COMMISSION OF THE EUROPEAN COMMUNITIES

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REPORT ON BOTTLENECKS AND POSSIBLE MODES OF FINANCE

(presented by the Commission to the Council)

Report on bottlenecks and possible modes of finance

1. PRESENTATION

1.1. At its meeting on 23 November 1978, the Council called on the Commission to submit a report before 1 January 1980 on bottlenecks in transport infrastructures and possible modes of finance.

At this meeting the Council was discussing the proposal for a Regulation on the financing of transport infrastructure projects of Community interest.

The Council's request is explained in paragraphs 2.1. and 2.2.

The problems brought up by the drafting of the report are set out in paragraphs 3 to 3.4. The positions of the Member States, as expressed in the Transport Infrastructure Committee, and the resulting delay in presenting the report are explained in paragraph 3.5.

1.2. The survey of bottlenecks should provide the Council with an overall view of the infrastructure inadequacies of Community communications from which to judge the appropriateness of taking certain steps proposed by the Commission.

The standardization of criteria for identifying bottlenecks, which was the original intention, ran into difficulties in practice (para. 3.1.). In view of the fact that the bottleneck is not always an easy indicator to handle, particularly as regards certain transport modes, many Member States went beyond the phase of identifying bottlenecks to the more advanced phase of presenting projects.

Although the contributions of the Member States are not completely identical, the Commission nevertheless takes the view that they fit perfectly well into the work schedule wanted by the Council (para. 4.2.). Thanks to the cooperation of the Member States, it was possible to form an accurate picture of the main shortcomings of the networks affecting the progress of traffic and in many cases to acquire information on the investment measures which the Member States think necessary to deal with them.

1.3. The question was raised of selecting only the bottlenecks of Community importance (para. 3.2.).
The selection was made pragmatically by limiting the geographic scope of the report to basic network links of Community significance (para. 3.3.). Obviously, this selection is not immutable. The possibility of amending or supplementing it will have to be explored in the future, in particular in the light of the outcome of forward studies.
It is presumed that the bottlenecks and the projects intended to deal with them, which are located on these links, are of Community significance. This presumption of Community significance does not anticipate the extent and nature of any Community interest - which will have to be estimated case by case - especially with an eye to financing.

1.4. Finally, the contributions of the Member States enable a satisfactory review to be made of the reality of present requirements and of their scope on the communications which are important for the Community. These requirements are considerable despite the slowdown in growth and the energy crisis.

They are analysed in points 4.1. and 4.3. and summarized in Annexes 4 to 12.

1.5. The Commission is not making a direct link between the investment projects deriving directly or indirectly from the contributions of the Member States and their eligibility for Community financing.
However, the budgetary restraints weighing upon all the Member States prompt the thought that not all these requirements are likely to be met,

at least not within the time limits to be wished for. In so far as the implementation of certain projects could provide greater benefits at Community level than those estimated merely for the Member State concerned, the question of Community financing is a matter to be considered (para. 5.1.).

1.6. The report's second aim is to explain to the Council the financing arrangements which, at Community level, could help to carry out specific investment projects.

In para. 5.2. the Commission provides a description of the existing financial instruments and their possible uses.

Starting with the requirements proper to the financing of transport infrastructure projects of Community interest, the Commission sets out the conditions with which the new financing arrangements should comply and provides a fuller explanation of its proposal for a Regulation on financial support for projects of Community interest (para. 5.3.).

1.7. This report presents an initial approach to the Community action aimed at identifying the practical projects which could receive Community financial support.

These projects cannot be specified until the following conditions have been met: notification of projects by the Member States, assessment of their Community interest and selection, bearing in mind financial restrictions and the requirement that there should be optimum benefit to the Community.

1.8. The Commission takes the view that the report provides information complete enough and usable enough to enable a new step to be taken in developing Community action in respect of infrastructures.

In its conclusions (para. 6.) the Commission emphasizes the following actions, which should go hand in hand.

(i) the swift setting up of a financial system providing Community aid for the implementation of projects of Community interest;

(ii) the utilization of the consultation procedure provided for by the Council Decision of 20 February 1978 for projects of Community interest.

The Commission points out that this highly flexible procedure is a preliminary to the procedure for examining projects under the proposed Regulation on financial support.

Application of this procedure does not anticipate financial interventions, but makes it possible to assess projects of Community interest, mainly in the light of their inter-dependence, the likely development of traffic between the Member States, Community policies, and national plans and programmes.

The Commission takes the view that consultation procedures could be initiated right now on some of the projects outlined in the contributions from the Member States. Such consultations would make it possible to draw up a reserve list of projects where Community interest was more clearly defined, which would enable the Member States - as the second phase - to select projects which might be eligible for Community aid.

2. THE COUNCIL'S REQUEST

2.1. At its meeting on 23 November 1978, the Council called on the Commission "to submit to it by 1 January 1980 a report on the bottlenecks in transport infrastructures and on the various possible modes of finance".

This request was made during the Council's general debate on the Commission's proposal for a Regulation on the financing of transport infrastructure projects of Community interest. "Several delegations pointed out that it would be important for those practical projects for which Community financing could be considered under this procedure and for the modes of this financing to be specified rapidly."*

At the end of the debate the Council also called on the Commission "in collaboration with the Committee in the field of transport infrastructures, to evolve criteria for evaluating projects of Community interest".

2.2. In view of the context in which these requests were voiced, the Council evidently wanted the following steps to be taken in logical order:

(i) an initial identification of those bottlenecks of which the elimination would be of particular interest to the Community, thus obtaining an idea of the scope and nature of the Community's infrastructure requirements;

(ii) an examination of the detailed financing arrangements likely to help the implementation of "practical projects" which might be selected in view of these requirements;

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* Text of the minutes of the Council meeting

(iii) the drawing up of criteria for assessing projects of Community interest making it possible to assess the specific consequences for the Community of the implementation of projects for eliminating bottlenecks.

The Council set no date for the completion of the third task. The Commission intends to submit the requested report to the Council in the course of 1981 after further consultations with the Transport Infrastructure Committee. However, the Commission already has available certain findings on modes of finance which are sufficiently usable to be usefully enumerated in this report.

3. THE PROBLEMS BROUGHT UP BY THE DRAFTING OF THE REPORT

From the beginning, the task entrusted to the Commission presented a number of problems related, in particular, to the meaning and the scope of the concept of a bottleneck, the identification of the "Community nature" of bottlenecks, and the scope of the requested report.

3.1. Meaning and scope of the concept of a bottleneck

Bottlenecks and investment requirements, i.e. projects, are not one and the same thing. The bottleneck is no more than a useful indicator in an initial approach to the Community's infrastructure requirements.

3.1.1. Nevertheless this indicator may vary in sophistication depending on the factors built into it and the methods by which these are calculated.

(i) A bottleneck can be identified not only by means of a saturation rate but also by other factors such as, in particular, average speed. Using a wide interpretation, it would be possible to describe as a bottleneck any section of a route failing to provide a certain level of service and ensure the basic performance one is entitled to expect of a transport mode.

(ii) Where a bottleneck is defined exclusively on the basis of a saturation rate, a varying number of parameters may be embodied in the calculations according to various methods.

It is not easy to define the level of traffic at which an infrastructure is described as inadequate and constitutes a bottleneck. A factor as discernible as traffic saturation presents a large number of problems when one comes to use it.

3.1.2. For some Member States identification of bottlenecks is not an important phase in the planning process.

Not all the Member States automatically identify bottlenecks as a preliminary step in selecting projects for assessment; they choose their projects on far wider and more flexible bases. It is not until the stage of evaluating projects is arrived at and their profitability is being calculated that data on traffic and the characteristics of infrastructures are brought in.

For other Member States, on the other hand, particularly those with a large number of congested routes and few opportunities for diverting traffic to alternative routes, the bottleneck is in itself a good indicator of infrastructure requirements.

Furthermore, the situation varies depending on the transport mode involved. The bottleneck concept is more applicable to roads than to railways or inland waterways.

Particularly where the bottleneck is regarded as a shortfall in the capacity of the infrastructure in relation to existing traffic, the use of this concept could lead to mistaken conclusions in respect of railways and inland waterways.

3.1.3. The diversity of interpretations and of methods of identifying bottlenecks and the varying availability of data from Member State to Member States led the Commission to propose criteria flexible and varied enough to reflect - without excessive effort on the part of national administrations - the same types of situation in all the Member States and, where possible, for all modes of transport.

These criteria are set out in Annex 1.

3.2. Community character of bottlenecks

The question also arose whether it might be appropriate to adopt selection criteria (in particular, the criterion of the amount of

international traffic) under which only bottlenecks of a Community character would be recognized. The following comments must be made:

3.2.1. The criterion of the amount of intra-Community traffic on a specific route cannot be applied to many networks for lack of data. Furthermore, important as this criterion may be, it cannot be regarded as decisive.

Much intra-Community traffic is long haulage which can take various alternative routes. Precisely because of the bottlenecks international traffic can in certain cases switch to other, less congested routes. The Community interest of a project aimed at eliminating a bottleneck must therefore derive from the potential international traffic on the section under consideration and not from the existing international traffic. Hence the importance of knowing starting points and destinations which, particularly in the case of road transport, are very poorly documented.

3.2.2. The Community's interest in the elimination of a bottleneck is not limited to the benefits directly accruing to the users of the new infrastructure. It depends on the effects of this infrastructure in other sectors among which we may cite energy, the building industry, regional development, the development of trade and economic integration.

This viewpoint is compatible with the Decision of 20 February 1978, which states that a project of Community interest is an important project aimed at eliminating a bottleneck, having an impact on Community traffic or influencing a Community policy or involving new transport techniques.

3.2.3. To avoid all ambiguity, it is appropriate to point out at this point that use of the general and flexible criteria of the Decision of 20 February 1978 aims at ensuring that projects likely to interest the Community be subject ot the Community examination process provided for by that Decision. Use of these criteria does not prejudice the precise form and scope of Community interest. Evaluation of that, in particular within the terms of the Regulation proposed by the Commission on financial support for projects of Community interest, means examining each case individually in the light of its economic

feasibility and on the basis of the various planning alternatives and after examining the possibility of applying measures outside the investment field.

3.3. The geographic scope of the report

In the light of these considerations, the Commission put forward the pragmatic proposal that networks of recognized international character be regarded as constituting the scope of this report. This approach makes it possible to draw up a list of bottlenecks in respect of which it may be assumed that projects intended to deal with them are likely to have a Community character, particularly on the criterion of traffic.

The proposed networks are as follows:

(i) road network: the network of major international roads covered by the European agreement signed in Geneva on 15 November 1975;

(ii) rail network: the lines covered by the UIC master plan (Annex II to the 1973 issue);

(iii) inland waterway network: inland waterways of class IV.

To these basic networks the Commission added a limited number of links needed mainly for greater cohesion. It also proposed that consideration be given to the main sea crossings forming vital links between land networks and to certain links crossing the territory of non-Community countries important for communications either between Member States (including Greece) or between the Community as a whole and certain non-Community countries.

3.4. The Commission also took the view that, for lack of adequate data, the report should deal only with the existing situation.

3.5. The position of the Transport Infrastructure Committee

The Commission wanted the Transport Infrastructure Committee set up under the Decision of 20 February 1978 to be closely associated with the planning and drafting of the report, particularly the section on bottlenecks.

At the Committee's meeting on 5 May 1979, Commission departments submitted a working paper setting out proposals on criteria for the identification of bottlenecks and on the scope of the report.

Most of the representatives of the Transport Infrastructures Committee approved the general lines of the working paper and expressed readiness to examine the detailed proposals in it.

However, the fact emerged from technical discussions that many Member States are somewhat reluctant to identify bottlenecks by methods other than their own procedures for assessing infrastructures; an attempt to overcome the difficulties cited above and arrive rapidly at a consensus on uniform criteria proved fruitless.

In the light of the unrewarding discussions held at this meeting of the Committee, the Commission decided to abandon its attempt to set up uniform criteria for selecting bottlenecks which - desirable as they might be - did not appear vital for an in-depth knowledge of the shortcomings on the Community's major communications routes.

Each representative was asked to provide the information necessary for drafting the report as he saw fit, but using the Commission working paper as a guide as far as possible.

These contributions were submitted late - the last not reaching the Commission until January 1980 - so that the Commission was unable to consult the Committee again until 5 February 1980. The Commission felt that this second consultation was essential for obtaining information and achieving greater consistency in the report then being drafted. The additional replies announced by the representatives in the following two weeks took longer than expected - a further reason for the delay in submitting this report.

4. THE MEMBER STATES' CONTRIBUTIONS

The contributions from the Member States are summed up and set out in cartographic form in Annexes 2 to 13.

These Annexes are either analyses done by Commission departments and approved by the representatives of the Transport Infrastructure Committee or documents provided by those representatives.

The tables in Annexes 2 and 3 set out for road and rail the criteria adopted by the Member States for the identification of bottlenecks (or of projects for those Member States which have in fact announced projects for certain transport modes).

Annexes 4 to 12 provide for each Member State, where possible, a list of the bottlenecks or projects reported and cartographic depictions of them:

Belgium	Annex 4	Luxembourg	Annex 9
Denmark	" 5	Netherlands	" 10
France	" 6	Germany	" 11
Ireland	" 7	UK	" 12
Italy	" 8		

4.1. General analysis

Analysis of these contributions gives rise to the following main comments:

4.1.1. The contributions from the Member States deal with the existing situation (with a few exceptions, which are pointed out).

4.1.2. The contributions from the Member States are concerned with the basic network suggested by the Commission (see point 6) plus a few additions which the Commission endorses.

4.1.3. It is likewise proposed that the following sea crossings be among the basic networks included in the report:

- the Channel (British request);
- the Irish Sea;
- the Fehmarn Belt (German request);
- the Straits of Messina.

4.1.4. Some Member States have already reported projects related to ports and airports. The contributions on this matter are contained in the Annexes relating to each Member State. The absence of information on a Member State's ports and airports does not mean that there are no problems deriving from inadequate infrastructures.

The Commission points out in this connection that while the Decision of 20 February 1978 (procedure for consultation on projects of Community interest) and its proposal for a Regulation (financial support for projects of Community interest) do not apply to ports

and airports (though they do apply to access to ports and airports), knowledge of projects involving ports and airports may be an essential factor in the evaluation of some internal transport infrastructure plans. Furthermore, the fact cannot be ignored that some Member States depend exclusively for their trade with the other Member States on the state of their port and airport infrastructures. The Commission therefore regards it as right and proper that the national contributions be reflected in information on ports and airports which are vital for traffic between Member States.

4.1.5. All the Member States have adopted a definition of bottlenecks which is not restrictive and which is often similar to that proposed by the Commission.

They did not merely indicate specific obstacles which paralyse or seriously slow down traffic; they also pointed out those - sometimes long - stretches of a route where a minimum level of service cannot be maintained.

Identification of these points and, above all, these sections derives in most cases from the application of national assessment procedures, which are not uniform. As will be pointed out further on, this lack of uniformity in method does not mean that results are not comparable.

4.1.6. For reasons already stated, most Member States notified projects rather that bottlenecks for one or more transport modes.

They took the view that the intermediate stage of identifying a bottleneck should be skipped where they had already planned appropriate investment projects to cope with difficult traffic situations and where, in their view, knowledge of these projects was of greater significance for the Council from the point of view of an assessment of the Community's infrastructure requirements.

4.2. Comparability of results

The major question is whether the apparently disparate nature of these contributions reduces their import.

Since the criteria used were not homogeneous, the Commission has not entered the Member States' results on the same map. However, it does stress that these findings are compatible with the aims pursued by the Council and that they lend themselves to exploration at Community level.

In this connection the following comments must be made:

4.2.1. Bottlenecks and projects are ultimately an indication, direct or indirect, of infrastructure shortcomings which the Member States have detected and which cannot be doubted.

4.2.2. Comparability of contributions on the basis of uniform criteria or identical methods, which was not demanded by the Council, is not necessary for a real knowledge of the requirements expressed by the Member States. A need might be felt for such comparability only if classification of projects (or the bottlenecks making them necessary) according to their profitability were to be required or simply envisaged as a goal. Such an objective is alien to this report.

4.2.3. At all events these differences between the contributions should not be magnified.

In respect of bottlenecks, an examination of the various methods of calculations used by the Member States to determine traffic saturation thresholds shows that they frequently use the same parameters and that the results at which they arrive fall within a relatively narrow range.

Obviously, if a traffic volume figure used as an indicator for bottlenecks is modified even slightly, the way of presenting bottlenecks may change. That is one of the reasons why many Member States which had worked out their own methods of calculation were reluctant to accept an automatic definition of bottlenecks on the basis of uniform figures differing from their own and insufficiently flexible to deal with the variety of circumstances which may arise. Nevertheless, the results supplied by the Member States do in fact reflect highly analogous traffic congestion situations.

Where other criteria above and beyond the criterion of traffic saturation are used to identify bottlenecks, a great similarity between them can be observed.

The projects notified by the Member States were prepared mainly to deal with traffic situations considered to be intolerable. The parameters used to assess the level of service provided by an infrastructure and, in particular, to determine the location of a bottleneck also serve as the basis for calculating profitability and so selecting projects for execution.

Overloaded sections of a route, where speed is fairly low, are indeed more deserving of investment than sections with lower saturation rates and relatively high speeds, even when the calculations take in other factors.

4.2.4. Even before it was called on by the Council to draft this report, the Commission had embarked on a study on the problems of infrastructure capacity and assessment.

The study includes a section devoted to an attempt to assess sections of the Community's main communications. Using uniform criteria, the study classifies these on a scale ranging from A (very good) to F (very bad).

Because of the difficulties encountered in obtaining data and because a sufficiently detailed analysis was not always possible, the findings of the study should be regarded only as indications of a trend.

It is not surprising that the bottlenecks and projects notified by the Member States do not always coincide with those sections of network classified by the study as providing an unsatisfactory level of service (E and F). However, it is significant that there is a fair degree of agreement, particularly as regards the aggregate length of congested sections.

A more noticeable discrepancy appears only in respect of the railways and in respect of some Member States. This may be explained by the differences in applying the criterion of speed. The note in Annex 13 provides additional information on the study's findings in this area.

One of the conclusions which may be drawn from the study is that the uniform application of criteria for the selection of bottlenecks would not fundamentally modify the picture of the shortcomings in the Community's infrastructures provided by the national contributions presented in this report.

The study, which provides a great deal of information on sections of networks, will prove very useful to the Commission and the Transport Infrastructure Committee when concrete cases are examined and the report further developed.

4.2.5. In conclusion, the Commission takes the view that the contributions from the Member States provide an inventory which, though it may yet be supplemented or amended, reflects with sufficient accuracy the infrastructural shortcomings of the Community's main transport links.

These shortcomings may be summed up as follows:

4.3. Summing up of the findings

4.3.1. Roads

Traffic saturation on raod sections of varying length is the criterion most frequently used by the Member States to identify bottlenecks or projects.

Those which are to be found on the networks selected by the Member States (essentially the E-road networks) are as follows:

Belgium	— *		
Denmark (projects)	215	kms	approximately
France (congested length)	1 012	"	
Ireland (bottlenecks)	320	"	
Italy (projects)	1 210	"	approximately
Luxembourg (bottlenecks)	40	"	
Netherlands (bottlenecks)	530	"	
FRG (bottlenecks)	1 618	"	
UK (projects)	1 160	"	approximately
Total	6 100		approximately

* The considerable amount of road building in Belgium over the last few years explains why no bottleneck was cited.

In addition, France put forward bottlenecks consisting of discrete hindrances (the "hot spot" concept) and causing "jams". These bottlenecks, which cause disruption expressed in hours-kilometres, derive mainly from utilization of the network.
Such bottlenecks were also considered by other Member States, but were either included among the projects or not specifically identified.

Only the F.R.G. was able to provide figures on international traffic, as the other Member States do not seem to record it. To make a more detailed analysis of projects or bottlenecks, data on this matter would be needed or at least there would have to be an estimate - which seems possible in some cases - on the basis of data on overall traffic from one region to another.

4.3.2. Railways

Most Member States put up projects, thus directly expressing indisputable minimum investment requirements. A simple criterion of capacity in terms of the maximum number of trains which can run during a specific unit of time hardly allows us to take account of non-dissociable railway objectives aimed at improving the quality of traffic handling (speed, regularity, reliability). For example, the higher the standard of punctuality demanded, the longer the tolerance times must be and the more the capacity of the line will be reduced. The contributions from the Member States do not seem to have taken sufficient account of these objectives, with the result that the overall results seem to contain sins of omission rather than commission. Almost all Member States notified plans for stations and terminals, the building of which is essential for railway traffic.

It must be pointed out that a line in one Member State may show signs of saturation because a line run by another Member State's Railway does not have the same capacity on the other side of the frontier. Such situations arise, in particular, on the Franco-Italian border at certain times of the year. In this repsect there is increased Community interest in projects aimed at dealing with such situations.

The contributions from the Member States provide the following overall view of the networks considered by the Member States (essentially the basic UIC network):

	Length of section (in kilometres)	Plans for stations and terminals (including ferries)
Belgium	710 (projects)	3
Denmark	60 (projects)	3
France - problems few or in process of solution - for a few examples, see Annex 6		-
Ireland	100	1
Italy	1 600 (projects)	1
Luxembourg	70	1
Netherlands	25* (bottlenecks)	1
F.R.G.	1 110 (")	19
U.K.	115	4
Total more than	3 460 kms	

* The Netherlands also reported seven discrete bottlenecks which disrupt traffic on sections of routes.

Data on international traffic have been compiled by the railway companies but were not provided. These data could no doubt be made available when a detailed examination is made of projects or bottlenecks.

4.3.3. Inland waterways

Identification of bottlenecks on inland waterways is extremely complex in view of the number of parameters involved.

Essentially, the Member States reported:

(i) Bottlenecks or projects determined by difficulties of passing through locks (a lock with less capacity or efficiency than other locks on that route, locks with difficult access) or other particular points.

(ii) Bottlenecks or projects covering sections which do not have the ideal dimensions for the class of vessel envisaged - which generally means that the draught has to be reduced and the vessels' profitability is impaired - or sections having a smaller gauge than the other sections of the route and thus preventing the use of vessels of higher classes.

Plans for improving such sections can be justified only with reference to potential traffic (volume and structure) and to the findings of profitability studies, which are difficult and sometimes rather hit-or-miss. This means that in some cases the intention of the Member States was to report the existence of an inland waterway planning problem without at the same time taking a stand on the existence of a bottleneck or the appropriateness of an investment measure.

To include in a summary table of bottlenecks identified by the Member States projects which have been approved (in particular, the Netherlands and Belgium) and projects which are envisaged (in particular, France, Germany and Italy) could well lead to false interpretations of the Member States' implementation intentions. It is therefore preferable to consult the Annexes, which show the size of the acknowledged requirements and the planning alternatives which exist for the Community's main inland waterways.

4.3.4. Links with non-Community countries

The Member States provided no information on the shortcomings of infrastructures related to communications with non-Community countries essential for Community trade.

It must be pointed out that the European Conference of Transport Ministers has drawn up a report on the major European communication axes which deals with the question of the shortcomings in their infrastructures.

This report could provide a useful basis for the Community to form an opinion on plans for the infrastructures of those communication links with non-Community countries which are the most vital for Community trade.

5. FINANCING ARRANGEMENTS

The Commission is not making a direct link between the investment projects deriving directly or indirectly from the projects and bottlenecks listed in the Annexes and their need for Community financing.

The problem facing the Commission is as follows:

5.1. The problem

The contributions from the Member States prove that considerable investments are needed on the Community's major transport links. It is presumed that a major portion of these projects are of Community interest in that their implementation would affect other Member States besides the one in whose territory they are located, particularly from the point of view of improving trade between Member States. The Member States are not necessarily able to handle their investment requirements, above all not at the right time - a failing likely to prove expensive for the Community. An optimum yield from investment projects on the major links requires a minimum of coordination of their implementation in space and time. Furthermore, the implementation of certain projects can itself be of specific benefit to the Community.

What we therefore have to know is whether a Member State can find a solution to the financial problems it encounters by using existing Community financial instruments, when a project of Community interest is involved. Where the reply is not fully satisfactory, thought will have to be given to the question of how other financial systems should be constructed.

5.2. The existing instruments

5.2.1. The main financial instruments of importance for transport infrastructures are the European Investment Bank (EIB), the new Community instrument (NCI), aids towards the payment of interest on loans either from the EIB or the NIC as part of the implementation of the European Monetary System and the Regional Development Fund (ERDF). The table in Annex 14 summarizes the main characteristics of these four financial instruments.

5.2.2. Their scale can be judged from the following figures. Between 1958, the year of its creation, and the end of 1978, the EIB provided 1 418.1 million units of account, i.e. 15.1 % of all the loans it granted, for some 84 lending operations in the transport and communications infrastructure sector.
In the three years which followed its creation (1975-77), the European Regional Development Fund devoted more than 165 million units of account, i.e. 12.8% of its total appropriations, to transport and communications infrastructure investment projects.

So far the NCI has been involved only to the extent of a loan of 20 million units of account for improvements to the Irish road network. These figures show that Community funds allocated to the transport infrastructure of the Member States have been considerable in recent years. However, it should not be concluded that these funds have made it possible - or will make it possible - to meet all the requests from the Member States corresponding to the requirements of the common transport policy.

5.2.3. The folowing main comments have to be made:

(i) There are geographical limits to intervention the case of two instruments: the ERDF and interest relief grants under the European Monetary System.

(ii) Non-repayable subsidies can be granted only by the ERDF, while EMS interest relief grants can be applied only to EIB and NCI loans for projects in countries which both participate fully in the EMS and are considered to be less prosperous.

(iii) The EIB and NCI grant loans on terms determined by those ruling on the capital market. These loans must meet certain requirements concerning either the guarantees provided or the financial return, or both.

(iv) In some cases the particular criteria for the use of the existing instruments can limit their ability to intervene in the field of transport infrastructure with the aim of contributing to the achievement of a coherent communications network. Some of these criteria - regional development, economic growth and increased investment - are however wide enough to cover projects intended to eliminate bottlenecks.

(v) Because of the limitations which in any case militate aginst the use of the existing instruments, the system proposed by the Commission for giving financial aid to certain projects of Community interest should be set up as soon as possible to complete the range of instruments available.

5.3. The principles of new financing arrangements

The limitations of the existing instruments set off a search for a financing scheme making it possible to speed up the implementation of infrastructure projects meeting the requirements of the common transport policy. The principles which it seems advisable to embody in such a scheme should be as follows:

(i) The financing of infrastructures is a matter for national bodies. Where a call is made for specific Community support for the financing of distinct and clearly defined projects of Community interest, this support shall be supplementary.

(ii) There must be a check on whether these projects are attended by optimum conditions for implementation, in particular those which help to improve service on the Community's major communications axes.

(iii) Where financial aid is granted, it should lead to implementation of the project of Community interest. Where applicable, it should make it possible to muster various means of financing so that large sums can be allocated to a limited number of projects. It must therefore be made possible to use loans and guarantees alongside non-repayable subsidies. This financial support is justified by the Community interest of the project. This means, in particular, that there should be a correlation between the non-repayable subsidy and the increased benefit for the Community resulting from implementation of the project. In the latter case, Community interest must not merely be stated in general terms, but must be evaluated. The

practical significance of this principle requires that certain explanations already made to the Transport Infrastructure Committee be briefly recapitulated.

5.4. Financing arrangements and Community interest of projects

5.4.1. A prime indicator of the magnitude of a project's Community interest is the international traffic on the route improved by the implementation of that project, for it can be used to determine the benefits derived by users from Member States other than the Member State in whose territory the project is located. This indicator should be used with caution in that this traffic between Member States is not always easily identifable. Nevertheless the yardstick of international traffic is a particularly appropriate and handy instrument for measuring Community interest.

Obviously, it plays a preponderant rôle in determining the projects which the Member States are required to notify to the Commission pursuant to the Decision of 20 February 1978. It is the main way of assessing the projects, implementation of which will have a notable effect on long-distance international traffic.

5.4.2. Community interest must be more fully appreciated by considering the quantifiable general benefits for the Community. Taking this approach, Community interest would be measured not only on the basis of the consequences for international users of the improved route, but also in terms of the effects on such factors as, for example, the losses or gains of operators in other Member States, total energy consumption, trade and regional development, and the building and civil engineering industries.

5.4.3. It will be necessary to clarify the nature of those impacts on the Community which are linked with the external effects of infrastructures. In particular, the effects on the network will have to be examined since, according to Article 5 of the Decision of 1978, the objective of Community action is to contribute to the harmonious development of the network of Community interest.

Determination of such a network raises problems similar to those faced by the Member States at national level. The Member States all identified a principal network of major axes for traffic between regions. However, these axes are often important for regional traffic which is numerically greater than national traffic. This fact was accepted by the Member

States, for a national network which is unified and of uniform quality is regarded as an essential element of the transport system.
Extrapolation of this principle to the Community level is logical. The reality of the Community, its equilibrium and its development depend on keeping its main communications at a high standard. In respect of these communications, which do not include links of purely local or regional interest, Community interest, at any rate that portion of it which is identified with benefits for users, is not gauged by means of calculations which are necessarily based on a demarcation between the international traffic and the Member States' domestic traffic.
These considerations cannot be ignored under the long-term prospect that the Community will achieve greater integration. They should underly any new Community financing system so that it can easily be used for the financing of projects, the implementation of which guarantees a minimum threshold of unification of the Community's main communications.

5.4.4. The report on the evaluation of projects of Community interest, which will be sent to the Council on conclusion of the work being done by the Commission in cooperation with the Transport Infrastructure Committee will go into these considerations in greater depth. On the basis of a pilot study it will provide more specific information on methods of calculating the identifiable effects which a major project can have on the Community.
It is already possible to tailor financial intervention to Community interest with satisfactory closeness. It would be unrealistic to make the possibility of financial intervention dependent on the availability of complete and foolproof methods proved right in many cases. As is generally the case in economics, practice and methodology must advance hand in hand. Methods of evaluating Community interest, on which there has already been some experimentation, can be perfected only gradually as they are applied to other practical cases.
The considerations set out in paras. 5.3. and 5.4.lead us to envisage the following new financing arrangements.

5.5. Analysis of new arrangements for financial intervention

5.5.1. One proposal that has been mooted in certain circles is a provision that the implementation of each project should be covered by a legal and financial arrangement between the Member States, which would negotiate their contributions under the aegis of the Community on the basis of the benefits they would derive from it. Under the existing procedures

(Decision of 20 February 1978), the Commission would verify that the project was of Community interest and compatible with other projects. The Commission would assist in assessing the specific Community interest of projects and would, if necessary, provide funding from existing financial instruments on application by the Member States.

In view of the wide variety of possible situations, the Commission recognises that such a formula could be useful in some cases, but it cannot be regarded as an exclusive solution.

5.5.2. The system of funding based on contributions from the Member States according to the benefits derived from the traffic angle has the following drawbacks:

(a) It would require very long lead times and could only be justified for very large projects.

It is not sufficiently flexible to be able quickly to "reserve" projects of Community interest which, because of economic uncertainties or national priorities, cannot be carried oud by the Member States. It cannot adapt to all the different situations which may arise. Non-repayable contributions are, furthermore, not the only way of expediting the implementation of infrastructure projects of Community interest. Support in the form of loans or guarantees, for example, for projects offering a high financial return may, in some cases, prove not only sufficient but also highly effective; in others, subsidies or interest-relief grants combined with loans or guarantees may be more suitable.

(b) It is based on a concept of Community interest which is limited solely to the benefits to users operating international transport services.

(c) It is based on the principle of the division of benefits among Member States. Although technically possible it is debatable whether this can be done on the basis of a traffic situation at any given time. Above all, however, this system seems to be based on the principle that the contributions made by the Member States to the implementation of each project must match the benefits they derive from it. This principle is put into practice by measures which belong to the field of inter-state co-operation. The usefulness of such co-operation in some cases cannot be denied, but such measures cannot by themselves make it possible to put into effect the common transport policy provided for in article 75 of the Treaty.

The Commission believes the previous system could with advantage be developed along the following lines:

(a) providing a suitable legal framework at Community level for a permanent system of general financial support for projects of Community interest irrespective of their size, the type of funding required, the Member States involved and the way in which the benefits derived are shared among them,

(b) establishing a link between the amount and form of aid provided and the overall benefits to the Community.

This does not mean that there would not, in time, be a correspondence between the financial burden imposed on each Member State by Community aid and the benefits which it derives from the projects.

5.6. The system proposed by the Commission

The system proposed by the Commission in the Regulation on financial support seems to meet these conditions.

Financial support will only be given to projects of Community interest which go through the consultation procedure set up by the Decision of 20 February 1978 as a check that they are compatible with an overall strategy.

The financial support may take various forms: loan guarantees, subsidies or interest relief. It does not exclude the possibility of other types of Community funding.

Since support is provided by the Community as such, the non-repayable contributions (subsidies and interest relief grants) have to come from the Budget. Subsidies and interest relief grants relate closely to the gauge of the benefit of a project to the Community.

Although loans and guarantees are only granted on projects of interest to the Community, they are not determined according to the amount of this interest. Loans and guarantees supplement existing Community financial instruments, or are used alone, to help encourage the implementation of projects of Community interest which cannot be carried out by a Member State.

5.7. How the system proposed by the Commission might work

5.7.1. It is up to the Member States to submit projects of Community interest to the Commission and to apply for financial support; the Commission cannot at this stage make any pronouncement as to what projects will qualify for financial support. The Commission is prepared to present an illustrative example of the working of its system, based on reasonable working hypotheses.

5.7.2. Possible working hypothesis

Projects

Average of three projects per year

(a) Large projects varying in cost

(b) Projects selected according to the following criteria: importance to trade between Member States (particularly projects to ease the crossing of natural barriers), opening up of peripheral areas of the Community and repercussions in energy terms (projects concerning, for example, rail routes which carry a large volume of combined rail/road traffic)

(c) Projects based largely on Member States' contributions on bottlenecks.

Forms of financial support

Guarantees, loans, subsidies and interest relief grants.

Subsidies and interest relief grants

Amount

For example, a total of 60 million units of account per year under Item 3781 in the Budget (Financial support for transport infrastructure projects).

Basis of calculation

A contribution of 20% towards the cost of one or two important projects of relatively low cost (totalling 50 million u.a.), i.e. 10 million u.a. per year.

Interest relief (two points) on loans of 350 million u.a.(for one or two projects);i.e. 50 million u.a. per year.

5.7.3. For example, this 60 million u.a. (non-repayable) would provide help over a five-year period and on this basis of calculation for projects totalling 2 000 million u.a.

Loans and guarantees

5.7.4. No figures are given for loans and guarantees since they would be too unreliable given the lack of information - in particular - about how much credit could be extended by existing Community instruments for transport infrastructure projects and what use Member States would make of these two forms of financial support.

6. CONCLUSIONS

6.1. Before even discussing the proposal for a Regulation on financial support for infrastructure projects the Council may well ask whether, given the slowdown in growth and the energy crisis, the Community's investment needs are so large as to warrant Community funding of practical measures.

There is no doubt of the answer: the fact that the Member States' contributions are not completely comparable and that bottleneck and project are not necessarily the same thing, does not detract from the significance of the results of the exercise. This report highlights serious and pressing infrastructure needs on major Community links.

6.2. The report also examines a related aspect: the Community interest of these needs, because it may lead to confusion.
A distinction must be made between general and simple criteria according to which a project to remove bottlenecks may be classed as being of Community interest (Decision of 20 February 1978) and the economic evaluation of this interest in actual terms, which may be required under the proposed Regulation. The Commission takes the view - as do the majority of representatives on the Committee - that since bottlenecks or projects are on international networks accepted by the Member States they are very likely in most cases to be classed as being of Community interest.

Another aspect is their eligibility for Community support, which requires fuller investigation of the various elements of Community interest and, in the case of non-repayable subsidies, an actual assessment of this interest. The aspects of this question which will influence the choice of funding system are discussed in the report. The actual techniques of assessment will be discussed in a report which the Commission will send to the Council at a later date at its request. The latter report is not necessary for judgment of the system of financing proposed by the Commission.

6.3. It is essential to continue with the significant work already accomplished in the preparation of this report, in order to keep the results abreast of new developments and to move on from static listing of present shortcomings to a dynamic means of foreseeing future problems.

The main ways in which the "capital" thus accumulated can be conserved - and the "return" on it enhanced - are:

(a) to use the findings of forward studies already undertaken or planned by the Commission to detect future shortcomings in infrastructures (on a gradual basis, starting with a small number of important Community links);

(b) to identify infrastructure inadequacies on the main links to and from non-Community countries by utilising the findings of ECMT studies etc.;

(c) to obtain a better understanding of intra-Community traffic flows on major Community links, their impact on bottlenecks and possible changes which might be made to them by improving routes, and to investigate how far some forms of traffic (holiday and heavy-goods traffic) contribute to traffic problems.

6.4. The Commission takes the view that this should be an ongoing task under the Transport Infrastructure Committee (subparagraph (b) of Article 5(2) of the Council Decision of 20 February 1978) and that the results should be incorporated in the regular reports which the Commission is required to make to the Council on the Committee's work under Article 6 of the Decision of 20 February 1978.

6.5. The report describes and explains the Community financial instruments which exist and outlines in more detail the system of financial support proposed by the Commission to meet the specific needs to develop infrastructures in the Community. The mechanism proposed by the Commission could "revive" projects of Community interest which have been shelved and has the obvious advantages of optimum speed, simplicity and efficiency in the context of common transport policy.

The report does not, however, list priority projects which might be financed by the system, simply illustrating them on reasonable working hypotheses.

Nothing else was possible. Under the terms of the proposal for a Regulation on financial support for infrastructure projects of Community interest the Member States would send their applications for financial support to the Commission. Their applications would then be discussed with the Member States before the Commission makes its proposals as part of the Community Budget. The Commission may not anticipate the positions of the Member States or itself until the appropriate procedures have been completed.

6.6. Community action may be hampered by this demand that Member States' primerresponsibility for infrastructures should be taken into account.

Some Member States do not wish to give their views on the proposed Regulation until they have full details of the projects to be financed, whereas the Member States which will have to propose concrete projects qualifying for funding are reluctant to do so until the Regulation has been adopted.

The Commission can do no more than demonstrate - as it has done in the report - the magnitude and urgency of requirements and the value of the financing system it has proposed.

6.7. The most constructive way of avoiding deadlock at Community level is, in the Commission's view, to:

(a) reach early agreement in principle on the system of financial support proposed by the Commission, which is primarily a basis and does not prejudge the actual projects which will be carried out;

(b) examine the value of a number of projects to the Community as part of the brief given to the Transport Infrastructure Committee by the Decision of 20 February 1978 and, in particular, within the consultation procedure. The financial problems which may be encountered by the Member States in incorporating these projects in their national programmes would emerge at the same time. Member States will be asked to indicate whether they consider some of these projects might qualify for financial support from the Community.

6.8. The consultation procedure does not of course anticipate the award of financial aid; it would enable a reserve list of projects to be drawn up, with their interest to the Community more accurately expressed. If such a list is drawn up quickly and subsequently supplemented, the Member States will be able, in a second phase, to make a careful selection of projects eligible for financial support. It should be noted that the consultation procedure is a precursor of the procedure under which the projects are examined pursuant to the Regulation on financial support. The preparation of a reserve list through the consultation procedure would enable the funding system to become operational as soon as it is approved.

6.9. The information collected on bottlenecks and projects, and the Commission fully appreciates its value, will provide a sufficiently broad basis for consultation on projects of Community interest.

The Commission is aware that the projects mentioned in the Member States' submissions are not all equally suitable for consultation.

The most efficient procedure would, in the Commission's opinion, be to hold a small number of consultations on projects which appear at first sight to be of relatively substantial interest to the Community. The Commission suggests that the Member States carry out this pre-selection of projects according to the following criteria:

(a) significance to intra-Community trade

(b) potential consequences in terms of energy

(c) importance from the viewpoint of providing connections with the network of communications links of Community interest.

On these criteria the Member States might be encouraged to submit the following projects to the Commission as their first choice:

(a) projects on congested sections of the network through which traffic from various international routes must past (particularly projects to ease the crossing of natural barriers)

(b) projects on links carrying a large volume of combined transport traffic or which may have a large influence on the modal split

(c) projects to open up peripheral areas.

List of Annexes

Annex 1

Bottlenecks

Criteria proposed by the Commission*

I. Road bottlenecks

1. Bottlenecks on sections of road

- An exact identification of bottlenecks implies a knowledge of extremely precise data on the characteristics of the infrastructure and traffic as well as complex methods developed by traffic engineers.

- It seems reasonable to base the report on certain simplifications such as are used by certain national authorities, since the aim is not to define criteria for determining economic activity.

The Committee is asked to consider the following proposals.

2. It is proposed to adopt the classification of roads used in the European Agreement on Main International Traffic Arteries, Geneva, 15th November 1975 (see Table 1).

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* Extract from a working document drawn up by the secretariat of the Transport Infrastructure Committee for its meeting of 3rd May 1979

3. The use of average daily traffic as an indicator is proposed since this is available in all Member States whereas the hourly traffic, which is more meaningful, is not always available.

A bottleneck can be said to exist when the average daily traffic exceeds a given service volume for each category of road.

4. It seems necessary to take into account the important effects of heavy vehicles on traffic conditions.

The methods used by MemberStates vary (maximum tonnage, conversion into p c u's, adjustments to take account of gradients, etc.) and there is no question of developing a common method which can be applied by all.

The Secretariat proposes that each Member State should remain free to apply its own methods, in preparing its contribution to the report and to simplify them if necessary, provided that :-

a) the volume of heavy vehicle traffic is expressed in passenger car units (as in the Geneva Agreement) by the use of one or more equivalence factors;

b) different equivalence factors are applied according to topographical conditions for roads other than motorways and express roads. If the national authorities are n ot able to use their own methods, the Secretariat suggests that the factors 2, 4 and 6 might be applied for flat, undulating and mountainous terrain respectively.

5. Speed is the most important factor for determining level of service. It is proposed that the speed to be taken into account should be defined, in terms inspired by the Highway Capacity Manual, as follows: overall speed that a driver can attain in open country between towns while respecting the principles of the Highway Code.

This speed should be about 90 km/h on motorways and express roads, and about 60-70 km/h on other roads. In general terms this means that the driver should not be excessively restricted by other traffic (e.g. in overtaking). This requirement can be translated into a service volume limit.

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The maximum service volume figures given in Table 1, based on the practices of national authorities and the technical literature, are submitted for the comments of the Committee. These figures are the result of considerable simplification:

6. Where government departments are able to use more precise criteria and a larger number of variables, it would be helpful if they could indicate which bottlenecks can be said to exist because the attainable speeds (as defined in point 16) are below the limits given above as a guideline.

7. Bottlenecks at isolated points

The bottlenecks in question are those caused by a permanent obstacle at a single point on the road, resulting in queuing in one or more lanes over a certain minimum distance, vehicles being unable to proceed except very slowly and intermittently.

Congestion of this type can perhaps be measured as a volume expressed for instance in hours-kilometres. However, the extent of the inconvenience felt by drivers depends on the general traffic conditions so that, at this stage, it is difficult to establish a precise, uniform quantitative criterion for the identification of such bottlenecks for the purposes of the report. The Secretariat suggests that representatives should provide information on the location of these "hot points" on the basis of the general definition, indicating if possible their main characteristics (length of queue, duration of traffic jams, periods during which they occur). The Secretariat will then consider the possibility of carrying out a more detailed analysis of this type of bottleneck.

Service Volume

(both directions - daily traffic in passenger car units)

Motorways and express roads (2 x 2 lanes)	40 000
for each additional lane	24 000
Category II	
4 lanes	30 000
3 lanes	15 000
Category I	9 000

N.B. These figures apply only outside urban areas

Railway Bottlenecks

8. The theoretical capacity of railway lines, calculated on the assumption of trains travelling at a uniform speed, is reduced even more markedly than in the case of roads by differences in the nature of services provided (intercity express services, local services, goods trains of various types, combined transport services, etc.) and by the rigorous requirements in respect of punctuality and safety which characterize this mode.

Practical capacity can, however, be more easily calculated for each line because the traffic is planned and the determining factors (signalling, sidings, capacity of stations, etc.) are precisely known.

Estimation procedures exist for determining capacity and hence identifying the bottlenecks with reference to the demand. The procedures are based on the use of numerous variables and may, therefore, pose problems for practical application.

As in the case of roads, it is necessary to find a uniform basis for identifying bottlenecks which can be easily applied where more through studies are not available.

The Secretariat suggests the following guidelines for identifying railway bottlenecks.

Inadequate capacity of lines in relation to the overall traffic volume

9. The lines in question are those where the introduction of a new regular service creates severe problems (operating costs increasing more than receipts, deterioration of other services, additional risk of delay).

As an initial indication of the capacity of a line, given a continuous flow, the figures mentioned by the UIC in its Master Plan seem appropriate. These are:-

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(Two-hundred) 200-220 trains per day on a double-track line and about 60 trains per day on a single-track line, with mixed traffic and suitable equipment of the line. These figures should be adjusted when the equipment is not appropriate, especially in respect of signalling or the layout of the tracks (junctions, centralized traffic control).

The particular conditions on each line, which are well known to the railway undertakings (e.g. proportion of different types of trains, speed differences, characteristics of the line), may lead to the identification of the bottlenecks at lower capacity levels. However, in such cases it would be desirable to know the main factors taken into consideration.

Inadequate capacity at nodal points in relation to the overall traffic volume (shunting yards, stations where electrified and non-electrified lines meet)

It is not possible to apply a very exact criterion. It would be advisable to be as restrictive as possible while retaining those bottlenecks which reduce the flexibility of operations to an intolerable extent.

Shortcomings in the infrastructure in relation to specific services

10. Intercity passenger traffic

As for the roads, it seems necessary to introduce the qualitative criterion of a minimum level of service for passenger services. In addition to requirements of frequency and punctuality, some express trains should attain a given commercial speed. In view of the mixture of traffic, maximum permitted speeds, deceleration distances and the inadequacy of certain stations, the commercial speed on some lines may be so low that a bottleneck is created as far as passenger traffic is concerned.

It is proposed that the report should indicate those major lines on the basic network of the UIC Master Plan where a commercial speed of 125 km/h cannot be attained by express trains.

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The lines included in the Master Plan are those which link together the category 1 traffic zones. In speaking of the 'major lines' of the UIC Master Plan, an additional selection criterion is introduced. The Secretariat proposes to select those lines in the Master Plan which link the following towns:

- national capitals,
- towns with more than 750 000 inhabitants.

The basic goods transport services for which the railways are specifically suitable are whole train-load services, combined transport and wagon-load traffic. These services require a fairly extensive network with appropriate characteristics.

In order to achieve a fairly homogeneous presentation and to eliminate all but the most important aspects, the Secretariat suggests that the following criteria should be adopted:-

- inadequacy of shunting yards having significant effects on lines both to and from the shunting yards (trains out of service for long periods, congestion of the line, delays in dispatch and poor quality of service);
- inadequate loading gauge of the line preventing the development of combined transport (piggy-back) when a potential demand exists;
- inadequacy or lack of terminal facilities, especially when this prevents the development of container transport.

Bottlenecks on inland waterways

11. Calculating the capacity of inland waterways is a difficult task because of the wide variations in the dimensions and loading of vessels and in the dimensions of the waterways themselves. Complex models have been developed to determine the capacity of locks as a function of a large number of parameters, since the capacity of the locks usually determines that of the waterway (traffic flow in each direction, time taken for each lock operation, types of vessel, frequency of arrivals at the lock). The use of such models, although very helpful in the preparation of projects, nevertheless seems less appropriate for assessing the existing traffic conditions.

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40

The characteristics of a waterway determine its classification (ECMT classes) and consequently the types of vessel which can use it. It is often important to know whether this limitation on the types of vessel which can use the waterway constitutes a bottleneck in relation to potential traffic.

The Secretariat has attempted to make a synthesis of the various considerations relevant to these points and proposes the following criteria:

12. Bottlenecks at isolated points

Such bottlenecks occur where a permanent obstacle at one point limits the flow of traffic or imposes certain constraints on the vessels' draught or height above water when no such restrictions apply to the waterway as a whole.

A typical example is the case of a single lock with a smaller capacity than all the other locks on the waterway, constituting a significant hindrance. Investigations carried out by the waterways authorities should make it possible to locate the important obstacles which still exist on the main waterway links.

13. Saturation criterion

A waterway of a given calss with fairly homogeneous characteristics along its whole length, taken together with its locks, has a minimum capacity (generally that of the type of lock used) which can be estimated and which depends on the types of vessel using the waterway.

A bottleneck can be identified when the volume of traffic is close to capacity over sufficiently long and frequent periods.

The differences between waterways and the structure of the traffic they carry make it extremely inadvisable to fix any upper limits, even as a guideline.

If the representatives agree that it would not be expedient for the report to give such figures, they are requested to inform the Secretariat of those waterways in their countries which are at saturation point, if possible with some indication of the observable effects of this saturation (e.g. average waiting time at each lock).

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41

14. Homogeneity criterion

In examining a waterway network such as that shown on the map it is clear that there are links with inferior characteristics to those of the waterways which they join.

Such links should not, of course, be regarded a priori as bottlenecks and the aim of a coherent network can only be justified on the basis of real needs.

To the extent that such needs have already been shown to exist (e.g. by a strong demand for transport of consignments of a type which suggest that larger vessels would be more appropriate), the criterion of homogeneity could be adopted for the identification of bottlenecks.

The Secretariat submits this proposal for the Committee's comments.

Criteria used for identification of bottlenecks or selection of projects

Road Network

X = element taken into account; no precise details provided

Country	Capacity	Speed	Level of service	Frequency of congestion	Other criteria
Federal Republic of Germany	Average daily traffic (number of vehicles): 1 x 2 lane : 9.000 1 x 3 lane : 15.000 1 x 4 lane : 30.000 Motorway : 2 x 2 lane : 40.000 for each additional lane in both directions : : 24.000			400 hours per year or more	
France	Average hourly traffic (number of vehicles) level of saturation width of the lane: 3m50 1 x 2 lane : 1.750 1 x 3 lane : 2.350 4 lanes : 3.250 Motorway : 2 x 2 lane : 4.350 2 x 3 lane : 6.500				The seriousness of bottlenecks (bouchons) at single points is measured by the average length of queues and the time taken for the traffic jam to clear, expressed in hours x km.
Italy	X				Regional development policy. Efficiency of the whole route
Netherlands		Delays due to congestion are taken into account	During evening peak hour in busiest direction: open country - level C urban areas - level D centres of conurbations - level D/E		Priority decided by taking into account also safety, environmental factors, economic and regional policy aims.

Criteria used for identification of bottlenecks or selection of projects

Road Network

X= element taken into account; no precise details provided

Country	Capacity	Speed	Level of service	Frequency of congestion	Other criteria
Belgium	Average daily traffic (passenger car units): 1 x 2 lane: 12500 1 x 3 lane: 16700 1 x 4 lane: 33000 Motorway: 2 x 2 lane: 42800		Minimum: level D when adjacent sections have a better level. Level E in other cases.		
Luxembourg	Average hourly traffic (passenger car units): 1 x 2 lane : 1500 1 x 3 lane : 1800 (1200 in built-up areas) Motorway: 2 x 2 lane: 4800		Minimum: level C		
United Kingdom	X	Speed restrictions are taken into account		X	Environmental factors and regional policy aims are taken into account
Ireland	Average daily traffic Standard 1 x 2 lane : 9500 Wide 1 x 2 lane: 11500		Minimum: level D		
Denmark	70% of (theoretical) capacity				Safety

ANNEX II

53

Criteria used for the identification of bottlenecks or selection of projects

Rail Network

(X = element taken into account; no precise details provided)

Country	Capacity of line	Commercial speed	Frequency of service	Reliability of services	Terminal facilities	Lack of rail link	Ferry capacity
Federal Republic of Germany	2-track lines : 120 commercial trains per direction per day. Single-track lines : 80 commercial trains per day				X		
France	2-track lines : 220 commercial trains per day (both tracks taken together)						
Italy	X			X	X		
Nederland		Minimum : 90 km/h measured over the whole link to frontier	Frequency of international services	Reliability of international services			
Belgium	From 12 to 18 trains per hour per direction	Minimum : 125 km/h		X	X		
Luxembourg	X	X					
UK	X	X	X		X	X	X
Ireland	No information						
Denmark	X	X		X	X		

ANNEX 3
VII

ANNEX 4

BELGIUM

Railway Network

A. Lines with inadequate capacity or where commercial speed is less than 125 KM/h

Line	Length	Remarks
Bruxelles-Arlon	206 KM	Capacity/speed
Bruxelles-Tournai-French border	100 KM	Capacity/speed
Bruxelles-Antwerpen-Dutch border (Essen)	75 KM	Speed
Bruxelles-Liège-German border	140 KM	Capacity/speed
Bruxelles-Mons-French border (Quévy)	80 KM	Speed
Bruxelles-Oostende	124 KM	Capacity/speed
Total length	708 KM*	

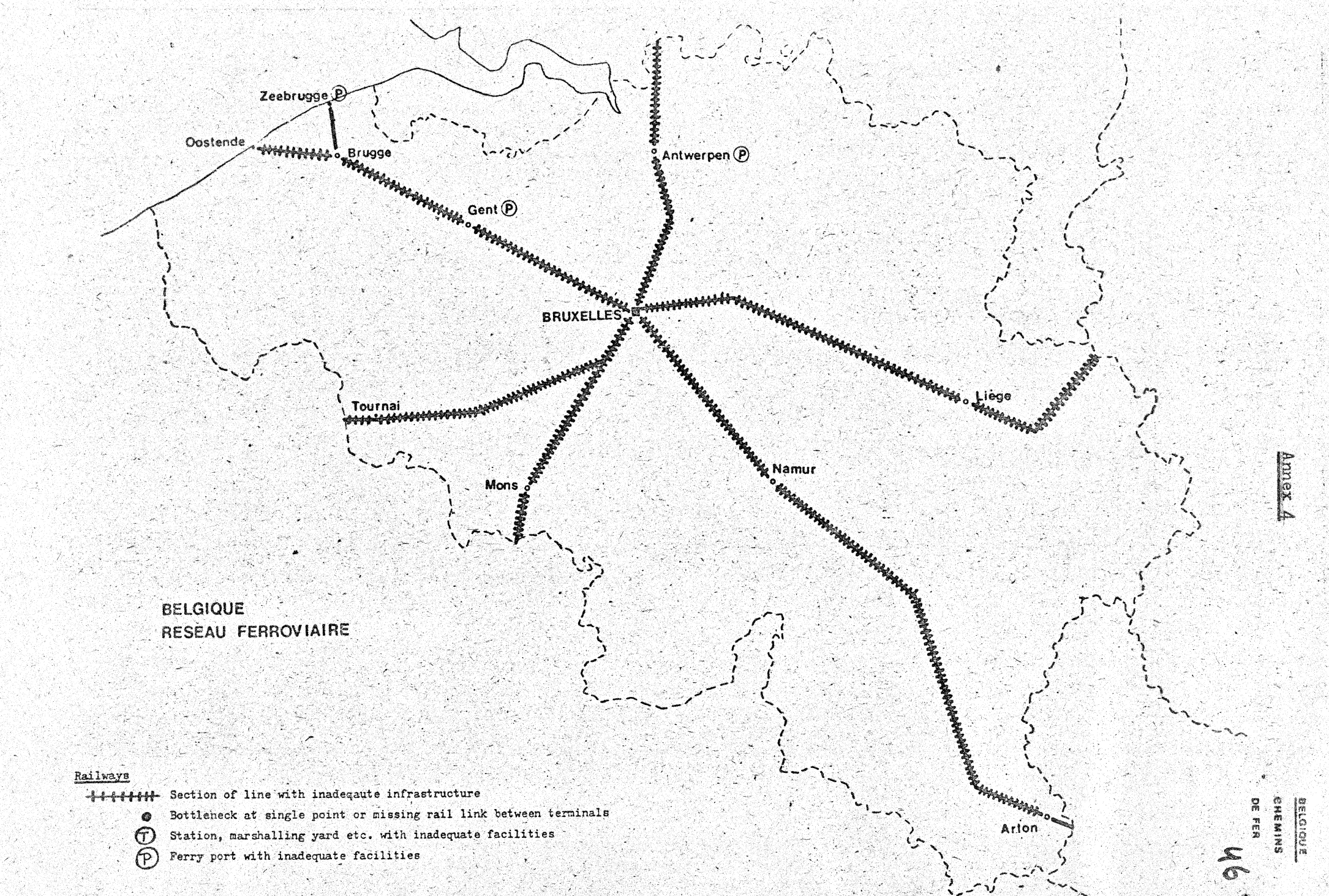
B. Ferry-ports with inadequate capacity:

Antwerpen

Gent

Zeebrugge

*Note: total differs from sum of columns because the section Bruxelles-Halle (17 KM) forms part of both the Bruxelles-Tournai and the Bruxelles-Mons lines.



Annex 4

BELGIQUE
CHEMINS DE FER

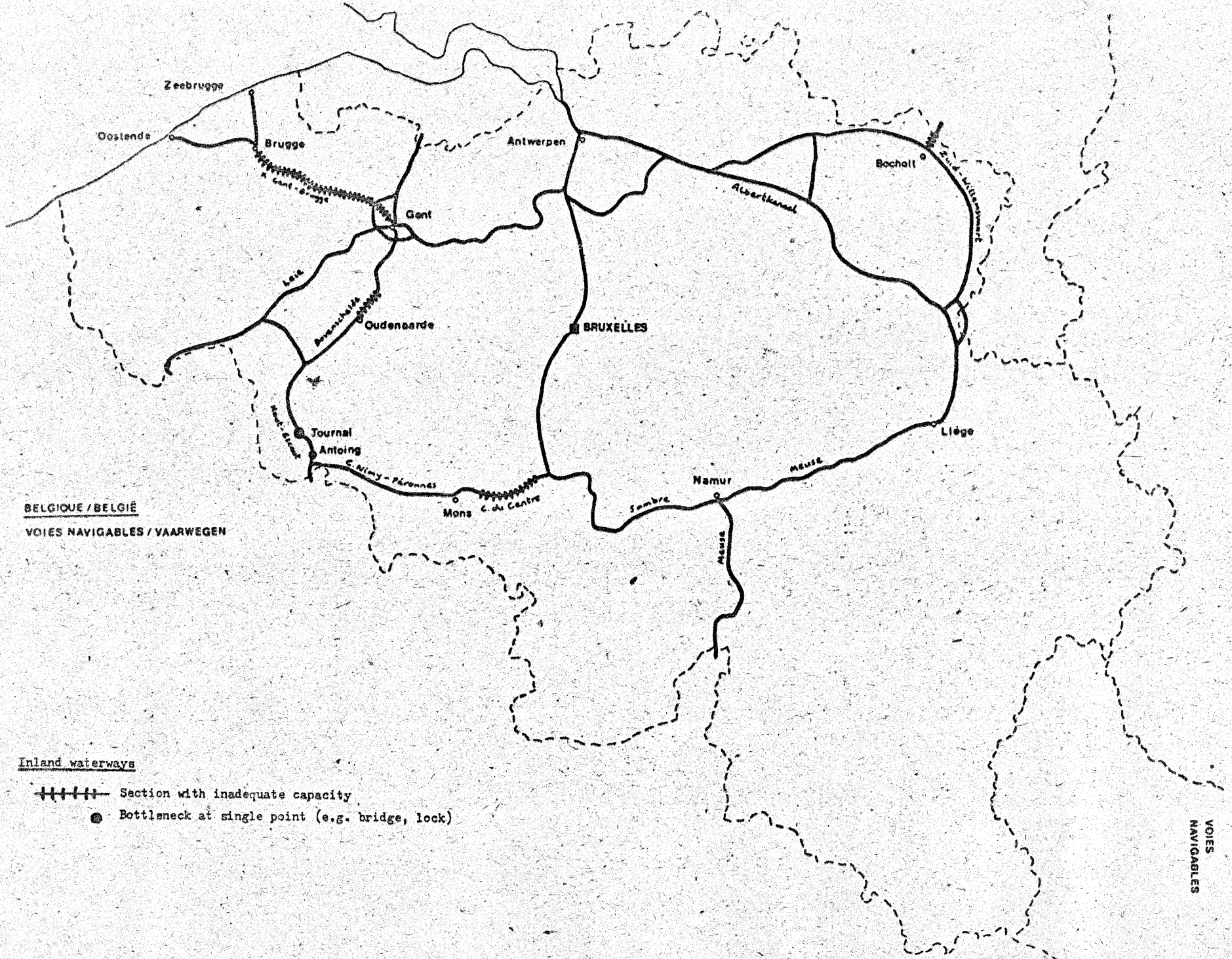
46

ANNEX 4

BELGIUM

Inland Waterways

Waterway	Section	Length	Remarks
Haut-Escaut	Lock, Antoing	-	Dimensions smaller than those of the rest of the waterway
	Tournai	1 KM	No passing possibilities for 1350 t barges
	Downstream from Oudenaarde	7 KM	Inadequate dimensions
Canal du Centre	Class I section	7 KM	
Gent-Brugge	Class II, whole length of canal	41 KM	
Zuid-Willemsvaart	Bocholt-Netherlands border	5 KM	Inadequate depth of waterway and lock
	Total length	61 KM	


Zeebrugge
Oostende
Brugge
Antwerpen
Bocholt
Gent
Albertkanaal
Leie
Oudenaarde
BRUXELLES
Tournai
Antoing
Liège
Namur
Meuse
Mons
Sambre
C. du Centre
BELGIQUE / BELGIË
VOIES NAVIGABLES / VAARWEGEN
Inland waterways
Section with inadequate capacity
Bottleneck at single point (e.g. bridge, lock)
Annex 4
BELGIQUE
VOIES NAVIGABLES
48

ANNEX 5

DENMARK

Road Network

List of projects

Road number	Section	Length
E 20	Ringsted-Skovse	26 KM
	Hjulby-Korsebjerg	37 KM
E 37	Rise Hjarup-Christiansfeld	34 KM
	Nørre Stenderup - Vejle	17 KM
	Vejle-Skanderborg	39 KM
E 45	Rønnede-Sakskøbing	60 KM
	Total length	213 KM

Railway Network

List of projects

A. Line with inadequate capacity and commercial speed:

Link	Section	Length
København-Rødby/Fredericia	København-Ringsted	60 KM

B. Stations in need of improvement:

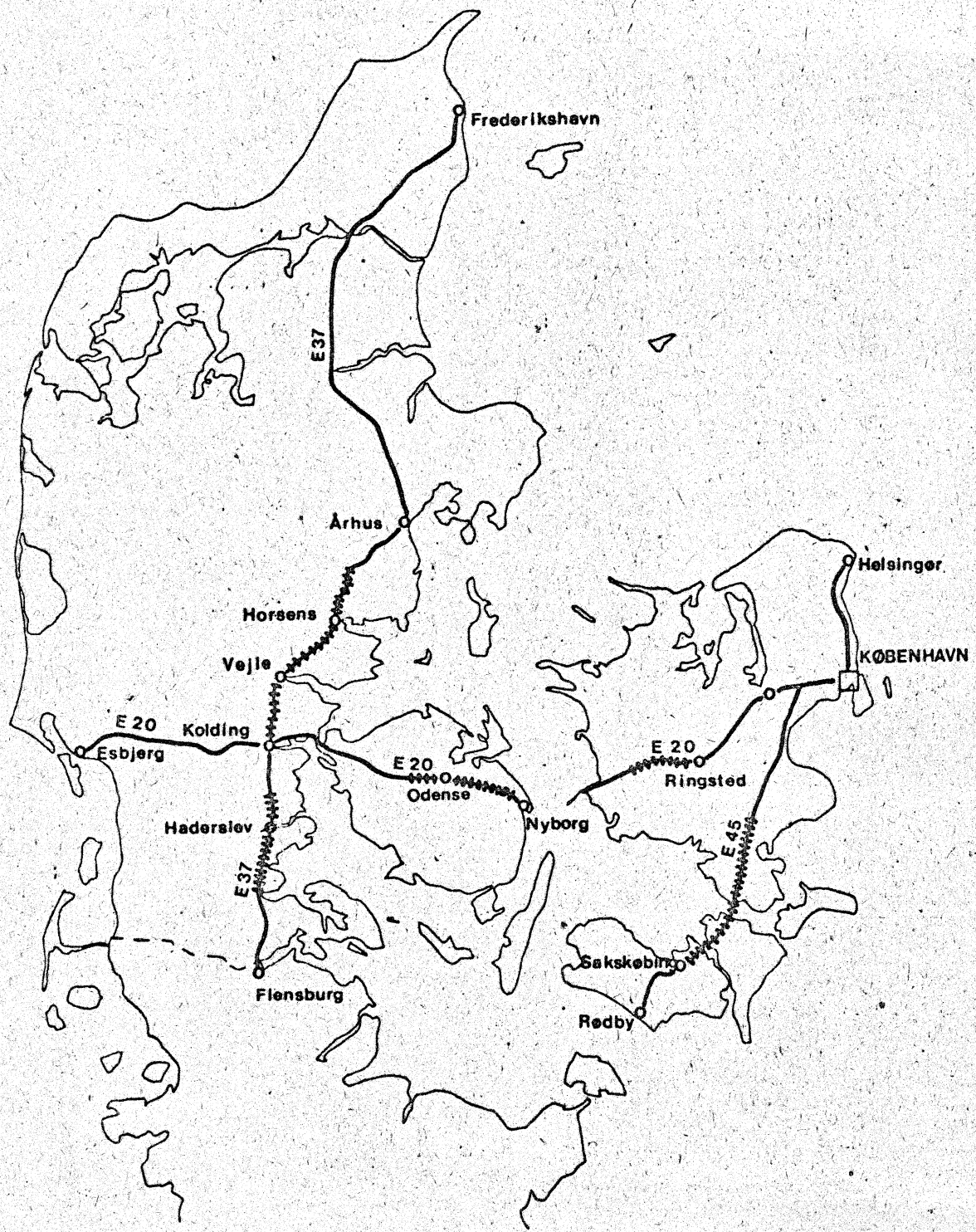
Location	Facilities needing improvement
Hellerup, Vigerslev } Stations on the København-Helsingør Line	Safety installations

C. Ferry-port with inadequate capacity:

Rødby ferry port	Ferry berth capacity.

DANMARK

VEJE



Roads

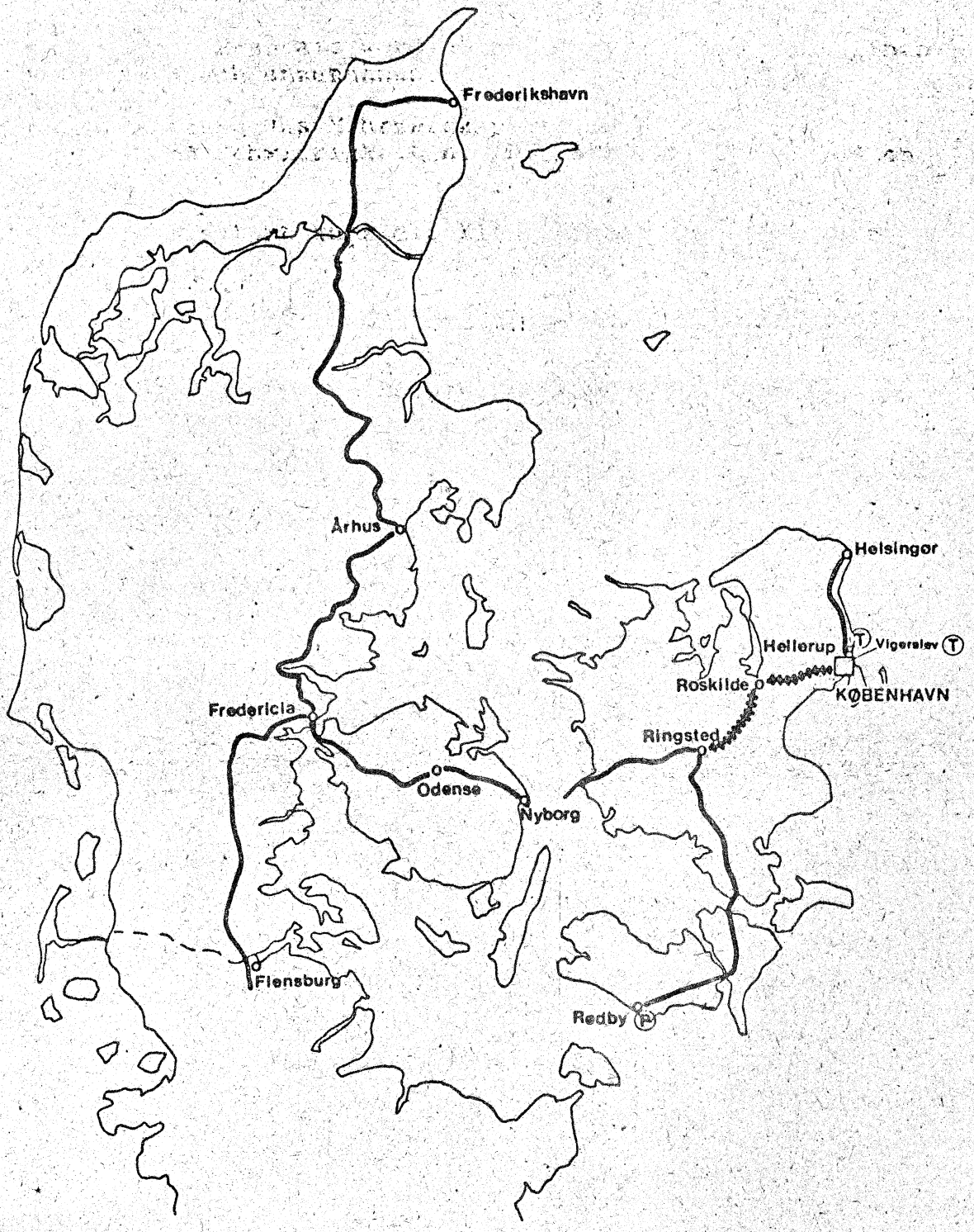
Section with inadequate infrastructure

Bottleneck at single point (e.g. built-up area)

RO/RO ferry port with inadequate facilities

DANMARK

JERNBANER



Railways

Section of line with inadeqaute infrastructure

Bottleneck at single point or missing rail link between terminals

(T) Station, marshalling yard etc. with inadequate facilities

(P) Ferry port with inadequate facilities

ANNEX 6 VII/156/80-EN
Orig. FR

FRANCE

Road Network

Road number	Section	Length of congested section
E 03	Avranches–Villedieu	22 KM
E 05	Paris–Mantes	55 KM
E 07	Châteauroux–Argenton La Souterraine–Limoges Montauban–E 76 Toulouse–Auterive Pamiers–Foix	178 KM
E 15	Senlis–Paris, Paris–Nemours Mâcon–Avignon	285 KM
E 17	Lille–Lens, Berry au Bac–Reims Châlons sur Marne–Vitry	39 KM
E 19	Senlis–Paris	— (cf. E 15)
E 21	Dijon–Dôle	48 KM
E 42	Lille–Bailleul	16 KM
E 44	Plerneuf–Saint Brieuc Caen–Villers Bocage, Rouen–Saint Martin	67 KM
E 46	Beauvais–Clermont, Jonchery–Reims	39 KM
E 50	Plerneuf–Saint Brieuc	— (cf. E 44)
E 52	Paris–Rozay en Brie, Sézanne–Fère Champenoise Saint Dizier–Stainville	96 KM
E 60	La Roche Bernard–Pontchâteau Pontchâteau–Savenay	25 KM
E 62	Bourg en Bresse–Nantua	58 KM
E 70	Chambéry–Aiguebelle	26 KM
E 80	Laoq–Pau, Tarbes,–Lannemezan	58 KM
	Total length	1.012 KM

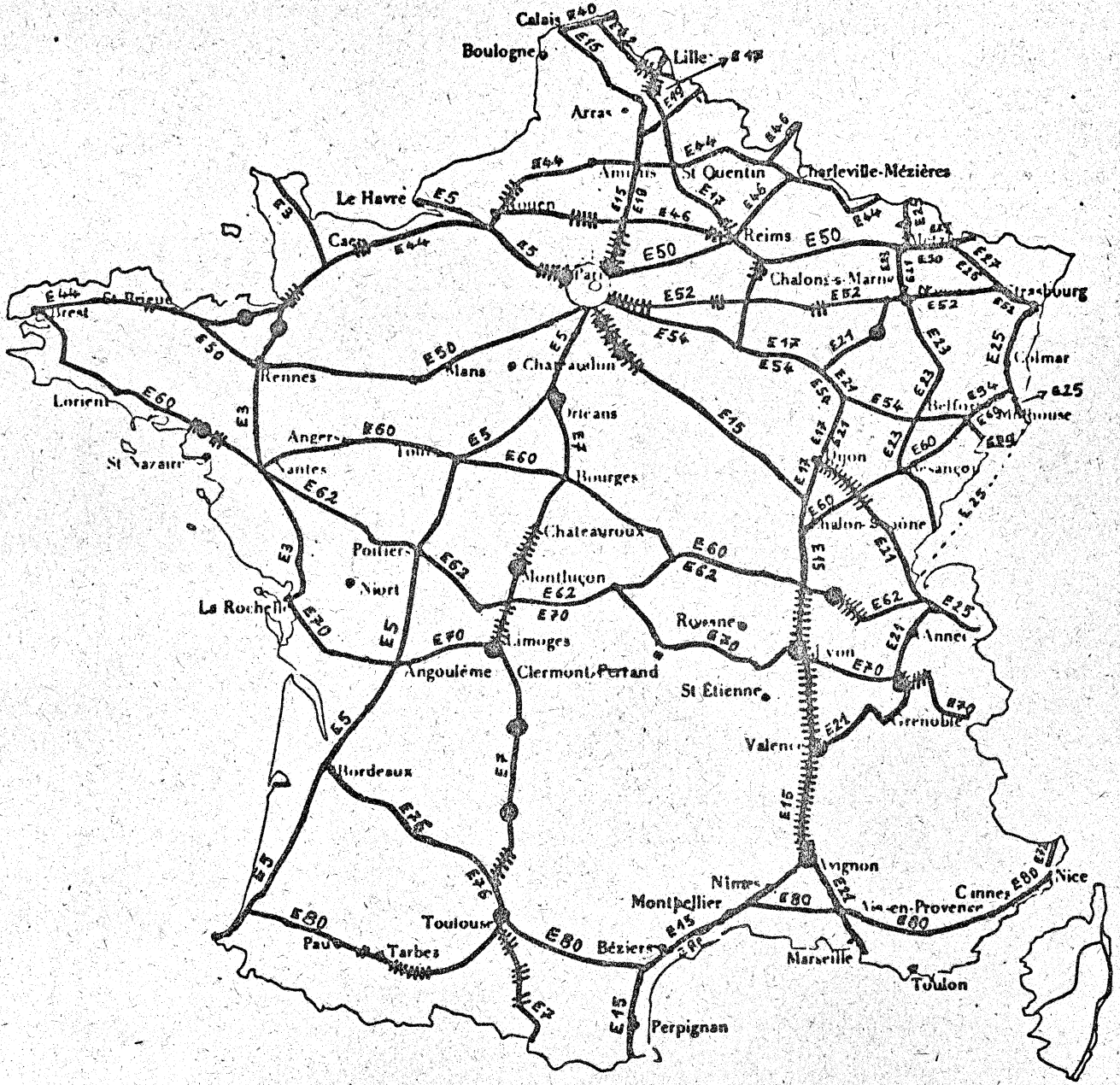
Annex 6

France

Roads

EUROPEAN ROUTES

BOTTLENECKS



congested sections

bottlenecks

Scale : 1/5 000 000

ANNEX 6

FRANCE

Railways

The new high-speed line between Paris and Lyon will, amongst other things, relieve the existing Paris-Dijon-Macon-Lyon line, which shows signs of congestion on some of its sections; this congestion will disappear once the new line is in service (the first part in 1981).

Similarly, south of Lyon, the electrification of the line running along the right bank of the Rhone, which was completed in September 1979, will relieve the line on the left bank and thus solve the capacity problems which were apparent on some sections by making it possible to achieve a better balance of traffic on both sides of the Rhône.

Between Paris and Orléans, the longest and most heavily used section of the line (33 km between Etampes and Toury) will have a third track at the end of 1982.

Once these works have been carried out, there will remain a few, mostly short, sections (in the region of 3 to 5 km) in the Paris suburbs, especially in the northern suburbs and on the line Paris-Orléans, where the coexistence of an intense commuter traffic and inter-city services sometimes gives rise to problems of congestion. Some problems of this sort are also encountered on the link Paris-Strasbourg around Meaux and on the approach to Nancy.

ANNEX 6

FRANCE

Inland Waterways

List of projects

Link	Route	Length
Bassin du Nord-Belgium	Lower Deule	20 KM
	Scheldt	30 KM
	Valenciennes-Mons	6 KM
Rhine-Rhône	Saône (Lyon-Auxonne)	250 KM
	St.Symphorien-Mulhouse	210 KM
Rhône-Fos/Port de Bouc	—	15 KM
Paris basin - Bassin du Nord	Several solutions are being studied	—

ANNEX 7

IRELAND

Road Network

Road number:	Section	Length
E 01	Border–Dundalk	12 KM
	Dundalk Town	—
	Blake's Cross–Dublin	11 KM
	Dublin City	—
	Dublin–Rathnew	50 KM
	Wexford Town	—
E 20	Naas–Portlaoise	51 KM
	Limerick City	—
	Limerick–Shannon	22 KM
E 30	Cork–Carrigtwohill	14 KM
	Waterford City	—
	Waterford–New Ross	24 KM
E 200	Fermoy–Cork	35 KM
N4	Dublin–Kilcock	30 KM
	Drumsna–Sligo	61 KM
N6	Athlone Town	—
	Oranmore–Galway	10 KM
	Total length	> 320 KM

Annex 7

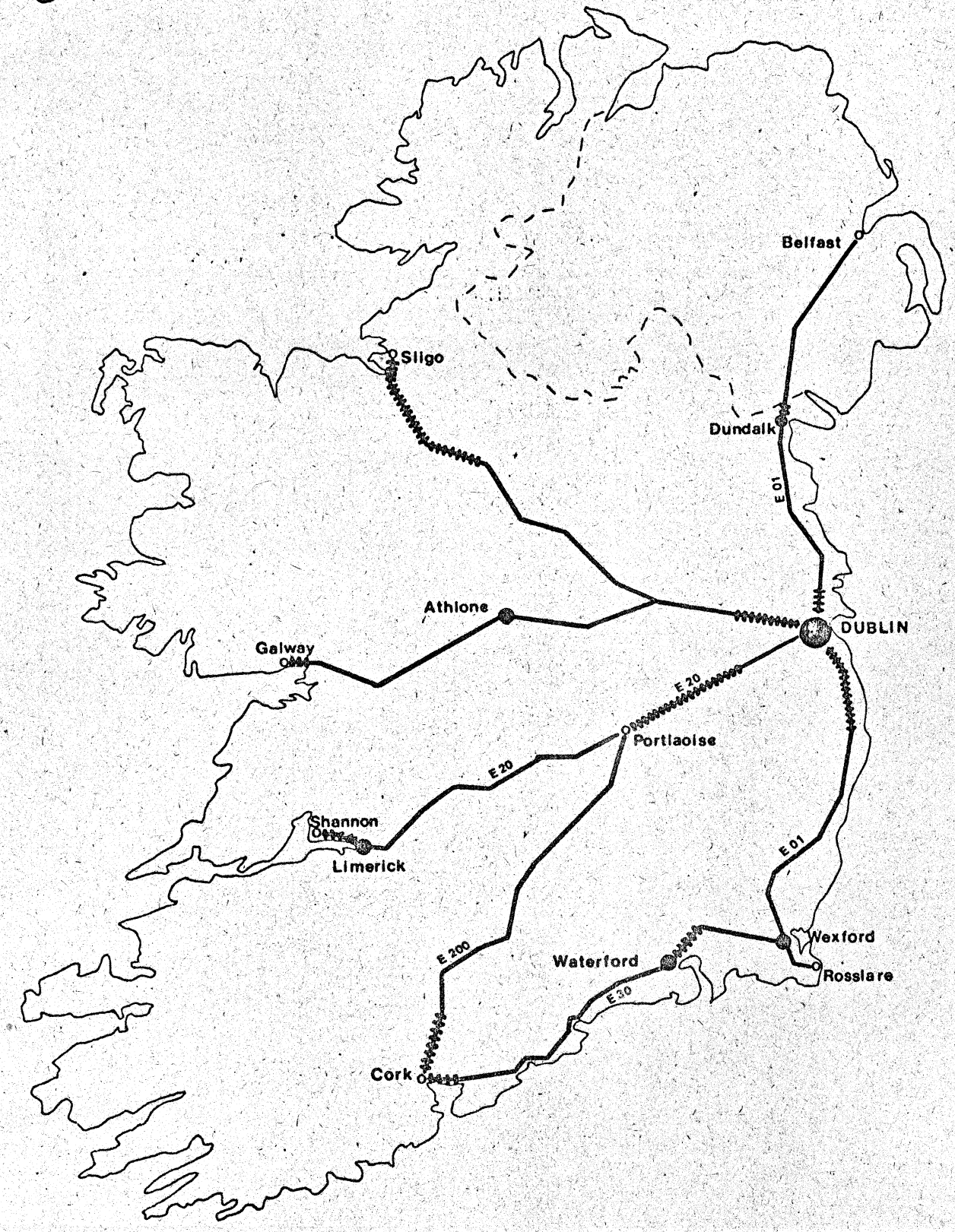
IRELAND

ROADS

Section with inadequate infrastructure

Bottleneck at single point (e.g. built-up area)

(P) RO/RO ferry port with inadequate facilities



ANNEX 7

IRELAND

Railway Network

A. Line with inadequate capacity and commercial speed:

Link	Section	Length
Dublin-Belfast	Dublin-Border	100 KM

B. Rail link missing:

Link between port of Dublin and the rail network.

C. Ferry-port with inadequate facilities: Dublin.

IRELAND

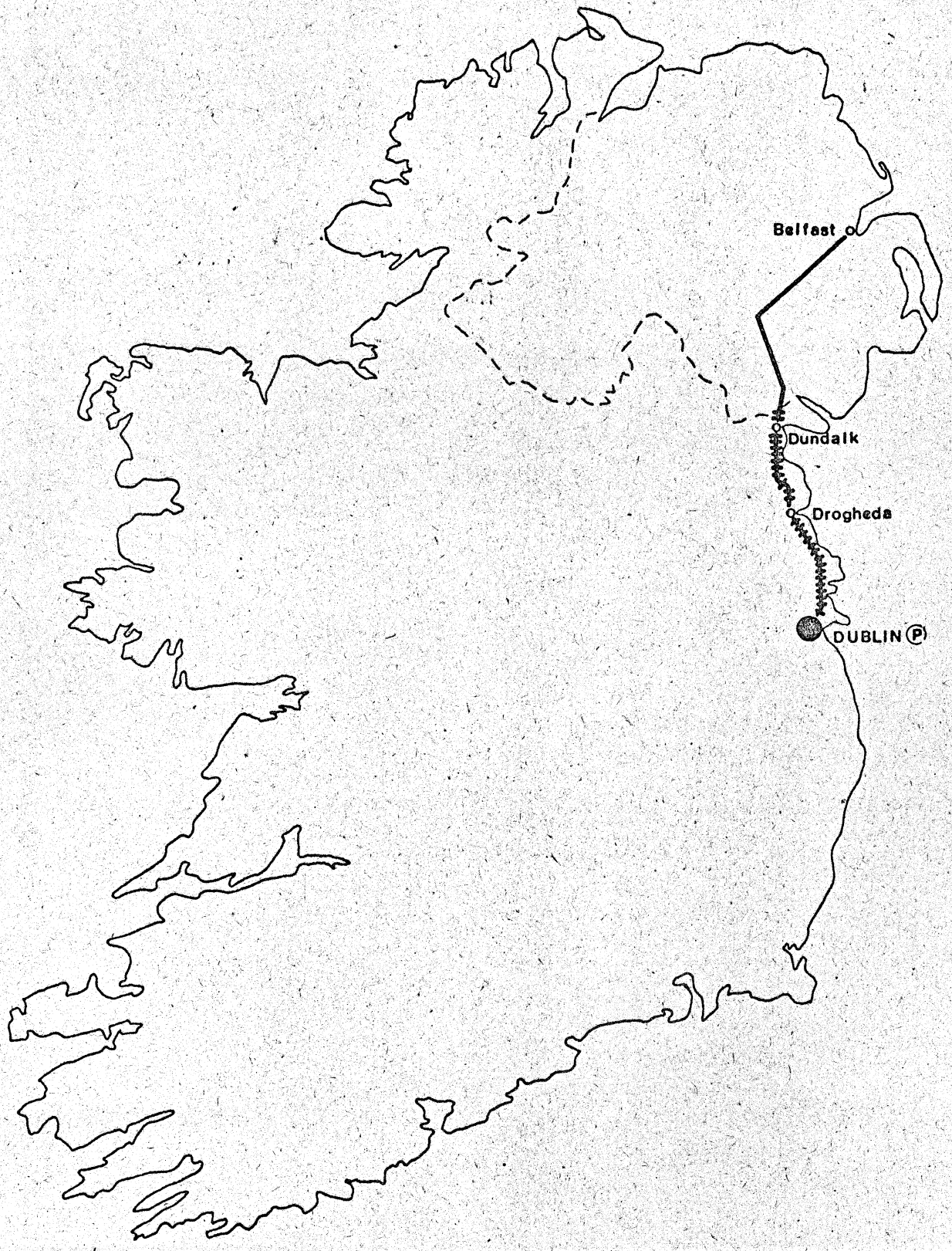
RAILWAYS

Section of line with inadeqaute infrastructure

Bottleneck at single point or missing rail link between terminals

Station, marshalling yard etc. with inadequate facilities

Ferry port with inadequate facilities



ANNEX 8

ITALY

Road Network

Road number	Section	Length	
E 25	Aosta-Traforo del Monte Bianco	37 KM	
E 29	Aosta-Traforo del Gran San Bernardo	20 KM	
E 45	Perugia-Cesena	130 KM	
	Catania (tangenziale)	11 KM	
E 70	Torino-Bardonecchia	75 KM	
E 78	Grosseto-Fano	220 KM	
E 80	Livorno-Civitavecchia	237 KM	
E 80/E 45	Fiano-Valmontone	50 KM	(Rome by-pass)
E 90	Taranto-Catanzaro	n.a.	(four sections)
	Messina-Palermo	66 KM	
	Palermo (tangenziale)	15 KM	
E 844	Spezzano Albanese (E45) - Sibari (E90)	21 KM	
Autostrada dei Trafori	Stroppiana-Gravellona Toce	113 KM	
Autostrada Venezia-Monaco	Vittorio Veneto-Austria	160 KM	
SS 52 bis	Tolmezzo-Monte Croce Carnico	33 KM	
E 45/E 90	Stretto di Messina	3 KM	(Bridge project under consideration)
	Total length	> 1.200 KM	

Inland waterways

Waterway	Section	Length
Litoranea Veneta	Laguna di Venezia-Laguna di Marano	50 KM
Canale Venezia-Po	Volta Grimana-Brondolo	20 KM
	Total length	70 KM

Annex 8

ITALIA

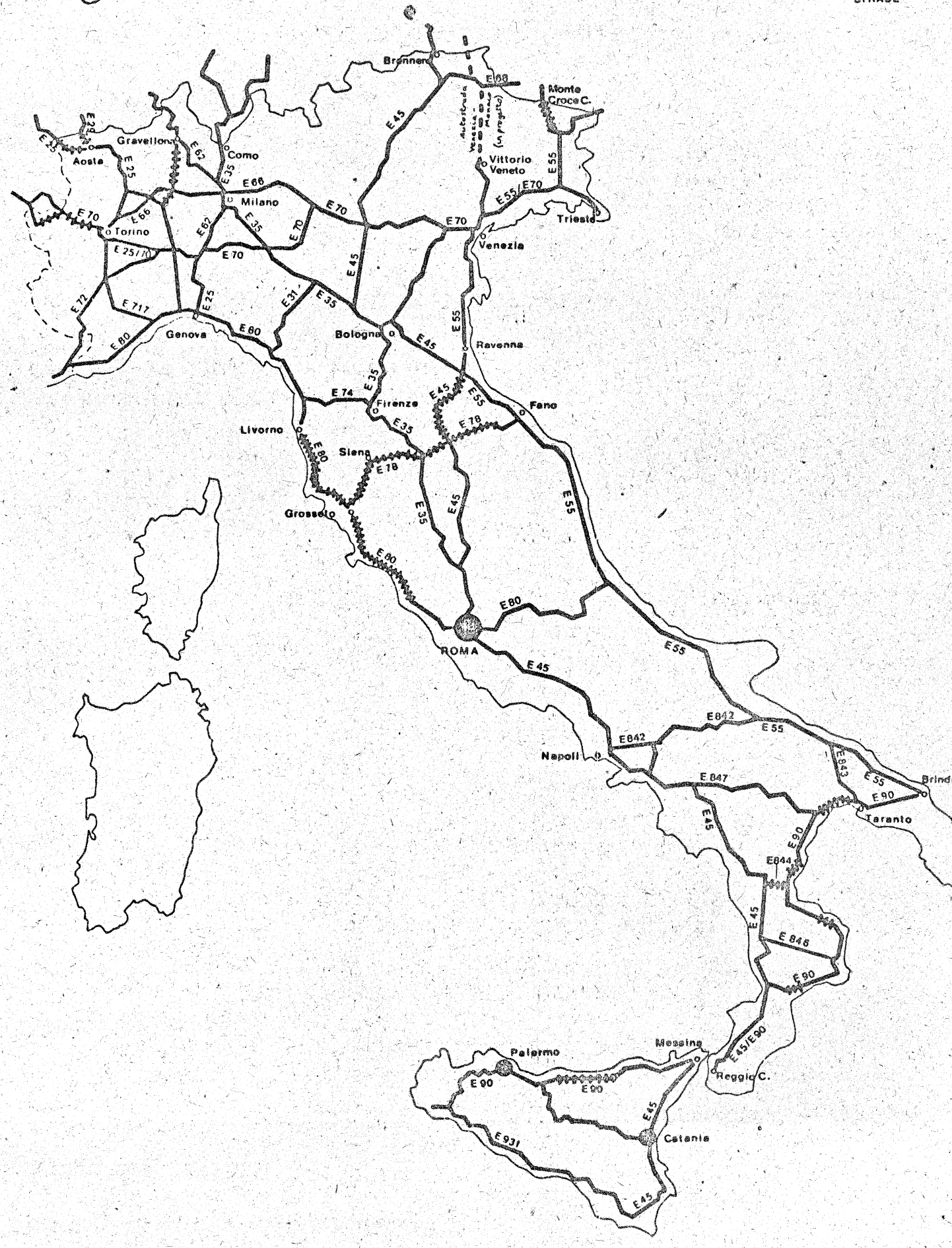
STRADE

Roads

Section with inadequate infrastructure

Bottleneck at single point (e.g. built-up area)

RO/RO ferry port with inadequate facilities



ANNEX 8

ITALY

Railway Network

List of projects

A. Lines with inadequate capacity

Link	Section	Length of section	Remarks
Genova-Ventimiglia	Savona-Ventimiglia	107 KM	Bottleneck forecast by 1985
Modane-Torino	Modane-Bussoleno	60 KM	
Torino-Milano	Torino-Chivasso	29 KM	
Torino-Genova	Torino-Trofarello	13 KM	
Milano-Padova	Milano-Treviglio	34 KM	
Padova-Venezia Mestre	Whole length of link	28 KM	
Milano-Bologna	Whole length of link	218 KM	
Seregno-Bergamo-Rovato	Whole length of link	70 KM	alternative East-West routes to relieve Milan
Chivasso-Casale-Valenze-Casalpusterlengo	Whole length of link	158 KM	
Udine-Tarvisio	Whole length of link	94 KM	
Brennero-Verona-Bologna	Whole length of link	351 KM	
Domodossola-Milano	Whole length of link	108 KM	
Parma-La Spezia	Whole length of link	105 KM	
Messina-Palermo	Whole length of link	132 KM	
Messina-Catania	Whole length of link	95 KM	
	Total length	1.602 KM	

B. Stations with inadequate capacity

Domodossola: frontier station

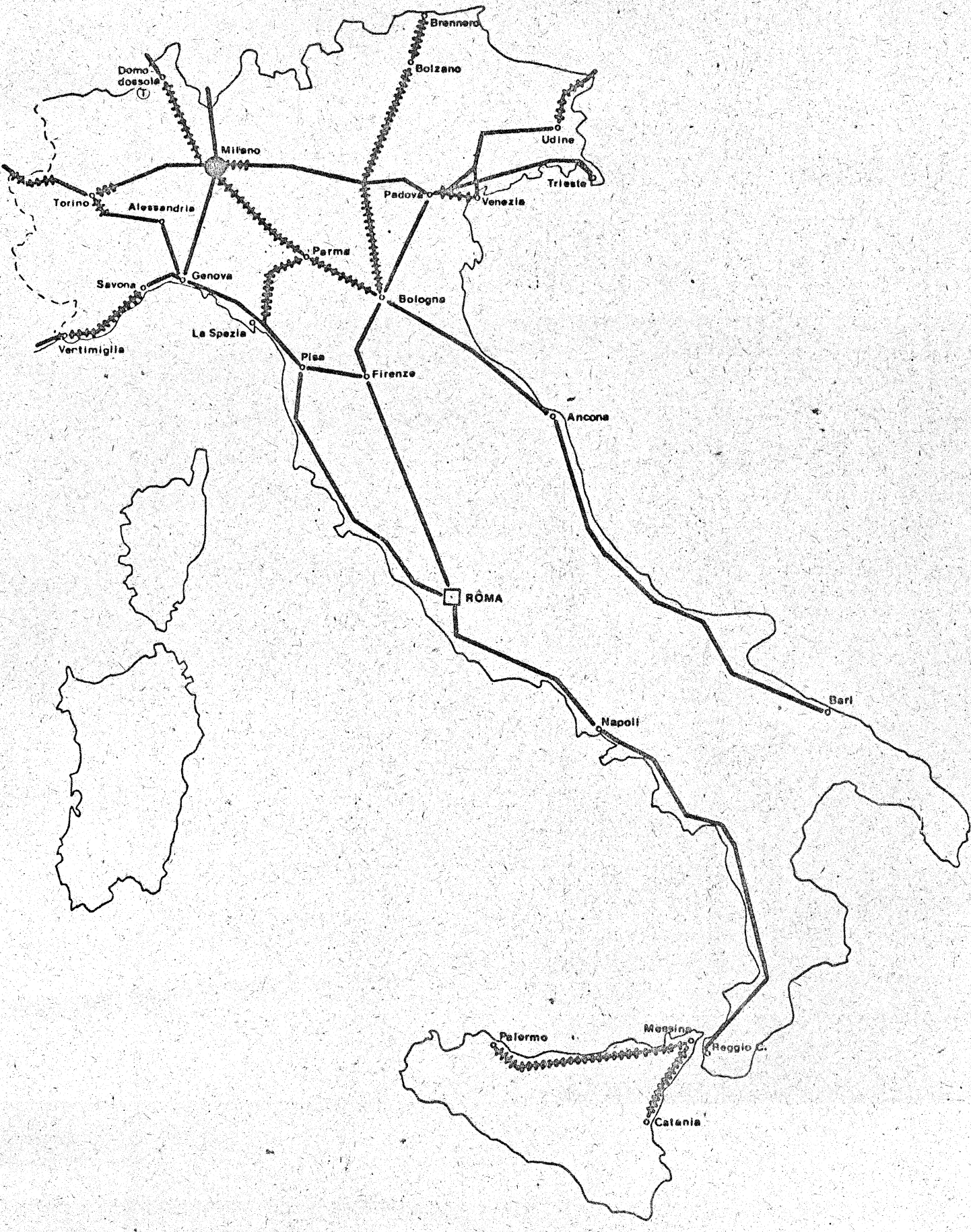
Airports

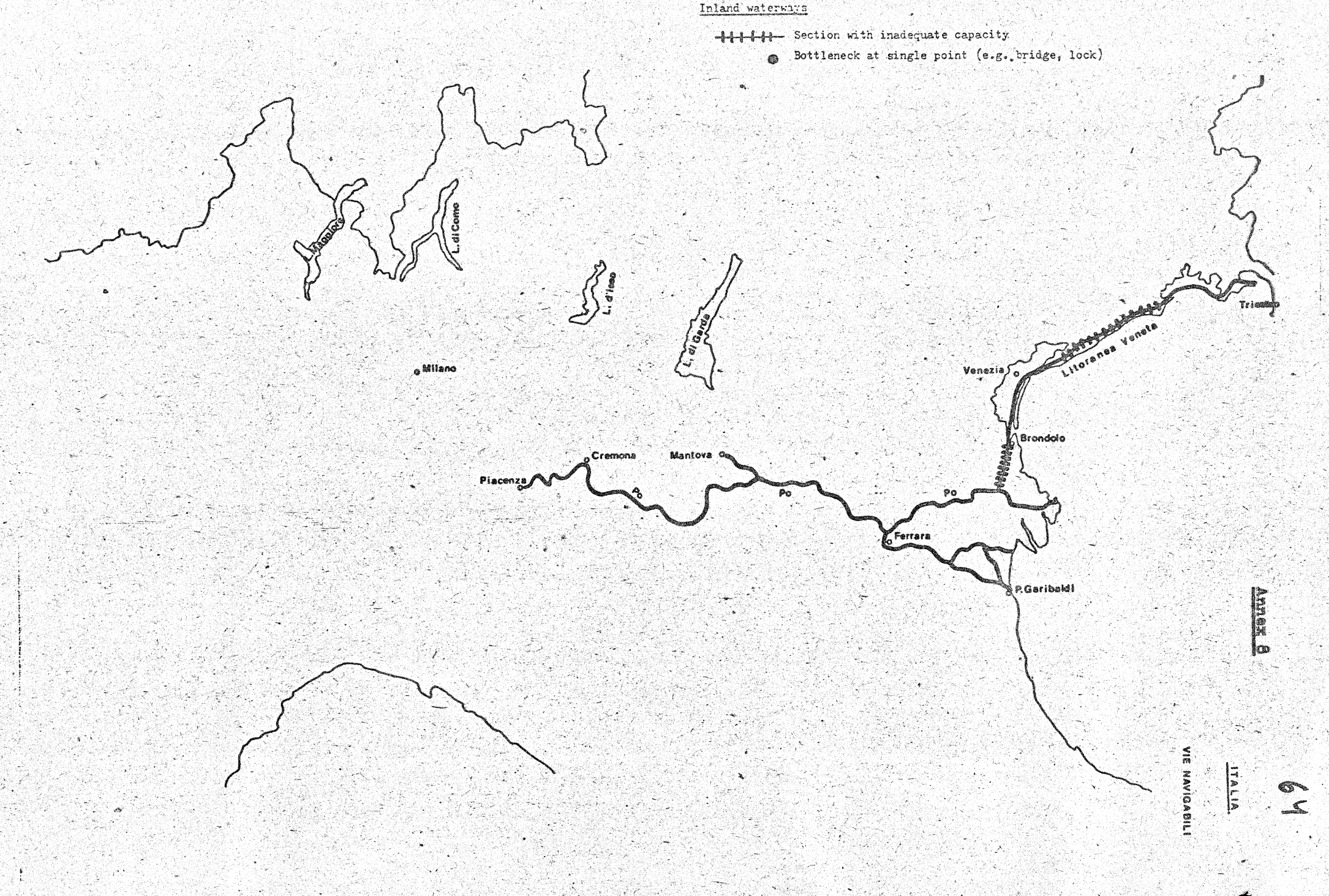
The airport systems of Rome and Milan constitute bottlenecks in the Italian air transport network.

Railways

- Section of line with inadequate infrastructure
- Bottleneck at single point or missing rail link between terminals
- (T) Station, marshalling yard etc. with inadequate facilities
- (P) Ferry port with inadequate facilities

ITALIA
FERROVIE





Annex 8

ITALIA

VIE NAVIGABILI

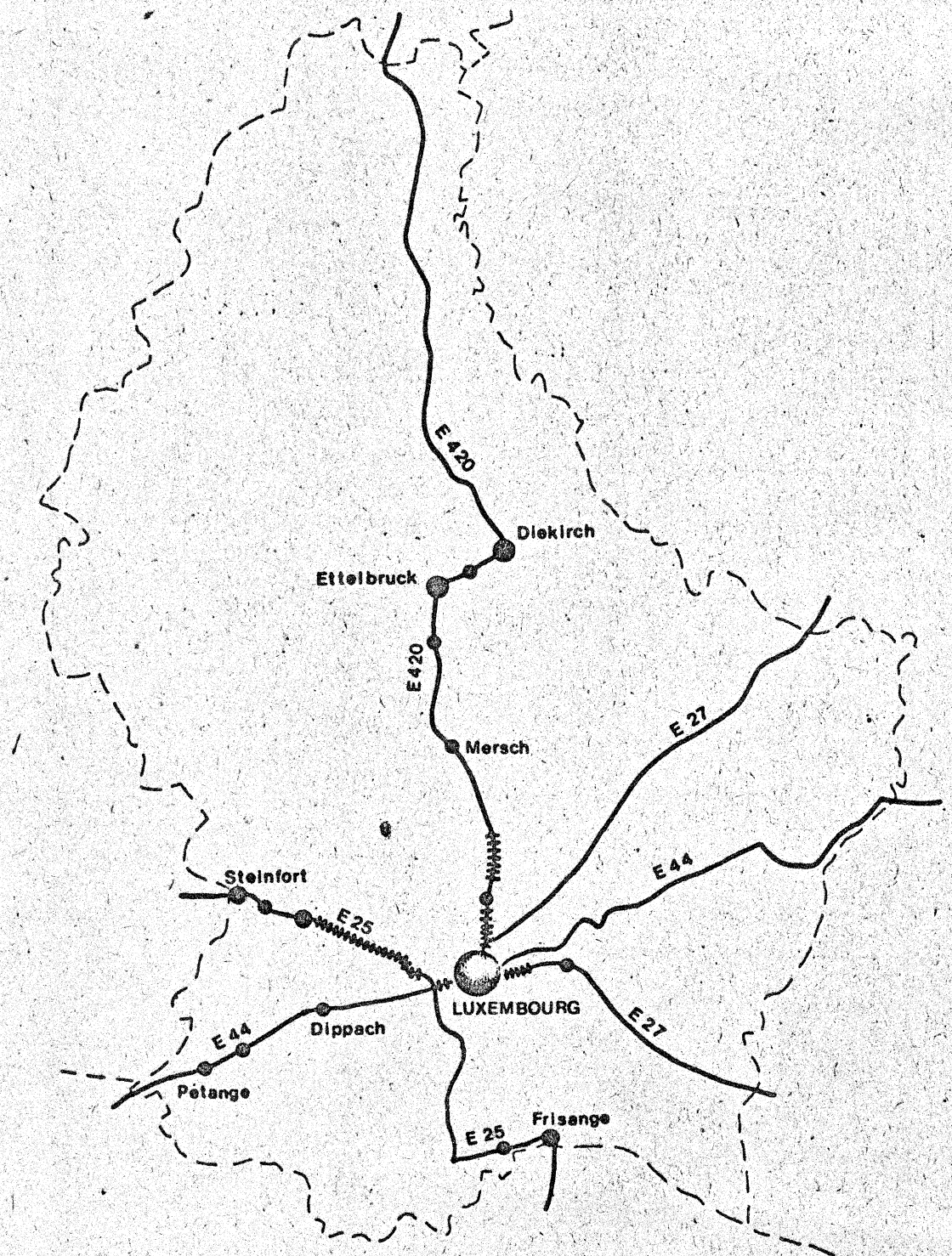
ANNEX 9

LUXEMBOURG

Road Network

Road number	Section	Length
E 25	Steinfort	1 KM
	Wandhaff	1 KM
	Cap-Strassen	9 KM
	Hellange	1 KM
	Frisange	1 KM
E 27	Luxembourg Ville	4 KM
	Luxembourg Ville-Airport	3 KM
	Sandweiler	1 KM
E 44	Pétange	1 KM
	Bascharage	1 KM
	Dippach	1 KM
	Luxembourg Ville	3 KM
E 420	Diekirch	1,5 KM
	Ingeldorf	1 KM
	Ettelbruck	1,5 KM
	Colmar	1 KM
	Mersch	0,5 KM
	Lorentzweiler-Heisdorf	3 KM
	Walferdange-Luxembourg Ville	4 KM
	Total length	40 KM

LUXEMBOURG
ROUTES



Roads

Section with inadequate infrastructure

Bottleneck at single point (e.g. built-up area)

(P) RO/RO ferry port with inadequate facilities

ANNEX 9

LUXEMBOURG

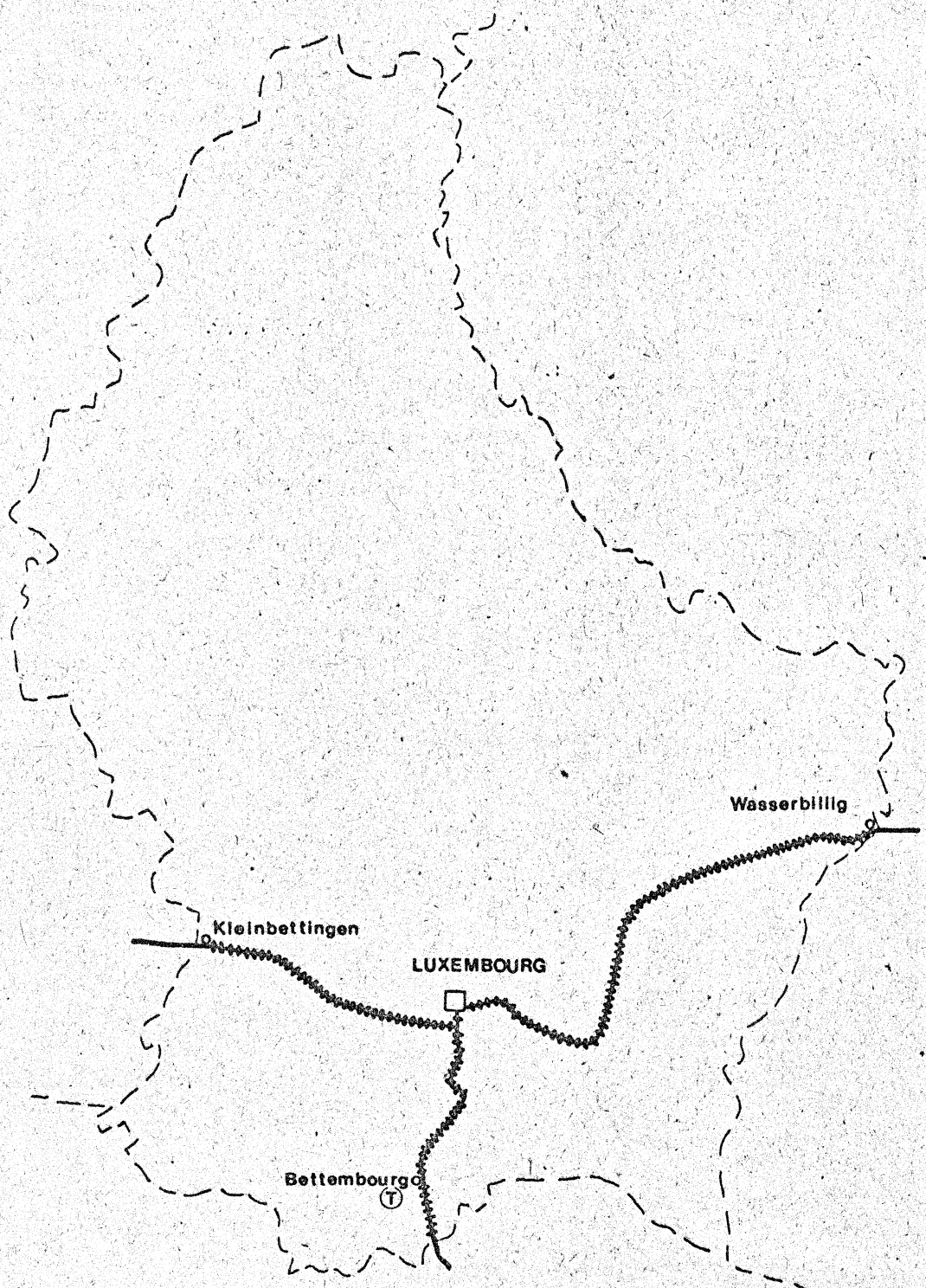
Railway Network

A. Line with inadequate capacity and permissible speed:

Link	Section	Length
Bruxelles-Arlon-Luxembourg-Metz	Kleinbettingen-Luxembourg-French border	35 KM
Luxembourg-Trier	Luxembourg-Wasserbillig	36 KM

B. Marshalling yard with inadequate capacity:

Bettembourg - new marshalling yard under construction; container terminal needed.



Railways

Section of line with inadeqaute infrastructure

Bottleneck at single point or missing rail link between terminals

(T) Station, marshalling yard etc. with inadequate facilities

(P) Ferry port with inadequate facilities

ANNEX 10

NETHERLANDS

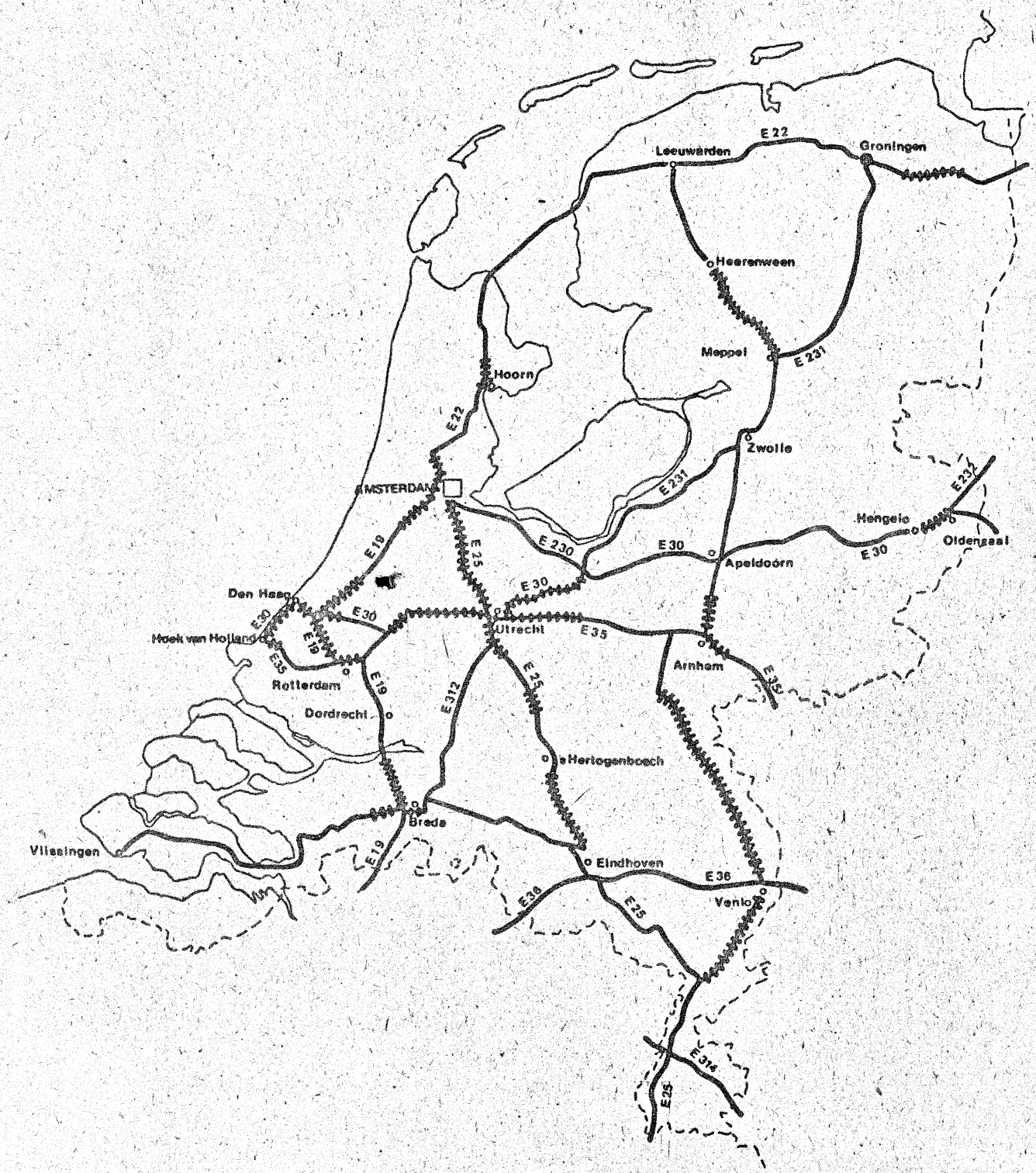
Road Network

Road number	Section	Length
E 19	Amsterdam-Schiphol	12 KM
	Leiden-Zwijndrecht	42 KM
	Moerdijk-Breda	15 KM
E 22	W. ringweg, Amsterdam	10 KM
	Hoorn-Wognum	10 KM
	Z. ringweg, Groningen	4 KM
	Hoogezand-Winschoten	15 KM
E 25	Amsterdam-Utrecht-Vianen	50 KM
	Beesd -Zaltbommel	10 KM
	's-Hertogenbosch-Eindhoven	40 KM
E 30	Hoek-Den Haag-Zoetermeer	28 KM
	Gouda-Utrecht-Amersfoort	58 KM
	Hengelo-Oldenzaal	12 KM
E 35	Hoek-Maassluis	7 KM
	N. Ringweg, Rotterdam	12 KM
	Gouda-Utrecht-Maarn	60 KM
	Arnhem-Zevenaar	12 KM
E 312	Z. ringweg, Breda	10 KM
A 32	Meppel-Heerenveen	30 KM
A 50	Beekbergen-Arnhem	10 KM
RW 271	Nijmegen-Gennep-Venlo	63 KM
RW 272	Venlo-Roermond-Maasbracht	36 KM
RW 58	Breda-Etten-Leur	8 KM
	Total length	527 KM*
	Work in progress	200 KM
	Bottlenecks forecast for 1984	327 KM*

* Note: total differs from the sum of the column because the section Gouda-Utrecht is common to E 30 and E 35.

NEDERLAND

WEGEN



Ports

Section with inadequate infrastructure

Bottleneck at single point (e.g. built-up area)

(P) RO/RO ferry port with inadequate facilities

ANNEX 10

NETHERLANDS

Railway Network

A. Lines with inadequate capacity:

Link	Section	Length
Rotterdam-Venlo-Deutschland	Boxtel-Eindhoven	23 KM

B. Bottlenecks at single points:

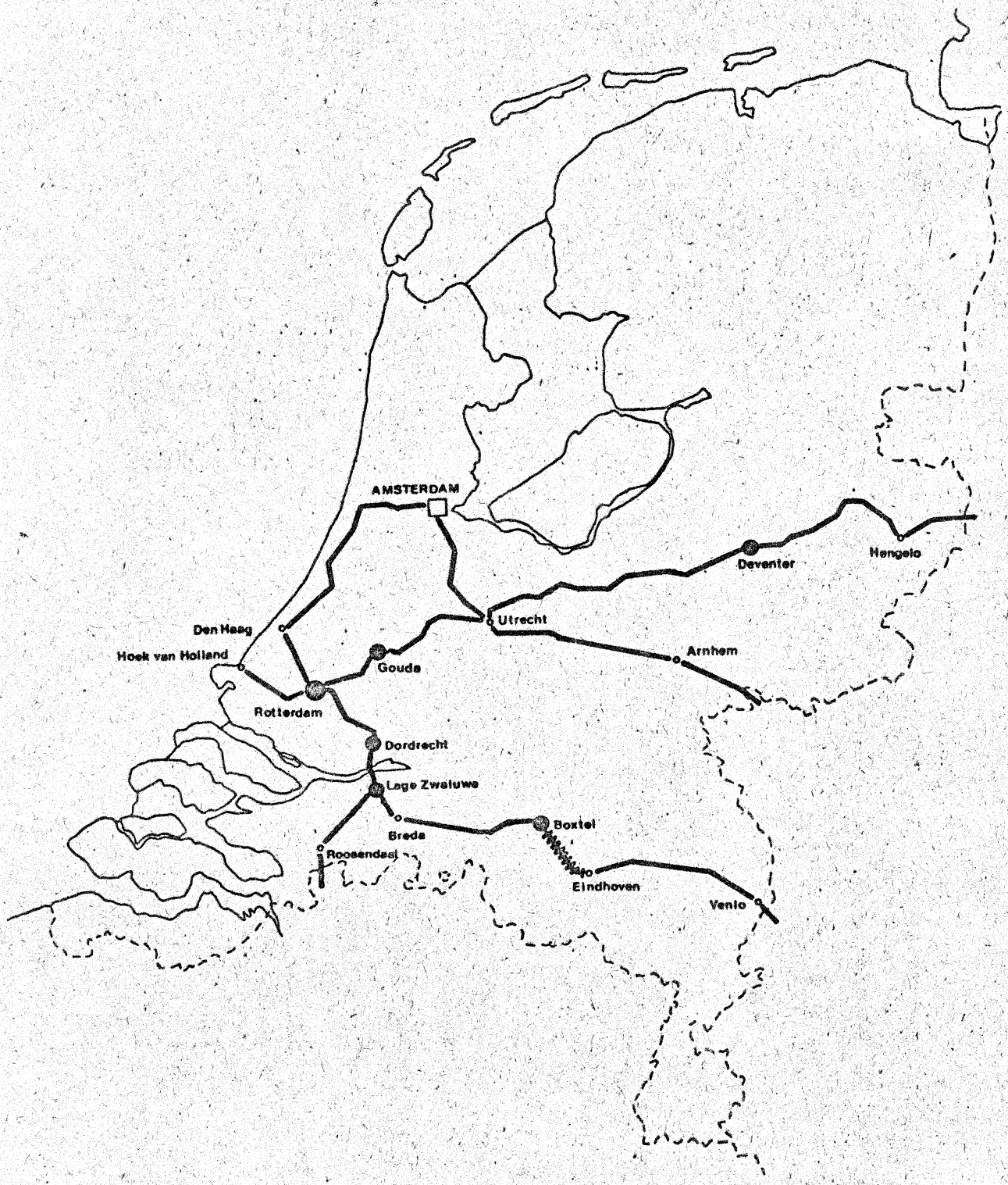
Link	Location	Nature of bottleneck
Hoek van Holland-Rotterdam-Hengelo-Deutschland	Near Moordrecht (Gouda)	Junction-speed limitation
	Near Gouda	Swing bridge over the Gouwe-speed limitation
	Near Deventer	Single track bridge over the IJssel
Rotterdam-Eindhoven-Venlo-Deutschland	Rotterdam*	The 'Willems' bridges over the Nieuwe Maas (swing bridges)
	Dordrecht*	Swing bridge
	Near Lage Zwaluwe*	Junction-speed limitation
	Near Boxtel	Junction-speed limitation

* These bottlenecks also lie on the line Amsterdam-Rotterdam-Roosendaal-Belgium

Annex 10

NEDERLAND

SPOORWEGEN



Railways

Section of line with inadequate infrastructure

Bottleneck at single point or missing rail link between terminals

(T) Station, marshalling yard etc. with inadequate facilities

(P) Ferry port with inadequate facilities

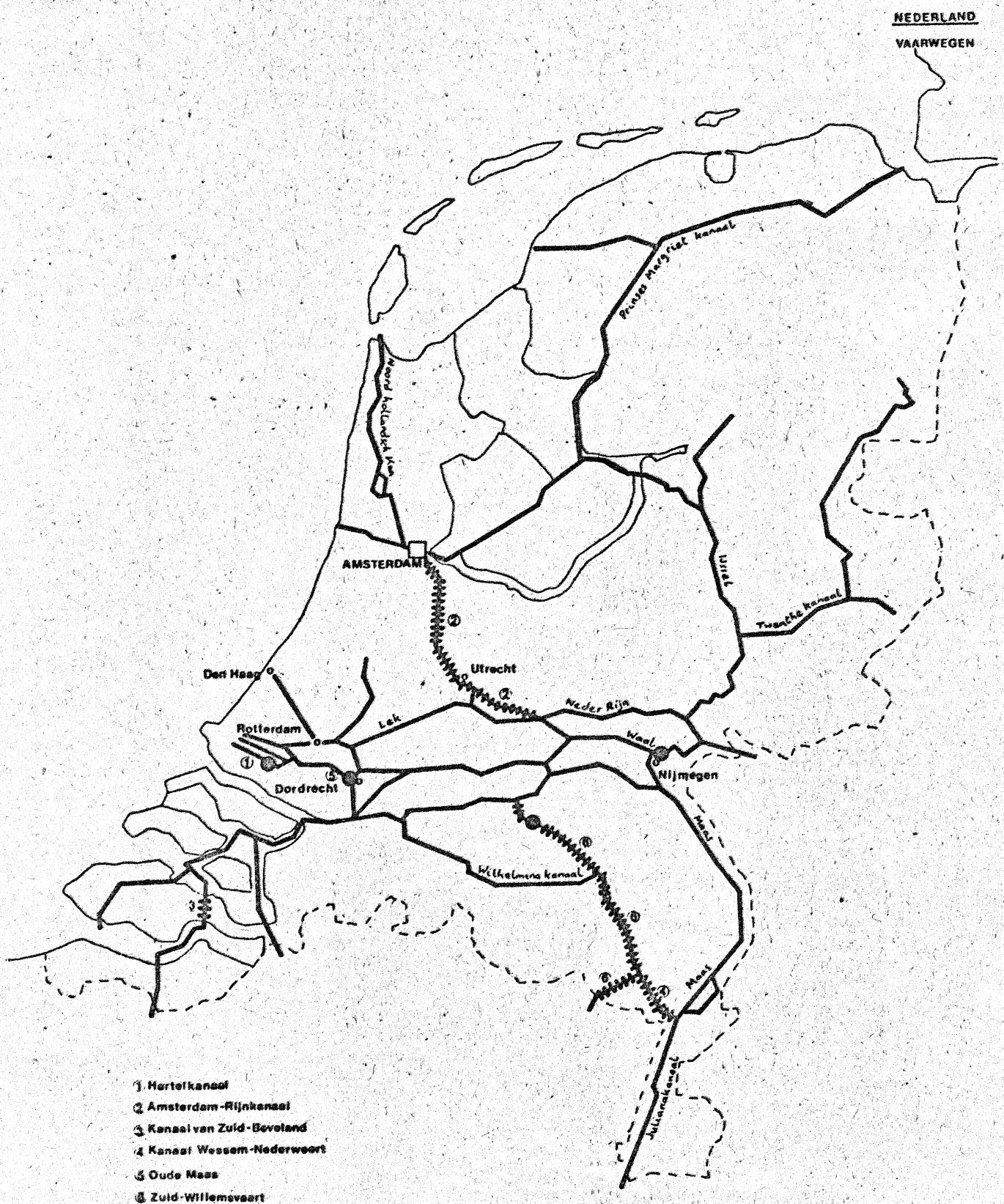
ANNEX 10

NETHERLANDS

Inland Waterways

Waterway	Section	Length	Remarks
Waal	Nijmegen	—	Bend in river
Hartelkanaal	Hartelmond	—	
Amsterdam-Rijnkanaal	—	80 KM	Class V waterway to be enlarged to Class VI
Kanaal van Zuid-Beveland	—	10 KM	Class V waterway to be enlarged to Class VI
Kanaal Wessem-Nederweert	—	15 KM	Class II waterway to be enlarged to Class IV
Oude Maas	Rail bridge, Dordrecht	—	
Zuid-Willemsvaart	—	60 KM	Class II waterway to be enlarged to Class IV
	Total length	165 KM	

Annex 10



Inland waterways

Section with inadequate capacity

Bottleneck at single point (e.g. bridge, lock)

ANNEX 11

F.R. of GERMANY

Road Network

Road number	Section	Length of section	% of international traffic Normal	Holiday period
E 22	Hesel-Kirchborgum	16 KM	28	35
	Neermoor-Westerstede	30 KM	18	30
E 24	Hamburg Bergedorf-Schnakenbek	20 KM	1	1
E 27	Kamener Kreuz-Burscheid	81 KM	11-14	16-19
	AK Leverkusen-AD Köln W./Frechen	19 KM	11	18
	Weilerswist-Tondorf	38 KM	14	23
	Saarbrücker St. Arnural-Saarbrücken Gersweiler	3 KM	9	13
	Saarbrücken-Saargemünd	14 KM	50	52
E 30	Hannover Bothfeld-Wunstorf/Luthe	19 KM	11	14
E 33	Meckenheim-Bad Neuenahr/Arhweiler	7 KM	20	29
E 35	Dinslaken-Köln Königsforst	85 KM	10-31	15-43
	AD Mönchof-Frankfurter Kreuz	8 KM	14	20
	Darmstädter Kreuz-Walldorfer Kreuz	68 KM	30	46
	Bruchsal-Achern	66 KM	45	64
E 36	Vennebeck-Bielefeld/Sennestadt	45 KM	12	15
	Hamm-Kamener Kreuz	11 KM	12	14
	AK Dortmund N.W.-Recklinghausen S.	11 KM	14	14
	Oberhausener Kreuz-Duisburg Neuenkamp	16 KM	12-17	17-23
E 37	Quickborn-Hamburg Stellingen	18 KM	15-26	19-31
	Elbtunnel, Hamburg	6 KM	15	19
	Bremen Hemelingen-Bremen Arsten	2 KM	9	13
	AK Münster S. - Kamener Kreuz	37 KM	11	12
	Westhofener Kreuz-AK Haagen	8 KM	14	24
E 39	Bad Homburg-Kreuz-Westkreuz, Frankfurt	14 KM	20-27	35-46
E 40	Bensberg Moitsfeld-Bensberg Refrath	6 KM	1	5
	AD Heumar-AK Aachen	69 KM	10-44	16-52
E 41	AK Weinsberg-Weinsberg/Ellhofen	2 KM	5	7
	Ilsfeld-Mundelsheim	6 KM	5	7
	Ludwigsburg Nord-Ludwigsburg Süd	3 KM	7	9
	Stuttgart Zuffenhausen-AD Stuttgart	13 KM	7	9
	Donaueschingen-Neuhaus (Randen)	25 KM	55	54

./.

ANNEX 11

F.R. of GERMANY

76

Road network (continued)

Road number	Section	Length of section	% of international traffic Normal	Holiday period
E 42	Frankfurter Kreuz-Frankfurt Süd	3 KM	10	15
	Offenbacher Kreuz-Hösbach	40 KM	13-18	19-26
E 43	Lindau-Grenze Österreich	4 KM	100	100
E 45	Burg(Fehmarn)-Neustadt	45 KM	37	35
	Stapelfeld-Hamburg Stillhorn	17 KM	6-12	10-17
	Maschen-Thieshope	10 KM	11-12	23-24
	Westenholz-Mellendorf	28 KM	14	25
	Laatzen-Hildesheim	29 KM	15	28
	Würzburg Kist-Tennenlohe	104 KM	25	37
	Nürnberg N.-Nürnberg Behringersdorf	4 KM	22	36
	AD Nürnberg Feucht-Hiltpolstein	15 KM	26	36
	Altmühtal-Neufahrn	57 KM	25	35
	Holzkirchen-AD Inntal (also on E 54)	25 KM	55	64
E 48	Bayreuth-Nenntmannsreuth	12 KM	4	11
	Wunsiedel-Lorenzreuth	6 KM	4	11
E 50	Heilbronn/Neckarsulm-Weinsberg	6 KM	7	10
E 52	AD Karlsruhe-Pforzheim West	17 KM	21	29
	AD Stuttgart-Mühlhausen	59 KM	14-18	22-26
E 53	Freising-Wörth	53 KM	10	11
E 54	Stockach-Lindau	74 KM	26-41	35-47
	Buchloe-Oberpfaffenhofen	44 KM	13	17
	Holzkirchen-AD Inntal (also on E 45)	25 KM	55	64
E 56	Rosenhof-Platting	58 KM	34	36
E 60	Schwarzbach-Unterjettenberg	16 KM	43	59
E 232	Nordhorn-Lingen	20 KM	67	72
	Stapelfeld-Cloppenburg	4 KM	35	44
E 233	Bremen Industriehafen-Bremen Freihafen	6 KM	2	3
E 530	Offenburg-Donaueschingen	50 KM	37-48	42-50
E 532	Ohlstadt-Mittenwald	40 KM	49	57
B 309	Bad Sulzbrunn-Pfronten Weissbach	17 KM	70	71
	Total length	1.618 KM		

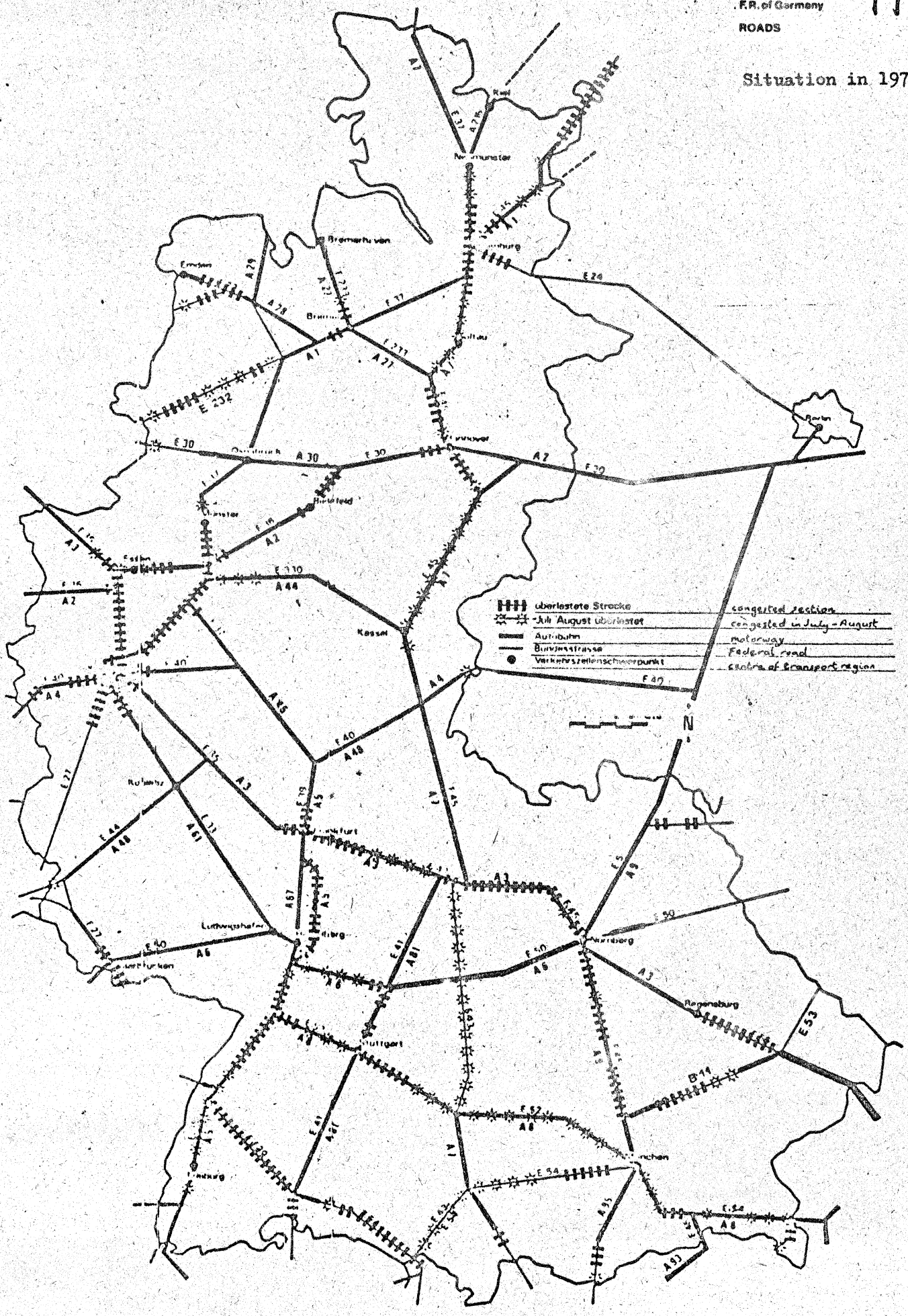
Note: Total differs from sum of the column because some sections are common to two E routes.

Annex 11

F.R. of Germany

ROADS

Situation in 1979



ANNEX 11

F.R. of GERMANY

Rail Network

A. Lines with inadequate capacity.

LINK	SECTION	LENGTH OF SECTION	PERCENTAGE OF INTERNATIONAL TRAINS
Hamburg-Lübeck-Puttgarden	Bad Schwartau-Puttgarden	80 km	15%
Hamburg-Bremen/Hannover	Hamburg-Winsen	30 km	5%
Hannover-Stuttgart/ Nürnberg	Hannover-Würzburg	365 km*)	5 - 7%
Köln-Bonn-Mainz	Köln-Bonn-Koblenz	175 km	18%
	Bingerbrück-Mainz	35 km	18%
Köln-Troisdorf-Frankfurt	Köln-Wiesbaden	215 km	18%
Mannheim-Karlsruhe	Schwetzingen-Grabenneudorf.	25 km	31%
Bruchsal/Karlsruhe-Stuttgart	Mühlacker-Bietigheim	25 km	10%
Stuttgart-München	Plochingen-Ulm	72 km	10%
	Augsburg-München	70 km	16%
Köln-Venlo (NL)	Dülken-Kaldenkirchen	15 km	—
		1.107 km	

B. Bottlenecks at nodal points (stations, marshalling yards, etc)

LOCATION	TYPE OF NODE	LOCATION	TYPE OF NODE
1) Köln-Eifeltor	Marshalling yard	14) Singen-Hohentweil	Marshalling yard
2) Kornwestheim (Stuttgart)	Container terminal	15) Regensburg-Ost	Station
3) Stuttgart-Untertürkheim	Marshalling yard	16) Helmstedt	Station
4) Aachen-West	Marshalling yard	17) Hamburg-Harburg	Station
5) München	Marshalling yard	Hamburg-Hauptbahnof	Main station
6) München-Süd	Express goods station	Hamburg-Hauptgüterbahnhof	Goods station
7) München	Container terminal		
8) Nürnberg	Marshalling yard		
9) Basel-Bad	Marshalling yard		
10) Mannheim	Marshalling yard		
11) Hannover-Linden	Container terminal		
12) Fallersleben	Station		
13) Emmerich	Container terminal		

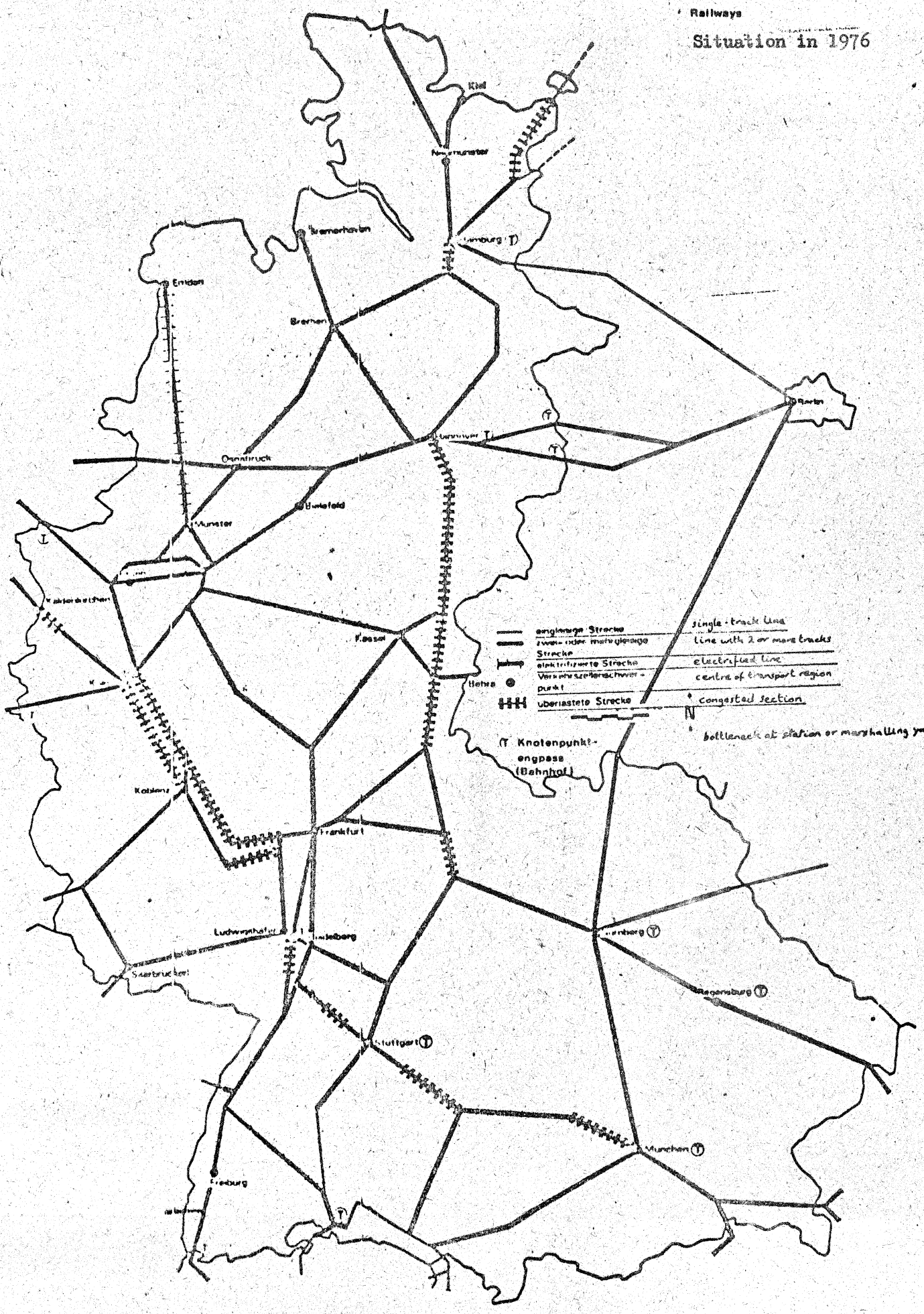
*) Section Gemünden—Würzburg also forms part of the link Frankfurt-Nürnberg

Annex 11

F.R. of Germany

Railways

Situation in 1976



ANNEX 11

F.R. of GERMANY

Inland Waterways

If economic factors used to determine the practical capacity of locks are left out of account, only a few bottlenecks are to be expected in the waterway network of the Federal Republic covered by this study, given the present traffic flows. This also holds for the capacity of the open stretches of waterway. Detailed information on this matter is not at present available.

The Lower Rhine could be cited as an example of a bottleneck, which, although it occurs only for limited periods (at low water), is nevertheless of great importance because of the heavy traffic, including considerable international traffic. Deepening this stretch by 0,3 meters would give comparatively high economic benefits for a relatively small investment.

As an example of a bottleneck resulting from the fact that a waterway is not navigable for standard vessels ('European' dimensions), the Elbe-Lübeck canal could be cited. The canal can take vessels of up to 1000 t. capacity (waterway class III). However, at present the relatively small volume of traffic does not, according to cost-benefit calculations, justify the enlargement of this canal to Class IV.

ANNEX 11

F.R. of GERMANY

Sea Ports

Port	Improvements needed
Emden	Deepening of access channel Increase in capacity of sea lock
Wilhelmshaven	Straightening the course of the River Jade Facilities for handling bulk goods
Bremerhaven	Increase in capacity of sea lock (Geestemünde /Luneplatte)
Kiel Brunsbüttel Lübeck	Increase in capacity of freight handling facilities

Sea and estuary crossings

Fehmarnbelt (Germany-Denmark)	Increased ferry capacity or construction of a bridge
Ferry services operated from: Kiel Brunsbüttel Lübeck	Increased ferry capacity

ANNEX 12

UNITED KINGDOM

Road Network

List of projects

Road number	Length of sections affected	Location
E 01	3,5 KM	Belfast, Newry
E 05	> 110 KM	Southampton–Winchester, Oxford–W. Midlands, W. Midlands conurbation
E 13/E 15/ E 30	150 KM	Greater London
E 15	> 57 KM	Dover–Folkestone Ashford–Maidstone, Musselburgh, Edinburgh, Perth, Perth–Inverness
E 16	17 KM	Dungiven, Castledawson, Toome
E 18	80 KM	Hexham–Carlisle, Gretna–Stranraer
E 22	107 KM	Holyhead–Chester Brigg–Immingham/Grimsby
E 28	118 KM	E 13 – E 15, Ipswich
E 30/32	126 KM	Colchester, Chelmsford, Newport–Fishguard
A 13	10 KM	London–Tilbury
A 17	65 KM	Newark–King's Lynn
A 47/A 12	83 KM	Leicester–Great Yarmouth –Lowestoft
A 590	20 KM	Barrow–E 05
A 361/A 39	54 KM	Bideford–Barnstaple– M 6 motorway
A 30	160 KM	Penzance–Exeter

Ports with inadequate RO/RO facilities for road vehicles :

North East England	Haven Ports	Humber	Hampshire
Tees Dock	Harwich	Grimsby	Portsmouth
Tyne	Ipswich		
		North Wales	
		Holyhead	
Thames and Kent	**Lancashire**	**West Country**	
Dover	Liverpool	Poole	
Medway			
Ramsgate			
Tilbury			

Annex 12

UNITED KINGDOM

ROADS

Section with inadequate infrastructure

Bottleneck at single point (e.g. built-up area)

RO/RO ferry port with inadequate facilities

ANNEX 12

UNITED KINGDOM

Railway Network

List of projects

A. Lines needing improvement:

Link	Section	Length of section
London-Harwich	Colchester-Harwich	30 KM
Belfast-Dublin	Belfast-Border	85 KM

B. Rail link missing:

Dover Priory station-Dover Hoverport

Belfast Central station-Belfast York Road station (to link Dublin-Belfast and Belfast-Larne lines)

C. Stations and ferry ports in need of improvement:

Holyhead station and ferry terminal (inadequate passenger facilities)

Parkestone Quay, Harwich (inadequate facilities for handling containers)

Folkestone ferry terminal
Dover ferry terminal
} (inadequate passenger facilities)

D. Train-ferry services with inadequate capacity:

Dover-France/Belgium

Harwich-Dunkerque/Zeebrugge

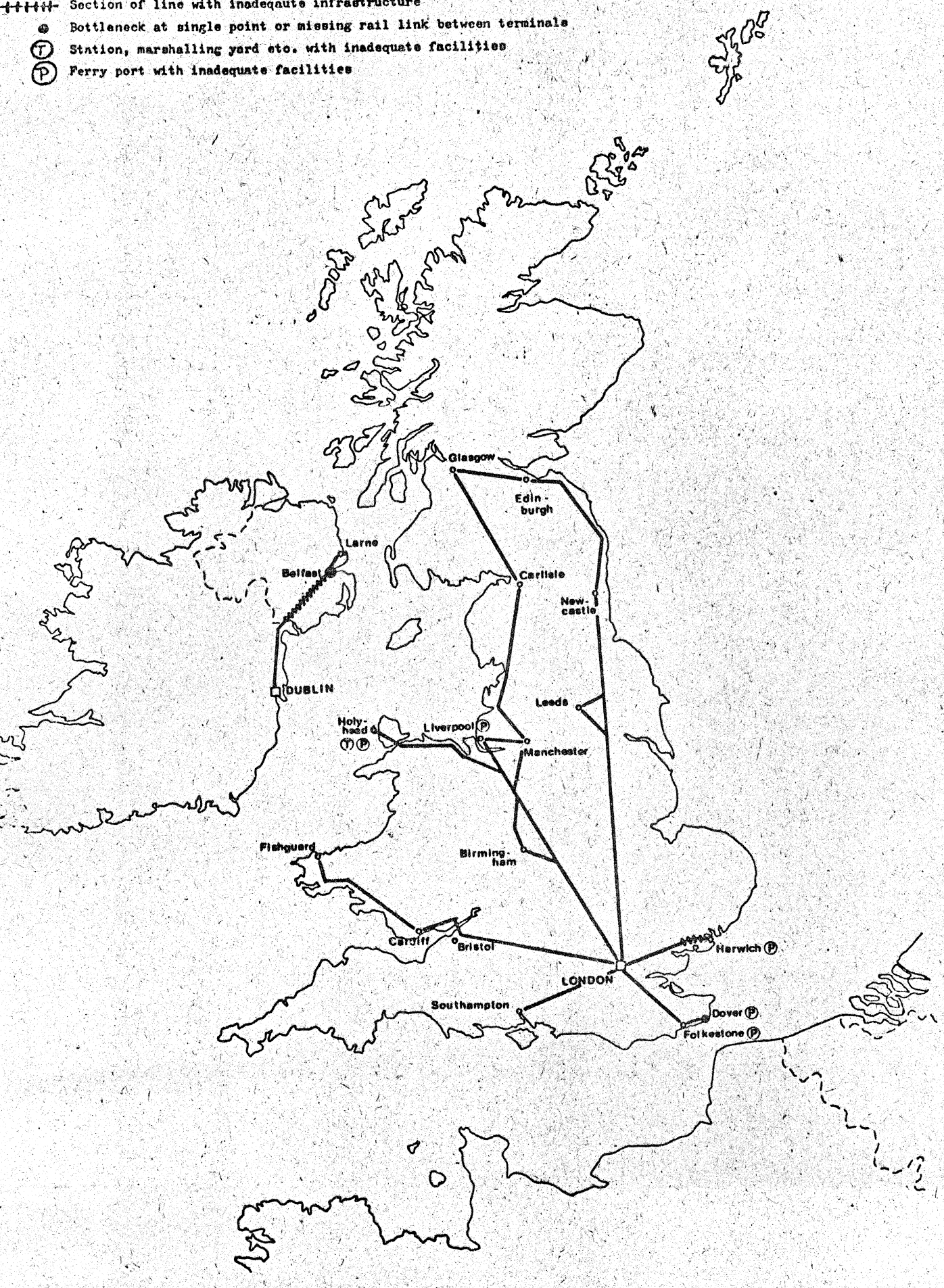
UNITED KINGDOM

-+++++- Section of line with inadequate infrastructure

Ⓑ Bottleneck at single point or missing rail link between terminals

Ⓣ Station, marshalling yard etc. with inadequate facilities

Ⓟ Ferry port with inadequate facilities



ANNEX 12

UNITED KINGDOM

96

Sea Ports

List of ports where improvements are planned

(excluding projects relating to RO/RO facilities and ferry ports, which are included under 'Road Network' and 'Rail Network')

North East England

Blyth
Tees and Hartlepool
Tyne

Bristol Channel

Bristol

Thames and Kent

London (including Tilbury)

Haven Ports

Felixstowe
Ipswich

Scotland

Forth
Lerwick
Montrose
Sullom Voe

Lancashire and Cumbria

Liverpool
Workington

Northern East Anglia

Lowestoft

Sussex and Hampshire

Portsmouth

Note : this list is derived from a preliminary survey of port capacity and cannot be regarded as final or complete. Projects due to be completed in 1980 have been excluded.

Airports

List of projects

	Project
LONDON*	
1. Heathrow	4th terminal
2. Gatwick	2nd terminal
3. Stansted	New terminal
BIRMINGHAM	New terminal
NEWCASTLE	Extension of terminal
MANCHESTER	Extension of runway
ABERDEEN	Extension of terminal

* Note:

The following improvements to surface transport access will probably be needed to cope with the increased traffic resulting from the enlargement of the London airports:-

1. Heathrow - Extension of the London Underground rail link

2. Gatwick - New railway station and new line to London Victoria Station

3. Stansted - Link to London-Cambridge railway line
Provision of dual-carriageway road

Note on the results of a survey of the existing networks of Member States

The following routes of the Community were studied :

- for road traffic :	the European road network in the new version of 1975;
- for rail traffic :	the 1976 version of the general network plan of the International Railway Federation (UIC)
- for inland waterways traffic :	waterways as defined in the CEMT category IV through VII

In order to be able to undertake a uniform assessment of the traffic situation on all sections of these networks in the different countries of the European Community it was first necessary to select or develop assessment criteria and corresponding methods of calculation. A comprehensive analysis of the assessment criteria and calculation methods applied in the countries of the European Community revealed that in particular the criteria

- route capacity;
- volume of traffic;
- volume-capacity ratio;
- speed;
- directness;
- travelling time; and
- level of service

play a major role in assessing traffic routes.

With respect to these criteria, definitions and calculation methods for all three categories of traffic were selected which appear appropriate for conducting a rough analysis of the traffic situation in very large traffic networks. Particular problems arose in connection with determining uniformly applicable volume calculation methods because the capacity of traffic routes can be defined in many different ways and hence the calculation methods vary widely. After examining all the volume calculation methods used in the member states of

the EEC the following methods were selected for uniform application:

- road traffic: the method described in the "Highway Capacity Manual 1965" (HCM);
- rail traffic: a modified and refined method of the International Railway Federation (UIC) and of the German Federal Railways (DB);
- inland waterways traffic: the method described in the Federal General Traffic Plan of the Federal Republic of Germany (capacity of unobstructed routes) and the method laid down by the Dutch government (Rijkswaterstaat) for the capacity of locks.

The concept "level of service" was elaborated in the Highway Capacity Manual 1965 and has been applied in the past only to road traffic. This concept, together with the way it is defined (as a combination of the volume-capacity ratio and speed), seems particularly appropriate for a preliminary assessment of large networks. For this reason it was also applied on an experimental basis for the categories of traffic comprising rail traffic and inland waterways traffic. The definitions of the level of service for these two categories of traffic were laid down in as close agreement as possible as regards their content with the HMC definitions for road traffic.

After the preconditions for a uniform assessment for all countries of the three types of traffic network in question had been created through this preliminary work on the theoretical aspects, all the sections of these networks were analysed in so far as the corresponding data were available. The results of the analysis are as follows:

- Road traffic

Number of sections analysed:	557	
Total length of the network analysed:	33,636 km	
of which: with traffic burden figures:	30,383 km	
of which: sections with		
Level of service A (very good):	6,435 km	(21 %)
Level of service B (good):	4,288 km	(14 %)
Level of service C (satisfactory):	7,524 km	(25 %)
Level of service D (sufficient):	4,129 km	(14 %)
Level of service E (poor):	2,844 km	(9 %)
Level of service F (very poor):	5,163 km	(17 %)

- Rail traffic

Number of sections analysed:	315	
Total length of the network analysed:	22,279 km	
of which:with traffic burden figures:	16,853 km	
of which: sections with		
Level of service A:	0 km	(-)
Level of service B:	1,701 km	(10 %)
Level of service C:	4,198 km	(25 %)
Level of service D:	2,318 km	(14 %)
Level of service E:	1,822 km	(11 %)
Level of service F:	6,814 km	(40 %)

- Inland waterways traffic

Number of sections analysed:	106
Total length of the network analysed:	5,977 km
of which: with traffic burden figures:	5,938 km

of which: sections with

Level of service A:	524 km	(9 %)
Level of service B:	2.354 km	(40 %)
Level of service C:	2,145 km	(36 %)
Level of service D:	684 km	(12 %)
Level of service E:	168 km	(3 %)
Level of service F:	63 km	(1 %)

This rough survey reveals that the traffic situation

- is relatively satisfactory with respect to the road network (60 % of the length of the network has at least level C) but that, with a figure of 17 %, a relatively large proportion of roads have a very poor level of service (level F), this applying in particular to sections with only two lanes (85 % of all sections with level F service are two-lane long-distance roads);
- is unsatisfactory as regards the railway network (only 35 % of the length of the network has at least level C quality, whereby the proportion of sections that bear a heavy traffic burden or which are overloaded (level F) is very high at 40 %:
- is, with the exception of a few sections, good to very good as regards the inland waterways network (85 % of the length of the network has at least level C quality), whereby the proportion of sections that bear a heavy traffic burden or which are overloaded (level F) is extremely low, namely 1 %.

However, due allowance must be made for the fact that the definitions chosen for the levels of service from A through F for rail traffic and inland waterways traffic are not absolutely comparable with the corresponding definitions for road traffic; this means that the results in each case are to be viewed more as an indication of trends rather than as a set of precise figures.

Existing sources for infrastructure financing in the Community [1]

(including transport infrastructure)

	European Regional Development Fund	European Investment Bank
Eligible infrastructure projects	Infrastructure investments which contribute to the development of certain regions.	Investments in infrastucture projects of regional or Community interest.
Geographical limits	1. Regions established by Member States in applying their systems of regional aids and for which State aids are granted. 2. Participation of the Fund in the financing of specific measures: regions to be determined by the Council.	1. Community. 2. Outside the Community (ACP and Mediterranean countries).
Forms of intervention	1. Subsidies. 2. Interest rebates of 3 points on EIB loans.	1. Loans. 2. Guarantees.
Resources	— Fund budget for 1979: 945 million u.a. Probably available for infrastructure projects: 70 % = 661.5 million u.a. maximum. — Distribution of the Fund's resources between the Member States according to quota [2] (95 % of the budget). — Specific measures: distribution to be determined by the Council (5 % of the budget).	Loans and guarantees granted in 1978: 2 140.4 million u.a., of which 320.4 million u.a. for transport infrastructure projects within the Community.
Financial conditions	1. Investments must exceed 50 000 u.a. 2. — investments < 10 million u.a.: maximum Fund contribution 30 % of national aid. — investments ≥ 10 million u.a.: maximum Fund contribution 10–30 %. — investments of particular importance: maximum Fund contribution 40 %. 3. Specific measures: conditions to be determined by the Council.	1. Maximum contribution 50 % of the cost of the project. 2. Projects must offer prospects of a reasonable return (commercial criterion). 3. State guarantee or other sufficient security.
Procedures	1. Member State submits requests to the Commission. 2. Consultation of Fund Committee. 3. Consultation of Regional Policy Committee projects ≥ 10 million u.a.). 4. Commission decides; if its decision is not in accordance with the Committee's, the Council decides.	1. Member State, Commission or undertaking submits requests to the Bank. 2. Consultation of Commission and Member State. 3. Bank decides (acting unanimously if the Commission's opinion is unfavourable).
Bases	1. Council Regulation (EEC) No 724/75 of 18 March 1975, as amended by: 2. Council Regulation (EEC) No 214/79 of 6 February 1979.	1. Treaty, Title IV, Articles 129 and 130. 2. Protocol on the Statute of the EIB. 3. EIB Annual Report.

[1] Apart from infrastructure aids under Article 56 of the ECSC Treaty and Article 84 of the Budget (EAGGF) which are specifically aimed at particular sectors (coal and steel, and agriculture), the amounts in question are comparatively small.

ANNEX 14

New Community Instrument (NCI)	EMS interest rebates
Investments in infrastructure projects which contribute to convergence and integration, taking into account the regional and employment effects.	Investments in infrastructure projects in the less prosperous countries participating in the EMS, taking into account the regional effects.
Community.	1. Italy. 2. Ireland.
Loans.	Interest rebates of 3 points on EIB and NCI loans.
1 000 million u.a. 500 million u.a. as first tranche, of which 250 million u.a. appropriate to infrastructure.	1 000 million u.a. (in five yearly tranches of 200 million u.a. each) as interest rebates on EIB and NCI loans of 5 000 million u.a. (in five yearly tranches of 1 000 million u.a. each).
In accordance with EIB conditions.	In accordance with EIB conditions.
1. Council approves tranches and establishes regulations for the projects. 2. Requests submitted to the European Investment Bank directly or through the Commission or Member State. 3. Commission decides on the eligibility of the project. 4. Bank decides on the granting and condition of the loan.	1. Commission and Member States prepare indicative programmes. 2. Consultation of Member States. 3. Commission decides on the eligibility of the project. 4. Bank decides on the granting and conditions of the loan.
1. Council Decision 78/870/EEC of 16 October 1978. 2. Cooperation agreement between the Commission and the Bank of 27 November 1978.	1. Council Regulation (EEC) No 1736/79 of 3 August 1979. 2. Council Decision 79/691/EEC of 3 August 1979.

Belgium	1.39 %	Italy	39.39 %
Denmark	1.20 %	Luxembourg	0.09 %
Federal Republic of Germany	6.0 %	Netherlands	1.38 %
France	16.86 %	United Kingdom	27.03 %
Ireland	6.46 %		

million u.a. = million of units of account.
million EUA = million of European units of account.