit largely depends on the ways and means of applying it, how far it extends, its enforcement and its credibility.

5.2 Failure to give way

	ACCIDENTS INVOLVING BODILY INJURIES
Germany	11.4%
Austria	6.7%
Belgium	24.0%
Spain	15.4%
France	16.2%
Italy	15.4%
Luxembourg	10.0%
Switzerland	19.8%
Yugoslavia	9.6%

It must be pointed out that "failure to give way" does not cover the same offences in every country.

In Belgium and Switzerland, it heads the list of causes of accidents.

Should the conclusion to be drawn from this be that Swiss and Belgian drivers lack courtesy or that the system of road signs and signals is inadequate?

It seems that other factors are to be taken into account. In a country such as Belgium, for instance:

- the density of the road network, hence involving very many intersections;
- a high degree of urbanisation along trunk roads;
- population mainly concentrated in urban areas.

All this increases the chances of the rules concerning right of way being broken.

The figures for Belgium help to distinguish the effects of "failure to give way", first, on roads of equal "rank" (priority to the right in built-up areas) and, secondly, on major roads (outside built-up areas) and at intersections with traffic lights:

Accidents involving (percentages)

	PERSONS KILLED ON THE SPOT	SERIOUS INJURIES	SLIGHT INJURIES	MATERIAL DAMAGE
Failure to stop at a red light	1.4	0.9	1.3	0.8
Failure to stop at a "Stop" sign	1.9	2.2	2.1	1.2
Failure to give way at the "inverted triangle" sign	2.9	4.2	5.2	3.6
Total for failure to give way as instructed by a road sign or signal	6.2	7.3	8.6	11.6
Failure to obey the rule of "priority to the right"	1.9	5.5	11.6	11.8

This table shows that failure to obey the rule of priority to the right accounts for only 1.9% of accidents involving death on the spot.

On the other hand, it is a major cause of accidents involving slight injuries or only material damage. This is because it applies mainly to accidents in built-up areas where speeds are limited.

As regards right of way indicated by appropriate road sign, the percentages of accidents due to failure to comply are more evenly distributed over the various categories of accident in the above table.

It need hardly be said that the development of inter-city and urban motorway networks helps to reduce the number of accidents due to failure to give way.

5.3 Faults or offences committed by pedestrians

	ACCIDENTS INVOLVING CASUALTIES
Germany	9.2%
Austria	6.9%
Belgium	10.0%
France	9.4%
Italy	8.0%
Luxembourg	7.8%
Switzerland	...
Yugoslavia	19.3%

Belgium and Yugoslavia have the highest percentages of accidents (10.0 and 19.3% respectively) in which pedestrians are to blame.

As in the case of "failure to give way", several factors help to increase these avoidable accidents involving drivers and pedestrians.

These factors may be summarised as follows:

- numerous intersections - absence of road signs;
- physical impossibility of applying the principle of traffic segregation in old towns;
- inadequate or non-existent road safety education for pedestrians;
- conspicuously undisciplined behaviour in certain countries (including Belgium);
- marked differences in the treatment of pedestrians by the courts;
- the influence of the level of car ownership on the cause under review is somewhat complex. A high level of car ownership does indeed increase the risk of accidents for pedestrians, but a low level of car ownership, though reducing the risk of vehicle collisions, entails an apparent increase in the rate of accidents involving pedestrians and vehicles when figures are calculated on a percentage basis.

It may be of interest to compare the distribution of pedestrian casualties and the distribution of accidents in which pedestrians were at fault.

The figures for Belgium (1969) are as follows:

PER CENT	KILLED ON THE SPOT	SERIOUS INJURIES	SLIGHT INJURIES
Casualties	24.2	16.2	8.7
Accidents where pedestrians were at fault	19.6	15.4	8.3

The truth is that pedestrians account for a high percentage of road casualties, and even more so of fatal casualties, in every country (see Tables in Chapter I).

Some British experts have shown the risks run by pedestrians and their extreme vulnerability compared with other road users (Smeed, 1968 - Bull., 1969).

The results of a recent careful study of pedestrian behaviour in built-up areas in the United Kingdom are illuminating.

They may be summarised as follows:

(i) 66% of accidents involving pedestrian casualties occur at intersections (this figure drops to 50% for the country as a whole);

(ii) 25% of these accidents are due to the fact that the pedestrian was concealed by a stationary vehicle when about to cross the road;

(iii) only 5% of the accidents occurred on a zebra crossing.

CONCLUSION

These few data do nonetheless lead to the conclusion that the education of pedestrians must be continued and intensified.

5.4 Influence of alcohol

	ACCIDENTS INVOLVING BODILY INJURIES
Germany 1/1,000	15.0%
Austria 8/1,000	6.9%
Belgium	5.0%
Spain	35.0% (estimate)
France	...
Italy	0.6%
Luxembourg	6.6%
Switzerland	6.6%
Yugoslavia	19.3%
Average rate : 8.4%	

This average, based on data provided by only eight countries, seems far short of the actual facts.

In principle, it is generally agreed that many road casualties are due to drunken driving. The estimates range from 10 to 40%.

These percentages come from systematic surveys carried out with the help of hospital authorities (United Kingdom: 25% of persons killed on the road have a blood alcohol level exceeding 0.8 per mil.).

Official statistics can never show the true percentage of accidents due to excessive drinking. The reasons are as follows:

In practice, when a serious casualty is taken to hospital, a blood sample is taken only in order to determine the blood group. If the level of blood alcohol is measured at the same time, it is solely because of its relevance to medical treatment. Bound as he is by professional secrecy, the physican never gives the police any information as to whether the patient is drunk or sober.

Again in actual practice, even when the police ask for such information, physicians in some hospitals are clearly reluctant to provide it.

At a recent medical congress in Paris, the debate showed that there was agreement on the proposition that the privacy of the individual must be safeguarded at all costs, even in the case of road accidents.

From a practical angle, besides these purely humanitarian considerations, there may be others that are less so. For example, the casualty may be a "potential patient" who might later complain about the "needless trouble" and the "awkward consequences" he has to put up with.

In short, medical practitioners take their stand on the principle of professional secrecy, which is quite sound and respectable in itself, but this is one of the reasons for believing that accidents caused by drunken driving are not all recorded as such.

Not only are the police especially concerned to ensure that casualties are taken to hospital as quickly as possible, and so refrain from checking their blood alcohol concentration, it must also be borne in mind that administrative red tape badly handicaps the seeking of evidence on accidents attributable to the influence of drink, and this dampens the zeal of the police in identifying this cause.

In most countries, moreover, the law allows a blood alcohol test only if there are evident outward signs of drunkenness; these, of course, vary from one individual to another.

Another point to bear in mind is that casualties in a coma or at a very advanced stage of drunkenness show much the same symtoms.

It is also worthy of note that accidents due to drunken driving are appreciably more frequent at night and at week-ends.

CONCLUSION

The only purpose of the foregoing considerations is to make it clear that the seriousness of the problem of drunken driving might be minimised if judged in the light of the calculated average figure (9.9%) shown above.

5.5 Unlawful overtaking

	ACCIDENTS INVOLVING BODILY INJURIES
Germany	10.9%
Austria	6.2%
Spain	4.4%
Belgium	6.0%
Italy	4.6%
France	6.2%
Luxembourg	4.1%
Switzerland	5.7%
Yugoslavia	8.3%

It might be assumed that this is a more frequent cause of serious accidents, which would explain the relatively low percentages sent in by some countries.

However, such is not the case.

It is usually taken for granted that accidents due to unlawful overtaking are spectacular head-on collisions with fatal consequences in most cases. This is because press reports and pictures of this type of accident are usually rather lurid.

However, a substantial number of accidents attributable to this cause involve only material damage.

In the absence of other specific data, the figures for Belgium may be taken as an instance.

BELGIUM	ACCIDENTS INVOLVING (PERCENTAGES)			
	PERSONS KILLED OUTRIGHT	SERIOUS INJURIES	SLIGHT INJURIES	MATERIAL DAMAGE ONLY
Unlawful overtaking	6.6	5.8	6.1	10.5

It must be pointed out that the number of three-lane roads (where accidents due to unlawful overtaking are prone to occur) is diminishing in many countries.

General remarks

It must be remembered that many accidents are attributable to several interrelated causes.

As pointed out earlier, identification of a single cause has more of a bearing on the question of guilt and only provides a clue, for legal purposes, as to the blame to be put on the author of the accident.

II. 6. ESSENTIAL POINTS TO BE BORNE IN MIND

1. Road safety policy must be based on comprehensive studies and co-ordinated action. It is a continuing task involving a combination of measures of a technical, legal and educational order.

2. Prevention and enforcement campaigns must not necessarily be shaped in the light of the "causes" of accidents but rather with an eye to the positive impact they are likely to have on road safety.

3. No preventive measure for making the roads safer is viable unless it is combined with a substantially stronger surveillance and enforcement backing.

4. Observance of the rules depends on users' willingness to comply with certain standards of road behaviour.

   A good deal remains to be done as regards information and education of pedestrians and drivers of vehicles alike.

5. Not taking into account road and vehicle factors, the experts unanimously agreed that driving at an unsafe speed, having regard to road or traffic conditions, was the principal behavioural cause involved in the occurrence of accidents.

6. The problem of drunken driving is of particularly great importance even though the average figure calculated on the basis of data supplied by Member countries is relatively low. As explained above, this figure is not in line with the facts.

Part II

STATISTICAL TABLES

LIST OF TABLES IN CHAPTER 1

Table 1. NUMBER OF KILLED (ROAD DEATHS), CASUALTIES AND PRIVATE CARS IN 1970 (INDEX 1961 = 100)

(* figures not adjusted to standard definition)

	DEATHS		CASUALTIES		PRIVATE CARS	
	TOTAL (in thousands)	INDICES (1961 = 100)	TOTAL (in thousands)	INDICES (1961 = 100)	TOTAL (in thousands)	INDICES (1961 = 100)
Germany	19, 193	132	551	119	13, 941. 1	261
Austria *	2, 238	156(2)	72. 5	125	1, 196. 6	252
Belgium *	1, 544	144	107. 8	127	2, 059. 6	237
Denmark	1, 208	144	26, 7	119	1, 076. 9	229
Spain *	4, 197	232	90. 7	186	2, 366. 2	659
France *	15, 060	165(2)	337. 7	152	12, 280. 0	199
Greece	-	-	-	-	-	-
Ireland	540	163	9. 8	(1)	389. 3	209
Italy *	10, 208	(?) 115(3)	238. 4	105	10, 209. 0	418
Luxembourg	132	171	2. 5	100	100. 3	197
Norway	560	153	12. 3	171	747. 2	272
Netherlands	3, 181	159	71. 4	137	2, 500. 0	406
Portugal *	1, 417	192	30. 2	169	452. 0	275
United Kingdom	7, 499	109	363. 4	104	11, 515. 0	190
Sweden	1, 307	121	23. 5	98	2, 287. 7	175
Switzerland	1, 649	119	37. 7	100	1, 385. 0	239
Turkey 69	3, 760	206	21. 0	174	137. 3	262
Yugoslavia	3, 684	306	53. 7	336	720. 8	923

Casualties = dead + injured.

1. Ireland - before 1968: seriously injured
   since 1968: seriously injured + slightly injured.
2. Adjusted index.
3. Indices not adjusted despite changed basis for defining "deaths", 1961-1970.

Table 2. NUMBER OF DEATHS PER 100,000 INHABITANTS)
100,000 PRIVATE CARS) 1970
100 MILLIONS CAR-KM)

(* figures adjusted to standard definition)

	100,000 INHABITANTS		100,000 PRIVATE CARS		100 MILLIONS CAR - KM			
Germany	31.4		138		11.1			
Austria *	35.0		215		-			
Belgium *	32.0		150		20.2			
Denmark	24.7		112		6.9			
Spain *	17.3		231		17.4			
France *	32.4		134		13.2			
Greece	-		-		-			
Ireland	18.7		139		7.1			
Italy *	19.8		107		10.0			
Luxembourg	38.9		132		13.2			
Norway	14.5		75		7.1			
Netherlands	24.2		127		7.5			
Portugal *	29.2		616		-			
United Kingdom	13.8		65		4.6			
Sweden	16.3		57		4.8			
Switzerland	26.6		119		-			
Turkey	10.8		2,738		159.2			
Yugoslavia	15.0		511		55.2			

Table 3. PERCENTAGE OF KILLED BY CATEGORY OF ROAD-USER (1970)

(* figures adjusted to standard definition)

	PEDESTRIANS	CYCLISTS	MOPED USERS	MOTOR-CYCLISTS	ALL-TWO-WHEELED VEHICLES	CAR USERS	OTHER VEHICLE USERS	TOTAL
Germany	31.6	9.6	3.6	4.4	17.6	46.8	4.0	100
Austria *	31.7	7.9	11.6	3.1	22.6	39.0	6.7	100
Belgium *	23.4	12.1	8.3	2.0	22.4	49.7	4.5	100
Denmark	27.2	12.6	12.8	3.6	28.0	43.8(a)	←(a)	100
Spain *	29.5	3.3	4.5	8.4	12.9	45.6	8.6	100
France *	21.3	5.3	17.6	2.0	24.9	50.0	3.8	100
Greece	-	-	-	-	-	-	-	-
Ireland	40.6	10.4	9.8(b)	←(b)	20.2	33.0	6.3	100
Italy *	26.0	10.9	10.8	8.6	30.3	37.9	5.8	100
Luxembourg	25.8	6.8(c)	←(c)	3.8	10.6	63.6(a)	←(a)	100
Norway	34.6	7.5	5.2	4.6	17.3	44.3	3.8	100
Netherlands	19.1	16.1	17.0	2.7	35.8	41.6	3.6	100
Portugal *	37.8	8.1	20.1	3.0	31.2	25.5	5.4	100
United Kingdom	39.0	5.0	0.8	9.4	15.2	38.4	7.5	100
Sweden	23.6	10.8	8.3	4.0	23.1	53.3(a)	←(a)	100
Switzerland	31.2	6.9	8.7	10.0	25.6	38.5	4.8	100
Turkey 69	41.7	4.6(d)	←(d)	←(d)	4.6	7.7	46.0	100
Yugoslavia	38.2	10.3(c)	←(c)	7.7	18.0	33.3	10.5	100

(a) Car users + other vehicle users.
(b) Moped users + motor-cyclists.
(c) Cyclists + moped users.
(d) Cyclists + moped users + motor-cyclists.

Table 4. PERCENTAGE OF CASUALTIES BY CATEGORY OF ROAD-USER (1970)

	PEDESTRIANS	CYCLISTS	MOPED USERS	MOTOR-CYCLISTS	ALL TWO-WHEELED VEHICLES	CAR USERS	OTHER VEHICLE USERS	TOTAL
Germany	15.2	7.7	3.7	5.1	16.5	63.7	4.6	100
Austria	15.2	8.0	17.9	3.6	29.5	50.6	4.6	100
Belgium	10.1	10.3	13.6	2.2	26.1	58.4	5.4	100
Denmark	13.6	11.2	14.7	5.0	30.9	55.7(a)	← (a)	100
Spain	21.4	2.1	5.7	10.7	16.4	50.0	10.3	100
France	13.1	4.2	21.8	2.4	28.4	55.0	3.5	100
Greece	-	-	-	-	-	-	-	-
Ireland	21.3	6.2	11.8(b)	← (b)	18.0	53.7	7.1	100
Italy	16.6	5.8	13.4	10.7	29.9	47.8	5.8	100
Luxembourg	13.0	4.4(c)	← (c)	4.4	8.8	78.2(a)	←(a)	100
Norway	21.8	7.0	5.6	8.0	20.6	57.1	0.8(?)	100
Netherlands	11.2	12.2	35.3	2.6	50.1	35.6	3.1	100
Portugal	36.4	6.0	19.0	3.4	28.4	30.4	4.9	100
United Kingdom	23.5	6.4	1.3	12.4	20.1	44.7	11.8	100
Sweden	12.0	8.3	8.1	5.0	21.4	66.8(a)	←(a)	100
Switzerland	18.3	6.8	12.4	10.6	29.8	48.1	3.8	100
Turkey	34.6	4.9(d)	← (d)	← (d)	4.9	13.6	46.8	100
Yugoslavia	24.8	8.6(c)	← (c)	11.2	19.8	45.3	10.0	100

(a) Car users + other vehicle users.
(b) Moped users + motor-cyclists.
(c) Cyclists + moped-users.
(d) Cyclists + moped users + motor-cyclists.

Table 5. SEVERITY OF ACCIDENTS BY CATEGORY OF ROAD-USER (1970)

defined as number of deaths per 1, 000 casualties for each category of road-user divided by number of deaths per 1, 000 victims for all road-users

(coefficient = 1 for all road-users)

	PEDESTRIANS	CYCLISTS	MOPED USERS	MOTOR-CYCLISTS	CAR USERS	OTHER VEHICLE USERS		(1)
Germany	2.08	1.24	0.99	0.87	0.74	0.86		34.8
Austria	2.08	0.98	0.64	0.86	0.77	1.45		30.9
Belgium	2.31	1.17	0.61	0.93	0.85	0.83		14.3
Denmark	2.00	1.13	0.87	0.71	0.79(a)	← (a)		45.2
Spain	1.38	1.63	0.79	0.79	0.91	0.84		46.3
France	1.63	1.27	0.81	0.84	0.91	1.08		44.6
Greece	-	-	-	-	-	-		-
Ireland	1.91	1.68	0.83(b)	← (b)	0.61	0.88		55.1
Italy	1.57	1.90	0.81	0.81	0.79	1.00		42.8
Luxembourg	1.99	1.54(c)	← (c)	0.87	0.81(a)	← (a)		52.8
Norway	1.59	1.08	0.93	0.58	0.78	4.97 (?)		45.5
Netherlands	1.70	1.32	0.48	1.02	1.17	1.16		44.6
Portugal	1.04	1.36	1.06	0.90	0.84	1.10		46.9
United Kingdom	1.67	0.78	0.62	0.76	0.86	0.64		20.6
Sweden	1.96	1.30	1.02	0.82	0.79(a)	← (a)		55.6
Switzerland	1.70	1.01	0.70	0.94	0.80	1.26		43.7
Turkey (69)	1.21	0.93(d)	← (d)	← (d)	0.56	0.98		179.0
Yugoslavia	1.55	1.19(c)	← (c)	0.69	0.73	1.05		68.6

(a) Car users + other vehicle users.
(b) Moped users + motor-cyclists.
(c) Cyclists + moped users.
(d) Cyclists + moped users + motor-cyclists.

1. Number of deaths per 1, 000 casualties for all road-users.

Table 6. PERCENTAGE OF KILLED AND CASUALTIES ACCOUNTED FOR BY DRIVERS AND PASSENGERS (1970)

	DRIVERS							
	KILLED	CASUALTIES						
Germany	59	54						
Austria	52	49						
Belgium	59	52						
Denmark 69	60	53						
Spain	45	42						
France	53	48						
Greece	-	-						
Ireland	48	47						
Italy	57	52						
Luxembourg	57	52						
Norway	54	47						
Netherlands	57	55						
Portugal	-	-						
United Kingdom	56	50						
Sweden	59	53						
Switzerland	54	52						
Turkey 69	31	33						
Yugoslavia	44	41						

Table 7. NUMBER OF KILLED FOR EACH CATEGORY PER 1,000 VEHICLES IN THAT CATEGORY (1970)

(* figures not adjusted to standard definition)

	MOPED USERS		MOTOR-CYCLISTS		CAR USERS		OTHER VEHICLE USERS	
Germany	0.66		1.99		0.64			
Austria *	0.54		0.61		0.73			
Belgium *	0.32		0.90		0.37			
Denmark	0.38		0.98		0.49			
Spain *	0.43		← (a)		0.81			
France *	0.46		1.02		0.61			
Greece	-		-		-			
Ireland	1.29 (a)		← (a)		0.46			
Italy *	0.52		0.74		0.38			
Luxembourg	-		1.32		0.84			
Norway	0.23		0.62		0.33			
Netherlands	0.27		1.31		0.53			
Portugal *	0.94		0.89		0.80			
United Kingdom	0.13		1.16		0.25			
Sweden	0.18		1.28		0.30			
Switzerland	0.27		1.15		0.46			
Turkey 69	-		-		2.10			
Yugoslavia	-		-		1.70			

(a) Moped users and motor-cyclists.

Table 8. NUMBER OF MOPEDS, MOTOR-CYCLES AND PRIVATE CARS PER 1,000 INHABITANTS IN 1970

	MOPEDS		MOTOR-CYCLISTS		MOPEDS AND MOTOR-CYCL.		CARS	
Germany	17.2		7.0		24.3		228	
Austria	65.5		15.3		80.8		162	
Belgium	41.0		3.5		44.5		213	
Denmark	83.0		9.0		92.0		220	
Spain	-		-		40.2		75	
France	114.7		5.9		120.6		243	
Greece	-		-		-		-	
Ireland	-		-		14.2		135	
Italy	38.6		21.5		60.1		185	
Luxembourg	22.1		11.2		33.3		296	
Norway	33.2		10.8		44.0		193	
Netherlands	154.4		5.0		159.4		191	
Portugal	31.2		5.0		36.2		47	
United Kingdom	8.2		11.2		19.4		213	
Sweden	75.0		5.2		80.2		286	
Switzerland	85.1		23.2		108.3		224	
Turkey 69	-		-		1.5		4	
Yugoslavia	-		-		18.0		35	

Table 9. NUMBER OF MOPEDS AND MOTOR-CYCLES PER 1,000 PRIVATE CARS IN 1970 (INDEX 1961 = 100)

	MOPEDS			MOTOR-CYCLES				
	‰	INDICES (1961 = 100)		‰	INDICES (1961 = 100)			
Germany	76	19		31	10			
Austria	404	46		95	15			
Belgium	192	38		17	5			
Denmark	377	48		41	17			
Spain	535 (a)	28 (a)		← (a)	← (a)			
France	472	69		24	19			
Greece	-	-		-	-			
Ireland	105 (a)	43 (a)		← (a)	← (a)			
Italy	209	47		116	10			
Luxembourg	75	29		38	19			
Norway	172	46		56	19			
Netherlands	810	39		26	9			
Portugal	669	-		107	67			
United Kingdom	39	59		53	23			
Sweden	± 262	-		18	17			
Switzerland	380	259		104	24			
Turkey 69	386 (a)	183 (a)		← (a)	← (a)			
Yugoslavia	513 (a)	-		← (a)	-			

(a) Mopeds and motor-cycles.

Table 10. (a) NUMBER OF PEDESTRIANS KILLED AND PEDESTRIAN CASUALTIES IN 1970 (INDEX 1961 = 100)
(b) NUMBER OF PEDESTRIANS KILLED PER 100,000 PRIVATE CARS (1970)
(c) NUMBER OF PEDESTRIANS KILLED PER 100,000 INHABITANTS (1970)

	PEDESTRIANS KILLED		PEDESTRIAN CASUALTIES					
	TOTAL	INDICES (1961 = 100)	TOTAL	INDICES (1961 = 100)		(b)		(c)
Germany	6,056	125	83,505	102		43		9.9
Austria *	710	133	11,054	115		59		9.6
Belgium *	361	129	10,916	104		18		3.7
Denmark	329	138	3,643	107		31		6.7
Spain *	1,238	198	19,381	-		52		3.9
France *	3,211	154	44,294	133		26		6.4
Greece	-	-	-			-		-
Ireland	219	186	2,083	162		56		7.6
Italy *	2,651	119	39,549	96		26		4.8
Luxembourg	34	136	325	105		34		10.0
Norway	194	180	2,682	175		26		5.0
Netherlands	609	129	8,019	104		24		4.6
Portugal *	536	158	10,992	145		119		5.5
United Kingdom	2,925	108	85,370	118		25		5.4
Sweden	308	110	2,823	86		13		3.8
Switzerland	514	121	6,907	101		37		8.3
Turkey	1,567	214	7,269	177		1,141		4.5
Yugoslavia	1,409	388	13,298	344		195		6.9

* Figures not adjusted to standard definition.

Table 11. NUMBER OF PEDESTRIANS KILLED IN 1970, BY AGE GROUP PER 100,000 INHABITANTS IN EACH GROUP

(* figures not adjusted to standard definition)

	0-5 YEARS	6-9 YEARS	10-14 YEARS	15-24 YEARS	25-64 YEARS	65 YEARS AND OVER		ALL AGES
Germany	9.2	13.5	5.0	4.6	6.1	31.6		9.9
Austria *	8.0	10.0	3.5	4.1	6.7	28.5		9.6
Belgium *	3.7	4.1	1.7	1.7	2.9	9.7		3.7
Denmark 69	8.7	8.6	6.0	2.8	3.2	24.0		6.7
Spain *	3.2 (0-14)	←	←	1.5	3.3	14.2		3.9
France *	3.2	8.0	2.7	2.4	5.7	16.8		6.4
Greece	-	-	-	-	-	-		-
Ireland	6.3 (0-4)	7.7 (5-9)	3.2	4,3	5.9	23.5		7.6
Italy *	3.0	3.3 (6-14)	←	1.5	3.1	16.4		4.8
Luxembourg	→	14.3 (0-14)	←	0.0	5.7	27.3		10.0
Norway	8.1	9.4	2.9	1.6	2.4	15.3		5.0
Netherlands	8.1	6.2	2.5	2.0	2.4	16.1		4.6
Portugal *	6.4 (0-9)	←	3.7	2.7	4.6	9.5		5.5
United Kingdom	5.2	5.7	3.2	3.0	3.0	18.3		5.4
Sweden	4.0 (0-6)	3.2 (7-14)	←	2.1	2.2	12.4		3.8
Switzerland	11.8 (0-9)	-	1.9	2.0	4.4	32.5		8.3
Turkey 69	3.8	8.4	3.3	2.5	3.6	10.4		4.5
Yugoslavia	3.8 (0-4)	5.5 (5-14)	←	3.5	6.5	20.5		6.9

Table 12. NUMBER OF PEDESTRIAN CASUALTIES IN 1970
BY AGE GROUPS PER 100,000 INHABITANTS IN EACH GROUP

	0 - 5 YEARS	6 - 9 YEARS	10 - 14 YEARS	15 - 24 YEARS	25 - 64 YEARS	65 YEARS AND OVER		ALL AGES
Germany	178	442	171	113	81	171		136
Austria	151	337	143	115	104	243		150
Belgium	127	244	123	98	74	162		113
Denmark 69	114	168	109	46	45	152		77
Spain	→	68 (0-14)	←	57	47	129		62
France	59	227	82	70	68	132		88
Greece	-	-	-	-	-	-		-
Ireland	78 (0-4)	158 (5-9)	82	65	48	77		72
Italy	54	96 (6-14)	←	60	53	102		72
Luxembourg	→	186 (0-14)	←	156	49	111		96
Norway	114	165	83	49	38	100		69
Netherlands	112	172	60	38	31	98		61
Portugal	112 (0-9)	←	115	102	90	234		122
United Kingdom	239	441	277	144	86	167		158
Sweden	44 (0-6)	48 (7-14)	←	29	25	62		35
Switzerland	229 (0-9)	←	92	67	71	192		112
Turkey 69	15	38	20	17	16	33		21
Yugoslavia	30 (0-4)	77 (5-14)	←	60	59	100		65

Table 13. FATAL ACCIDENT RISK (COEFFICIENT) TO PEDESTRIANS BY AGE GROUP (1970)

defined as the number of pedestrians killed, by age group, per 100, 000 inhabitants of that group, divided by the number of pedestrians of all age groups killed per 100, 000 inhabitants

(Coefficient = 1 for all users (all ages)

	0-5 YEARS	6-9 YEARS	10-14 YEARS	15-24 YEARS	25-64 YEARS	65 YEARS AND OVER		(1)
Germany	0.93	1.36	0.51	0.46	0.62	3.19		9.9
Austria	0.83	1.04	0.36	0.43	0.70	2.97		9.6 *
Belgium	1.00	1.10	0.46	0.46	0.78	2.62		3.7 *
Denmark	1.30	1.28	0.90	0.42	0.48	3.58		6.7
Spain	→	0.82 (0-14)	←	0.38	0.85	3.64		3.9 *
France	0.50	1.25	0.42	0.38	0.89	2.63		6.4 *
Greece	-	-	-	-	-	-		-
Ireland	0.83 (0-4)	1.01 (5-9)	0.42	0.57	0.78	3.09		7.6
Italy	0.63	0.69 (6-14)	←	0.31	0.65	3.42		4.8 *
Luxembourg	→	1.43	←	0.00	0.57	2.73		10.0
Norway	1.62	1.88	0.58	0.32	0.48	3.06		5.0
Netherlands	1.76	1.35	0.54	0.43	0.52	3.50		4.6 *
Portugal	1.16 (0-9)	←	0.67	0.49	0.84	1.73		5.5
United Kingdom	0.96	1.06	0.59	0.56	0.56	3.39		5.4
Sweden	1.05 (0-6)	0.84 (7-14)	←	0.55	0.58	3.26		3.8
Switzerland	1.42 (0-9)	←	0.23	0.24	0.53	3.92		8.3
Turkey	0.84	1.87	0.73	0.56	0.80	2.31		4.5
Yugoslavia	0.55 (0-4)	0.79 (5-14)	←	0.51	0.94	2.97		6.9

* Figures not adjusted to standard definition.

1. Number of pedestrians killed, all ages, per 100, 000 inhabitants.

Table 14. DEATH OR INJURY ACCIDENT RISK (COEFFICIENT) TO PEDESTRIANS BY AGE GROUP (1970)

defined as the number of pedestrian casualties for each age group per 100, 000 inhabitants in each group divided by the number of pedestrian casualties of all ages per 100, 000 inhabitants

Coefficient = 1 for all users (all ages)

	0 - 5 YEARS	6 - 9 YEARS	10 - 14 YEARS	15 - 24 YEARS	25 - 64 YEARS	65 YEARS AND OVER		(1)
Germany	1.3	3.2	1.2	0.8	0.6	1.2		136
Austria	1.0	3.0	1.0	0.8	0.7	1.6		150
Belgium	1.1	2.2	1.1	0.9	0.7	1.4		113
Denmark 69	1.5	2.2	1.4	0.6	0.6	2.0		77
Spain	→	1.1 (0-14)	←	0.9	0.8	2.1		62
France	0.7	2.6	0.9	0.8	0.8	1.5		88
Greece	-	-	-	-	-	-		-
Ireland	1.1 (0-4)	2.2 (5-9)	1.1	0.9	0.7	1.1		72
Italy	0.8	1.3 (6-14)	←	0.8	0.7	1.4		72
Luxembourg	→	1.9 (0-14)	←	1.6	0.5	1.2		96
Norway	1.7	2.4	1.2	0.7	0.6	1.4		69
Netherlands	1.8	2.8	1.0	0.6	0.5	1.6		61
Portugal	0.9 (0-9)	←	0.9	0.8	0.7	1.9		122
United Kingdom	1.5	2.8	1.8	0.9	0.5	1.1		158
Sweden	1.3 (0-6)	1.4 (7-14)	←	0.8	0.7	1.8		35
Switzerland	2.0 (0-9)	←	0.8	0.6	0.6	1.7		112
Turkey 69	0.7	1.8	1.0	0.8	0.8	1.6		21
Yugoslavia	0.5 (0-4)	1.2 (5-14)	←	0.9	0.9	1.5		65

1. Number of pedestrian casualties, all ages, per 100, 000 inhabitants.

Table 15. SEVERITY (COEFFICIENT) OF ACCIDENTS INVOLVING PEDESTRIANS, BY AGE GROUP (1970)

defined as the number of pedestrians killed per 1, 000 pedestrian casualties, for each age group, divided by the number of pedestrians killed per 1, 000 pedestrian casualties all ages

(Coefficient = 1 for all pedestrians)

	0 - 5 YEARS	6 - 9 YEARS	10 - 14 YEARS	15 - 24 YEARS	25 64 YEARS	65 YEARS AND OVER		(1)
Germany	0.71	0.42	0.40	0.56	1.03	2.54		72.5
Austria	0.83	0.46	0.38	0.56	1.00	1.83		64.3*
Belgium	0.88	0.51	0.42	0.51	1.20	1.81		33.1*
Denmark	0.88	0.58	0.63	0.69	0.82	1.82		87.1
Spain	1.13 (0-4)	0.61 (5-14)	←	0.41	1.09	1.71		63.9*
France	0.76	0.53	0.46	0.48	1.16	1.76		72.5*
Greece	-	-	-	-	-	-		-
Ireland	0.78 (0-4)	0.46 (5-9)	0.36	0.63	1.18	2.89		105.1
Italy	0.81	0.52 (6-14)	←	0.38	0.88	2.39		67.0*
Luxembourg	→	0.74 (0-14)	←	0.00	1.12	2.34		104.6
Norway	0.98	0.79	0.49	0.45	0.89	2.11		72.3
Netherlands	0.96	0.48	0.55	0.71	1.01	2.16		75.9
Portugal	1.25 (0-9)	←	0.71	0.59	1.11	0.89		45.5*
United Kingdom	0.64	0.38	0.34	0.60	1.03	3.19		34.3
Sweden	0.83 (0-6)	0.60 (7-14)	←	0.66	0.79	1.83		109.1
Switzerland	0.69 (0-9)	←	0.28	0.39	0.83	2.28		74.4
Turkey 69	1.18	1.03	0.77	0.67	1.02	1.46		215.6
Yugoslavia	1.19 (0-4)	0.67 (5-14)	←	0.54	1.04	1.94		106.0

* Figures not adjusted to standard definition.

1. Number of pedestrians killed per 1, 000 pedestrian casualties (all ages).

Table 16. SEVERITY (COEFFICIENT) OF ACCIDENTS BY MONTH (1970)

defined as the number of fatal accidents per 1, 000 accidents involving casualties for each month divided by the number of fatal accidents per 1, 000 accidents for the whole year 1970

Coefficient = 1 for the whole year

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.		(1)
Germany	0.95	0.94	0.90	0.92	0.94	0.92	0.94	1.05	1.01	1.06	1.18	1.11		46.3
Austria	1.07	0.93	0.88	0.90	0.94	0.79	0.95	0.92	1.22	1.07	1.25	1.12		39.7*
Belgium	1.03	0.94	1.03	0.79	1.07	0.96	1.01	1.04	0.84	0.85	1.32	1.09		18.2*
Denmark	-	-	-	-	-	-	-	-	-	-	-	-		53.8
Spain (a)	1.06	0.98	1.00	0.85	0.88	1.01	0.93	0.94	1.05	0.99	1.07	1.26		96.4*
France	1.09	0.97	0.97	0.84	0.87	0.90	1.07	1.09	0.95	1.03	1.11	1.10		58.8*
Greece	-	-	-	-	-	-	-	-	-	-	-	-		
Ireland	1.02	0.82	0.80	0.71	1.08	0.73	0.88	1.13	1.18	1.23	1.18	1.08		78.5
Italy	1.01	1.06	0.95	0.93	0.94	0.87	0.99	1.05	0.99	1.06	1.05	1.11		54.2*
Luxembourg	0.75	0.73	0.55	0.90	0.77	0.71	1.16	1.36	1.20	1.17	1.13	1.32		71.6
Norway	1.02	0.94	0.68	0.95	0.98	1.14	0.66	0.96	0.92	1.20	1.22	1.25		55.3
Netherlands	1.25	0.98	1.28	1.00	0.97	0.88	1.03	0.94	0.85	0.97	1.17	1.06		48.9
Portugal	-	-	-	-	-	-	-	-	-	-	-	-		57.8*
United Kingdom	1.10	1.01	0.92	0.90	0.89	0.87	0.97	1.02	0.93	1.07	1.13	1.14		25.7
Sweden	0.92	1.03	0.84	0.90	0.97	0.85	0.96	0.90	0.89	1.13	1.28	1.33		69.6
Switzerland	1.09	0.72	0.87	0.93	0.93	0.86	1.05	1.08	1.03	0.95	1.19	1.26		53.3
Turkey 69	0.82	0.82	0.87	0.86	0.92	1.01	1.05	1.06	1.13	1.12	1.04	1.07		244.5
Yugoslavia	0.89	0.85	1.01	0.92	0.88	0.86	0.97	1.00	1.15	1.09	1.13	1.12		91.1

(a) For accidents outside built-up areas.

* Figures not adjusted to standard definition.

1. Number of fatal accidents per 1, 000 accidents involving casualties.

Table 17. (a) PERCENTAGE OF KILLED AND PERCENTAGE OF CASUALTIES IN BUILT-UP AREAS AS A RATIO OF THE TOTAL NUMBER OF KILLED AND CASUALTIES (1969)
(b) NUMBER OF DEATHS PER 1,000 CASUALTIES INSIDE AND OUTSIDE BUILT-UP AREAS (1970)
(c) SEVERITY (COEFFICIENT) OF ACCIDENTS OUTSIDE BUILT-UP AREAS COMPARED WITH ACCIDENTS INSIDE BUILT-UP AREAS (1970) (1)

	(a) KILLED	(a) CASUALTIES		(b) IN BUILT-UP AREAS	(b) NON BUILT-UP AREAS		(c)	
Germany	43.5%	61.6%		24	50		2.1	
Austria *	34.9	55.1		19	43		2.3	
Belgium *	37.2	58.3		9	21		2.3	
Denmark	42.4	58.5		32	60		1.9	
Spain *	20.7	42.7		23	65		2.8	
France *	37.2	59.5		28	70		2.5	
Greece	-	-		-	-		-	
Ireland	32.3	40.8		36	53		1.5	
Italy *	36.1	65.0		23	75		3.3	
Luxembourg	41.6	59.6		34	70		2.1	
Norway	24.6	43.7		24	56		2.3	
Netherlands	41.0	67.4		26	79		3.0	
Portugal *	-	-		-	-		-	
United Kingdom	56.4	72.6		16	33		2.1	
Sweden	33.9	49.9		35	69		2.0	
Switzerland	41.4	60.9		29	65		2.2	
Turkey	37.6	49.3		137	220	(69)	1.6	
Yugoslavia	52.1	62.4		55	84		1.5	

1. Defined as the $\frac{\text{number of deaths per 1,000 casualties outside built-up areas}}{\text{divided by the number of deaths per 1,000 casualties within built-up areas.}}$

Table 18. (a) NUMBER OF KILLED PER FATAL ACCIDENT (1970)
(b) NUMBER OF CASUALTIES PER ACCIDENT INVOLVING CASUALTIES (1970)

(* figures not adjusted to standard definition)

	(a)		(b)					
Germany	1.10		1.46					
Austria *	1.09		1.40					
Belgium *	1.10		1.40					
Denmark 69	1.10		1.30					
Spain *	1.16		1.56					
France *	1.12		1.48					
Greece	-		-					
Ireland	1.07		1.53					
Italy *	1.09		1.38					
Luxembourg	1.15		1.56					
Norway	1.09		1.33					
Netherlands	1.10		1.21					
Portugal *	1.08		1.33					
United Kingdom	1.09		1.36					
Sweden	1.13		1.41					
Switzerland	1.08		1.32					
Turkey 69	1.23		1.68					
Yugoslavia	1.12		1.49					

Part III

ANNEXES

LIST OF ANNEXES TO CHAPTER 1

Annex 1. NUMBER OF MOTOR-VEHICLES BY TYPE OF VEHICULE IN 1970 (INDEX 1961 = 100)

	MOPEDS		MOTOR-CYCLES		CARS			
	TOTAL (in thousands)	INDICE (1961 = 100)	TOTAL (in thousands)	INDICE (1961 = 100)	TOTAL (in thousands)	INDICE (1961 = 100)		
Germany	1,054.2	50	428.6	25	13,941.1	261		
Austria	482.9	116	113.1	39	1,196.6	252		
Belgium	397.0	91	34.3	13	2,059.6	237		
Denmark	406.0	110	43.9	39	1,076.9	229		
Spain	1,265.2(a)	187(a)	← (a)	← (a)	2,366.2	659		
France	5,800.0	138	300.0	37	12,280.0	199		
Greece	-	-	-	-	-	-		
Ireland	41.0(a)	90(a)	← (a)	← (a)	389.3	209		
Italy	2,133.8	197	1,187.8	40	10,209.0	418		
Luxembourg	7.5	58	3.8	37	100.3	197		
Norway	128.3	125	41.8	53	747.2	272		
Netherlands	2,025.0	159	65.0	38	2,500.0	406		
Portugal	302.6	-	48.5	184	452.0	275		
United Kingdom	444.0	112	605.0	43	11,515.0	190		
Sweden	600.0	-	41.3	29	2,287.7	175		
Switzerland	526.5	619	143.8	58	1,385.0	239		
Turkey 69	53.0(a)	480(a)	← (a)	← (a)	137.3	262		
Yugoslavia	369.5(a)	-	← (a)	-	720.8	923		

(a) Mopeds and motor-cycles.

Annex 2. NUMBER KILLED, BY USER CATEGORY, IN 1970 (INDEX 1961 = 100) Part 1

(* without correction factor)

	PEDESTRIANS		CYCLISTS		MOPEDS		MOTOR-CYCLISTS	
	TOTAL	INDICES (1961 = 100)	TOTAL	INDICES (1961 = 100)	TOTAL	INDICES (1961 = 100)	TOTAL	INDICES (1961 = 100)
Germany	6,056	125	1,835	118	700	58	853	42
Austria * (1)	710	133	176	136	259	140	69	23
Belgium *	361	129	187	136	128	125	31	20
Denmark	329	138	152	99	155	115	43	43
Spain *	1,238	138	140	-	189	-	353	-
France * (1)	3,211	154	797	88	2,645	140	307	40
Greece	-	-	-	-	-	-	-	-
Ireland	219	186	56	81	53(b)	120(b)	←(b)	←(b)
Italy * (1)	2,651	119	1,115	96	1,106	223	878	32
Luxembourg	34	136	9(c)	113(c)			5	38
Norway	194	180	42	78	29	56(b)	26	←(b)
Netherlands	609	129	512	131	540	123	85	41
Portugal *	536	158	115	122	285	348	43	148
United Kingdom	2,925	108	373	58	59	57	702	49
Sweden	308	110	141	84	108	78	53	83
Switzerland	514	121	113	48	143	168	165	77
Turkey 69	1,567	214	173(d)	288(d)	←(d)	←(d)	←(d)	←(d)
Yugoslavia	1,409	388	380(c)	195(c)	←(c)	←(c)	284	182

1. Indices not adjusted despite changed definition of "killed" during the period 1961 - 1970.

(a) Users of cars + other vehicles.

(b) Moped users + motor-cyclists.

(c) Cyclists + moped users.

(d) Cyclists + moped users + motor-cyclists.

Annex 2. NUMBER KILLED, BY USER CATEGORY, IN 1970 (INDEX 1961 = 100) Part 2

(* without correction factor)

	CAR USERS		DRIVERS OF OTHER VEHICLES		ALL ROAD-USERS			
	TOTAL	INDICES (1961 = 100)	TOTAL	INDICES (1961 = 100)	TOTAL	INDICES (1961 = 100)		
Germany	8, 989	216	760	103	19, 193	132		
Austria *	874	236	150	122	2, 238	136		
Belgium *	768	235	69	97	1, 544	144		
Denmark	529(a)	247(a)	← (a)	← (a)	1, 208	144		
Spain *	1, 915	-	362	-	4, 197	232		
France *	7, 528	250	572	130	15, 060	165		
Greece	-	-	-	-	-	-		
Ireland	178	210(a)	34	← (a)	540	163		
Italy *	3, 864	214	594	118	10, 208	115		
Luxembourg	84 (a)	271(a)	← (a)	← (a)	132	171		
Norway	248	256(a)	21	← (a)	560	153		
Netherlands	1, 322	341	113	113	3, 181	159		
Portugal *	361	293	77	108	1, 417	192		
United Kingdom	2, 877	186	563	124	7, 499	109		
Sweden	697 (a)	162 (a)	← (a)	← (a)	1, 307	121		
Switzerland	635	190	79	89	1, 649	119		
Turkey 69	289	190 (a)	1, 731	← (a)	3, 760	206		
Yugoslavia	1, 225	290	386	576	3, 684	306		

(a) Users of cars and other vehicles.

Annex 3. NUMBER OF CASUALTIES BY USER CATEGORY (1970) (INDEX 1961 = 100) Part 1

	PEDESTRIANS	INDEX		CYCLISTS	INDEX		MOPED USERS	INDEX
Germany	83, 505	1.02		42, 366	0.80		20, 432	0.35
Austria	11, 054	1.15		5, 797	1.00		12, 989	1.09
Belgium	10, 916	1.04		11, 148	0.91		14, 607	0.96
Denmark	3, 643	1.07		2, 978	0.67		3, 921	1.17
Spain	19, 381	-		1, 859	-		5, 142	-
France	44, 294	1.33		14, 020	0.78		73, 530	1.37
Greece	-	-		-	-		-	-
Ireland	2, 083	1.62		604	0.62		1, 161(b)	1.43 (b)
Italy	39, 549	0.96		13, 712	0.62		31, 800	2.47
Luxembourg	325	1.05		111(c)	0.64 (c)		← (c)	← (c)
Norway	2, 682	1.75		855	1.07		687	0.95 (b)
Netherlands	8, 019	1.04		8, 717	0.78		25, 226	1.46
Portugal	10, 992	1.45		1, 800	0.89		5, 741	2.49
United Kingdom	85, 370	1.18		23, 106	0.52		4, 660	0.79
Sweden	2, 823	0.86		1, 953	0.86		1, 904	0.68
Switzerland	6, 907	1.01		2, 550	0.38		4, 657	1.82
Turkey 69	7, 269	1.77		1, 035(d)	1.89 (d)		← (d)	← (d)
Yugoslavia	13, 298	3.44		4, 642(c)	1.68 (c)		← (c)	← (c)

(a) Car users + users of other vehicles.
(b) Moped users + motor-cyclists.
(c) Cyclists + moped users.
(d) Cyclists + moped users + motor-cyclists.

Annex 3. NUMBER OF CASUALTIES BY USER CATEGORY (1970) (INDEX 1961 = 100) Part 2

	MOTOR-CYCLISTS	INDEX		CAR USERS	INDEX		OTHER ROAD USERS	INDEX
Germany	28, 104	0.37		351, 266	2.07		25, 315	1.01
Austria	2, 590	0.21		36, 688	2.37		3, 357	1.08
Belgium	2, 323	0.16		62, 919	2.32		5, 864	1.18
Denmark	1, 331	0.31		14, 859(a)	2.11 (a)		← (a)	← (a)
Spain	9, 680	-		45, 281	-		9, 309	-
France	8, 207	0.30		185, 773	2.37		11, 839	1.07
Greece	-	-		-	-		-	-
Ireland	← (b)	← (b)		5, 261	2.54 (a)		700	← (a)
Italy	25, 428	0.29		113, 988	2.41		13, 907	0.87
Luxembourg	109	0.24		1, 954 (a)	1.23 (a)		← (a)	← (a)
Norway	981	← (b)		7, 022	2, 30 (a)		93	← (a)
Netherlands	1, 869	0.31		25, 394	3, 35		2, 181	0.92
Portugal	1, 019	0.88		9, 184	2.95		1, 487	0.84
United Kingdom	44, 987	0.50		162, 540	1.49 (a)		42, 705	← (a) -
Sweden	1, 168	0.58		15, 689 (a)	1.15 (a)		← (a)	← (a)
Switzerland	4, 002	0.52		18, 121	1.46		1, 438	0.97
Turkey 69	← (d)	← (d)		2, 856	1.69 (a)		9, 833	← (a)
Yugoslavia	6, 018	1.83		24, 328	4.31		5, 365	11.41

(a) Car users + users of other vehicles.
(b) Moped users + motor-cyclists.
(c) Cyclists + moped users.
(d) Cyclists + moped users + motor-cyclists.

Annex 4. POPULATION BY AGE GROUP

	DATE	0 - 5 YEARS	6 - 9 YEARS	10 - 14 YEARS	15 - 24 YEARS	25 - 64 YEARS	65 YEARS AND OVER	TOTAL
Germany	31/12/1970	5, 910, 000	3, 962, 000	4, 328, 000	7, 819, 000	31, 237, 000	7, 939, 000	61, 195, 000
Austria *	31/12/1969	750, 501	499, 483	545, 877	967, 204	3, 575, 733	1, 034, 060	7, 372, 858
Belgium *	31/12/1969	889, 564	627, 719	765, 633	1, 434, 885	4, 653, 417	1, 288, 936	9, 660, 154
Denmark	...../1969	481, 996	301, 643	368, 182	795, 330	2, 352, 961	590, 575	4, 890, 687
Spain *	...../1969	2, 969, 000	2, 699, 000	2, 679, 000	4, 702, 000	15, 910, 000	2, 505, 000	31, 464, 000
France *	...../1970	5, 046, 200	3, 663, 800	4, 138, 900	8, 285, 900	23, 220, 900	6, 489, 700	50, 545, 400
Greece	-	-	-	-	-	-	-	-
Ireland	1966	315, 931 (0-4)	298, 990 (5-9)	285, 475	444, 645	1, 215, 954	323, 007	2, 884, 002
Italy *	31/12/1970	5, 724, 245	3, 814, 379	4, 187, 117	8, 112, 958	27, 571, 506	5, 833, 422	55, 243, 627
Luxembourg ?	31/12/1970	77, 000 (0-14)	←	←	47, 000	171, 000	44, 000	339, 000
Norway	1/ 1/1970	394, 290	244, 770	308, 713	616, 457	1, 806, 074	496, 164	3, 866, 468
Netherlands	31/12/1970	1, 427, 407	977, 173	1, 161, 487	2, 316, 539	5, 897, 075	1, 339, 749	13, 119, 430
Portugal *	...../1970	1, 877, 100 (0-9)	←	907, 700	1, 385, 100	4, 665, 500	864, 200	9, 699, 600
United Kingdom	30/ 6/1970	5, 393, 500	3, 605, 700	3, 941, 800	7, 892, 800	26, 171, 400	6, 981, 600	54, 186, 800
Sweden	1/ 1/1970	822, 319 (0-6)	847, 937 (7-14)	←	1, 219, 961	4, 027, 975	1, 085, 585	8, 004, 377
Switzerland	31/12/1970	597, 000 (0-4)	488, 000 (5-9)	466, 000	1, 025, 000	2, 981, 000	733, 000	6, 190, 000
Turkey	...../1969	6, 122, 000	3, 897, 000	4, 266, 000	5, 795, 000	13, 357, 000	1, 370, 000	34, 807, 000
Yugoslavia	30/ 6/1970	1, 913, 000 (0-4)	1, 859, 000 (5-9)	1, 894, 000	3, 677, 000	9, 636, 000	1, 548, 000	20, 527, 000

Annex 5. TOTAL POPULATION AND PERCENTAGE DISTRIBUTION BY AGE GROUP (LAST YEAR AVAILABLE)

	TOTAL		0 - 5 YEARS	6 - 9 YEARS	10 - 14 YEARS	15 - 24 YEARS	25 - 64 YEARS	65 YEARS AND OVER
Germany 70	61, 195, 000		10	6	7	13	51	13
Austria 69	7, 372, 858		10	7	7	13	48	14
Belgium 69	9, 660, 154		9	6	8	15	48	13
Denmark 69	4, 890, 687		10	6	8	16	48	12
Spain 69	31, 464, 000		9	9	9	15	51	8
France 70	50, 545, 400		10	7	8	16	46	13
Greece			-	-	-	-	-	-
Ireland 66	2, 884, 002		11 (0-4)	10 (5-9)	10	15	42	11
Italy 70	55, 243, 627		10	7	8	15	50	11
Luxembourg 70	339, 000		23 (0-14)	←	←	14	50	13
Norway 69	3, 866, 468		10	6	8	16	47	13
Netherlands 70	13, 119, 430		11	7	9	18	45	10
Portugal 70	9, 699, 600		19 (0-9)	←	9	14	48	9
United Kingdom 70	54, 186, 800		10	7	7	15	49	13
Sweden 69	8, 004, 377		10 (0-6)	11 (7-14)	←	15	50	14
Switzerland 70	6, 190, 000		8 (0-4)	8 (5-9)	8	17	48	12
Turkey 69	34, 807, 000		18	11	12	17	38	4
Yugoslavia 70	20, 527, 000		9 (0-4)	9 (5-9)	9	18	47	8

In principle, figure at 31st December.

Annex 6. NUMBER OF PEDESTRIANS KILLED, BY AGE GROUP (1970)

	0 - 5 YEARS	6 - 9 YEARS	10 - 14 YEARS	15 - 24 YEARS	25 - 64 YEARS	65 YEARS AND OVER	UNKNOW	TOTAL
Germany	541	533	216	360	1, 890	2, 509	7	6, 056
Austria *	60	50	19	40	240	295	6	710
Belgium *	33	26	13	24	136	125	4	361
Denmark 69	42	26	22	22	75	142	0	329
Spain *	95 (0-4)	171 (5-14)		71	519	355	27	1, 238
France *	163	294	112	202	1, 331	1, 088	21	3, 211
Greece	-	-	-	-	-	-	-	-
Ireland	20 (0-4)	23 (5-9)	9	19	72	76	0	219
Italy *	169	268 (6-14)	-	125	865	956	268	2, 651
Luxembourg	0	11 (6-14)	-	0	11	12	0	34
Norway	32	23	9	10	44	76	0	194
Netherlands	116	61	29	47	140	216	0	609
Portugal *	70	51	34	38	213	82	48	536
United Kingdom	283	205	128	234	798	1, 277	0	2, 925
Sweden	33 (0-6)	27 (7-14)	-	26	87	135	0	308
Switzerland	52	64	9	20	131	238	0	514
Turkey 69	233	328	142	143	485	143	93	1, 567
Yugoslavia	72 (0-4)	90 (5-7)	115 (8-14)	127	630	317	58	1, 409

Annex 7. NUMBER OF PEDESTRIAN CASUALTIES BY AGE GROUP (1970)

	0 - 5 YEARS	6 - 9 YEARS	10 - 14 YEARS	15 - 24 YEARS	25 - 64 YEARS	65 YEARS AND OVER	UNKNOWN	TOTAL
Germany	10, 497	17, 527	7, 380	8, 873	25, 299	13, 614	315	83, 505
Austria *	1, 130	1, 681	780	1, 114	3, 725	2, 515	109	11, 054
Belgium *	1, 131	1, 531	944	1, 411	3, 421	2, 083	395	10, 916
Denmark 69	549	512	401	368	1, 048	897	2	3, 777
Spain *	1, 314 (0-4)	4, 381 (5-14)	←	2, 688	7, 468	3, 243	287	19, 381
France *	2, 954	7, 642	3, 388	5, 773	15, 769	8, 550	218	44, 294
Greece	-	-	-	-	-	-	-	-
Ireland	245 (0-4)	472 (5-9)	235	287	579	250	15	2, 083
Italy *	3, 101	7, 658 (6-14)	←	4, 950	14, 673	5, 964	3, 201	39, 549
Luxembourg	20	123 (6-14)	←	39	94	49	0	325
Norway	451	405	256	305	687	497	81	2, 682
Netherlands	1, 594	1, 685	699	875	1, 829	1, 315	22	8, 019
Portugal *	1, 064	1, 036	1, 048	1, 414	4, 221	2, 023	986	11, 792
United Kingdom	12, 886	15, 893	10, 921	11, 403	22, 566	11, 688	13	85, 370
Sweden	364 (0-6)	410 (7-14)	←	359	1, 011	676	3	2, 823
Switzerland	862	1, 398	429	685	2, 127	1, 406	0	6, 907
Turkey 69	918	1, 476	856	987	2, 203	455	374	7, 269
Yugoslavia	571 (0-4)	1, 173 (5-7)	1, 708 (8-14)	2, 211	5, 709	1, 543	383	13, 298

Annex 8. NUMBER OF FATAL ACCIDENTS AND ACCIDENTS INVOLVING CASUALTIES (1970)

(* figures not adjusted to standard definition)

	FATAL ACCIDENTS		ACCIDENTS INVOLVING CASUALTIES					
Germany	17, 455		377, 198					
Austria *	2, 051		51, 631					
Belgium *	1, 400		76, 968					
Denmark 69	1, 103		20, 491					
Spain *	3, 622		57, 968					
France *	13, 463		228, 865					
Greece	-		-					
Ireland	503		6, 405					
Italy *	9, 386		173, 132					
Luxembourg	115		1, 607					
Norway	512		9, 266					
Netherlands	2, 879		58, 883					
Portugal *	1, 309		22, 662					
United Kingdom	6, 888		267, 631					
Sweden	1, 158		16, 636					
Switzerland	1, 527		28, 651					
Turkey 69	3, 050		12, 472					
Yugoslavia	3, 276		35, 948					

Annex 9. NUMBER OF KILOMETRES TRAVELLED (IN MILLION VEHICLES x km) BY TYPE OF VEHICLE

	MOPEDS		MOTOR-CYCLES		CARS			
Germany 66	4, 180		3, 000		172, 878			
Austria -								
Belgium	-		-		15, 284			
Denmark 70	2, 025		135		17, 520			
Spain 70	3, 124 (a)		← (a)		31, 274			
France 69	-		-		124, 500			
Greece	-		-		-			
Ireland 70	260 (a)		← (a)		7, 600			
Italy 70	9, 100 (b)		14, 570 (b)		110, 280			
Luxembourg 70	30		25		1, 000			
Norway 70	462		133		7, 934			
Netherlands 70	10, 000		500		42, 500			
Portugal -								
United Kingdom 70	692		3, 190		161, 327			
Sweden 66	-		-		27, 300			
Switzerland 66								
Turkey 69	-		-		2, 362			
Yugoslavia 70	-		736		6, 609			

(a) Moped + motor-cycles.
(b) Refers only to major roads.

Annex 10. LENGTH OF ROAD NETWORK-KILOMETRES AND AREA OF COUNTRY (km^2)

	AREA		MOTOR-WAY	A ROADS	B ROADS			TOTAL
Germany	248, 553		4, 461	32, 540	65, 500			416, 000
Austria	83, 849		478	9, 260	22, 593			94, 832
Belgium	30, 507		482	10, 298 (69)	13, 176 (65)			91, 843 (69)
Denmark	43, 000		184	→	9, 763 (67)			62, 093 (67)
Spain 67	504, 879		220	→	→			140, 220
France	551, 000		1, 553	81, 200	278, 377 (61)			785, 171
Greece	-		-	-	-			-
Ireland	68, 894		0	9, 886	41, 864			52, 987
Italy	301, 226		3, 907	42, 423	91, 637			284, 988
Luxembourg	2, 600		7	865	1, 959			4, 447
Norway	324, 219		79	24, 241	29, 572			72, 261
Netherlands	33, 779		500	→	47, 511			78, 551
Portugal 69	88, 500		77	5, 708	12, 268			29, 932
United Kingdom	229, 894		1, 076	13, 435	→			334, 132
Sweden	411, 258		403	11, 844	85, 707			173, 963
Switzerland	41, 288		377	17, 856	→			59, 233
Turkey	770, 665		24	33, 855	22, 763			56, 642(1)
Yugoslavia	255, 804		0	9, 915	13, 460			88, 260

1. Without the other roads.

Annex 11. PERCENTAGE OF ACCIDENTS INVOLVING CASUALTIES, BY MONTH (1969 + 1970) Part 1

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE			
	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970		
Germany	5.9	5.8	5.9	6.6	6.4	7.1	7.5	7.7	9.1	9.0	9.3	9.1		
Austria	4.6	4.5	4.9	5.3	6.0	5.9	7.7	7.1	10.2	9.0	10.1	10.5		
Belgium	6.6	7.3	5.5	7.3	7.1	7.8	8.0	7.8	9.3	8.6	9.3	8.8		
Denmark	6.0	-	6.0	-	6.3	-	7.1	-	8.6	-	9.5	-		
Spain (a)	6.2	6.5	5.5	5.6	6.6	8.1	7.7	6.5	8.1	8.6	8.6	8.3		
France	7.1	6.9	5.9	6.5	7.3	7.1	7.8	7.4	9.3	8.8	9.5	9.4		
Greece	-	-	-	-	-	-	-	-		-	-	-		
Ireland	7.4	6.9	6.2	7.5	6.5	7.7	7.4	7.0	8.1	7.9	9.0	8.2		
Italy	6.8	7.2	6.5	6.9	7.7	8.1	8.4	7.9	9.3	8.7	8.8	8.7		
Luxembourg	6.1	7.0	5.4	7.2	6.2	7.8	7.9	6.8	9.0	9.1	10.5	7.3		
Norway	6.5	6.1	5.8	6.9	6.7	6.0	5.2	6.2	8.3	9.0	9.4	10.1		
Netherlands	6.4	5.9	5.2	5.7	6.5	6.9	8.0	7.7	9.7	9.0	9.9	10.2		
Portugal	7.1	7.1	6.4	7.2	6.9	7.4	7.6	7.4	8.1	8.3	8.6	7.6		
United Kingdom	8.1	7.6	6.8	7.4	7.2	7.6	7.5	7.5	8.8	8.2	8.3	8.0		
Sweden	6.3	6.2	6.3	6.0	6.1	6.7	6.6	6.0	7.9	8.2	10.3	10.5		
Switzerland	5.6	5.4	5.3	6.0	6.6	6.5	7.5	7.7	10.7	9.6	9.7	10.0		
Turkey	5.4	-	5.2	-	7.2	-	6.8	-	9.2	-	9.9	-		
Yugoslavia	4.6	4.4	3.9	4.8	5.9	6.1	8.0	7.4	9.7	8.8	9.8	9.2		

(a) Outside built-up areas only.

Annex 11. PERCENTAGE OF ACCIDENTS INVOLVING CASUALTIES, BY MONTH (1969 + 1970) Part 2

	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER			
	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970		
Germany	9.6	9.4	9.8	8.9	9.4	9.2	9.7	9.7	9.7	8.8	7.8	8.7		
Austria	11.5	11.2	11.3	11.6	10.0	9.7	9.7	9.7	8.5	8.2	5.5	7.3		
Belgium	8.9	8.5	9.5	8.6	9.4	8.8	9.1	9.4	9.8	8.9	7.6	7.5		
Denmark	9.3	-	10.2	-	9.8	-	9.3	-	10.4	-	7.6	-		
Spain (a)	11.2	10.6	12.9	12.9	9.5	9.4	8.3	8.4	7.4	7.3	7.5	7.8		
France	9.7	9.4	9.1	8.9	9.0	9.1	9.5	9.4	9.0	9.1	6.7	7.5		
Greece	-	-	-	-	-	-	-	-	-	-	-	-		
Ireland	9.6	9.2	10.4	8.9	8.7	9.6	9.5	9.4	8.5	8.6	8.8	9.2		
Italy	9.5	9.4	9.2	9.1	9.1	8.8	9.4	9.4	8.4	8.3	6.8	7.6		
Luxembourg	10.0	10.5	9.0	9.6	8.0	8.7	9.4	8.2	11.0	11.0	7.3	7.9		
Norway	10.0	9.7	10.9	9.7	11.2	10.6	10.9	10.4	8.8	7.5	6.4	7.8		
Netherlands	9.8	8.9	9.9	9.8	9.5	9.8	9.5	9.6	9.0	8.6	6.4	7.9		
Portugal	9.9	9.5	10.8	10.1	8.8	8.9	8.5	9.2	8.6	8.8	8.6	8.6		
United Kingdom	8.7	8.8	8.8	8.3	8.5	8.5	9.1	9.2	9.5	9.4	8.8	9.4		
Sweden	9.9	9.4	10.8	10.9	9.7	9.6	9.6	10.0	10.1	7.8	6.4	8.7		
Switzerland	10.0	9.7	9.7	9.6	9.9	10.3	9.9	9.5	8.7	8.7	6.5	7.0		
Turkey	10.4	-	10.9	-	9.5	-	11.0	-	7.7	-	6.8	-		
Yugoslavia	10.3	10.5	11.8	11.7	10.8	10.2	10.6	10.7	9.3	9.0	5.2	7.2		

Annex 12. NUMBER KILLED PER 1,000 CASUALTIES IN 1961 AND 1970

(* figures adjusted to standard definition)

	1961		1970					
Germany	31		35					
Austria *	28		36					
Belgium *	25		29					
Denmark	37		45					
Spain *	48		60					
France *	47		49					
Greece	-		-					
Ireland	62(1)		55 (1)					
Italy *	42 (?)		46 (?)					
Luxembourg	31		53					
Norway	51		46					
Netherlands	38		45					
Portugal *	82		94					
United Kingdom	20		21					
Sweden	45		56					
Switzerland	37		44					
Turkey 69	151		179					
Yugoslavia	75		69					

Casualties = killed + injured.

(1) Ireland - before 1968: severely injured
after 1968: severely injured + slightly injured.

Annex 13

CORRECTION FACTORS TO BE APPLIED TO FATAL ACCIDENTS

The definition of "Road Death" recommended by the Economic Commission for Europe is death due to a road accident and occurring within 30 days of that accident. Most of the E.C.M.T. Member countries have adopted this definition but Austria, Belgium, France, Italy, Portugal and Spain have been unable to do so. These countries either define road deaths as those arising within a given number of days (always fewer than 30) after the accident, or in the case of Belgium and Portugal, restrict the definition to deaths occurring on the spot or immediately after the accident.

To make the figures comparable, correction factors must be applied to the numbers of deaths reported by the six countries referred to. There has been research in various countries to ascertain what percentage of deaths arises, on average, within a given number of days following an accident, while the Economic Commission for Europe can provide a set of values for the percentages killed (a) on the spot, (b) within three days and (c) within 30 days. This report employs a set of correction factors which have been worked out from the approximate average percentages obtained from various studies; these factors are as follows:

COUNTRY	DEFINITION OF "KILLED" (ROAD DEATHS)	ESTIMATED % DURING PERIOD REFERRED TO	CORRECTION FACTOR
Belgium	Killed on the spot		
Italy (before 1964)	Killed on the spot	46	2.00
Portugal	Killed on the spot or died before arrival at hospital		
Spain	Within 24 hours	71	1.30
France (before 1967)	Within 3 days	80	1.15
* Austria (since 1966)	Within 3 days	80	1.15
France (since 1967)	Within 6 days	84 1/2	1.09
Italy (since 1964)	Within 7 days	85 1/2	1.07
Standard Definition	Within 30 days of the accident	92	1.00
* Austria (before 1966): Within 30 days			1.00

Part IV

GRAPHS

Relationship between accidents, persons injured and deaths
with the increase of the numbers of private cars
between the years 1961 and 1970

Figures 1 to 17

and

The number of people injured as a percentage of the total accident
for each month of the year 1969

Figure 18 (1), (2) and (3)

Figure 1

GERMANY

	1970
——— Deaths	19.193
..... Casualties (thousands)	551
——— Cars (thousands)	13.941,1

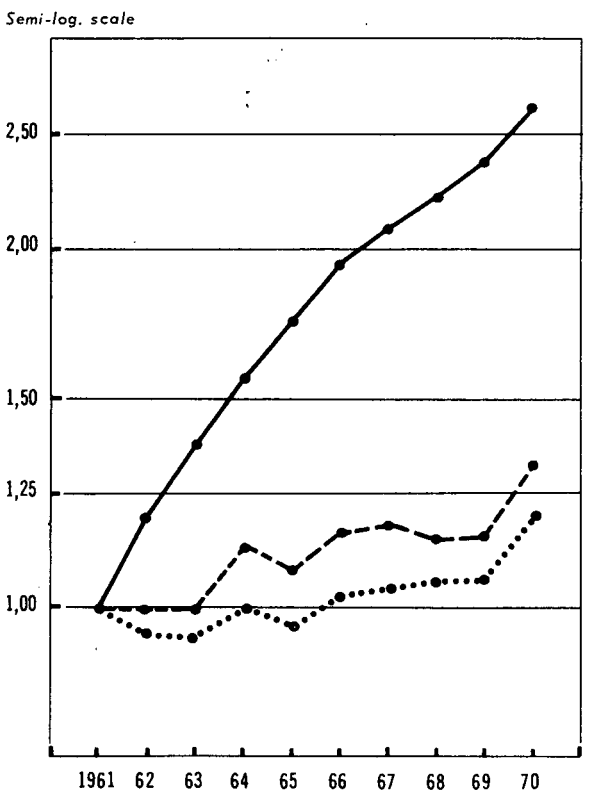


Figure 2

AUSTRIA

	1970
———— Deaths	2.238
..... Casualties (thousands)	72,5
———— Cars (thousands)	1.196,6

Before 66 : deaths
Since 66 : deaths fatalities within 3 days (correction factor 1 5)

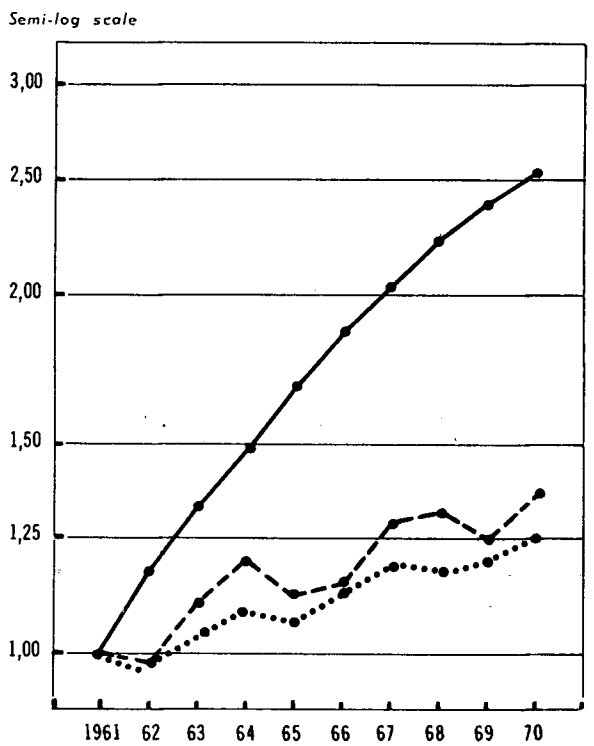
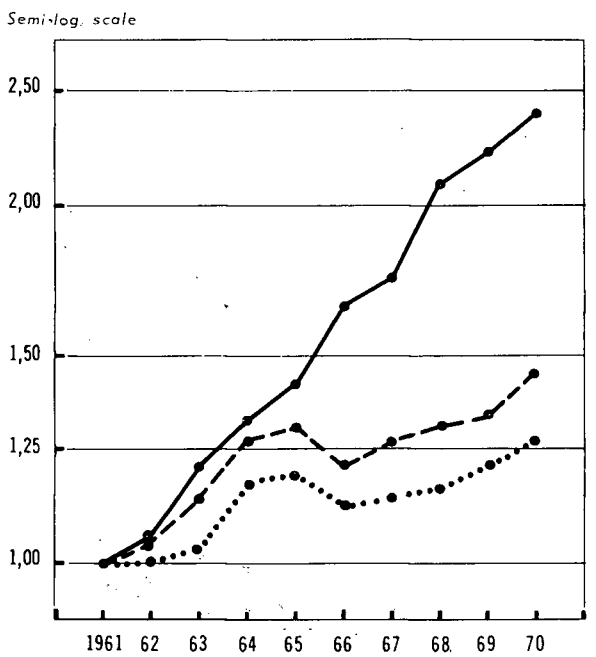


Figure 3

BELGIUM

	1970
———— Deaths	1.544
..... Casualties (thousands)	107,7
———— Cars (thousands)	2.059,6

Death : killed outright (correction factor(2 0)

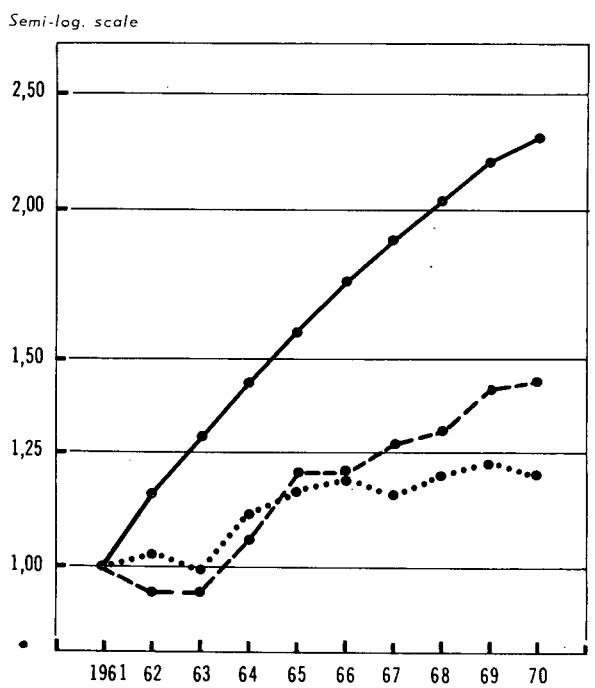


Deaths and casualties : regression in 1966

Figure 4

DENMARK

	1970
——— Deaths	1.208
..... Casualties (thousands)	26,8
——— Cars (thousands)	1.076,9



1965 : new definition or more serious accidents ?

Figure 5

SPAIN

	1970
———— Deaths	4.197
..... Casualties (thousands)	90,7
———— Cars (thousands)	2.377,7

Death : died within 24 hours (correction factor 1 3)

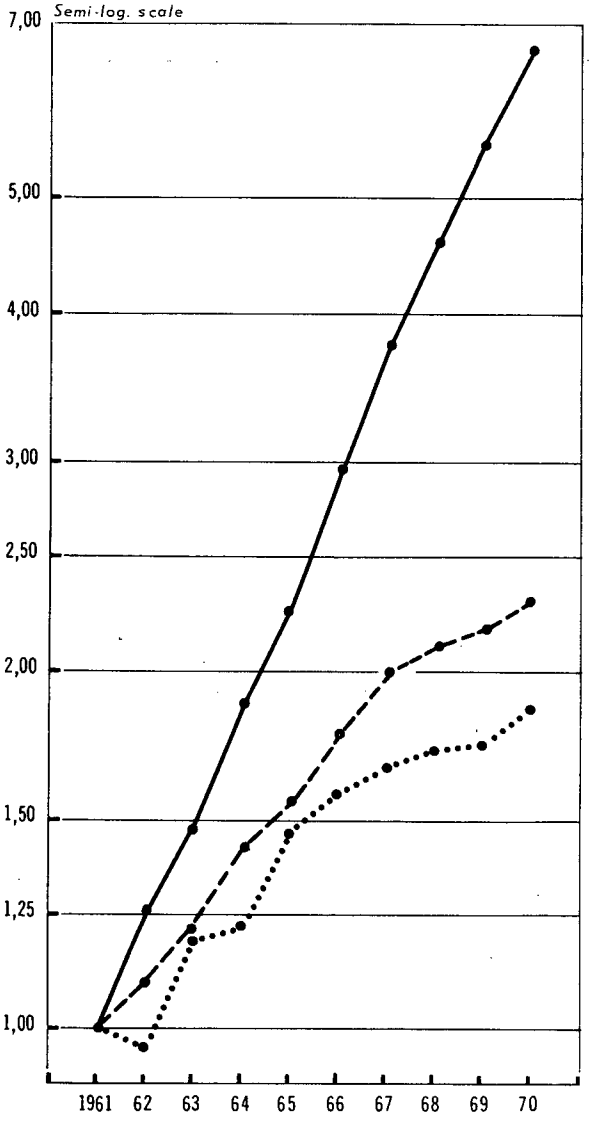


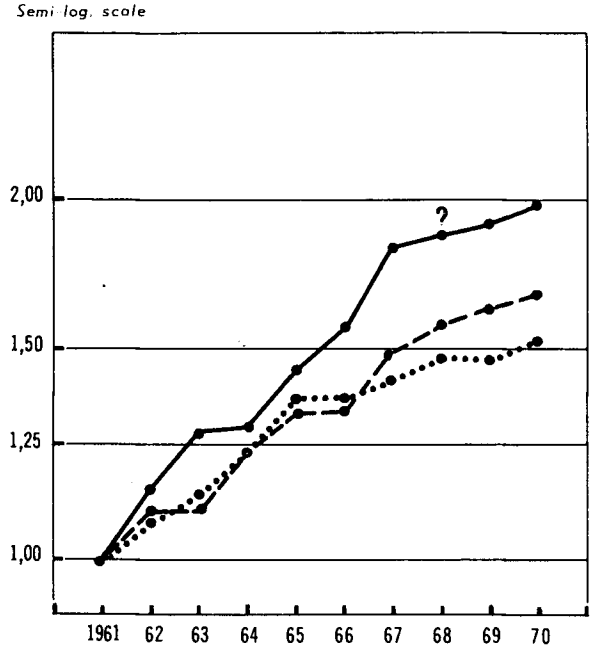
Figure 6

FRANCE

	1970
———— Deaths	15.060
..... Casualties (thousands)	337,6
———— Cars (thousands)	12.280,0

Before 1967 : death died within 3 says (correction factor 1 15)
Since 1967 : death died within 6 days (correction factor 1 09)

Semi log. scale



The progressive rise in the number of deaths and casualties is disquieting.

Figure 7

IRELAND

	1970
———— Deaths	540
..... Casualties (thousands)	9,8
———— Cars (thousands)	389,3

1. before 68 : seriously injured
since 68 : seriously injured + slightly injured

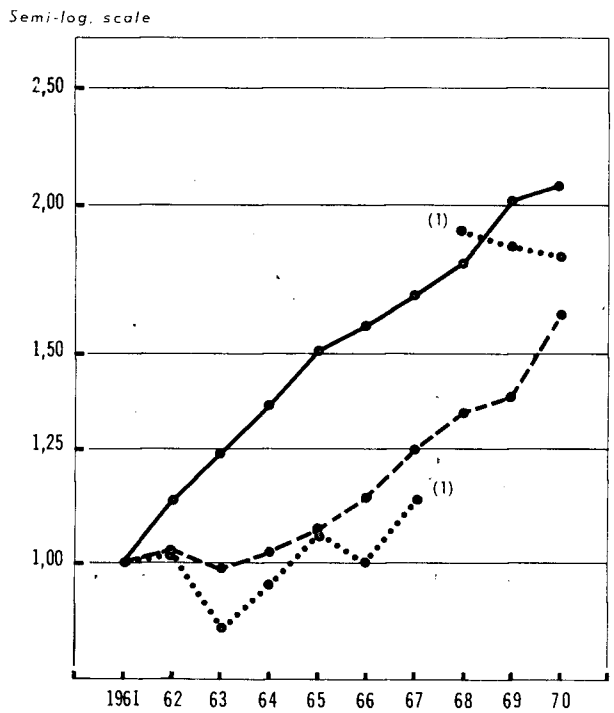


Figure 8

ITALY

	1970
——— Deaths	10.208
..... Casualties (thousands)	238,4
——— Cars (thousands)	10.209,0

Before 1964 : death died at the time (correction factor 2.0)
Since 1964 : death died within 7 days (correction factor 1.07)

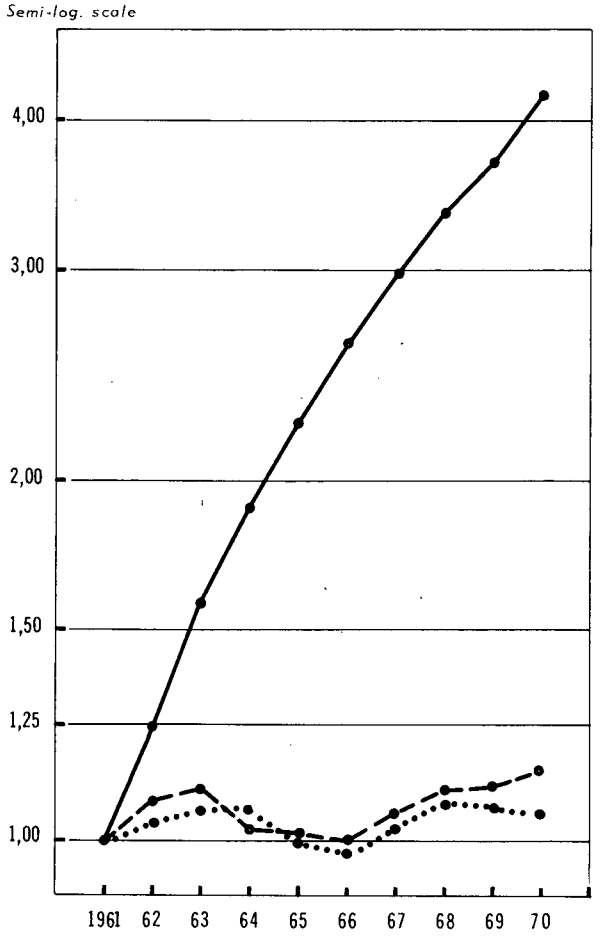
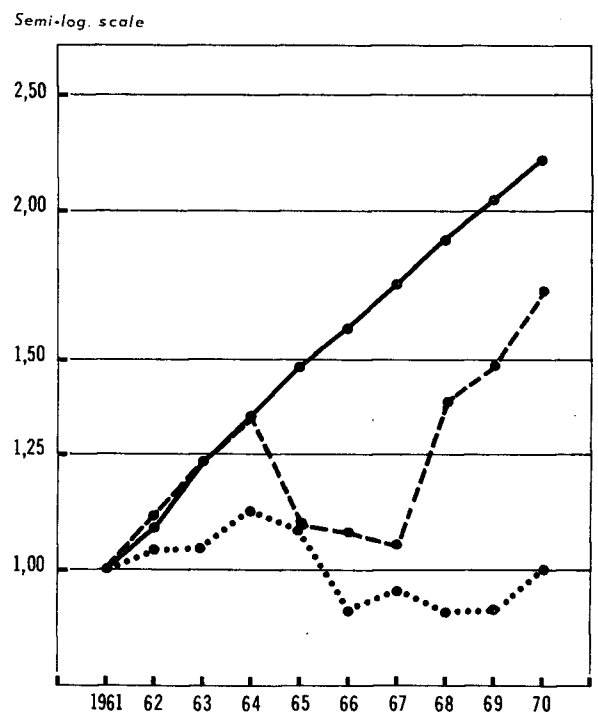


Figure 9

LUXEMBOURG

	1970
——— Deaths (thousands)	132
..... Casualties (thousands)	2,5
——— Cars (thousands)	100,3

The annual number of deaths are much reduced, hence the scatter,



Increasing seriousness of accidents over the last few years.

Figure 10

NORWAY

	1970
———— Deaths	560
..... Casualties (thousands)	12,3
———— Cars (thousands)	747,2

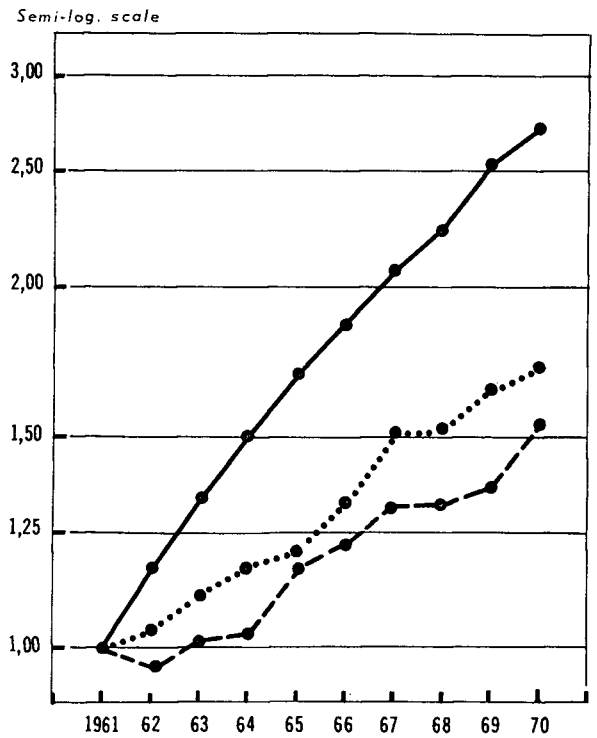


Figure 11

NETHERLANDS

	1970
——— Deaths	3.181
..... Casualties (thousands)	71,4
——— Cars (thousands)	2.500,0

Since 1967, some casualties involving slight injuries are no longer recorded

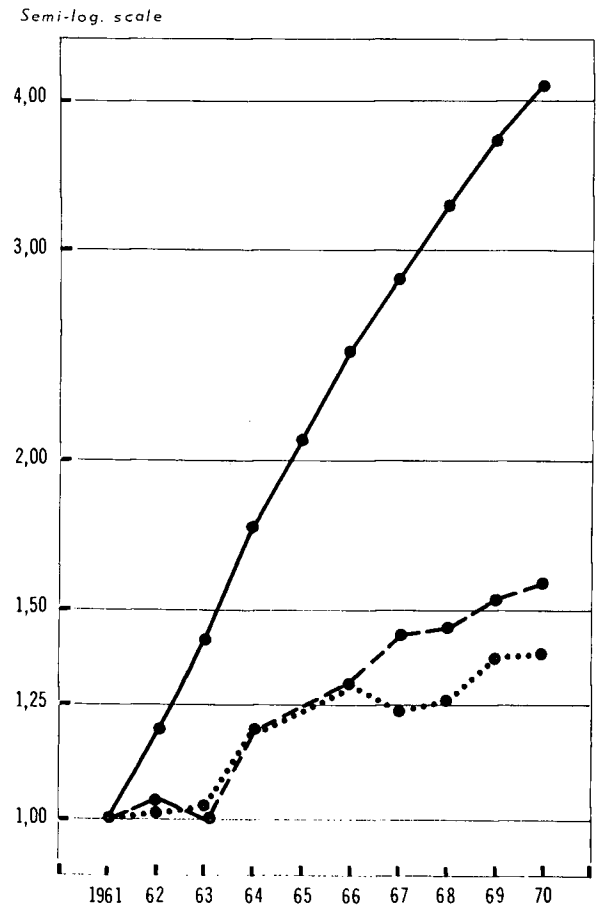


Figure 12

PORTUGAL

	1970
---------- Deaths	1.417
..... Casualties (thousands)	30,3
———— Cars (thousands)	452,0

Cars 1969 ? Deaths 1964 ?

Death : died before arrival at hospital (2 - 1 85 ?)

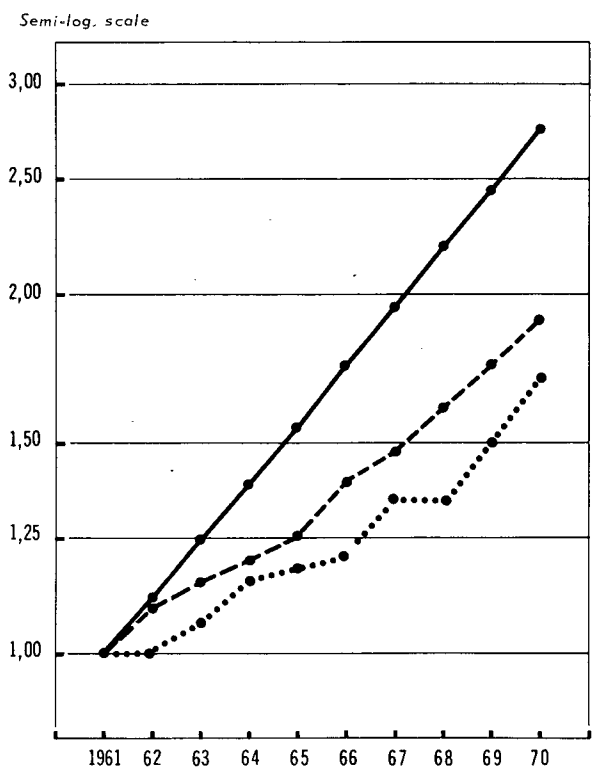


Figure 13

UNITED KINGDOM

	1970
———— Deaths	7.499
..... Casualties (thousands)	363,4
———— Cars (thousands)	11.515,0

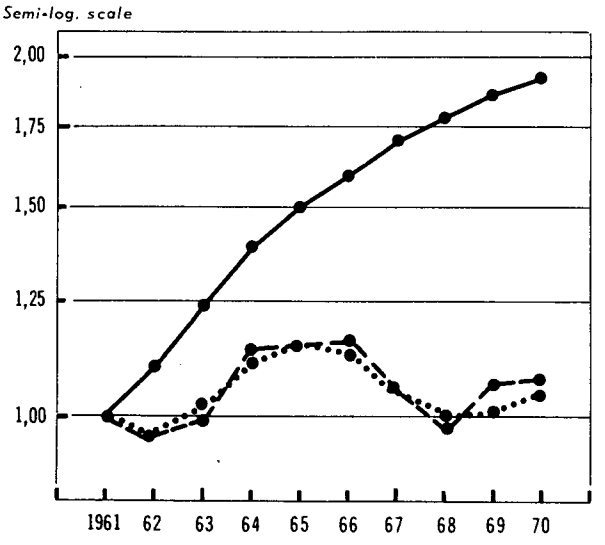
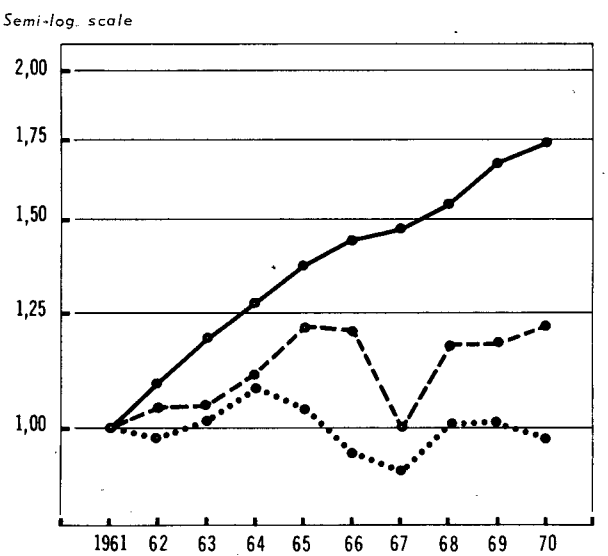


Figure 14

SWEDEN

	1970
———— Deaths	1.307
..... Casualties (thousands)	23,5
———— Cars (thousands)	2.287,7



Few casualties, and even sharper reduction in number of deaths in 1967.

Figure 15

SWITZERLAND

	1970
——●—— Deaths	1 649
..... Casualties (thousands)	37,7
——— Cars (thousands)	1 385,0

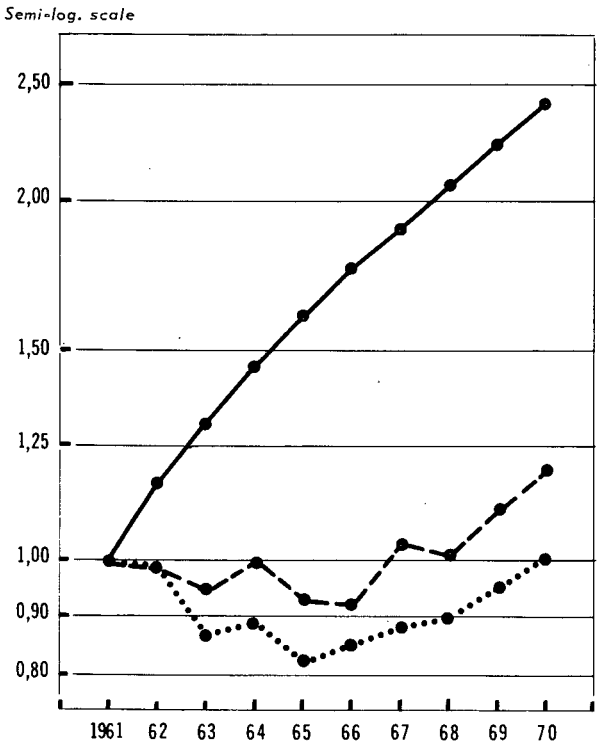


Figure 16

TURKEY

	1969
———— Deaths	3.760
..... Casualties (thousands)	21,0
———— Cars (thousands)	137,3

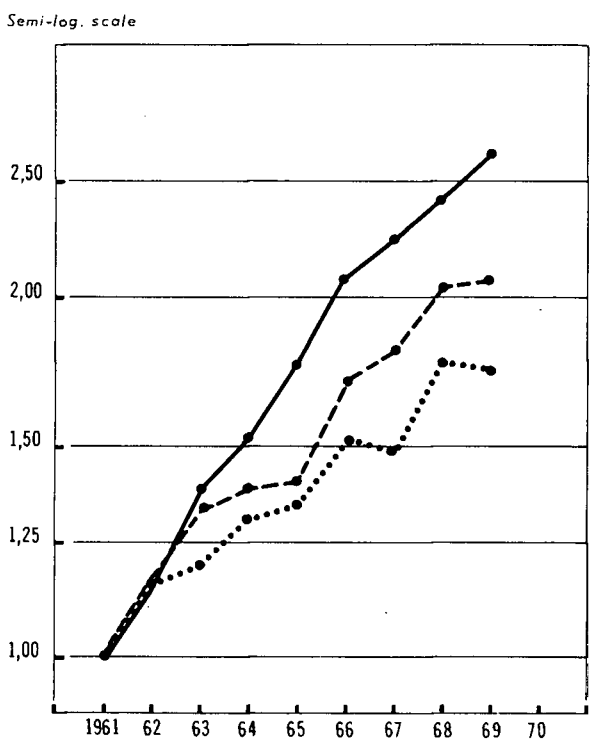


Figure 17

YUGOSLAVIA

	1970
Deaths	2.684
Casualties (thousands)	53,4
Cars (thousands)	720,8

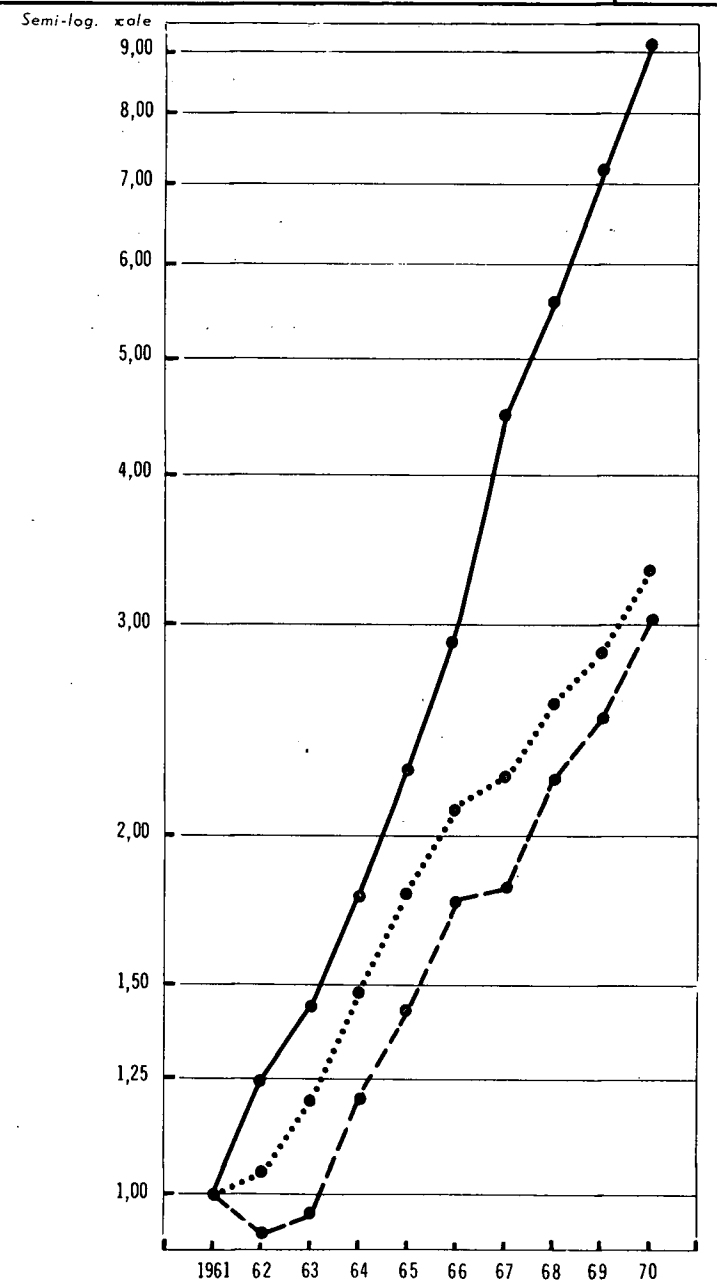


Figure 18 (1)

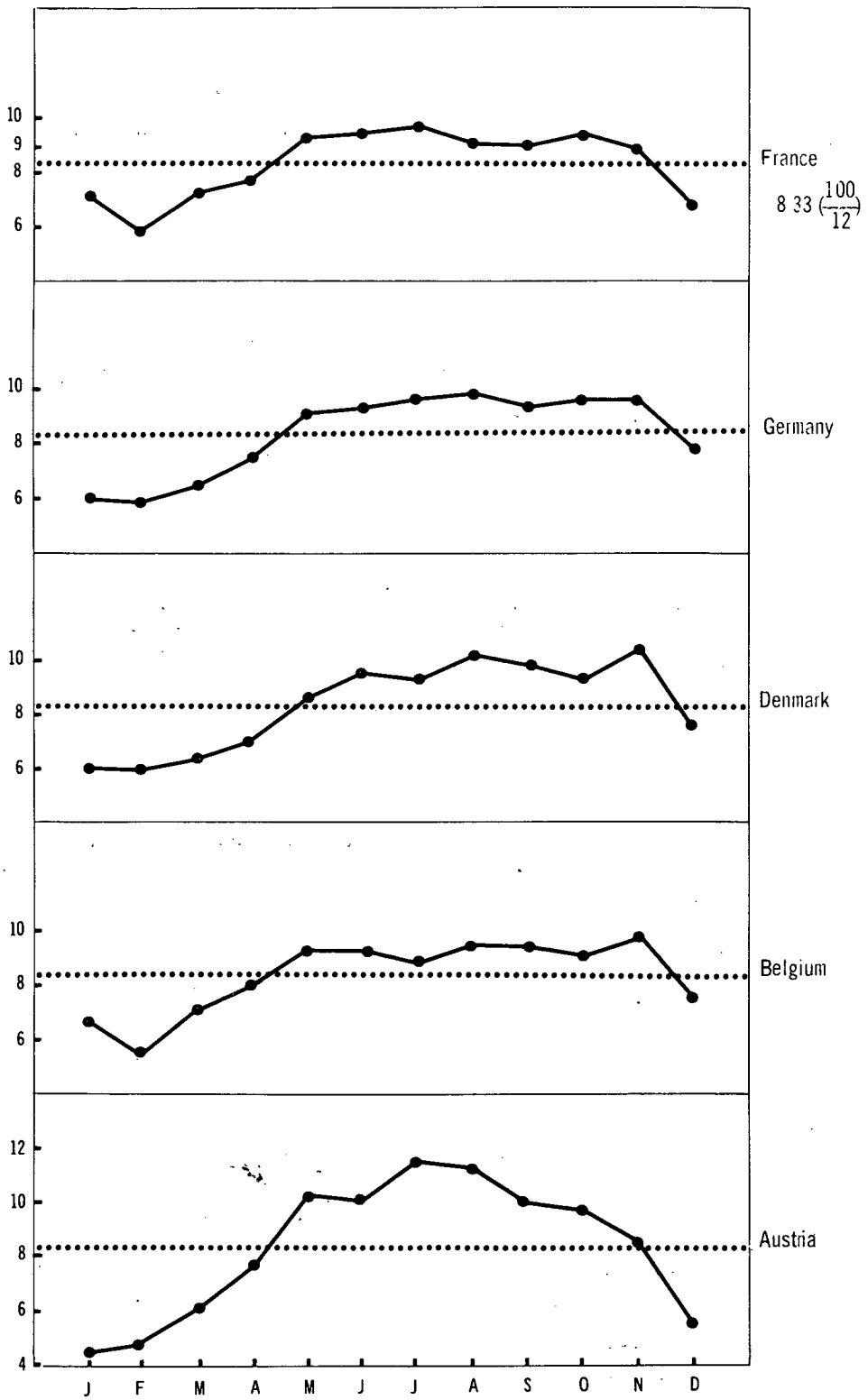
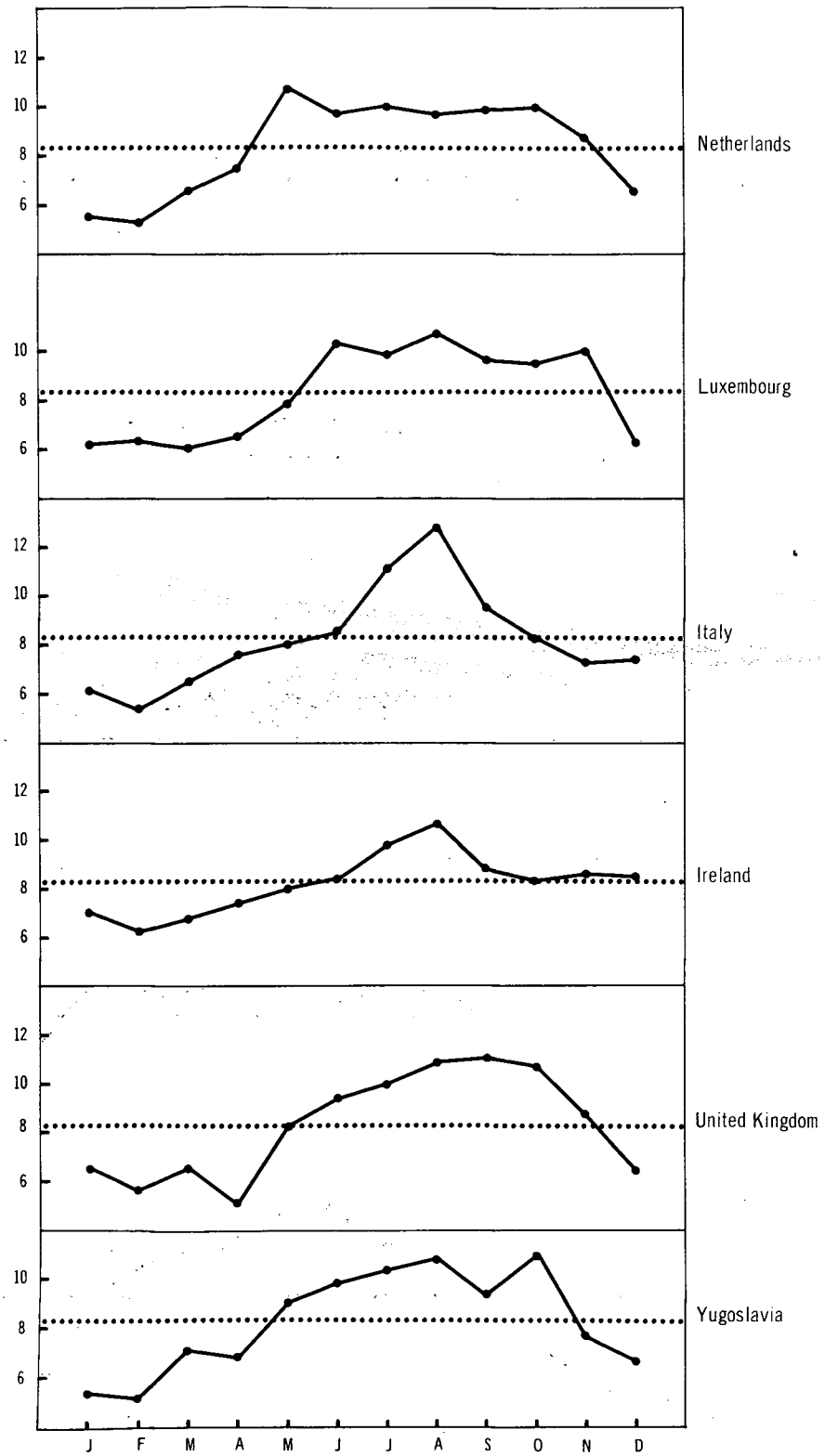

France
8 33 (100/12)
Germany
Denmark
Belgium
Austria
J F M A M J J A S O N D

Figure 18 (2)


12
10
8
6
Netherlands
10
8
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Luxembourg
12
10
8
6
Italy
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Ireland
12
10
8
6
United Kingdom
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Yugoslavia
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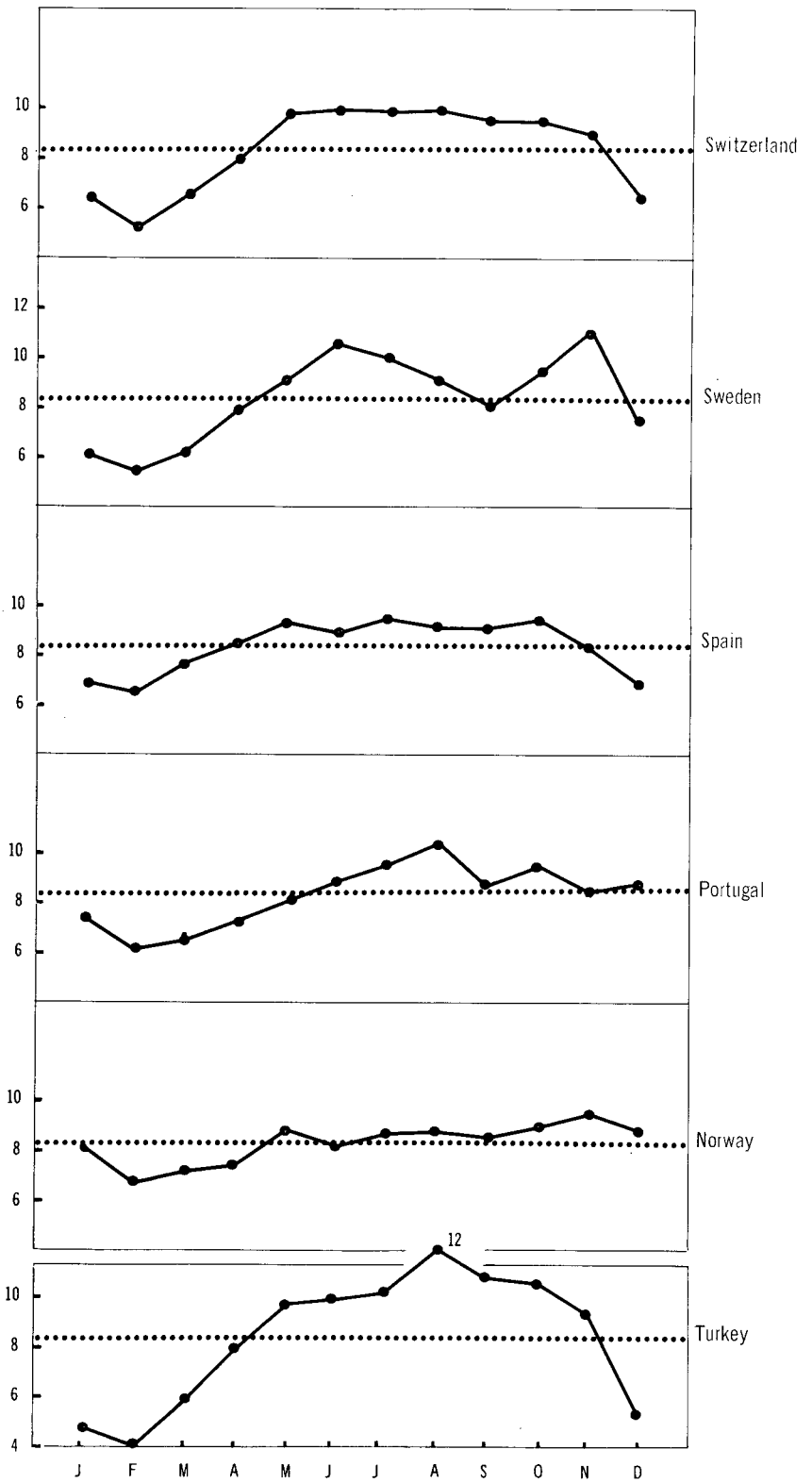
Figure 18 (3)


Switzerland
Sweden
Spain
Portugal
Norway
Turkey
12
J F M A M J J A S O N D

NEW PROGRAMME OF WORK OF THE ECMT IN THE FIELD OF ROAD SAFETY

[CM(72)19]

Hearing of the International Organisations

COVERING NOTE

Before submission to the Council of Ministers, the ECMT's new Programme of Work for Road Safety was communicated to the international governmental and non-governmental organisations concerned so that they could give their comments and suggestions.

A hearing was accordingly arranged by the Road Safety Committee on 28th November 1972. The following Organisations attended:

- European Communities Commission (EEC)
- United Nations Economic Commission for Europe (ECE)
- Organisation for Economic Co-operation and Development (OECD)
- World Health Organisation (WHO)
- Permanent International Association of Road Congresses (PIARC)
- International Permanent Bureau of Motor Manufacturers (BPICA)
- International Federation of Senior Police Officers (SIFSP)
- International Federation of Pedestrians (FIP)
- International Road Federation (IRF)
- World Touring and Automobile Organisation (OTA)
- Prévention Routière Internationale (PRI)
- International Road Transport Union (IRU)
- World Confederation of Labour (CMT)
- International Federation of Transport Executives (FICT)

The new programme of work, its lines of action and the considerations on which it is based were, in general approved by the Organisations concerned. Some of the points it contained were given special emphasis and discussed in more detail.

The following are the main points on which attention was drawn to other facets, amendments were suggested and criticisms put forward.

1. As an objective basis for road accident prevention of any kind, Member countries' accidents statistics should be improved and standardized. It is most important that these statistics should be shaped as a means of information and appraisal giving as

convincing and meaningful as possible a picture of all the relevant factors. If statistics are to be fully comprehensive they should also cover the degree of severity of injuries, the scale of rehabilitation needed and, more generally, show clearly the burden that road accidents lay upon society as a whole. With a view to producing this information, there should be close co-operation between transport and medical statisticians.

2. More should be done for pedestrian safety besides the action mentioned in the programme of work. The legitimate interests of pedestrians should be given due consideration in road transport policy, urban planning and road design.

3. Special stress was laid on the need for special training and, at suitable intervals, refresher courses for professional drivers of heavy vehicles (e. g. lorry and coach drivers).

4. It was repeatedly emphasized that the road infrastructure had an important bearing on better road safety. This being so, attention should again be drawn to the vital importance of taking all suitable steps for improving the road network.

   Much importance was also attached to the effective co-ordination of road signs and signals at the earliest possible date on the basis of the Vienna Convention of 1968 and the Supplementary Agreement (Geneva 1971).

5. On various sides, attention was drawn to the fact that more effective action for road safety in all the sectors concerned implies the availability of substantially larger financial resources.

6. Closer co-operation and co-ordination between governmental and non-governmental organisations was judged to be most desirable in order to avoid duplication of the work on road safety. Concertation in this field seems essential to prevent the scattering of efforts and resources, and to contribute usefully to the solutions of the problems at issue. It was accordingly proposed that arrangements should be made for regular contacts between the Chairmen and Secretariats of specialized working bodies, at least where inter-governmental organisations were concerned.

7. Some organisations took a rather guarded attitude to the problem of speed limits outside built up areas. They judged it appropriate to introduce speed limits on specified road sections for certain periods and certain categories of vehicles, but had reservations about a general speed limit.

The suggestions put forward under paragraphs 1 to 6 above can be regarded as valid and useful, and they will be taken into consideration as fully as possible when the programme of work is put into effect.

With regard to the views expressed in paragraph 7, reference should be made to Resolution No. 25 adopted by the Council of Ministers of Transport on 16th December 1971. This Resolution recommends the imposition, outside built up areas, of general speed limits applying to the entire road system or to as large a part of it as possible, it being understood that the limit may vary according to the class of road.

Moreover, the new programme of work specifically provides for the ways of giving effect to this Resolution in the light of technical experience and research findings.

CONTENTS

Annexes

NEW ECMT PROGRAMME OF WORK ON ROAD SAFETY

I. THE ACTIVITIES OF THE CONFERENCE WITH REGARD TO THE ROAD SAFETY PROBLEM

1. The work that has already been done

For many years the Council of Ministers of the ECMT has devoted very special attention to measures for improving road safety. Confronted with an alarming increase in road accidents and the loss of life they cause, the Council decided in 1959 to supplement the measures being taken by the various countries in isolation by concerted action at international level aimed at finding and implementing the most effective ways of containing a trend that has become increasingly disturbing with the rapid growth in road traffic throughout Western Europe.

Whilst the first subjects appearing on the Conference programme were essentially those claiming particular attention at that time, the work done on them quickly revealed the need for more systematic co-operation to permit a continuous exchange of experience between the responsible national authorities and so that concerted action might be planned to improve road safety. As a result a general programme was drawn up and approved by the Council in 1963 [CM(63)22 Revised] and included work to be carried out over a number of years. It also gave an order of priority for the issues to be studied together with a suggested procedure in each case.

The Road Safety Committee has now practically completed the task which the Committee of Deputies had asked it to carry out. It began by analysing the situation in the various countries and determined the level of knowledge with regard to the main problems arising. A deeper study of these problems was then undertaken and a series of recommendations drafted which were designed to make realistic advances in road safety and to obtain the greatest possible degree of co-ordination in national regulations. The results of this work are recorded in the many reports submitted to the Council of Ministers in recent years; many of these resulted in Resolutions on which Member countries have, to a large extent, taken action.

All in all, the measures recommended in these Resolutions may reasonably be regarded as a suitable means of action for the prevention of road accidents and, however incomplete, as an instrument worthy of consideration. Lastly, a survey has been made of action taken by Member countries as a result of the ECMT Resolutions and the results are reproduced in Annex I.

2. New approaches

If this occasion is taken for a critical analysis of the work done, the first conclusion to emerge is that, in most countries, accident statistics have not increased as steeply as the number of vehicles in use although there is a tendency for the two curves to run parallel for the last year or two in some countries. Even so, the numbers killed and injured in road accidents make it abundantly clear that road safety is still, and today more than ever, a grave and urgent problem.

A second conclusion is the vital need for the ECMT to find new approaches in this field so that action can be adapted to the changes that have taken place in traffic engineering itself and in the factors affecting the nature of road accidents.

In other words, the whole situation needs to be reviewed and a coherent and effective global strategy formulated to provide better ways and means of treating this complex and tragic affliction of modern society.

If this strategy is really to cover every aspect of its objective it will need to call upon all available resources in the widest sense of the term, and weld the instruments of action into a well co-ordinated whole. This implies three basic requirements:

- from the operational standpoint, steps must be taken to establish priority fields of action to select, from the ways and means which are theoretically available, those measures which, severally or jointly, will produce the best results;
- from the methodological viewpoint, an interdisciplinary approach is necessary, drawing on the knowledge and assistance of all sectors concerned (engineering, psychology, medicine, law, education, sociology, etc.);
- from the organisational viewpoint, close collaboration is essential between these international bodies whose activities are linked in any way whatsoever with improvements to road safety.

3. International co-operation and the ECMT's co-ordinating role

At international level, the ECMT has always maintained regular contact with the various international organisations concerned. The following notes refer to its relations with inter-governmental organisations alone:

- permanent liaison is maintained with the Council of Europe, not only at political level, but also with regard to certain specific action which is the province of government departments not otherwise involved in transport proper (operation and strengthening of police forces, improvement to technical police equipment; road safety education in schools, etc.);
- contact has recently been established between the ECMT and the Commission of the European Communities with the object of strengthening co-operation generally between the two institutions in the transport field;
- the ECMT has a long tradition of co-operation with the Transport Division of the United Nations Economic Commission for Europe, which is permanently engaged in the activities under review, with particular reference to the characteristics and safety equipment of motor vehicles. One result of this collaboration has been the successful conclusion of the work on standardizing traffic rules and road signs and signals in the most satisfactory manner;
- co-operation also exists with the OECD which has set up a road research secretariat working to a medium-term programme and regularly communicating the results of its research to the Conference so that any political conclusions may be drawn from them.

The above examples do not detract in any way from the importance attached by the ECMT to continuing and constructive co-operation with non-governmental organisations, each contributing in its own way to improve road safety.

A further general point is that, under the terms of its Protocol and by the very fact that it brings together, in Council, the Ministers responsible for road traffic and road safety, the ECMT performs a co-ordinating and consolidating role with regard to those international institutions whose efforts are devoted to making the roads safer in Europe and so converge with the aims of the ECMT in this field.

As proof of its firm intention to intensify co-operation on this subject with all international organisations concerned, the ECMT decided that it would be useful to invite them to join in its work from the very first stage, in other words to ask them to help draw up a new road safety programme. These organisations were accordingly convened for consultations in late November 1972. They thus had an opportunity for a wide exchange of views on the whole issue, to see what was being done in various quarters and give a considered opinion on the present programme.

4. Concrete action to be undertaken

Progress in statistics may be expected to give an increasingly clear indication of the real causes of road accidents but reasonably safe assumptions may already be made with regard to the main causes. It is also true to say that a varied armoury of ways and means of reducing the number of road accidents already exists in the various areas concerned, although individually these may not always be applied to the greatest effect. On the other hand, it must be admitted that some specific problems still require further research; one particular need is for a better appraisal, in practical terms, of the degree of effectiveness of the various measures and of their mode of application before it will be possible to construct a general strategy, based in every respect on firm scientific evidence.

However, the urgency of the problem and the seriousness of its implications for human life call for continual positive intervention on the part of the responsible authorities. For these reasons it seemed best, as far as the ECMT was concerned, that work should be focussed on practical considerations and concern itself with the immediate requirements of present reality. The objective therefore, in the present situation, is to arrive at concrete action in clearly-defined fields designed to produce the best results and the greatest effectiveness in the light of present knowledge. At the same time, it is clear that as and when the results of research produce precise conclusions these must be incorporated in subsequent government action and even alter its course where this should be necessary.

II. MAIN CHARACTERISTICS OF ROAD ACCIDENTS

If the ECMT road safety programme is to be framed to meet the cardinal requirements of the present situation, it is only logical to take into account certain lessons regarding the main characteristics of road accidents derived from a statistical analysis of the facts.

The ECMT, it will be remembered, has already published four reports on road accident trends covering, in all, the period 1955 to 1970. Within the limitations of the figures available, these reports have helped to fill in the picture of the problem dealt with in this paper and the following paragraphs sum up its most important aspects.

1. Main causes of accidents

Road accidents are known to be generally the combined result of a number of factors involving driver behaviour, vehicle characteristics, road and traffic conditions and the environment. Thus an accident may be regarded as the culmination of a chain of circumstances which nothing less than a study in depth, based on scientific methods, will be able to define sufficiently accurately in terms of their respective roles.

It is also true to say that in practice the presumed causes of accidents taken from police or other reports need to be regarded with caution because those responsible for filling in report forms at the scene of the accident sometimes tend to lay the blame on one single factor, when the other causes are not immediately apparent.

Subject to this reservation, the main causes of serious accidents (those causing personal injury) may be said, on the basis firstly of the available statistics of the results of court cases, and secondly of the studies made by insurance companies, to be the following, although the order shown is not necessarily the same in all countries:

- excessive speed having regard to the conditions;
- ignoring priority rules;
- traffic offences or unwise behaviour by pedestrians;
- alcohol;
- overtaking illegally.

There are, of course, important causes of accidents other than those attributable to the human factor against which effective steps need to be taken but, according to the figures available at the moment, causes involving human behaviour seem to be well in the lead of all factors contributing to road accidents.

It is highly desirable that active scientific research in this field (e. g. the work being done by the OECD) should be continued.

2. Main casualty groups in road accidents

The fourth ECMT report on recent trends in road accidents [CM(72)10, Tables 3 and 4 in particular] shows clearly that the following categories account for the highest percentages of road casualties:

a) Occupants of motor vehicles. These account for the highest number of road deaths in practically all Member countries.

b) Pedestrians, accounting for the second highest number of people killed, form a particularly vulnerable category. Table 1 below shows that pedestrian deaths are particularly high among the under 15 and over 65 age groups.

c) Riders of two-wheeled vehicles (cycles, mopeds and motorcycles) come third in number of road deaths.

This information has a bearing on the development of safety measures for these specific categories of road user.

3. Groups involved in a disproportionately high number of accidents

These same statistics also show that certain categories of road user are involved in a disproportionately high number of road accidents of which, of course, they are also the casualties (see Table 2). The categories involved are:

a) Young drivers under 25. It is fairly clear that young drivers all too often take to the road with insufficient experience and in some cases without displaying the requisite sense of responsibility. They also tend to take thoughtless risks and the number of them involved in road accidents is therefore disproportionately high.

b) Inexperienced drivers holding a licence for less than one year. The main reason for the involvement of this group, which overlaps with group (a), in a disproportionately high number of road accidents (again according to the statistical evidence of many Member countries) is their lack of experience.

Table 1. PEDESTRIAN ROAD DEATHS IN THE UNDER 15 AND OVER 65 AGE GROUPS AS A PERCENTAGE OF ALL PEDESTRIANS KILLED ON THE ROAD

1970 figures

COUNTRY	UNDER 15s	OVER 65s	OTHER AGE GROUPS (15-65)
Austria	32.5	23.7	43.8
Belgium	19.9	35.7	44.4
Denmark	25.7	37.9	36.4
France	17.7	33.9	45.8 [1]
Germany	21.3	41.6	37.1
Greece	18.0	35.0	47.0
Ireland			
Italy	5.9	46.2	47.9
Luxembourg	32.4	23.6	44.0
Netherlands	34.0	35.0	31.0
Norway			
Portugal	17.0	31.0	52.0
Spain	21.5	28.7	49.8
Sweden	19.5	43.8	36.7
Switzerland	24.0	46.0	30.0
Turkey	48.4	34.9	10.5
United Kingdom	21.0	44.0	35.0
Yugoslavia	19.7	22.4	57.9

1. A number of pedestrian road deaths, where the ages of the victims are unknown, are not included in the figures for these countries.

Table 2. NUMBER OF FATAL CASUALTIES AMONG 15 TO 25-YEAR OLD USERS OF MOPEDS, MOTORCYCLES AND CARS AS A PERCENTAGE OF THE TOTAL ROAD DEATHS IN EACH CATEGORY

1970 figures

COUNTRY	FATAL CASUALTIES AMONG 15 TO 25-YEAR OLD USERS OF THE FOLLOWING VEHICLES, AS A PERCENTAGE OF TOTAL DEATHS IN EACH CATEGORY		
	MOPEDS	MOTORCYCLES	CARS
Austria	46.9	29.0	10.2
Belgium	50.0	58.1	24.6
Denmark	27.3	69.0	25.7
France			31.4
Germany	19.8	68.9	32.6
Greece	47.0	26.0	19.0
Ireland			
Italy	27.8	33.6	25.4
Luxembourg	0.0	25.0	45.0
Netherlands	17.0	75.0	26.0
Norway			
Portugal	32.0	27.0	17.0
Spain	22.5 [1]	38.5	22.5
Sweden	22.2	83.0	29.6
Switzerland	22.0	53.0	28.0
Turkey	26.1 [1]	32.9	17.2
United Kingdom	13.0	73.0	32.0
Yugoslavia	11.0 [1]	31.0	20.0

1. Including cyclists.

III. GENERAL REVIEW OF WAYS AND MEANS OF PREVENTING ROAD ACCIDENTS

A convenient system for classifying measures for preventing road accidents is the three-way breakdown used in the United States, namely the three Es: Engineering, Education and Enforcement.

The three Es together form a complete repertory of measures theoretically available for improving road safety.

1. Engineering covers all those measures designed to make roads and vehicles safer to use.

a) Modern road construction helps in many ways to promote safe traffic flow. As a starting point for what can be done to promote road safety there is the road itself. Road construction and design should, for example, aim at providing a surface offering the necessary grip and an alignment compatible with vehicles' road-holding characteristics and driver visibility (e. g. bend radio, visibility range and banking). A second approach under this heading (which is already being applied) consists in regarding the road as a kind of "Lebensraum" with its various dimensions (road surface configuration, subdivision into traffic lanes with specific treatment of road edges and road environment). One area of road design and construction, known as "traffic engineering", covers a range of measures including optical traffic guidance (reflectorized posts at the roadside, light signals, street lighting, etc.), traffic routing for safer traffic flow (panels with systematic place-name indication, traffic control by variable light signals, automatic fog and ice warning systems, radio and telephone services providing information about the state of the roads and traffic, etc.). Traffic engineering also covers traffic control systems on roads in towns, with segregation of the various categories of road user (bus lanes and cycle tracks). Other measures under the same heading include the protection of road users by means of safety barriers, and road improvements designed to eliminate "black spots". Here again co-operation is essential between road engineers, the police, psychologists, ophtalmologists and other specialists.

b) Engineering also includes the technical design of the motor vehicle. This covers the construction and "primary security" of the vehicle in terms of its main equipment (steering system, brakes, lighting and tyres) and the design of the interior of the passenger compartment to mitigate the effects of an accident. Another contribution is made to road safety by the large number of technical standards imposed by legislation. A considerable degree of international co-operation already exists in this field (inter alia) with a view to the design of experimental "safety" vehicles.

2. Education with regard to road safety unquestionably has a vital bearing on accident prevention. It covers teaching (children at school and learner-drivers in driving schools), education and information for adults, and road safety campaigns. It should embrace all road users regardless of age or category (pedestrians, motorcyclists, etc.) and the various approaches should be specifically and psychologically tailored to these different age groups and categories of road users. Education and information with regard to road safety has a motivation function, in other words it should endeavour to modify the attitude and behaviour of road users.

All these problems and the relevant methodology have been dealt with in a detailed report recently produced by the ECMT [CM(72)9] and at a conference on road safety education in schools, held in Vienna in 1971 and organised jointly with the Council of Europe [CM(71)17].

3. Enforcement covers firstly legislation and regulations prescribing rules of behaviour for road users, including those for drivers of heavy vehicles, their driving hours and

rest periods, road signs and signals, technical provisions with regard to road vehicles, regulations concerning driving licences and, secondly, traffic monitoring and control by the police for purposes of enforcing all these regulations. Enforcement also covers penalties for infringement.

In reality, these three groups of road prevention measures (the three Es) are interdependent. The results that may be obtained by engineering improvements generally simplify the information and education that has to be given to road users. A first problem will therefore be to see to what extent progress in engineering offers opportunities for priority action in order to improve road safety. Disregarding the problem of financing, it is in principle easier and more effective in the long run to apply technical measures or lay down technical standards than to require human beings to comply with rules of behaviour. Again, if steps taken to inform and educate road users achieve their object, that is to say spontaneous compliance with rules, fewer rules will be needed and less effort will be necessary to enforce them.

In view of their interdependence the three Es need all to be involved in the design of practical measures. Moreover, because of the variety of scientific disciplines involved, effective action with regard to the various aspects of road safety will call for interdisciplinary co-operation.

A classified list of all measures contributing to road safety under all three headings is given in Annex II.

A final factor is accident first-aid and the medical treatment to be administered to road accident casualties. The various aspects of this problem are analysed in detail in the ECMT paper CM(69)13.

IV. PROGRAMME OF WORK

A. Before dealing with the specific contents of the new programme of work, it may be helpful to set out the guiding principles on which future ECMT road safety activity will be based.

The new programme is intelligible only when seen as the continuation of recent work done by the Conference and relating, in particular, to:

- the fixing of a legal threshold for the concentration of alcohol in the blood for drivers of motor vehicles;
- speed limits in and outside built-up areas;
- measures concerning the information and education of road users;
- the role of the police in road safety;
- first-aid for those injured in road accidents, and
- the standardization of rules on road traffic, signs and signals.

On the one hand the strategy behind this programme is pragmatic, in other words it is linked to the trends in road accidents, which are continually under review by the ECMT. On the other hand, the strategy needs the constant backing of scientific research, since the road accident prevention measures to be prepared and finalized should be based, as far as possible, on scientific studies and be checked, either immediately or subsequently, for their effectiveness.

Because of the limitations on the funds available it will also be important to develop the use of cost-effectiveness analysis with regard to the measures planned in order to help the authorities arrive at the decisions they will have to take.

For each problem shown in the programme the appropriate means of action will have to be selected as listed in Chapter III. The list of these ways and means needs to be continually brought up to date with the latest progress in engineering and science. Each given problem will call for a well-chosen combination of engineering, education and enforcement measures.

The ECMT plans to maintain close contact with the international organisations and national institutes concerned in order, in particular, to acquire a deeper understanding of the problem. Research is required that digs beneath the surface and delves into the complex interplay of the many factors affecting the root-causes of accidents. The effectiveness of accident prevention measures will be directly proportional to the progress made in elucidating this vital question.

In conclusion it should be understood that this is not a new, fully comprehensive road safety programme but rather the setting down of a number of major problems such as they emerge from the experience of Member countries, from the results of scientific research and from the statistical data at present available.

B. The programme itself is a medium-term programme. It covers six general problems which will be the focal points of the Conference's future work and whose study will enable priority action to be defined.

For each problem a number of specific measures is listed out. After practical analysis of the resources at its disposal, the ECMT will endeavour to formulate practical solutions which will then be recommended to Member countries.

The study of the various problems raised will also extend to the environmental aspects.

Finally, the ECMT will continue to co-operate actively in the organisation of international road safety campaigns.

The new programme covers the following items:

1. Safety of pedestrians;
2. Safety of young and learner-drivers;
3. Safety of riders of two-wheeled vehicles;
4. Safety of occupants of motor vehicles;
5. Training of learner-drivers, issue and suspension of driving licences;
6. Speed limits.

The ECMT will always feel free to enlarge this programme to include other aspects which may, in the light of subsequent developments in the various countries, become matters of urgency.

1. Safety of pedestrians

Pedestrians figure prominently in fatal road accidents and pedestrians in the under-15 and over-65 age groups account for a disproportionately high number of these road deaths.

It is intended, in the light of the detailed studies that have been made of this problem and experience acquired in various Member countries, that practical proposals will be made designed to improve pedestrian safety.

The work under this heading will relate, inter alia, to:

i) pedestrian crossings, etc. (provision, lighting, signs and signals, footpaths, pedestrian-only streets or precincts, subways);

ii) pedestrian education in general (educational campaigns, advisability of wearing a light-reflecting device at night);

iii) special measures designed to improve the safety of children and old people (education, training grounds, school patrols, special routes for children, use of special methods to reach old people);

iv) rules to be obeyed by pedestrians, and by drivers in relation to pedestrians.

2. Safety of young and learner-drivers

Young and learner-drivers are involved in a disproportionately high number of accidents. Learner-drivers lack experience and many young drivers are given to risk-taking and showy driving.

The measures which the Conference proposes to study in this area relate mainly to the training of young drivers:

i) "Engineering" measures (e. g. provision of training grounds; special signs to identify learner-drivers on the road);

ii) Learning how to drive (e. g. driving schools, driving simulators, motorway driving, driving at night and in difficult conditions);

iii) Stricter conditions for the issue of driving licences (e. g. introduction of provisional licences);

iv) Special restrictions on young drivers and learner-drivers (e. g. special speed limits).

3. Safety of riders of two-wheeled vehicles

The statistics show that riders of two-wheeled vehicles are particularly vulnerable. The following measures, whose purpose is to improve the safety of these road users, will be considered:

i) "Engineering" measures (e. g. provision of cycle and moped tracks; use of light-reflecting materials to make riders and vehicles more visible);

ii) Education measures specially applicable to riders of two-wheeled vehicles (e. g. road safety instruction at school);

iii) Enforcement measures (e. g. minimum age for cyclists, moped riders and motor-cyclists; driving licences for motor-cyclists; special speed limits; riding helmets to be compulsory for motorcycle and moped riders and passengers).

4. Safety of occupants of motor vehicles

The occupants of motor vehicles unquestionably form the category of road users worst hit by road accidents.

Work on improving motor vehicle safety from the engineering point of view, particularly as regards its construction and its external and internal fittings, is going on continuously especially with the Economic Commission for Europe at Geneva. In Annex II, Section A3 there is a review of all aspects coming under this heading. The ECMT intends to make sure that it is regularly informed of progress in this work and to provide any policy stimulus and support that may be necessary.

At the same time the Conference plans to make a study of a series of special measures, to which it attaches particular importance and which include the following items:

i) Compulsory fitment of safety belts in motor vehicles and other measures designed specifically to protect the occupants of motor vehicles;

ii) Educational measures designed to influence the motivation of drivers and to induce them to adjust their behaviour to suit the requirements of present-day road traffic (e. g. awareness of the common interests and responsibilities of all road users, and recognition of the claims of the environment and the need for temperance and for adjusting vehicle speed to suit the circumstances);

iii) Enforcement measures (e. g. compulsory wearing of safety belts; no children under 10 in the front seat; children under four to travel in special seats; compulsory periodical testing of vehicles).

5. Training of learner-drivers, issue and suspension of driving licences

The theoretical and practical training of learner-drivers and the suspension of driving licences can make a considerable contribution to road safety. Achieving greater uniformity in the basic situation in ECMT countries in this respect would be highly desirable.

The ECMT therefore proposes to make a study of the following questions:

i) The training of learner-drivers (e. g. driving schools: theoretical and practical instruction, minimum number of lessons, special equipment on driving school vehicles, special identification of driving school vehicles, training and approval of instructors);

ii) Organisation of driving tests (e. g. scope and conditions of theoretical and practical tests, official approval of examiners);

iii) Issue of driving licences (e. g. minimum age limit, medical examination, provisional driving licences, probationary driving licences, period of validity of driving licences);

iv) Suspension of driving licences (e. g. conditions in which driving licences are withdrawn or suspended; powers of legal and/or administrative authorities; centralized records of traffic offences, the problem of habitual offenders).

6. Speed limits

In Resolution CM(71)22 dated 16th December 1971, the ECMT Council of Ministers recommended that all Member countries should, inter alia:

"- impose a speed limit on drivers of motor vehicles outside built-up areas, applying to the whole road system or to as large a part of it as possible. This limit may vary according to the class of road;

- make this limit applicable also to drivers of motorcycles and light-weight lorries;

- study the possibility of introducing a uniform European system of speed limits based on scientific analyses now proceeding."

Steps should be taken to observe how the situation develops and to see what progress has been made in research at national and international level with a view to implementing the recommendations and preparing the policy decisions that will have to be taken.

The ECMT will be following up the implementation of this recommendation among Member countries, the ultimate objective being the standardization of the systems applied.

The Conference also plans to make a further attempt to standardize speed limits within built-up areas.

Lastly it is planned that the ECMT and the OECD will jointly conduct experiments designed to determine the optimum level that repressive measures should take in order to ensure that speed limits are observed.

Annex I

REPORT ON ACTION TAKEN AT NATIONAL LEVEL TO IMPLEMENT RESOLUTIONS ADOPTED BY THE COUNCIL OF MINISTERS IN THE FIELD OF ROAD SAFETY

I. TERMS OF REFERENCE

At its 29th Session, held on 11th June 1969, the Council of Ministers asked for an enquiry into the measures taken in each country to implement the Resolutions or Recommendations adopted by the ECMT.

At its 101st Session on 10th July 1969, the Committee of Deputies instructed the specialized committees to review the situation in this respect insofar as the Resolutions concerned were still of topical interest and practical significance.

At its 41st Session, held on 9th and 10th December 1970, the Road Safety Committee instructed the Belgian Delegation to draw up a questionnaire covering the information needed for a report on this subject.

II. FOREWARD

The section of Resolution No. 10 of 20th October 1959, which concerned ratification and implementation of the European Agreement supplementing the 1949 Convention on Road Traffic and Road Signs and Signals is not dealt with as these texts are now superseded by the Vienna Conventions signed in 1968. The situation with regard to the ratification of these new Conventions will be dealt with in an addendum to the European Highway Code.

The same applies to the section of this Resolution which concerns the "European Highway Code" as this is a matter for the Committee for Road Traffic Rules, Signs and Signals. The ECMT has already issued one such European Highway Code.

Resolution No. 11 on the education of road users is also omitted in this paper as a special report is being drawn up on the subject.

Information relating to Resolution No. 12 is combined with that for Resolution No. 21 (relationship between drunkenness and road accidents).

The section of Resolution No. 13 relating to driving licences is dealt with in conjunction with Resolution No. 18.

Apart from the foregoing exceptions, this report takes each resolution separately and in each case sets out:

A) the text of the Resolution;

B) an analysis of the situation in Member countries.

To ascertain the difficulties that some countries may encounter in bringing their national regulations into line with the Resolutions of the Council of Ministers of the ECMT, it was asked whether statutes are required to amend existing legislation or whether implementing orders suffice.

To ensure that these terms are interpreted consistently, it should be made clear that a "statute" calls for an Act of Parliament whereas an "implementing order" can be made by the government and requires no Act of Parliament.

Apart from Greece and Ireland, all countries replied to the questionnaire.

III. ANALYSIS OF THE SITUATION WITH REGARD TO RESOLUTIONS

1. RESOLUTION No. 10 OF 20TH OCTOBER 1959 - EXTERNAL FITTINGS OF MOTOR VEHICLES - TECHNICAL INSPECTION

A. Text of the Resolution

"The Council of Ministers of Transport,

Recommends that those Member countries which have not already done so should apply as far as possible the Resolution set out below:

.....

d) Resolution No. 76 concerning objects protruding beyond the bonnet or over the sides of the vehicle, adopted by the Road Transport Sub-Committee of the ECE Inland Transport Committee on 14th October 1955.

.....

f) Resolution No. 80 on the Technical Inspection of Motor Vehicles adopted by the Road Transport Sub-Committee of the ECE Inland Transport Committee on 21st September 1956."

B. Analysis of the situation in Member countries

1. External fittings on motor vehicles

1.1. Cutting, pointed or protruding objects involving greater hazards in the event of an accident are prohibited on the front of the vehicle in all countries except the United Kingdom, whose legislation at the present time covers only mascots (which must not be carried in any position where they are likely to strike any person with whom the vehicle may collide, unless the mascot is not liable to cause injury to such persons by reason of any projection thereon), and Italy. The United Kingdom has a similar ban under consideration, which could be effected by implementing order, and one is envisaged in Italy where statutory provisions would be required.

1.2. Such dangerous objects are also prohibited on the sides and back of the vehicle in all countries, except Belgium, Italy and the United Kingdom. The former two are prepared to amend their legislation in this connection, and it is under consideration in the United Kingdom. In Belgium and in the United Kingdom the amendment can be made by an implementing order, whereas a Statute is required in Italy.

1.3. Dangerous protuberances (over-riders), notably those of ogival shape, are prohibited on bumpers in all countries except Denmark, Italy, Norway, Turkey and the United Kingdom.

Italy envisages the prohibition of these dangerous fittings, and it is under consideration in the United Kingdom. A Statute would be required in Italy, in the United Kingdom it would be done by implementing order.

In Denmark, Norway and Turkey prohibition would require only an implementing order but these three countries do not intend to amend their regulations.

1.4. Meanwhile, the ECE has completed its work on Regulation No. 26 concerning the design of external fittings. The European Communities will issue a Directive containing similar provisions on this point.

2. Technical Inspection

2.1. All countries have government-instituted or approved bodies for technical inspection.

2.2. All categories of vehicles are usually subject to this inspection, except slow or purpose-built vehicles such as tractors, etc.

However, cars are not subject to technical inspection in France, the Netherlands, Portugal and Spain.

Furthermore, compulsory inspection of lorries in France applies only to those with a gross laden weight exceeding 6 tons; in the Netherlands it applies only to those used for carrying dangerous goods.

France, the Netherlands and Spain all envisage the extension of compulsory technical inspection requirements to all categories of vehicles. In France and Spain this can be done by an implementing order, where a Statute is required in the Netherlands.

2.3. The intervals at which buses, coaches, taxis and lorries must be inspected vary widely from country to country:

2.3.1. Buses and coaches

Belgium	3 months
Germany:	
Major inspection	1 year
Special inspection of brakes	1 year
Interim inspection	3 months
Turkey	4 months
France (public services), Luxembourg, Netherlands, Portugal, Yugoslavia	6 months

Austria
Denmark (vehicles more than 5 years old
France (private services)
Italy
Spain
Sweden
Switzerland
United Kingdom
... 1 year

Norway ..... 2 years

2.3.2. Taxis

Turkey ..... 4 months

Belgium
Luxembourg
Netherlands
Portugal
Yugoslavia
..... 6 months

Austria
Denmark
France
Germany
Italy
Spain
Sweden
Switzerland
United Kingdom
..... 1 year

Norway ..... 2 years

2.3.3 Lorries

Turkey ..... 4 months

Belgium
Luxembourg
..... 6 months

Austria
Denmark (vehicles more than 5 years old)
France (vehicles weighing over 6 tons)
Italy
Netherlands (dangerous goods)
Sweden
Spain
Switzerland (dangerous goods)
United Kingdom
Yugoslavia
.... 1 year

Germany:
- permitted gross laden weight up to 2.8 tonnes ..... 2 years major inspection
- permitted gross laden weight up to 7.5 tonnes ..... 1 year major inspection
- permitted gross laden weight over 7.5 tonnes and up to 9 tonnes .... 1 year major inspection
  1 year special inspection of brakes
- permitted gross laden weight over 9 tonnes ..... 1 year major inspection
  1 year special inspection of brakes
  6 months interim inspection

Norway ..... 2 years

Switzerland (other than dangerous goods) ..... 3 years

2.4.

2.4.1. Cars are subject to technical inspection when they have reached a certain age in the following countries: Austria, Belgium, Germany, Italy, Luxembourg, Sweden, Switzerland and the United Kingdom.

2.4.2. Cars are subject to technical inspection when they reach the age of:

4 years in Belgium;
5 years in Italy and Luxembourg;
3 years in Austria, Switzerland and the United Kingdom;
2 years in Germany and Sweden.

2.4.3. Subsequent inspection of cars is carried out yearly in Austria, Belgium, Luxembourg, Sweden and the United Kingdom, every two years in Germany, every three years in Switzerland, every five years in Italy. The interval between inspections in Norway ranges from three to five years.

2.5. In Belgium and Luxembourg (and in Switzerland if more than a year has passed since the vehicle was inspected) vehicles are subject to a further technical inspection, regardless of age, at every change of ownership.

2.6. In Luxembourg, vehicles listed under 2.3 and 2.4 are subject to technical inspection before use by their first owner.

2. RESOLUTION No. 13 OF 5TH OCTOBER 1960 - FILE OF CONVICTIONS AND OFFENCES - FIRST-AID FOR ROAD CASUALTIES

A. Text of the Resolution

"The Council of Ministers of Transport,

.....

II. Noting:

- that withdrawal of the driving licence is a very effective penalty, the threat of which may be sufficient in itself;

- that, in order to impose this penalty advisedly, the authority responsible must be in possession of all necessary information;
- that valid grounds for judgement are provided if the authority has access to a file of convictions and infringements of the Highway Code;
- that the very existence of such a file has a salutary effect on the public;
- that such a file may, at the same time, by reason of the information it provides, render other services to legislators, courts of law and administrative authorities, as well as to statistical or scientific research:

Recommends that Member countries which do not already do so should keep such a file on lines which avoid any risk of duplication of entries, but which will ensure that a driver's offences are all recorded in the same file;

Considers it desirable, in order to make the file fully effective, to enter all penalties imposed, of whatsoever kind.

III. Conscious of the importance of first-aid to persons injured in cases of accident,

Recommends:

- that printed information on this subject be supplied to applicants for driving licences;
- that drivers of motor-coaches should be required by regulation to have some knowledge of first-aid. "

B. Analysis of the situation in Member countries

1. File of convictions and offences

1.1. Every country except Austria, Belgium, Luxembourg, Norway, Sweden, Switzerland and the United Kingdom holds a central file recording a driver's infringements of the Highway Code and his convictions for such offences. In Switzerland, however, a file on infringements and convictions exists in each Canton.

1.2. Any fines (except possibly those less than a specified small amount), prison sentences and disqualifications from driving are recorded in these files wherever they exist.

In Austria, Belgium, Norway, Portugal and Switzerland, there is a central file recording all disqualifications from driving.

1.3. Traffic offenders may pay a fine to a policeman on the spot or at a police station shortly afterwards, except in Denmark, Sweden and the United Kingdom. In some countries this procedure applies only to minor offences.

Only in France, Italy and Spain are fines paid in this way recorded in the central file.

1.4. The establishment of a central file of convictions and offences is envisaged in Belgium, Switzerland and the United Kingdom. A statute is required for this purpose in Belgium and Switzerland, whereas an implementing order suffices in the United Kingdom.

2. First-aid for road casualties

2.1. An elementary knowledge of first-aid for road casualties is required of:

- bus and coach drivers in Austria, Denmark, Germany, Norway, Sweden, Switzerland and Yugoslavia;
- taxi drivers in Germany, Norway, Sweden, Switzerland and Yugoslavia;
- other drivers in Germany, Norway, Sweden, Switzerland and Yugoslavia.

2.2. Where this elementary knowledge is required, the drivers concerned are questioned on this subject before obtaining a driving licence in the following countries: Denmark, Germany, Norway, Sweden, Switzerland and Yugoslavia.

2.3. Documentation on first-aid is supplied to all driving licence candidates in Denmark, Germany, Luxembourg, Norway, Spain, Sweden and Switzerland.

2.4. The following countries have organised campaigns to induce drivers to get first-aid training: France, Germany, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and Yugoslavia. Generally speaking, no clear assessment could be provided as to the results of such campaigns.

Some countries envisage giving courses with the assistance of the Red Cross.

2.5. In Austria, driving licence candidates in all categories except bus and coach drivers must produce a certificate attesting that they have received first-aid training.

Spain intends to oblige drivers of public service and goods vehicles to take courses in first-aid and to examine them on the subject before granting a driving licence.

The Netherlands is studying the possibility of obliging all drivers to acquire the requisite first-aid training and to examine them on the subject before granting them a driving licence.

3. RESOLUTION No. 14 OF 30TH-31ST MAY 1961 - TEMPORARY SPEED LIMITS OUTSIDE BUILT-UP AREAS

A. Text of the Resolution

"The Council of Ministers of Transport

.....

Recommends that:

1. Member countries which have imposed such temporary speed limits should consider making further experiments on the same lines;

2. where possible, such experiments should be on a larger scale, either in duration or in length of road covered, or both;

3. other Member countries should consider whether temporary speed limits could usefully be tried out in their territories;

4. in applying speed limits outside built-up areas, Member countries should consider whether this could not be done in such a way as would provide information about the results which might be expected from speed limits which were applied permanently or on a larger number of roads, or both;

5. Member countries should continue to make the results of applying temporary speed limits available to other Member countries through the ECMT."

B. Analysis of the situation in Member countries

1. Since this Resolution was adopted, speed limits of a temporary nature or on a trial basis have been imposed outside built-up areas in Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Luxembourg, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom.

2. The length of such trials ranges from a few days in some countries to several years in others. Some trials are still in progress.

3. The speed limits applied vary frome one country to another. As a general rule, however, they range between 80 and 110 km. per hour.

4. The limits thus applied on a trial basis affect the entire road network in some countries (for example, Luxembourg) and only certain roads in others.

Where a speed limit is also applicable to motorways, it is higher than on other roads.

5. Permanent speed limits are currently applied in Belgium, France, Ireland, Luxembourg, Norway, Sweden, Turkey and the United Kingdom, as follows:

- Belgium: 90 km. on all roads, except motorways and four-lane carriageways (two lanes in each direction).
- Ireland: 60 m. p. h. on all roads.
- Norway: 90 km. on motorways and 80 km. on other roads.
- United Kingdom: 112 km. on all roads except 640 km. of road with a speed limit of 80 km.
- Sweden: 70 km. on 70,000 km. of road.
  90 km. on other roads, except motorways and certain other roads with a low density of traffic which have a speed limit of 110 km. (roughly 2,000 km. of road).
- Turkey: 90 km. on all roads.

6. The introduction of a speed limit has usually resulted in fewer and less severe accidents and fewer casualties.

7. A temporary or permanent speed limit is envisaged in the Netherlands and Switzerland. In Germany, large-scale trials extending over several years are to be introduced on two-lane roads (i. e. one lane in each direction) in the Autumn of 1972. In Switzerland, a three-year trial period will begin on 1st January 1973.

4. RESOLUTION No. 15 OF 29TH-30TH MAY 1962 - MINIMUM SPEED LIMITS FOR ROAD VEHICLES

A. Text of the Resolution

"The Council of Ministers of Transport,

.....

Recommends Member countries:

a) to impose a minimum speed of at least 40 km. p. h. which vehicles must be capable of attaining on the level in order to be allowed on motorways;

b) to consider the problem of the effect, from the road safety aspect, of an appropriate minimum speed for goods vehicles and combinations of vehicles brought about by adequate technical measures.

Instructs the Committee of Deputies:

a) to study the technical and practical conditions in which a minimum engine power in the towing vehicle can be fixed in relation to the total authorized weight for goods vehicles and their trailers;

b) to collect the results of the experiments on minimum speed limits."

B. Analysis of the situation in Member countries

1. Minimum speed limits on motorways

1.1. In all countries except Denmark, Italy and Turkey, vehicles allowed on motorways must be capable of attaining a specified minimum speed on the level.

1.2. This minimum speed is:

30 km. in Sweden;

40 km. in Austria, France, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom and Yugoslavia;

60 km. in Germany, Spain and Switzerland;

70 km. in Belgium.

1.3. Belgium is the only country requiring vehicles to proceed at a specified minimum speed on motorways, namely 70 km. p. h. on the level.

1.4. In some countries, specific types of vehicles are exempt from the minimum speed requirement on motorways (military vehicles, abnormal loads, etc.).

1.5. The specification of a minimum speed, which vehicles allowed on motorways must be capable of attaining, has generally helped to smooth the flow of traffic and has cut down the frequency of overtaking.

1.6. No country except the Netherlands is at present contemplating the introduction of a minimum speed requirement on motorways. An Act of Parliament is needed to introduce this measure in the Netherlands.

2. Minimum engine power in relation to total authorized weight

2.1. The countries listed below have specified minimum weight/power ratios as follows:

Germany	=	8 h. p. /tonne;
Belgium	=	5 h. p. /tonne;
Luxembourg	=	5 h. p. /tonne (8 h. p. /tonne if the authorized laden weight of the trailer exceeds that of the tractor);
Norway	=	8 h. p. /tonne;
Netherlands	=	5 h. p. /tonne;
Switzerland	=	10 h. p. /tonne for "motorcars" (rigid vehicles) and, as from 1977, for lorry-drawbar trailer combinations and articulated vehicles; 6 h. p. /tonne for road-making machinery and refuse-collection vehicles; 4 h. p. /tonne for road trains drawn by a tractor.

2.2. The power/weight ratio regulations apply to all categories of vehicle in all the above-mentioned countries. In the Federal Republic of Germany these regulations apply to lorries, coaches, passenger and goods articulated vehicles and lorry-trailer combinations.

In this connection the effective weight of the trailed load needs to be taken into account as well as the permitted gross laden weight of the tractive unit. With regard to tractive units (not agricultural tractors) the regulations require power/weight ratio of at least 3 h. p. /tonne of the permitted gross laden weight of the vehicle, trailed load included.

2.3. In Austria, recent regulations provide that the minimum power/weight ratio for coaches, lorries, tractors and certain specialized vehicles shall be 8 h. p. /tonne. In

cases where trailers are drawn by such vehicles, the minimum power/weight ratio (by reference to permitted gross laden weight) shall be 6 h. p. /tonne.

These requirements must be fulfilled as from 1st January 1980. However, they apply only to vehicles which cannot, or must not, exceed 30 km. /p. h.

2. 4. France, Spain and the United Kingdom are considering the introduction of a minimum weight/power ratio. The figure envisaged in Austria and the United Kingdom is 6 h. p. /tonne.

France, Spain and the United Kingdom could introduce such a measure by an implementing order.

2. 5. Denmark, Sweden and Turkey do not envisage taking such measures in the near future.

2. 6. The European Communities are studying this matter. At this stage of the proceedings, no provisions are planned before the end of 1979, but the specification of the following power to weight ratios is under consideration:

7 h. p. per tonne on 1st January 1980;

8 h. p. per tonne on 1st January 1985.

5. RESOLUTION No. 16 OF 29TH-30TH MAY 1962 - SAFETY OF PASSENGERS

A. Text of the Resolution

"The Council of Ministers of Transport,

. . . . . .

Recommends to Member countries:

- without making safety belts obligatory, that they introduce government-approved standards for the design, construction and anchorage of motor-vehicle safety belts, and thereby attempt to set uniform standards for the ECMT countries;
- that international standards for safety belts now being prepared in the Inland Transport Committee of the ECE be used;
- that new vehicles supplied by makers be fitted with suitable safety-belt anchorage, and that purchasers should be given a notice specifying the type or types of belt best suited to the passenger accommodation of the vehicle;
- that the organisations in the countries for information and propaganda in the road safety field be stimulated to make the public more fully aware of the importance of using safety belts.

. . . . . .

Recommends to Member countries:

- that certain types of crash helmets be approved on a national basis and that the sale of unapproved helmets be prohibited;
- that attempts be made on a national basis to expedite the work of the ISO;
- that continuous campaigns for the use of crash helmets be conducted.

. . . . . .

Recommends to Member countries:

- to promote as far as possible the use of anti-theft devices in new vehicles.

. . . . . .

Recommends to Member countries:

- that the recommendation in Resolution No. 198 adopted at Geneva on 18th December 1959 should be generally accepted."

B. Analysis of the situation in Member countries

1. Safety belts

1.1. Safety-belt anchorages must conform to a national standard in Belgium, France, the Netherlands, Norway, Portugal, Sweden, Turkey, the United Kingdom and Yugoslavia.

1.2.1. Safety-belt anchorages are compulsory on new cars in Austria, Belgium, France, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland, the United Kingdom and Yugoslavia.

1.2.2. Anchorages are compulsory for front seats in all these countries; in France and Sweden they are also compulsory for back seats.

1.2.3. In all these countries, anchorages are compulsory only on cars and vehicles in the station-wagon category. In Norway, they are also compulsory on goods transport vehicles of less than 3.5 tons authorized laden weight.

1.3. New vehicles must be fitted with safety belts in Belgium, France, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and, as from 1st January 1973, in Spain.

1.4.1. Safety belts must conform to a national standard in all countries except Italy and Luxembourg.

1.4.2. Except in the United Kingdom, the national standards comply with the specifications laid down in Geneva by the ECE.

1.5. In no ECMT country is the use of safety belts compulsory. However, Sweden and Turkey are considering the possibility of making it so, and studies are also proceeding in Switzerland.

1.6.1. Campaigns to persuade motorists to use safety belts have been organised in all countries except Italy, Spain, Turkey and Yugoslavia.

1.6.2. Generally speaking, these campaigns do not appear to have given very satisfactory results.

1.7. Germany, Italy and Turkey intend to make anchorages and safety belts compulsory on new vehicles.

An Act of Parliament is required for this purpose in Italy, whereas an Implementing Order is sufficient in Germany and Turkey.

2. Crash Helmets

2.1. It is compulsory for motorcyclists to wear a crash helmet in Belgium, Luxembourg, the Netherlands, Portugal and Yugoslavia.

2.2. In these five countries, this applies to passengers and drivers alike; in France, it applies to the driver only.

2.3. In Belgium, Luxembourg and the Netherlands it is compulsory to wear a crash helmet both inside and outside built-up areas. In France and Yugoslavia it is compulsory to wear helmets only outside built-up areas.

2.4. Crash helmets must conform to a national standard except in Denmark, Italy, Luxembourg, the Netherlands, Spain and Turkey.

2.5.1. Campaigns to encourage the use of crash helmets have been organised in all countries except Austria, Belgium, Italy, Luxembourg, Spain and Turkey.

2.5.2. Although it is very difficult to evaluate the results of such campaigns, they generally appear to have been satisfactory.

2.6. Compulsory wearing of crash helmets is under consideration in Italy, the United Kingdom and Turkey. Sweden is also studying this point. Compulsory wearing of crash helmets for moped riders is under consideration in the Netherlands. This would require an Act of Parliament in Italy and Sweden, but an implementing order would be sufficient in the United Kingdom and Turkey.

3. Anti-theft devices

3.1. Vehicles must be fitted with an anti-theft device in Austria, Denmark, France, Germany, Norway, Switzerland and Yugoslavia. The same will apply to Spain as from 1st January 1973.

3.2. This obligation applies to all categories of vehicle in Denmark and Norway, whereas it usually applies only to cars and two-wheel vehicles in the other countries.

3.3. Provision for compulsory anti-theft devices is envisaged in Belgium, Italy, Sweden and the United Kingdom.

4. Internal fittings of vehicles

4.1. Except in Italy, Spain and the United Kingdom, there are provisions to the effect that vehicle exhaust gases must be evacuated in such a way as to ensure that they cannot invade the passenger compartment. The engine must be insulated from the passenger compartment in such a way that gases, vapours and fumes cannot seep into the latter.

4.2. Except in Belgium, Denmark, Italy, Luxembourg, Spain, Turkey and the United Kingdom, the internal fittings of vehicles must be so designed as to ensure that there are no protuberances or sharp edges which might increase the seriousness of injuries in the event of an accident.

4.3. Door-hinges must be placed on the side of the door nearest to the front of the vehicle in Belgium, France, Germany, the Netherlands, Norway, Switzerland and Yugoslavia.

4.4.1. A driving-mirror inside motor vehicles is compulsory in the following countries: Austria, Denmark, France, Germany, the Netherlands, Norway, Spain, Sweden and Yugoslavia.

4.4.2. All countries allow one or more driving mirrors to be fitted on the outside of a vehicle.

4.4.3. In all countries, private cars must be fitted with at least one driving mirror. Two are compulsory in Austria, Switzerland and Germany. In Norway there must be at least one inside and two outside. In France and the Netherlands, an external mirror is also compulsory.

4. 4. Except for Denmark and Luxembourg, all countries envisage bringing their national regulations into line with the ECE recommendations concerning the internal fittings of vehicles.

An Act of Parliament is required for this purpose in Italy, but an implementing order is sufficient in the other countries.

6. RESOLUTION No. 17 OF 27TH NOVEMBER 1962 - RESTRICTIONS ON LORRY TRAFFIC (Sundays and public holidays)

A. Text of the Resolution

"The Council of Ministers of Transport,

.....

Recommends the Member countries*

- insofar as road safety is concerned, to take the necessary steps to this end as soon as possible wherever there is heavy traffic of commercial vehicles and private cars on Sundays and public holidays;
- to consider, as a measure of this kind, the restriction of the movement of commercial vehicles above a certain authorized weight, to be fixed by national legislation, on Sundays and public holidays during the appropriate hours, particularly on main roads with heavy traffic;
- to grant exceptions to the restrictions on the movement of commercial vehicles insofar as is justified by business practice and the characteristics of the traffic."

B. Analysis of the situation in Member countries

1. Restrictions on lorry traffic on Sundays and public holidays are applied in the following countries: Austria, France, Germany, Italy, the Netherlands, Sweden, Switzerland and Yugoslavia.

2. These restrictions are applicable on all Sundays and public holidays in most of these countries; in others they are applicable only at certain times of the year.

Some countries also restrict lorry traffic during the holiday period or at other times when holiday traffic is on a massive scale.

3. The hours during which these restrictions are applicable vary considerably from one country to another.

4. Similarly, there are substantial differences from country to country as regards the categories of lorry to which restrictions apply. For example, they are applicable to lorries of more than:

- 3. 5 tons in Austria and Switzerland;
- 5 tons in Italy and Yugoslavia;
- 7 tons in Sweden;
- 7. 5 tons in Germany.

5. Generally speaking, the above-mentioned restrictions are applicable on all roads including motorways.

6. Apart from the countries mentioned in paragraph 1, Spain alone envisages the introduction of restrictions on lorry traffic on Sundays and public holidays.

* The Danish and Swedish Delegations entered a reservation in this connection.

7. RESOLUTION No. 18 OF 25TH-26TH NOVEMBER 1963 (+ No. 13 OF 5TH OCTOBER 1960) - DRIVING LICENCES

A. Text of the Resolution

"The Council of Ministers of Transport,

.....

RESOLUTION No. 13

.....

Recommends the fixing of a minimum age for taxi-drivers, higher than the lower age limit for drivers of private cars, as is already the case for motor-coach drivers.

.....

RESOLUTION No. 18

.....

Recommends that Member countries take adequate steps:

1. Where it is compulsory or customary to attend a driving school, to raise the standard of training provided by such schools, particularly by approving professional instructors after making sure that certain minimum conditions have been fulfilled: such instructors are to hold at least the driving livence appropriate to the categories for which they wish to teach and offer personal guarantees of moral qualities and the necessary professional skills.

2. In the case of private instruction, to consider whether the person other than a professional instructor accompanying the learner should have held a licence to drive vehicles of the appropriate category for a definite minimum period.

3. To ensure that the person accompanying the learner during training and examination can take effective action at any moment.

4. To ensure that, as far as possible, the candidate's training covers his ability to drive on trunk roads and during hours of darkness.

5. To ensure that the test deals less with technical knowledge of the vehicle than with behaviour in traffic, even for candidates for licences to drive motor-coaches and heavy lorries.

6. To ensure that the test deals, as far as possible, with the matters referred to in the foregoing paragraph 4.

7. To give special importance to the practical test* and ensure that it lasts long enough for the examiner to form a sound judgement of the candidate's capabilities.

8. To consider the possibility of providing training grounds, off the public highway, on which candidates and qualified drivers who lack experience could practice driving unaccompanied."

B. Analysis of the situation in Member countries

1. A medical examination is one of the requirements for obtaining a driving licence in Austria, Italy, Spain, Portugal and Yugoslavia. In Italy, it has to be repeated every ten years.

* The Belgian Delegation, which would have liked the words "if any" to be added here, entered a reservation on this point.

2. In all countries, drivers of buses, coaches and taxis must pass a medical examination before obtaining a driving licence.

3. Persons aged over 65 years are obliged to pass a medical examination before obtaining a driving licence in the following countries: Austria, Denmark, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Switzerland and Turkey. In Italy, it has to be repeated every five years.

4. Except in Belgium and France, all candidates for a driving licence must have their sight tested.

5.1. The lower age-limit for driving a car is 18 in all countries except the United Kingdom, where it is 17.

5.2. The lower age-limit for driving a taxi is also 18 years in France, the Netherlands, Portugal, Switzerland and Yugoslavia, 19 in Turkey, 20 in Luxembourg and Norway, 21 in all the other countries.

5.3. The lower age-limit for driving a bus or coach is 19 in Turkey and 21 in all the other countries with the following exceptions: 22 in Switzerland, 23 in Germany, 24 in Austria and 25 in Portugal.

6. Driving school tuition is a prerequisite for obtaining a licence only in Denmark, Luxembourg and some Yugoslav Republics. In these cases, driving school tuition is compulsory for both theory (Highway Code) and practical training.

7.1. Driving school instructors must have official qualifications in all countries except the Netherlands and Turkey.

7.2. The official qualifications required to become a driving school instructor vary according to the country. In most countries, candidates for the post of instructor must have held a driving licence for some years, comply with certain ethical standards and pass a qualifying examination.

7.3. In all countries, this examination covers road traffic rules; the would-be instructor is also tested on teaching methods, except in Luxembourg.

In some countries, the examination also covers elements of psychology and first-aid.

8. In all countries, candidates for driving licences are questioned on the Highway Code.

9. A practical driving test must also be passed for all categories of vehicle in every country except Belgium, where no practical test is required for obtaining a car driving licence.

10. In most countries, a driving-licence candidate's training does not specifically cover driving at night and driving on inter-city roads.

11.1. The minimum number of hours that driving schools spend on Highway Code instruction varies considerably from one country to another, e.g. six hours in Luxembourg, 8 to 10 hours in Belgium, 12 hours in Italy, 18 hours in Spain and 30 hours in Yugoslavia.

There is no fixed minimum number of hours in the other countries.

11.2. The minimum number of hours spent on practical driving instruction is not usually fixed and varies considerably from one country to another, e.g. 8 hours in Italy and 25 hours in Yugoslavia.

12. The practical driving test usually takes 30 to 45 minutes.

13. Training grounds off the public highway are provided for driving-licence candidates in Germany, Italy, Portugal, Spain, Switzerland and Turkey.

14. All countries envisage bringing their legislation into line with Resolutions Nos. 13 and 18 where it does not already conform. An Act of Parliament is required for this purpose in most countries.

8. RESOLUTION No. 19 OF 3RD DECEMBER 1964 - MAXIMUM SPEED LIMITS IN BUILT-UP AREAS

A. Text of the Resolution

"The Council of Ministers of Transport,

.....

Recommends that all Member countries:*

- which have not already done so should lay down a maximum speed limit in built-up areas in order to achieve this aim [increased road safety];
- fix the maximum speed at 50 km. p. h. (30 m. p. h.) or 60 km. p. h. (40 m. p. h.) at their discretion and clearly indicate the beginning and end of speed limits;
- allow the possibility of exceptions above or below this level for certain roads or sections of road where conditions allow for faster traffic or require slower traffic, and expressly indicate these exceptions by means of road signs;
- take all appropriate measures to ensure that the prescribed maximum speed is effectively observed by drivers of motor vehicles."

B. Analysis of the situation in Member countries

1. The speed of vehicles is limited in built-up areas in all countries except Denmark and Spain.

Spain intends to apply a speed limit in built-up areas; an implementing order will suffice for this purpose.

2. The authorized maximum speed limit is:

- 50 km. p. h. in Austria, Germany, Ireland (30 miles), Italy, the Netherlands, Norway, Sweden, Turkey and the United Kingdom (30 miles);
- 60 km. p. h. in Belgium, France, Luxembourg, Portugal, Switzerland and Yugoslavia.

3. The points at which speed limits begin and end are signposted in every country, but the signs are not identical in all countries.

4. In most countries, limits below those referred to in paragraph 2 can be imposed on certain sections of road in built-up areas.

5. 1. Speeds in excess of the limits referred to in paragraph 2 are authorized on certain road sections in built-up areas in all countries except Portugal, Turkey and Yugoslavia.

5. 2. The maximum speed authorized on such road sections is generally 20 km. p. h. above the normal speed limit in built-up areas (70 km. p. h. in countries where the limit is 50 km. p. h. and 80 km. p. h. in countries with a 60 km. p. h. limit).

9. RESOLUTION No. 20 OF 1ST DECEMBER 1966 - INTERNATIONAL COACH PASSENGER TRANSPORT

A. Text of the Resolution

"The Council of Ministers of Transport,

.....

* The Danish Delegation entered a reservation on this point.

Resolves that the Inland Transport Committee of the Economic Commission for Europe be requested to give urgent consideration to international requirements concerning the construction and equipment of motor coaches.

Instructs the Committee of Deputies to assemble and analyse all available information concerning the circumstances of accidents involving motor coaches in international traffic during 1966;

Resolves that Member countries which have signed but not ratified the AETR should take steps to bring about ratification as soon as possible and that countries which have not signed should adhere;

Instructs the Committee of Deputies to initiate urgently studies of possible improvements which may be desirable in the provisions of the AETR, and in this connection to maintain close contact with the European Economic Community;

Urges Member countries to take the measures of enforcement necessary to ensure that motor vehicles are maintained in accordance with the needs of safety, if they have not already done so."

B. Analysis of the situation in Member countries

1. The amended version of the AETR recently drawn up by the United Nations Economic Commission for Europe has been signed by all countries except Turkey but that country envisages adhering to the Agreement in due course.

2. The period normally required for ratification of the AETR as amended is between 6 months and 2 years.

3. Coaches are subject to periodical technical inspection in all countries. The intervals at which this is done are shown in the analysis of Resolution No. 10.

10. RESOLUTION No. 21 OF 14TH JUNE 1967 (+No. 12 OF 5TH OCTOBER 1960) THE RELATIONSHIP BETWEEN DRUNKENNESS AND ROAD ACCIDENTS

A. Text of the Resolution

"The Council of Ministers of Transport,

.....

Recommends the Member countries:

a) first, to consider the recommendations in Resolution No. 12 of 1960 as still valid;

b) to improve and amplify their accident statistics in such a way that, not only if drinking is plainly the main cause but one of several factors to be taken into account, the figures will be drawn up accordingly, and to take the necessary steps to make such statistics validly comparable from one country to another;

c) to take the necessary steps to ensure that not only drunken drivers but those under the influence of drink may be more easily traced;

To this end,

1) to perfect and simplify the detection of drunken drivers by quick check tests (e. g. the breath test);

2) to ensure legal provision for a blood test in the following cases:

- evident drunkenness, whether or not involving any accident or serious traffic offence;

- accidents involving fatal casualties or serious bodily injuries, and serious traffic offences, if the driver is suspected of being under the influence of drink even though he is not obviously so;

it being understood that national legislation will specify whether the driver's consent to a blood test is required and the consequences that follow if he refuses;

d) to prescribe for blood alcohol concentration a legal level beyond which the driver of a motor vehicle would be liable to the sanctions laid down for driving under the influence of alcohol. 0.8 per mille should generally be adopted as the standard for this purpose insofar as no lower level has been fixed;*

e) to apply these sanctions even when there has been no traffic offence nor accident;

f) to provide for the withdrawal of the driving licence among the above sanctions.

B. Analysis of the situation in Member countries

1. In all countries except Denmark, Italy, the Netherlands, Spain, Portugal and Turkey, there is a critical threshold for the level of alcohol concentration in the blood beyond which any person is deemed to be under the influence of drink, and such thresholds are determined by legislation or by the courts.

2. These thresholds are as follows:

- 0.5 per mille in Norway, Sweden and Yugoslavia;
- 0.8 per mille in Austria, France, Luxembourg,** Switzerland and the United Kingdom;
- 1.2 per mille in Luxembourg;**
- 1.3 per mille in Germany;
- 1.5 per mille in Belgium (preventive measures - not penalties - are applicable as from 0.8 per mille).

3.1. Belgium, Denmark, Germany, Italy and Portugal envisage prescribing a threshold of 0.8 per mille.

In the Netherlands the threshold envisaged is 0.5 per mille. An Act of Parliament is required for this purpose in all these countries.

3.2. No legal threshold of the kind mentioned above is at present envisaged in Spain and Turkey.

4.1. Breath tests are used to detect drivers under the influence of drink in all countries except Italy, the Netherlands, Portugal, Spain and Turkey.

4.2. The introduction of the breath test is envisaged in Italy, the Netherlands and Portugal, but not, for the time being, in Spain and Turkey.

* The Danish Delegation entered a reservation in the following terms:
"In the Danish traffic law, it is prescribed that a motor driven vehicle may not be conducted or attempted to be conducted by any person who has consumed a quantity of alcohol which disables him from conducting the vehicle with full safety.

If a legal level for blood alcohol concentration is fixed beyond which a driver is liable to sanctions, this will involve a new type of crime, the basis of which will be not the actual danger caused by the driver in question but the overall danger which is typically caused by persons driving motor vehicles with a blood alcohol concentration above the fixed level.

The introduction of such a regulation which would mean a radical change in the Danish road traffic legislation is being discussed in the Nordic Council. For the time being, the Danish authorities doubt the advisability of introducing a legal level for blood alcohol concentration and would therefore like to wait for the result of this discussion before recommending a radical change of the law."

** In Luxembourg, a concentration of 0.8 per mille is treated as a minor infraction ("contravention"); a concentration of 1.2 per mille or more is treated as a more serious offence ("délit").

4.3. Systems other than the breath test for quick detection of drivers under the influence of drink are neither used nor planned in any country.

5. Generally speaking, the breath test is applied to any person who is driving, preparing to drive, is involved in an accident or commits a serious traffic offence.

In some countries the breath test may only be applied if the driver shows symptons which give reason to believe that he is under the influence of drink.

6.1. Sanctions are imposed only if the result of the breath test is corroborated by other means, in particular a blood test. In some Swiss Cantons, sanctions may be imposed on the driver when the breath test is positive (over 1 per mille) and he does not question its result.

In all Member countries, these provisions are applicable even in cases where there is no accident or no offence committed.

In Austria and the United Kingdom penalties can be imposed solely on the basis of the breath test without a corrobatory blood test.

6.2. In most countries, when a driver's blood test shows an alcohol concentration behond the rate specified by law, he is at once prevented from driving for as long as he remains under the influence of drink.

This is done either by keeping the vehicle out of his control or, more commonly, by confiscating his driving licence.

7. In the following countries, when a driver shows evident signs of drunkenness, a blood test may be taken even if there has been no accident or serious traffic offence: Belgium, Denmark, France, Germany, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom and Yugoslavia.

8. In the following countries, in the event of an accident or serious traffic offence, a blood test may be taken when there are symptoms that give reason to believe that the driver is under the influence of drink even though he is not evidently drunk: Austria, Belgium, Denmark, France, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and Yugoslavia.

9. In most countries, sanctions may be imposed on drivers who refuse to submit to a blood test or other test.

10.1. Most countries regularly organise campaigns to draw the attention of road users to the risks of driving under the influence of drink. International campaigns sponsored by the ECMT have also been organised in most countries.

10.2. It is difficult to evaluate the results of such campaigns but they are generally assumed to be good.

Annex II

CLASSIFIED LIST OF MEANS THEORETICALLY AVAILABLE FOR ROAD ACCIDENT PREVENTION

A. ENGINEERING

1. Road design

a) Roads, their construction and condition have an important bearing on accidents since it is on them and within the "traffic area" they form that pedestrians and drivers or passengers of vehicles travel. Road surfaces and edges, and approaches to roads, are often divided and marked with various kinds of signs and signals; the technical characteristics and organisation of the traffic area nowadays has the status of a science and is known as "traffic engineering" (see item 2 below).

b) Modern road construction can contribute to road safety in many ways. Firstly, in terms of road alignment (radius of bends, banking, road design speeds, visibility range, provision of slow and fast lanes, correlation between surface strength and road cross-section) and secondly in the development of non-skid road surfaces.

2. Traffic from the engineering standpoint

a) Various means are used in order to direct traffic on the road in order to ensure that it moves with maximum safety:

- light signals, road markings (at centre and edges), traffic lanes and reflectorized posts at the roadside;
- improvements to the roadside area, in particular by planting appropriate vegetation;
- fences to keep animals off the road;
- road and street lighting;
- traffic control systems, particularly light signals;
- panels indicating routes, roadworks and instructions to traffic in the roadworks area.

b) For the direction and guidance of traffic on the road network outside built-up areas, the following are being used or are envisaged:

- panels with systematic place-name indication (long-range or close-range);
- numbering systems for motorways, trunk roads, etc.;
- visual traffic routing by means of a mobile system of panels indicating turnings to be taken (to divert traffic to alternative routes or secondary roads);
- computer-monitored traffic routing for the whole, or certain parts, of the road network;

- traffic lane signals (variable light signals), the barring of lanes to traffic in this or that direction depending on the main traffic flow;
- the control of traffic speed by variable signals to suit the state of traffic;
- automatic fog and ice warning systems;
- radio and telephone services providing information and warnings about the state of the roads.

c) The main purpose of the routing of urban traffic is to direct it according to destination (inward or outward), co-ordinate traffic in the various parts of the network (linked traffic lights), ensure pedestrians' safety (subways and foot bridges, areas barred to vehicles) and provide suitable indication of parking areas.

d) To ease the flow of traffic. For different categories of road users, tracks can be provided for cyclists, reserved lanes for buses, separate precincts for pedestrians, etc.

e) The following are designed to mitigate the effects of accidents:

- crash barriers, to prevent vehicles coming off the highway,
- collapsible roadside signposts, etc. and, if possible, removal of obstacles, such as trees, too near the edge of the road.

f) Another way in which road engineering may help to improve road safety in certain cases is the definition, study and elimination of the principal "black spots" (places where accidents commonly occur).

g) Signs informing the driver with regard to inter-vehicle distance, overtaking and lane discipline, may also help to prevent certain types of accidents (overtaking accidents, going off the road, nose-to-tail collisions, accidents at night, etc.). Highway engineers, ophthalmologists and psychologists have already begun to co-operate in this field. They may use working models for their studies (e. g. "psychological visibility range" models), or modern techniques based on cybernetics. An important factor here, however, is the acceptance of such systems by drivers.

3. The motor vehicle

a) From the technical point of view, the safety of a motor vehicle depends on its design, on the reliability of its equipment (steering gear, brakes, lighting and tyres - so-called "primary safety"), and the design of the interior of the passenger compartment to mitigate the effects of an accident (seats, headrests, gear-change lever, instrument panel and windscreen - so-called "secondary safety").

The safety measures dependent on motor vehicle design may have the backing of legislation or regulations requiring certain technical standards to be complied with (vehicle construction and use regulations) or of action initiated by the motor industry itself.

b) International co-operation is already highly developed in the field of motor vehicle design. The United Nations Economics Commission for Europe at Geneva has already laid down a number of standard rules, which are in process of adoption in the various States, for many motor vehicle parts. Some current instances are listed below:

R 1 Motor vehicle headlights emitting an asymmetrical passing beam.

R 2 Incandescent electric lamps for headlights emitting an asymmetrical passing beam.

R 3 Reflector devices for motor vehicles.

R 4 Devices for lighting the rear number plate.

R 5 Motor vehicle "sealed beam" headlights emitting an asymmetrical passing beam.

R 6 Direction indicators.

R 7 Position (side) lights, red rear lights and stop lights.

R 8 Motor vehicle headlights emitting an asymmetrical passing beam and/or driving beam and equipped with halogen lamps (H_1, H_2 and H_3 lamps).

R 9 Measurement of noise caused by motor vehicles (note: differs from European Economic Community directives).

R 10 Radio interference suppression for motor vehicles.

R 11 Strength of motor car door latches and hinges.

R 12 Protection of motor car drivers against the steering mechanism in the event of impact.

R 13 Braking devices (motor vehicles and trailers) (note: differs from European Economic Community directives).

R 14 Safety-belt anchorages on passenger cars.

R 15 Emission of gaseous pollutants by petrol engines (carbon monoxide and hydrocarbons).

R 16 Safety belts for adult occupants of power-driven vehicles.

R 17 Strength of passenger car seats and their anchorages.

R 18 Protection against unauthorized use of motor vehicles.

R 19 Motor vehicle fog lights.

R 20 Motor vehicle headlights emitting an asymmetrical passing beam and/or driving beam and equipped with halogen lamps (H_4 lamps).

R 21 Improvements to passenger compartment of private cars.

R 22 Protective helmets for motorcycle riders and passengers.

R 23 Reversing lights.

R 24 The emission of pollutants by diesel engines.

R 25 Head restraints (headrests) in passenger cars.

R 26 Design of external parts.

c) As a result of efforts made in the United States, several countries are in favour of the experimental design of so-called "safe cars" which would give substantially better chances of survival when they are involved in a collision or overturn.

B. EDUCATION

The need for education and information with regard to road safety applies to all age groups and all road-user categories. Their role is to motivate, in other words to modify the mental approach and behaviour of the road user.

Efforts made in this direction have a vital bearing on accident prevention since most traffic accidents are due to human failings (see Chapter II setting out the main causes of accidents).

Modern thinking with regard to the education and information of road users singles out three main criteria:

a) the objective should be to reach all age groups and all road-user categories (pedestrians, motorcyclists, etc.). The psychological approach should be specifically tailored to each age-group and road-user category;

b) today accident prevention needs to use modern methods capable of influencing human behaviour in present-day communities and enabling suitable techniques to be devised for selective application. The objective should be close co-ordination of all the mass media, the utilization of the tenets of advertising psychology and the application of the whole vast range of modern information and motivation techniques whether for small and detailed operations or for full-scale publicity campaigns;

c) governments are tending increasingly to see road-user education and information as their responsibility and to regard it as their duty to support this activity in the form of financial assistance since it involves the protection of the public. The need here is for close government co-operation with private road safety organisations, motor clubs, the car industry, insurance companies, and so on.

For further details, see:

- conclusions of the second ECMT/Council of Europe Joint Conference on Road Safety Education in Schools held on 21st to 26th June 1971 in Vienna [CM(71)17];
- the report on education and information of road users approved by the ECMT Council of Ministers in June 1972 [cf. CM(72)9 of 5th May 1972].

C. REGULATIONS

This has five different aspects:

a) driving licences;

b) road licences;

c) traffic rules (road user behaviour) and road signs and signals;

d) control measures:
   - regarding traffic flow;
   - regarding vehicles, i. e. periodical or systematic inspection designed to check their safety and roadworthiness;

e) enforcement.

1. Requirements related to driving licences

This covers the following points:

- the issue of driving licences (ordinary, temporary, provisional or probationary, the latter, for example, being conditional on the observance of a maximum speed limit and the display of an appropriate plate);
- training of candidates for driving licences;
- the definition of conditions in which candidates shall undergo medical or psychological examination;
- permanent or temporary suspension of driving licence accompanied by a ban on driving;
- administrative procedures in case of repeated infringement of road traffic rules;
- requirements, in the broad sense, with regard to the training of driving-school instructors and driving-test examiners;

2. Requirements related to the use of vehicles

This heading covers legal requirements and administrative rules regarding [see also Section A. 3]:

- type approval of vehicles and their parts;
- the use of tachographs or logbooks;
- technical requirements regarding vehicle maintenance and testing;
- requirements regarding a vehicle's equipment and its use (studded tyres, for instance).

3. Traffic rules (road-user behaviour) and road signs and signals

These legal or administrative measures mainly concern:

- the control of road traffic, including provisions regarding rules, signs and signals, speed limits (general limits, trial limits, or limits on certain road categories) and general or special restrictions on traffic (on Sundays, public holidays, etc.);
- provisions concerning hours of driving and rest periods, shift working, breaks, holidays and prohibition of productivity bonuses;
- provisions for carriage of dangerous goods (toxic products, flammable liquids, acids, etc.), requirements for transport of such products, technical requirements for vehicles, more particularly for road tankers, etc. (See, for instance, the ADR rules for international traffic.)

4. Control

Traffic control is generally in the hands of the police. ECMT paper /CM(7019/ describes in detail the possibilities of providing the police with effective ways and means of controlling road traffic if their number are increased and they are given the necessary technical equipment. Police action can take the following form:

- systematic monitoring of dangerous traffic offences, coupled with the education of the road users involved;
- speed checks;
- surveillance of sensitive traffic points;
- plain-clothes patrols;
- automatic filming at cross-roads (this also comes under the "engineering" heading) and utilization of results;
- television monitoring (this also comes under the "engineering" heading);
- breath tests;
- systematic inspection of vehicles in use (lighting, tyres, etc.);

Experience in many Member countries has shown that effective police control considerably improves compliance with traffic rules.

5. Enforcement

Apart from fines and prison sentences, the government authorities and courts may take a number of secondary measures or impose certain conditions such as:

- compulsory driving courses or instruction given by the police;
- obligation to retake the driving test;
- temporary driving bans, etc.

In this connection, centralized records of major traffic offences could also contribute to road safety.

REPORT OF THE COMMITTEE OF DEPUTIES ON PROBLEMS CONCERNING COMBINED TRANSPORT

[CM(72)7]

CONTENTS

I. FOREWORD

1. At its 32nd Session, on 17th December 1970 in Paris, the Council of Ministers approved the report on present problems concerning combined transport with special reference to large containers [CM(70)18] * and, at the same time, gave the following instruction to the Committee of Deputies:

- in co-operation with the international organisations, to watch the development of combined transport, especially large container transport, in relation to the different modes of transport concerned;
- to ascertain the technical, economic or administrative obstacles which may perhaps impede the wider extension of combined transport, and to submit various proposed solutions, especially as regards intra-European traffic;
- to consider the problems raised by the financing of investment required for the development of containerization;
- to propose various measures for promoting piggy-back transport at national and international level, bearing in mind, in particular, the positive experiments conducted by certain railway companies in the United States;
- to investigate the impact of LASH transport on inland water transport;
- to report to the Council of Ministers for its June 1972 Session.

2. The Committee of Deputies instructed the Combined Transport Group to draft this additional report. The members of the Group are Experts from the Federal Republic of Germany (Chairman), Belgium, France, Italy, the Netherlands, the United Kingdom, Sweden and Switzerland. Representatives of the Secretariat of the OECD Maritime Transport Committee and the Secretariat of the Economic Commission for Europe also took part in the discussions.

3. As instructed, the Group discussed the draft of this report with the representatives of the International Organisations concerned.

A hearing was arranged for these Organisations in Paris on 14th March 1972, and representatives of the OECD Secretariat also attended. The following Organisations took part or sent in their comments:

1. United Nations Economic Commission for Europe (ECE)
2. Organisation for Economic Co-operation and Development (OECD)
3. International Union of Railways (UIC) and Intercontainer
4. International Road Transport Union (IRU)
5. International Union for Inland Navigation (UINF)
6. International Chamber of Shipping (ICS)
7. Air Transport Institute (ITA)

* In this report "large containers" means containers at least 20 feet (6.06 m) in length.

8. International Union of Combined Rail/Road Transport Companies (UITC)
9. International Federation of Forwarding Agents Associations (FIATA)
10. International Chamber of Commerce (ICC)
11. International Container Bureau (ICB)
12. World Confederation of Labour (CMT)
13. International Standardization Organisation (ISO).

The International Organisations generally expressed their satisfaction regarding the draft report submitted to them. They gave special attention to co-operation between modes of transport concerned, to the harmonization of standards for road vehicles, combined transport technologies and containers, and to suitable tariffs for such transport.

These Organisations also provided useful contributions, either orally or in writing, and these have been duly taken into account in the final drafting of the report.

II. DEVELOPMENT OF LARGE CONTAINER AND ROLL-ON/ROLL-OFF TRANSPORT *

1. Seaborne container transport trends as shown in the OECD Maritime Transport Committee's Report

a) General

Virtually all existing deep-sea container capacity is employed on the routes between North America (East and West Coasts), Europe, Australia/New Zealand and Japan/Far East. Otherwise, large container vessels are only used on some regional, inter-coastal services in North America and Australia. Outside the four regions, only a few services exist using part-container, e. g. between North America and South America and between Western Europe and Africa. It is, therefore, not surprising that ownership of container vessels has so far been virtually limited to flags of OECD countries.

1971 was a year of consolidation on the older container routes, such as the North Atlantic and the Europe - Australia routes, of rapid growth on others, for instance the Japan - North America routes, and of preparation for the Europe - Far East services.

b) Developments on major routes affecting Europe in 1971

i) Western Europe - North America

The North Atlantic route between North-Western Europe and the American East Coast was the first inter-regional route to be containerized and is today by far the most important one. An agreement was reached in November 1971 and filed for approval with the United States Federal Maritime Commission. Major operators which are not part of the North Atlantic pooling agreement are Manchester Liners and Canadian Pacific which serve only European and Canadian ports. The implementation of a pooling and revenue sharing agreement in the North Atlantic trade is subject to the approval of United States authorities and this might still create problems, even though the U. S. flag lines involved are exempt from certain aspects of the anti-trust legislation. If approved, the agreement could contribute to a normalization of the trade.

*. Under the ECC definition, "roll-on/roll-off" services are those in which vehicles (railway wagons, lorries, trailers, semi-trailers, containers, etc.) can be transferred from one mode of transport to another either on their own wheels or with the help of detachable axles or moving platforms. Similarly, "lift-on/lift-off" services are those where transport equipment is transferred from one mode to another by means of appropriate lifting gear. These terms are usually applied only to transfers from a mode of land transport to a ship and vice-versa.

By all indications, the North Atlantic route is now fully containerized.

Considerable progress was made on the Europe - North America West Coast route with increased capacity of the Johnson Line container/pallet service and the introduction of the Scanstar service (Blue Star Line, East Asiatic Co.) which operates the first large full-container ships on this route. A major development was the introduction of the first barge carrier services between Mediterranean ports and the United States East Coast.

ii) Western Europe - Japan/Far East

This is one of the world's most important liner routes, second only to the North Atlantic. It is also one of the longest routes and the introduction of container services in 1972/1973 will be the largest and most costly venture to date in commercial shipping. There are now 25 vessels with 820,000 dwt and a capacity of nearly 50,000 containers delivered or under construction for this route. In mid-1971, total movements suitable for containerization were estimated at 4 million tons, more or less evenly distributed between the two directions. During an initial period, however, when mainly European and Japanese ports will be served, the vessels are expected to be under-utilized on the east-bound voyages. The service was inaugurated at the very end of 1971, calling at Southampton, Rotterdam and Hamburg and at Tokyo/Kobe. By mid-1972, six to eight very large ships (1,800 to 2,300 containers, about 27,000 to 40,000 dwt, 25 knots) will be operating and Singapore will be served. Hong Kong, Port Swettenham (Malaysia) and Kaohsiung (Formosa) are to follow. By the end of 1973, the "Trio-Group", made up of ACT, OCL, NYK, Mitsui-OSK and Hapag-Lloyd, will be operating 17 vessels and another six will be employed on a combined service of Nedlloyd and Scan-service, under the name of ScanDutch Line. The latter service will commence in April 1972.

iii) Western Europe - Australia/New Zealand

Serious doubts were raised about the general future of containerization when far-advanced plans for a United Kingdom/New Zealand container service were cancelled in May 1971. OCL and ACT had already ordered four large vessels intended to replace by 1973/1974, 20 conventional lines on this route. High increases in operating costs and insufficient revenue prospects were given as the main reasons for this decision, but in October 1971, following a substantial increase of freight rates, it was rumoured that the question might be re-examined in 1972.

In the meantime, two members of the Australia-Europe Container Service (ACT and Australian National Line) announced that they will withdraw their three ships from the consortium in 1972, in order to set up a separate service to both Australia and New Zealand which is to be integrated with the Pace Line service between Australia/New Zealand and North America.

c) The world container fleet in 1971

i) The deep-sea fleet of unit-load vessels

The total existing fleet consisted of 265 vessels with a combined carrying capacity of 155,000 containers. Full container ships accounted for about half of all vessels and two-thirds of carrying capacity. Their share in the new building orders was significantly higher, with 80% of all ships and of total carrying capacity.

Roll-on/roll-off container ships may constitute a convenient form of transport for certain long-distance trade routes. They nevertheless seemed to be of declining importance, with 9% of existing capacity and 5% of capacity on order. The same was true to a much greater extent for the "part container ships". This rather heterogeneous group comprised 45% of all existing vessels and 21% of their container capacity. However, there were only six new buildings on order, including two very large container-pallet ships.

The third column in Table 1 covers container barge carriers, which seem to be entering a period of particularly fast growth, although their share in the total is still small.

Table 1. DEEP-SEA UNIT LOAD VESSELS IN OPERATION AND NEW BUILDINGS ON ORDER, 1st January 1971

	FULL CONTAINER SHIPS[1]		ROLL-ON/ROLL-OFF CONTAINER SHIPS[1]		CONTAINER BARGE-CARRIERS[1]		PART-CONTAINER SHIPS[2]		TOTAL	
	No.	CONTAINERS	No.	CONTAINERS	No.	CONTAINERS	No.	CONTAINERS	No.	CONTAINERS
In operation	126	104,675	19	14,181	2	3,300	118	32,530	265	154,686
New buildings on order	111	153,080	8	10,580	16	20,934	6	6,602	141	191,196

1. Container capacity of over 300 units.
2. Part-container ships with at least one cellular hold, permanently installed or convertible; limited container ships; container pallet ships; container-railcar carriers of 7,000 d.w.t. and over.

Source: Norwegian Shipping News "A tabular Analysis of the World Container Ship Fleet", Harald Fondenaer, Shipping Consultants A/S, May 1971.

Table 2. SHORT-SEA UNIT LOAD VESSELS IN OPERATION AND NEW BUILDINGS ON ORDER, 1st January 1971

	FULL CONTAINER SHIPS[1]		ROLL-ON/ROLL-OFF CONTAINER SHIPS[1]		PART-CONTAINER SHIPS[2]		TOTAL	
	No.	CONTAINERS	No.	CONTAINERS	No.	CONTAINERS	No.	CONTAINERS
In operation	75	9,260	81	8,282	93	9,946	247	27,438
New buildings on order	46	6,356	78	12,937	56	7,437	180	26,730

1. Container capacity up to 300 units.
2. Part-container ships with at least one cellular hold, permanently installed or convertible, of less than 7,000 d.w.t.

Source: Norwegian Shipping News "A tabular Analysis of the World Container Ship Fleet", Harald Fondenaer, Shipping Consultants A/S, May 1971.

ii) The short-sea fleet of unit-load vessels

The composition of the fleet of deep-sea vessels contrasts remarkably with that of the fleet of container carriers in the short-sea trades. Vessels in operation and on order in this category, defined as all vessels smaller than the deep-sea vessels described above, are summarized in Table 2. Full container ships represented only 32% of total capacity and, judging from the order book, their share was declining. Part-container ships accounted for 37% of the existing fleet, and their share in new building orders was lower at 28%. Roll-on/roll-off container ships were the growing sector with 31% of the existing fleet and 48% of building orders.

2. Containers handled at seaports

As shown in the tables below, the number of large containers handled at European seaports has increased steadily.

Table 1. NUMBER OF CONTAINERS HANDLED

(20's and over; loaded and empty)

PORT	1969	1970	1971
	NUMBER OF CONTAINERS		
Bremen	36,695	44,550	44,384
Bremerhaven	23,244	47,097	59,695
Hamburg	41,942	60,852	90,242
Lübeck	4,112	5,707	5,381
German seaports, Total	105,993	158,206	199,702
Antwerp	100,442[1]	190,620	149,014
Zeebrugge	64,858	69,218	74,035
Rotterdam	176,715	237,136	146,717[2]
Amsterdam	17,254	18,933	9,948[2]
Dutch seaports, Total	194,675	257,320	159,468[2]
Le Havre	44,600	68,070	66,962
Dunkirk	9,417	10,980	20,489
Marseilles	3,000[3]	10,000[3]	11,581
Southampton	16,513	43,419	
Liverpool	27,789	69,826	
Preston	42,255	46,780	
Tees and Hartlepool	-	34,348	
Hull	53,647	47,906	
Felixstowe	56,673	78,115	
Other ports	305,060	361,735	
British ports, Total	576,363	822,701	

1. Not including empty containers.
2. Actual figures for first six months of 1971.
3. Estimates.

Table 1 (Cont'd)

PORT	1969	1970	1971
	NUMBER OF CONTAINERS		
Alicante	563	1,846	4,234
Barcelona	9,000	16,413	27,604
Bilbao	11,518	18,901	21,997
Cadiz	13,459	26,518	16,578
Cartagena	-	-	-
La Luz y Las Palmas	-	2,908	5,871
Palma de Mallorca	-	618	5,892
Pasajes	1,359	4,625	3,055
S. Cruz de Tenerife	-	296	3,265
Seville	-	2,342	1,020
Valencia	1,517	3,152	8,260
Puerto de S. Maria	-	-	1,063
Other ports	-	-	703
Spanish seaports, Total	37,416	77,719	100,318
Gênoa	33,198	70,662	93,188
Leghorn	22,625	38,395	33,295
Naples	10,235	20,559	13,880
Other ports	23,000[1]	35,890	50,790[1]
Italian seaports, Total	89,508	165,506	191,153
Leixões	1,103	1,759	5,625
Douro	3,530	5,171	8,105
Portuguese seaports, Total	4,633	6,930	13,730

1. Estimates.

Table 2. CARGO HANDLED IN CONTAINERS

PORT	1969	1970	1971
	(Thousand metric tonnes)		
Bremen	377	507	501
Bremerhaven	219	506	646
Hamburg	411	648	1,000
Lübec	49	68	62
German seaports, Total	1,056[1]	1,729	2,209
Antwerp	1,196[1]	2,216[1]	1,955[1]
Zeebrugge	821[1]	962[1]	939[1]
Rotterdam	1,891[1]	2,910[1]	1,845[1,2]
Amsterdam	174[1]	199[1]	144[1,2]
Dutch seaports, Total	2,058[1]	3,112[1]	1,981[1,2]
Le Havre	361[1]	860[1]	796[1]
Dunkirk	84[1]	152[1]	302[1]
Marseilles	-	130[1, 3]	175[1]
Bordeaux	-	-	44[1]
London	611	1,365	
Southampton	138	370	
Liverpool	269	682	
Preston	334	418	
Tees and Hartlepool	-	353	
Hull	604	608	
Felixstowe	553	742	
Other ports	2,620	3,452	
British ports, Total	5,129	7,990	
Gênoa	236	613	784
Leghorn	110	179	300
Naples	49	142	136
Other ports	150	353	449
Italian seaports, Total	545	1,287	1,669
Leixões	7	12	36
Douro	22	42	65
Portuguese seaports, Total	29	54	101

1. Tare weight of containers included.
2. Actual returns for first six months of 1971.
3. Estimates.

Transport of large containers between seaports and the hinterland

Most of these containers are consigned by rail or road to or from various points in the European hinterland. The railways' share varies from country to country.

a) Federal Republic of Germany

Percentages of container transport accounted for by rail and road.

Port	1971	
	rail	road
Bremen/Bremerhaven	64%	36%
Hamburg	35%	65%
Lübeck	10%	90%

Number of loaded DB Containers (units of 20' or more) carried inside Germany.

1969	1970	1971
Number of loaded containers		
3,884	17,417	36,402
'000 tons		
40	199	399

b) Belgium

Port	1969		1970		1971	
	rail	road	rail	road	rail	road
Antwerp	32%	68%	30%	70%	39%	61%
Zeebrugge	92%	8%	92%	8%	85%	15%

c) Netherlands

According to the estimates of respective shares of traffic accounted for by each mode, about 25% of the number of containers are carried by rail and most of the rest by road. Inland transport of containers in the Netherlands is negligible.

d) United Kingdom

For both the years 1969 and 1970, it is estimated that the percentage of containers (over 20') which are carried from the ports inland by rail is between 10% and 15%. The rest of containers are either unloaded in the ports themselves or carried by road. No figures are available for inland transport of containers.

e) Austria

The figures for containers (loaded and empty) carried by rail between seaports and Austria are as follows:

1969	1970	1971
8,500	13,500	16,000

f) Portugal

Out of the number of transhipped containers in Portuguese ports, 60% remain in the port zone; the other 40% are transported almost exclusively by road. The proportion of containers transported by rail is estimated around 2 to 3%.

3. Roll-on/roll-off services

Roll-on/roll-off traffic went on increasing in 1970-1971, as is plainly apparent from the following tables:

Table 1. NUMBER OF VEHICLES CARRIED

(lorries and trailers/semi-trailers; empty and loaded)

SERVICE	1969	1970	1971
	NUMBER OF VEHICLES		
German ports			
Lübeck-Scandinavia and vice-versa	111,257	119,871	139,033
Kiel-Scandinavia and vice-versa	11,788	14,413	13,183
Bremerhaven-Great Britain and vice-versa	3,317	4,693	3,179 [1]
Other services	521	3,106	4,393
Great Britain ports			
Foreign trade [2]	199,471	276,751	
Coastwise trade [2]	72,047	94,810	
Near-sea trade [3]	167,515	222,130	
Netherlands	56,153	66,290	
Short-sea trade [4]	31,956	55,421	
Denmark	-	45,432	
Sweden	-	6,131	
Northern Ireland	72,047	89,786	
Dutch ports [5]	121,800	143,160	87,600 [6]
Italian ports			
Genoa	80,791	111,434	133,503
Naples	50,143	36,589	72,811
Palermo	36,803	43,001	53,415
Portuguese ports			
Lisbon [7]	-	-	1,567

1. Actual figures for period January-November.
2. "Coastwise trade" refers to trade with Northern Ireland, Channel Islands, Isle of Man, Scottish Islands and Great Britain feeder services.
3. "Near-sea trade" refers to trade with Irish Republic, France, Netherlands, Western Germany and Belgium.
4. "Short-sea trade" refers to trade with the rest of Europe, Scandinavia, the Baltic and the Mediterranean.
5. Estimates.
6. January-June.
7. Portugal: a roll-on/roll-off service began on the Southampton Lisbon route in 1971. In all, at the Lisbon end, 734 vehicles were loaded and 833 unloaded.

Table 2. FREIGHT CARRIED BY ROLL-ON/ROLL-OFF SERVICES

SERVICE	1969	1970	1971
	(1,000 tons)		
German ports			
Lübeck-Scandinavia and vice-versa	1,090	1,216	1,431
Kiel-Scandinavia and vice-versa	96	120	105
Bremerhaven-Great Britain and vice-versa	48	64	52[1]
Other services	7	47	71
Great Britain			
Foreign trade	1,932	2,759	
Coastwise trade	621	724	
Near-sea trade	1,688	2,361	
Netherlands	631	806	
Short-sea trade	244	397	
Denmark	-	276	
Sweden	-	78	
Northern Ireland	621	702	
Netherlands[2]	1,526	1,799	1,096[3]
Italian ports			
Gênoa	979	1,359	1,624
Naples	304	278	324
Palermo	335	400	500
Portuguese ports			
Lisbon	-	-	16,500

1. January-November 1971.
2. Estimates. Most of this traffic is with Great Britain.
3. January-June 1971.

III. PROBLEMS CONCERNING THE VARIOUS MODES OF COMBINED TRANSPORT AND PROPOSED SOLUTIONS

The Council of Ministers of the ECMT defined the following basic principles as part of an Outline Plan concerning general transport policy. This Outline Plan was approved by the Council at its Session on 25th November 1963.

a) Equality of treatment as between transport modes and operators, implying the closest possible alignment of basic conditions, due regard being paid to structural differences, inherent characteristics and such public service obligations as may be necessary.

b) Freedom of choice for users, including transport on own account.

c) Equal treatment for users under comparable conditions.

d) Profitability of undertakings and sufficiently independent management.

As these principles also apply to combined transport [see previous report CM(70)18 Final] and are still valid today they should serve as guidelines for any combined transport promotion policy.

A. LARGE CONTAINER TRANSPORT

1. Container traffic forecasts - the need for an interchange of research findings

Many container traffic forecasts have been made by various authorities in a number of countries. Some are confidential and, hence, not available to the public.

Moreover, the scope of most of these forecasts is restricted to specific geographical areas, certain domestic markets or certain traffic routes. To get a more general picture of the development prospects for container transport, it would be desirable to take a wider forecasting framework embracing, say, all the ECMT countries, all European geographical areas with similar market characteristics from a containerization angle (e. g. countries bordering the North Sea or the Mediterranean Basin, etc.).

It would perhaps be useful if the authorities responsible for economic research in the ECMT could look into this matter more closely. The Member countries of the Conference should also take steps to disseminate the forecasts as widely as possible.

A market study on container transport prospects has been carried out in the Federal Republic of Germany. On a "low" estimate, potentially containerizable goods on inter-city hauls exceeding 300 km. amount to some 27 million tons (1968). Against this, overall container traffic during the second half of 1969 and the first half of 1970 amounted to some 1.7 million tons. In the light of the foregoing study and, on the basis of realistic forecasts, container traffic may be expected to rise to 5-7 million tons during the next few years.

The second study concerned development trends for freight transport between the Scandinavian countries, Great Britain and the countries of Western Europe specifically from a combined transport angle. In this case, the experts forecast an increase of 90% in traffic from the Scandinavian countries to the Common Market countries by 1980, and a 70% increase in the other direction. One of the most important findings of this study is that traffic carried in containers and semi-trailers, and lorries and wagons carried by sea-ferries will also have a high rate of growth on these routes, having regard to the favourable development of cost structure and standard of service. Container traffic between the Federal Republic of Germany and Great Britain is expected to increase to a fairly substantial degree.

With a view to appraising the financial viability of such transport where seaports are concerned, the foregoing study drew attention to the following points:

- in relation to the costs incurred, roll-on/roll-off is the best proposition for an annual throughput ranging from 50;000 to 350,000 tons per berth;
- within this tonnage bracket, container transhipment costs are distinctly higher, but they still remain below those for break-bulk cargo if the annual throughput per berth exceeds 100,000 tons;
- on short-sea routes, roll-on/roll-off is generally cheaper than lift-on/lift-off.

2. Weights and dimensions of commercial vehicles (road transport)

International discussions on weights and dimensions of commercial vehicles are proceeding in various quarters including the Common Market and the ECMT.

The main points which have a special bearing on transport of large containers by road are those concerning maximum gross laden weight and maximum length of lorry-drawbar trailer combinations and articulated vehicles (semi-trailers).

In principle, a fully-laden 40-ft. container can weigh up to 30 tons gross, and two 20-ft. containers, 40 tons. To carry a fully-laden 40-ft. container or two fully-laden 20-ft. containers by road, vehicles with a maximum gross laden weight of approximately 45 tons and 55 tons respectively would be needed.

The maximum gross laden weight of road vehicles actually permitted at present varies from country to country (e. g. grom 28 tons in Switzerland to 50 tons in the Netherlands).

However, surveys have shown that the average laden weight is in practice about 19 tons for 40-ft. containers and 12 tons for 20-ft. containers. A noteworthy point is that the average laden weight of containers shows a rising tendency in recent years. Containers with a laden weight exceeding 25 tons at present account for between 1 and 3% of the total. If account is taken of the percentage of all road transport accounted for by containers, it then becomes apparent that a permitted gross laden weight of 38 tons is inadequate, at most, for one consignment in every thousand.

According to information provided by INTERCONTAINER, the average gross laden weights for the various types of container carried by rail are as follows:

	20'	30'	35' (Sea-Land)	40'
1968	14.4	18.8	19.5	17.00
1969	14.86	19.03	16.15	17.09
1970	14.55	19.13	17.58	16.90
1971	15.06	19.57	16.90	17.45

Special permits are, however, granted in certain countries where the permitted gross laden weight is lower. In some quarters, it is argued that this weight limit for road transport should be decided multilaterally so as to dispense with special permits for the consignment of laden large containers.

The IRU and the ICC, for instance, consider it essential that the maximum gross laden weight should be raised to 44 tons in all countries.

Lorries with drawbar trailers are well adapted to the carriage of 20-ft. containers as the overall length (18 metres) is enough for two such units, but 40-ft. containers have to be carried on articulated vehicles. In this event, the permitted overall length (15 metres) is generally exceeded in most European countries. The proponents of a maximum length of 15 metres point out that this existing limit is adequate even for the carriage of 40-ft. containers on artics if no berth is provided in the driver's cab. If a sleeper cab is provided, the overall length must be at least 15.5 metres. The IRU proposes that the overall length should be raised to 16 metres. On many occasions, it has also been claimed that Europe should adopt the overall length authorized in the United States i. e. 16.7 metres.

Conclusion

Weights and dimensions of lorry-drawbar trailer combinations and artics, and more particularly the regulations concerning maximum gross laden weight and overall length of artics, have a vital bearing on container traffic. But this is not the only consideration to be taken into account; when deciding on specific figures, due regard must also be paid to the impact on road safety, to various disbenefits relating to amenity and to heavier wear and tear of road infrastructures.

3. Social implications of containerization

The ECMT has given much attention to the social implications of containerization in recent years. The representatives of the international trade union organisations concerned were able to state their views in the course of several hearings. On these occasions, they pointed more particularly to the problems confronting dockworkers as a consequence of the change-over to container transport techniques.

In order to see more clearly how workers in the transport sector are affected by containerization, the Ministry of Labour and Social Affairs of the Federal Republic of Germany commissioned the Battelle Institute to carry out a survey. The report on this survey is now available. The following extracts, though relating to the Federal Republic of Germany, are of general interest:

- The main effects of containerization on employment are felt in transhipment at seaports. The grouping of traditional break-bulk cargoes in containers has converted them into unitised loads. Because of the changed composition of loading units, transhipment can be handled entirely from dockside without it being necessary to employ stevedores on board.

- The improved mechanical handling facilities resulting from containerization usually imply redeployment of the dockside labour force. This implies, in particular, acute social hardship in cases where unskilled or semi-skilled workers cannot be suitably retrained.

- Containerization substantially increases the productivity of labour by comparison with conventional cargo-handling methods. At a given port studied in the course of the survey, it was found to be 19 times greater. Against this, however, skilled labour - at higher rates of pay - has to be employed and containerization also involves much bigger capital costs.

- Because of the constant increase in volume of traffic, the quantitative effects of containerization on the employment situation are of limited scope where forwarding agents, shipping companies and air freight handling are concerned, and should not lead to redundancies from now to 1980. The work force required for container transhipment in German seaports is estimated at 4,500 in 1975 and 4,800 in 1980. However, as the surplus demand for labour in these same ports would increase by 1980 if there were no containerization, the latter must not be expected to cause unemployment but rather to alleviate substantially the situation on the labour market which is at present very tight. According to the calculations of the Battelle Institute, the German Railways inland terminasl will need, by 1980, an additional work force of roughly 1,400 units for transhipment operations and 3,500 units for feeder services.

- Containerization more especially riases problems of structural adjustment for firms engaged in transport, stevedoring and packaging production which are not big enough to bear the loss of certain outlets without difficulty. The introduction of containers involves more extensive use of computers in certain sectors of the freight transport industry. The retraining of the work force that this implies cannot be handled entirely within the industry itself. The findings of this study are confirmed by those obtained in other countries.

Conclusion

It is once again apparent that there can be no generally valid judgment as to the implications of containerization for employment in the transport sector: in each case, the effects can be positive or negative depending on the qualitative and quantitative situation on the labour market at a given time. In a country inclining towards overfull employment, technical progress is the driving force of economic development, and the mobility of labour then becomes a pre-requisite of better productivity and economic growth. If containerization leads to redundancies the main effort should be directed to retraining measures designed to give those concerned access to better and more highly paid jobs. On the other hand, in countries where the tendency is towards under-employment, over-hasty mechanization can make the unemployment situation worse.

The CMT (World Confederation of Labour) considers that, generally speaking, vocational training is not sufficiently developed at the time when conversion from traditional transport to containerization takes place.

4. Encouragement of capital investment

Combined transport, and more particularly, container transport, calls for a high level of capital investment in ships, vehicles and specialized handling equipment. These investments are made by forwarding agents, transport operators themselves and companies providing transhipment facilities at seaports and inland. All such undertakings have a common denominator in that they sell their services on the market: whether they belong to the private or public sector, financial viability must be the guiding principle for their investment decisions. In any event, over-capacity must be avoided if optimal use is to be made of capital equipment such as transport and transhipment facilities. Investment policy in this case is therefore the same as in the production sector.

Investments can be either self- or loan-financed. In the latter case, recourse can be had to various international finance institutions such as EUROFIMA (for purchases of rolling stock) and the International Bank for Reconstruction and Development (IBRD). Investment in combined transport is indeed listed among the projects conducive to development that the IBRD intends to encourage.

Conclusion

Stronger government intervention in combined-transport investment does not seem to be needed. The role of the State will generally be restricted to the provision of large-capacity infrastructures to and from terminals.

5. Work in progress within the ECE

a) United Nations/IMCO Conference on international contained traffic (13th November - December 1972)

Following the decision of the Economic and Social Council, at its resumed 48th Session (May 1970) to convene jointly with the Inter-Governmental Maritime Consultative Organisation (IMCO), a world-wide conference on container traffic covering certain administrative, technical and legal aspects of international container transport, the activities of the ECE in the field of international container traffic and transport have been largely focussed on preparatory work, where appropriate in co-operation with IMCO, for the Conference. The Council referred, in its decision, to the following areas of action:

1) safety agreements;
2) customs questions;
3) legal problems concerning in particular the liability of combined transport operators and related questions;
4) standardization of dimensions and weight of containers;
5) inspection, testing and certification of containers;
6) identification and marking of containers;
7) documentation;
8) various facilitation questions.

1) Safety agreements

Safety standards for containers have been elaborated at joint IMCO/ECE meetings and the text of a draft International Convention for Safe Multimodal Transport Containers has been finalized for consideration by the Conference.

2) Customs questions

The draft text of a revised Customs Convention on Containers has been prepared for consideration by the Conference. A Resolution entitled "Customs provisions applicable to containers used in international transport" recommends governments to apply, pending the entering into force of the revised Convention, the substantive provisions of the above-mentioned Convention.

3) Legal problems concerning in particular the liability of combined transport operators and related questions

The text of a draft Convention on the International Combined Transport of Goods, drawn up at "round table" meetings, convened at the request of the ECE by the International Institute for the Unification of Private Law, was examined at four sessions of a Joint IMCO/ECE Meeting to Study the Draft Convention on the International Combined Transport of Goods (TCM Convention). Agreement was reached on the text of draft articles for such a Convention, though with regard to the system of liability, alternative draft texts for certain articles were included.

A study on the economic implications of the TCM Convention, prepared under the auspices of United Nations Headquarters, will be reviewed inter alia by the ECE in order to express its opinion on whether the draft TCM Convention is ready for consideration by the Conference.

4) Standardization of dimensions and weight of containers

After reviewing the many aspects involved in this question, the ECE prepared a draft resolution on container standards for international multimodal transport, recommending governments inter alia to support the ISO work with regard to freight containers. The joint IMCO/ECE meeting on container safety [see item (1) above] endorsed the circulation of the text for consideration by the Conference.

5) Inspection, testing and certification of containers

These questions have been considered within the context of the respective draft Conventions, i. e. the draft revised Customs Convention on Containers [see (2) above] and the draft International Convention for Safe Multimodal Transport Containers [see (1) above], it being left to the Conference to harmonize any discrepancies with a view to facilitating the application of joint testing, approval and codification procedures at the national level.

6) Identification and marking of containers

Limited progress has been made with regard to developing an internationally agreed system for nationality identification for official purposes. The work of ISO with regard to a draft recommendation entitled "Identification Marking Code for Freight Containers" was closely followed; after studying the advantages and disadvantages of an internationally agreed system of displaying a uniform distinguishing sign on containers exceeding 8 feet in height, it was agreed to refer the question to the appropriate body of ISO.

7) Documentation

Following a decision to omit from the draft text of the revised Customs Convention on Containers provisions concerning a container manifest, the question of simplifying dovumentary requirements in international container transport is being considered within the wider context of facilitation of international trade procedures in general.

8) Various facilitation questions

Special attention has been given to the various aspects of health, phytosanitary and veterinary controls affecting international container transport. A draft recommendation concerning the facilitation of such control operations at frontiers is being reviewed with a view to deciding whether to refer a draft resolution on the subject for consideration to the Conference.

b) Revision of the Customs Convention on the international transport of goods under cover of TIR carnets (TIR Convention)

After noting preliminary work on the subject, it was agreed to undertake a general revision of the provisions of the Convention. A preliminary draft revised text should, if possible, be elaborated by the latter part of 1972.

c) Statistical questions

Continuing efforts are being made to obtain, on an annual basis, more complete statistical coverage with regard to the international movement of large containers involving a sea journey.

6. Use of containers for airborne freight

The Air Transport Institute (ITA) has provided the following information:

Unit loads for existing air freighters are based on special large-sized pallets (88 x 108" or 88 x 125", i. e. 2.24 x 2.74 m or 2.24 x 3.18 m). * These are usually put together at the airport of departure and broken down at the airport of destination but it is increasingly common for the "pre-consignment" and "reconsignment" operations at each end to be handled by road:

- either by carriers acting for the air companies;
- or by forwarding agents who have established ware-houses outside the airports.

In both cases the vehicles used, like the handling equipment at the airports, are fitted with roller conveyors.

There is also an increasing use of containers, approved by IATA, which - with a view to suitability for door-to-door transport - have a slotted base so that they can be handled with conventional fork-lift trucks. Most of these containers cover either a whole pallet or half a pallet (the capacity of these two types is approximately 12 cubic metres and 6 cubic metres respectively).

For the large air freighters of the future, consideration is at present being given to the specifications of ISO trans-containers, series I, which would cover both the requirements of surface transport and the particular needs of air transport, whilst at the same time being light enough for this latter purpose.

The only type of giant air freighter which is about to come into commission, the Boeing 747-F, can take two rows of trans-containers side by side. Deutsche Lufthansa, the only company which is preparing to put this freighter into commission, has designed 10-ft. containers that are fastened to 96 x 125" (2.44 x 3.18 m) pallets. For surface transport and terminal handling, the container-pallet combination is itself fastened to a slave-pallet with fork-lift slots and corner fittings conforming to ISO standards.

B. PIGGY-BACK TRANSPORT

1. Characteristics of piggy-back transport

For the purposes of this paper, piggy-back means the conveyance of lorries, trailers and semi-trailers on railway wagons. The object is to combine the advantages of road and

* These are very thin pallets for which conventional lifting gear such as fork-lift trucks, jib cranes or gantry cranes are unsuitable and which must therefore be handled with roller conveyors or the like (ball-bearing or "skate" wheel conveyors).

rail, i. e. a fast service in train-load lots on long distances together with the speed and flexibility of road transport for short-distance hauls.

The essential advantage of piggy-back is the saving obtainable on vehicle crews, no driver being needed for road vehicles on the rail-hauled part of the journey: drivers can pick up their vehicles at the other end or accompany them by using the sleeper-car provided for this purpose. This saves the cost of the second driver for an entirely road-hauled journey. Other savings are obtained on fuel, on wear and tear or tyres and vehicles and by a quicker turnround of the latter. Another important advantage is that the tractive unit remains available to the operator while the semi-trailer is on rail. This arrangement becomes a paying proposition for the haulier if the additional costs (transhipment from road to rail and vice-versa, plus rail transport costs) and other expenditure supplementary to ordinary road transport (more complex design and possibly purpose-built vehicles) fall short of the savings obtained from piggy-back operation.

One difficulty lies in the fact that piggy-back terminals are often located off the required route: the additional runs this implies lengthen the overall piggy-back journey as compared with a direct road haul.

Piggy-back also reduces the operator's freedom of action to some extent as the arrangements for transhipment from road to rail, the rail haul itself, and transhipment from rail to road are, of course, controlled by the railways.

Other difficulties may also derive from the loading gauge (i. e. dimensional limitations on rail vehicles and their loads). In the case of piggy-back operations, it applies to the rail and road vehicle combination, including the road vehicle body. As a consequence, specially designed rail or road vehicles are required for this purpose on most European railway systems. In Britain, for instance, piggy-back is hardly practicable bacause of the close limitations imposed by the loading gauge.

2. Various piggy-back systems

As explained above, piggy-back calls for the design of a rail vehicle which can carry a road vehicle without exceeding the loading gauge. As a general rule, the aim is to keep the total height of the vehicle combination as low as possible. One way of doing this is to make wagons with much smaller wheels, but as this reduces the permissible axle loading (normally 20 tons) it then becomes necessary to have more than two axles. Wagons of this type are heavier and so lead to higher capital costs. Another method consists in designing the deck of the wagon in such a way that the road vehicle undercarriage fits into recesses or pockets which may or may not be "bridgeable". If they are not (i. e. with the "fixed pocket" type of wagon) the lorry cannot be rolled onto the wagon or move along several coupled wagons and, in this case, lift-on/lift-off facilities for lorries and semi-trailers are needed, but the piggy-back system then loses some of its flexibility. To overcome this problem, special wagons with a "bridgeable" recess have been designed, but these are normally intended for road vehicles with a single wheel-assembly (i. e. semi-trailers). A single bridgeable recess would not suffice for road vehicles with several axles, for in this event highly elaborate hydraulic equipment would be needed. In such cases the more usual procedure is to use a continuous flat-decked set of vehicles with small-diameter wheels ("Rollende Landstrasse").

Various types of rail vehicles have attained a fair degree of development in the European pigg-back transport sector, more particularly in connection with the following systems:

a) Kangourou system

This system was developed in France in 1958. After a first experiment with low-loader wagons for carrying lorries and trailers, the SNCF, having regard to the high operating costs involved and to the widespread use of artics for heavy long-distance consignments in France, finally preferred the Kangourou system designed for the carriage of ordinary semi-trailers.

The two-axled or three-bogie wagons are equipped with a guideway, part of which swivels on a horizontal axis as a "draw-bridge" which can be put in one or the other of the following positions:

- horizontal, to provide a continuous track so that vehicles can move from one wagon to the next;
- inclined, for loading.

Semi-trailers are hoisted on or off the wagons along a mobile ramp by means of a tractor equipped with a hydraulic lifting device. The average length of this loading or unloading operation is roughly three or four minutes.

b) "Aachen" system

This system, developed in the Federal Republic of Germany, is based on the same principle as Kangourou. Semi-trailers are carried on two- or four-axled low-loader wagons. These wagons have an inclinable loading ramp for the wheel assembly of the semi-trailer.

c) "Fixed-pocket" wagon

However, as Kangourou wagons are relatively expensive and imply the use of a special tractor, a special bogie-wagon, of simpler design, with a flat-bedded "pocket", was put into service by the SNCF in 1970. Semi-trailers are hoisted on and off with a container gantry crane.

d) DB/SNCF unified "fixed pocket" wagon

As part of an assignment from the UIC, the DB and SNCF have jointly developed a new type of "fixed-pocket" wagon intended in the first place, for combined transport services between France and Germany, but which could later become the European "unified" wagon for semi-trailers and "swop bodies".

A prototype will be built during the first six months of 1972.

This new unit, based on the French "fixed pocket" wagon, provides a wider range of loading facilities to cater for the various types of semi-trailers and box-bodies encountered in Europe. Accessorily, it can take containers subject to certain load limitations and, with detachable special fittings, may also be used for caravans.

The growing use of gantry cranes for container handling on the European railways will gradually extend the network on which wagons of this type can be used.

e) System adopted on the Swedish Railways

The Swedish Railways use special low-loader wagons for containers and semi-trailers. The deck on which semi-trailers are loaded is of fixed height and cannot be lowered. Semi-trailers up to a total height of 3,800 mm can be carried in this way, but only on the Swedish network, because of its fairly high loading gauge.

f) "Rollende Landstrasse" system

This system is based on special wagons with an exceptionally low loadline (410 mm measured from the top edge of the rail). These wagons (known as SGP) were developed in Austria and are designed to carry lorry-drawbar trailer and artic combinations. The deck is flat with no moveable elements. Lorries move up a mobile ramp end-on and then along the train to their assigned berths. The gaps between wagons are bridged for this purpose.

Lorries with maximum dimensions (width 2,500 mm - height 4,000 mm) commonly encountered on the Continent can be conveyed in this way practically throughout the entire electrified network of the Deutsche Bundesbahn. There may be some restrictions on non-electrified lines and on other networks.

SGP wagons are of fairly complex design (i. e. multi-axled) and are not amenable to routine operation. As a general rule, they are made up into block trains or fairly large sets,

and it is even necessary to insert so-called buffer wagons between them and conventional stock. The wheel-diameter being exceptionally small, each wagon has eight axles. Requirements as regards braking equipment and resistance to derailment of running gear are particularly exacting.

3. International piggy-back transport services

International piggy-back transport is still at its early stage in Europe but a good many services are already in operation, some of them remarkably successful. For instance, a Kangourou service is operated on the Paris-Brussels-Rotterdam route by Novatrans (France) in joint agreement with S. A. Transport Route Wagon (Belgium) and N. V. Trailstar (Netherlands). Two Kangourou terminals have been put into service at Antwerp and Charleroi. Other Kangourou services run from Paris to Novare, Milan and Rome. Facilities for handling Kangourou consignments from France to Switzerland, Spain and the United Kingdom respectively are provided as follows: a) Mulhouse, b) Perpignan and Hendaye, c) Dunkirk and Le Havre. The figures for Kangourou piggy-back traffic on international routes are substantial:

1968	210,000 gross tonnes
1969	265,000 gross tonnes
1970	315,000 gross tonnes
1971	327,000 gross tonnes

International piggy-back services based on the UFR system (special wagons with loading deck of normal height) are in operation between various French railheads and Brussels, Turin and Geneva, but the volume of traffic recorded is not very great.

Since November 1970, Novatrans (France) and Kombiverkehr (Germany) have been running a piggy-back service on the Paris-Frankfurt/Ludwigsburg route with "Euro-rail-route", "Kangourou" and "Aachen" rolling stock. The volume of traffic handled still falls short of the original expectations of the railway administrations concerned and is not yet sufficient for the operation of block-trains to be a paying proposition. In both countries, efforts are being made in various directions to develop this traffic.

The introduction, at an early date or later on, of a whole series of additional piggy-back services is being planned, as follows:

Hamburg-Lyons-Avignon-Perpignan-(Spain);

Paris-Cologne;

Cologne-Verona (via Austria, SGP train);

Cologne-Melide (and on to Milan at a later stage);

Hamburg-Switzerland;

Rotterdam-Antwerp-Paris-Spanish frontier;

Finland-Sweden-Travemünde-Cologne-Paris-Spanish frontier;

Flansburg/Travemünde-Hamburg-Milan;

Munich-Verona;

Hamburg-Mannheim-Chiasso or Milan;

Trieste-Villach;

Ruhr-Mainz-Lyons-Marseilles;

Rotterdam-Antwerp-Mannheim-Ludwigsburg-Basle;

Ruhr/Cologne and Ludwigsburg/Mannheim-Frankfurt-Vienna;

Ruhr/Cologne and Frankfurt/Mannheim-Melide-Milan;

Cologne-Ruhr-Lübeck-Puttgarden for ferry services to Scandinavia.

a) International organisation of piggy-back transport

The "International Union of Rail/Road Combined Transport Companies" was founded in Munich on 23rd October 1970, its members include:

- Aktiebolaget Svenska Godscentraler, Stockholm;
- Ferpac, Milan;
- Hucketrans, Vienna;
- Hupac S. A., Chiasso;
- Kombiverkehr, Frankfurt (Main);
- Novatrans, Paris;
- S. A. Transport Route Wagon, Brussels;
- N. V. Trailstar, Rotterdam.

This body proposes to arrange continuing exchanges or experience at international level and to co-ordinate commercial conditions. It also aims to prepare the organisation and operation of international piggy-back services, harmonize commercial documents and consignment procedures and co-ordinate technical development. Another of its responsibilities will be to represent the interests of piggy-back transport companies.

b) Problems relating to international piggy-back transport

aa) Technical problems

The main technical problems arising in international piggy-back transport systems are the differences in road vehicle design and in railway loading gauge.

In the case of road vehicles, incompatibilities are frequently encountered in the lighting and braking circuits and in the coupling devices of tractive units and semi-trailers.

These technical discrepancies are not usually attributable to government regulations. Having regard to the growing scale of international piggy-back services, the motor industry, the road haulage industry, and the railway authorities may be expected to look into these problems with closer attention. However, the ECMT countries should encourage the search for suitable solutions in an international co-operation context without delay.

For the railways, the difficulties are mainly due to differences in loading gauge. It follows that the routes selected for international piggy-back services must be those imposing the least constraints in this respect.

Another point to bear in mind is that some piggy-back systems of national design are workable only with specially-equipped road vehicles which do not exist at all - or at least not in sufficient numbers - in other countries.

Conclusion

Despite certain practical problems still confronting international piggy-back transport, co-operation between the countries concerned, at railway administration level for instance, should lead to appropriate solutions.

bb) Administrative problems

The same Customs, insurance and licensing documents are needed for international piggy-back transport as for purely road-hauled transport, and these documents have to be carried in the vehicle. Customs formalities within the country often raise problems. Many rail terminals have no Customs office competent to deal with road transport. This implies journeys back and forth for the road vehicles concerned, and hence much loss of time besides that spent waiting at Customs offices.

Conclusion

The ECMT countries should see that inland Customs offices are provided in step with the growing volume of freight arriving at rail terminals. They should in any event make arrangements to ensure that piggy-back consignments are swiftly cleared through Customs.

cc) Access of road vehicles to the market

Various ECMT bodies have already discussed the problems concerning access to the combined transport market.

At its 32nd Session on 17th December 1970, the Council of Ministers of the ECMT carefully reviewed the problems concerning access to the market in the combined transport sector and instructed the Working Group to give special attention to this matter which has a special aspect in the case of piggy-back transport.

Difficulties arise in particular from the fact that the terminal operations of international piggy-back services are subject to the regulations in force in each of the countries concerned.

The discussions on this subject so far have shown that the core of the problem is a somewhat thorny issue ultimately depending on the basic attitude adopted by each country to the liberalization of road transport (i. e. an integral part of national policy).

Generally speaking, piggy-back transport can be classified in the seven basic types shown below, which may call for separate solution to the problem of access to the market:

a) piggy-back transport of a foreign semi-trailer or drawbar trailer drawn by a foreign artic or lorry from the station to its destination point, and piggu-back transport of a foreign lorry or lorry-trailer combination;

b) piggy-back transport of a foreign semi-trailer or drawbar trailer drawn by a "home-country" artic or lorry from the station to its destination point;

c) piggy-back transport of a "home-country" semi-trailer or drawbar trailer registered in the country concerned drawn by a "home-country" lorry or lorry-trailer combination;

d) piggy-back transport of a "home-country" semi-trailer or drawbar trailer drawn by a foreign artic or lorry from the station to its destination point;

e) piggy-back transport in transit wholly or partly by rail.

In each of the specimen cases shown under (a) and (e) above, two sub-categories must be taken into account to cover cases where the country of destination makes a distinction, for access to the market purposes, between short- and long- distance transport. In exceptional cases, it may happen that a "foreign" tractive unit is occasionally left, for the terminal run, in a country other than that in which it is registered.

It seems that in some countries piggy-back hauls are treated by national authorities everywhere as if they were entirely road-hauled, and it follows that they have to be covered by a corresponding licence. This is the crux of the problem for this type of transport does have an essential peculiarity in that it combines rail and road transport technologies.

To allow for this factor, special licences are issued for piggy-back transport in certain cases but, as in France for instance, the percentage of licences taken up at present is relatively small (up to about 30%). The Federal Republic of Germany has also made agreements concerning special piggy-back quotas with several countries.

Conclusion

Whatever the angle of approach to this matter, the sharpest edge of the problem seems to lie in the regulations concerning access to the market, and this is an issue which forms part of general transport policy. In the event, it is for the Road Transport Committee to formulate proposals designed to reconcile this general policy with the specific requirements of combined transport.

dd) Piggy-back transport pricing

One essential condition that the piggy-back system must fulfil is that the cost of transport by rail does not exceed the savings it can procure. Conversely, the railways themselves have nothing to gain in providing transport services unless these earn revenues which cover the corresponding costs, at least after the period required for "running-in". In the case of international piggy-back services, a further element is introduced because revenues have to be shared between at least two railway administrations. Against this, there is a positive aspect: as a general rule, international hauls are fairly long and this works to the advantage of piggy-back traffic.

Piggy-back services can be provided at fairly low cost, and with competitive journey times, only in train-load lots. But in order to be able to do this, the railways must have a regular and fairly large volume of traffic to handle.

Furthermore, the diversity of rolling-stock has a direct bearing on the question of rates because each of the railways concerned with combined transport has organised its operations in this field differently. Thus, the SNCF works jointly with a company which owns the carrier-wagons and another company which handles operations at Kangourous terminals, contracts with customers and door-to-door operations.

The DB on the other hand, has retained ownership of the carrier wagons but relations with users are dealt with by a separate concern.

The two systems developed simultaneously alongside each other but because they did so on a different basis, their respective pricing procedures are not the same.

For consignments in specialized trains, the SNCF has produced a rate structure based on length of haul, gross weight of semi-trailers (laden or unladen) and overall weight of consignments handed in on the same day on one same train. These tariffs are published officially, with separate scales for French and international traffic, the latter sub-divided according to route (France-Belgium-Netherlands and France-Italy).

The DB applies special rates for piggy-back traffic. These are not published officially. They are calculated according to length of haul and number of vehicles handed in on the same day on a given route.

In the special case of international traffic involving third countries, a distinction must be made between French piggy-back services, where this facility does indeed exist, and the German ones which, at present, are restricted to German territory.

International piggy-back traffic is sometimes hampered by the increased transport costs resulting from tariffs based on the aggregation of domestic rates.

This drawback is all the heavier when the length of haul on either network, or on both, is slight.

The railway administrations concerned are taking active steps to harmonize the two tariffs so as to avoid the split which raises the overall transport cost since the benefit of tapering rates is lost.

In the opinion of the International Union of Combined Rail/Road Transport Companies (UITC) the situation of piggy-back transport so far can be described as a vicious circle in that, on the one hand, rail tariffs are largely determined by the volume of traffic and, on the other hand, traffic growth is held back because tariffs are too high.

Conclusion

The development of international piggy-back transport is at present hampered by a tariff which is not altogether satisfactory in level and structure. The ECMT countries should encourage the search for appropriate solutions in a co-operation framework.

4. Piggy-back traffic in various countries

a) United States

The basic conditions under which piggy-back traffic operates in the United States are better than in Europe. As most United States' railways have a bigger loading gauge, they can take standard type semi-trailers on ordinary flat wagons. What is more, a substantial percentage of the freight carried by road is handled by large firms with branches in a good many American cities. Large undertakings of this kind are often in a better position to deal with the organisational problems that a piggy-back system involves.

The US-standard G-85 wagon used for piggy-back transport provides a deck on which two semi-trailers can be loaded either from the platform end-on, or lifted on with a crane. New York Central have introduced the so-called Flexi-Van-System whereby semi-trailer swop bodies are lifted on to wagons side-on. G-85 wagons are used in this case too. The following table shows the steady increase in piggy-back traffic over the last 15 years.

PIGGY-BACK TRAFFIC IN THE UNITED STATES

1955-1969

YEAR	NUMBER OF PIGGY-BACK LOADS (to the nearest thousand)
1955	168,000
1956	208,000
1957	249,000
1958	278,000
1959	417,000
1960	554,000
1961	591,000
1962	706,000
1963	797,000
1964	891,000
1965	1,034,000
1966	1,163,000
1967	1,207,000
1968	1,337,000
1969	1,344,000

The Trailer Train Company was established in 1955 by 35 of the largest piggy-back transport concerns. The Company levies a daily hire charge per trailer-wagon plus a tapering rate based on average daily mileage.

Train-load traffic plays an important part in the United States. This type of operation enables the railways to out transport costs and provide rapid transport. About 60 block-trains assigned to piggy-back traffic alone are now operating in the United States.

Conclusion

United States' experience confirms that piggy-back is competitive for long-distance hauls when technical problems present no special difficulty. It therefore seems that this type of service should go on expanding in Europe, especially for international traffic, provided that certain technical, regulatory and commercial obstacles can be removed. The co-operation between several railway companies that this requires does not seem to raise any particular problems in the United States, and the same should apply in Europe except for problems arising from differences in loading gauge.

b) France

Novatrans operates piggy-back services with the following types of equipment:

- UFR
- Kangourou
- MC 22.

In 1970, Novatrans rolling stock was made up as follows:

- 1,000 UFR flat wagons
- 426 Kangourou wagons and 20 "fixed-pocket" wagons
- 50 MC 22 wagons.

At the end of 1971, the fleet was made up as follows:

- 800 UFR wagons
- 546 Kangourou wagons
- 50 "fixed-pocket" wagons
- 50 MC 22 wagons.

In France, regular piggy-back services are provided on the following routes (block-trains both ways daily on working days):

- Paris-Avignon
- Paris-Marseilles
- Paris-Toulouse
- Paris-Bordeaux
- Paris-Lyon
- Paris-Le Mans

On the following routes, single-wagons and sets are coupled to fast goods trains:

- Paris-St. Quentin-Lille-Dunkerque
- Paris-Le Havre
- Paris-Montmélian.
- Paris-Grenoble
- Paris-Strasbourg

Piggy-back services also cater for a number of other cities. In 1970, nearly 2,000 hauls amounting to a tonnage of about 2,500,000 gross tons were handled in this way. Despite the steady decline of the old UFR system, piggy-back traffic in terms of ton-km. increased substantially (rising from 800 to 1,000 million tons-km.) between 1960 and 1970, the biggest increase being recorded by Kangourou international traffic, which also doubled between 1967 and 1970.

c) Belgium

S.A. Transport Route-Wagon (TRW), all of whose members are road hauliers, operates jointly with the French Novatrans Company a Belgian-based semi-trailer transport service to

France and Italy. The rolling stock is French (SEGI). Terminal facilities are provided at Brussels, Antwerp and Charleroi.

The number of hauls per year has developed as follows:

1966	259
1967	934
1968	1,239
1969	1,832
1970	2,237
1971	2,463

d) Netherlands

N. V. Trailstar (Rotterdam), owned by road hauliers and the Netherlands Railways, operates jointly with the French Novatrans Company a semi-trailer transport service from the Netherlands and France to Italy. The rolling stock is French (SEGI). There is a terminal at Rotterdam.

The number of hauls per year has developed as follows:

1969	6,191 vehicles	129,090 gross tons
1970	7,702 "	161,027 " "
1971	6,558 "	137,691 " "

e) Sweden

Since the Autumn of 1968, the Swedish Railways (SJ) are running regular piggy-back services between Stockholm and Göteborg (five block-trains weekly both ways). Almost the entire load is made up of AB Svenska Godscentraler semi-trailers. In all, 11 special wagons are available. The utilization factor for these trains is satisfactory.

f) Switzerland

Piggy-back services in Switzerland are provided by Hupac S. A., Chiasso. This company, jointly owned by forwarding agents and the Swiss Federal Railways, was established in 1967. The piggy-back rolling stock consists of ten "Aachen" low-loader wagons and ten SGP low-loader wagons for "Rollende Landstrasse" operations. The service operates between Basle (Badischer Bahnhof) and Melide every two days both ways. Traffic has developed as follows:

1969	3,678 vehicles	83,233 gross tons
1970	4,868 "	113,836 " "
1971	6,280 "	129,283 " "

g) Federal Republic of Germany

Piggy-back traffic in the Federal Republic has expanded fairly substantially since 1960. In the early days, only a few isolated firms responded to the offers of the Deutsche Bundesbahn, and these firms grouped themselves together in a somewhat loosely-knit association for some time. It was the transport policy programme drawn up by the Federal Government for the years 1968-1972 which gave piggy-back traffic a fresh impulse. This type of traffic in the Federal Republic is handled by the Konbiverkehr whose members, on a partnership basis, are road hauliers and forwarding agents' associations, the Deutsche Bundesbahn and about 120 road freight transport concerns. In 1970, some 50,000 units amounting to a net weight of 840,000 tons were consigned by piggy-back. Terminal facilities for piggy-back services are provided in the following cities:

CITY	PERCENTAGE OF TOTAL PIGGY-BACK TONNAGE CARRIED
Ludwigsburg near Stuttgart	20.1
Hamburg	18.1
Wuppertal	13.5
Düsseldorf	11.8
Munich	11.3
Cologne	7.1
Frankfurt (Main)	5.0
Bremen	4.2
Nüremberg	3.0
Mannheim	2.4
Hanover	1.4
Bielefeld	0.8
Augsbourg	0.6
Neu-Ulm	0.3
Bochum	0.2
Karlsruhe	0.2

In 1971, the number of units carried rose to 71,500, an increase of 43%. The percentage for each city station was much the same as before.

The network is made up of seven lines as follows:

Line 1 A: Düsseldorf and Wuppertal-Cologne-Frankfurt (Main) (with branch line to Nüremberg) Neu-Ulm-Augsbourg-Munich;

Line 1 B: Düsseldorf, Bochum and Wuppertal-Cologne-Mannheim, Karlsruhe and Ludwigsburg;

Line 2: Bremen and Hamburg - Hanover - Frankfurt - Mannheim - Ludwigsburg;

Line 3: Bielefeld, Bremen and Hamburg - Hanover - Nüremberg - Augsbourg - Munich;

Line 4: Hamburg - Wuppertal - Düsseldorf - Cologne;

Line 5: Cologne - Ludwigsburg;

Line 6: Hanover - Düsseldorf.

Only semi-trailers and swop bodies are consigned on Lines 1 - 4. Line 5 (equipped with "Rollende Landstrasse" SGP wagons) carries only lorry-trailer combinations. In February 1971, 470 special wagons were available for piggy-back services in the Federal Republic. Other wagons are on order (200 wagons for swop bodies, 120 wagons for semi-trailers and 35 SGP low-loader wagons for lorry-trailer combinations). With these new acquisitions, the carrying capacity of piggy-back services should be raised to about 2 million tons a year.

C. DEMOUNTABLE BODY (SWOP BODY) TRANSPORT SYSTEMS

The question arises as to whether the swop body system should be regarded as a form of rail/road transport, as a refinement of road haulage as such, or as a variant of containerization.

In any event, it may be useful to give a description of the system, as follows:

1. Swop body transhipment

Swop bodies can be of different types: sheeted platform, box body or tank.

A special technique designed to improve the swop body system has been developed in the Federal Republic of Germany in recent years:

- swop bodies can be transhipped at any terminal equipped with cranes, without it being necessary to provide special facilities;
- the swop body can be carried on practically any lorry or trailer suitable for 20-ft. containers and on rolling stock used for carrying containers;
- the swop body can be hoisted on and off, in the course of a haul, with loading devices which are part of the lorry itself, and without the help of any additional equipment.

The advantage of this arrangement is the ability to set down, pick up or transfer swop bodies at any point as efficient practice requires. Another benefit of this system is that lorries and trailers having a skeleton frame with pneumatic suspension can handle transhipments without needing other mechanical handling facilities. Pneumatic suspension is indeed somewhat more expensive than the conventional leaf spring type, but saves having to fit the lorry with elaborate mechanical or hydraulic lifting gear.

2. Economic advantages of swop bodies

The economic advantages of swop bodies lie in the possibility of separating the load compartment from the carrier vehicle. This is a decisive factor because fixed operating costs are much higher for the lorry than for the swop body.

Applicable as it is to a wide range of systems, the separability of the vehicle and swop body units is always an attractive economic proposition. The vehicle no longer has to wait at a loading ramp as the driver drops the swop body nearby and is immediately free to deal with another haul. Once the goods have been loaded in the swop body, it can be taken to the nearest rail terminal on a lorry used for short-distance runs and lifted on to a wagon by crane. Swop bodies also provide useful opportunities for rationalization of purely road-hauled transport; for instance, swift transfer from short-distance vehicles to long-distance lorry-trailer combinations.

Though akin to containers, swop bodies are treated as piggy-back loads by the German railways for commercial reasons. Ordinary flat wagons such as those used for conveying containers are also suitable for swop bodies. The same applies to lorries and trailers.

3. Swop body transport trends

a) Federal Republic of Germany

In July 1969, 760 swop body lorries were registered and licensed in the Federal Republic. This figure rose to 1,500 in July 1970 and 2,100 in July 1971. Thus, about 10% of all lorries carrying a freight for hire or reward were equipped to take swop bodies. The reconversion state is expected to be completed between 1975 and 1978, by which time from 30 to 40% of all lorries carrying freight for hire or reward in the Federal Republic will be equipped in this way. The latter should then account for 40% of long-distance hauls for hire or reward.

About 10,000 swop bodies are at present in commission. There should be roughly twice or four times as many by 1975 or 1976.

Combined transport (road - rail - road) accounts for approximately 15% of all swop body traffic. The current growth of piggy-back in the Federal Republic is entirely due to swop bodies. The number of semi-trailers and lorry-drawbar trailer combinations carried by piggy-back in the first half of 1971 was much the same as in the corresponding period of 1970, but the number of swop bodies nearly doubled. Of the 31,736 piggy-back loads handled during the first half of 1971 in the Federal Republic,

swop bodies accounted for 54%,

semi-trailers for 38%,

lorry-drawbar trailer combinations for 8%.

This trend is still gathering strength.

b) United Kingdom

Demountable body (swop body) systems

There are a number of manufacturers in Great Britain offering various types of demountable body systems. These have chiefly been adopted by own account transport operators - e.g. for carrying glasswear, biscuits, mattresses, pillows, and cushioning, textiles and furniture - but there is at least one general haulier using a swop body system. It is not though that swop bodies are carried by rail in Great Britain though platform swop bodies are offered which could be used for carrying freight containers or indeed a variety of different loads and forms of packaging.

No statistics of the extent to which these freight transfer systems are used are available, but though it is probable that only a very small proportion of freight is at present handled in this way, use of these systems appears to be increasing.

D. BARGE-CARRIER TRANSPORT SYSTEMS

1. Economic aspects

"Barge-carrier transport" means transport to overseas destinations in special ships carrying, in their holds, barges designed to carry freight to and from the seaboard and/or along the waterways before or after the sea voyage as such.

The original trend of thinking on this, ten or so years ago, was based on barge-carrier traffic between the ports of highly industrialized countries and those of developing countries. The idea was to cut down demurrage in the latter ports, much time being lost there because mechanical handling facilities were still inadequate. Ocean-going vessels cannot berth at many of these ports and their cargoes have to be discharged on lighters offshore. It was also envisaged from the start that barges carried on a mother-ship might be used on the inland waterways. The aim of the barge-carrier system is to reduce to the utmost the time spent in port by the mother-ship by making it entirely independent of the lengthy process of discharging cargo. This system:

- shortens the turn-round time of ocean-going ships;
- reduces the number of ships required;
- reduces the overall size of the ship's crew;
- frees the mother-ship from constraints as to the type and productivity of transhipment facilities in the ports.

Barge-carrier vessels may or may not berth at seaports depending on the depth of the fairway. They can without exception use all the main European ports with bulk transhipment

facilities and link-up with international scheduled services. These ports provide safe moorings for putting down and picking up barges, together with suitable facilities for loading and discharging any kind of freight carried by them.

No special transhipment facilities are usually needed for loading and discharging barges in river ports.

2. Technical aspects

Barge-carriers are large vessels exceeding 40,000 dwt. The barges they carry are fairly small and, as those in commission so far have no anchors nor streamlined bows, they are incorporated in conventional barge trains when moving upstream. Unladen barges can be lashed side-on to a train of laden conventional barges without affecting manœuverability.

a) LASH system*

LASH barge-carriers have very large hatches on the main deck and carry their barges athwart in cell-type holds. This cellular design both ensures safe transport of the cargo and enables the vessel to be used as a container ship as well as a barge-carrier. Except in the first two units built, some of the cells in LASH carrier holds are fitted with container fastening devices and in this way accommodation is provided for from 100 to 360 20-ft. containers. In addition, the entire hold normally used for barges can be converted to accommodate containers in 24 hours. When adapted to carry containers alone, the capacity of the ship rises to 1,500 20-ft. units. The ship carries its own gantry crane. The dimensions of LASH barges are as follows: 18.75 m x 9.5 m x 4.42 m. Their effective capacity is 550 m3 and 380 tons load deadweight (with 2.60 m draft) - the light deadweight being 80 tons, their total displacement is 460 dwt.

The LASH mother-ship of the Central Gulf Steamship Corporation carries 73 barges on five decks and covers the 4,800 sea miles from New Orleans to Rotterdam in 12 days (voyage as such). The loading and unloading throughput is four barges an hour. Besides the holds for carrying barges, there are exceptionally large ballast tanks which can be used partly for liquid or grain cargoes.

b) SEABEE system

This system was developed by Lykes Lines. The SEABEE mother-ship can accommodate a total of 38 barges on three decks. Barges are loaded and discharged by a stern elevator capable of lifting up to 2,000 tons. The mother-ship can also be used for roll-on/roll-off and container traffic. When equipped for containers alone, it can take 1,800 20-ft. units.

The dimensions of SEABEE barges are as follows: 29.7 m x 10.7 m x 5.0 m; their effective capacity is 1,140 m3 and their load deadweight ranges from 650 tons (with 2.5 m draft) to 850 tons (with 3.2 m draft); their light deadweight is 150 tons.

Loading and unloading throughput ranges from 1,500 to 4,500 tons an hour.

c) Catamaran barge-carriers

An Anglo-Danish project provides for the coming into service of Catamaran barge-carriers on the North Sea in 1973. Each parent-ship would carry 18 barges 70 m long 4.7 m wide with an effective capacity of 140 tons (with a draft of 2.74 m). Catamaran barge-carriers can also be used for roll-on/roll-off and container traffic.

3. Present situation and developments concerning barge-carrier services

In contrast to what was originally foreseen, the first LASH ships were not used for links with the developing countries but on the U.S. Gulf - Europe route. Two regular barge-carrier services are in operation at present:

* "Lighter aboard ship".

a) U. S. Gulf - North Sea ports

This line serves, or will shortly serve, the following ports: New Orleans, Houston, Galveston, Le Havre, Antwerp, Rotterdam, Bremen-Bremerhaven, Hamburg and the United Kingdom ports.

Two barge-carrier vessels are at present in commission: "Akadia Forest" and "Atlantik Forest". This is a regular fortnightly service but when the third LASH vessel comes into commission (1974) it will be possible either to reduce the interval between sailings to nine days or to increase the number of ports of call.

b) United States East Coast - Mediterranean

This line serves, or will shortly serve, the following ports: Boston-Norfolk-Range; Lisbon-Barcelona, Genoa-Naples, Piraeus, Istanbul, Izmir.

Ships at present in service: "LASH Italia" and "LASH Turkiye".

Estimates of the number of LASH barge-carriers over the next few years are given below (cumulative figures):

Year	Number of ships
1969	1
1970	2
1971	8 [1]
1972	15
1973	19
1974	22

1. Five ships were in commission at the end of 1971.

These 22 ships will represent a capacity of about 800,000 tons, to which must be added the three SEABEE ships to be delivered in 1971-1972. They will operate on the United States-Europe route. The North Sea trade will be handled by a smaller (2,700 dwt.) Catamaran vessel now under construction.

It is estimated that the yearly volume of cargo handled on the North Atlantic route by the first seven barge-carrier ships is in the region of 4.6-5 million tons, most of it accounted for by the traffic with the Rhine Basin.

4. Problems concerning barge-carrier transport technology

Problems calling for special attention under this head are those concerning the admittance of barges to navigation on European inland waterways.

a) Technical problems

As the ship-borne barges built so far do not conform to the design and safety requirements laid down for inland waterway navigation, the authorities have up to the present merely granted temporary derogations.

Barge dimensions do not raise any problems, at least in the Rhine Basin. Even the big SEABEE barges fall short of the maximum length and width (76.5 metres and 11.4 metres

respectively) permitted on the Rhine. Draft requirements can be met by suitable adjustments to the load.

On the other hand, the barges do not fulfil all the requirements laid down in the Rhine traffic control regulations (1st October 1971), the regulations for inspection of Rhine vessels and rafts (1st April 1970) and the corresponding amendments (Volume 1). The Central Commission adopted a number of provisions whereby ship-borne barges, their bows not being streamlined, must not be put in the lead for push-towed barge trains. In addition, when push-trains are moving upstream, the leading barge must carry an anchor. Some derogations are envisaged as regards the requirements concerning watertight bulkheads on metal-hulled ships, but no exemptions are likely to be granted in the case of the provisions for "freeboard marks, deadweight scales, and measurement" and these will therefore be fully applicable.

In the Federal Republic of Germany, on waterways outside the jurisdiction of the Central Commission for Navigation of the Rhine, safety rules are laid down by the waterway transport operators' trade associations. On some points, these rules are even more stringent than those of the Commission: ship-borne barges are required to carry an "inspection certificate" or "ship's certificate", they being subject to the same safety requirements as inland waterway craft. Pending the formulation of final provisions, derogations are granted to enable barges from the "Akadia Forest" and "Atlantik Forest" to use the German inland waterways.

Conclusion

Ship-borne barges sailing on inland waterways are in competition with traditional craft. As regards safety requirements, they should in principle comply with those applicable to craft of conventional types. Distortion of the terms of competition, from the technical and economic angles alike, should as far as possible be avoided.

b) Rates and terms of carriage for inland waterway voyagers

Wherever shipping dues are levied on the inland waterways, there can be no doubt whatsoever that ship-borne barges and their cargoes will be subject to such taxes and the corresponding procedures.

On the other hand, the question of freight rates for ship-borne barges using inland waterways is not yet completely settled. In this connection, the following distinction must be borne in mind:

a) "an overall contract of carriage" from consignor to consignee, including inland transport, with a corresponding "through rate" and

b) successive contracts of carriage for the journey from the hinterland to the seaport, the sea leg itself, and the journey from the seaport to the hinterland.

In case (a), there is no special contract of carriage for the inland waterways journey. Responsibility for expenditure incurred in this particular respect lies with the operator who entered into the overall contract of carriage. There is no legal provision for billing this expenditure separately nor is it possible to check whether the charges for loading and unloading barges are exactly proportional to the total costs under the overall contract of carriage.

In case (b), there are successive contracts of carriage for each section of the journey. Such contracts are legally subject to the provisions concerning freight rates and terms of carriage applicable on a given waterway. This point is of little importance when freight rates are governed by the law of supply and demand, but becomes vital if they are determined and controlled by public authorities. In practice, however, most countries dispense such contracts from the provisions of inland waterway freight rate legislation.

Draft legislation (known as the Trade Simplification Act) in the United States authorizes through rates for barge-carrier transport in cases where the destination of the consignment is not located on a United States inland waterway, that is, when there is an overland haul after unloading.

Though, in this case, the shipper can be quoted a through rate, each of the carriers involved must notify the competent authority (IEC, FMC, CAB) of the rate corresponding to his part of the journey. The Trade Simplification Act has not yet been passed by Congress.

c) Social problems

No special problems arise as regards manning ship-borne barges on inland waterways. The provisions applicable in their case are the same as for push-towed craft.

Problems that might arise are those relating to safety of the crew as the craft in question are of very simple design. The inland waterway transport workers' organisations have accordingly called for more stringent safety requirements and for the strict application of existing provisions concerning barge navigation on the inland waterways.

d) Problems concerning capacity

Barge-carrier transport at present accounts for only a small proportion of the total volume of inland waterway traffic. Even allowing for the likely development of this type of transport, its share of Rhine traffic in the near future will barely exceed 1%. Ship-borne barges could potentially take 3% of the waterway traffic on the Seine above Rouen. However, countries which control transport capacity on their inland waterways will be confronted, for reasons of competition, with the problem of providing for barge-carrier transport in such controls.

Conclusion

The ECMT should keep the future development of barge-carrier transport closely under review.

5. Work on barge-carrier transport in progress within the ECE

In the light of information obtained concerning the technical, economic and administrative problems arising in connection with the use of ship-borne barges on inland waterways, it has been agreed to convene an ad hoc meeting to study administrative and economic problems presented by ship-borne barges; technical aspects and questions relating to crew safety would be considered within the existing framework.

TERMS OF REFERENCE

The Council of Ministers gives the following terms of reference to the Committee of Deputies:

- to keep the trend of all forms of combined transport under review with the help of the International Organisations;
- to ascertain the possibilities for development of such transport within Europe, the technical, economic and administrative obstacles which hamper its more widespread adoption and the practical measures for removing them;
- to consider whether the ECMT might draw up containerization forecasts on an international basis;
- to watch developments concerning barge-carrier transport and its implications for inland transport;
- to study the problems concerning the location and rational operation of combined transport terminals;
- to give special attention to protection of the environment;
- to submit a report to the Council of Ministers at its June 1974 session.

REPORT ON THE FINANCING OF URBAN TRANSPORT

[CM(72)13 revised]

December 1972

(See off print)

REPORT ON THE CAPACITY OF THE INLAND WATERWAY FLEET AND ON TRENDS IN TRANSPORT DEMAND

[CM(72)11]

INTRODUCTION

In June 1970, the Council of Ministers approved a report on the trend of inland waterway fleet capacity during the years 1955-1968 and gave instructions for a further study on this subject two years later.

This report reviews the trend during the years 1968, 1969 and 1970, outlines the prospects for waterway transport demand up to 1980, and sets out the capacity that will be needed to cater for the expected increase in this demand.

Information is also given on the actual out-turn for 1971 and part of 1972.

This report does not go into the social implications of the predicted growth of inland waterway transport. Scarcity of skilled manpower and changes in working conditions on the waterways will undoubtedly have a big impact. This aspect will therefore have to be considered in closer detail as soon as all the relevant data have been collected.

SUMMARY

Chapter I of this report discusses the trend of inland waterway transport and fleet capacity in the Federal Republic of Germany, the Netherlands, France, Belgium and Switzerland during the period 1968-1970.

The weighted capacity of the foregoing countries' respective fleets in 1969 and 1970 also appears in this chapter. For all these countries combined, the increase in weighted capacity is 2%.

The weights applied were: self-propelled craft, 1.7 (as compared with 1.6 in the first report), push-towed barges, 2 (as compared with 1.9 in the first report) and pull-towed barges, 1 (unchanged). In the case of push-towed barges, a smaller weight was applied to part of the fleet to allow for special operating conditions. Increased capacity is more particularly due to a sharp increase in productivity resulting mainly from faster turn-round.

As transport output during the same period increased by 1.8%, it follows that the relationship between weighted capacity and transport output in 1970 was much the same as in 1968. It is reasonable to assume that, on a purely arithmetic basis, there was no effective over-capacity on the inland waterways of Western Europe in 1970.

If the fleet was not always fully employed in 1970 this may be due, as was the case in 1968, to exceptionally favourable navigating conditions (i. e. water level).

Chapter II sets out the trend of inland waterway transport demand up to 1980. The figures on this point show the same general tendency for all countries.

There is of course a link between the transport trend and the economic growth assumption on which these studies are based.

A steady growth in waterway transport is forecast, albeit to a greater degree for international traffic than for domestic traffic.

These figures show a slight increase in the share of the market accounted for by inland waterway transport as compared with other modes.

There should be little change, generally speaking, in the commodity breakdown of waterway traffic. The main items for which carryings are expected to increase are: sand, gravel and building materials, crude oil and oil products and - more especially in the Rhine Basin - raw materials for the iron and steel industry.

Coal carryings, however, will drop steeply.

The forecasts assume that, between now and 1980, the newer transport technologies such as push-towing and barge-carrier vessels, will not attract additional traffic or other types of traffic to the waterways.

The third and last chapter concerns the estimates of waterway fleet capacity for countries bordering the Rhine and for Belgium up to 1980.

As the data for the forecasts discussed in Chapter II were not fully comparable because of the differences in methods employed, it was judged that if the Netherlands survey were taken as a basis, waterway fleet capacity for all Western European countries could be estimated by applying suitable correction factors to the figures for the Netherlands.

The conclusion arrived at in this study is that, by 1980, traffic should increase by 65% on average, that is by 5% a year. As pointed out in the report, this will imply an increase in the number of craft, especially for those exceeding 950 tons. A German study forecasts a smaller increase in traffic - roughly 3%; in this event, the yearly increase for the period 1970-1980 would be in the region of 300,000 tons.

The figures actually recorded for 1971 and part of 1972 fell well short of the forecasts.

On a purely arithmetical reckoning, the conclusion must be drawn that there already was some over-capacity in 1971 and that this is also likely to be the case in 1972.

The presupposed relationship between increased traffic and fleet capacity requirements must therefore be treated with circumspection. The trend of capacity will have to be kept carefully under review.

It also seems desirable to adjust the forecasts regularly to changes in the factors on which they are based.

TERMS OF REFERENCE

The Council of Ministers instructs the Committee of Deputies:

- to keep the trend of waterway fleet capacity regularly under review,
- to study the future trend of transport demand in order to determine the capacity needed and adapt the forecasts to the latest data,
- to take account of the social implications of developments in inland waterway transport,
- to prepare a report for the Council of Ministers at its session in December 1973.

Chapter I

FLEET CAPACITY AND TRANSPORT DEMAND ON THE INLAND WATERWAYS OF THE FEDERAL REPUBLIC OF GERMANY, THE NETHERLANDS, FRANCE, BELGIUM AND SWITZERLAND IN 1968 AND 1970

1. 1955-1968

The last study made by the ECMT Inland Waterways Sub-Committee on trends in inland waterway capacity and traffic in the Riparian States of the Rhine and Belgium covered the period 1955 to 1968. The study had shown that between 1955 and 1967 the weighted capacity of the waterway fleet had increased at a greater rate than demand. Surplus capacity had built up, amounting, according to the studies made at that time, to about 1,000,000 tonnes (weighted) in 1967. But the study also showed that in 1968 the fleet capacity in the countries concerned had levelled out whereas output had gone up by at least 5.3%. The over-capacity shown by the figures for 1967 was therefore largely absorbed in 1968.

2. Basis for calculating weighted capacity for 1969 and 1970

For purposes of calculating the weighted capacity of the various types of craft, the Sub-Committee decided that the coefficient of 1.0 used up to now for pull-towed barges could be retained and that the coefficient for self-propelled craft (including tankers) should be fixed at a standard figure of 1.7. On the other hand, the 1.9 coefficient used up to now for push-towed barges in all countries has been discarded. The French Delegation asked that French push-towed barges should be given a coefficient of 1.4 and this was accepted. The waterways that are mainly used by these barges and the traffic they handle do not admit of the same efficiency that is possible, for example, between the ports at the mouth of the Rhine and the German zone of the lower Rhine. Moreover, although French push-towed barges on the Rhine are as big, sometimes even bigger, that their counterparts in other countries, the average capacity per unit of the French Fleet as a whole is smaller than that of other countries. The first argument also applies to Belgian and Swiss craft of this type when used in similar conditions to those of the French fleet. As a result, half of the push-towed barges of these countries have been allotted a coefficient of 1.4 and half a coefficient of 2. For all German and Dutch push-towed barges the coefficient has been increased to 2.

The Sub-Committee has noted that a further increase in capacity has been achieved in 1969 and 1970 as a result of quicker turn-round due in particular to faster transhipment in port (shorter lay-days), longer hours of navigation per day, waterway improvements and other rationalization measures. The increase in capacity resulting indirectly from these measures is estimated, for these two years, at 3% for dry cargo craft, 1.5% for self-propelled tankers, 2% for push-towed barges and 1% for pull-towed barges. The corresponding figures going back to 1955, the base year for the first study, are 23% for dry cargo craft, 18% for tankers, 17% for push-towed barges and 16% for pull-towed barges.

3. Fleet size in the Federal Republic of Germany, the Netherlands, France, Belgium and Switzerland in 1968 and 1970

According to the figures given to the Waterways Sub-Committee by these countries, the total unweighted capacity of the inland waterway fleet has fallen from 16.0 to 16.5 million tonnes (0.35 million tonnes or 2%). Expressed, however, as weighted tonnes - though not allowing for the indirect increase in capacity as a result of quicker turnround, waterway improvements, longer hours of navigation per day and other rationalization measures - the capacity of the inland waterway fleet fell by only 0.1 million tonnes or 0.3% (from 25.9 million tonnes in 1968 to 25.8 million tonnes in 1970). The new coefficients referred to in paragraph 2 have been used in the formulae for calculating the above figures.

In 1970, the total weighted capacity was made up as follows:

Germany:	28.1%
Netherlands:	24.5%
France:	18.3%
Belgium:	16.3%
Switzerland:	2.8%

The relative shares of the various countries have therefore hardly changed compared with 1968 when the figures were as follows:

Germany:	28.0%
Netherlands:	33.3%
France:	18.6%
Belgium:	17.3%
Switzerland:	2.8%

Weighted capacity by types of craft has increased as follows:

Dry cargo:	by 566,000 tonnes
Self-propelled tankers:	by 96,000 tonnes
Pushed-towed tankers:	by 37,000 tonnes

Weighted capacity has fallen for:

Dry-cargo pull-barges:	by 641,000 tonnes
Self-propelled dry cargo barges:	by 125,000 tonnes

(See also Table I, following page).

However, taking into account the increase in capacity due to quicker turnround, faster transhipment in port, longer hours of navigation, waterway improvements and other rationalization measures, the capacity of the inland waterway fleet of the Riparian States of the Rhine and Belgium, increased from 30.7 to 31.2 million tonnes (+2%) between 1968 and 1970.

The situation with regard to the capacity to the various types of craft is as follows:

Dry-cargo self-propelled:	up by 370,000 tonnes
Self-propelled tankers:	up by 150,000 tonnes
Dry-cargo push-towed barges:	up by 690,000 tonnes
Push-tow tankers:	up by 50,000 tonnes
Dry-cargo pull-towed barges:	down by 710,000 tonnes

The increase in capacity is solely due to the enlargement of the Dutch and German fleets (by 550,000 and 200,000 tonnes respectively). The weighted capacity of the French and Swiss fleets increased hardly at all even allowing for the increase in capacity due to rationalization, while that of the Belgian fleet actually fell by 0.2 million tonnes (see Table II, page 282).

Thus, dry cargo craft capacity has increased by 360,000 tonnes or 1.3% and tanker craft capacity by 200,000 tonnes or 5.3%.

Table I. CAPACITY OF INLAND WATERWAY FLEET IN 1968 AND 1970
BY COUNTRY AND TYPES OF CRAFT ON THE BASIS OF THE NEW COEFFICIENTS

('000 tonnes)

TYPE OF CRAFT	ALL COUNTRIES		GERMANY		NETHERLANDS		FRANCE		BELGIUM		SWITZERLAND	
	1970	1968	1970	1968	1970	1968	1970	1968	1970	1968	1970	1968
Dry cargo self-propelled barges	17,448	17,573	4,814	4,905	5,528	5,365	3,220	3,189	3,502	3,689	384	425
Self-propelled tankers	2,833	2,737	1,042	928	901	859	393	481	313	313	184	156
Dry-cargo pull-towed barges	3,016	3,657	700	1,010	1,661	1,783	268	383	319	414	67	67
Pull-towed tankers	285	286	74	85	172	145	15	30	11	13	13	13
Dry cargo push-towed barges	1,891	1,325	558	274	558	388	640	559	67	46	68	58
Push-towed tankers	311	274	54	27	66	62	181	176	3	3	7	6
Total	25,784	25,852	7,242	7,229	8,887	8,602	4,717	4,818	4,215	4,478	723	725
Difference, end 1970 compared with 1968	-70,000 tonnes or -3%		+10,000 tonnes or +0.2%		+290,000 tonnes or +3.3%		-100,000 tonnes or -2.3%		-260,000 tonnes or -5.4%		+ -	0

Table II. WEIGHTED CAPACITY OF INLAND WATERWAY FLEET IN 1968 AND 1970
INCLUDING INDIRECT INCREASES IN CAPACITY DUE TO QUICKER TURNROUND, FASTER TRANSHIPMENT, LONGER HOURS OF NAVIGATION, WATERWAY IMPROVEMENTS AND OTHER RATIONALIZATION MEASURES

('000 tonnes)

TYPE OF CRAFT	ALL COUNTRIES		GERMANY		NETHERLANDS		FRANCE		BELGIUM		SWITZERLAND	
	1970	1968	1970	1968	1970	1968	1970	1968	1970	1968	1970	1968
Dry cargo self-propelled barges	21,461	21,088	5,921	5,886	6,800	6,438	3,961	3,827	4,307	4,427	472	510
Self-propelled tankers	3,343	3,189	1,230	1,081	1,063	1,000	464	560	369	365	217	182
Dry cargo pull-towed barges	3,499	4,206	812	1,167	1,928	2,050	311	440	370	476	78	77
Pull-towed tankers	331	329	86	98	200	167	17	35	13	15	15	15
Dry cargo push-towed barges	2,212	1,524	653	315	653	446	749	643	78	53	80	67
Push-towed tankers	364	315	63	31	77	71	212	202	4	4	8	7
Total	31,210	30,651	8,765	8,572	10,721	10,032	5,714	5,707	5,141	5,340	870	858
Difference, end 1970 compared with 1968	+550,000 million tonnes or +2%		+20,000 million tonnes or +2.3%		+550,000 million tonnes or +5.4%		+ 0 -		-20,000 million tonnes or -3.8%		+ 0 -	

The increase in the number of dry cargo craft is practically wholly due to the enlargement of the Dutch and French fleets (+400,000 and +100,000 tonnes respectively), whereas the increase in the number of tanker craft is primarily due to the increase in the size of the German, Dutch and Swiss fleets (+170,000, +100,000 and +40,000 tonnes respectively). Dry cargo capacity in the Belgian fleet and tanker craft capacity in the French fleet fell by 200,000 and 100,000 tonnes respectively.

4. Transport output in tonne-kms on the inland waterways of the Riparian States of the Rhine, and Belgium, 1968-1970

Totals

The traffic on the inland waterways of these countries expressed in tonne-kms, amounted to:

98,700 million tonne-kms in 1968
99,300 million tonne-kms in 1969 and
100,400 million tonne-kms in 1970

The increase between 1968 and 1970 was therefore 1,700 million tonne-kms or 1.8%.

Transport output in tonne-kms therefore increased by a similar rate to weighted capacith which went up by 2% over this same period.

The ratio between weighted capacity and transport output in 1970 is therefore roughly the same as for 1968. On an arithmetical reckoning, therefore, it may be presumed that there was no effective overcapacity on the inland waterways of Western Europe in 1970. An analysis of the traffic output in tonne-kms by dry cargo and tanker craft shows that the figure for the former increased from 83,700 to 84,700 million tonne-kms (+1.3%) and the latter from 15,000 to 15,700 million (+4.8%) between 1968 and 1970.

Weighted capacity and traffic output in tonne-kms therefore went up at practically the same rate for both dry cargo and tanker craft.

If, even so, the fleet was not always fully employed in all waterways in 1970, this may be attributed, as in 1968, to the exceptionally good navigation conditions (water level). For instance, the average utilization factor for all fully or partly laden craft in the Federal Republic of Germany was 79.5% in 1970, a considerable increase on the already high utilization factor for 1968 which was 77.8% (see Table III, next page).

Table III. OUTPUT IN THOUSAND MILLION TONNE-KM[1] FOR DRY CARGO AND TANKER CRAFT, 1968-1970

TYPE OF CRAFT	ALL COUNTRIES		GERMANY		NETHERLANDS		FRANCE		BELGIUM		SWITZERLAND[2]	
	1970	1968	1970	1968	1970	1968	1970	1968	1970	1968	1970	1968
Dry cargo	84.7	83.7	41.0	40.4	26.6	26.9	11.3	10.6	5.8	5.8	0.025	0.025
Tankers	15.7	15.0	7.8	7.5	4.1	4.1	2.9	2.6	0.9	0.8	0.015	0.015
Total	100.4	98.7	48.8	47.9	30.7	31.0	14.2	13.2	6.7	6.6	0.04	0.04

1. Traffic handled (tonne-km), within the territory of each of the countries referred to, by all craft irrespective of nationality.
2. Traffic on the Rhine.

Chapter II

TRENDS IN THE DEMAND FOR INLAND WATERWAY TRANSPORT TO 1980

The previous chapter dealt with the development and capacity of the inland waterway fleet in Western Europe up to the 1st January 1971.

It is clear that, whilst the number of craft has fallen, the capacity of the fleet has increased considerably owing to the improvements in productivity produced by modernizing the fleet and using larger units. Quicker turnround and a reduction of idle time in port have also helped.

Waterway transport has therefore been able to cope with the increased demand except in special certain cases where the supply of tonnage was temporarily curtailed (strikes, economic situation) or full use of capacity was temporarily prevented by weather conditions.

More detailed study of future trends in the demand for inland waterway transport is called for at this point in order to form an idea of the capacity required and because the industry needs more information under this heading when considering future investment: readiness or otherwise to invest depends largely on the degree of confidence there is in the growth of demand for waterway transport services.

This chapter will draw upon the results of a number of studies that have already been carried out and attempt a more detailed analysis of trends in demand to 1980, the horizon to which the studies referred to extend. Greater uncertainty attaches to forecasts beyond 1980.

1. Forecasts of inland waterway traffic for 1968 to 1980 in Germany, Belgium, France and the Netherlands*

Table IV, relating to inland waterway traffic in Belgium and in France, is based on direct extrapolation of 1961-1970 trends. Both countries anticipate a considerable increase in hydrocarbons traffic to 1980 and a very much smaller increase in dry cargoes.

Extrapolation from the 1966-1970 and 1968-1970 periods gave higher figures but in view of events in 1970 and 1971, when growth fell short of forecast, it seems more prudent to adopt the lowest figures.

Both Belgium and France consider that the position of inland waterway transport, both as regards infrastructure and competition with other types of transport, will be affected solely by the factors governing general economic trends. Nor do they anticipate any shifts in the relative importance of the categories of goods usually carried on inland waterways.

Tables V and VI, relating to inland waterway transport in the Federal Republic of Germany, are taken from the IFO report on trends in transport to 1980; the figures include international but not transit traffic.

* Sufficiently precise forecasts for this purpose have not yet been worked out in Switzerland.

The increase in inland waterway transport output shows a satisfactory relationship with the increase in the gross national product but this varies greatly according to the category of goods carried by this mode of transport (bulk).

The largest item of inland waterway traffic (building materials) shows a much steeper increase than other categories (fuel, iron and steel, etc.). Coal carryings show a downward trend.

No substantial changes are expected between now and 1980 in the pattern of inland waterway transport either with regard to makeup or route.

Categories of goods

a) It may well be that the 1980 forecast of 20 million tons of coal is over-optimistic. German coal production depends on the level at which the Government decides to maintain it and account has to be taken of the general trend towards a greater use of other materials for energy production.

b) It is assumed that no new pipeline for oil products will come into use between now and 1980 that might reduce the call on inland waterway transport. This assumption is supported by the substantial investment in tanker craft.

c) Forecasts for iron and steel transport are based on growth in production at current locations.

Infrastructure

A considerable increase in traffic is also anticipated on waterways that are to be modernized and enlarged between now and 1980 (Elbe-Seitenkanal), in the same way that it has increased on recently enlarged and improved waterways (e. g. the Moselle and the Neckar).

External factors

No account could be taken, in the 1980 forecasts, of the possible introduction of a system of infrastructure pricing, nor could any allowance be made for other transport policy decisions, such as the liberalization of the rate system.

New techniques such as push-towing may lead to an increase in the output of the inland waterway fleet over the period of the forecast. Apart from the possibilities already referred to, there are no grounds for anticipating any change in the competitive situation as between inland waterways and other modes of transport.

As stated in Chapter I on fleet capacity, the anticipated increase in inland waterway traffic for 1971 failed to materialize. If the tonnage forecast for 1980 is to be reached, therefore, the average rate of increase will need to be higher over the period to 1980.

Table VII, relating to transport in the Netherlands, is based on an integrated study which attempts to forecast trends in traffic and transport to 1980, 1990 and 2000 (Report by the Netherlands Economic Institute - NEI). This gives an index figure of 184 for 1980 (1968 = 100) and considers that the relative importance of inland waterway transport should increase slightly compared with other modes.

The volume of goods carried, wet and dry, in most categories - and building materials in particular - will have in increased to more than twice the 1968 figure.

The biggest increase in absolute figures will be for sand and gravel although the rate of growth here will be lower than in earlier years.

Carryings of solid fuel will no longer be recorded.

2. Trends in international traffic between 1968 and 1980 across the border between Germany and the Netherlands

Tables VIII, IX, X and XIII are taken from NEI study referred to above.

This study deals with transport from and into the Netherlands and takes the economic development of other countries into account in its forecasts for inbound traffic. Domestic (internal) inland waterway traffic has increased at a greater rate than international traffic in general. Road haulage shows the steepest increase in absolute figures. Inland waterways increased their share of total traffic at the expense of the railways.

By 1980 the index for all kinds of goods as a whole should climb to 164 (1968 = 100).

Inbound foodstuffs, liquid fuel and processed building materials should increase to double their 1968 figure. Sand and gravel also show a considerable increase though lower than that for internal transport.

The general index for inbound traffic is given as 137 in 1980.

For outbound traffic the overall index is put at 181 in 1980, a very considerable increase over the figure for 1968. By 1980 sand and gravel should account for 48% of all inbound traffic (41% in 1968) and iron ore should form 44% of all outbound traffic (40% in 1968).

Table XIII shows that for the Rhine basin as a whole (Germany and other countries, including Switzerland) goods coming from the Netherlands should practically double in volume by 1980.

Though to a lesser degree, an appreciable increase is also expected in traffic from other countries, including Switzerland, to the Netherlands.

The trend in wet cargoes can be deduced from Table XIII by deducing dry cargoes from total traffic; this shows a considerable growth in wet cargoes from the Netherlands to Germany, Switzerland, and other countries. Table XI shows that traffic to and from France via the Rhine and the Moselle will amount to 54,381,000 tonnes in 1980 if the 1968-1970 trend continues (27,408,000 tonnes in 1968).

The IFO report (Table V) indicates that internal and international (excluding transit) traffic on Germany's waterways should increase by 114,000,000 tonnes (52%) between 1969 and 1980. By comparison the Netherlands study estimates an increase of 151,000,000 tonnes (or 73%) for Dutch internal and international traffic between 1968 and 1980.

3. International traffic between Belgium, France and the Netherlands, 1968 to 1980

Tables XI and XII show trends in total international traffic for Belgium and France to 1980 based on the 1968-1970 trends. It will be seen that traffic in wet cargoes promises to increase at a greater rate than dry cargo traffic. Here again extrapolation on the basis of trends going back to 1961 and 1966 would have given higher figures and the 1968-1970 period was felt to be a safer basis.

Table XII relates to traffic crossing the border between France and Belgium which is steadily increasing. The forecasts here are based on the assumption that the 1980 infrastructure will be the same as it is today, in other words goods will have to be carried between Belgium and France in craft of under 350 tonnes (except for traffic with the port of Givet).

Table XIII relates to traffic between the Netherlands and the BLEU; these figures are based on the Dutch integrated transport and traffic study and suggest a higher figure for all inland waterway transport in 1980 (39,000,000 tonnes) than the figure derived from Table XII (34,000,000 tonnes).

Summary and conclusions concerning Chapter II

The forecasts discussed suggest that the general trend of inland waterway traffic to 1980 will be the same in all countries.

These studies obviously relate transport trends to assumed economic growth.

A steady increase may be expected in waterway transport, more marked in international than in internal traffic.

There is likely to be a slight increase in the share of transport accounted for by inland waterways compared with other modes. There will be little change, generally speaking, in the pattern of inland waterway transport as regards goods carried. The main increases will take place in sand and gravel and building materials, crude oil and refinery products and, primarily in the Rhine Basin, raw materials for the iron and steel industry.

However, coal traffic will fall off sharply.

It is assumed that, between now and 1980, new technologies such as pusher navigation and barge-carrier vessels will not attract more traffic or traffic of different kinds to the inland waterways.

It is also assumed that national or international transport policy, at least up to 1980, will not have any considerable influence on pricing and on the allocation of infrastructure costs.

With regard to the effect of infrastructure developments (new and improved waterways) it is generally felt that once the projects now in hand are completed, they will make a major contribution to the growth that is forecast in inland waterway traffic between now and 1980.

The forecasts for traffic between France and Belgium do not allow for infrastructure development.

It should not be forgotten that a relatively slight increase in traffic is sufficient, at certain points, to create infrastructure difficulties impeding the development of inland waterway transport.

The report stops at 1980 which enabled the study to be confined to inland waterway transport in Western Europe; beyond that date, the opening of the Rhine-Main-Danube link would have had to be taken into account.

A general point to be noted is that the forecasts in these studies should be treated with circumspection.

Short-term economic development is already having a considerable effect on the forecasts of economic growth on which the studies are based; moreover there is a growing body of opinion opposed to the view that economic expansion can continue indefinitely.

On the basis of existing information, however, it can be assumed that, failing any radical changes in the industries and other economic sectors on which barge operators depend, traffic on the inland waterways will go on increasing.

A last point is in view of the nature and quantity of goods carried in barges - primarily bulk products - it is hardly likely that they will be transferred to other modes of transport.

The general conclusion on these considerations regarding trends to 1980 must be that the industry is fully justified in expecting the demand for waterway transport to continue to grow as regards those goods (mainly bulk products) for which barges are the ideal mode of transport, and secondly that there is no factor in sight likely to introduce any major changes.

Table IV. INTERNAL TRAFFIC

BELGIUM

	TONNAGE						OUTPUT					
	TRAFFIC 1961 ('000 tonnes)	TRAFFIC 1970	1970 / 1961	ANNUAL[2] COEFF. $\sqrt[9]{1970/1961}$	1980 / 1970	TRAFFIC 1980 ('000 tonnes)	TRAFFIC 1961 (million tonne-kms)	TRAFFIC 1970	1970 / 1961	ANNUAL[2] COEFF. $\sqrt[9]{1970/1961}$	1980* / 1970	TRAFFIC 1980 (mill. tonne-kms)
Hydrocarbons[1]	2,100	7,574	3.607	1.153	4.101	31,061(a)	211	575	2.725	1.105	3.011	1,731(a)
Other goods	22,720	23,663	1.041	1.004	1.045	24,728(b)	2,152	2,127	0.988	0.999	0.987	2,099(b)
Total internal traffic	24,820	31,237	1.258	1.023	1.287	40,202	2,363	2,702	1.143	1.013	1.157	3,126
Total (a + b)						(55,789)						(3,830)

FRANCE*

Hydrocarbons	8,564	14,203	1.658	1.058	1.754	24,912(a)	1,769	2,088	1.180	1.019	1.202	2,510(a)
Other goods	40,154	52,728	1.313	1.031	1.353	71,341(b)	6,048	6,625	1.095	1.010	1.106	7,327(b)
Total internal traffic	48,718	66,931	1.373	1.036	1.422	95,176	7,817	8.713	1.115	1.012	1.128	9,828
Total (a + b)						(96,253)						(9,837)

1. Classification changed in 1966.

2. This coefficient is the 9th root of the ratio: $\frac{\text{1970 traffic}}{\text{1961 traffic}}$.

* A more recent study, based on a different method for extrapolating trends prior to 1970 over a longer period, gives the following figures which seem more probable:

	Estimated internal traffic, 1980	
	'000 tons	million tonne-kms
Hydrocarbons	19,000	3,100
Other goods	63,000	8,100
Total	82,000	11,200

Table V. GERMANY

Estimated tonnage carried, average distances and output by mode of transport

GOODS	RAIL	WATERWAY	ROAD	PIPELINE	TOTAL
Tonnage (million tonnes)					
1969	371	221	156	74	822
1975[1]	381	273	191	101	945
1980[1]	421	335	237	135	1,128
Average distance (km)					
1969	204	186	250	201	203
1975[1]	198	187	248	209	206
1980[1]	199	187	250	208	207
Output (thousand million tonne-kms)					
1969	76	42	39	15	171
1975[1]	76	51	47	21	195
1980[1]	84	63	59	28	234

1. IFO estimates.

Table VI. GERMANY

Categories of goods carried by mode of transport (excluding transit traffic)

million tonnes

CATEGORY OF GOODS	1968	1975[1]	1980[1]
Coal (a)	113	97	84
Hydrocarbons (b)	157	213	265
(a + b)	270	310	349
Iron and steel products	169	188	212
Building materials	125	168	222
Foodstuffs	85	120	150
Other goods	123	159	196
Total	771	945	1,128

1. IFO estimates.

Table VII. NETHERLANDS

Forecasts of internal transport, all modes (total) and inland waterways only

NSTR NOMENCLATURE	1968			1980		
	TOTAL ('000 tonnes)	INLAND WATERWAYS		TOTAL ('000 tonnes)	INLAND WATERWAYS	
		ABSOLUTE	%[1]		ABSOLUTE	%[1]
Goods						
1. Cereals	14,137	6,462 (100)	45.5	30,796	15,165 (236)	49.2
2. Foodstuffs	57,951	2,482 (100)	4.3	97,127	5,475 (221)	5.6
3. Beet and sugar	6,168	1,128 (100)	18.3	10,806	2,051 (182)	10.0
4. Sand and gravel	128,678	59,308 (100)	46.1	204,222	99,041 (167)	48.5
5. Stone, clay, etc.	25,848	1,904 (100)	7.4	40,174	3,771 (198)	9.4
6. Iron ore, ferrous scrap	1,524	346 (100)	22.7	3,164	735 (212)	23.2
7. Cellulose and wastes	1,267	292 (100)	23.0	2,758	643 (221)	23.3
8. Semi-finished products	29,078	1,925 (100)	6.6	68,629	5,245 (273)	7.6
9. Coal and coke	8,758	1,773 (100)	20.2	-	-	-
10. Crude oil	2,103	824 (100)	39.2	1,880	700 (85)	37.2
11. Other fuels	33,221	12,915 (100)	38.9	64,596	31,192 (242)	48.3
12. Carbochemicals	328	130 (100)	39.7	1,137	347 (267)	30.5
13. Cement and lime	5,797	2,033 (100)	35.1	9,483	3,464 (170)	36.5
14. Building materials	24,710	173 (100)	0.7	30,402	297 (171)	1.0
15. Manufactured goods	43,205	655 (100)	1.5	85,359	925 (141)	1.1
Total (1-15)	382,773	91,359 (100)	24.0	650,533	168,003 (184)	25.9
Number of consignments		205,563 (100)			358,217 (174)	
Average per consignment		444.4 (100)			469.0 (106)	

1. Percentage of total internal transport accounted for by inland waterway traffic.

Source: Netherlands Economic Institute.

Table VIII. NETHERLANDS

Development of international waterway traffic from 1968 to 1980

'000 tons

	1968		1980	
	TOTAL	WATERWAYS	TOTAL	WATERWAYS
Outbound	90,000	71,241 (100)	157,000	128,975 (181)
Inbound	64,000	44,459 (100)	91,000	61,111 (137)
Transit traffic (without transhipment)	31,000	29,487 (100)	54,000	48,772 (165)
Total	185,000	145,187 (100)	202,000	238,858 (165)

Table IX. NETHERLANDS

Distribution of international transport by mode for 1968-1980

YEAR	INBOUND			OUTBOUND			TRANSIT		TOTAL		
	RAIL	WATER	ROAD	RAIL	WATER	ROAD	RAIL	WATER	RAIL	WATER	ROAD
1968	9	69	22	7	79	14	6	94	7	78	15
1980	8	67	25	5	82	13	9	91	5	79	16

Table X. NETHERLANDS

Trends in inland waterway international traffic by category of goods from 1968 to 1980

(Index figures in brackets)

GOODS	1968			1980		
	INBOUND	OUTBOUND	TOTAL	INBOUND	OUTBOUND	TOTAL
1. Cereals	2,667	8,021	10,688	2,766	14,347	17,113
	(100)	(100)	(100)	(104)	(179)	(134)
2. Foodstuffs	775	1,869	2,644	1,575	3,290	4,865
	(100)	(100)	(100)	(203)	(176)	(184)
3. Beet and sugar	130	124	254	249	189	438
	(100)	(100)	(100)	(191)	(153)	(172)
4. Sand and gravel	18,525	11,408	29,933	29,429	13,009	42,438
	(100)	(100)	(100)	(159)	(114)	(142)
5. Stone clay, etc.	5,039	629	5,668	8,691	1,013	9,704
	(100)	(100)	(100)	(172)	(161)	(171)
6. Iron ore, ferrous scrap	250	28,468	28,718	344	56,514	56,858
	(100)	(100)	(100)	(138)	(199)	(198)
7. Cellulose and wastes	21	504	525	24	897	921
	(100)	(100)	(100)	(111)	(178)	(175)
8. Semi-finished products	4,318	4,033	8,351	7,313	10,434	17,747
	(100)	(100)	(100)	(169)	(259)	(213)
9. Coal and coke	7,608	4,050	11,658	810	3,399	4,209
	(100)	(100)	(100)	(11)	(84)	(36)
10. Crude oil	5	1,074	1,079	-	887	887
	(100)	(100)	(100)	(-)	(83)	(82)
11. Other fuels	2,767	9,941	12,708	6,335	23,184	29,519
	(100)	(100)	(100)	(229)	(233)	(232)
12. Carbochemicals	286	289	575	441	495	936
	(100)	(100)	(100)	(154)	(171)	(163)
13. Cement and lime	1,577	2	1,579	2,249	4	2,253
	(100)	(100)	(100)	(143)	(194)	(143)
14. Building materials	112	100	212	226	178	404
	(100)	(100)	(100)	(202)	(178)	(191)
15. Manufactured goods	379	729	1,108	659	1,135	1,794
	(100)	(100)	(100)	(174)	(156)	(162)
Total	44,459	71,241	115,700	61,111	128,975	190,086
	(100)	(100)	(100)	(137)	(181)	(164)

Table XI. FRANCE

Forecast international traffic in 1980
based on extrapolating from trends to 1970 from 1961 (A), 1966 (B) and 1968 (C)

	TOTAL TRAFFIC '000 tonnes			RHINE AND MOSELLE TRAFFIC GOVERNED BY INTERNATIONAL AFFREIGHTMENT REGULATION					
				TRAFFIC IN '000 TONNES			OUTPUT IN MILLION TONNE-KMS		
	A	B	C	A	B	C	A	B	C
Rhine and Moselle	75,858	56,379	54,381	73,973	54,835	54,055	3,742	3,509	4,848
Waterways crossing the Franco-Belgium Frontier	19,428	22,663	15,003						
Other waterways	323	419	1,729						
Total	95,609	79,461	71,113						

INTERNATIONAL TRAFFIC	'000 tonnes					1
	TRAFFIC 1968	TRAFFIC 1970	1970/1968	ANNUAL VARIATION[2]	1980/1970	TRAFFIC 1980
Hydrocarbons	5,238	5,973	1.140	1.068	1.931	11,534
Other goods	34,258	37,446	1.093	1.045	1.553	58,154
Total international traffic	39,496	43,419	1.099	1.048	1.598	69,384

INTERNATIONAL TRAFFIC	Million tonne-kms					1
Hydrocarbons	658	828	1.258	1.121	3.134	2,595
Other goods	4,348	4,642	1.068	1.033	1.394	6,471
Total international traffic	5,006	5,470	1.093	1.045	1.553	8,495

1. A more recent study, also based on extrapolating from the trend to 1970, but covering a longer period, gives the following figures which seem more probable:

	Forecast international traffic in 1980	
	'000 tonnes	Million tonne-kms
Hydrocarbons	8,000	1,300
Other goods	57,000	7,200
Total	65,000	8,500

2. This coefficient is the 9th root of the ratio: $\frac{\text{1970 traffic}}{\text{1961 traffic}}$.

Table XII. TRAFFIC MOVEMENTS AT BELGIAN FRONTIERS

FRENCH FRONTIER TOTAL OF INBOUND AND OUTBOUND TRAFFIC						DUTCH FRONTIER (TRAFFIC TO AND FROM NETHERLANDS) TOTAL OF INBOUND AND OUTBOUND					
TRAFFIC 1968	TRAFFIC 1970	1970/1968	ANNUAL COEFF. 1970/1968 [1]	1980/1970	TRAFFIC 1980	TRAFFIC 1968	TRAFFIC 1970	1970/1968	ANNUAL COEFF. 1970/1968 [1]	1980/1970	TRAFFIC 1980
('000 tonnes)					('000 tonnes)	('000 tonnes)					('000 tonnes)
11,720	12,113	1.034	1.017	1.184	14,342	29,619	30,294	1.023	1.011	1.116	33,808

• Based on annual coefficient in previous column.

TOTAL INTERNATIONAL TRAFFIC 1061-1980

BELGIUM

	TRAFFIC 1961	TRAFFIC 1970	1970/1961	ANNUAL COEFF. 1970/1961 [1]	1980/1970	TRAFFIC 1980	TRAFFIC 1961	TRAFFIC 1970	1970/1961	ANNUAL COEFF. 1970/1961 [1]	1980/1970	TRAFFIC 1980 (million tonne-kms)
	('000 tonnes)					('000 tonnes)	(million tonne-kms)					
Hydrocarbons	4,024	9,719	2.415	1.092	2.637	25,629a)	164	293	1.786	1.060	1.893	555a)
Other goods	36,271	50,609	1.395	1.034	1.442	72,978b)	2,946	3,739	1.269	1.024	1.299	4,857b)
Total international traffic	40,295	60,328	1.497	1.041	1.558	93,991	3,110	4,032	1.296	1.026	1.330	5,363
Total (a + b)						(98,607)						(5,412)

1. This coefficient is the 9th root of the ratio: $\frac{\text{1970 traffic}}{\text{1961 traffic}}$.

Source: National Statistics Institute, Brussels (Belgian inland waterway statistics).

Table XIII. FORECAST TRENDS IN INLAND WATERWAY INTERNATIONAL TRAFFIC FROM 1968 TO 1980, INTO AND FROM THE NETHERLANDS, FOR THE VARIOUS COUNTRIES

'000 tonnes

	FED. REP. GERMANY		BLEU		FRANCE		OTHER COUNTRIES (SWITZERLAND)		TOTAL	
	1968	1980	1968	1980	1968	1980	1968	1980	1968	1980
a)	29,830	36,736	8,443	12,974	2,655	3,797	474	829	41,402	54,336
b)	40,088	77,973	14,792	18,077	3,617	5,575	1,440	2,783	59,937	104,408
(a + b)	69,918	114,709	23,235	31,051	6,272	9,372	1,914	3,612	101,339	158,744
c)	31,587	40,526	9,720	15,905	2,678	3,852	474	929	44,459	61,212
d)	47,999	95,582	17,404	23,086	3,659	5,695	2,179	4,612	71,241	128,975
(c + d)	79,586	136,108	27,124	38,991	6,337	9,547	2,653	5,541	115,700	190,187

a) = dry inbound cargo.
b) = dry outbound cargo.
c) = total inbound.
d) = total outbound.

Chapter III

FORECAST REQUIREMENTS OF WATERWAY CRAFT TO 1980

The absence of comparable studies giving traffic forecasts for the next 10 years in the various countries makes it difficult to forecast what waterway craft will be required in the Riparian states of the Rhine and Belgium to meet demand in Western Europe to 1980.

In some cases the figures from the studies referred to in Chapter II are direct extrapolations; in others they are not comparable.

From them, however, it is possible to estimate the craft required for the Netherlands inland waterway fleet to 1980, and this may be used as a basis, mutatis mutandis, for conclusions regarding the fleet of the Western European countries as a whole.

1. Study conducted by the Netherlands Transport Institute (NVI)

A study conducted by the Netherlands Transport Institute (NVI) on waterway transport in the Netherlands shows the likely development of dry-cargo fleet requirements (see Tables XIV and XV).

The NVI study* on the number of craft (by tonnage class) needed in 1980 is based on estimated traffic patterns.

Transport output - expressed as the number of voyages from one zone to another - is broken down into length of haul and tonnage classes.

The Table thus drawn up for 1980 shows the number of inland waterway fleet voyages broken down by craft capacity and length of haul.

The number of craft, subdivided by tonnage category, that will be required in future was evaluated by establishing a relationship between the maximum number of voyages under load ("transport production factors") performed by a vessel of given tonnage capacity and the frequency distribution (number of voyages) mentioned earlier on.

Particular account has been taken of reductions in loading and offloading times and in voyage time. The calculation has been made only for dry cargo vessels.

Maximum and minimum figures have been worked out, the difference between the two representing reserve capacity (about 25%).

With regard to international traffic it has been assumed that the Netherlands fleet would have the same relative share in 1980 as it had in 1968.

The calculations show that, an additional capacity of 56% (maximum figure), i. e. an average of 4% per annum, will be needed for the dry cargo fleet by the end of the 12 years (1968-1980).

* The NVI calculations are outlined in Table XVI.

In 1980, domestic traffic is expected to have increased by 74%, and international traffic by 59%, or 65% on average. This represents a yearly average increase of 5%. To this should be added the tanker traffic for the same period shown in Tables VII and XIII. However, tanker fleet requirements were not calculated.

It is clear that additions to the fleet will be mainly units of 950 tonnes and over. It may be wondered to what extent the estimated increase for large units in the NVI study is applicable to the fleets of other countries.

The proportion of craft exceeding 950 tonnes in the Netherlands fleet (about 23%) is about the same as for the other fleets combined.

In estimating the number of large units required, it was assumed that the Netherlands share of international traffic - which, in the large tonnage categories, accounts for about half the other countries' share - would remain constant.

On this assumption, the number of Netherlands craft of 950 tonnes and over should increase by 377 or 53%, whereas on the basis of the corresponding combined figures for foreign vessels in this category, the number of large foreign units outside the Netherlands should increase by twice as much, i. e. 754 units.

2. Forecasts produced by the Federal Republic of Germany, on the basis of the IFO Institute Study

These forecasts are based on the assumption that traffic on the waterways of Western Europe will increase by 25% in all during the period 1972-1980, i. e. a yearly increase of roughly 3%. On this assumption, the weighted capacity of the combined waterway fleets of the countries concerned should increase by 6 million tonnes during this 8-year period. This is equivalent to some 2. 5 million tonnes of effective capacity for 8 years, or about 300,000 tonnes per year.

To this should be added the replacement of craft that are scrapped or taken out of commission for other reasons. Given that - at least during the next few years - most of the scrapped capacity will consist of pull-towed barges or small unremunerative units, whereas the craft replacing them will be of the very latest design, the replacement tonnage should necessarily be proportionally smaller than that of the craft replaced since the weighting coefficients will be higher.

When considering these forecasts, it must be borne in mind that they are based on the recorded increase in traffic from 1968 to 1970. At the time when this study was conducted, it could not be foreseen that the trend would be less favourable in 1971 and - if the partial figures already available are a true indication - in 1972 as well. It follows that the forecasts shown in Chapter II are perhaps somewhat optimistic.

The actual figures for 1971 showing the trend of fleet-capacity for countries bordering the Rhine and for Belgium, and those for the trend of traffic on Western European Waterways show that the "fleet capacity" and "traffic" factors ran counter to each other in 1971. From 1968 to 1970, fleet capacity rose on the same scale as the volume of traffic (see Chapter I); in 1971, on the other hand, the increase of about 3% in fleet capacity was coupled with a decline of about 4% in transport output (measured in tonne kilometres).

Fleet capacity in the countries bordering the Rhine and in Belgium rose from 31. 2 million tonnes in 1970 to 32. 2 million tonnes in 1971 - a weighted tonnage increase of 1 million tonnes, made up as follows:

Netherlands flag:	48% =	0. 52 million tonnes
German flag	: 34% =	0. 38 million tonnes
Swiss flag	: 12% =	0. 14 million tonnes
French flag	: 5% =	0. 06 million tonnes.

Only in Belgium did waterway fleet capacity fall somewhat below the 1970 level in 1971 (-0. 1 million tonnes).

The decline in transport output (tonne-km.) on the waterways of Western Europe from 100,400 million in 1970 to 96,000 million in 1971, was mainly due to less international traffic on the Rhine. The biggest drop was on the German reaches of the Rhine.

With regard to capacity, the favourable trend - especially for international traffic - during the years 1968 to 1970 gave further impetus to the construction of new craft (self-propelled barges and large capacity push-towed barges only). Apart from poor navigation conditions resulting from low water-levels on the Upper Rhine, the fall in transport output in 1971 was due to big declines in certain traffic of essential importance for waterway transport, i. e. ores and coal.

It follows that on a purely arithmetic reckoning an over-capacity of between 0. 8 and 1 million tonnes should have been recorded by 1971. On balance, this was not the case because the length of the low water period in the river basins was such that waterway craft were unable to take their normal loads and more units accordingly had to be put into commission. Thus, the average utilization factor for waterway craft in the Federal Republic of Germany fell from 79% in 1970 to 68% in 1971.

Since a further increase in fleet capacity must again be expected in 1972 (this is amply borne out by the figures for vessels under construction) and since transport demand will, at best, remain the same, the gap between fleet capacity and transport demand is likely to get worse.

Any general conclusion as to fleet capacity requirements up to 1980 must be extremely cautious. The situation must be judged with an eye to the economic forecasts for each country and for international trade.

Traffic in the Rhine Basin seems likely to increase to a greater degree than traffic between the Benelux countries and France.

It is, however, fair to say that the waterways will keep and even improve their important role in domestic and international trade. Despite the trend actually recorded in 1971 and 1972, all the estimates point to an increase in inland waterway traffic later on, the main emphasis being put on a bigger number of large units. This means that the waterway fleet will have to be increased and, above all, modernized by putting large units into commission.

Given the increased number of large units with consequently higher productivity, the NVI does not expect any quantitative problems as regards the manning of canal craft. The difficulties are likely to be mainly qualitative because of the relatively low level of skilled training of part of the existing workforce.

It would be useful to inquire to what extent this may affect the development of waterway transport.

Table XIV. CHANGES IN THE NETHERLANDS INLAND WATERWAY FLEET FOR INTERNATIONAL TRAFFIC BETWEEN 1968 AND 1980

CRAFT CAPACITY		NUMBER OF CRAFT	NUMBER OF CRAFT	DIFFERENCE
0- 499	1	974	1,034	+ 60
	2	116	108	- 8
	3	1,090	1,142	+ 52
500- 949	1	820	847	+ 27
	2	113	114	+ 1
	3	933	961	+ 28
950-1399	1	239	405	+166
	2	15	30	+ 15
	3	254	435	+181
1400-1899	1	288	450	+162
	2	54	85	+ 31
	3	342	535	+193
1900	1	7	10	+ 3
	2	-	-	-
	3	7	10	+ 3
Total Number		2,626	3,083	+457
Index		100	114	
Capacity ('000 tonnes)		1,860	2,435	+575
Index		100	131	
Average craft capacity (tonnes)		708	790	+ 82
Index		100	122	

1. International traffic, less transit (without transhipment).
2. Transit (without transhipment).
3. Total.

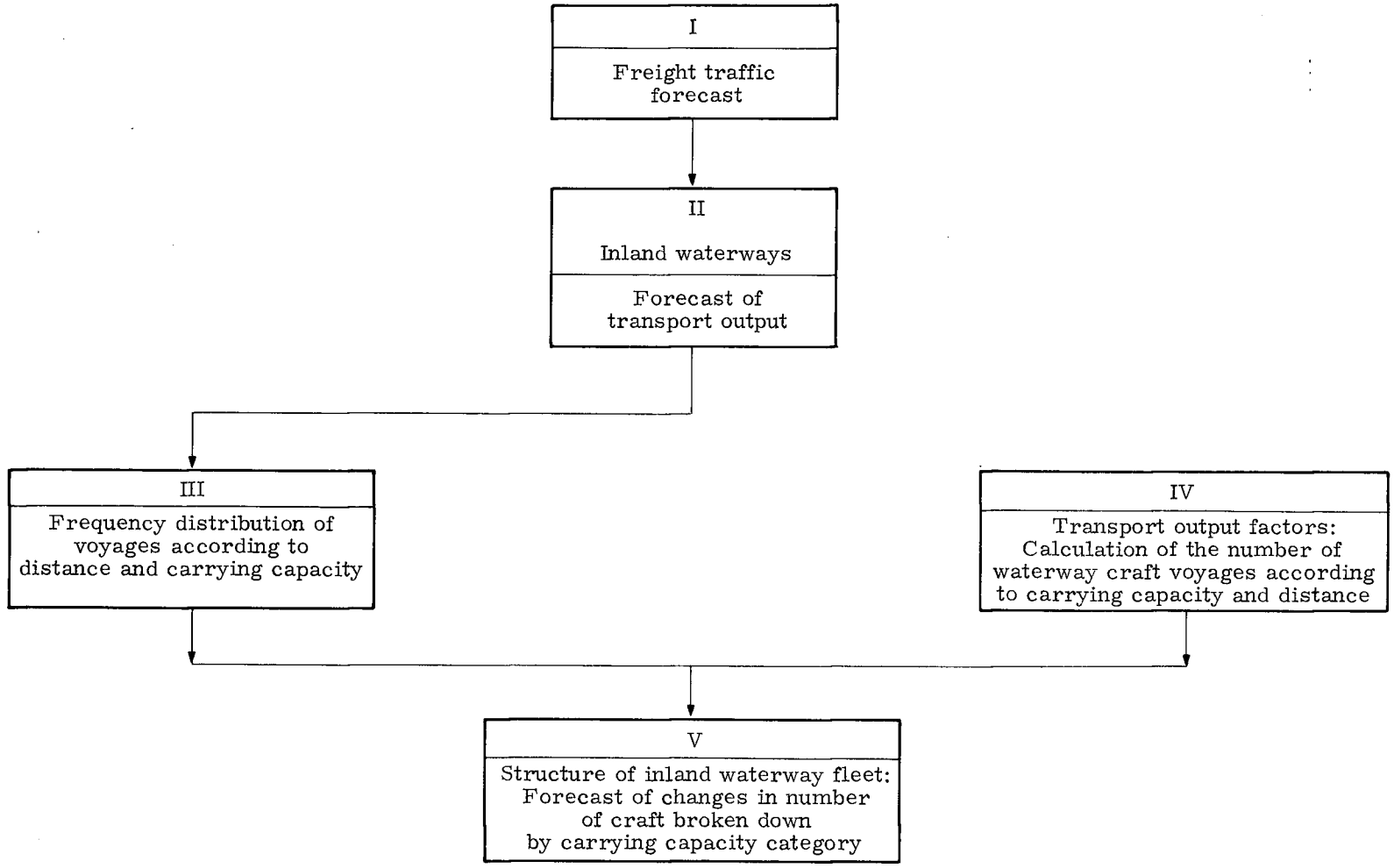
Source: Netherlands Transport Institute (NVI).

Table XV. TRENDS IN NETHERLANDS DRY CARGO TRAFFIC AND IN THE NETHERLANDS FLAG INLAND WATERWAY FLEET TO 1980

	1968		1980	
	ABSOLUTE	INDEX	ABSOLUTE	INDEX
Tonnage carried ('000 tonnes)				
Internal traffic	78,444	100	136,811	174
International traffic	130,826	100	207,516	159
Total	209,270	100	344,327	165
Number of voyages				
Internal	197,843	100	332,664	168
International	211,698	100	273,926	129
Total	409,541	100	606,590	148
	High estimate (dry cargo)			
Dutch flag craft				
0- 499	6,232	100	5,994	96
500- 949	1,927	100	3,039	158
950-1399	532	100	1,066	200
1400-1899	291	100	670	233
-1900	144	100	174	121
Total	9,126	100	10,952	120
	High estimate (dry cargo)			
Total carrying capacity ('000 tonnes)	4,314	100	6,716	156
Average per craft (tonnes)	470	100	610	130
	Low estimate (dry cargo)			
Dutch flag craft				
0- 499	6,232	100	4,796	77
500- 949	1,927	100	2,431	126
950-1399	532	100	853	160
1400-1899	291	100	543	187
-1900	144	100	139	96
Total	9,126	100	8,762	96
	Low estimate (dry cargo)			
Total carrying capacity ('000 tonnes)	4,314	100	5,080	118
Average per craft (tonnes)	470	100	610	130

Source: Netherlands Transport Institute (NVI).

Table XVI. METHOD OF FORECASTING NUMBER OF CRAFT IN 1980



Source: Netherlands Transport Institute (NVI).

Annex

At its meeting in Paris on 19th April 1972, the Inland Waterways Investment Sub-Committee heard the views of the international organisations concerned with this type of transport on the report relating to the capacity of the Inland Waterway fleet and trends in transport demand (first version).

To prepare for this "hearing", a questionnaire on some of the practical points dealt with in the report had been sent to the international organisations.

The following international organisations were represented:

- International Chamber of Commerce (Mr. GREEBE, Mr. LACOIN and Mr. REES)
- International Road Transport Union (Mr. DROIN)
- International Transport Workers Federation (Mr. DUNIAU)
- International Union of Railways (Mr. RAVELLI)
- International Union for Inland Navigation (Mr. ALOY and Mr. RAUX).

These international organisations made the following comments concerning the report on inland waterway fleet capacity and trend of demand:

International Chamber of Commerce (ICC)

"We have nothing but praise for the ECMT's statistical survey on the development of the fleet during the period 1968-1971 and 1955-1968. The report makes it clear that, on balance, despite the smaller number of craft, fleet capacity has increased as a consequence of modernization (increased unit capacities, better productivity, etc.). However, some users regret certain qualitative deficiencies and, in one country at least, shortages of 38.50 m. pull-towed barges are reported.

In this connection, the ICC recommends sectoral studies. These were indeed already suggested by the World Confederation of Labour at the 1970 'hearing' on the grounds that there is by no means a uniform pattern of supply and demand throughout Europe.

In its conclusions, the Report records improvements in productivity. Users as a whole can endorse this finding though it is difficult for them individually to measure such improvements. They are, however, convinced that vast opportunities for improved productivity still exist, if only by reducing time losses (idle time and queueing for affreightment) and by more effective commercial practice, quite apart from the modernization of infrastructures and extension of the waterways system.

As regards development prospects up to 1980, users are inclined to think that traffic could still go on rising steadily insofar as the chronic shortage of labour and the growth of demand will stimulate the modernization of equipment.

In some sectors, technical change inevitably leads to traffic losses: the substitution of new sources of energy (nuclear power stations along the Rhine) for traditional ones, the development of pipeline transport, and the location of industry along the cost - all these factors point to the elimination of certain traditional traffics.

Against this, economic expansion and the development of trade between well-linked countries should more than offset waterway traffic losses, provided of course that waterway transport remains, as it always has been, a cheap mode of transport well adapted to requirements.

In this connection, we note that the ECMT considers that the policy to be adopted with regard to the allocation of infrastructure costs will not affect the development of inland waterway navigation during the period ending in 1980. The ICC is far less sure of this and considers that the prevailing uncertainty about future policy on this point might well compromise the development of river traffic, bearing in mind the considerable time-lags between project and design stages, financing arrangements and actual completion. That was why, at the September 1971 hearing, the ICC proposed that the forthcoming report should take into consideration the consequences of the policy to be adopted on this subject. We still feel that a careful study on this topic would be extremely useful.

We should like to make one more suggestion: in its report on combined transport [CS(72)6], the ECMT refers to barge-carrier technology (LASH and Seabee). Though the immediate impact of this new technology on inland navigation may seem slight, the report does say that the number of barge-carrier vessels on the North Atlantic routes will rise from 5 in 1971 to 22 in 1974. Is there not likely to be an even more spectacular increase in the number of barge-carriers with correspondingly sharper effects on inland waterway transport by 1980? Perhaps it would be useful if the ECMT, in liaison with the Maritime Transport Committee of the OECD, took advantage of the studies proceeding in other organisations to go more deeply into this question of barge-carrier vessels and its implications for inland waterway transport."

International Road Transport Union (IRU)

The IRU stated that it had no major comments to make on the report as a whole, but there was a general point that the ECMT might bear in mind, i.e. to take into account, in the course of the various theoretical and practical studies, the co-ordination of investment in each mode of transport by the countries concerned and the application of this principle to main trunk routes with an eye to the future economic development of Europe.

International Transport Workers Federation (ITF)

The ITF made a number of comments which were more particularly relevant to the report on promotion of inland waterway traffic. The statement made by the ITF is accordingly shown under another heading (see Annex to CS(72)20 revised).

International Union of Railways (UIC)

"Starting from an analysis of the present situation and various forecasts (studies conducted by the OECD, ECMT and national bodies), the authors of the report under review try to determine what the level of inland waterway traffic might be in 1980 and, on this basis, the expansion of the fleet needed to cater for it.

The UIC knows only too well, in the light of its own Planning Commission's experience, how hazardous such forecasts can be. The authors of the ECMT Report do indeed recognize this with commendable objectivity and that is perhaps the main lesson to be drawn from their efforts.

It did seem to us, however, that the problems relating to an improvement of fleet productivity deserve to be set out in more detail and it was doubtless in order to collect more information on this subject that item 2 was included in the questionnaire appended to the report.

With regard to the impact of structural changes in transport supply on the development of inland waterway transport up to 1980, we should like to make the two following comments:

a) One of the most striking structural changes in waterway traffic is the considerable development of oil carryings. The forecasts are based on the assumption that no additional pipelines will upset existing traffic flows. It must be pointed out that the forecasts would be radically affected if this turned out to be a wrong assumption.

b) Our other comment concerns the allocation of infrastructure costs. The authors assume that in 1980, waterway transport will not pay for its infrastructure costs any more than it does at the present. This is a very pessimistic appraisal of the effectiveness of the measures envisaged by many national and international bodies to make those who benefit from an infrastructure pay for its cost. This principle is generally accepted and one can imagine that by 1980 it will at least have begun to be put into practice. If so, this could have important implications for the volume of traffic ultimately carried on the waterways."

International Union for Inland Navigation (UINF)

The UINF stated that "the development of the waterway fleet had lagged behind the growth of PNB in the countries bordering the Rhine. This was due to the over-capacity which resulted from keeping a technically and economically obsolete fleet in commission. This delay was indispensable and proved that a free market economy is able to respond to the phenomenon of over-capacity by stopping investment.

Apart from this, the improvement of productivity is the Industry's most pressing concern and can never be judged sufficient. The Industry has contributed to this with motorization, push-towing, specialization, automation and shorter laydays. It appeals to governments not to relax their efforts:

1) to improve waterway infrastructures;

2) to solve the problem of capacity by a coherent policy for long-term development, notably by encouraging the scrapping of old vessels, planning a uniform system of classification and introducing a system of depreciation allowances and financing that is adapted to the special features of waterway transport, by supporting any measures likely to shorten idle time in port, and by creating an industrial relations climate based on the special aspects of inland navigation and conciliating the requirements of social progress and technical progress.

As regards waterway transport needs in 1980, the UINF believes that waterway transport will account for a fairly constant share of the increase in PNB and transport generally, and hence that this share will be larger in 1980 than in 1968-1971.

The UINF also considers that in 1980, the waterways will go on losing certain traffics as a consequence of structural changes in transport supply (coal and "freight sundries") or record a slower development in certain cases such as oil carryings.

However, the growing scale of industrial structures will create new outlets for the waterways, and LASH technology is a case in point. The question arises whether these structural changes will be handled by existing waterways transport operators or by other enterprises still unconnected with waterway transport at present.

REPORT OF THE COMMITTEE OF DEPUTIES ON TRAFFIC AND INVESTMENT TRENDS IN 1971

Chapter I - General

This report on traffic and investment trends in 1971 consists of three chapters giving detailed information in respect of transport by railways road and inland waterway.

The main features for the year 1971 are as follows:

A. RAILWAYS

Traffic

The distinct reversal in 1970 of the earlier falling trend in passenger traffic was not reinforced in 1971. Overall 0.1% fewer passengers were carried and passenger kilometres increased by 0.9%: in 1970 there had been an increase of 2.0% in passengers and 4.4% in passenger kilometres. While five of the smaller countries report considerable increases in passengers carried seven countries reported reductions: four reported reductions in passenger kilometres. In the first three months of 1972 the trend was rather more favourable with overall increases of 0.3% in passengers carried and 3.6% in passenger kilometres. Freight tonnage and tonne-kilometres fell in most countries, and overall by 4.9% and 5.2% respectively, reflecting the general economic recession. As with passenger traffic however some of the smaller countries reported marked increases in freight traffic. In the first three months of 1972 freight traffic continued to fall.

Rolling Stock

During 1970 the number of steam locomotives fell by just on 1,000 to less than 5,300. The number of diesel locomotives also fell, but by only 90, and the number of electric locomotives increased by 170. The number of goods wagons owned by the railways (other than in Great Britain) fell in 1970 by 4,100 compared with falls of 6,600, 54,000, and 3,100 in the previous three years.

Infrastructure

The electrified network increased by 757 km in the twelve months to October 1972. Established programmes for electrification envisage a further increase of approximately 3,027 km by 1976 of which some 60% will be in Yugoslavia and Germany.

The report gives details of numerous measures undertaken in the various countries, for modernization, cost reduction, and safety, such as centralization of signalling, modernization and replacement of level crossings, installation of heavier rails and long welded

rails, telecommunications systems, electronic reservation systems and modernization of passenger and freight terminals.

Energy Consumption

With a 16% reduction in consumption of coal in steam locomotives and fuel oil, a reduction of 1% in consumption of electricity for traction and an increase of 1% in consumption of diesel fuel, total energy consumption in coal-equivalent terms fell by 5% in 1971 with virtually no change in train-kilometres.

In 1971 electric traction accounted for 55% of total energy consumption by locomotives in the ECMT countries, steam traction for 25% and diesel traction for 20% compared with 53, 28 and 19% in 1970.

Annexes 3 and 4 to Chapter II give detailed information on the evolution of passenger and freight traffic in the various member countries.

B. ROAD TRANSPORT

Vehicles

The growth in the number of vehicles on the road continued. For the 11 countries providing figures the increase for vehicles with more than 2 wheels was 7.7%, and for the first time for years the number of 2-wheeled motor vehicles increased overall, although in 4 countries the numbers continued to fall.

Growth rates for private cars ranged from 4% to 14% in the 11 countries reporting, and averaged 7.4% compared with 6.5% in 1970.

The number of passenger service vehicles increased by 4.6% in the 11 countries reporting compared with 4.2% for the same countries in 1970.

The number of goods vehicles increased by 3.6% in the 11 countries reporting compared with 6.2% in 1970. Once again lorries carrying more than 10 tons and semi-trailers showed the largest increases - 10.5 and 12.8% respectively with some very large increases in a few countries. The number of medium sized lorries, with 5 to 10 tons capacity, showed overall a slight reduction.

Traffic

Vehicle-kilometres on national territory increased - for private cars by 12% (6 countries) for lorries by 3% (5 countries) and for buses and coaches by 3% (8 countries). As in other years, the figures available for transport of passengers and goods by road are too few to permit general conclusions to be drawn.

The Road System

The total length of motorways in service in 13 countries reporting increased by 1848 km (13%) as compared with 1861 km in 1970 for the same countries.

The largest increases were in Italy (435 km), the United Kingdom (393 km) and Germany (367 km), but a number of the smaller countries also reported large percentage increases.

The International Network

On information received from 11 countries the length of the international network hardly changed in 1970, but the proportion in the form of motorways increased from 25 to 28%.

For 10 countries reporting for which comparisons with 1970 can be made, the degree of saturation increased from 77 to 80% due primarily to increased saturation on roads other than motorways. For the same countries the length of route judged to be of adequate capacity increased by 3,138 km or from 78 to 86%. Thus in 1971, the earlier trend of increasing saturation of the international network was not merely halted but significantly reversed.

For the 8 countries for which the comparison can be made, the length of the international network in service rose from 46 to 50% of that of the future network envisaged.

Investment

Investment expenditure on the international network, following the extraordinary increase of 26% recorded for 1970, dropped back to 5% for the 11 countries for which the comparison can be made. Nevertheless the investment expenditure was 12% above that forecast. Forecasts for 1972 for the international network are 1% below those for 1971 and 12% below actual expenditure in 1971.

For the entire road network investment expenditure forecast for 1972 exceeds that forecast for 1971 by 21% for the 6 countries for which the comparison can be made.

Detailed information is given on current work in hand on the various "E" routes.

C. INLAND WATERWAYS

Tonnage of international traffic carried on inland waterways was 1% lower and that of domestic traffic less than 1% higher, both figures reflecting the less favourable turn of economic conditions in 1971.

Evolution of the Fleet

In 1971 the total capacity of the fleet, which had been falling, increased by 1.6%. The number of vessels continued to fall - in 1971 by 4% compared with 3% in 1970. Average capacity of craft rose by 5%.

Infrastructure

Considerable progress has again been reported in the improvement of links of European interest. Details are given in paragraph III of Chapter IV.

D. PIPELINES

Further additions to the pipelines in operation or under construction were reported by France, the Netherlands and the United Kingdom, and traffic throughout increased generally in ECMT countries reporting. Details for individual countries are given in Chapter IV.

E. SEAPORTS

Indications of the trend of traffic handled by the major seaports are given in a table in Chapter IV.

Table 1. INLAND TRANSPORT INVESTMENT

COUNTRY	YEAR	GROSS NATIONAL PRODUCT (AT CURRENT PRICES)* 1	GROSS FIXED CAPITAL FORMATION* 2	RAILWAYS			LOCAL RAILWAYS AND URBAN LINES 6
				ROLLING STOCK 3	INFRASTRUCTURE 4	TOTAL (3 + 4) 5	
Germany	1969	605,680*	146,200	677	1,499	2,176	907
	1970	686,960*	181,080	970	1,872	2,842	948
	1971	759,600*	202,940	1,203	2,099	3,302	1,221
Austria	1969	332,260	84,630				
	1970	372,200	99,700				
	1971						
Belgium	1969	1,152,200	240,533				
	1970	1,284,900	289,686				
	1971	1,406,896*	307,162				
Denmark	1969	105,599*	23,006	118	111	229	67
	1970	116,982*	25,817	100	117	217	75
	1971	127,901*	27,521	125	104	229	111
Spain	1969	2,010,500	441,100	2,975	7,175	10,150	1,698
	1970	2,258,000	481,500	1,609	8,215	9,824	2,150
	1971	2,551,000*	498,500	2,368	9,603	11,971	3,135
France	1969	731,680	184,040	776	837	1,613	...
	1970	819,600	211,430	747	893	1,640	...
	1971			774	958	1,732	...
Greece	1969	252,260	74,798	135	116	251	8
	1970			91	160	251	4
	1971			35	181	216	12
Ireland (in thousands units)	1969	1,451,900	333,400	1,447	756	2,203	-
	1970	1,621,300	356,300	1,919	981	2,900	-
	1971	1,862,000	431,000	...	...	...	-
Italy	1969	52,149,000	10,695,000				
	1970	58,244,200	12,327,000				
	1971						
Luxembourg	1969	45,015*	10,456	70	54	124	-
	1970	51,096*	13,329	147	49	196	-
	1971	52,935*	15,835	31	95	126	-
Norway	1969	70,285	17,308	91	159	250	
	1970	81,367	22,071	89	164	253	
	1971	91,156*	26,675	88	186	274	
Netherlands	1969	101,611*	24,888	121	83	204	37
	1970	113,510*	28,010	164	106	270	24
	1971	127,770*	32,510	247	146	393	46
Portugal	1969	155,988	27,294	218	152	370	69
	1970	174,579	31,060	181	420	601	450
	1971	194,514	32,791	262	774	1,036	401
United Kingdom	1969	45,385*	8,323	18	42	60	10
	1970	49,699*	9,173	24	53	77	11
	1971	55,014*	9,923	25	68	93	10
Sweden	1969	152,130*	33,329	177	163	340	-
	1970	170,112*	36,889	164	137	301	-
	1971	183,405*	38,767	163	155	318	-
Switzerland	1969	79,205	20,475	396	231	627	67
	1970			429	254	683	86
	1971			463	298	761	76
Turkey	1969	117,502	23,608	109	281	390	
	1970	135,610	27,342	174	273	447	
	1971			271	277	548	
Yugoslavia	1969						
	1970						
	1971						

1. Roads under State control only.
2. Net investments.
* Source: OECD Statistical Bulletin. In column 1, figures followed by an asterisk are Gross Domestic Product in purchasers' values.

National currency units (millions)
For Ireland (thousands)

ROAD TRANSPORT				INLAND WATERWAYS			INVESTMENT IN INLAND TRANSPORT (5+6+10+13)
VEHICLES		INFRA-STRUCTURE	TOTAL (7+8+9)	VESSELS	INFRA-STRUCTURE	TOTAL (11+12)	
COMMERCIAL VEHICLES	OTHER VEHICLES						
7	8	9	10	11	12	13	14
4,677	14,012	9,573	28,262	114	238	352	31,697
6,914	17,668	11,445	36,027	168	296	464	40,281
5,897	17,829	4,907 [1]	28,633	279	560	839	33,995
227	1,474	2,286	3,987	-	-	-	4,283
219	1,473	2,236	3,928	-	-	-	4,220
339	1,498	2,348	4,185	-	-	-	4,525
24,503	51,638	17,627	93,768	-	-	-	105,616
28,260	28,260	21,701	105,861	-	-	-	117,835
24,297	24,297	27,792	116,862	-	-	-	131,968
		2,112 [1]		25	248	273	
		2,615 [1]		23	285	308	
		2,852 [1]		57	314	371	
1,023	1,124	3,429	5,576	-	-	-	5,835
1,078	1,479	3,848	6,405	-	-	-	6,660
1,368	1,886	4,428	7,682	-	-	-	7,910
82,140	44,840	8,610	135,590	-	168	168	137,961
91,504	52,325	8,806	152,635	-	173	173	155,708
95,991	58,649	9,343	163,983	-	...	...	
186	747	260	1,193	-	26	26	1,343
215	792	250	1,257	-	9	9	1,462
188	925	332	1,445	-	4	4	1,575
1,146	2,428	1,363	4,937	-	-	-	5,187
1,142	1,920	1,400	4,462	-	-	-	4,715
1,224	2,303	1,561	5,088	-	-	-	5,362
779	2,678	1,208	4,665	58	399	457	5,363
1,089	3,394	1,379	5,862	115	414	529	6,585
1,021	3,318	1,620	5,959	115	509	624	7,122
257	1,450	999	2,706	12	-	12	3,157
212	1,488	932	2,632	42	-	42	3,725
...	...	939	939	...	-	...	2,376
373	970	420	1,763	-	-	-	1,833
405	1,152	513	2,070	-	-	-	2,158
425	1,536	525	2,486	-	-	-	2,589
1,095	3,960	2,001	7,056	-	-		7,396
1,110	3,973	2,150	7,233	-	-	-	7,534
1,128	4,027	2,111	7,266	-	-		7,584
401	2,007	1,450	3,858	10	19	29	4,581
517	2,286	1,674	4,477	10	19	29	5,275
629	2,759	1,894	5,282	40 [2]	21 [2]	61 [2]	6,180
...	...	999					
...	...	293					
...	...	1,713					

REPORT BY THE COMMITTEE OF DEPUTIES
ON TRAFFIC AND INVESTMENT TRENDS IN 1971

Chapter II - Railways

Contents

FOREWORD

1. This report is based on data supplied by Member countries for 1971. It also shows certain trends apparent in 1972 and draws comparisons with 1970.

2. Unless otherwise stated, the figures given are for the 18 Member countries combined; those shown in brackets refer to the six EEC countries (i. e. the membership of the EEC during the period under review).

A. TRAFFIC TRENDS

I. Passengers

1. Passenger traffic trends in 1971 show a very mixed picture. About one third of Member countries recorded a decline in the number of passengers carried; Turkey, Austria, Greece, Ireland and Luxembourg, on the other hand, recorded a considerable increase. In other countries there was a small increase, while Sweden and Yugoslavia recorded a considerable decrease (-7% and -7. 3% respectively).

Sweden also showed the largest decrease (11. 6%), in the number of passenger-km. , largely owing to the Swedish railways strike from 5th February to 10th March.

2. As compared with the previous year the overall number of passengers carried varied slightly, bu -0. 1% (+0. 1%) but there was a small increase, 0. 9% (+1. 7%) in passenger-km.

3. The trend for 1971 and for the first quarter or early part of 1972 is shown in Annex 3. Table 16 gives the figures for the period in question. The overall figures show an appreciable increase of 0. 3% (+2. 3%) in passengers carried and 3. 6% (+2. 8%) in passenger-km.

II. Freight

1. The cyclical downturn in 1971 brought about a decrease of -4. 9% (-6. 3%) in the overall number of tonnes carried and a fall of -5. 2% (-5. 9%) in tonne-km. There were however significant departures from this general trend in the various countries (see Table 2). In some countries there was also (as in the case of passenger traffic) an appreciable increase in the average length of haul (see Table 3).

2. The trend for 1971 and the first quarter or early months of 1972 is shown in Annex 4. Table 17 gives the figures for this period. In the six EEC countries, these figures show a decrease (-1. 9%), and in gross tonne-km. , (-1. 8%); in the other countries, the decline in both cases was substantial, (-18. 1% and -7. 3% respectively).

Table 1. PASSENGER TRAFFIC

	PASSENGERS CARRIED		PASSENGER-KM.	
	1971 (Thousand)	1971/1970 %	1971 (Thousand)	1971/1970 %
Germany	986,312	+ 0.7	37,592,367	+ 0.7
Belgium	201,309	+ 0.2	7,749,655	+ 2.4
France	597,682	- 1.3	40,954,180	+ 0.3
Italy	347,297	+ 1.2	33,947,745	+ 4.6
Luxembourg	9,982	+ 3.4	207,246	+ 1.1
Netherlands	187,585	- 0.2	8,113,735	+ 1.3
EEC countries	2,330,167	+ 0.1	128,564,928	+ 1.7
Austria	163,824	+ 4.2	6,506,417	+ 3.6
Denmark	115,293	+ 1.3	3,354,276	- 0.6
Spain	167,277	+ 1.8	13,532,679	+ 1.8
United Kingdom	815,513	- 1.0	30,126,900	- 0.9
Greece	13,256	+ 5,0	1,635,104	+ 6.8
Ireland	11,001	+ 6.5	629,714	+ 8.1
Norway	29,214	0	1,595,800	+ 1.7
Portugal	104,341	- 0.2	2,825,422	+ 0.2
Sweden	53,088	- 7.0	4,058,836	-11.6
Switzerland	229,584	- 0.5	8,214,764	+ 0.7
Turkey	110,709	+ 6.4	5,737,998	+ 3.2
Yugoslavia	145,594	- 7.3	10,565,944	- 3.4
Other countries	1,958,694	- 0.3	88,783,854	- 0.4
Total	4,288,861	- 0.1	217,348,782	+ 0.9

III. Length of network and transport output

1. The total length of Member countries' combined networks at the end of 1971 was 171,134 (88,786) km. compared with 172,453 (89,600) km. at the end of 1970. Only France (742 km.), the German Federal Republic (339 km.), Sweden (297 km.) and Great Britain (251 km.) report significant line closures (see Table 4). Turkey (150 km.) and Yugoslavia (46 km.) report increases.

2. Table 5 summarizes operations in terms of train-km. with separate figures for steam, electric and diesel traction. Comparison with the figures for the previous year shows the progress made with structural changes in traction.

Table 2. FREIGHT TRAFFIC

	TONNES CARRIED		TONNE-KM.	
	1971 (Thousand)	1971/70 %	1971 (Thousand)	1971/70 %
Germany	324,044	- 7.9	64,262,762	- 7.1
Belgium	67,005	- 6.6	7,386,216	- 6.2
France	238,892	- 4.3	66,618,000	- 4.9
Italy	54,283	- 6.1	17,226,372	- 4.7
Luxembourg	21,075	+ 5.0	764,287	+ 0.3
Netherlands	23,253	-13.1	3,233,230	- 8.5
EEC countries	728,552	- 6.3	159,490,867	- 5.9
Austria	48,863	- 2.3	9,763,113	- 1.1
Denmark	7,960	+ 4.1	1,842,742	+ 8.3
Spain	29,728	+ 3.0	9,103,361	- 2.5
United Kingdom	191,943	- 5.1	22,006,000	-10.4
Greece	3,358	+13.7	748,143	+ 8.7
Ireland	3,749	+ 8.7	577,950	+ 6.0
Norway	27,719	- 3.6	2,511,344	- 7.8
Portugal	3,992	+ 1.7	773,136	- 0.4
Sweden	57,199	- 8.5	14,435,883	-10.6
Switzerland	45,404	- 0.5	6,616,832	+ 0.5
Turkey	15,227	+10.4	5,735,619	+ 2.1
Yugoslavia	75,630	+ 0.3	19,653,270	+ 2.1
Other countries	510,772	- 2.7	93,767,393	- 4.1
Total	1,239,324	- 4.9	253,258,260	- 5.2

Table 3. AVERAGE LENGTH OF JOURNEY OR HAUL

	PER PASSENGER		PER TONNE	
	1971	1970	1971	1970
Germany	38.1	38.1	198.7	195.0
Belgium	38.5	37.6	110.2	109.7
France	67.7	66.8	279.0	281.0
Italy	97.8	94.6	317.0	313.0
Luxembourg	19.8	21.2	35.4	38.0
Netherlands	43.3	42.6	147.0	139.0
Austria	39.7	40.0	199.8	197.4
Denmark			220.0	239.0
Spain	80.9	80.9	297.0	314.0
United Kingdom	37.0	36.9	114.7	121.4
Greece	123.0	121.0	223.0	233.0
Ireland	53.0	58.0	157.0	161.0
Norway	54.6	53.7	91.2	95.2
Portugal	27.1	26.9	203.5	197.7
Sweden	72.0	77.0	255.0	256.0
Switzerland	35.8	35.4	145.7	144.4
Turkey	51.8	53.4	367.7	407.4
Yugoslavia	72.6	69.0	260.6	255.0

Table 4. SIZE OF NETWORK AT END OF YEAR

	1971 (km.)	1970 (km.)
Germany	29,216	29,555
Belgium	4,482	4,232
France	35,277	36,019
Italy	16,392	16,375
Luxembourg	271	271
Netherlands	3,148	3,148
EEC countries	88,786	89,600
Austria	5,431	5,420
Denmark	2,352	2,352
Spain	13,495	13,668
United Kingdom	18,738	18,989
Greece	1,561	1,560
Ireland	2,189	2,190
Norway	4,240	4,242
Portugal*	2,807	2,807
Sweden	11,247	11,544
Switzerland	2,913	2,913
Turkey	8,135	7,985
Yugoslavia	9,235	9,189
Other countries	82,348	82,859
Total	171,134	172,459

* c.p. only, wide gauge.

3. Table 8 shows the transport output of the various systems in terms of gross tonne-km. (excluding the United Kingdom, Ireland and Norway) for each mode of traction, with the previous year's figures for comparison. The share of steam traction has now fallen to 7%, while that of electric traction has risen to 72%, although the proportion of lines electrified is only 32%.

4. Tables 6 and 7 give fuller information concerning this trend.

Table 5. TRAIN-KM.

	STEAM TRACTION		ELECTRIC TRACTION		DIESEL TRACTION	
	1971 (million)	1970 (million)	1971 (million)	1970 (million)	1971 (million)	1970 (million)
Germany	43.3	52.4	375.7	367.3	195.5	195.6
Belgium	0.1	0.1	42.2	39.5	41.9	42.9
France	5.2	16.3	355.0	353.2	254.6	254.1
Italy	6.0	6.0	201.0	199.0	74.0	72.0
Luxembourg	-	0.002	1.0	1.2	1.6	1.5
Netherlands	-	-	79.6	75.2	23.8	23.3
EEC countries	54.6	74.8	1,054.5	1,035.4	591.4	589.4
Austria	5.4	6.4	62.5	60.7	18.2	17.5
Denmark	0.0004	0.026	6.8	6.8	34.9	35.9
Spain	5.8	9.6	68.5	64.7	100.2	96.6
United Kingdom	-	-	153.9	146.0	290.8	298.4
Greece	2.0	3.0	-	-	17.0	17.0
Ireland	-	-	-	-	13.1	12.8
Norway	-	-	24.7	24.1	7.7	8.3
Portugal*	1.4	1.4	8.2	8.3	16.1	15.9
Sweden	-	-	76.6	86.7	17.2	12.6
Switzerland	0.001	0.002	90.0	89.6	0.5	0.6
Turkey	25.8	27.8	2.6	2.5	13.3	12.4
Yugoslavia	34.3	41.6	30.6	23.8	55.2	55.2
Other countries	74.7	89.8	524.4	513.2	584.2	583.2
Total	129.3	164.6	1,578.9	1,548.6	1,175.6	1,172.6

* C.P. only, wide gauge.

Table 6. TRAIN-KM.

	1971				1970			
	(Million)		%		(Million)		%	
Steam traction	129.3	(54.6)	4.5	(3.2)	164.6	(74.8)	5.8	(4.4)
Electric traction	1,578.9	(1,054.5)	54.9	(62.0)	1,548.6	(1,035.4)	54.4	(61.0)
Diesel traction	1,175.6	(591.4)	40.6	(34.8)	1,172.6	(589.4)	39.8	(34.6)
All types combined	2,883.8	(1,700.5)	100.0	(100.0)	2,885.8	(1,699.6)	100.0	(100.0)

Table 7. GROSS TONNE-KM. [1]

	1971				1970			
	(Million)		%		(Million)		%	
Steam traction	68,123.5	(32,889.7)	7.3	(4.8)	87,731.8	(45,992.4)	9.2	(6.7)
Electric traction	673,230.9	(527,179.8)	72.0	(77.0)	673,307.3	(529,614.0)	70.7	(75.7)
Diesel traction	194,660.6	(125,240.2)	20.7	(18.2)	191,233.4	(123,151.1)	20.1	(17.6)
All types combined	936 015.0	(685,309.7)	100.0	(100.0)	952,272.5	(698,757.5)	100.0	(100.0)

1. Excluding United Kingdom, Ireland and Norway.

Table 8. GROSS TONNE-KM.

	STEAM TRACTION		ELECTRIC TRACTION		DIESEL TRACTION	
	1971 (Million)	1970 (Million)	1971 (Million)	1970 (Million)	1971 (Million)	1970 (Million)
Germany	28,502.8	35,803.6	191,216.8	193,374.0	40,703.6	39,999.7
Belgium	9.9	10.6	16,517.3	16,353.2	15,918.4	16,231.4
France	2,760.0	8,470.0	191,130.0	193,840.0	53,010.0	51,050.0
Italy	1,617.0	1,708.0	104,933.0	103,377.0	7,869.0	7,851.0
Luxembourg	-	-	816.0	888.0	981.0	944.0
Netherlands	-	-	22,566.7	21,781.8	6,758.2	7,075.0
EEC countries	32,889.7	45,992.4	527,179.8	529,614.0	125,240.2	123,151.1
Austria	2,566.8	2,957.4	27,927.8	27,027.7	2,982.2	2,858.2
Denmark	0.05	9.5	1,613.3	1,580.3	9,472.7	9,844.9
Spain	1,584.0	3,168.0	21,710.0	21,256.0	20,397.0	19,808.0
United Kingdom	-	-	.	.	.	.
Greece	699.0	727.0	-	-	4,412.0	3,589.0
Ireland	-	-	-	-	.	.
Norway	-	-	.	.	.	.
Portugal**	288.7	278.9	2,793.1	2,805.3	3,400.5	3,307.6
Sweden	-	3.0	37,766.0	42,375.0	2,226.0	2,383.0
Switzerland	0.2	0.6	33,623.9	33,437.0	66.0	80.6
Turkey	13,977.0	14,849.0	738.0	735.0	5,854.0	5,213.0
Yugoslavia	16,118.0	19,746.0	19,897.0	14,477.0	20,610.0	20,998.0
Other countries *	35,233.75	41,740.4	146,051.1	143,693.3	69,420.4	68,082.3
Total	68,123.45	87,731.8	673,230.9	673,307.3	194,660.6	191,233.4

* Excluding United Kingdom, Ireland and Norway.
** C.P. only, wide gauge.

B. ROLLING STOCK

I. Tractive stock

1. The total number of locomotives at the end of 1971 was 32,935 (19,584) compared with 33,879 (19,693) at the end of the previous year. The breakdown of locomotives between the three types of traction is given below:

Table 9. NUMBER OF LOCOMOTIVES

TYPE OF TRACTION	1971				1970			
	(UNITS)		%		(UNITS)		%	
Steam locomotives	5,274	(2,520)	16.0	(12.9)	6,295	(3,046)	18.6	(15.5)
Electric locomotives	10,121	(6,775)	30.8	(34.6)	9,954	(6,637)	29.4	(33.7)
Diesel locomotives	17,540	(10,289)	53.2	(52.5)	17,630	(10,010)	52.0	(50.8)
Total	32,935	(19,584)	100.0	(100.0)	33,879	(19,693)	100.0	(100.0)

2. Table 10 shows the changes in numbers of electric locomotives for each type of current including multi-current locomotives.

3. Table 11 shows the development of the diesel locomotive fleet. The number of locomotives totalled 17,540 (10,289) compared with 17,630 (10,010) in the previous year. The United Kingdom still has the biggest fleet of diesel locomotives rating over 1,000 h. p.

4. The number of electric railcars was 6,942 (4,080). Here, too, the United Kingdom fleet of DC railcars predominates.

5. Approximately 78% of diesel railcars are in the category up to 350 h. p., the remainder being in the higher output categories, but with very few units exceeding 1,000 h. p.

6. Further details are given below:

The German Federal railways (DB) intend to scrap their steam locomotives by 1976 and replace them by electric and diesel stock, provided that they can acquire these in sufficient quantity.

In Belgium, the following electric tractive stock will be delivered:

- 12 railcars delivered in 1971/72,
- 30 railcars to be delivered in 1973,
- 24 railcars to be delivered in 1974,
- 20 railcars to be delivered in 1975,
- 6 locomotives operating at 4 voltages to be delivered in 1973,
- 15 locomotives 3,000 V to be delivered in 1974.

Table 10. NUMBER OF ELECTRIC LOCOMOTIVES, BY TYPE OF CURRENT

TYPE OF CURRENT	1971			1970		
	(UNITS)		%	(UNITS)		%
DC 660-1,200 V	123[1]	(-)	1.2	73[1]	(-)	0.7
DC 1,500 V	1,407	(1,330)	13.9	1,460	(1,333)	14.7
DC 3,000 V	2,250	(1,903)	22.4	2,199	(1,845)	22.1
AC single-phase 16 2/3 Hz	4,720	(2,365)	46.7	4,637	(2,285)	46.5
AC single-phase 50 Hz	1,175	(805)	11.6	1,133	(803)	11.4
AC three-phase	134	(134)	1.3	136	(136)	1.4
Two types of current	272	(209)		275	(205)	
Three types of current	7	(6)	2.9	8	(7)	3.2
Four types of current	33	(23)		33	(23)	
Total	10,121	(6,775)	100.0	9,954	(6,637)	100.0

1. Including 59 diesel-electric locomotives.

Table 11. NUMBER OF DIESEL LOCOMOTIVES, BY RATED OUTPUT

POWER	1971			1970		
	(UNITS)		%	(UNITS)		%
Up to 150 h. p.	3,208	(3,041)	18.3	4,263	(2,945)	24.2
From 151 to 350 h. p.	3,173	(1,187)	18.1	2,602	(1,230)	14.8
From 351 to 1,000 h. p.	5,001	(3,368)	28.6	4,382	(3,308)	24.8
From 1,001 to 2,000 h. p.	4,710	(2,302)	26.8	4,762	(2,244)	27.0
Over 2,000 h. p.	1,442	(391)	8.2	1,621	(283)	9.2
Total	17,540	(10,289)	100.0	17,630	(10,010)	100.0

Deliveries of diesel tractive stock will include: Conversion of a Series 51, 1950 h. p., locomotive to Series 50, 4,000 h. p.

- 1971 : research and development
- 1972)
- 1973) delivery of completed unit and test runs over 200,000 km.

Construction of sixty 750 h. p. shunting engines.

- 1971)
- 1972) research and development

- 1973)
- 1974) delivery

Installation of radio equipment in 15 diesel locomotives in the 51 Series.

- (completed in 1971).

In France, the last steam locomotives should in principle be taken out of service in 1973.

Italy gave the following information:

In 1971, deliveries of tractive stock included one diesel shunting engine, 54 light motor tractors, 46 diesel railcars, 13 electric railcars, and 45 electric locomotives, of which 32 for main line operation and 13 for shunting.

In 1972, it is intended to bring into service:

- 60 diesel railcars,
- 26 electric railcars,
- 46 light motor tractors,
- 30 diesel shunting engines and
- 7 main line electric locomotives.

Other deliveries are planned for 1973 and the following years, viz:

- 106 electric locomotives,
- 169 diesel locomotives,
- 85 electric multiple units.

In Luxembourg, it is intended to bring into service 4 light motor tractors and to replace 10 diesel railcars by 6 electric 25 kV railcars.

In Austria, there still remained 254 steam locomotives at the end of 1971; roughly between 50 to 60 units are scrapped each year. During 1971 20 Series 1042 electric locomotives (5,400 h. p., 150 km/h.), were brought into service, together with 3 Series 1043 electric locomotives (ASEA thyristor-control, 4,900 h. p., 135 km/h.), 6 Series 2043 diesel locomotives (1,500 h. p., 110 km/h.) and 3 Series 206 diesel locomotives (for shunting services). In 1972 another thyristor-control locomotive was delivered by the Swedish firm ASEA; the 4 ASEA locomotives run on the "Tauernbahn" line.

24 Series 1042 electric locomotives will also be delivered in 1972.

Spain reports the following main developments:

In 1971 the following new tractive equipment was brought into service: eight 3,000 h. p. railcars, six 2,180 h. p. diesel locomotives, three 1,977 h. p. diesel locomotives and twenty 1,578 h. p. electric multiple units.

In 1972, four 3,000 kW electric locomotives and eight 1,977 h. p. diesel locomotives were delivered although only two of the latter were scheduled.

For 1973 the following deliveries are scheduled: five 3,345 h. p. diesel locomotives, sixteen 3,100 kW electric locomotives and nine 3,000 V (DC) Talgo units.

The following are scheduled for 1974: 38 diesel locomotives (3,345 h. p.), 26 electric locomotives (3,100 kW) and 21 Talgo units (3,000 V DC).

Portugal reports the following main developments in 1971 and future plans:

- In 1971, 22 of the 24 electric multiple units ordered under the Third Development Plan were delivered;
- The first three modernized ALCO locomotives with power rating increased to 2,100 h. p. have been brought into service;
- The following table shows plans relating to tractive stock for 1972 and 1973.

1972	1973
Locomotives	Locomotives
Delivery of 4 modernized ALCO units	Delivery of 4 modernized ALCO units
Electric railcars	Delivery of 20 diesel units
Delivery of 2 UTE units	Delivery of 4 electric units

In Sweden the following tractive units were delivered in 1971:

- 11 Series RC_2 thyristor-control locomotives, maximum speed 135 km/h. and 4 Series RC_3 thyristor-control locomotives, maximum speed 160 km/h. Both series have the following characteristics: 3,600 kW, 16 2/3 Hz, 15 kW;
- 1 Series Dm locomotive for ore trains, 4,800 kW, 16 2/3 Hz, 15 kW maximum speed 75 km/h. ;
- 2 thyristor-control multiple units Series X1, 1,120 kW, 16 2/3 Hz, 15 kW, maximum speed 120 km/h. ;
- 6 Series T44 diesel electric locomotives, with an effective power rating of 1,650 h. p., maximum speed 100 km/h. ;
- 2 Series Tc diesel electric snow ploughs, 460 kW, maximum speed 90 km/h. ;
- 1 Series Z66 diesel electric motor tractor, 265 kW, maximum speed 70 km/h.

In addition, the following stock is to be purchased during the next few years: 50 Series Rc^2 thyristor-control locomotives, prototypes of a new 6-axle locomotive, 30 Series Z66 diesel electric motor tractors, 265 kW, maximum speed 70 km/h., 10 Series V4 diesel electric locomotives, 460 kW, maximum speed 70 km/h., and finally a number of Series Z66 motor tractors, Series V4 locomoti es and Series XI railcars.

Switzerland gives the following dates for its delivery programme:

1971: deliveries made	11 Re $4/4^{II}$	/ 20 Re $4/4^{II}$
	9 Ee $3/3^{II}$	/ 1 Eem 6/6
1972: deliveries scheduled	4 Re 6/6	/ 30 Re $4/4^{II}$
1973: deliveries scheduled	1 RABDe 8/16	/ 28 Re $4/4^{II}$

In Turkey, 230 diesel locomotives are to built during the next 5 years (1973-1977) in the Railways' own workshops.

II. Freight and coaching stock

a) Freight wagons

1. The total number of railway freight wagons (excluding the United Kingdom) dropped to 954,887 (688,880) at the end of 1971 compared with 959,005 (684,594) the previous year. To these must be added 298,273 freight wagons belonging to British Rail and 171,501 privately owned wagons. Overall capacity increased to 26,676,600 (20,234,900) tonnes, the average pay-load per wagon being 28 (29.4) tonnes. The figure for privately-owned wagons was 33,6 (34.2) tonnes.

2. Table 12 shown numbers of wagons in the different Member countries; Table 13 groups them by type and shows the shares of the EUROP and POOL fleets.

3. By the end of 1971 the number of standard and unified wagons accounted for almost 39% of the total. Freight wagons with 4 or more axles, which are specially suitable for conversion to automatic coupling, account for only a very small proportion the total number, i.e. 11.6% (13.2%). A survey carried out a few years ago showed that one-quarter of them were open or covered wagons, the others being listed as "other wagons".

b) Coaches

4. Changes in the number of coaches from one year to the next were very uneven. The total for the six EEC countries rose from 47,502 in 1970 to 48,899 in 1971. For the other Member countries of the ECMT, there was also an increase, from 35,035 to 37,783. For the 18 countries combined, the increase amounted to about 4,000. As new acquisitions were bogie stock which replaced two-axle coaches, seating capacity is unlikely to have been affected.

In the United Kingdom and to a lesser extent in other countries, the changeover from locomotive traction to multiple units played a considerable role.

c) Information concerning individual countries

The Federal German Railways (DB) reports the following measures:

Freight wagons: increased purchases of sliding door wagons to replace the covered wagons which are being scrapped.

Coaches:
1. Acquisitions of new stock for so-called "Inter-city" services were larger than originally planned, these services having proved highly successful from the start.
2. Scrapping, during the period up to 1974, of the old restaurant cars which no longer satisfy the health regulations of the Federal Republic of Germany.
3. Construction of two prototypes complying with the specifications of the "International Passenger Transport" Pushing Group. These prototypes will shortly undergo tests.
4. As a consequence of the increase in passenger traffic, it was not possible during the past year to scrap obsolete equipment as planned, nor can this be done within the framework of the capital investment expenditure which can be incurred at present.
5. Faster conversion of coaches for automatic coupling.

In Belgium, deliveries and plans are as follows:

Coaches: 1971: nil
next few years: construction of 1,000 coaches.

Table 12. FREIGHT WAGONS

Year	WAGONS BELONGING TO RAILWAY ADMINISTRATIONS (TOTAL NUMBER) 1971	WAGONS BELONGING TO RAILWAY ADMINISTRATIONS (TOTAL NUMBER) 1970	WAGONS BELONGING TO RAILWAY ADMINISTRATIONS (OF WHICH "POOL" WAGONS) 1971	WAGONS BELONGING TO RAILWAY ADMINISTRATIONS (OF WHICH "POOL" WAGONS) 1970	PRIVATELY-OWNED WAGONS (NUMBER) 1971	PRIVATELY-OWNED WAGONS (NUMBER) 1970
Germany	283,517	278,331	84,020	83,867	43,646	41,277
Belgium	45,882	44,658	17,784	18,045	4,411	4,651
France	225,200	227,300	88,320	88,710	79,170	74,940
Italy	113,167	112,953	24,000	24,000	13,150	12,805
Luxembourg	3,817	3,751	1,449	1,349	480	479
Netherlands	17,297	17,601	4,721	4,351	1,338	1,155
EEC countries	688,880	684,594	220,204	220,322	142,195	135,307
Austria	34,645	33,925	8,138	8,176	3,504	3,534
Denmark	9,737	10,156	4,527	4,511	500	556
Spain	40,398	46,421	-	-	10,415	10,597
United Kingdom	298,273	364,884	-	-	18,765	19,043
Greece	7,166	9,154	-	-	-	-
Ireland	9,417	9,884	-	-	76	68
Norway	9,559	9,714	-	-	472	484
Portugal	7,929	8,306	-	-	617	642
Sweden	47,701	47,432	-	-	5,031	5,061
Switzerland	25,626	25,707	9,229	9,206	7,250	6,816
Turkey	16,003	16,089	-	-	1,342	1,247
Yugoslavia	57,828	57,621	-	-	-	-
Other countries	564,280	639,295	21,871	21,916	48,071	48,048
Total	1,253,160	1,323,889	242,165	242,238	190,266	183,355
Other countries	226,007 [1]	274,411	21,916	21,871	29,306	29,005
Total	914,887	959,005	242,165	242,238	171,501	164,312

1. Excluding the United Kingdom.

Table 13. FREIGHT WAGONS (EXCLUDING UNITED KINGDOM)

	1971 (NUMBER)		%
A. RAILWAY WAGONS [1]			
a) All wagons:			
of which:			
covered wagons	400,023	(289,051)	42.0
open wagons	310,040	(215,044)	32.5
other wagons	244,824	(184,785)	25.5
Total (a)	954,887	(688,880)	100.0
b) EUROP fleet:			
of which:			
covered wagons	95,279	(84,492)	39.4
open wagons	108,922	(99,898)	45.0
c) POOL fleet:			
flat wagons	37,964	(35,904)	15.6
Total (b) and (e)	242,165	(220,294)	100.0
d) Standard wagons	209,228	(183,578)	56.8
e) Unified wagons	159,833	(115,099)	43.2
Total (d) and (e)	369,061	(298,677)	100.0
f) Wagons with 4 or more axles	110,691	(90,787)	11.6
B. PRIVATELY-OWNED WAGONS [1]			
of which:			
covered wagons	13,636	(11,624)	8.2
open wagons	25,223	(22,690)	15.4
other wagons	132,642	(107,881)	76.4
Total B	171,501	(142,195)	100.0
of which:			
wagons with 4 or more axles	40,315	(36,241)	23.5

1. Excluding United Kingdom wagons.

Wagons: 1971: Modernization of existing wagons;
Scrapping of obsolete wagons and construction of 3,120 new wagons;
Improvement of equipment of existing wagons.

1972: Reconstruction of equipment;
Construction of new wagons;
Improvement of equipment of existing wagons;
Planned conversion of existing wagons for automatic coupling.

Developments in Italy were as follows:

- deliveries in 1971: 372 coaches
65 vans
1,394 wagons
- deliveries schedules for 1972: 230 coaches
110 vans
2,100 wagons

In Luxembourg there were few changes to report in 1971. In the next few years the CFL will be acquiring special wagons to cater for users' requirements.

In 1971, the Austrian railways (OBB) acquired 30 new coaches and ordered 35 others for delivery from the autumn of 1972 onwards.

During the same year Austrian railways brought into service 974 freight wagons; another 867 will be delivered in 1972 and 1973.

Spain give the following information:

RENFE - During 1971 the following new trailer stock came into service:

14 sleeping cars, 272 flat wagons, 421 hopper wagons, 22 sliding door wagons and 2 open wagons.

In 1972, deliveries were as follows: 43 sleeping cars, 28 flat wagons, 179 hopper wagons, 50 sliding-roof wagons and 28 sliding-door wagons.

Delivery schedules for 1973 include 100 covered wagons and 245 flat wagons and for 1974, 160 flat wagons.

Definitions - "Covered" wagons include closed wagons, cages and refrigerator wagons; "open" wagons and "other wagons" include flats, tank wagons of various types, hopper wagons and high-sided open wagons.

Norway reported a decrease in the number of covered wagons in 1971 as compared with 1970.

In the course of 1971, Portugal took delivery of 15 coaches. Two contracts were signed:

- one for the supply of 110 coaches for long distance services;
- the other for the supply of 30 ballast-carrier wagons.

In Sweden, 611 wagons were delivered during 1971, most of them standard SJ units, Series Hbis and Rs together with the last batches of a series of ore-carrier and oil tanker wagons. A few partly converted Rs wagons were also delivered. They are to be tried for container transport.

As regards conversions, reference should be made to a wagon converted "sliding hood" (Debach Vit) tests.

Pending the results of the study on conditions for introduction of high speed trains, no coaching stock was bought in 1971.

Besides the renovation of coaching stock dating from 1940-1950 to bring it into line with present-day standards of comfort, 13 coaches in this category have been converted into sleeping cars.

Switzerland reports the following schedule of acquisitions:

Deliveries in 1971

40 RIC coaches
60 "unified standard" coaches Type II
12 luggage vans

112 units.

Deliveries scheduled for 1972:

32 RIC coaches
107 "unified standard" coaches (type II)
4 "unified standard" coaches
20 luggage vans

163 units.

Deliveries scheduled for 1973

14 RIC coaches
52 "unified standard" coaches (type II)
28 luggage vans

93 units.

Orders scheduled for 1973 and 1974

135 RIC coaches
30 RIC luggage vans
50 "unified standard" coaches (type III)
30 luggage vans

245 units.

Wagons

Deliveries in 1971: 591 wagons
Deliveries scheduled for 1972: 783 wagons
Deliveries scheduled for 1973: 688 wagons

Orders scheduled for 1972

750 sliding door wagons
50 Uaces cement carrier wagons
200 RS flat wagons

1,000 wagons.

III. The role of EUROFIMA

1. In 1971 EUROFIMA concluded contracts for a total of

- 1,971 diesel locomotives
- 43 two-car electric multiple units
- 101 coaches and luggage vans
- 5,874 goods wagons (including 4,393 bogie wagons), broken down by railway administration as follows:

SNCF:	75 2,100 h. p. diesel locomotives 18 "Gril-Express" coaches 1,684 flat bogie wagons	178 million*
DB:	31 1,800 h. p. diesel locomotives 57 1,100 h. p. diesel locomotives	100 million*
FS:	285 covered bogie wagons 300 flat bogie wagons 535 open bogie wagons	93 million*
SNCB:	3 two-car electric multiple units 1,200 flat bogie wagons 50 container bogie wagons	68 million*
NS:	40 two-car electric multiple units 36 sliding roof bogie wagons 252 two-axle container wagons	54 million*
ÖBB:	680 two-axle sliding door covered wagons 170 covered bogie wagons	38 million*
JZ:	3 600 h. p. diesel locomotives 3 3-axle car-carrier wagons 338 open bogie wagons 320 covered bogie wagons 21 bogie tank wagons 7 coaches	35 million*
RENFE:	5 medium-power diesel locomotives 57 sleeping cars	31 million*
CP:	8 coaches 11 luggage vans	8 million*

Total deliveries during 1972 were: 108 diesel locomotives, 54 electric multiple units, 9 power cars (including 6 with trailers), 93 coaches or luggage vans and 5,056 goods wagons (including 3,212 bogie wagons).

Invitations for international tenders

In accordance with the objectives which it set itself at the time of its creation, EUROFIMA is at present engaged in large-scale operations for the joint purchase of rolling stock. Its activities in this field in 1971 concerned, in particular, the unified standard European coach and automatic coupling.

The unified standard European coach

In July 1971, at the request of the International Union of Railways, EUROFIMA issued international invitations to tender for a grouped order of 500 carriages, built to high comfort specifications for long distance services, for the railways of the Federal Republic of Germany, Belgium, France, Italy, Austria and Switzerland.

The order will be placed with an international group of manufacturers which will also have to consider the standardization aspects in consultation with an international group of railway experts. The delivery of the first batch of these coaches is scheduled for 1975. Should the results of the invitation for tenders come up to expectations, a supplement to the

* Swiss Francs.

order, or even a further order of the same magnitude might be envisaged. Further invitations to tender might even be issued in the future for the construction of other batches on a similar scale.

Automatic coupling

EUROFIMA has been requested to participate as far as it can in the financing of this joint venture and also to co-operate in the purchase of couplers. The Company will therefore invite tenders from Europe and elsewhere for the supply of all the couplers (about 2 million units) needed to equip the rolling stock of all the railway administrations concerned.

As the date for the introduction of automatic coupling has still not been decided, these invitations to tender, which were originally to have been issued in 1972, will probably not be issued before the first half of 1973. The advance notice to manufacturers, to enable them to prepare for this invitation to tender, will reach them only in the course of 1972.

C. INFRASTRUCTURE

I. Fixed installations (excluding electrification)

The Federal Republic of Germany reports the following developments:

Superstructure

The length of continuous welded rail rose to 47,180 km. i. e. 79.3% of the total network. The number of welded points totalled 104,100 units, or 79.2% of the total.

As a consequence of rail replacements the percentage of UIC 60 type rail has risen to 45%.

Signalling and telecommunications installations

In 1971, 137 obsolete signal boxes were replaced by 45 new push button "area-control" signal boxes, covering a total of 1,290 points.

The German Federal railways have at present built 1,061 push-button "area-control" signal boxes, 1,033 of which are at present in service. Modern technology has thus made it possible to scrap 2,551 obsolete signal boxes.

The length of track (single or double) equipped with the automatic block system has risen by 400 kilometres to a total of 5,410 kilometres.

612 tractive units have been equipped with induction braking devices (Indusi), bringing the total of vehicles so equipped to 7,087. Safety has been improved at sections with permanent speed limits by the installation of induction braking devices.

On the Lübeck-Puttgarden line radio control of trains has been introduced for the first time on the DB network. Seven receiver/transmitters along the line keep the control room staff in permanent touch with driving cabs similarly equipped. The results as regards safe working, improved traffic flow and better service for passengers have come up to expectations.

DB have for some time been making general use of radio telephony to increase safety of operation, particularly on branch lines. In the course of the year under review, 3,000 extra receiver/transmitters and other transmission and reception installations were brought into service.

In order to provide better service for users, passenger bookings, hitherto carried out mannually on a decentralized basis, have since 1st February 1971 been handled by the computerized booking centre at Frankfurt (Main). This centre, the largest of its kind in Europe, makes bookings up to a maximum capacity of 80,000 seats per day (1.3 million seats per month) on request from the 350 consoles installed at ticket offices and travel agencies. These results are well in excess of the original estimates.

Automation of operations

A detailed plan has been drawn up for the first stage of an integrated transport control project. This stage, which from the outset will embrace the entire DB network, will provide basic technical guidance for subsequent stages.

The main purpose at this stage is to compile data relating to transport movements in connection with processing of waybills by the services responsible for freight consignment and the manning of trailer and tractive stock.

In the light of successful tests with the "Cybernetics Island" at Hanover, a working party has been instructed to develop a standardized model for a "Central regional control" which will be responsible, within the framework of integrated control of transport movements, for central control of operations (remote control of signal boxes) within a relatively large area, including the operational lay-out.

Construction of New Lines and Development of Existing Lines

As part of the development programme for the Federal Railway network (which, in order to increase capacity and improve services, provides inter alia for the construction of 11 additional lines) detailed studies have been made for the first two new lines which have been given priority, i. e. Cologne - Gross Gerau and Hanover - Gemünden (Main) via Kassel. The conclusions of these studies were expected early in 1972.

Plans for short-haul traffic

During the year under review, about 25% of all capital expenditure on new construction was allocated to construction for short-haul traffic.

Adjustments have been made to the programmes for the Munich metropolitan railway network and the railway link with Frankfurt (Main) airport in order to bring them into service by the specified date. In the case of the airport link the main items were the infrastructure and superstructure for the double-track section from the Rhine-Main airport to the junction with the Mainz - Frankfurt (Main) line, and this work is nearly completed. Work in the Munich region was concentrated on the construction of 380 km. for the suburban network.

Electrification of the 23 km. long Frankfurt - Höchst - Nidernhausen (Taunus) section is now completed. Construction of the Limesbahn has continued according to plan and preparations have been made for the construction of tunnels for the Frankfurt(Main) metropolitan railway to the city centre in the region of the Frankfurt Central Station.

Modernization of Freight Stations

Work on the construction of the new marshalling yards at Maschen south of Hamburg has continued apace. In the light of experience with the first automatic sorting installations at the Seelze marshalling yard, work has started in the Mannheim marshalling yard on the installation of automatic speed control equipment.

Goods Traffic and Container handling installations

As part of the re-modelling of parcels traffic facilities, adjustments have been made to a whole range of consignment services, goods sheds and loading ramps to match the new

transport situation. The most important project at present is the construction of a direct link over 15 km. long to serve the "Rüstersieler Groden" industrial area near Wilhelmshaven, which was began during the year under review.

In Belgium,

- the work on railway facilities in connection with the extension of the ports of Antwerp, Ghent and Zeebrugge is proceeding. At Zeebrugge the new deepwater terminal for transcontainers has been put into commission;
- in 1971, 143 km. of track were equipped with long welded rails, bringing the total to 1,300 km.;
- during 1971, 29 level crossings were taken out of service by substituting bridges, etc. or by passes; 86 level crossings were equipped with automatic signalling and 76 also with half-barriers;
- as part of the modernization of signalling facilities, 13 new "all relay interlockings" have been built and 46 old mechanical lever interlocking cabins consequently taken out of service.

France reports the following:

1. Further increases in maximum speed over many sections of line:

   a) the authorized speed of 200 km./h. which applied to 230 km. of single track at the the end of 1970 was extended to 533 km. at the end of 1971, more particularly to certain sections of the Paris - Bordeaux line (Les Aubrais - Blois, Blois to Saint-Pierre-des-Corps, Poitiers-Ruffec);

   b) up-gruding to 160 km./h. and over on various other sections of line totalling 257 km. of single track, bringing to 4,227 km. the length of track on the sections concerned.

2. The fitting of 810 km. of track with long welded rails and strengthening of 490 km. of track by the use of heavy rails (60 kg. per metre).

3. Installation of the automatic colour-light block system of the classical type on a further 110 km. of line and permissive automatic block on 26 km. (between Frapois and Arc-Senans).

In Italy, technical modernization by the FS mainly concerned:

- replacement of track, using 60 kg/m. rails, on reinforced concrete sleepers;
- installation of long welded rails.

Among the most important developments in 1971, attention should be drawn to:

- improvement of the double track between Ceprano and Sparanise (78 km.) on the Rome - Cassino line;
- completion of the new Eccellente - Rosarno section (45 km.) on the Battipaglia - Reggio Calabria line;
- replacement of 500 km. of main-line track;
- repairs on 350 km. of track on other less important lines.

In the Netherlands, the total length of track equipped with automatic block signalling was increased by 17 km. to 1,452 km.

The length of line equipped with CTC at the end of 1971 was 591 km., and with automatic train control, 469 km.

More than 178 km. of track were equipped with long welded rails, thus bringing the total at the end of 1971 to 1,313 km.

In 1971 the number of level crossings equipped with automatic flashing lights rose to 777, and those equipped with half barriers to 453.

In Austria, in order to speed up slow traffic on the "Arlbergbahn" valley section between Innsbruck and Landeck (transit traffic, very heavy passenger traffic, business traffic), the Zirls - Telfs - Pfaffenhofen section will be converted to double track to follow up the improvements already made between In sbruck and Zirl. This section was re-aligned to a considerable extent in 1971.

The very high density of traffic on the "Tauern" line causes serious operational difficulties, particularly during peak periods. To make it possible to increase the capacity of the line and accelerate train movements, the Austrian Federal Railways have drawn up a large scale investment programme for the Tauern-Bahn, providing for conversion to double track.

As a first stage, the Summer of 1971 saw the completion of the new Pfaffenberg-Zwenberg bridge and the construction of a loop line which also improves the alignment.

The structures on the previous alignment (two tunnels, one bridge) were in fact in such poor condition that the best solution from the economic and technical angles alike, was a new double track alignment and construction of a new bridge.

This structure, 120 m. high, is the highest railway bridge in Austria. The old track has been taken out of commission.

Austrian railways attach particular importance to the problem of level crossings. During 1971, the number of level crossings was reduced by 127 units; these were replaced by structures or simply scrapped.

In Denmark, the modernization of main lines with a view to higher speeds, is continuing; some of the major stations along these lines have been re-structured.

Spain gave the following information:

1. Improvements and replacements during 1971

- With new materials

443.1 km.	with	54 kg.	rails	and	reinforced concrete sleepers
98.7 km.	"	"	"	"	wooden sleepers
0.5 km.	"	45 kg.	"	"	reinforced concrete sleepers
14.9 km.	"	"	"	"	wooden sleepers

- The following were replaced with recovered materials:

126.5 km.	with	45 kg.	rails	and	wooden sleepers
2.3 km.	with	42.5 kg.	rails	and	wooden sleepers.

Replacements and new construction accounted for 446,000 wooden sleepers, 691,000 concrete sleepers and 1,382,000 m^3 of ballast.

2. Maintenance

A number of scheduled maintenance operations were completed. The network is divided into 46 sections, with 215 districts and 1,161 cantons. 419,000 sleepers were laid as part of open track maintenance and another 121,000 within station precincts.

741,000 m^3 of ballast were used.

Two new ballast clearing and riveting sets were brought into service

3. Other measures

Signalling and safety installations with entry and exit light signals, CTC, block and interlocking systems, etc.

Greece reports the following measures:

A. Athens - Thessaloniki - Idomeni line

1. The survey for re-alignment and the laying of a second track on the main Athens - Thessaloniki line (apart from the mountainous regions between Tithorea and Domokos) has been assigned to private consultants. The object is to provide for speeds up to 200 km./h.

Technical characteristics of the new track

Minimum radius of curveture	2,000 m.
Radius of gradient transition	10,000 m.
Maximum gradient	16%
Distance between rail centres	4.20 m.
Width of permanent way	14.00 m.
Type of rail	UIC 54

2. Geological surveys are in progress in the mountain area (Tithorea - Domokos) where lengthy tunnels are to be drilled.

3. International invitations to tender will be published on 4th September 1972 for the installation of an automatic signalling and traffic control system on the Tithorea - Domokos line which is intended to be kept in its present form for some time.

4. Tenders were invited by 14th August 1972 for the laying of new track in stations on the Tithorea - Domokos line.

5. Re-adjustment of the alignment of the existing Athens - Thessaloniki line is being planned with a view to raising speeds to 120 km./h. in five years' time (first stage of modernization). This does not apply to the mountain stretches for which the plans provide for a loop line and complete replacement.

B. Thessaloniki - Alexandroupolis - Ormenion line

Work is already in progress to adjust the alignment for speeds of 160 km./h.; the track is being relaid with concrete sleepers.

In Ireland, the following programme was carried out in 1971/1972:

New relaying	20.35 km.
Relaying of second hand rails	23.06 km.
Resleepering	59.37 km.
Total	102.78 km.

Coast defence

The track at Ballygannon in the Greystones to Wicklow section was moved inland by about 100 feet to reduce the effect of wave action on the track with consequent delay to trains, and to provide better access for maintaining the existing coast defence works at this place. Damage caused by winter storms has necessitated special remedial measures at Rosslare Harbour and Wexford Quay to protect the installations there from further coast erosion.

Signal and electrical section

Specifications have been prepared for the introduction of Central Traffic Control on two sections of the Board's lines, viz. Dublin/Ballybrophy and Dublin/Mullingar. Automatic barriers were brought into operation at Farranfore and a similar installation at Garrandaragh will be commissioned shortly. In addition, equipment was ordered for a further six level crossings which are to be automated.

Following powers conferred by the Transport (Miscellaneous provisions) Act 1971, arrangements are in hand for the installation of automatic controls at 7 level crossings on public roads.

Structural section

34 bridges were renewed during the year to designs prepared by this section. These included Bridge 238 on the Cork line which was renewed with 40 ton units, the heaviest yet used on the system. Arrangements are in hand for the renewal of two load-restricted road bridges on the Galway line; when these are completed there will be only four such bridges on the national primary and secondary roads. Some progress has been made towards introduction of computer-aided design work.

Future developments

A detailed survey of rail requirements on the system has been undertaken and a scheme for reconditioning rails will shortly be completed.

It is anticipated that modern signalling installations will be the major development for consideration on the railway.

Investigations are proceeding on the possibility of increased axle load with bogie type freight stock.

Norway is continuing, as last year, the installation of long welded rails and concrete sleepers.

In Portugal, renovation of the track continued during 1971, i. e. :

TYPE OF REPLACEMENT	LINE	KM.
Total replacement	Northern line Sintra line Cintura line	120
Ballast	Beira Alta line	100

The following work is planned for 1972 and 1973:

TYPE OF REPLACEMENT	LINE	KM.	
		1972	1973
Complete replacement	Northern line	206	202
	Southern line	-	13
Relaying with secondhand rails	Western line	88	-
	Douro line	5	52
	Minho line	-	33
	Figueira junction	-	5
Ballast	Beira Alta line	16	-

In Sweden

1. Long welded rails were laid over 220 kilometres of track. Track strengthening operations proceeded according to plan with the laying of concrete sleepers over 120 km. of track and of Hey-Back fasteners over 100 km. of track, both operations being carried out simultaneously with relaying of rails.

2. Replacement of stone ballast by macadam ballast over 109 km. of track.

3. Entry into service of new or improved facilities:

- Jönköping station has been extended and renovated and new terminal facilities have been built for goods services.
- A new transhipment track has been built at Haparanda.
- Container transhipment facilities have been installed at Luleå.
- A freight terminal has been installed at Luleå.
- A new signal box was installed at Ånge.
- A new automatic telephone exchange was installed at Ängelholm.

4. The automatic block system was introduced on five single-track lines, i.e.:

Skytts Vemmerlöv - Trelleborg	5.6 km.
Olskroken - Bohus	15.5 km.
Hallsberg - Godegård	41.9 km.
Storvik - Avesta	57.8 km.
Hällnäs - Bastuträsk	63.7 km.
	184.7 km.

5. Centralized Traffic Control (CTC) was brought into service on the following lines:

	Single track	Double track
Hallsberg - Godegård	41.9 km.	
Hällnäs - Bastuträsk	63.7 km.	
Älvsjö - Södertälje		27.7 km.
Sundbyberg - Kungsängen		21.6 km.
Solna - Märsta		31.6 km.
Storvik - Avesta	57.8 km.	
	163.4 km.	80.9 km.

6. Safety installations with "route-relay" control systems were completed, including four on double-track lines.

Switzerland reports the following measures:

- construction of modern marshalling yards;
- construction of new freight stations;
- construction of central stations for express freight;
- construction of new connecting lines;
- doubling of track on single-track lines;
- reconstruction and improvement of station facilities and construction of passing tracks;
- construction of intermediate platforms with subways or footbridges for access to platforms;
- replacement of level crossings by fly-overs;
- adjustments to track alignment for high speed traffic;

- installation of two-way working facilities on sections where distances between stations are too long;
- equipment of double track for reverse or signal-controlled two-way working;
- installation of automatic block systems on some sections of lines where remote control is feasible;
- extension of the telex network;
- installation of computerized reservation system;
- extension of the long-distance cable network.

In 1971, double track lines were brought into service on the following sections:

- Boswil - Muri (Rotkreuz - Rupperswil line);
- Oberrüti (Rotkreuz - Rupperswil line).

The following were also built during 1971:

New electrical interlocking boxes:

Region I	Region II	Region III
Lausanne-Marshalling	Inkwil	Hauptwil
Bussigny	Bodio	Koblenz
Lutry	Muri (prov)	Kloten
Cully	Lenzburg (prov)	Trimmis Bl
Rivaz		
Pully Bl		
6 boxes	4 boxes	4 boxes

New block sections (main lines)

Region I	Region II	Region III
-	Herzogenbuchsee - Subingen	-
	Hunzenschwil - Lenzburg	

Converted block sections (main lines, replacement of manual block by automatic block)

Renens - Bussigny	Rupperswil - Othmarsingen	Wallisellen Effretikon
Renens - Morges	Gexi - Handschiken	
Lutry - Cully		Zizers - Chur
Cully - Vevey		Turgi- Brugg

Summary

In 1971, the following were brought into service:

- 14 electric interlocking boxes,
- 16 other interlocking boxes,
- 195 points control devices,
- 642 light signals (including low signals),
- 3 block sections,
- 5 train describers connected to the block on barrier signal boxes,
- 13 automatically controlled level-crossing gates.

Turkey gave the following information:

Under the Second Development Plan (1968-1972), T£ (Turkish pounds) 1,003,916,000 were allocated to permanent-way investment and development projects; a total of T£ 76,453,225 was spent in 1971.

The following work had been completed by the end of 1971:

- replacement of 318 km. of track,
- strengthening of 110 km. of track,
- replacement of ballast (1,229,627 m^3),
- changing and replacement of 157 sets of junction points,
- replacement or strengthening of 101,997 sleepers,
- construction of 216 retaining walls,
- completion of 7 tunnels.

II. Electrification

1. The length of the electrified network has increased by 754 (398) km. since October 1971, and is now 53,730 (29,590) km. Table 14 shows the totals broken down by type of current at the end of Octobre 1972.

Table 14. LENGTH OF ELECTRIFIED NETWORKS BROKEN DOWN BY TYPE OF CURRENT

TYPE OF CURRENT	ALL ECMT COUNTRIES			EEC COUNTRIES		
	KM.	%		KM.	%	
DC 600-1,200 V	2,066	3.9		177	0.6	
DC 1,500 V	7,247	13.6	39.8	6,394	21.4	51.5
DC 3,000 V	11,851	22.3		8,767	29.7	
Single-phase AC 16 2/3 Hz	23,882	45.0		9,305	31.7	
Single-phase AC 50 Hz	7,585	14.2	60.2	4,495	15.1	48.3
Three-phase AC	499	1.0		452	1.5	
Total	53,130	100.0		29,590	100.0	

2. Some 63% of the total electrified network is accounted for by four countries: Germany (9,303 km.), France (9,268 km.), Italy (8,006 km.), and Sweden (6,876 km.). The remaining 19,677 km., i.e. 37%, are shared by twelve other countries. Two countries (Greece and Ireland) have no electrified lines. The electrified network, which covers about 32% of the whole European system, accounted for approximately 72% of gross tonne-km. (excluding the United Kingdom, Ireland and Norway).

3. Existing programmes provide for the following further increases up to 1976: 1,144 (428) km. on trunk lines and 1,883 (428 km. on other lines. Yugoslavia (1,234 km.) accounts for nearly 40% of the combined figure of 3,027 km., the remainder being made up as follows: Germany 572 km., Austria 406 km., United Kingdom 354 km., France 116 km., Belgium 101 km., Turkey 96 km., Portugal 77 km., Netherlands 67 km., and Denmark 4 km.

4. If these programmes are carried out, 86/87% of European trunk lines (excluding links between Belgrade and Greece and Turkey, but including the direct Madrid-Burgos line) will be electrified by 1976.

5. The map of the electrified network to be reissued this year will take account of all changes since October 1970.

Sweden has provided the following information on electrification:

No new lines have been converted for electric traction or for a different system of current during this period.

The total length of lines has been reduced by 83 km. following the transfer to municipal administration of the Roslagen railway line (DC 1,500 V) from 1st May 1972.

No lines are to be converted for electric traction or another type of current during the period October 1972-end of 1976.

D. POWER CONSUMPTION

1. Electrification and dieselization have very favourable affected the trend of power consumption.

2. Consumption of electric power for traction increased from 21.06 (13.78) milliard KWh in 1969 to 22.05 (14.72) milliard KWh in 1971, and consumption of gas-oil from 2.61 (1.11) to 2.85 (1.24) million tonnes, while coal consumption fell from 5.23 (2.06) to 4.43 (1.39) million tonnes over the same period. Consumption of fuel oil for steam traction was approximately 0.36 million tonnes.

3. Table 15 shows power consumption in terms of coal equivalent (CE) for the two years under review.

Table 15. POWER CONSUMPTION FOR TRACTION

TYPE OF TRACTION	1971				1970			
	(1,000 t CE)[2]		%		(1,000 t CE)[2]		%	
Steam [1]	4,918	(1,654)	24.7	(15.4)	5,835	(2,241)	27.8	(19.8)
Diesel	3,990	(1,736)	20.0	(16.2)	3,961	(1,725)	18.8	(15.2)
Electric	11,027	(7,360)	55.3	(68.4)	11,177	(7,356)	53.4	(65.0)
Total	19,935	(10,750)	100.0	100.0	20,973	(11,322)	100.0	100.0

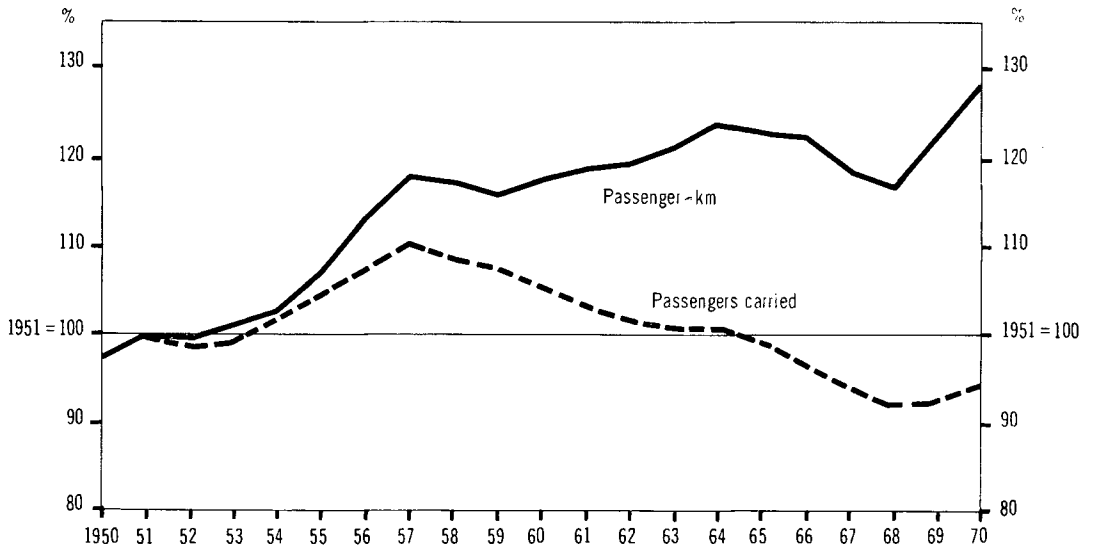
1. Coal, including lignite and fuel oil.
2. Conversion of energy into coal equivalent (CE): 1 t Coal = 1 t CE
   1 t Lignite = 0.5 t CE
   1 t Fuel oil = 1.35 t CE
   1 t Diesel oil = 1.4 t CE
   1,000 KWh = 0.5 t CE

Annex 1

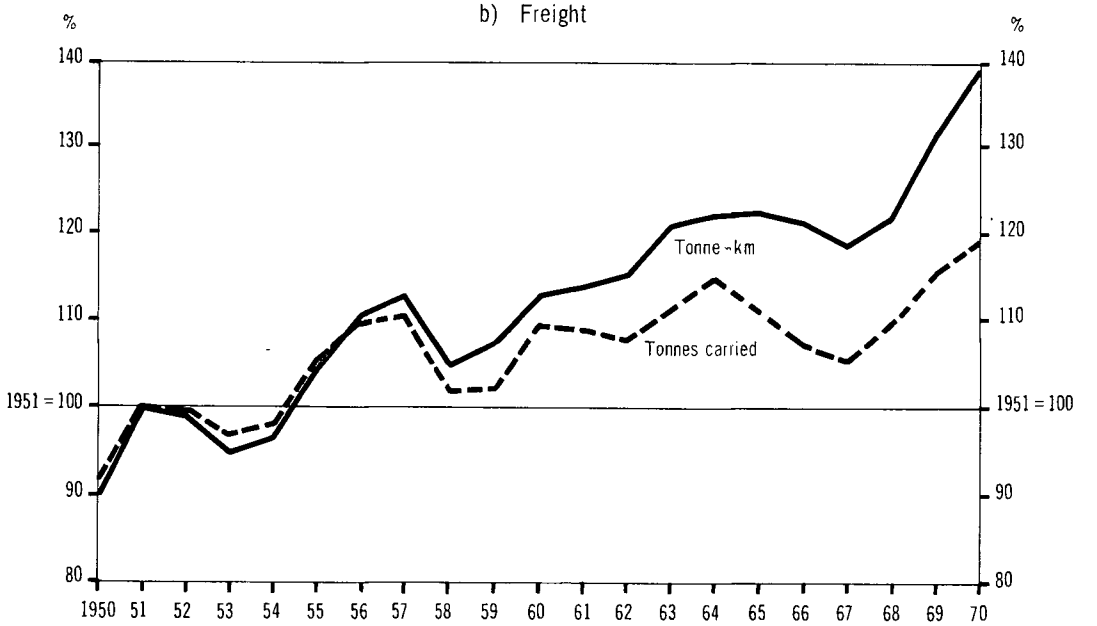
Graph 1

TREND OF RAILWAY TRAFFIC

a) Passengers



b) Freight

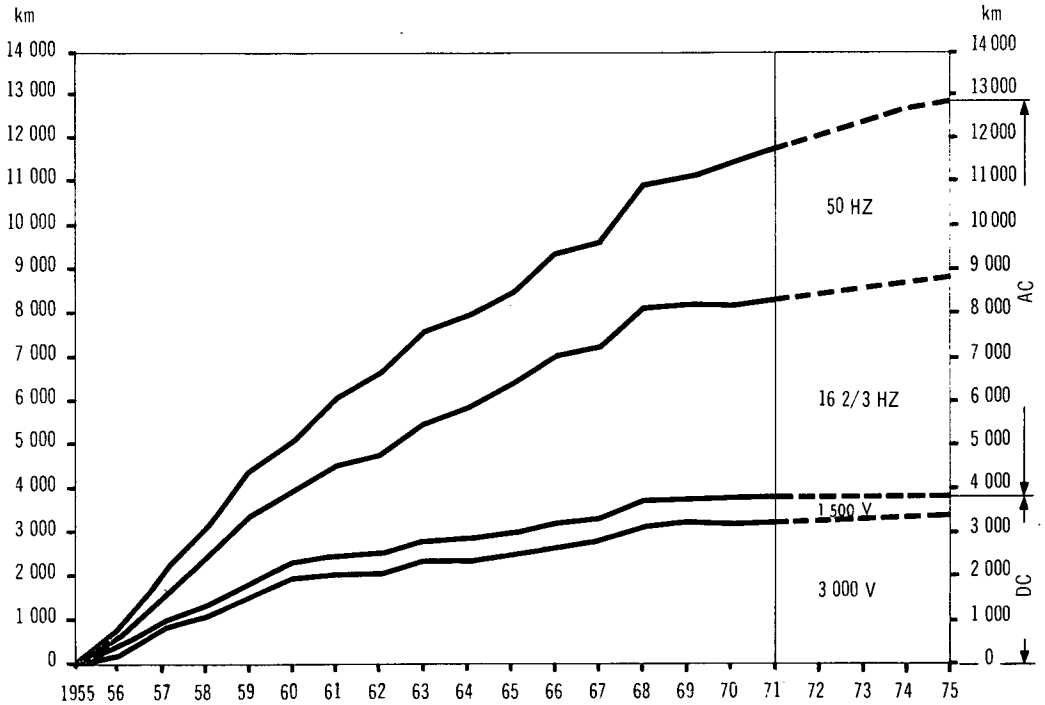


Annex 2

Graph 2

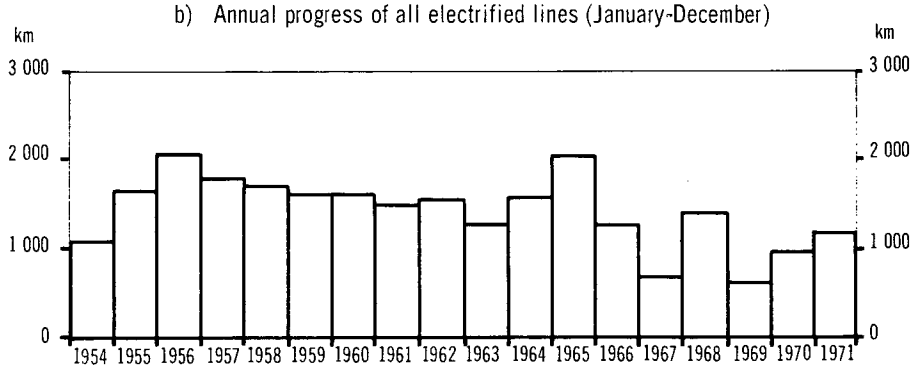
DEVELOPMENT OF ELECTRIFICATION

a) Progress with electrification of European trunk lines (October)*



* Excluding results of current conversion programme.

b) Annual progress of all electrified lines (January-December)



Annex 3

PASSENGER TRAFFIC TRENDS IN INDIVIDUAL COUNTRIES

In Germany, passenger transport demand in 1971 moved in step with the general economic situation: upwards until mid-year when it flagged and then declined. There was, however, a slight increase over the previous year (especially apparent in the "tourist traffic" market) despite the downward trend in the economy. The decline which was particularly noticeable from the summer of 1971 may be attributed to the considerable increase in car ownership and to stronger competition from charter operators. Some positive features were noted in various sub-sectors: increase in traffic following special offers to certain categories of passengers and valid for a specified period, introduction of special "Inter-city" services (+42%). For the first time "work travel" did not decline. This was due to an improvement in the quality of service (greater frequency) and intensified advertising. "School" traffic has shown a considerable increase in consequence of the educational reform and as the Länd authorities bear the costs. A considerable increase in revenues, roughly in line with the forecasts, has been obtained by pricing based on cost, elasticity of demand and the competitive situation (1st March 1971 = +15.6% on average), but this calculation duce not take concessionary fares into account.

The early months of 1972 confirmed the figures recorded at the end of 1971. The slight decline was, however, checked by the economic upturn and the trend has been improving since May 1972.

Concessionary fares and fares for short-distance traffic (up to 50 km.) were increased by 12% and 8% respectively owing to the considerable gap between the revenues and real costs. "School" transport nevertheless shows a considerable increase and "work travel" (despite the large increase in new vehicle registrations) shows a small increase.

In Belgium, traffic in terms of passenger-kilometres increased by 2.4%. The number of passengers showed little change (+0.2%); the average length passenger journey, however, increased by 2.3%.

The increase in the number of passenger-kilometres is the end result, on balance, of the differences for separate passenger traffics.

The most notable change concerns transport of passengers travelling at reduced fares and is due mainly to the remarkable growth of mass international tourism. Thus, despite a slight fall in full-fare passenger traffic, an increase was recorded in the total number of ticket-holding passengers.

At 1st September the raising of the wage ceiling for entitlement to concessionary monthly or three-monthly season tickets led to an increase in this category of traffic. An increasing number of weekly season ticket holders are moreover transferring to this category.

The traffic figures for standard-fare season tickets remains much the same.

Taken as a whole, despite a slight decrease in the number of schoolchildren and weekly season ticket holders travelling at reduced fares, season-ticket traffic is increasing slightly.

For the first four months of 1972, passenger traffic totalled 68.5 million passengers and 2,496.8 million passenger-kilometres.

As compared with the corresponding period of 1971, the number of passengers carried fell by 1.2% and passenger-kilometres by 2.2%.

Weekly season ticket holders accounted for the biggest drop. This was due to the considerable increase in unemployment.

A small reduction is also recorded, however, in the number of fare-paying passengers other than season-ticket holders.

In Italy, passenger traffic in 1971 showed an increase over the previous year in the number of passengers carried (+1.24%) and passenger-kilometres (4.59%).

The most marked increase in the number of passenger-kilometres is due to a further increase in the average passenger journey length.

This favourable trend continued during the first two months of 1972, the number of passengers carried increasing by 4.19% and passenger-kilometres by 3.64%, as compared with the corresponding period of 1971.

In Luxembourg, the number of passengers carried in 1971 showed an increase of 3.4% compared with 1970. This increase may be attributed to the increase in tourist traffic and study tours.

Traffic during the first three months of 1972 was substantially the same as during the corresponding period of 1971.

In the Netherlands, the increase in passenger traffic slackened off in 1971. Passenger-kilometres rose from 8,011 million in 1970 to 8,114 million in 1971. The increase is due to the growth of "complementary" transport; the volume of basic transport (single and return journeys, season tickets, international transport, troop transport) has not changed. Passenger traffic receipts have increased by HFl. 45 million.

In Austria, the increase in passenger traffic on the Federal railways system is due partly to a revival of international traffic (foreign workers) but mainly to the increase in "school" transport which during the school year 1971/72 was made free for the first time for this category of users. However, as journey lengths for this latter type of transport are relatively short, traffic in terms of passenger-kilometres shows a smaller increase than passengers carried. This trend should continue or even become more pronounced in 1972 as the expanded school services have to be provided throughout the school year. The repercussions of the increase in fares introduced from 1st March 1972 cannot yet be assessed.

In Denmark passenger traffic during the early months of 1972 decreased slightly as compared with the corresponding period of 1971, partly owing to stronger competition from private cars.

In Spain, the upward trend of passenger traffic, with a total of 13,467 million passenger-kilometres, as compared with 13,293 million in 1970, continued in 1971. Changes in the trend during the course of the year were due to normal seasonal fluctuations. During the early months of 1972 the same trend continued; for the period January to June an increase of 5% in passenger-kilometres was recorded, i.e., the same percentage increase as for the corresponding period of the previous year.

In the United Kingdom, growth in passenger traffic was satisfactory up to the middle of 1971, when national economic conditions led to a reduction in the demand for travel and increased fares in the spring met with some customer resistance.

Passenger journeys fell by 12% during the first 4 months of 1972 as compared with the corresponding period of 1971. Industrial disputes in the coal industry and on the railways were contributory factors, in addition to national economic conditions.

In Greece, certain measures concerning fares and the favourable trend in the national economy led to a 6.8% increase in passenger-kilometres in 1971.

In Ireland, fares were increased by 10% on 30th August 1971. The internal economic situation combined with the disturbed political situation in Northern Ireland militated against securing the necessary additional revenue from this fares increase and towards the end of the year tests in "sale" offerings on a restricted basis were undertaken. The indications from these were good and a major "sale" on a national basis was introduced from 1st January 1972. This has continued, with various modifications, up to the present.

Suburban rail services in the Dublin area became part of the total Dublin District transportation incorporating bus and train services all of which continue to be part of CIE. A considerable degree of rationalization of fares was undertaken in the Dublin Suburban Rail Services with effect from 30th August 1971, with the object of facilitating the introduction of automatic ticket issuing and checking and to bring a degree of parity as between rail and bus services in the Dublin District.

In Norway the figures for passenger traffic are as follows:

	1971	VARIATION COMPARED WITH 1970
Total traffic	10^6 P	
Passengers carried	29.2	0%
Passenger-kilometres	1,596	+1.8%

During the first two months of 1972 Norway recorded a fall of 1.6% in passenger-kilometres.

Portugal gave the following information:

	1971	VARIATION COMPARED WITH 1970
Total traffic	10^6 P	
Passengers carried	104.3	-0.2%
Passenger-km.	2,825	+0.2%

		1971	VARIATION COMPARED WITH 1970
Traffic		10^6 P	
Passenger-km.	Long distance	1,614	+0.8%
	Suburban	1,212	-0.6%

Domestic traffic

		1971 10^3p	%
Passengers carried	total	103,780	100.0
	Suburban	83,848	82.3

International traffic

	1971 10^3p	VARIATION COMPARED WITH 1970
Passengers carried	561	= 2%
Passenger-km.	112,707	2.2%

Note: As in the previous year, international traffic accounted for approximately 4% of total traffic in terms of passenger-km.

COMPARATIVE ANALYSES OF THE FIRST QUARTERS OF 1972 AND 1971

	1st QUARTER 1972 10^3p	VARIATION AS COMPARED WITH 1st QUARTER 1971
Passengers carried	27,173	+2%
Passenger-km.	694,532	+8%
Average journey length	25.6 km.	+5%

Note: The short average journey reflects the large share accounted for by suburban traffic.

In Sweden, the railways' share in total passenger traffic continues to decrease, mainly owing to the increase in private car ownership but to a certain extent also to the increase in domestic air transport. Since 1968, when shuttle services were introduced in the Stockholm area, the number of rail journeys has nonetheless taken an upward trend.

In 1971, as a consequent of industrial disputes which affected the SJ from 5th February to 12th March 1971 combined with the uncertain economic situation and the general downturn in consumption, the number of railway journeys on the SJ network fell by about 7%. Rail traffic in terms of passenger-km. fell more sharply, by 12%, as a result of the smaller number of journeys even over longer distances; 28.4 million (27 million the previous year) journeys were made with monthly and 6-monthly season tickets. Because of the dispute referred to above, a comparison of the results of the first quarter of 1972 with those of the corresponding quarter of the previous year would have little significance.

Local ferry traffic between Sweden and Denmark and the other continental countries amounted to 3.7 million journeys (-4.3% compared with 1970) in 1971. During the first quarter of 1972 these journeys totalled 0.66 million (0.58 million during the corresponding period of 1971). Ferry traffic was only partly affected by the industrial dispute.

In Switzerland the number of passengers carried totalled 229.6 million, a fall of 0.5% compared with 1970. Both standard fare specific-journey season ticket traffics decreased slightly. On the other hand group transport and the use of season tickets for business and tourist travel increased. Owing to a small increase in average journey length, passenger-km. rose by 0.7%. The levelling off of passenger traffic is due mainly to less favourable economic conditions in Switzerland and abroad and to the increasingly large number of new car registrations. During the first five months of 1972, the number of passengers carried fell by 1% to 93.6 million. Standard fare traffic, group transport and season tickets for business and tourist travel increased, while travel on specific journey season tickets and international traffic decreased. Passenger-km. rose by 1.6% owing to the increased average length of journey.

In Turkey, passenger traffic on main and suburban lines rose considerably in 1971, as compared with 1970. This trend continued during the early months of 1972; among the reasons for this are the increase in road accidents and the introduction of diesel and electric traction in Turkey.

Table 16. PASSENGER TRAFFIC
FIGURES FOR THE EARLY MONTHS OF 1972

	PASSENGERS CARRIED		PASSENGER-KM.	
	1972 (Thousands)	1972/71 %	1972 (Thousands)	1972/71 %
Germany	250,239	+ 2.3	8,023,600	- 0.9
Belgium	51,872	- 0.6	1,885,441	- 1.1
France	169,700	+ 3.7	10,025,000	+ 5.4
Italy	91,400	+ 3.5	7,810,000	+ 4.6
Luxembourg	2,526	+ 0.6	51,498	- 0.2
Netherlands	30,373	- 3.4	1,248,700	+ 1.7
EEC countries	596,110	+ 2.3	29,044,239	+ 2.8
Austria	41,698	+10.8	1,510,572	+ 6.6
Denmark	18,024	- 5.2	501,941	- 2.8
Spain	35,481	+ 5.2	2,870,434	+ 5.2
United Kingdom	186,140	- 9.4	.	.
Greece	1,937	- 1.2	238,334	- 2.2
Ireland	2,620	+ 9.2	159,710	+41.6 [1]
Norway	5,124	+ 2.3	232,200	- 1.6
Portugal	27,173	+ 2.4	694,532	+ 7.6
Sweden	16,219	+43.2 [1]	1,102,000	+57.4 [1]
Switzerland	56,500	- 0.8	1,902,000	+ 1.8
Turkey	17,050	+ 3.0	911,221	+ 1.0
Yugoslavia	36,804	- 3.5	2,663,920	- 3.0
Other countries	444,770	- 2.2	12,781,684	+ 5.5
Total	1,040,880	+ 0.3	41,825,923	+ 3.6

1. Trend affected by special factors.

Annex 4

DETAILED INFORMATION ON FREIGHT TRAFFIC TRENDS

In the Federal Republic of Germany the slackening in economic activity coupled with reduced demand for rail transport which began in 1970 persisted in 1971. This fall in demand was first confined to the iron and steel and coal industries but in 1971 it embraced all significant categories of railborne freight. It was not therefore possible to maintain the high figures recorded during the previous year. The total of about 370 million tonnes carried by rail was 7.8% lower than that for 1970; traffic in terms of tonne-km. (66,195 million) fell by 8.7%.

Combined transport carryings, by contrast, went on rising, but without this having any marked influence on overall freight traffic figures. This upward trend continued in 1972.

The fall in freight traffic went on in 1972. Only in the last few months of 1972 could an improvement in the freight traffic figures reflect the economic upturn expected in the course of this year.

1971 Figures

In Belgium, although traffic during the first quarter showed a temporary improvement due to replenishment of stocks, which had fallen considerably prior to the introduction of VAT on 1st January 1971, the overall trend was in step with a general slow down in economic activity which began at the end of 1970, and was particularly marked at the end of 1971. The result, as compared with 1970, was a fall in freight traffic: -6.6% in tonnes carried and -6.2% in tonne-kilometre. These figures reflect a slight increase in average length of haul (+0.5%).

The decrease can be broken down as follows according to origin of consignment:

	DIFFERENCE 1971-1970	
	TONNES	TONNE-KM.
1. Freight loaded in Belgian yards	- 4.7%	- 4.6%
2. Inbound freight (except 3 below)	-14.3%	-10.5%
3. International transit between two inland frontiers	- 2.7%	- 2.4%

Wagon load traffic

The fall in solid fuel and ore carryings alone (almost the whole of it on the imports side), exceeded the fall in total wagon load traffic, but was offset by increases in other sectors. In the case of fuels, the decline is due to the exceptionaly large supplies imported from abroad in 1970 owing to industrial disputes in the coal industry, whereas ore carryings have fallen because of increasing use of richer ores from overseas and the smaller output of steel.

Despite this last factor, transport of metal products showed a further increase of 59 million tonne-kilometres or 3.3%, due mainly to the growth of transit traffic (108 million tonne-km. or 15.5%).

Coupled with the long-established carryings of oil products to distribution centres within the country and in the Grand Duchy of Luxembourg, the development of this type of transport for supplies to power stations led to a further increase (54 million tonne-km. or 24.2%).

As regards chemical products, the increase was mainly accounted for by fertilizers.

In the case of construction materials and quarrying products the fall was mainly on the exports side, i.e. exports of cement and clinker overseas, and the quarry stone consignments to the Netherlands which ceased when the works at Rotterdam (Europoort) were completed.

Part-load consignments

Part-load traffic (including express parcels) decreased in tonnage by 3.4%.

The fall affected all sectors: it was small for "fast train" parcels (2.6%) but more substantial for express parcels (9.6%) and post office parcels (5.9%).

Domestic traffic decreased by 3.3% and international traffic by 3.6%.

Results for 1972

Wagon-load traffic

In the first four months of 1972 wagon-load traffic amounted to 22.6 million tonnes and 2,460.5 million tonne-kilometres.

Compared with the corresponding period of 1971 these figures show a decrease of 1.4% and 3.5% respectively. They also indicate a shorter average length of haul (-2.1%).

The traffic decline is in line with the slackening of activity which persisted in many sectors. One notable exception is the iron and steel industry which recorded a level of production higher than that for the corresponding period of 1971, with the result that carryings of metal products were even higher than in 1971.

Carryings of the following commodities also increased:

- agricultural products (largely due to large consignments of maize from France to Belgium and the Netherlands;
- mineral oils and lubricants, following a further increase in consignments of petroleum products to the Grand Duchy of Luxembourg.

On the other hand, traffic decreased in the following sectors:

- solid fuels, owing to the gradual substitution of oil and natural gas;
- ores, mainly because of appreciably smaller consignments to Luxembourg smelters;
- building materials, owing to the continuing recession in the house building industry and the small tonnage of cement loaded for export by sea;
- quarrying products, due to the stopping of consignments of rubble to the Europoort building sites at Rotterdam.

Analysis of the origin of consignments shows that the fall in tonne-kilometres is accounted for by consignments loaded at goods yards on the Belgian network (-4.9%) and with by inbound consignments except those in transit by land (-4.1%).

On the other hand transport of freight in international transit between two land frontiers increased by 7.2%.

Part-load consignments

During the first four months of 1972, tonnage of part-load consignments (including express parcels) was practically at the same level as in 1971 (+0.1%).

This small increase is the net balance between domestic traffic (+1.7%), offset by the drop in international traffic (-5.1%).

The breakdown by categories shows an increase for post office parcels and "fast train" parcels, while "express parcels" further declined.

In France, noteworthy developments were the levelling off iron and steel output together with very lively competition from road transport in certain sectors (building materials, perishable goods).

The first figures available for 1972 show that traffic kept up to the level for the first quarter of 1971, the steepening decline in transport of mineral fuels being confirmed, but with prospects of a slight upturn in carryings of iron and steel and other metal products.

Freight traffic in Italy, compared with 1970, decreased by 6.05% in terms of tonnes carried and by 4.6% in tonne-km.

The fall was less steep, however, during the first two months of 1972, when tonnes carried and tonne-km. fell by 0.70% and 0.34% respectively as compared with the same period of 1971.

In Luxembourg, tonnes carried increased by 5% over 1970. This increase was due to international traffic and to transit traffic. The main items are fuels, iron ores, iron and steel products, fertilizers and oil products.

The increase in total tonnage carried coupled with a decrease in tonne-kilometres, is due to substantially larger ore carryings over very short distances on the Luxembourg railways.

In the first three months of 1972, the tonnage carried rose by 2.9% compared with the same period of 1971. In terms of tonne-kilometres the increase during the same period was 7%, most of it accounted for by domestic and export traffic.

In the Netherlands, wagon load traffic was affected by the structural decline of solid fuel carryings and unfavourable economic conditions. The closure of about 100 goods yards also had a direct impact on the volume of transport, and the planned closure of 146 yards by 28th May 1972 has already made its effects felt:

Several users have begun to transfer to alternative means of transport. Traffic in terms of tonnes carried has thus fallen from 25.4 million in 1970 to 22.5 million in 1971. Against this, revenues from part-load consignments and express parcels increased by about HFl. 10 million to 141.5 million. In 1971 the number of containers carried rose by 7,000 (compared with 1970) to 95,000, but failed to reach the expected level because of recessionary economic conditions.

Freight carryings on the Austrian Federal Railways fell short of the high level reached in 1972. Imports largely accounted for this decline (-14.4%). The reason lies in structural changes in Austria's energy supply and the switching of traffic to the pipeline from the Adriatic to Vienna which for the first time was in operation for a full year. Export and transit traffics barely exceeded the figures for the previous year. A further decrease in the volume of traffic is to be expected in 1972, as the effects of the higher rates introduced on 1st March 1972 cannot yet be estimated.

In Denmark freight traffic during the first three months of 1972 showed a small increase over the corresponding period of 1971.

In Spain, freight traffic in 1971 was influenced by the general economic situation. It did, however, increase slightly in terms of tonnes carried compared with 1970, but a shorter average length of haul led to a small decrease in tonne-km.

For the early part of 1972 an increase of 3% in tonne-km. was recorded between January and June as compared with the same period of 1971.

In the United Kingdom, traffic was 10 million tons down on the 1970 level, reflecting the annual run down of coal production and industrial recession which affected in particular the steel industry's traffics. Growth in carryings of oil and materials for the construction industry only partly offset the decline.

In 1972, a seven-week pit strike caused a major loss of coal traffic and impacted on other traffic sectors. Carryings for the steel industry were lower due to the depth and persistence of the recession cycle. Overall, with growth traffics, principally oil, still being maintained, the volume decline on 1971 was 21 million tons.

In Greece, industrial development and agricultural production, preferential rates for large customers and special rates for certain goods led to an increase in freight traffic, amounting to 8.7% for 1971 and 5% for the first 2 months of 1972.

In Ireland,

1. Standard rail freight rates increased by 18% from 30th August 1971;
2. Rail freight tonnage increased as compared with the previous year; the reasons for the increase are:
   - resumption of normal working in the Cement Industry after the internal industrial disputes in 1970;
   - resumption of normal working in the Banks after the prolonged strike of 1970;
   - an increase in beet and beet pulp traffic due to an increase in acreage.

This gains were however partly offset by the following factors:

- Decline in mineral ores traffic following a labour dispute and other internal problems in the lead/zinc concentrates mine at Silvermines, Co. Tipperary;
- a decline in fertilizer carryings, with a large block reverting to private haulier transport;
- the effects of the political situation in Northern Ireland on the economy as a whole and particularly on tourism;

- the implementation of further measures of liberalization of Road Haulage in May 1971.

In the first three months of 1972, a further deterioration in the Northern Ireland situation led to increased difficulties for the economy, including a setback to tourism prospects and this situation had an adverse effect on freight carryings.

In Norway, the NSB recorded an average increase of 7% during the period 1965-70. In 1971 a decrease of 10% in tonne-kilometres was recorded compared with the results for the previous year.

For the early months of 1972, cyclical conditions led to an increase of 5.2% over the corresponding period of the previous year.

In Portugal the following results were recorded:

Total Traffic

	1971 Million tonnes	VARIATION COMPARED WITH 1970
Tonnes carried	3.99	+ 2%
Tonne-kilometres	812.3	+ 5%

Domestic Traffic

		1971 '000 tonnes	VARIATION COMPARED WITH 1970
Tonnes carried	Fast train	149	+ 1%
	Slow train	3,843	+ 2%
Tonne-kilometres	Fast train	39,582	+ 1%
	Slow train	772,682	+ 5%

Note: 86.2% of "slow train" traffic is made up of wagon-load consignments, and the remaining 13.8% of part-load consignments.

International Traffic

	1971 '000 tonnes	VARIATION COMPARED WITH 1970
Tonnes carried	151	-23.8%

Comparative analysis of the first quarters of 1972 and 1973

		1st QUARTER 1972 '000 Tonnes	VARIATION COMPARED WITH 1st QUARTER OF 1971
Tonnes carried	Fast train	35	- 2%
	Slow train	1,032	+ 2%
Tonne-km.		209,394	+ 1%
Average length of haul		196.2 km	- 1%

Note: 85.7% of slow train traffic was made up of wagon-load consignments and 14.3% of part-load consignments.

In Sweden, freight traffic on the SJ was considerably affected by the labour dispute and by recessionary conditions. Wagon load traffic demand declined in the course of the year and considerable surplus capacity was built up. In 1971 total carryings on the SJ network amounted to 57.2 million tons (-8.5% compared with the previous year) and to 14,600 million tons (-9.8% compared with the previous year). The average length of haul was 255 kilometres (-1.2% compared with the previous year).

Decreases were recorded for both wagon load and part-load traffic and practically all types of freight were affected. The volume of bulk traffic (i.e. in train-load lots) carried on the SJ network has however increased considerably in recent years. This traffic includes, inter alia, certain categories of freight such as timber, which was formerly floated down river.

As there was an industrial dispute on the SJ in the previous year, a comparison of the figures of the first quarter of 1972 with those for the same period of the past year would have little significance.

In Switzerland, the slight economic downturn of 1971 also affected Swiss railway traffic. The total in terms of tonnes carried was 45.41 million, or 0.5% less than the previous year. Domestic traffic increased by 1.4% to 17.9 million tonnes, but export traffic fell by 5.8%, and import traffic by 3.7%. Transit traffic increased by only 1.4%, due mainly to the recession in Italy and economic stagnation in the Federal Republic of Germany. All sub-sectors recorded considerably lower rates of increase, or even decreases in comparison with the results of the previous year when economic prosperity led to a considerable increase in traffic. From January to May 1972, freight traffic picked up slightly with the improvement in the general economic situation in the country and abroad. A total of 18.26 million tonnes was carried, or 0.5% more than in the corresponding period of the previous year; domestic traffic increased by 8.1% to 7.05 million tonnes, imports by 2.3% to 5.64 million tonnes and exports by 10.7% to 0.8 million tonnes. Transit traffic, on the other hand, decreased by 12.4% compared with the reference period for the previous year, totalling only 4.63 million tons, the reduction being mainly due to the recession in Italy. Traffic in terms of tonne-kilometres which had again increased by 0.5% in 1971 as compared with 1970, fell by 3% during the first five months of 1972, due to the decline in transit traffic.

In Turkey, freight traffic increased in 1971 by 2% and revenues by 6%; a still larger increase is expected for 1972.

The reasons were the introduction of diesel and electric traction in Turkey, and increased carryings of ores (iron ores, etc.), coal and various iron and steel products as a result of Turkish industrial development.

Table 17. FREIGHT TRAFFIC
RESULTS FOR THE EARLY MONTHS OF 1972

	TONNES CARRIED		TONNE-KM.	
	1972 (Thousands)	1972/71 %	1972 (Thousands)	1972/71 %
Germany	76,577	- 3.9	15,489,000	- 2.9
Belgium	17,234	- 2.1	1,877,445	- 3.7
France	62,400	+ 0.5	17,274,000	- 0.5
Italy	14,013	- 0.5	4,525,741	- 1.8
Luxembourg	5,225	+ 2.9	186,761	+ 1.3
Netherlands	3,436	-12.3	493,036	- 8.4
EEC countries	178,885	- 1.9	39,845,983	- 1.8
Austria	10,992	- 2.1	2,244,857	- 1.8
Denmark	2,022	+ 7.2	479,551	+12.9
Spain	7,360	-	2,330,000	-
United Kingdom	32,190	-39.1[1]	4,292,170	-31.2[1]
Greece	237	-16.8	61,919	+ 6.1
Ireland	960	+11.6	151,820	+ 9.2
Norway	3,694	-21.3	373,900	- 8.3
Portugal	1,077	+ 3.2	209,418	+ 1.4
Sweden	13,586	- 5.4	3,689,699	+ 7.3
Switzerland	10,480	- 2.3	1,572,000	- 7.4
Turkey	2,166	+19.3	751,824	- 7.2
Yugoslavia	15,829	+ 0.9	4,221,842	+ 6.8
Other countries	100,593	-18.1	20,379,000	- 7.3
Total	279,478	- 8.4	60,224,983	- 3.8

1. Trend influenced by special factors.

REPORT BY THE COMMITTEE OF DEPUTIES
ON TRAFFIC AND INVESTMENT TRENDS IN 1971

Chapter III - Roads

Contents

REPORT OF THE ROAD INVESTMENT SUB-COMMITTEE ON THE SITUATION OF ROAD TRANSPORT AND THE INTERNATIONAL ROAD NETWORK AT THE END OF 1970

This report is in two parts, the first dealing with the numbers of vehicles in use and transport output, and the second with infrastructure.

Some of the tables contain relatively little information but they are included nonetheless to highlight the gaps in transport statistics and so help to show where improvements might be made.

Part I

VEHICLES IN USE: TRANSPORT OUTPUT

1. TRENDS IN THE NUMBERS OF VEHICLES IN USE

1.1. All motor vehicles (Table 1)

a) Two-wheeled vehicles (10 countries). For the first time for many years, the total under this heading went up (by 3.42%) though the number in use has continued to fall in certain countries (Austria, Denmark, Spain and the United Kingdom). The greatest increases were in Italy (5.7%) and in Switzerland (9.5%). Two-wheelers therefore seem to be regaining popularity, signs of which were already detectable in the previous report.

b) The number of private cars, accounting for about 88% of the total number of motor vehicles with more than two wheels, went up by 7.46% (11 countries). The rate of increase ranges from 4% (France) to 14% (Germany) and was frequently higher than in 1970 so that the general slowing down that has been noticeable for several years in the rate of increase did not continue into 1971.

c) The general upward trend in the number of public transport vehicles continued and even steepened. The overall rate of increase for 11 countries (none of which has reported a fall) was 4.85% compared with 4.2% in 1972.

d) The number of tractor units (for semi-trailers) continued to increase at a faster pace than that of private cars. The overall rate of increase (10 countries) was higher, at

9.92%, than in 1971 when it was 8.6%. Even so the rate of increase in more than half the countries concerned was lower than in 1970, possible a sign of incipient saturation.

e) The rate of increase in the number of lorries, although generally slightly lower than in the previous year, was relatively steady at 3.2% (11 countries).

f) In all, the total number of motor vehicles in use (excluding two-wheelers) went up by 7.68% (10 countries) compared with 6.8% in 1970. The rates of increase in individual countries range from 3% in Denmark to 11% in the Netherlands and, in general were lower than in the previous year.

1.2. Goods vehicles (Tables 2, 3 and 4)

1.2.1. Number of vehicles in use

Table 2 breaks down lorries into four payload categories and also includes trailers and semi-trailers (which are not shown in Table 1 as they are not classified as motor vehicles). A first observation is that the overall increase (3.55%) was considerably less than in 1970 (6.2%) and was even lower than in 1969 (4.2%).

A second point is that the various categories exhibit very different trends as is shown by the following table:

VEHICLE CATEGORY	RATE OF INCREASE IN %	
	1971/1970	1970/1969
Trailers	+ 5.3	+12.7
Semi-trailers	+12.8	+13.9
Lorries		
Under 1.5 tonnes	+ 2.2	+ 3.8
1.5 to 5 tonnes	+ 3.6	+ 3.3
5 to 10 tonnes	- 0.5	+ 0.3
Over 10 tonnes	+10.5	+15.1
Overall rate of increase	+ 3.6	+ 6.2

The categories in which the number of vehicles has increased the most were again semi-trailers and lorries of over 10 tonnes, followed by trailers. The number of lorries in the 5 to 10-tonne payload range appears to have levelled off.

These figures, however, relate purely to the ECMT countries as a whole and the rates of increase in individual countries were in some cases much higher than those shown in the above table. In Spain the number of semi-rrailers went up by 27% (compared with 36% in 1970) and in Austria the number of over 10-tonne lorries increased by 48% (34% in 1970).

While these high rates of increase concern relatively small national fleets they reflect the significant trend for total transport capacity to increase which has been apparent for several years.

1.2.2. Capacity

Apart from larger numbers, larger vehicle size also increases transport capacity. Figures on capacity are shown in Tables 3 and 4. Table 3 shows the total

capacity of the vehicle fleet broken down by the same categories as Table 2. Unfortunately these figures relate to only 6 countries so that the overall rate of increase in capacity cannot be directly compared with that in the number of vehicles in use.

A comparison covering the 6 countries, however, is given in Table 4 which shows average vehicle capacity in each category obtained by dividing total capacity (Table 3) by the relevant number of vehicles (Table 2). These figures show that average capacity did not undergo any significant change except in the semi-trailer category where there was an increase of 3.15%, i.e. 552 kg per vehicle.

The growth in capacity, therefore, was basically due to the increase in the number of vehicles. The relative importance of the various vehicle categories, both in terms of number of vehicles and carrying capacity, can be seen from the following table showing the percentage of total capacity and of the total number of goods vehicles accounted for by each vehicle category:

CATEGORY AND PAYLOAD	% OF TOTAL CAPACITY	% OF TOTAL NUMBER
Trailers	15.2	11.1
Semi-trailers	9.2	1.3
Lorries		
Under 1.5 tonnes	9.6	49.9
1.5 to 5 tonnes	13.2	24.2
5 to 10 tonnes	26.3	9.5
Over 10 tonnes	26.5	4.0
	100.0	100.0

2. TRANSPORT OUTPUT (Tables 5 to 12)

2.1. Vehicle-km. on national territory (Table 5)

Table 5 gives details of traffic in national as well as foreign vehicles. The figures are, of course, estimates with no claim to accuracy. The following points emerge:

a) Total two-wheeler mileage (4 countries) fell very slightly (by 0.4%) though the number of two-wheeled vehicles in use in the same countries went up overall by 2%; this fleet was therefore used less intensively. It must however be remembered that only 4 countries are involved and that Italy is the only one of these to report an increase in its number of two-wheeled vehicles (this increase, incidentally, being greater than that in vehicle-km.).

b) Total private car mileage (6 countries) has gon up by 12% compared with an increase of only 8.6% in the number of private cars in these same countries. This would suggest that vehicle use is on the increase but the figures for the individual countries throw some doubt on this general conclusion. A comparison of the figures in Table 5 and Table 1 for each country shows Italy, Spain and the United Kingdom to be the only countries in which the rate of increase in vehicle-km. exceeds that in the number of private cars in use. The rates of increase are equal in Austria and Belgium whereas in the Netherlands vehicle-km. increased at a distinctly lower rate than cars themselves. The fact that the vehicle-km. figures are, as has been said, estimates (in which there maybe a substantial margin of error) is probably relevant.

c) The increase in vehicle-km. for public transport totals some 3% for 8 countries. A comparison between this figure and the growth in the number of vehicles in use is possible for seven of these countries, their total vehicle-km. showing an increase of 3.3% compared with a 2.8% increase in the number of vehicles in use. This would suggest, with the same reservations as above, that public transport vehicles are tending to be used more intensively but the reverse trend is reported from Germany, Belgium and the United Kingdom.

d) Information on goods vehicles is available for only 5 countries, where vehicle-km. have increased by 3.4% and the corresponding fleets (lorries and tractor units) went up by a very similar figure (3.6%). An exception is Italy where vehicle-km. levelled off whilst the number of vehicles in use increased by 7%.

e) Overall (and for what it is worth since the figures relate to only 4 countries) vehicle km. went up by 11% against an increase of 7.5% in vehicles in use.

2.2. Passenger transport (Tables 6, 7 and 8)

For a comprehensive picture of passenger transport in relation to a given country, the figures need to embrace transport by:

- national vehicles on national territory;
- foreign vehicles on national territory, and
- national vehicles on foreign territory.

Where several countries are involved, the last two sub-divisions obviously must not be counted twice.

In Tables 6, 7 and 8, passenger transport is sub-divided in this way.

The figures have considerable gaps and the only conclusion to be drawn is that, apart from two-wheeled vehicles, they are all increasing. Table 7 does, however, show that private cars, public transport and two-wheelers account for 8.2%, 14% and 4%, respectively, of passenger traffic.

2.3. Goods transport (Tables 9 and 10)

In Tables 9 and 10 the same breakdown is used as for passenger transport though the figures are presented in slightly different form, mainly owing to the method of collecting the data. "Internal transport" means transport operations performed within the frontiers of a given country (i.e. excluding those starting or ending abroad) whether the vehicles belong to that country or any other.

"International transport" covers all other transport operations (in other words those involving at least one crossing of the frontier of the country concerned) whether performed by vehicles belonging to that or any other country.

These definitions are clearly fully in line with the three sub-divisions referred to in the previous paragraph.

It also follows from these definitions that, for a given set of countries, international transport operations overlap and must not simply be added together.

Table 9 relates to total goods transport and Table 10 to transport for hire or reward, the difference between the two giving own-account transport.

Great care must obviously be taken when trying to draw various conclusions from such sparse information as that given in these tables but they would appear to suggest that international transport is growing more rapidly than internal transport, particularly in the case of transport for hire or reward.

2. 4. Average annual km. per vehicle (Table 11)

Table 11 shows, in km., the annual average distance run by national vehicles whether in their own country or abroad.

In so far as it is possible to judge from the few countries represented it suggests that average annual vehicle mileage has hardly changed.

An interesting comparison may be made between annual average vehicle mileage, as shown in Table 11 and other results computed from Tables 5 and 1. Assuming that vehicle-km. run by foreign vehicles in the country concerned matches those run by national vehicles abroad, then dividing the vehicle-km. covered on national territory (given in Table 5) by the number of vehicles in use (given in Table 1) would give the average mileage of national vehicles. If this figure is lower than that given in Table 11, this would mean that the country is a net exporter of vehicle-km., in other words its vehicles have a greater mileage abroad than the corresponding foreign vehicles have in the country concerned.

This is in fact what is found: in other words the countries listed in Table 11 are, in general, net exporters of vehicle-km.

However, the figures obtained in both ways for the United Kingdom are very similar for all vehicle categories, any differences being insignificant. The same is true in Austria for two-wheeled vehicles and in Belgium for public passenger transport.

The only net importers of vehicle-km. out of the five countries in Table 11 are Spain (for private cars) and Italy (goods vehicles).

3. FUEL CONSUMPTION (Table 12)

Table 12 gives the results obtained from 12 countries though a comparison with 1970 is only possible for 8 of them. This shows an increase of 7. 54% in petrol consumption (in line with the increase in the number of vehicles in use) and an increase of 1. 69% for gas-oil which is distinctly lower than in the increase in the vehicles in use (3. 4%).

For this to be reconcilable with the observation (from Table 5) that there has been little decrease in the use of goods vehicles, specific consumption by goods vehicles would have had to improve by nearly 50%. This hardly seems possible and the only conclusion that can be drawn is that these statistics (either on consumption or - and this is more probable - on vehicle-km.) are inacceptable inaccurate.

Part II

INFRASTRUCTURE

1. Motorways in service

Table 13 shows the length of motorways in service at the end of 1970 (17 countries) and at the end of 1971 (for 13 countries). For those 13 countries the figure increased by 1,848 km. compared with 1,861 km. in 1970 for the same countries. The rate of increase is therefore rising gradually. Italy, Germany and the United Kingdom still have very large

increases, but particular mention should be made of the achievements of the small countries such as Belgium (116 km.), the Netherlands (86 km.) and Switzerland (94 km.). A considerable part of the motorways in service in the last-mentioned country so far have only a single carriageway, but the proportion is gradually falling.

2. International network (Tables 14 to 17)

The international network is defined simply by a list of the main places served by each route (E routes). The category of road (based primarily on width) is not laid down internationally but is determined by each country in the light of its own requirements.

Most countries have found it necessary to prepare a twofold development programme as follows:

- the improvement of existing roads to bring them up to international standards;
- the construction on different alignments of entirely new trunk roads, usually motorways, which are only partly in existence at present. Obviously, these new trunk roads can be integrated only gradually into the E network as and when they can be substituted for existing roads without this involving any break in the route of which they form part.

The figures are therefore shown separately for:

a) the existing network, meaning the unbroken routes at present constituting the international network, whether on a permanent or provisional basis, and

b) the future network, i.e. the "theoretical" network defined above, which comprises some sections not yet built and others which are not necessarily integrated into the existing network.

Table 14 shows, for 13 countries, the length of the existing international network. This is almost unchanged, but the proportion represented by the different categories has changed as follows (11 countries):

	END 1970	END 1971
Motorways	25.1%	28.1%
Category II	10.7%	9.9%
Category I	64.2%	62.0%

Category I roads are thus slowly losing ground to the higher category roads, mainly motorways, which increased by 1,200 km. for the 11 countries concerned.

Table 15 shows, for 12 countries, how much of the existing network conforms to the dimensional standard specified in the 1950 Declaration on the construction of international roads. Altogether 74% of the E roads in these 12 countries complies with the standards.

A comparison with 1970 is possible for only 10 countries. It shows the extent to which the standards are being reached (proportion of total length in each category meeting the international standards).

	END 1970	END 1971
Motorways	98%	98%
Category II	70%	74%
Category I	68%	72%
Total	77%	80%

The overall proportion that reaches the standard thus increased by 3%, mainly owing to the raising of standards of category II roads, to which the main effort is being devoted. The motorway figure is below 100% because of the opening of single-carriageway motorways (especially in Switzerland) which are not regarded as complying with the international standards.

Table 16 shows, for 12 countries, how much of the network is regarded as being of adequate capacity for the traffic it handles, regardless of whether the standards are reached, and shows the ratio of these sections to the total length of the network for each category. A comparison with 1970 can be made for only 9 countries in the various categories, and for 10 countries for the whole group. It shows that the total length of sections of adequate capacity increased by 3,139 km. in 1971, which is encouraging. In 1970 the increase was only 110 km. and before then the situation was usually worsening. Expressed as a percentage of the length of the network for each category, the trend is as follows:

	END 1970	END 1971
Motorways	92%	92%
Category II	80%	91%
Category I	81%	84%
Total	78%	86%

On the whole, therefore, the degree of saturation of the international network is no longer increasing and is in fact diminishing appreciably.

Table 17 relates to the future network, and compares its total length (or at least the length corresponding to present programmes) and that already completed for each category (9 countries). Comparison with the previous year is possible for 8 countries.

It will be seen that while total planned length has changed little the length of the sections completed has increased by 950 km., thus raising the overall proportion completed from 46 to 50%.

3. Investment

Table 18 shows gross investment in millions during 1971 and forecasts for 1972 (11 countries). Comparison with 1970 is possible for only a varying number of countries (6 to 11) depending on which column is taken.

The remarkable expansion in investment in the international network observed in 1970 does not seem to have been maintained. Investment increased by only 4. 6% (11 countries);

the increase was 26% in the previous year (12 countries). Even so investment in the international network in 1971 exceeded forecasts by 11.6%.

The 1972 forecasts (international network) are 1.4% down on the 1971 figure and 11.7% lower than actual investment in 1971.

Even so, forecast investment on all roads is 21% higher than that for 1971 (6 countries).

For the 7 countries where a comparison is possible, expenditure forecast on the international network amounts to an average of 40% of total road expenditure by the central authorities.

4. Major works in progress on the main European routes

Information concerning each route has been grouped so as to give a general picture for that route.

Figures given for lengths are net. They do not, therefore, include sections of routes that overlap with a route identified by a smaller code number, nor sections outside the territory of ECMT countries.

E.1. United Kingdom - Italy (3,095 km.)

In the United Kingdom, 43 km. of new motorway has been brought into use on the Popham-Lightwater section.

In Italy, motorway construction began in 1971 near Naples and Messina and on the Salerno-Reggia Calabria and Messina-Patti sections. The Scilla-S. Trada, Imperia-San Remo-Bordighera, Sestri-Levante-Ramello, Versilia-Viareggio and Carrara-Viareggio sections were completed in the same year. The length of these sections totals 122 km. The conversion of the Leghorn-Civitavecchia section to motorway standard is scheduled in the near future.

E.2. United Kingdom - Italy (Brindisi)(2,233 km.)

In the United Kingdom, the Ditton Bypass (M20) was opened to traffic (length - 11 km.).

In France, the Calais-Dijon motorway is scheduled for construction after 1978.

In Switzerland, 9 km. of dual-carriageway motorway have been opened to traffic, and 13 km. of dual-carriageway and 7 km. of category I road are under construction on this route.

In Italy the Ancona-Pescara-Canosa section is under construction.

E.3. Portugal - Sweden (3,586 km.)

In Spain 30 million dollars it to be spent on the sections in the neighbourhood of Burgos, San Sebastian and Loyola.

In France, the section from the Spanish frontier to St. Geours de Marenne and the Poitiers - Tours section will come into service at the end of 1976. The Bordeaux-Poitiers motorway is planned for after 1978 but the Chartres-Paris motorway will be opened to traffic at the end of 1972.

In Belgium work is continuing on the E3 Motorway along its entire length in Belgian territory.

Various sections, totalling 61 km. (this includes 14 km. of single carriageway), were opened to traffic in 1971 between the French frontier and Antwerp. The entire motorway will be finished by the end of 1972.

In the Netherlands, about 5 km. of the southern carriageway of the section from Veldhoven to the Belgian frontier was brought into use on 1st November 1971. The northern carriageway and the remainder of this section will probably be completed by mid-1972.

In Germany a further 43 km. section of motorway was completed in 1971. Work has yet to be finished on the following motorway sections:

- Hamburg-Flensburg (186 km.), completion dates 1969-77;
- the West Hamburg bypass (31 km.) completion dates 1972-74, including the tunnel under the Elbe;
- Duisburg-Venlo (45 km.) completion dates 1975-76.

In Denmark, 27 km. were opened to traffic in 1971 and 13 km. of motorway from Bramdrupdom to Christiansfeld in the neighbourhood of Kolding are under construction.

E. 4. Portugal - Finland (4,883 km.)

In Spain, a further 5 km. section of motorway was brought into use in 1971 and a further sum of $26 million has been allocated to this route.

In France, the Boulou-Nîmes section is scheduled to be open by the end of 1976 and the Valence-Grenoble-Chambéry-Annecy sections by the end of 1978.

In Switzerland 11 km. of dual-carriageway motorway are under construction on this route.

In Germany the Hamburg-Lübeck section is now being widened to six lanes over a length of 65 km. (completion date 1980). A 28 km. section is also under construction between Lübeck and Neustadt (completion dates 1976-1977).

In Denmark 5 km. of motorway were brought into service in 1971. Various sections are at present under construction as follows:

- 15 km. from Elsinore to Brønsholm
- 20 km. between Vallensback and Solrør
- 12 km. from Dyrehavehus to Rønnede

E. 5. United Kingdom - Turkey (4,085 km.)

In Belgium the Brussels-Louvain section (15 km.) was opened to traffic in 1971. The whole of the route is scheduled for completion by the end of 1972.

In Germany some 50 km. of motorway were brought into use this year. The widening of 172 km. of the Cologne-Frankfurt section is continuing (completion dates 1975-1980). Work is also proceeding on the Deggendorf-Passau section (66 km.) and on the bridges over the Danube near Schalding and Deggenau (completion date 1975).

In Greece 50 km. of motorway are under construction on the Thessaloniki-Euzones section (completion dates 1972-73).

E. 6. Italy - Norway (2,485 km.)

In Italy, work proceeded on the Modena-Verona-Brennero route, the Pecognaga-Rolo, Brennero-Terme, Roverto-Mori-Garda, Rolo-Carpi, Fortezza-Le Cave, Chiusa-Stazione Chiusa, Affi-Mori-Garda, Cave-Varna, Carpi-Campo Galliano, and Campo Galliano-A 1 sections having being completed during the year.

In Norway 26 km. of motorway are under construction.

E. 8. United Kingdom - Poland (610 km.)

In the Netherlands the Terschuur-Apeldoorn and Deventer-Holton sections will be open to traffic in May 1972. The Appeldoorn-Deventer section will probably be ready in September 1972.

In Germany, 56 km. of motorway have been brought into use in 1971, 105 km. on the Rheine-Bad Oeynhausen section are currently under construction (completion dates 1968/78).

E. 9. Italy - Netherlands (1, 217 km.)

In Switzerland 62 km. of dual-carriageway motorway, 16 km. of single-carriageway motorway and 7 km. of type I roads are under construction.

In France the Metz-Strasbourg motorway is scheduled to be open by the end of 1976.

In Belgium a motorway is planned for the full length of the route by 1980. At the moment 8 km. of motorway are in use north of Liège.

E. 10. France - Netherlands (546 km.)

In Belgium 62 km. of motorway, in several sections, are open to traffic. Motorway construction work is currently in progress over the full length of this route on Belgian territory. Work is scheduled for completion by the end of 1973.

In the Netherlands the 9 km. section between Breda and the Belgian frontier was brought into use on 30th December 1971.

E. 12. Paris - Saarbrücken - Nüremberg (623 km.)

In Germany 77 km. of motorway were brought into use in 1971, and a further length of 142 km. is under construction between Nüremberg and Heilbronn (completion dates 1973/1980).

E. 13. Lyons - Venice (688 km.)

In France the section of motorway between Lyons and Chambéry will be opened in 1975 and that between Chambéry and Arbin in 1978. The Angers - Nantes motorway is not planned for construction until after 1978.

E. 17. Chagny (France) - Salzburg (Austria) (799 km.)

In France the Beaune - Dijon motorway will come into service in 1975.

In Switzerland 8 km. of dual carriageway motorway were brought into use in 1971 whilst 29 km. are at present under construction on this route.

E. 18. Stavanger - Oslo - Stockholm (1, 063 km.)

In Norway 21 km. of motorway are under construction on this route.

E. 19. Corinth - Igonmenitsa (Greece) (469 km.)

In Greece 70 km. of new highway have been open to traffic during this year between Agrinion and Antirrion.

E. 21. B. Geneva - Mont Blanc - Turin

In France the whole of the motorway from the Swiss frontier via Bonneville to Mont-Blanc is scheduled for completion by the end of 1975.

E. 25. Algeciras - Madrid - Burgos

In Spain work amounting to $28 million is in progress.

E. 26. Algeciras - Valencia - Barcelona

In Spain work amounting to $26 million is in progress.

5. Work in progress on roads outside the "E" network

In Germany 362 km. of motorway are under construction between Krefeld and Ludwigshafen, 89 km. between Trier and Landstuhl, 61 km. between Ulm and Memmingen, 19 km. between Neumünster and Kiel, 62 km. between Cologne and Olpe, 99 km. between Koblenz and Schweich (Luxembourg frontier), 77 km. between Wüppertal and Munster, 70 km. between Krefeld and Dortmund, 65 km. on the Düsseldorf - Bachun - Dortmund section, 58 km. between Aachen and Düsseldorf, and 31 km. on the Munich ring road; a total of 993 km.

In Spain work amounting to 98 million dollars is in progress on the various sections.

In France the motorway programme in progress and scheduled to 1980 goes far beyond the "E" network; the intention is that the major national links, part of which are included in this network, shall be motorway throughout (e. g. the Beaune - Belfort - Mulhouse motorway).

The Paris - Reims - Châlons-sur-Marne - Metz motorway, no part of which is in the "E" network, is now under construction and scheduled to be in service by the end of 1976.

Work on the Fréjus international tunnel (on the E. 13.) is scheduled to start in 1973 and to be completed by 1980.

In Greece 1, 223 km. of roads not in the "E" network are under construction. They include the Thermopyles - Itea - Nafpactos - Antirrion sections (161 km.), scheduled for completion by 1974, and the Castellion - Hania - Rethymnon - Irachion - Sitia sections (307 km.) which should be open by 1973.

In Italy work has already begun or is scheduled to begin shortly on the Magliano Sabino - Cesena - Ravenna and Florence - Pisa - Leghorn routes.

In Norway the Sotra and Gisund bridges will be open to traffic in 1972 and the Malφy and Sandnessund bridges in 1973.

In the Netherlands the Zwalsche Hoek - Emmeloord section of the N. 6 will be open to traffic in 1973, and the Kesteren - Valburg - Bemmel section and 25 km. of the N. 50 southeast of Apeldoorn, in 1972. The following sections were completed in 1971:

- 7 km. of the N. 15 between Echteld and Kesteren;
- 4 km. of the N. 57 along the Horingvliet dyke;
- 7 km. of the N. 58 (Rilland - Bath - Waarde).

In addition the conversion of the N. 75 to motorway standard between Valburg and Heteren (5. 5 km.) and between Heteren and Ede (5 km.) will be completed by the end of 1972.

In Switzerland, outside the European network, 129 km. of dual carriageway motorway and 50 km. of single carriageway motorway are under construction.

In Turkey work is continuing on the bridge over the Bosphorus (scheduled to be completed by 1973) and on the Golden Horne bridge.

6. Traffic through certain recent tunnels

In France total traffic through the Mont Blanc transalpine tunnel (route E. 21B between Chamonix and Corte Maggiore, two lanes) was 841,029 motor vehicles in 1971 compared with 754,518 in 1970.

In Switzerland the average daily traffic (motor vehicles) in 1971 was 1,355 (1,269 in 1970) for the Great St. Bernard road tunnel (E. 21a, two lanes) and 3,445 (3,140 in 1970) for the San Bernardino road tunnel (E. 61, two lanes).

Table 1. NUMBERS OF MOTOR VEHICLES IN USE

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

COUNTRY	TWO-WHEELED VEHICLES INCLUDING CYCLES WITH AUXILIARY ENGINES	VEHICLES WITH MORE THAN TWO WHEELS					
		PASSENGER TRANSPORT			GOODS TRANSPORT		TOTAL FOR VEHICLES WITH MORE THAN TWO WHEELS
		PRIVATE CARS INCLUDING TAXIS	PUBLIC TRANSPORT		ROAD TRACTORS	LORRIES	
			TOTAL	OF WHICH MAINLY URBAN			
No.	%	%	%	%	%	%	%
1. Austria	585,250 (- 2)	1,325,162 (+11)	6,906 (+2)	-	12,104 (+ 7)	128,068 (+ 6)	1,719,977 (+ 9)
2. Belgium	449,856 (+ 4)	2,154,149 (+ 5)	16,169 (+5)	905 (+3)	12,883 (+ 8)	190,232 (+ 0)	2,573,433 (+ 4)
3. Denmark	447,812 (- 1)	1,147,271 (+ 7)	5,260 (+4)		2,050 (+16)	212,426 (-13)	1,367,007 (+ 3)
4. France		13,400,000 (+ 4)	73,000 (+6)	-	81,000 (+11)	2,736,000 (+ 6)	16,290,000 (+ 4)
5. Germany	1,303,977 (+ 2)	15,115,049 (+14)	50,038 (+6)	-	99,752 (+10)	1,078,001 (+ 5)	16,342,840 (+ 2)
6. Greece							
7. Italy	3,540,000 (+ 6)	11,298,575 (+11)	40,610 (+4)	9,537 (+4)	14,910 (+ 7)	937,605 (+ 7)	12,240,220 (+10)
8. Luxembourg	6,686 (+ 2)	102,163 (+ 8)	595 (+1)	-	426 (+12)	8,671 (+ 2)	111,855 (+ 8)
9. Netherlands	2,175,000 (+ 4)	2,800,000 (+12)	10,500 0		17,000 (+ 7)	325,000 (+ 5)	3,150,500 (+11)
10. Norway							
11. Portugal							
12. Spain	1,246,650 (- 2)	2,784,686 (+17)	32,633 (+6)		7,033 (+12)	760,363 (+ 7)	3,577,682 (+ 1)
13. Sweden							
14. Switzerland	732,399 (+10)	1,482,000 (+ 7)	5,750 (+4)	-	2,795 (+ 3)	115,240 (+ 4)	1,605,785 (+ 7)
15. Turkey							
16. United Kingdom	1,033,000 (- 3)	12,482,131 (+ 5)	79,721 0	-	95,757	1,597,588 (- 4)	14,255,197
17. Yugoslavia							
18. Ireland							
Total	11,520,630	64,091,176	321,182	-	343,710	8,089,204	73,034,496
1971 / 1970 (%)	+3.4	+7.5	+4.6		+9.9	+3.2	+7.7

Table 2. NUMBERS OF GOODS VEHICLES IN USE

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

No.	COUNTRY	VEHICLES: NOT SELF-PROPELLED		LORRIES				TOTAL
		TRAILERS	SEMI-TRAILERS	PAYLOAD UNDER 1.5 tonnes	PAYLOAD FROM 1.5 to 4.999 tonnes	PAYLOAD FROM 5 to 9.999 tonnes	PAYLOAD 10 TONNES AND OVER	
		%	%	%	%	%	%	%
1.	Austria	92,182 (+ 5)	1,688 (+18)	63,740 (+ 8)	31,228 0	30,847 (+5)	2,253 (+48)	221,938 (+ 6)
2.	Belgium	10,173 (+ 5)	18,860 (+ 8)	91,021 (+ 2)	53,573 (- 5)	34,971 (+2)	10,667 (+13)	219,265 (+ 1)
3.	Denmark	34,550 (+10)	3,962 (+15)	150,472 (-19)	30,552 (+14)	27,652 (-3)	3,750 (+13)	250,938 (-10)
4.	France	← 305,000 →		2,015,000 (+ 7)	523,000 (+ 2)	177,000 (+5)	21,000 (+ 5)	3,041,000 (+ 6)
5.	Germany	446,140 (+ 5)	42,059 (+13)	456,483 (+ 3)	395,730 (+ 5)	188,071 (+4)	37,717 (+33)	1,566,200 (+ 5)
6.	Greece							
7.	Italy	← 113,325 →			752,514 (+ 7)			1,050,930 (+ 7)
8.	Luxembourg	3,374	511	4,562 (- 4)	← 4,109 (+9) →			12,556 (+ 5)
9.	Netherlands				← 325,000 (+5) →			325,000 (+ 5)
10.	Norway							
11.	Portugal							
12.	Spain	12,452 (+ 3)	7,122 (+27)	← 606,813 (+8) →		98,001 0	55,559 (+11)	779,947 (+ 7)
13.	Sweden							
14.	Switzerland	53,000 (+ 6)	1,720 (+ 8)	62,670 (+ 4)	24,610 (+ 2)	27,895 (+4)	65 (+ 3)	169,960 (+ 4)
15.	Turkey							
16.	United Kingdom			1,033,119 (- 4)	128,066 (- 9)	227,860 (-9)	208,543 (+ 7)	1,597,588 (- 4)
17.	Yugoslavia							
18.	Ireland							
Total		651,871	75,922	3,877,067	1,938,273	812,297	339,554	9,235,322
	1971 / 1970 (%)	+ 5.3	+12.8	+ 2.2	+ 3.6	- 0.5	+10.5	+ 3.6

Table 3. TOTAL CAPACITY OF GOODS VEHICLES

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

Tonnes payload

No. COUNTRY	VEHICLES: NOT SELF-PROPELLED		LORRIES				TOTAL
	TRAILERS	SEMI-TRAILERS	PAYLOAD UNDER 1.5 tonne	PAYLOAD FROM 1.5 to 4.999 tonnes	PAYLOAD FROM 5 to 9.999 tonnes	PAYLOAD 10 TONNES AND OVER	
	%	%	%	%	%	%	%
1. Austria	← 358,104 (+5) →		59,300 (+ 7)	93,695 0	225,332 (+6)	26,590 (+47)	763,021 (+6)
2. Belgium	59,427 (+6)	370,558 (+12)	71,572 (+ 2)	147,443 0	223,664 (+2)	132,708 (+15)	1,015,372 (+7)
3. Denmark	94,515 (+3)	44,400 (+16)	109,955 (-14)	76,722 (+8)	177,028 (+3)	41,777 (+13)	544,397 (-1)
4. France							
5. Germany	1,688,625 (+5)	775,688 (+16)	424,696 (+ 3)	1,071,053 (+6)	1,334,206 (+5)	443,630 (+32)	5,717,898 (+8)
6. Greece							
7. Italy							
8. Luxembourg							
9. Netherlands							
10. Norway							
11. Portugal							
12. Spain							
13. Sweden							
14. Switzerland	159,000 (+6)	12,000 (+ 7)	61,000 (+ 4)	64,000 (+3)	203,000 (+4)	700 (+ 2)	499,700 (+5)
15. Turkey							
16. United Kingdom			671,157 (- 4)	455,403 (-9)	1,644,881 (-8)	3,198,979 (+ 8)	5,970,420 0
17. Yugoslavia							
18. Ireland							
Total 1971	1,981,567	1,202,646	1,397,680	1,908,316	3,818,111	3,844,384	14,510,808
1971 / 1970 (%)	+4.7	+14.8	-1.8	+1.3	-1.7	+11.0	+4.1

Table 4. AVERAGE CAPACITY OF GOODS VEHICLES

Position at end 1971
EEC countries are underlined

Tonnes payload

No. COUNTRY	VEHICLES: NOT SELF-PROPELLED		LORRIES				COMBINED
	TRAILERS	SEMI-TRAILERS	PAYLOAD UNDER 1.5 tonne	PAYLOAD FROM 1.5 to 4.999 tonnes	PAYLOAD FROM 5 to 9.999 tonnes	PAYLOAD 10 TONNES AND OVER	
1. Austria	← 3,815 →		0,846	3,000	7,305	11,802	3,438
2. Belgium	5,842	19,648	0,786	2,752	6,682	12,441	4,631
3. Denmark	2,736	11,206	0,731	2,511	6,402	11,141	2,169
4. France							
5. Germany	3,740	18,443	0,930	2,707	7,094	11,762	3,651
6. Greece							
7. Italy							
8. Luxembourg							
9. Netherlands							
10. Norway							
11. Portugal							
12. Spain							
13. Sweden							
14. Switzerland	3,000	6,977	0,973	2,601	7,277	10,769	2,942
15. Turkey							
16. United Kingdom	-	-	0,650	3,556	7,218	15,340	3,737
17. Yugoslavia							
18. Ireland							
Average 1971	3,644 a)	18,057 a)	0,752	2,875	7,106	14,618	3,517

a) Excluding Austria and United Kingdom.

Table 5. VEHICLE-KM. ON NATIONAL TERRITORY (NATIONAL AND FOREIGN VEHICLES)

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

Million vehicle-km

No.	COUNTRY	TWO-WHEELED MOTOR VEHICLES, INCLUDING CYCLES WITH AUXILIARY ENGINES (1)	%	MOTOR VEHICLES WITH MORE THAN TWO WHEELS						TOTAL (2+3+6)	
				PRIVATE CARS, INCLUDING TAXIS (2)	%	COACHES BUSES TROLLEY BUSES (3)	%	GOODS VEHICLES			
								ARTICULATED VEHICLES (4)	%	OTHER VEHICLES INCLUDING SPECIAL VEHICLES (5)	%	TOTAL (4+5) (6)	%		
1.	Austria	2,611	(- 2)	22,649	(+11)	424	(+8)					3,439	(+11)	26,512	(+11)
2.	Belgium[b]	-		22,619	(+ 5)	373	(-3)	-		-		-			
3.	Denmark	-		-		-		-		-		-		-	
4.	France	-		-		-		-		-		-		-	
5.	Germany	-		-		2,084[a]	(+5)								
6.	Greece	-		-		-		-		-		-		-	
7.	Italy	21,020	(+ 2)	144,600	(+18)	1,401	(+3)	547	0	21,966	0	22,513	0	168,500	(+15)
8.	Luxembourg[b]							1.6	(+6)	61	(+8)	62	(+ 8)		
9.	Netherlands	-		42,500	(+ 7)	525	(+1)	-		-		-		-	
10.	Norway	-		-		-		-		-		-		-	
11.	Portugal														
12.	Spain	2,760	(-12)	36,940	(+18)	1,330	(+7)					16,900	(+ 6)	55,170	(+14)
13.	Sweden	-		-		-		-		-		-		-	
14.	Switzerland	-		-		-		-		-		-		-	
15.	Turkey	-		-		-		-		-		-		-	
16.	United Kingdom[c]	3,800	(- 3)	173,900	(+ 8)	3,600	0	-		-		39,200	(+ 4)	216,700	(+ 7)
17.	Yugoslavia	-		-		-		-		-		-		-	
18.	Ireland	-		-		85[d]	(-2)	-		-		-		-	
Total 1971		30,191		443,208		9,822						82,111		466,882	
1971/1970	(%)	-0.0		+11.7		+2.8						+3.4		+10.8	

a) National vehicles in the country and abroad (excluding "service" traffic).
b) National vehicles only.
c) Excluding Northern Ireland.
d) Excluding coaches.

Table 6. PASSENGER TRANSPORT IN NATIONAL VEHICLES ON NATIONAL TERRITORY

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

Million passenger-km

No.	COUNTRY	TWO-WHEELED MOTOR VEHICLES, INCLUDING CYCLES WITH AUXILIARY ENGINES (1)	%	PRIVATE CARS INCLUDING TAXIS (2)	%	PUBLIC TRANSPORT (3)	%	TOTAL FOR MOTOR VEHICLES (2+3)	%
1.	Austria	2,977	(- 2)	33,394	(+11)	7,743	(+8)	41,137	(+10)
2.	Belgium	-		-		-		-	
3.	Denmark	-		-		-		-	
4.	France								
5.	Germany	-		-		-		-	
6.	Greece	-		-		-		-	
7.	Italy								
8.	Luxembourg								
9.	Netherlands	-		-		-		-	
10.	Norway	-		-		-		-	
11.	Portugal								
12.	Spain	2,960	(-12)	66,400	(+18)	22,140	(+7)	88,540	(+15)
13.	Sweden								
14.	Switzerland								
15.	Turkey								
16.	United Kingdom								
17.	Yugoslavia								
18.	Ireland								

Table 7. PASSENGER TRANSPORT IN NATIONAL AND FOREIGN VEHICLES ON NATIONAL TERRITORY

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

Million passenger-km

No.	COUNTRY	TWO-WHEELED MOTOR VEHICLES, INCLUDING CYCLES WITH AUXILIARY ENGINES (1)	%	PRIVATE CARS, INCLUDING TAXIS (2)	%	PUBLIC TRANSPORT (3)	%	TOTAL FOR MOTOR VEHICLES (2+3)	%
1.	Austria	2,977	(-2)	47,733	(+11)	12,706	(+8)	60,439	(+10)
2.	Belgium	-		-		5,868 [b]	(+6)		
3.	Denmark								
4.	France								
5.	Germany								
6.	Greece								
7.	Italy	23,080	(+3)	248,700	(+18)	33,210	(+4)	281,910	(+16)
8.	Luxembourg								
9.	Netherlands								
10.	Norway								
11.	Portugal								
12.	Spain	2,970	(-12)	70,840	(+16)	22,430	(+7)	93,270	(+14)
13.	Sweden								
14.	Switzerland								
15.	Turkey								
16.	United Kingdom [a]	4,300	(-3)	335,700	(+ 8)	54,700	-0	390,400	(+ 7)
17.	Yugoslavia								
18.	Ireland								
Total 1971		33,327		702,973		128,914		826,019	
1971/1970	(%)	+0.0		+12.1		+3.2		+10.6	

a) Excluding Northern Ireland.

b) Excluding coaches.

Table 8. PASSENGER TRANSPORT IN NATIONAL VEHICLES ON NATIONAL AND FOREIGN TERRITORY

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

Million passenger-km

No. COUNTRY	TWO-WHEELED MOTOR VEHICLES, INCLUDING CYCLES WITH AUXILIARY ENGINES (1)	%	PRIVATE CARS, INCLUDING TAXIS (2)	%	PUBLIC TRANSPORT (3)	%	TOTAL FOR MOTOR VEHICLES (2+3)
1. Austria	2,977	(-2)					
2. Belgium					9,380 [a]	(+1)	
3. Denmark							
4. France							
5. Germany							
6. Greece							
7. Italy							
8. Luxembourg							
9. Netherlands			92,400	(+7)	10,200	+0	
10. Norway							
11. Portugal							
12. Spain							
13. Sweden							
14. Switzerland							
15. Turkey							
16. United Kingdom							
17. Yugoslavia							
18. Ireland			-				

a) Including total for foreign coaches.

Table 9. GOODS CARRIED IN NATIONAL AND FOREIGN VEHICLES

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

No.	COUNTRY	MILLION TONNES						MILLION TONNE-KM					
		INTERNAL TRANSPORT		INTERNATIONAL TRANSPORT (INCLUDING TRANSIT)		TOTAL (1+2)		INTERNAL TRANSPORT		INTERNATIONAL TRANSPORT			
										ON REPORTING COUNTRY'S TERRITORY		ON OTHER COUNTRIES' TERRITORY IN NATIONAL VEHICLES	
		(1)	%	(2)	%		%		%		%		%
1.	Austria			11.86	(+14)					1,384		1,671	(+ 9)
2.	Belgium [b]	324	(+ 9)	17.7	(+ 7)	342	(+ 9)	9,901	(+ 8)	4,428	(+14)		
3.	Denmark	-		-		-		-		-		-	
4.	France	1,564	(+ 4)					66,900					
5.	Germany [a]					174	(+ 6)	←		4,450	→		
6.	Greece	-		-		-		-		-		-	
7.	Italy					57,481	(- 2)						
8.	Luxembourg	10.5	(+23)	1.42	(+10)	11.88	(+21)	166	(+17)	45 [c]	(+17)	320	(+17)
9.	Netherlands			24.4 [c]	(+ 9)								
10.	Norway	-		-		-		-		-		-	
11.	Portugal	-		-		-		-		-		-	
12.	Spain	-		-		-		-		-		-	
13.	Sweden	-		-		-		-		-		-	
14.	Switzerland			9.03 [d]	(+16)								
15.	Turkey	-		-		-		-		-		-	
16.	United Kingdom	1,785	(+ 3)					87,400	(+ 3)				
17.	Yugoslavia	-		-		-		-		-		-	
18.	Ireland	-		-		-		-		-		-	
Total 1971		3,683.5		64.41		58,008.88		164,367		5,857		1,991	
1971/1970 (%)		+3.7		+10.1		-2		+4.1		+13.8		+10.2	

a) Long-distance hauls only.
b) National vehicles only.
c) Excluding traffic to and from BLEU.
d) Excluding 745,015 tonnes border traffic.

Table 10. GOODS CARRIED IN NATIONAL AND FOREIGN VEHICLES FOR HIRE OR REWARD

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

No.	COUNTRY	MILLION TONNES						MILLION TONNE-KM					
		INLAND TRANSPORT		INTERNATIONAL TRANSPORT		TOTAL (1+2)		INTERNAL TRANSPORT		INTERNATIONAL TRANSPORT [a]			
										ON REPORTING COUNTRY'S TERRITORY		ON OTHER COUNTRIES' TERRITORY	
		(1)	%	(2)	%	(3)	%	(4)	%	(5)	%	(6)	%
1.	Austria											1,630	(+ 9)
2.	Belgium [b]	111.64	(+10)	11.09	(+ 8)	122.73	(+ 9.4)	3,895.8	(+ 8)	2,897	(+10)		
3.	Denmark												
4.	France	530	(- 9)					39.100	(- 3)				
5.	Germany [a]	-				127.4	(+ 3.9)	← 35.80	(+5) →				
6.	Greece												
7.	Italy												
8.	Luxembourg	1.96	(+14)	1.12	(+12)	3.08	(+13.2)	44	(+10)	37 [c]	(+19)	281	(+22)
9.	Netherlands			20.7	(+11)								
10.	Norway												
11.	Portugal												
12.	Spain												
13.	Sweden												
14.	Switzerland			7.51	(+20)								
15.	Turkey												
16.	United Kingdom	895	(+ 8)					51,100	(- 2.3)				
17.	Yugoslavia												
18.	Ireland												

a) Long-distance hauls only.
b) National vehicles only.
c) Excluding traffic to and from BLEU

Table 11. AVERAGE ANNUAL KM. FOR EACH TYPE OF NATIONAL VEHICLE (ON NATIONAL TERRITORY AND ABROAD)

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

Km

No. COUNTRY	TWO-WHEELED MOTOR VEHICLES INCLUDING CYCLES WITH AUXILIARY ENGINES (1)	%	MOTOR VEHICLES OTHER THAN THOSE IN COLUMN (1)					
			PRIVATE CARS INCLUDING TAXIS	%	PUBLIC TRANSPORT	%	AVERAGE FOR GOODS VEHICLES	%
1. Austria	4,461	(-0.3)	-		-		32,277	(+ 3.4)
2. Belgium					23,063	(-4)	25,634	(+21)
3. Denmark								
4. France								
5. Germany								
6. Greece								
7. Italy	7,600	0	16,000	(+6.5)	49,000	0	21,300	(-2)
8. Luxembourg								
9. Netherlands	-		16,500	(-1)	52,500	(+1)	-	
10. Norway								
11. Portugal								
12. Spain	6,900	(-7)	11,700	(-6)	51,100	(+2)	31,400	(-1)
13. Sweden								
14. Switzerland								
15. Turkey								
16. United Kingdom a)	3,701	0	14,162	(+2.3)	45,222	(-1.4)	23,496	(+2.8)
17. Yugoslavia								
18. Ireland								

a) Excluding Northern Ireland.

Table 12. YEARLY CONSUMPTION OF MOTOR FUEL

Position at end 1971
EEC countries are underlined
The percentages are the changes compared with the previous year

Tonnes

No.	COUNTRY	PETROL	%	GASOIL (DIESEL)	%	L.P.G.	%
1.	Austria	1,738,100		610,700		2,900	
2.	Belgium	2,308,000	(+ 5)	1,063,000	(+ 5)	16,000	(-41)
3.	Denmark	1,551,780		907,190		39,664	
4.	France [a]	13,038,800		4,883,720		10,612,800	
5.	Germany	17,032,000	(+12)	6,532,000	(+ 2)	-	
6.	Greece [a]	425,902	(-34)	258,949	(-72)	635,718	
7.	Italy	9,408,000		4,048,000		1,770,000 [c]	
8.	Luxembourg						
9.	Netherlands	3,200,000	(+6)	1,104,000	(+14)	59,000	(+ 2)
10.	Norway	857,000	(+4)	550,000 [b]	(+ 6)	-	
11.	Portugal						
12.	Spain [a]	2,897,951	(+11)	2,377,211	(+16)		
13.	Sweden						
14.	Switzerland						
15.	Turkey	880,647	(+ 4)	2,025,267	(+ 8)	-	
16.	United Kingdom	14,963,000	(+ 5)	5,186,000	(+ 3)		
17.	Yugoslavia						
18.	Ireland						
Total 1971		68,301,118		29,546,037		13,136,082	
1971/1970	(%)	+7.54		+1.69			

a) Specific gravity adopted for conversion from volume to weight: petrol: 0.74 tonne/m^3
gasoil: 0.83 " "
L.P.G.: 0.536 " "

b) Including fuel consumed by railways and farm tractors.

c) Including consumption by tractors.

Table 13. TOTAL LENGTH OF MOTORWAYS IN SERVICE

Position at end 1971
EEC countries are underlined

Km

No.	COUNTRY	TOTAL AT END 1970		TOTAL AT END 1971		MOTORWAYS PUT INTO SERVICE IN 1971
		TOTAL	OF WHICH SINGLE CARRIAGE-WAY	TOTAL	OF WHICH SINGLE CARRIAGE-WAY	
1.	Austria	489	0			
2.	Belgium	501	0	617	0	116
3.	Denmark	198	6	240	6	42
4.	France	1,753	0	1,927	0	174
5.	Germany	4,461	69	4,828	49	367
6.	Greece	0	0	0	0	0
7.	Italy	3,907	0	4,342	0	435
8.	Luxembourg	10	0			
9.	Netherlands	979	0	1,065	0	86
10.	Norway	79	53	98	72	19
11.	Portugal	66	0			
12.	Spain	185	0	307	0	122
13.	Sweden	556	153			
14.	Switzerland	666	289	760	310	94
15.	Turkey	0	0	0	0	0
16.	United Kingdom	1,337	0	1,730	0	393
17.	Yugoslavia					
18.	Ireland	0	0	0	0	0
Total 1971		15,187	570	15,914	437	1,848
Total 1970		13,248	536	14,066	417	1,867

Table 14. INTERNATIONAL NETWORK

Position at end 1971
EEC countries are underlined

Km and %

No. COUNTRY	LENGTH BY CATEGORY (KM)				TOTAL (KM)
	A (MOTORWAYS)		II (MORE THAN TWO LANES)	I (TWO LANES)	
	KM.	% TOTAL			
1. Austria	-	-	-	-	-
2. Belgium	423	39	436	225	1,084
3. Denmark	206	23	318	366	890
4. France	1,512	18	1,679	5,356	8,547
5. Germany	3,869	63	161	2,113	6,143
6. Greece	0	0	67	2,675	2,742
7. Italy	3,956	67	721	1,243	5,920
8. Luxembourg	-	-	-	-	-
9. Netherlands	779	57	82	500	1,361
10. Norway	98 a)	2.5	9	3,817	3,924
11. Portugal	-	-	-	-	-
12. Spain	225	4	763	4,941	5,929
13. Sweden	-	-	-	-	-
14. Switzerland	509 b)	39	101	690	1,300
15. Turkey	0	0	91	5,761	6,852
16. United Kingdom	1,362	30	1,287	1,939	4,588
17. Yugoslavia	-	-	-	-	-
18. Ireland	0	0	115	707	822
Total 1971	12,939	26	5,830	31,333	50,102

a) Of which 72 km. single carriageway.
b) Of which 164 km. single carriageway.

Table 15. DEVELOPMENT OF THE INTERNATIONAL NETWORK LENGTH STANDARDIZED AND DEGREE OF STANDARDIZATION

Position at end 1971
EEC countries are underlined
The percentages indicate the proportion of total length in each category that meets the international standards

No. COUNTRY	CATEGORY A KM	A %	II KM	II %	I KM	I %	TOTAL LENGTH STANDARDIZED KM	DEGREE OF STANDARDIZATION %
1. Austria								
2. Belgium	423	100	328	75	93	41	844	78
3. Denmark	200	97	266	84	328	90	794	89
4. France	1,485	98	1,267	75	4,143	77	6,895	81
5. Germany	3,869	100	135	84	1,371	65	5,375	87
6. Greece	-	-	67	100	1,569	59	1,636	60
7. Italy	3,956	100	592	82	662	53	5,210	88
8. Luxembourg								
9. Netherlands	779	100	81	99	420	84	1,280	94
10. Norway								
11. Portugal								
12. Spain	225	100	415	54	2,897	59	5,357	60
13. Sweden								
14. Switzerland	343	67	62	61	639	93	1,044	80
15. Turkey	-	-	91	100	6,426	95	6,517	95
16. United Kingdom	1,362	100	957	74	987	51	3,306	72
17. Yugoslavia								
18. Ireland	0	0	37	32	395	56	432	53
Total 1971	12,642	98	4,298	74	19,930	64	36,870	74
Total 1970 [a]	9,983	98	3,065	70	15,206	68	28,254	77

a) Excluding France and Ireland.

Table 16. INTERNATIONAL NETWORK - LENGTH AND PERCENTAGE OF SECTIONS OF ADEQUATE CAPACITY

Position at end 1971
EEC countries are underlined
The percentages indicate the ratio to total length in each category

No. COUNTRY	CATEGORY A KM	A %	II KM	II %	I KM	I %	TOTAL LENGTH KM	PERCENTAGE OF TOTAL NETWORK
1. Austria								
2. Belgium	423	100	328	75	93	41	844	78
3. Denmark	206	100	114	36	197	54	517	58
4. France	1,512	100	1,029	61	3,833	72	6,383	75
5. Germany	2,980	77	91	57	1,524	72	4,595	75
6. Greece								
7. Italy	3,956	100	721	100	1,113	90	5,790	98
8. Luxembourg								
9. Netherlands	758	97	48	59	326	65	1,132	83
10. Norway	93	95	0	0	3,139	82	3,232	82
11. Portugal								
12. Spain	225	100	763	100	3,925	79	4,912	83
13. Sweden								
14. Switzerland	507	100	77	76	367	53	951	73
15. Turkey	0	0	76	84	6,460	96	6,536	95
16. United Kingdom	1,362	100	1,210	94	1,766	91	4,338	95
17. Yugoslavia								
18. Ireland							467	57
Total 1971	12,022	93	4,457	79	22,743	73	39,697	80
Total 1970	9,242 a)	92	3,169 a)	79	18,730 a)	72	29,619 b)	73

a) Excluding France, Ireland and Denmark.

b) Excluding France and Ireland.

Table 17. FUTURE INTERNATIONAL NETWORK

1) Length already in service in its final form.
2) Total length of future international network.

Position at end 1971
EEC countries are underlined

Km

No. COUNTRY	CATEGORY A (MOTORWAYS) (1)	A (MOTORWAYS) (2)	II (MORE THAN 2 LANES) (1)	II (MORE THAN 2 LANES) (2)	I (2 LANES) (1)	I (2 LANES) (2)	TOTAL LENGTH (1)	TOTAL LENGTH (2)	OVERALL RATE OF COMPLETION %
1. Austria									
2. Belgium	446	1,129	0	0	0	0	446	1,129	40
3. Denmark	376	572	39	97	5	118	420	787	53
4. France									
5. Germany	3,899	5,678	47	47	313	313	4,259	6,038	71
6. Greece									
7. Italy	4,147	5,337	198	402	310	401	4,655	6,140	76
8. Luxembourg									
9. Netherlands	743	1,341	0	0	8	10	751	1,351	56
10. Norway	76	545	9	27	653	3,235	738	3,807	19
11. Portugal									
12. Spain	225	4,986	11	-	660	-	896	4,986	18
13. Sweden									
14. Switzerland	512 a)	1,135 b)	1	4	80	148	593	1,287	46
15. Turkey	-	-	84	91	4,824	6,649	4,908	6,740	73
16. United Kingdom	1,730	3,200							
17. Yugoslavia									
18. Ireland									
Total	12,154	23,923	389	668	6,853	10,874	17,666	32,265	55

a) Of which 148 km. single carriageway.

b) Of which 224 km. single carriageway (including 16 km. for the St. Gothard Tunnel).

Table 18. INVESTMENT

Position at end 1971
EEC countries are underlined

$ million

No.	COUNTRY	EXCHANGE RATE [a]	INTERNATIONAL NETWORK 1971	FORECASTS FOR 1972		
				INTERNATIONAL NETWORK	TOTAL NETWORK	OF WHICH ROADS UNDER CENTRAL GOVERNMENT CONTROL AND MOTORWAYS
1.	Austria					
2.	Belgium	50	487	435	-	525
3.	Denmark	7	43	34	-	58
4.	France	5.00	155.4 [b]	176.6 [b]	-	-
5.	Germany	3.20	430	460	4,850	1,900
6.	Greece	30.00	43.72	33.87	120	-
7.	Italy	594	419.28	404.39	-	758.95
8.	Luxembourg	50				
9.	Netherlands	3.62	108	93	465	204
10.	Norway	6.55	45.8	49	154.5	
11.	Portugal					
12.	Spain	66	187.4	45	-	145
13.	Sweden					
14.	Switzerland	3.75	221	242	700 [c]	
15.	Turkey	14	10.79	-	99.65	87.17
16.	United Kingdom	0.42	333	260	1,612	693
17.	Yugoslavia					
18.	Ireland	0.42				
Total 1971			2,484.39	2,232.86	8,001.15	4,371.12
Change compared with previous year in %			+4.6	-1.4	+21.1	+9.9

a) Value of $1 in national currency.

b) Excluding projects in the Paris area and privately operated motorways.

c) Including maintenance work accounting for about 25%.

REPORT OF THE COMMITTEE OF DEPUTIES
ON TRAFFIC AND INVESTMENT TRENDS IN 1971

Chapter IV - Inland Waterways

Contents

I. TRANSPORT TRENDS

1. All countries under review

Both internal and international inland waterway goods traffic in the Federal Republic of Germany, France, Netherlands, Belgium, Switzerland and Luxembourg has increased considerably in recent years as can be seen from the following table:

Tonnes carried

('000 tonnes)

YEAR	INTERNAL TRAFFIC	INTERNATIONAL TRAFFIC	TOTAL
1965	264,498	127,503	392,001
1966	267,067	138,186	405,253
1967	275,484	152,312	427,796
1968	285,289	170,380	455,669
1969	289,098	171,033	460,131
1970	293,263	174,401	467,664
1971	293,983	171,407	465,390

Thus, between 1965 and 1971 internal inland waterway traffic in these six countries went up by 29.5 million tonnes (11.1%), international outbound traffic having increased by 43.9 million tonnes (34.4%).

Whereas internal traffic increased at a regular rate from year to year between 1965 and 1971, figures for outbound international traffic increased only from 1965 to 1970, although at a higher rate than internal traffic.

Between 1970 and 1971, in fact, outbound international traffic fell by 3 million tonnes (1.7%). This decrease mainly affected ore and building materials and is attributable to the economic situation and unfavourable waterway conditions. Total traffic (internal and outbound international traffic for the six countries) amounted to 465.4 million tonnes of goods in 1971, an increase of 73.4 million tonnes (or 18.7%) over 1965.

This figure does not however represent all inland waterway traffic for the six countries, since inbound consignments from third countries are not included.

This mainly concerns the Federal Republic of Germany, the only one of the six countries to have any appreciable traffic with third countries. * In 1965 this amounted to 3.5 million tonnes and in 1971 to about 4.9 million tonnes.

2. Remarks on the trend of traffic in various countries

In the Federal Republic of Germany 230 million tonnes of freight were carried by inland waterway in 1971 - a decrease of 10 million tonnes (4.2%) compared with the previous year.

In terms of tonne/km., the 1971 figure (44,990 million) is 3,820 million (7.8%) lower than in 1970.

This downturn in the figures for the Federal Republic of Germany is due to the decrease in coal transport (down by 3.5 million tonnes, internal German traffic having fallen by 1.6 million and exports by 1.3 million tonnes) and to that in iron ore transport (down by 4 million tonnes including 3.4 million tonnes of imports and 0.2 million tonnes in transit). Carryings of metal products also decreased appreciably (down by 1.14 million tonnes: internal German traffic, exports, and transit down by 0.5, 0.55 and 0.65 million tonnes respectively, and imports up by 0.5 million tonnes) as did minerals and building materials (down by 1.6 million tonnes: internal, export and transit traffic down by 0.9, 0.9 and 0.5 million tonnes respectively, and imports up by 0.9 million tonnes), and grain (down by 0.8 million tonnes, internal traffic accounting for 0.6 million tonnes).

In Belgium, freight carried by inland waterway totalled 95.3 million tonnes in 1971, an increase of about 3.8 million tonnes (4.2%) over 1970.

International traffic was responsible for this increase having gone up from 60.33 to 65.99 million tonnes (an increase of 9.32%). Internal traffic fell by 6% mainly as a result of decreases in the transport of solid mineral fuels and, to a lesser extent, of raw or processed minerals and building materials.

In tonne/km., total waterway traffic remained practically unchanged in spite of a decrease of 9.8% in internal traffic for this was offset by an increase of 6.46% in international traffic. Practically all commodities showed increases except for solid mineral fuels, ore and ferrous scrap.

In 1971 the number of craft registered on the rota list of the "Bureau d'affrètement de l'Office régulateur de la navigation intérieure" was sufficient to meet demand.

Overall, inland waterway transport can be said to be helding its ground and that slow but steady progress may reasonably be expected, subject to impredictable economic fluctuations.

In France, total goods carried by inland waterway fell from 110.35 million tonnes in 1970 to 106.60 million tonnes in 1971, a drop of 3.75 million tonnes (3.4%).

Internal traffic was down by 2.61 million tonnes (4%), exports up by 0.41 million tonnes, and imports down by 0.16 million tonnes.

Transit traffic fell by 1.4 million tonnes (17.5%) compared with 1970.

* Consignments from East Germany, Poland, Czechoslovakia and the Danube countries.

Broken down by commodities, traffic in 1971 showed the following changes compared with 1970.

Agricultural products

Up by 953,646 tonnes (11.2%), internal and outbound traffic having gone up by 251,154 tonnes (9.2%) and 820,498 tonnes (19.1%) respectively and inbound traffic having fallen by 110,422 tonnes (14.6%).

Foodstuffs and animal feedstuffs

Up by 75,400 tonnes (2.4%) on balance, a 159,305 tonnes (12.6%) increase in internal traffic being fartly offset by a 48,072 tonnes (5.9%) fall in exports.

Solid mineral fuels

Down by 906,492 tonnes (12%) in line with the general decline in coal production and carryings over the past few years. The main impact has been on internal traffic (down by 386,392 tonnes or 13.3%) since imports increased slightly (up by 144,852 tonnes) whilst exports fell by 102,036 tonnes. Transit traffic decreased from 465,947 to 192,735 tonnes.

Oil products

Overall increase of 162,585 tonnes (0.8%) mainly as a result of much larger exports (up by 354,166 tonnes or 14%) and imports (up by 159,233 tonnes or 52%) partly offset by a decrease in transit traffic of 257,964 tonnes (8%).

Ore and ferrous scrap

Down by 378,254 tonnes (11.5%), imports accounting for the biggest drop (down by 173,626 tonnes or 9.9%) although exports and transit traffic were also involved (down by 73,017 tonnes or 25.3% and 96,816 tonnes or 26% respectively).

Metal products

Down, overall, by 908,163 tonnes (16.3%) due to falls in all four traffic categories: inbound (down by 403,568 tonnes or 21%), transit (down by 340,075 tonnes or 26.1%), outbound (down by 96,203 tonnes or 5.2%) and inland traffic (down by 68,317 tonnes or 14%).

Minerals and building materials

Down by 2,491,477 tonnes (4.4%), inland, outbound and transit traffic having fallen by 2,344,485 tonnes (5.5%), 255,845 tonnes (2.3%) and 263,635 tonnes (26.5%) respectively, and inbound traffic having increased by 372,488 tonnes (17.6%).

Fertilizers

Up by 171,382 tonnes (7.2%): internal and inbound traffic up by 37,230 tonnes (5.9%) and 231,187 tonnes (24.3%) respectively and outward traffic down by 94,189 tonnes (12.8%).

Chemicals

Down by 382,123 tonnes (17.2%): internal, outbound, inbound and transit traffic down, in all cases, by 111,425 tonnes (13.4%), 85,540 tonnes (25.5%), 64,519 tonnes (9.6%) and 120,639 tonnes (31.4%) respectively.

Machinery, motor vehicles, manufactured goods, etc.

Down by 51,041 tonnes (8.7%): internal, outbound and transit traffic down by 20,612 tonnes (6%), 6,556 tonnes (16.8%) and 28,748 tonnes (24%) respectively and inbound traffic up by 6,875 tonnes (5.6%).

In the Netherlands total traffic went up from 241.44 million tonnes in 1970 to 245.46 million tonnes in 1971, an increase of 1.6%, but fell in terms of tonne/km., from 30,740 to 30,430 million (1% down).

Internal traffic increased by 8.19 million tonnes (8.9%).

International inland waterway transport decreased from 148.78 million tonnes in 1970 to 144.61 million in 1971 (a drop of 2.8%).

Outbound, inbound and transit traffic all fell by 2.4%, 4.1% and 1.9% respectively.

Traffic on the Rhine decreased by 7.8 million tonnes (6.9%).

Total Rhine traffic at the Germany - Netherlands frontier totalled 104.6 million tonnes.

Down-river traffic fell from 43.8 million tonnes in 1970 to 41.2 million tonnes in 1970 to 41.2 million tonnes in 1971 (6% down).

Up-river traffic fell from 68.6 million tonnes in 1970 to 63.4 million tonnes in 1971, a drop of 5.2 million tonnes (7.6%).

In Switzerland, traffic handled at the Basle ports fell by about 700,000 tonnes (8%) in 1971 compared with 1970. There was a slight increase in terms of tonne/km. on the short Swiss reaches of the Rhine.

During the first half of 1972, traffic flows at the Basle ports were as follows:

	INBOUND	OUTBOUND	TOTAL
First half 1972	3,694,020 t.	146,151 t.	3,840,171 t.
(First half 1971)	(4,288,969 t.)	(145,195 t.)	(4,434,164 t.)

Total traffic during the first half of 1972 was therefore about 600,000 tonnes (13%) less than that recorded during the same period last year.

In Luxembourg all the freight loaded at the port of Mertert (359,000 tonnes) was exported by inland waterway. The 771,505 tonnes of goods imported were also discharged at Mertert.

The total tonnage carried dropped from 1.33 million tonnes in 1970 to 1.13 million tonnes in 1971, a decrease of 0.2 million (15.4%).

In Austria 6,215,776 tonnes of freight were carried on the Austrian reaches of the Danube in 1971, a decrease of 18.1% compared with 1970.

Internal and outbound traffic both went up in comparison with 1970, the increases being 21% and 2.7% respectively.

Transit and inbound traffic both fell, by 13.4 and 29.6% respectively. The decrease in coal carryings accounts for the sharp fall in inbound traffic.

In terms of tonne/km. the decrease amounts to 8.9%. The main commodities carried on the Danube are oil, chemicals, solid fuels, iron ore and ferrous scrap. Altogether these amount to about two-thirds of the total volume of freight carried. One reason for the considerable traffic decline on the Danube, (after the increase between 1968 and 1970) was the bad weather conditions which prevented full use being made of the capacity available.

Slacker demand in general also played a part, and a further factor was the changing pattern of coal supplies, in coal from the Ruhr being replaced by railborne supplies from Eastern Europe.

Lastly, the volume of traffic on the Danube has been affected by the shift of oil traffic to the Adriatic-Vienna pipeline.

II. DEVELOPMENT OF THE FLEET

In 1971 the total capacity* of the fleet went up by 254,918 tonnes (1.6%) but the total number of craft fell by 1,113 (4%). The average, unweighted capacity of craft increased overall by 29 tonnes, or 5%.

Total horsepower of tugs and pushers went up in France (by 13%), the Netherlands (4.1%) and Germany (5.3%), but went down in Switzerland (by 50%) and Belgium (12%).

In Germany the cargo carrying fleet at 31st December 1971 comprised 5,823 units with a capacity of 4,493,400 tonnes together with 425 tugs and pushers totalling 193,600 h.p.

The decline compared with 1970 is 513 units and 30,900 tonnes of effective capacity, and 23 fewer tugs and pushers (10,300 h.p.).

The reduction in capacity mainly affected the self-propelled fleet which lost 418 units totalling 18,000 tonnes capacity.

The following craft were scrapped:

- 440 self-propelled craft, capacity 135,580 tonnes
- 158 pull-towed barges (117,810 tonnes).

The following were sold abroad (including changes of home port) or taken out of commission or converted:

- 52 self-propelled craft, i.e. 47,620 tonnes
- 25 pull-towed barges, 24,000 tonnes.

However, 156 new units with a capacity of 240,750 tonnes were added to the fleet (45% push-towed barges, 32% self-propelled tankers and 23% self-propelled dry cargo craft).

* Consolidated figures for Belgium, France, Germany, Netherlands and Switzerland.

In Belgium, the inland waterway fleet lost 233 units and 117,000 tonnes capacity in 1971. The number of self-propelled craft dropped by 160 units (27,900 tonnes) and the number of tugs fell by 73 units (89,200 tonnes).

In France the total number of craft fell from 7,174 units in 1970 to 7,088 units in 1971, a drop of 1.2%.

The capacity of the fleet as a whole went up from 2,994,098 tonnes to 3,018,500 tonnes, an increase of 0.8%.

The number of self-propelled craft fell, by 0.9%, from 5,583 in 1970 to 5,536 in 1971.

In the Netherlands,* the fleet total fell from 9,330 units in 1970 to 9,017 units in 1971, a drop of 3.4%, largely due to scrapped craft. There were 2.7% fewer self-propelled craft but total capacity increased from 3,296,700 tonnes in 1970 to 3,453,600 tonnes in 1971. The number of towed barges dropped by 6.2% though their total capacity went up by 51,300 tonnes, i.e. 3.2%.

In Switzerland total capacity went up by 70,209 tonnes (15.7%), the number of units having risen by 37 (8.9%).

The number of self-propelled craft increased from 333 units in 1970 to 362 in 1972 (an increase of 8.8%).

The number of push and pull-towed barges went up by 8 (an increase of 9.7%) and now totals 90.

In Italy the total number of craft rose from 814 units in 1970 to 826 units in 1971 (an increase of 1.5%).

III. INFRASTRUCTURAL DEVELOPMENT

Progress report on studies and achievements concerning waterways of interest to Europe as a whole (Resolution No. 9: inland waterways - 3rd September 1964).

1. Improvement of the Dunkirk-Scheldt link and its international extensions

The section between Dunkirk and Denain is now in service. Additional improvements made in 1971 included further work on the provision of canal sidings, calibration by deepening the channel, and construction of loading facilities for canal craft at Dunkirk.

On the stretch between Denain and Valenciennes, locks have already been built at Denain and Trith. Improvements to the Trith pond on the Scheldt are continuing.

In Belgium, development work on the Upper Scheldt is proceeding satisfactorily.

2. Improvements to the Scheldt-Rhine link

Work on the Scheldt-Rhine link continued as planned in 1971.

* The figures for the Netherlands inland waterway fleet relate to the "active" fleet, that is to say all craft effectively engaged in inland waterway transport at least once during the year.

3. Improvements to the Meuse and its international links

The work on improvements to the Linne-Buggenum lateral canal has reached its final stage.

The widening of the Meuse-Waal Canal continued to schedule.

4. Meuse-Rhine link with connection to Aix-la-Chapelle

No further developments to report.

5. Canalization of the Moselle

This operation is completed as regards the section downstream of Metz.

In 1971 the section between Metz and Frouard and the extension to the port of Frouard were completed.

During the year, work also continued to bring the Frouard-Toul section into conformity with the loading gauge for 1,350 tonne craft (work began on the improvements to the Aingeray pond).

6. Improvement of navigation conditions on the Rhine between Strasbourg and Germany-Netherlands frontier

Contracts for revetments, excavation and underground construction work for the locks and dams of the Gambsheim falls were awarded in 1971 as part of the main contract of 4th July 1969 covering development works on the Rhine between Kehl/Strasbourg and Neuburgweier/Lauterburg. The procedure for the implementation of the project has been launched. Regarding the Iffezheim Falls, outline projects are already being planned and preparations have been made for acquiring the land. As regards construction works at the falls, the planning of a general model and a model for the impounded water area has been assigned to the Federal Republic's hydraulics department at Karlsruhe.

In the light of an interim report from the Technical Committee, the Permanent Commission found that the objectives of the contract of 4th July 1969 might perhaps fail to be achieved by lining the bed downstream of the Iffezheim Falls. Governments have been informed of the technical and financial difficulties involved. No definitive decision will be taken until a final report is submitted. Development work is proceeding on other sections of the Upper Rhine.

Deepening of the Rhine channel by 40 cm. in order to improve navigation conditions has continued on the section between Neuburgweier/Lauterburg and St. Goar, with special emphasis on the improvement to the relatively narrow Binger Loch section.

Large-scale works for re-alignment with the 1962 equivalent gauge readings (partly intended to restore the required river depth and channel width) went on between St. Goar and the German-Netherlands frontier.

7. Rhone-Rhine link

Technical studies concerning the whole of the link are proceeding satisfactorily.

On the Rhone-Rhine Canal, the Kembs - Niffer - Mulhouse section is completed. Additional improvements were made in 1971.

On the Saône, the improvements to the Couzon section are completed. Construction of the Charnay Dam and the reconstruction of the Serin bridge at Lyon were both completed in 1971.

On the Rhone the Saint-Vallier Falls lock was brought into service and work began on the Avignon falls.

8. Development of the Rhine between Rheinfelden and Lake Constance

In Switzerland, discussions continued on the measures to be taken to safeguard the alignment of the navigable waterways planned on the Upper Rhine between Rheinfelden and Lake Constance and on the Aar between its confluent with the Rhine and the lowland lakes of the Jura.

9. Rhine-Main-Danube link

The Kleinostheim falls installations on the lower reaches of the Main were brought into service in May 1971. They replaced obsolete installations at three smaller falls.

On the Erlangen-Nuremberg stretch of the Main-Danube Canal, the underground works in hand were mostly completed during 1971 so that it will be possible to open the port of Nuremberg to shipping in September 1972.

Preliminary work on the construction of the southern part of the Nuremberg-Regensburg Canal is proceeding. Work has begun on a number of intersection structures.

10. Development of the Elbe with a link from Hamburg to the waterways network of Western Europe including the Mittellandkanal

The construction of the approximately 115 km. -long Elbe-Seitenkanal continued at a fairly fast pace. Work on more than half of the canal is already at the completion stage. Development work on the Mittellandkanal has continued.

11. Oder-Danube link

No information for the time being.

12. Link between Lake Maggiore and the Adriatic

The construction of the second section (Spinadesco - Cascina Belvedere) of the Milan - Cremona - Po Canal is nearing completion.

Work on the twin-lock at Acquanegra - Cremonese, planned as part of the above Canal, is now under way. Current work on the construction of the Milan - Cremona- Po Canal falls within the scope of the 12th project of Resolution No. 9/1965.

The following information relates to waterways other than the projects listed in Resolution No. 9 of the Council of Ministers.

In Germany development works involving the widening of various sections, the provision of laybys and the reconstruction or conversion of locks are proceeding on the Rhein-Herne, Wesel-Datteln, Datteln-Hamm and Dortmund-Ems canals.

In Belgium work is continuing on the Lys to make it accessible to 1,350 tonne craft. The new Harelbeke Lock is now in service. Improvements to the Deinze-Schipdonk by-pass and the Roulers-Lys and Bossuyt-Courtrai canals are proceeding to schedule. The building of the Hensies Lock on the Mons-Condé Canal is continuing satisfactorily.

On the Canal du Centre, the new Havré Lock is nearly completed. Work is about to begin on the section of this canal between the Havré and Obourg locks to bring it up to standard gauge. The new Zemst lock on the Brussels-Rouppel ship canal will be brought into service at the end of this year.

Development of the Albert Canal to make it accessible to 9,000-tonne pusher convoys continued, and work on the new pusher-convoy locks at Diepenbeek, Hasselt, Kwaadmechelen and Olen is proceeding normally. The widening of certain sections of this canal is completed. A contract has been awarded for the construction of a new lock for push-towed craft at Genk and work has begun.

Work has begun on the new Oelegem-Zandvliet link with the construction of three bridges.

In Austria, work has proceeded on the improvements to the section of the Danube upstream of Vienna in which the navigable channel is to be deepened to 2.5 metres during the low water control period.

The building of the Ottensheim power station is proceeding as planned. In the course of this project, Aschager and Brandstätter Kachlet, which at present impede navigation, will be submerged.

In the Netherlands improvements to the Amsterdam-Rhine Canal, including the building of new locks at Wijk bij Duurstede and Tiel and the replacement of a number of bridges, has proceeded to schedule.

IV. DEVELOPMENTS IN PIPELINE TRANSPORT

Developments in the various countries under review were as follows:

In Germany, no pipelines came into service in 1971 and no pipeline was under construction on 31st December 1971.

No new legislation concerning pipeline transport came into force 1971.

The total length of the pipeline network in operation at the end of 1971 was 2,086 km.

Total throughput amounted to 90.4 million tonnes (18,100 million tonne/km.), of which oil products accounted for only 8.5 million tonnes (1,900 million tonne/km.).

In France the situation was as follows in 1971.*

* Excluding the following coastal refinery pipelines:

- le Havre Gonfreville	-	Lavera Berre
- le Havre Port Jerome	-	Lavera La Méde
- le Havre N.D. de Gravenchon	-	Lavera Fos
- le Havre Petit Couronne	-	Le Verdon Pauilla

THROUGHPUT	CRUDE		OIL PRODUCTS		COMMENTS
	Million tonnes	'000 million tonne/km.	Million tonnes	'000 million tonne/km.	
	Year 1971				
In transit	17.4	13.0	-	-	South Europe pipeline
Internal	31.7	12.7	14.2	2.8	
Total	49.1	25.7	14.2	2.8	
Corresponding figures for 1970 (possibly different from those given last year)					
In transit	19.4	14.5	-	-	
Internal	28.2	10.5	13.3	2.5	
Total	47.6	25.0	13.3	2.5	
Grand Total:	Million tonnes		1971 : 63.3		1970 : 60.9
	'000 million tonne/km.		1971 : 28.5		1970 : 27.5

- Infrastructural development

  20/40 inch pipeline between Fos and Lyon doubling up the South Europe pipeline (crude).

Under construction:

- 20-inch pipeline Port Jérome - Caen (products),
- 20 " " Orly - Poissy (products),
- 16 " " Coignières - Orléans (products),
- 20 " " Lavera - Manosque (crude) additional line,
- 22 " " Caen - May-sur-Orne (products),
- 40 " " Lyon - Strasbourg (new pipeline in addition to the existing 34-inch line),
- 8 " " Saint Auban - Pont-de-Claix (ethylene)

Scheduled to come on stream in 1972 or 1973.

Nothing special to report as regards legislation and regulations.

In Belgium all pipelines under construction during 1970 came on stream in 1971. Pipelines in Belgium totalled 319 km. at the end of 1971.

In Switzerland no new legislation or regulations on pipelines were introduced in in 1971.

By the end of 1971 the Swiss branch of the Marseille - Villette-de-Vienne - St. Julien - Vernier oil products pipeline was under construction. The first tests were made on 21st March 1972 and a temporary operating permit issued on 25th April 1972.

The length of the main pipeline on Swiss territory is 10.4 km. and that of the branch lines 4.8 km.

In Italy the following pipelines were brought into service during 1971:

- Ferrera - Volpiano (crude),
- Ferrera - Bertonico (crude),
- Ferrera - La Casella (products)

Pipelines under construction on 31st December 1971:

- Leghorn - Calenzano (products)
- Cremona - Tavazzano (products)
- Gaeta - Pomezia (products)

No changes were made to regulations affecting oil pipelines during 1971.

In the Netherlands, the pipeline between Rotterdam and the German-Netherlands frontier had a throughput of 25,043,000 tonnes in 1971 compared with 24,500,000 tonnes in 1970, an increase of 2.2%.

In 1971, the 105 km. Rotterdam-Antwerp crude pipeline, of which 71 km. are on Netherlands territory, came on stream.

Pipelines in service at the end of 1971 totalled 476 km.

The total throughput of these oil pipelines amounted to 31,782,000 tonnes (4,600 million tonne/km.). Oil products accounted for only 6,530,000 tonnes out of this figure (1,000 million tonne/km.).

In the United Kingdom the crude pipeline from Tetney to Immingham, 15 miles-long and 22 inch diameter, came on stream in 1971.

On 31st December 1971, the 22-inch, 29 mile-long Mablethore-Immingham gas pipeline was under construction.

There were no changes to pipeline regulations.

In Austria no pipeline came on stream during 1971.

Pipelines in service at the end of 1971 totalled 597 km.

The total throughput of these pipelines amounted to 33.2 million tonnes (5,400 million tonnes/km.).

V. TRENDS IN SEAPORT TRAFFIC

Table 8 gives some particulars on seaport traffic.

Table 1. FREIGHT TRAFFIC CARRIED ON INLAND WATERWAYS

(in '000 tonnes)

COUNTRY	YEAR	INTERNAL TRAFFIC	INTERNATIONAL TRAFFIC		FREIGHT IN TRANSIT	TOTAL TONNAGE CARRIED	TOTAL TONNE/KM. (millions)	TONNE/KM. INDEX (1955=100)
			LOADED	DISCHARGED				
Austria	1955	284	616	1,738	473	3,112	507	100
	1965	765	1,040	3,491	689	5,985	977	193
	1966	722	1,099	4,199	721	6,741	1,055	208
	1967	512	1,094	3,903	915	6,424	1,077	212
	1968	562	1,342	5,298	865	8,067	1,285	253
	1969	684	1,232	4,486	836	7,238	1,194	236
	1970	..	..	..	..	..	..	..
	1971	1,048	837	3,429	902	6,216	1,178	232
Belgium	1955	22,572	15,826	16,441	2,001	56,840	4,617	100
	1965	25,778	18,867	27,806	4,580	77,031	6,087	132
	1966	26,456	19,785	28,865	4,488	79,594	5,970	129
	1967	27,111	20,999	32,601	4,621	85,332	6,262	136
	1968	28,168	22,657	37,644	4,861	93,330	6,649	144
	1969	29,213	20,916	36,926	5,602	92,657	6,870	149
	1970	31,237	20,272	35,638	4,418	91,565	6,734	146
	1971	29,413	21,456	39,096	5,401	95,366	6,729	146
France	1955	40,211	7,752	5,475	4,817	58,255	8,917	100
	1965	58,311	15,129	9,344	6,972	89,756	12,510	140
	1966	59,283	17,082	9,989	7,098	93,452	12,652	142
	1967	61,148	18,284	11,243	6,970	97,645	12,965	145
	1968	62,256	20,601	11,939	6,956	101,752	13,235	148
	1969	68,315	21,882	12,985	7,023	110,205	14,601	164
	1970	66,931	22,183	13,250	7,986	110,350	14,183	159
	1971	64,320	22,596	13,092	6,587	106,595	13,773	154
Germany (Fed. Rep.)	1955	64,418	21,908	31,606	6,680	124,612	28,624	100
	1965	98,180	32,409	57,007	8,098	195,694	43,552	152
	1966	100,313	39,688	58,655	9,238	207,894	44,826	157
	1967	94,576	47,869	62,089	9,905	214,439	45,785	160
	1968	100,077	52,772	69,795	10,683	233,328	47,932	167
	1969	101,069	50,253	71,598	10,870	233,800	47,650	166
	1970	102,388	49,527	75,754	12,284	239,958	48,813	171
	1971	99,365	47,273	73,637	9,706	229,981	44,991	157

Table 1 (continued)

(in '000 tonnes)

COUNTRY	YEAR	INTERNAL TRAFFIC	INTERNATIONAL TRAFFIC		FREIGHT IN TRANSIT	TOTAL TONNAGE CARRIED	TOTAL TONNE/KM. (millions)	TONNE/KM. INDEX (1955=100)
			LOADED	DISCHARGED				
Italy	1955	2,135	-	120	-	2,256	..	..
	1965	2,753	-	24	-	2,777	..	..
	1966	3,149	-	-	-	3,149	..	..
	1967	3,687	-	-	-	3,687	..	..
	1968	4,388	-	-	-	4,388	..	..
	1969	4,296	-	-	-	4,296	273	..
	1970	4,390	-	-	-	4,390	350	..
	1971							
Netherlands	1955	44,426	33,889	20,369	13,589	112,273	15,255	100
	1965	82,229	60,357	28,222	23,184	193,992	24,070	158
	1966	81,015	60,912	32,424	24,617	198,963	25,315	166
	1967	92,654	64,239	39,928	27,369	224,190	28,568	187
	1968	94,800	73,439	44,481	29,497	242,217	31,044	204
	1969	90,500	77,028	43,561	25,913	237,002	30,072	197
	1970	92,666	81,371	42,888	24,520	241,445	30,743	202
	1971	100,855	79,446	41,118	24,043	245,462	30,429	199
Switzerland	1955	2	456	4,131	164	4,753	14	100
	1965	0	661	7,955	211	8,827	40	286
	1966	0	395	8,012	241	8,648	39	279
	1967	4	342	7,595	280	8,221	38	271
	1968	1	320	7,515	284	8,120	39	279
	1969	1	309	7,737	268	8,315	41	293
	1970	1	305	8,645	312	9,263	44	314
	1971	0	277	7,955	319	8,551	45	320
Yugoslavia	1955	2,763	400	122	2,875	6,160	2,106	100
	1965	6,443	849	1,026	4,716	13,034	4,354	207
	1966	7,287	1,143	1,235	5,651	15,307	5,196	247
	1967	7,933	1,106	1,475	4,996	15,510	4,690	223
	1968	9,744	1,308	2,111	5,451	18,614	5,318	253

Table 2. RHINE TRAFFIC AT THE GERMAN-NETHERLANDS FRONTIER EMMERICH/LOBITH

('000 tonnes)

	1970	1971	1971 EN % DE 1970
Upstream			
January	5,337	5,342	100
February	4,518	5,394	119
March	6,093	6,114	100
April	6,478	5,705	88
May	5,845	5,012	86
June	6,426	6,452	100
July	6,628	5,962	90
August	6,014	5,780	96
September	5,422	4,856	90
October	5,887	4,248	72
November	5,399	3,883	72
December	4,539	4,701	104
Year	68,586	63,449	93
Downstream			
January	2,512	2,746	109
February	2,446	3,156	129
March	3,807	3,713	98
April	4,172	3,629	87
May	3,610	3,714	103
June	4,217	4,113	98
July	4,151	3,419	82
August	3,790	3,882	102
September	4,013	3,664	91
October	4,156	3,102	75
November	3,489	2,630	75
December	3,450	3,397	98
Year	43,813	41,165	94

Tableau 2 bis. PUSH-TOW FLEET IN 1971

COUNTRY	DUMB CRAFT		PUSHERS	
	NUMBER	CARRYING CAPACITY ('000 tonnes)	NUMBER	H.P.
Belgium	37	48.0	5	3.8
France	914	674.0	159	119.9
Germany (Fed. Rep.)	193	318.4	30	38.3
Netherlands	194	395.3	52	51.5
Switzerland	40	80.9	-	-

PUSH-TOWED RHINE TRAFFIC AT THE GERMAN-NETHERLANDS FRONTIER, EMMERICH/LOBITH

YEAR	TOTAL TONNAGE CARRIED (million tonnes)	OF WHICH PUSH-TOWED:	
		TONNAGE CARRIED	IN %
1966	88.2	9.1	10.3
1967	99.0	11.2	11.3
1968	109.8	14.3	13.0
1969	109.0	17.2	15.8
1970	112.4	21.7	19.3
1971	104.6	21.4	20.5

Table 3. DEVELOPMENT OF THE FLEET

COUNTRY	AT END OF	SELF-PROPELLED CRAFT			DUMB CRAFT			TOTAL CARGO-CARRYING CRAFT			TUGS AND PUSHERS		
		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		NUMBER	HORSEPOWER	
			TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL	AVERAGE
Austria	1955	2	1.1	559	261	205.7	788	263	206.8	786	35	26.5	757
	1965	12	11.3	943	286	247.6	866	298	258.9	869	41	34.8	848
	1966	15	12.8	988	271	237.8	877	284	250.6	812	36	32.7	907
	1967	21	20.5	974	259	228.9	884	280	249.4	891	39	32.1	822
	1968	22	21.5	977	248	221.9	895	270	243.4	901	36	30.0	833
	1969	..	..	..	..	..	..	..	..	..	..	..	..
	1970	..	..	..	..	..	..	..	..	..	..	..	..
	1971	29	29.6	1,019	194	183.2	944	223	212.8	954	26	23.1	889
Belgium	1955	4,386	1,552.5	347	1,764	879.2	498	6,150	2,401.8	391	225	26.1	116
	1965	5,212	2,294.4	440	689	520.3	755	5,901	2,814.7	477	165	26.3	160
	1966	5,264	2,352.9	447	678	522.3	770	5,942	2,875.2	484	152	23.5	155
	1967	5,247	2,369.6	451	629	494.5	786	5,876	2,864.1	487	153	26.5	173
	1968	5,180	2,354.3	455	587	454.9	775	5,767	2,809.2	487	95	19.9	210
	1969	5,047	2,324.7	461	516	406.3	787	5,563	2,731.1	491	91	16.3	179
	1970	4,843	2,244.3	463	455	370.4	814	5,298	2,614.7	494	247	40.3	164
	1971	4,683	2,216.4	473	382	281.2	736	5,065	2,497.6	493	211	36.0	171
France	1955	3,925	1,396.7	356	6,506	2,378.1	366	10,431	3,774.8	362	429	135.0	315
	1965	5,961	2,211.5	371	3,727	1,401.4	376	9,688	3,612.9	373	520	164.1	316
	1966	5,981	2,230.3	373	3,018	1,202.7	399	8,999	3,433.0	381	521	161.8	311
	1967	5,784	2,190.5	379	1,992	978.2	491	7,776	3,168.7	407	199	103.6	521
	1968	5,677	2,158.7	380	1,855	939.7	507	7,532	3,098.4	411	190	103.7	546
	1969	5,570	2,122.7	381	1,639	871.8	532	7,209	2,994.5	415	197	111.4	565
	1970	5,583	2,124.3	380	1,591	869.8	547	7,174	2,994.1	417	207	119.9	579
	1971	5,536	2,109.5	381	1,552	909.0	586	7,088	3,018.5	426	222	135.4	610
Germany (F R.)	1955	3,094	1,363.9	441	3,614	2,650.6	733	6,708	4,014.5	598	834	319.1	383
	1965	5,681	3,404.8	599	1,836	1,540.9	839	7,517	4,945.7	658	687	261.4	380
	1966	5,662	3,432.9	606	1,726	1,452.6	842	7,388	4,885.5	661	610	222.1	364
	1967	5,614	3,416.8	608	1,558	1,292.9	830	7,172	4,709.7	657	582	220.9	380
	1968	5,586	3,431.5	614	1,480	1,252.9	847	7,066	4,684.4	663	529	199.5	377
	1969	5,442	3,449.9	634	1,323	1,177.2	890	6,765	4,627.1	684	469	187.4	400
	1970	5,190	3,447.8	664	1,146	1,076.2	939	6,336	4,524.0	714	448	183.3	409
	1971	4,772	3,429.8	719	1,051	1,063.6	1,012	5,823	4,493.4	772	425	193.6	456

Table 3 (continued)

COUNTRY	AT END OF	SELF-PROPELLED CRAFT			DUMB CRAFT			TOTAL CARGO-CARRYING CRAFT			TUGS AND PUSHERS		
		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		NUMBER	HORSEPOWER	
			TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL	AVERAGE
Italy	1955	353	36.8	104	1,256	102.7	82	1,609	139.5	87	80	6.3	79
	1965	645	60.6	94	2,177	98.7	45	2,822	159.3	56	123	8.2	67
	1966	607	58.7	97	2,155	98.4	46	2,762	157.1	57	122	8.3	68
Netherlands	1968	8,525	3,290.8	386	1,721	1,673.4	972	10,246	4,964.2	485	2,224	450.1	202
	1969	8,214	3,289.4	400	1,670	1,659.2	994	9,884	4,948.7	501	2,232	456.8	205
	1970	7,807	3,296.7	422	1,523	1,600.1	1,051	9,330	4,896.8	525	2,078	440.3	212
	1971	7,598	3,453.6	455	1,419	1,651.3	1,164	9,017	5,104.8	566	2,100	458.6	218
Switzerland	1955	274	203.9	744	64	63.6	994	338	267.5	792	19	24.8	1,305
	1965	371	337.5	910	87	115.8	1,331	458	453.3	990	21	30.7	1,463
	1966	370	338.8	916	88	118.2	1,343	458	457.0	998	21	28.6	1,360
	1967	359	340.5	948	96	126.9	1,322	455	467.4	1,027	21	27.3	1,302
	1968	355	342.4	965	90	117.8	1,309	445	460.2	1,034	18	23.4	1,303
	1969	326	322.4	990	82[1]	106.7	1,300	408	429.0	1,052	15[2]	20.4	1,362
	1970	333	334.2	1,001	82	116.5	1,421	415	450.7	1,085	14[3]	17.1	1,219
	1971	362	373.7	1,032	90	147.3	1,636	452	521.0	1,153	13	7.6	582
Yugoslavia	1955	18	5.1	285	726	302.3	416	744	307.5	413	145	34.7	239
	1965	20	6.4	319	729	480.8	660	749	487.2	650	240	72.1	300
	1966	20	6.4	319	751	505.0	672	771	511.4	663	231	65.8	285
	1967	20	5.4	268	766	506.1	661	786	511.5	651	247	82.7	338

1. Including 11 push-towed barges
2. No pushers.
3. Including 2 pushers.

Table 4. CRAFT IN SERVICE, CLASSIFIED BY AGE GROUPS, AT END 1971

COUNTRY	SELF-PROPELLED CRAFT				DUMB CRAFT				TOTAL CARGO-CARRYING CRAFT				TUGS			
	NUMBER	%	CAPACITY	%	NUMBER	%	CAPACITY	%	NUMBER	%	CAPACITY	%	NUMBER	%	HORSEPOWER	%
Austria																
Before 1900	1	3.4	0.3	1.0	14	7.2	8.6	4.7	15	6.7	8.9	4.2	-	-	-	-
1900-1909	-	-	-	-	10	5.2	6.5	3.5	10	4.5	6.5	3.0	1	3.8	0.3	1.3
1910-1919	-	-	-	-	8	4.1	5.5	3.0	8	3.6	5.5	2.6	1	3.8	1.3	5.6
1920-1929	1	3.4	0.7	2.4	18	9.3	13.7	7.5	19	8.5	14.4	6.8	1	3.8	0.4	1.7
1930-1939	-	-	-	-	3	1.5	3.0	1.6	3	1.4	3.0	1.4	2	7.7	0.4	1.7
1940-1949	-	-	-	-	52	26.8	51.3	28.0	52	23.3	51.3	24.1	5	19.3	6.4	27.6
1950-1959	8	27.5	6.8	23.0	57	29.4	55.9	30.5	65	29.2	62.7	29.4	5	19.3	4.0	17.3
1960-1969	15	51.7	17.2	58.3	31	16.0	37.9	20.7	46	20.6	55.1	25.9	11	42.3	10.4	44.8
1970 and later	4	14.0	4.5	15.3	1	0.5	1.0	0.5	5	2.2	5.5	2.6	-	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	29	100	29.5	100	194	100	183.4	100	223	100	212.9	100	26	100	23.2	100
Belgium																
Before 1900	178	3.8	80.4	3.6	34	8.9	24.9	8.9	212	4.2	105.3	4.2	5	2.4	1.1	3.4
1900-1909	416	8.9	194.3	8.8	87	22.8	83.7	29.8	503	9.9	278.0	11.1	13	6.3	2.0	6.2
1910-1919	528	11.3	206.5	9.3	104	27.2	69.1	24.6	632	12.5	275.6	11.0	30	14.6	5.0	15.5
1920-1929	1,129	24.1	503.8	22.7	97	25.4	65.0	23.1	1,226	24.2	568.8	22.8	25	12.1	4.5	14.0
1930-1939	695	14.8	282.7	12.8	39	10.2	17.7	6.3	734	14.5	300.4	12.0	46	22.3	5.6	17.4
1940-1949	370	7.9	165.8	7.5	13	3.4	10.0	3.5	383	7.6	175.8	7.0	24	11.7	4.5	14.0
1950-1959	705	15.0	334.7	15.1	8	2.1	10.8	3.8	713	14.1	345.5	13.9	15	7.3	2.8	8.7
1960-1969	633	13.5	424.6	19.1	-	-	-	-	633	12.5	424.6	17.0	9	4.4	1.3	4.0
1970 and later	17	0.4	22.0	1.0	-	-	-	-	17	0.3	22.0	0.9	-	-	-	-
Unknown	12	0.3	1.6	0.1	-	-	-	-	12	0.2	1.6	0.1	39	18.9	5.4	16.8
Total	4,683	100	2,216.4	100	382	100	281.2	100	5,065	100	2,497.6	100	206	100	32.2	100
France																
Before 1910	282	5.1	89.1	4.2	77	5.0	31.0	3.4	359	5.1	120.1	4.0	9	14.3	1.9	12.3
1910-1919	185	3.4	59.4	2.8	62	4.0	33.7	3.7	247	3.5	93.1	3.1	4	6.4	1.2	7.7
1920-1929	1,160	21.0	401.2	19.0	323	20.8	122.8	13.5	1,483	20.9	524.0	17.4	13	20.6	3.2	20.7
1930-1939	1,237	22.3	439.9	20.9	238	15.3	93.2	10.3	1,475	20.8	533.1	17.6	21	33.3	5.8	37.4
1940-1949	607	11.0	256.9	12.2	53	3.4	17.8	2.0	660	9.3	274.7	9.1	6	9.5	1.3	8.4
1950-1959	1,624	29.3	688.9	32.7	266	17.2	134.0	14.7	1,890	26.7	822.9	27.2	4	6.4	1.4	9.0
1960-1969	384	6.9	153.8	7.3	466	30.0	400.0	44.0	850	12.0	553.8	18.4	-	-	-	-
1970 and later	2	0.0	0.6	0.0	57	3.7	70.5	7.7	59	0.8	71.1	2.3	-	-	-	-
Unknown	55	1.0	19.7	0.9	10	0.6	6.0	0.7	65	0.9	25.7	0.9	6	9.5	0.7	4.5
Total	5,536	100	2,109.5	100	1,552	100	909.0	100	7,088	100	3,018.5	100	63	100	15.5	100

Table 4 (continued)

COUNTRY	SELF-PROPELLED CRAFT				DUMB CRAFT				TOTAL CARGO-CARRYING CRAFT				TUGS			
	NUMBER	%	CAPACITY	%	NUMBER	%	CAPACITY	%	NUMBER	%	CAPACITY	%	NUMBER	%	HORSEPOWER	%
Germany (Fed. Rep.)																
Before 1900	515	10.8	292.8	0.5	161	15.3	139.4	13.1	676	11.6	432.2	9.6	40	9.4	14.4	
1900-1909	685	14.4	337.6	9.8	186	17.7	150.4	14.1	871	15.0	488.0	10.9	59	13.9	21.6	
1910-1919	544	11.4	271.1	7.9	153	14.5	111.8	10.5	697	12.0	382.9	8.5	36	8.5	15.0	
1920-1929	727	15.2	462.8	13.5	173	16.5	171.5	16.1	900	15.4	634.3	14.1	74	17.4	28.9	
1930-1939	425	8.9	257.1	7.5	48	4.6	32.7	3.1	473	8.1	289.8	6.4	71	16.7	21.1	
1940-1949	269	5.6	221.8	6.5	61	5.8	59.7	5.6	330	5.7	281.5	6.3	49	11.5	22.1	
1950-1959	956	20.0	874.1	25.5	56	5.3	46.3	4.4	1,012	17.4	920.4	20.5	47	11.1	23.2	
1960-1969	508	10.7	513.9	15.0	123	11.7	189.2	17.8	631	10.8	703.1	15.7	31	7.3	25.9	
1970 and later	143	3.0	198.7	5.8	90	8.6	162.6	15.3	233	4.0	361.3	8.0	18	4.2	21.4	
Unknown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	4,772	100	3,429.9	100	1,051	100	1,063.6	100	5,823	100	4,493.5	100	425	100	193,6	
Italy																
Before 1900																
1900-1909																
1910-1919																
1920-1929																
1930-1939																
1940-1949																
1950-1959																
1960-1969																
1970 and later																
Netherlands																
Before 1900	473	6.2	148.7	4.3	114	8.0	93.6	5.7	587	6.5	242.3	4.8	25	1.2	4.9	1.2
1900-1909	1,068	14.0	346.6	10.0	283	20.0	260.9	15.8	1,351	15.0	607.4	11.9	111	5.4	21.9	5.2
1910-1919	1,101	14.5	371.0	10.7	237	16.7	240.8	14.6	1,338	14.8	611.9	12.0	214	10.4	35.2	8.6
1920-1929	1,830	24.1	679.9	19.7	375	26.4	423.7	25.6	2,205	24.5	1,103.6	21.6	406	19.8	78.4	19.2
1930-1939	862	11.3	347.2	10.1	99	7.0	124.8	7.5	961	10.7	472.0	9.3	331	16.2	51.2	12.6
1940-1949	310	4.1	179.2	5.2	20	1.4	20.8	1.3	330	3.7	200.0	3.9	295	14.4	69.9	17.2
1950-1959	879	11.6	552.6	16.0	60	4.2	77.0	4.7	939	10.4	629.6	12.3	364	17.8	82.1	20.2
1960-1969	1,009	13.3	754.4	21.8	154	10.9	262.1	15.9	1,163	12.9	1,016.4	19.9	165	8.1	44.0	10.8
1970 and later	45	0.6	64.9	1.9	58	4.1	144.6	8.7	103	1.1	209.4	4.1	24	1.2	9.3	2.3
Unknown	21	0.3	9.1	0.3	19	1.3	3.0	0.2	40	0.4	12.1	0.2	113	5.5	11.0	2.7
Total	7,598	100	3,453.6	100	1,419	100	1,651.3	100	9,017	100	5,104.7	100	2,048	100	407.1	100

Table 4 (continued)

COUNTRY	SELF-PROPELLED CRAFT				DUMB CRAFT				TOTAL CARGO-CARRYING CRAFT				TUGS			
	NUMBER	%	CAPACITY	%	NUMBER	%	CAPACITY	%	NUMBER	%	CAPACITY	%	NUMBER	%	HORSEPOWER	%
Switzerland																
Before 1900	1	0.3	0.5	0.1	6	6.7	6.8	4.6	7	1.5	7.3	1.4	1	7.7	0.8	
1900-1909	1	0.3	0.7	0.2	3	3.3	4.3	2.9	4	0.8	5.0	0.9	3	23.1	2.3	
1910-1919	4	1.1	4.2	1.1	6	6.7	10.0	6.8	10	2.2	14.2	2.7	-	-	-	
1920-1929	37	10.4	32.4	8.6	24	26.7	31.9	21.6	61	13.5	64.2	12.5	3	23.1	2.0	
1930-1939	47	13.0	34.5	9.1	-	-	-	-	47	10.4	34.5	6.6	1	7.7	0.7	
1940-1949	81	22.3	78.6	21.2	9	10.0	10.1	6.8	90	20.0	88.7	17.0	1	7.7	0.3	
1950-1959	132	36.3	143.7	38.4	3	3.3	5.0	3.4	135	29.9	148.7	28.4	2	15.4	1.1	
1960-1969	40	11.1	45.1	12.2	24	26.7	38.7	26.3	64	14.2	83.8	16.1	2	15.4	0.4	
1970 and later	19	5.2	34.1	9.1	15	16.6	40.6	27.6	34	7.5	74.7	14.4	-	-	-	
Unknown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	362	100	373.7	100	90	100	147.3	100	452	100	521.0	100	13	100	7.6	
Yugoslavia																
Before 1900																
1900-1909																
1910-1919																
1920-1929																
1930-1939																
1940-1949																
1950-1959																
1960-1969																
1970 and later																

Table 5. NUMBER OF CRAFT, BROKEN DOWN BY CARGO CAPACITY, AT END OF 1971

COUNTRY	CLASS	SELF-PROPELLED CRAFT			DUMB CRAFT			TOTAL CARGO-CARRYING CRAFT			TUGS AND PUSHERS			
		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		TYPE	NUMBER	HORSEPOWER	
			TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes			TOTAL	AVERAGE
Austria														
Up to 250 t	0	-	-	-	-	-	-	-	-	-				
From 251 to 400 t	I	2	0.7	350	-	-	-	2	0.7	350				
" 401 to 650 t	II	-	-	-	9	4.9	544	9	4.9	544				
" 651 to 1,000 t	III	10	9.1	910	140	125.0	893	150	134.1	894				
" 1,001 to 1,500 t	IV	17	19.9	1,171	45	53.3	1,184	62	73.2	1,181				
Over 1,500 t	V	-	-	-	-	-	-	-	-	-				
Total		29	29.7	1,024	194	183.2	944	223	212.9	955				
Belgium														
Up to 250 t	0													
From 251 to 400 t	I													
" 401 to 650 t	II													
" 651 to 1,000 t	III													
" 1,001 to 1,500 t	IV													
Over 1,500 t	V													
Total														
France														
Up to 250 t	0	266	48.1	181	181	24.9	138	447	73.0	163				
From 251 to 400 t	I	4,382	1,565.2	357	546	188.2	345	4,928	1,753.4	356				
" 401 to 650 t	II	661	296.4	448	445	201.2	452	1,106	497.6	450				
" 651 to 1,000 t	III	214	182.3	852	167	128.7	771	381	311.0	816				
" 1,001 to 1,500 t	IV	10	11.7	1,170	57	68.8	1,207	67	80.5	1,201				
Over 1,500 t	V	3	5.8	1,933	156	297.2	1,905	159	303.0	1,906				
Total		5,536	2,109.5	381	1,552	909.0	586	7,088	3,018.5	426				
Germany (Fed. Rep.)														
Up to 250 t	0	636	87.3	137	119	16.3	137	755	103.6	137				
From 251 to 400 t	I	661	216.0	327	78	25.3	324	739	241.3	327				
" 401 to 650 t	II	885	441.3	516	156	81.3	521	1,011	522.6	517				
" 651 to 1,000 t	III	1,428	1,195.8	837	265	224.6	848	1,693	1,420.4	839				
" 1,001 to 1,500 t	IV	1,115	1,360.5	1,220	242	318.6	1,317	1,357	1,679.1	1,237				
Over 1,500 t	V	77	128.9	1,674	191	397.5	2,081	268	526.4	1,964				
Total		4,772	3,429.8	719	1,051	1,063.6	1,012	5,823	4,493.4	772				

Table 5 (continued)

COUNTRY	CLASS	SELF-PROPELLED CRAFT			DUMB CRAFT			TOTAL CARGO-CARRYING CRAFT			TUGS AND PUSHERS			
		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		TYPE	NUMBER	HORSEPOWER	
			TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes			TOTAL	AVERAGE
Italy														
Up to 250 t	0													
From 251 to 400 t	I													
" 401 to 650 t	II													
" 651 to 1,000 t	III													
" 1,001 to 1,500 t	IV													
Over 1,500 t	V													
Total														
Netherlands														
Up to 250 t	0	2,139	344.9	161	131	15.5	118	2,270	360.4	159				
From 251 to 400 t	I	2,202	723.6	329	77	25.2	326	2,279	748.8	329				
" 401 to 650 t	II	1,794	928.8	518	234	122.5	524	2,028	1,051.3	518				
" 651 to 1,000 t	III	1,022	840.6	823	248	211.1	851	1,270	1,051.7	828				
" 1,001 to 1,500 t	IV	347	432.0	1,245	348	456.0	1,310	695	888.0	1,278				
Over 1,500 t	V	94	183.6	1,953	381	820.9	2,155	475	1,004.5	2,115				
Total		7,598	3,453.6	455	1,419	1,651.3	1,164	9,017	5,104.8	566				
Switzerland														
Up to 250 t	0	1	186	186	-	-	-	1	186	186				
From 251 to 400 t	I	8	2,495	312	-	-	-	8	2,495	312				
" 401 to 650 t	II	23		589	-	-	-	23	13,400	589				
" 651 to 1,000 t	III	176		855	23	22,189	964	199	172,704	868				
" 1,001 to 1,500 t	IV	120		1,227	31	40,980	1,320	151	188,243	1,247				
Over 1,500 t	V	34		1,761	36	84,081	2,336	70	143,967	2,057				
Total		362		1,032	90	147,250	1,636	452	520,995	1,153				
Yugoslavia														
Up to 250 t	0													
From 251 to 400 t	I													
" 401 to 650 t	II													
" 651 to 1,000 t	III													
" 1,001 to 1,500 t	IV													
Over 1,500 t	V													
Total														

Table 6. NEW CRAFT BROUGHT INTO SERVICE DURING 1971

COUNTRY	CLASS	SELF-PROPELLED CRAFT			DUMB CRAFT			TOTAL CARGO-CARRYING CRAFT			TUGS AND PUSHERS			
		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		TYPE	NUMBER	HORSEPOWER	
			TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes			TOTAL	AVERAGE
Austria														
Up to 250 t	0	-	-	-	-	-	-	-	-	-				
From 251 to 400 t	I	-	-	-	-	-	-	-	-	-				
" 401 to 650 t	II	-	-	-	-	-	-	-	-	-				
" 651 to 1,000 t	III	-	-	-	1	0.7	700	1	0.7	700				
" 1,001 to 1,500 t	IV	2	2.1	1,050	-	-	-	2	2.1	1,050				
Over 1,500 t	V	-	-	-	-	-	-	-	-	-				
Total		2	2.1	1,050	1	0.7	700	3	2.8	933				
Belgium														
Up to 250 t	0													
From 251 to 400 t	I													
" 401 to 650 t	II													
" 651 to 1,000 t	III													
" 1,001 to 1,500 t	IV													
Over 1,500 t	V													
Total														
France[1]														
Up to 250 t	0	11	1.7	155	14	2.5	179	25	4.2	168				
From 251 to 400 t	I	31	11.0	355	40	13.7	343	71	24.7	348				
" 401 to 650 t	II	6	3.1	517	36	16.0	444	42	19.1	455				
" 651 to 1,000 t	III	3	2.5	833	14	11.3	807	17	13.8	812				
" 1,001 to 1,500 t	IV	1	1.1	1,100	20	25.5	1,275	21	26.6	1,267				
Over 1,500 t	V	-	-	-	15	37.2	2,480	15	37.2	2,480				
Total		52	19.4	373	139	106.2	764	191	125.6	658				
Germany (Fed. Rep.)														
Up to 250 t	0	5	0.8	160	2	0.2	100	7	1.0	143				
From 251 to 400 t	I	4	1.2	300	3	0.9	300	7	2.1	300				
" 401 to 650 t	II	8	4.0	500	28	12.6	450	36	16.6	461				
" 651 to 1,000 t	III	11	10.0	909	11	9.7	882	22	19.7	895				
" 1,001 to 1,500 t	IV	88	117.4	1,334	7	8.7	1,243	95	126.1	1,327				
Over 1,500 t	V	32	56.8	1,775	49	112.0	2,286	81	168.8	2,084				
Total		148	190.2	1,285	100	144.1	1,441	248	334.3	1,348				

1. New and second-hand craft.

Table 6 (continued)

COUNTRY	CLASS	SELF-PROPELLED CRAFT			DUMB CRAFT			TOTAL CARGO-CARRYING CRAFT			TUGS AND PUSHERS			
		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		NUMBER	CARGO CAPACITY		TYPE	NUMBER	HORSEPOWER	
			TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes		TOTAL '000 tonnes	AVERAGE Tonnes			TOTAL	AVERAGE
Italy														
Up to 250 t	0													
From 251 to 400 t	I													
" 401 to 650 t	II													
" 651 to 1,000 t	III													
" 1,001 to 1,500 t	IV													
Over 1,500 t	V													
Total														
Netherlands														
Up to 250 t	0	15	1.9	127	18	1.7	94	33	3.6	109				
From 251 to 400 t	I	28	9.6	343	16	4.7	294	44	14.3	325				
" 401 to 650 t	II	32	17.3	541	9	4.8	533	41	22.1	539				
" 651 to 1,000 t	III	53	44.5	840	6	4.6	767	59	49.1	832				
" 1,001 to 1,500 t	IV	16	18.9	1,181	6	7.7	1,283	22	26.6	1,209				
Over 1,500 t	V	22	48.2	2,191	54	136.7	2,531	76	184.9	2,433				
Total		166	140.4	846	109	160.2	1,470	275	300.6	1,093				
Switzerland														
Up to 250 t	0	-	-	-	-	-	-	-	-	-				
From 251 to 400 t	I	-	-	-	-	-	-	-	-	-				
" 401 to 650 t	II	2	0.9	439	-	-	-	2	0.9	439				
" 651 to 1,000 t	III	18	14.2	789	1	0.8	826	19	15.0	790				
" 1,001 to 1,500 t	IV	13	16.8	1,292	3	3.6	1,190	16	20.4	1,275				
Over 1,500 t	V	12	23.0	1,917	16	42.6	2,660	28	65.6	2,350				
Total		45	54.9	1,220	20	47.0	2,350	65	101.9	1,575				
Yugoslavie														
Up to 250 t	0													
From 251 to 400 t	I													
" 401 to 650 t	II													
" 651 to 1,000 t	III													
" 1,001 to 1,500 t	IV													
Over 1,500 t														
Total														

Table 7. PIPELINES
LENGTH OF PIPELINES IN OPERATION AT END OF YEAR

	KM.			
	1968	1969	1970	1971
Belgium	..	50	50	..
France	3,003	3,407	3,533	3,820
Germany (Fed. Rep.)	1,571	1,571	2,058	2,086
Netherlands	323	323	408	476
Spain	267	267	267	..
Switzerland	222	222	222	319
United Kingdom	1,513	1,577	1,777	1,898

Table 8. TRAFFIC AT MAJOR SEAPORTS

	TRAFFIC 1970 (million tonnes)	TRAFFIC 1971 (million tonnes)	PERCENTAGE CHANGE
Belgium (all seaports combined)	96,837	91,379	- 5.6
of which : Antwerp	78,133	72,250	- 7.5
France (all seaports combined)	219,335	228,693	+ 4.3
of which : Marseilles and annexes	74,073	75,517	+ 1.9
Le Havre	57,991	59,774	+ 3.0
Dunkirk	25,387	25,393	- 0.1
Germany (Fed. Rep.) (all seaports combined)	141,169	136,073	- 3.6
of which : Hamburg	49,960	45,302	- 3.5
Bremen	23,381	22,637	- 3.2
Wilhelmshaven	22,331	23,519	+ 5.3
Italy	325,473	..	..
Netherlands	264,392	272,883	+ 3.2
of which : Rotterdam	218,657	225,161	+ 3.0
Amsterdam	21,356	23,438	+ 9.7
United Kingdom	346,613	..	..
of which : London	56,139	..	..
Liverpool	28,851	..	..
Milford Haven	40,637	..	..

Annexes

1. LIST OF OFFICERS OF THE ECMT
OFFICERS OF THE COUNCIL OF MINISTERS

In accordance with the provision of Article 1 a) of the Rules of Procedure, the Council of Ministers, at its session of 8th December 1972, elected the following Officers:

Chairmanship (Netherlands)

Mr. KRUISINGA, Secretary of State for Transport and Water Control

First Vice-Chairmanship (Austria)

Mr. FRÜHBAUER, Federal Minister of Transport

Second Vice-Chairmanship (Denmark)

Mr. KAMPMANN, Minister of Public Works.

OFFICERS OF THE COMMITTEE OF DEPUTIES

In application of Article 3 of the Rules of Procedure, the Officers of the Committee are the following:

Chairmanship (Netherlands)

Mr. Van der NOORDT, Director of International Transport,
Ministry of Transport and Water Control

First Vice-Chairmanship (Austria)

Mr. FISCHER, Director-General, Federal Ministry of Transport

Second Vice-Chairmanship (Denmark)

Mr. HALCK, General Secretary, Ministry of Public Works.

2. LIST OF DELEGATES AT THE LONDON AND PARIS CONFERENCES

AUSTRIA

Mr. FRÜHBAUER, Federal Minister of Transport

Mr. FISCHER, Director General (Deputy to the Federal Minister of Transport)

Mr. KNAPPL, Management Adviser, Federal Ministry of Transport

Mr. KORHERR, Private Secretary to the Minister

Mr. METZNER, Ministerial Consellor (Deputy to the Minister of Trade and Industry)

Mr. JAGODA,* Director General, Federal Ministry of Trade and Industry

BELGIUM

Mr. DELMOTTE, Minister of Communications

Mr. VREBOS, Secretary General, Ministry of Communications (Deputy to the Minister)

Mr. POPPE, Administrative Director

Mr. VANDERPERREN,* Director

Mr. BURTON,* Head of the Private Office of the Minister of Communications

Mr. SINNAEVE,** Consellor, Ministry of Communications

Miss FLAMENT,* Private Secretary to the Minister

DENMARK

Mr. KAMPMANN,* Minister of Public Works

Mr. CHRISTENSEN, Secretary General (Deputy to the Minister of Public Works)

Mr. ALSØE, Head of Section

Mr. STORM,* Deputy Head of Section

Mr. FRYD,* Private Secretary to the Minister

FRANCE

Mr. CHAMAND,* Minister of Transport

Mr. GALLEY,** Minister of Transport

Mr. DEBAYLES, Chief Highways Engineer, in charge of International Relations Office (Deputy to the Minister)

* London Session.

** Paris Session.

FRANCE (continued)

Mr. CARON,* Technical Adviser to the Minister

Mr. KOSCIUSKO-MORIZET,** Private Office of the Minister Regional Planning

Mr. BILLET, Inspector General

Mr. GAUTHIER, Administrative Officer

Miss FRIBAUD, Administrative Officer, Road Directorate

Mr. PERRIN,* Mining Engineer, General-Secretariat for Economic Co-operation

Mr. GABARRA,* Consellor, Ministry of Foreign Affairs

GERMANY

Mr. WITTROCK, Secretary of State

Mr. NEUPERT, Ministerial Director (Deputy to the Federal Minister of Transport)

Mr. LINDER, Ministerial Director

Mr. WOELKER,* Ministerial Director

Mr. NAEFE,* Ministerial Consellor

Mr. HOCH,** Ministerial Consellor

Mr. HOFMANN, Administrative Director

Mr. NEUMANN,* First Secretary, Federal Republic of Germany, Embassy in London

Mr. STRUVE,** Consellor, German Delegation to OECD

Mr. GOETZEN,** German Delegation to OECD

GREECE

Mr. YAKAS, Minister for Merchant Shipping, Transport and Communications

Mr. LIONTAS, Consellor, Greek Delegation to OECD (Deputy to the Minister of Communications)

Mr. CHRISTIDIS,** Director, Ministry of Merchant Shipping, Transport and Communications

IRELAND

Mr. LENIHAN,* Minister for Transport and Power

Mr. O'RIORDAN, Secretary General, Department of Transport and Power (Deputy to the Minister)

Mr. O'DOHERTY, Assistant Secretary (Roads) Department of Local Government

* London Session.

** Paris Session.

ITALY

Mr. GIGLIA,** Under-Secretary of State

Mr. DOMINICI, Director-General of Co-ordination and General Affairs (Deputy to the Minister of Transport)

Mr. TRIGGIANI,* Deputy-Head, Private Office of the Minister of Transport

Mr. FENELLI, Inspector General, Ministry of Transport

Mr. AMERIO,** Inspector General

Mr. ROSSINI, Chief Inspector

LUXEMBOURG

Mr. MART, Minister of Transport and National Economic Affairs

Mr. LOGELIN, Government Consellor (Deputy to the Minister)

Mr. BLEY,* Principal Inspector, Ministry of Transport.

NETHERLANDS

Mr. KRUISINGA, Secretary of State for Transport and Water control

Mr. VAN DER NOORDT, Director of International Transport, Ministry of Transport and Waterways (Deputy of the Minister of Transport)

Mr. HOOGHOUDT,* Head of Division, Ministry of Transport

Mr. KALHORN,* Deputy Head of Division

Mr. VAN REES, Consellor

Mr. NIEUWENHUIJSEN,* Transport Adviser to the Ministry of Foreign Affairs

Mr. GLAZENBURG,** Consellor

Mr. OKKEN,** Consellor

Mr. HALFF,** Consellor to the Ministry of Foreign Affairs

Mr. RIJSDIJK,** Press Information Office

NORWAY

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Mr. RIBU,** Secretary-General, Ministry of Transport

Mr. HAUKVIK, Director-General, (Deputy to the Minister of Transport)

PORTUGAL

Mr. de OLIVEIRA MARTINS, Secretary of State for Communications and Transport

Mr. CORREIA, Director-General of Land Transport (Deputy to the Minister of Communications)

Mr. FERNANDES, Director-General of Road Traffic

Mr. AIRES,* Deputy Director General for Land Transport

Mr. MURTEIRA,** Administrative Officer, Portuguese Railways

Mr. COSTA, Head of the Private Office of the Secretary of State

* London Session.

** Paris Session.

SPAIN

Mr. FERNANDEZ DE LA MORA, Minister of Public Works

Mr. SANTOS-REIN, General Director of Land Transport (Deputy to the Minister)

Mr. MARTINEZ-CATENA,* Deputy General-Director of Land Transport

Mr. HERNANDO,** Head of Division, Land Transport Directorate

Mr. IMEDIO, Economist, High Council for Land Transport

SWEDEN

Mr. HASSLEV, Under-Secretary of State (Deputy to the Minister of Communications)

Mr. VOSS, Head of Department, International Affairs, Ministry of Communications

Mr. ORRSTEN, Head of Section, Ministry of Communications

SWITZERLAND

Mr. ISLIKER,** Deputy-Director, Federal Transport Department

Mr. JORDANIS, Head of the International Organisations Office (Deputy to the Minister of Transport, Communications and Power)

Mr. MESSERLI, Deputy-Director, Federal Police Division

TURKEY

Mr. DANISMAN, Minister of Communications

Mr. ÖZDEDE, Consellor, Ministry of Communications (Deputy to the Minister)

Mr. TÜZEL,* Head of the Private Office of the Minister

Mr. SARP,** Director-General, Turkish Railways (TCDD)

Mr. KUYAS,** Head of the Private Office of the Minister

Mme CARKACI,** Finance Adviser, Turkish Delegation to OECD

UNITED KINGDOM

The Right Honourable J. PEYTON, Minister for Transport Industries

Mr. DICKINSON, Under-Secretary, Department of the Environment (Deputy to the Minister)

Mr. HILL, Assistant Secretary, Head of the International Transport Division

Mr. BAXTER,* Assistant Secretary

Mr. PITTAM, "Principal" International Transport Division

Mr. OWEN,* Assistant Private Secretary to the Minister

* London Session.

** Paris Session.

YUGOSLAVIA

Mr. POPOV, Federal Secretary for Communications and Transport

Mr. FRANGES, Ambassador, Head of the Yugoslav Delegation to OECD

Mr. JANKOVIC, Consellor (Deputy to the Federal Secretary for Communications and Transport)

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Mr. LEROY F. PERCIVAL Jr.,* Consellor, United States Delegation to OECD

Mr. ROGERS,** Consellor, United States Delegation to OECD

CANADA (Observer)

Mr. LAVER,** Consellor, Canadian Delegation to OECD

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Mr. HAMADA,* Head of Transport Policy Division, Private Office of the Minister, Ministry of Transport Tokyo

Mr. TAKEISHI,** Senior Policy Planning Officer, Ministry of Transport Tokyo

Mr. INUI,* First Secretary, Japanese Delegation to OECD

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