

ECONOMIC RESEARCH CENTRE



FOURTEENTH ROUND TABLE

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REPORT OF THE FOURTEENTH ROUND TABLE

ON TRANSPORT ECONOMICS

Held in Paris, on the following topic:

**the efficient participation
of the railways
in the market economy**

EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT

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INTRODUCTION

This Round Table was the logical complement of two previous ones (11 and 12) which dealt with access to the market for transport of goods by road and inland waterway. However, in view of the "self-contained" aspect of railway operations, it was judged appropriate to deal with rail passenger transport also, having regard to the importance of this sector.

The actual title chosen for this Round Table implies the existence, or possible existence, of a free market for transport. In practice, the situation in this respect varies widely from one country to another.

These differences were given ample treatment in the course of the discussions, often by reference to concrete cases. As the main purpose of Round Tables is to bring out internationally valid conclusions, specific cases of this kind - notwithstanding their importance and significance - are not explicitly set out in this summary.

Because of these shades of distinction between theory and practice (and between different types of practice) it seemed necessary to begin by defining clearly what was meant by a market economy for the railways and their competitors.

As several participants from university circles who had been invited to this Round Table were unable to attend at the last minute, the majority of those present were specialists belonging to railway administrations. A Round Table, by its very nature, implies a free exchange of views from a scientific angle, none of the participants is deemed to have expressed anything else than his own personal opinion from this standpoint.

The membership of the discussion "Panel" largely shaped the course of the discussion - beyond doctrinal considerations - towards pragmatic aspects. Covering as it did a great many practical points, the discussion took stock of the long or short-term measures for making the railways competitive or improving their competitive position.

The presence of practitioners meant that the exchange of views was fitted into the context of true feasibility for it was based on practical experience backed up by concrete data.

Round Table 14 was most enlightening: it yielded a rich crop of clear conclusions and guidelines.

The E.C.M.T. takes this opportunity of thanking the Chairman and other participants in the Round Table for the splendid work they did on this occasion. They achieved one of the major objectives of the scientific activities of the E.C.M.T.: namely, the closer alignment of theory and practice with a view to tracing policy guidelines.

This booklet is sent to everyone on the E.C.M.T. mailing list; copies (French or English version) are readily available on request.

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THE EFFICIENT PARTICIPATION
OF THE RAILWAYS
IN THE MARKET ECONOMY

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SUMMARY

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I. BASIC CONCEPTS

A. FOREWORD

As it is not within the scope of this Report, nor within that of the Round Table, to initiate a discussion on market economy principles as applied to the transport system, it may be more useful to recall briefly a few fundamental points and then move straight on to an analysis of practical aspects.

B. HANDICAPS TO THE WORKING OF A MARKET ECONOMY

1. Technological handicaps

The actual technology of rail transport puts it in sharp contrast with road or inland waterway transport.

Rolling stock and infrastructure are so intimately intertwined that a single operator for each route, even for each network, is well-nigh essential. As a consequence, rail stands as a single entity on the market, confronted by a multitude of competitors. The size of the railway "business" and, even more, the close relationship between infrastructure and transport operations mean that output must be planned beforehand to a very considerable degree. This is borne out by the fact that most of output conforms to predetermined and published schedules.

In the short-term, supply is thus entirely (or almost entirely) governed by technology. Use depends on the infrastructure and, in this context, one could say that the railway is nothing else than a huge infrastructure (incorporating its own pre-set transport activity) similar to a pipeline system.

2. Economic handicaps

The inseparable link between infrastructure and transport activity has obvious implications where competition is concerned:

- a crushingly heavy proportion of costs which, in the short-term, vary only very slightly with output;
- a lack of flexibility for continuous adjustment to the requirements of demand except at high cost.

This of course implies that there can be no short-term adjustment to traffic fluctuations without throwing the economics of the system out of gear. An optimal supply system would thus

consist of a highly simplified combination of standardised and continuous outputs. The fact that this type of supply is not practically feasible because of the diversity of demand makes it at once clear that the working of the system is not economically optimal.

Research should therefore be directed towards a model involving as continuous and standardised a supply as demand will allow.

3. Political handicaps

This is not the place to judge various kinds of government intervention which have contributed to the dislocation of railway economics. Whatever the arguments put forward to justify this intervention, it has to be admitted that, in practice:

- it originated at a time when the railways were the only modern transport technology and when they generally earned large profits;
- nowadays, other means of transport have come closer to criteria involving no geographical or sociological limitations (road transport and private cars respectively);
- this being so, rail potential is overexpanded by comparison with its new economic function which has ceased to be all-embracing;
- the present function of the railways should consist in providing, by comparison with its competitors, an economic benefit in terms of price or in terms of decongestion.

C. NORMALISATION OF ACCOUNTS

To save the railways from having to compete on unfavourable terms (which would have a snowball effect on the unbalance between demand and supply) the majority of countries apply, to a greater or lesser degree, a "normalisation of accounts" policy.

This consists in readjusting operating accounts by eliminating any items not conforming to strictly commercial practice. In the event, this can be carried to considerable lengths; for instance, it may go so far as to accept that part of the work force could be dispensed with.

In theory, normalisation should meet one of the first requirements of competition, namely, that all operators should receive equal treatment. In practice, it does not necessarily provide this basically equal treatment, at least not entirely.

As a general rule, normalisation comes after a long-standing policy based on "public service". In many cases, this consisted in putting as many obligations as possible on the operator. As a consequence, operators were compelled to postpone the modernisation of certain facilities and, in the long run, this may have created a considerable backlog in the readjustment of supply. It should therefore be considered whether supply, in its present form, matches the qualitative and quantitative requirements of demand - an exercise which goes beyond the scope of normalisation.

What is more, normalisation may crystallise - even fossilise - certain traffics. For instance, low charges can keep in existence traffics which would otherwise perish. The backlash on the expansion of other traffics may be harmful, as when the satisfaction of new demand is checked (e.g. utilisation of a given capacity for peak-hour suburban traffics to the detriment of the development of inter-city traffics).

Whilst providing immediate relief for the financial problems of the railways as such, normalisation passes on these problems to national community level where it involves political choices. Ultimately, the political issue will consist in using for a different purpose resources which could have been spent on such things as housing, education and health.

The conclusion is that the objectives of a public service policy should be periodically reviewed to see whether it matches the requirements of a given situation. There is no question of any wholesale rejection of public service as such, the object is to bring its content into line with current needs. Payment for past mistakes means a loss of resources which could have been used to prepare the future.

D. MARKET RESEARCH

I. The motivational approach

Railway technology imposes on the services that can be supplied certain specific limits which may be inconsistent with what potential users want.

Only too often in the past when the service to be supplied had been predetermined, it was later discovered that the potential user did not utilise it as expected. There lies all the difference between "operating" and "supplying" a service for the public.

The right course is therefore to begin by exploring demand, its variants, its elasticities and its limits. That is why the motivation of the users choice is of such primary importance, but it does not follow that supply can be exactly tailored to fit the desires brought to light by the "motivational" approach.

The motivational approach is, in a sense, a prerequisite of the quantitative approach. A clear description of the determinants of demand can save a good many errors of interpretation in the quantitative approach (in some quarters it is considered that both approaches should be integrated).

2. The economic approach

The first part of the description of the rail market concerns the quantitative survey. Several methods are available for this purpose and each has its value at a particular stage. The following may be mentioned pro mem:

- (a) Major traffic surveys covering all trips within a given area.
- (b) Specific surveys covering traffic on one or more routes (with their variants).
- (c) Overall comparison of traffic flows for different modes on one or more routes.
- (d) Comparison of supposedly optimal supply with existing supply and inferring therefrom the potential market (e.g. expected impact of higher speeds or greater frequency on a given route).

The combination of several methods often gives an overall picture of requirements broken down by time, route, mode and type of trip; it is then possible to establish correlations or construct modal-split models.

The railways can use such data as a basis for ascertaining which type of supply matches a particular section of demand.

The second part of the description concerns the search for an economically suitable formula for meeting a given section of demand.

To find the optimal point of convergence between supply possibilities and demand response, the problem should be tackled from two strictly practical angles:

- (a) if possible, by reducing the production cost of the services supplied (i.e. by rationalisation measures);
- (b) if possible, by making supply more attractive for potential users (i.e. by sales promotion).

Given the actual financial situation of the railways, it seems appropriate to classify improvements to supply under three heads:

- (a) those implying no investment;
- (b) those implying only replacement investment;
- (c) those implying investment in new or development projects, or in improvements other than replacement.

II. THE PASSENGER MARKET

A. FOREWORD

This paper sets out a series of proposals to improve the position of the railways or a particular market.

These proposals follow from information previously collected and earlier studies, but as this material has not all been published, no reference is made to sources.

It lies with the Round Table to judge how far these proposals are applicable in concrete cases. The guidelines given on the subject by the international organisations are implicitly taken into account in this paper.

B. SUMMARY DESCRIPTION OF DEMAND

Broadly speaking, the lesson to be drawn from motivation surveys is that car-owners easily come to terms with the characteristics of public transport supply. Hence, the question is how far these characteristics can be made more flexible or otherwise improved in order to give more weight to the benefits of rail transport.

The improvements recommended by users are as follows, in decreasing order:

(1) Cost

Though some social groups are prepared to pay for a better service, rail transport is considered expensive by large sections of the community. This latter attitude will doubtless gradually change as higher living standards become more widespread; the

former category will expand without this meaning that the second will at once become insignificant. A dual market can thus be traced from the outset.

(2) Connections

Many criticisms are aimed at frequencies and connections. On medium-distance journeys, time losses that could be saved by using a car are no longer tolerated; in other words, for this type of journey, what the user wants is a system enabling him to go all the way without losing considerable time in making connections.

This raises the problem of the structure of medium-distance rail services (frequency, speed and connections).

(3) Comfort

Many users want more spacious carriages (and more seats at peak hours). This type of claim comes from users in social groups where incomes are fairly high. It can thus be inferred that those who are prepared to pay expect an impeccable service in return. This again points to some differentiation of demand.

(4) Car-parks

Some users consider that inadequate facilities are provided to enable motorists to have access to rail services. This is a most interesting point because of the future scale of this type of demand.

As a general rule, users make no special comments about railways' staff; it follows that the improvements desired are mainly on the "physical" side, i.e. a more attractive form of supply.

C. SUPPLY POSSIBILITIES AND TREND OF DEMAND

When using his car, the motorist himself determines his "supply", the only restriction on demand in his case lies in the characteristics of the infrastructure.

Where the railways are concerned, on the other hand, the use-pattern is entirely based on a pre-determined formula. As car-ownership spreads, users will not have recourse to other forms of supply unless these have real attractions. The relative absence of infrastructural constraints is precisely one of the advantages of rail transport.

Demand is made up of all the journeys made by the various modes of transport, to which must be added potential demand, but the existence of private means of transport reduces the size of the latter.

An improved standard of service is most unlikely to stimulate a substantial increase in overall short-term demand since it has no impact on the determinants of passenger movements except those that can be classified as "recreational". In the long-term, however, there is a steady increase in overall demand.

The real problem lies in finding what share of this overall demand the railways can carve for themselves and how this share will develop in the long-term.

One factor which has a bearing on attractiveness is the time the user takes to move from origin to destination (and not from one station to another).

A related factor is access to rail services. Urban traffic congestion does not necessarily help the railways for it also impedes access to the train itself. Hence, the corollary to a good suburban or inter-city service is a good urban transport service (public transport services and car-parks near railway stations).

Various studies have shown the close relationship between the share of overall traffic that rail accounts for on a given route and the kind of service actually supplied. In other words, shortcomings as regards speed, frequency or bad connections reduce rail's share of total traffic. Methods of research for the construction of timetables should doubtlessly be developed and applied. Experience on the basis of practical cases should be exchanged at international level.

It would also be most useful to have a better knowledge of the elements taken as a basis by operators for shaping their timetables. Is this process governed by the exigencies of transport supply system itself or is it based on analyses of overall demand, potential demand or sectoral (as distinct from overall) demand as it really stands?

D. LIMITATIONS OF SUPPLY

In a market economy, there can be no question of traffic being allocated otherwise than on the basis of economic criteria. This means that if obligations have to be imposed without

reference to strict profitability criteria, they should logically fall upon the mode of transport capable of fulfilling them suitably well at least cost.

In this context, the railways can be plainly seen as having to handle urban or suburban transport assignments that are not justifiable in the interests of the operator as such, but rather in the economic interests of the community as a whole.

This may also apply to certain rural or regional rail services kept in commission as long as replacement services of the required standard are not provided instead.

To avoid any misunderstanding, it must be clearly recognised from the outset that it does not lie with rail to provide all public transport services, but part of this "public service" can indeed be the responsibility of the railways.

The main handicap to a readjustment of supply lies in the present financial situation of the railways. As the only realistic approach is to bear this in mind, the measures recommended to improve supply are put forward with due regard to financial constraints which imply certain limitations.

Apart from this, it would seem somewhat paradoxical to claim high productivity for rail as a mass transport operator given that, in many cases, labour costs account for more than two-thirds of total costs.

This last aspect is altogether vital for it shows that the supply system, as at present constituted, is a long way from what railway technology could provide, namely, uniformity and continuity. As the wide diversity of traffics prevents the railways from operating under optimum economic conditions, special attention must be paid to measures for reconciling the technology and economics of railway operations more closely with the satisfaction of demand.

The type of operation which calls for too big a work force (as compared with total production cost and revenue) puts a direct handicap on investment and prevents the apparatus from being suitably adapted to its tasks. The railways are not really competitive as long as the function they fulfill is out of step with the economic potentialities of their equipment.

Better productivity is unobtainable without reducing the range of services and limiting practices which complicate

operations (e.g. schedules involving consecutive trains at different speeds, so-called through carriages to be integrated in several consecutive trains etc.).

With the advent of other transport technologies, rail has ceased to serve its fully comprehensive economic purpose, and specialisation involving uniformity and continuity has become essential (such specialisation being technically consistent with railway infrastructures). This conversion from an all-purpose to a specific function has not always been carried to sufficient lengths in actual practice.

E. IMPROVEMENTS TO SUPPLY WITHOUT INVESTMENT

1. Positive action on traffic peaks

Some railway administrations still consider that their main passenger transport function is to cater for the mass transit of commuters. Apart from this, fares policy has substantially contributed to the generation of journey-to-work traffics on a considerable scale.

This type of traffic is increasingly in the form of peak flows. Apart from the considerable and widespread waste that an unduly uniform pattern of working hours can entail with regard to public utilities, the economic consequences for public transport are unfortunate. The direct effects, namely, overlarge installations and fleets, are very familiar.

The indirect effects, on the other hand, are sometimes overlooked. The discomforts of travel at peak hours dissuade potential users. Moreover, full utilisation of capacity means that the operator must in practice give priority to unremunerative traffic to the detriment of more profitable ones whose development is impeded.

It would be unwise to pin too much hope in a "normalisation of accounts" policy implying that certain types of customer will be permanently tied to the railways. Shorter working hours will raise further problems in this field in future. What is more, this approach overlooks other user categories.

Operators must untiringly claim and promote measures for load spreading. To concentrate the maximum output in the minimum time may be a shining technical achievement but it does not make economic sense.

A first series of measures could cover "customer selection", that is, inducing users to travel outside peak hours if they are not obliged to do so. In practice, the following measures are feasible:

- limitations or bans on reduced fares at certain hours or periods;
- reduced fares at off-peak hours (e.g. for elderly people).

Another set of measures concerns more direct action on the smoothing of peaks, e.g.:

- agreements with firms, schools or army authorities;
- contact with other public bodies or firms with a view to promoting staggered working hours or fixed off-peak work schedules.

However, it also lies with government authorities to encourage action on these lines. In brief, the object is to save losses (i.e. to save resources which could be used elsewhere) and not to use transport methodically as a substitute for effective reorganisation.

This need to spread the peak is becoming increasingly important for recreational travel. The railways can indeed help to relieve congestion during recreational traffic peaks, but any chance of their doing this is destroyed from the outset if, at such times, trains are crammed with free-ticket holders.

2. Action for the development of off-peak traffic

Though certain practices or concepts have contributed to the over-development of traffic peaks which ought never to have come into being, better balanced utilisation of capacity at different hours or periods can be obtained by improving off-peak transport supply.

The building of peaks has often been fostered by the lack of satisfactory services at off-peak hours.

Comparison of hourly demand curves for rail and road shows that road traffic peaks are plainly the weaker of the two and that, in very many cases, medium-distance trips by road are well spread throughout the day.

By giving too much exclusive attention to traffic peaks, the railways are foregoing a market a priori. Yet, given that rail

has no justification except on dense traffic routes, it is inconceivable that a minimum frequency maintained throughout the day should fail to be required by demand. Recent examples have indeed shown that the introduction of new services (off-peak) realised a genuine demand, whereas it had often been claimed that no such services were provided because there was no call for them.

A stronger-textured supply at off-peak hours calls for practically no investment because infrastructural and coaching stock capacities are available at those times. It is precisely because this capacity is under-utilised that the railways suffer from poor productivity.

A strategy designed to get a better yield from capacity must start with the gradual transformation of transport supply.

3. Action with regard to fares

The railways are confronted with two sharply different types of demand as regards fares. For large sections of the population in low-income groups and for many services (daily commuters) cheap fares are a paramount factor. On the other hand, another category of user attaches more weight to the quality of supply. This category will expand (as higher living standards become more widespread and as more people are employed in the service sector).

A differentiation of supply is thus conceivable, the fares applicable being decided after careful market research and investigation of the cost of the various possible types of supply. Two differentiation procedures are available:

- (a) Conventional subdivision of stock into two classes on the same train. This is chiefly suitable for types of demand involving frequent mass transits over medium distances. It implies, however, that more demanding passengers have to put up with lower speeds and, sometimes, with overcrowding.
- (b) A surcharge for a better level of service; this is already the practice for certain fast trains. The underlying principle is the same as tolls for motorways.

In this way, the existing fare structure (as regards both fare levels and rebates) can be adjusted without making an increase across the board, and fares can be tailored more closely in line with what various categories of users can afford.

On lines carrying very heavy flows, however, differentiation of train composition and speed is most difficult. It may sometimes be necessary to seek a compromise by combining the two procedures (e.g. a surcharge for first class only to prevent overcrowding).

4. Action to adapt the scale of supply to that of demand

Here, the aim is to keep train services for high density traffics only. The technical characteristics of rail are such that it is less and less able to provide services that cater for small numbers of passengers or are unduly varied, one of the main reasons being the complexity of railway installations and the large work force needed to man them.

The grounds often put forward to justify the continued operation of services handling little traffic do not all stand up to careful scrutiny:

- (a) The transfer of additional traffics would contribute to road congestion.

It is not easy to see how railway services can be atrophied whilst running alongside high-density road corridors. A situation such as this would suggest that the service supplied by the railways is poor. The general case of services in rural areas often applies to lines and roads which are by no means saturated and for which it is fairly easy to switch from one to the other.

Another point to bear in mind is that local road transport services can usually be designed to provide a better pattern of staging points (more door-to-door facilities). In the medium-term, the transfer of local traffic now using the two infrastructures to a single one (road) makes for a more effective infrastructural policy.

- (b) Users prefer trains.

A perfectly simple way of checking the truth of this is to provide a bus service duplicating the rail service for a trial period. Users can then decide with complete freedom. This arrangement disposes of all the emotional undertones and puts the problem squarely by letting the user choose for himself.

If the user still prefers to travel by train, the problem arises of finding the resources to pay for any deficits that the continuance of rail services implies.

(c) Possibilities of cost-savings are not entirely exhausted.

It may well be that costs could be brought more closely into line with revenues, but given the present trend of production costs and productivity, too much hope cannot be pinned on this prospect. Careful calculations for different "systems of supply" are nonetheless required; reference to two such "systems" only and the implicit rejection of others can lead to arbitrary judgements.

(d) The savings expected are slight by comparison with the total turnover or "deficit" of the railways.

There is indeed a whole range of rationalisation procedures each of which calls for careful calculation. On grounds unconnected with economics, it is often necessary to adopt the least effective gambit, that is, the closure of lines or stations taken singly. The financial benefits of a closure programme can be much greater if the conversion process follows a predetermined plan covering an entire operating region. The impact of rationalisation is then distinctly stronger since it embraces depots, junction structures, rolling stock maintenance and traffic management as a whole, all of which are little affected if the conversion process is carried out piecemeal.

There is prima facie evidence for believing that the geographical reshaping of the railways should yield substantial savings, for if it is simultaneously claimed that the smaller lines (and stations) do not incur substantial losses and that main lines are still showing a surplus it is difficult to explain how the difference is accounted for other than through reasons of scale.

The conversion of railways into mass transit networks is a most important aspect. Unless low-density traffic comes under a separate accounting system, this sector of operations absorbs resources which could be more usefully invested in adapting the railways to their true future role. In short, it would be hazardous to recommend an investment policy aiming at modernisation as long as part of the equipment raises problems as to future productivity. It is rather as if one tried to incorporate obsolete components in a brand new machine.

5. Action to create new scales of operation

The national autonomy of the railways produces increasingly poor results from an economic angle, either because of insufficiently attractive services or increased production costs. Hence the need for very close investigation of the possibilities of international co-operation which might lead to operations on a more economic scale.

At national level too there is an obvious need for more precise costing of each activity.

- (a) Surplus capacity for construction and major maintenance of rolling stock is frequent. In addition, railway services in this field are paralleled by those in the private sector.

Whatever benefits the railways may reap from handling part of these activities themselves, it would be useful to draw up separate accounts to check their true impact on the economics of railway operation and how they compete with the private sector. Even so, this first step towards more clarity would not in itself resolve the problems raised by surplus capacity and lack of rationalisation at international level.

- (b) Separate accounts should also be drawn up for the operation and development of urban and suburban services as transport activities of this kind can be justified only by analysis of their costs and benefits to the community. They should not therefore be confused with the competitive market.

It is at international level that genuine possibilities of rationalising rail transport supply and making it more attractive, without this involving capital outlays, can be sought.

- (i) Though international links have in many cases been substantially improved, some international rail services remain unattractive. The first step is to see whether potential traffic on the link concerned warrants train services. In some cases, there can be practically no doubt about this, especially if roads on the corresponding route can no longer cope with traffic needs and if motorways have to be built or planned to ease the load. When this is so, the low density of rail traffic is plainly largely due to unsatisfactory service (long waits at the Customs, having to change train, services catering for purely local requirements).

Some of the objections of Police and Custom's officials to their carrying out inspections en route (as this sometimes involves long waits before returning to their headquarters station) could easily be overcome if the railways provided a vehicle enabling them to return home by road without delay.

The railway administrations themselves too often regard the frontier as the last staging point for traction units and even for entire trains. This is not always consistent with optimal turn-round of rolling stock, nor with actual traffic requirements.

(ii) The incorporation of through carriages often complicates the running of international trains. It raises problems of capacity in stations where they have to be shunted and often causes delay. This practice is warranted only if it caters for a sufficient number of passengers; in many cases, it is no more than a tradition going back to a time when trains were less frequent.

Economically efficient operations call for straightforward procedures; any operation involving a change in the composition of a train should be subject to careful costing; the same applies to the withdrawal or addition of coaches en route in order to adapt composition to requirements.

(iii) International co-operation in railway planning and design offices is one of the prerequisites of international standardisation and mass production of equipment.

In each country, planning and design is geared to the requirements of the national network; as a consequence, there is at international level a proliferation of equipment produced on too short production runs and at much too high cost.

(iv) Production of rolling stock on a mass scale in practice calls for the internationalisation of orders. Some railway administrations are badly handicapped by national restrictions in this field. The construction of railway equipment undoubtedly raises a problem of rationalisation, but this matter lies outside the province of transport.

It would be interesting to compare the cost, say, of a locomotive produced as part of a series of less than ten units and the same locomotive mass-produced; bearing in mind the motor industry, the difference seems likely to be substantial. However, such adjustments sometimes call for changes in legislation hampering the free import of goods. A possible first step towards

rationalisation and specialisation for the construction and ordering of railway equipment on an international basis is the systematic operation of a neighbouring network's rolling stock - a solution recently introduced in the Netherlands. In this way construction of equipment in short production runs can be dispensed with. What is more, the utilisation factor of rolling stock is often improved by merging several successive journeys into one.

(v) Political considerations do indeed have to be taken into account in railway management, but for as long as these are connected with the economics of operation, they constrain the readjustment of the railways to their future tasks.

A long-term solution for separating the two objectives lies in the creation of a European high density network. This would mean hiving off from the European network (which bears the same relation to the railways generally as do motorways to the highway network) the "public service" facilities and assignments that national or local authorities wish to retain (e.g. lines with weak traffic flows, urban and suburban lines, workshops, administrative machinery for the sectors concerned, etc.). In addition, these authorities would have to compensate the international undertaking for any public service assignments they care to lay upon it.

A fresh distinction between "general utility" and "local utility" networks simply reflects, in a wider sphere matching the future size of the economy, a similar distinction hitherto applied on a smaller scale. The advantage would be to bring out clearly what is the essential function of transport as distinct from those that are extraneous to it. As a result, the railways would be reshaped to match transport requirements, this being one of the prerequisites of proper working of the market.

Roughly speaking, it may be estimated that this international network would be made up, depending on the component networks concerned, of lines accounting for between 25 and 40 per cent of the passenger network at its present stage of development. In the long term, it would also include a number of other lines classifiable within the European network precisely because of the traffic they carry.

F. IMPROVEMENTS TO SUPPLY BY REPLACEMENT INVESTMENT

1. General considerations

The object must be to give the railways an optimal role in the transport system as a whole. This implies a series of measures to adapt the service supplied. However, to begin by ensuring that investment is correctly oriented, ways and means of obtaining optimal output with minimal equipment must first be devised. The pattern of facilities should therefore be reshaped (or put under the control of two managements with separate functions) according to industrial productivity criteria.

Once the apparatus has been adapted to match as closely as possible the required output, it is possible to envisage replacement investment (reallocation of resources displaced from elsewhere) and concentrate on the following areas:

- access to trains;
- comfortable carriages;
- attractive timetables.

2. Access to trains

Convenient access to trains must be devised with an eye to the needs of a car-owning community. It follows that in places where the private car raises problems of capacity, access must be provided by effective public transport.

It is pointless to provide a first-class system of inter-city links as long as the benefit to the user is largely lost in terminal transport to and from stations.

In large conurbations, it may be wondered whether the single terminal is always the ideal gateway. A station - equipped with ample parking space - in the suburbs could offer new possibilities for users as well as relieving congestion at terminals.

In cities having several rail terminals, the provision of inter-terminal junctions has much to be said for it. The aim is not so much to provide connections for passengers in transit (these being indeed a minority) but rather to serve the city at several points and so give more direct access (i.e. with fewer line changes) to urban public transport. For the operator himself, this arrangement dispenses with the complexity of terminal operations absorbing a great deal of space for stations and

sidings. On medium distances, junctions provide opportunities for the "welding" of routes through the conurbation (e.g. the system through Brussels).

3. Comfortable carriages

Here, operators are confronted with two constraints which may not always allow them to provide the required degree of comfort.

First, coaches have so long a working life that they remain in service when their "public image" and performance are no longer popular.

Secondly, the peak hour rush on medium-distances services sometimes imposes less comfortable arrangements (too many seats breadthways and not enough leg-room). The same applies to certain seasonal peaks when stand-by capacity on a considerable scale has to be called in. Hence it would be hopeless to try to create a railway service of high standard whilst remaining faithful to the concept of stand-by capacity. It is up to the community to organise its affairs in a sufficiently rational manner to avoid excessive demands as regards stand-by capacity. In this day and age, when the aim in every field and activity is to reduce stocks, it would be inconsistent to make the railways do exactly the opposite.

Broadly speaking, rolling stock should be run more intensely in order to be written off more quickly. It will fairly soon cease to be commercially warrantable to keep in commission, on medium and long distances, carriages (such as are still commonly encountered) which are more than 30 years old.

A sharper distinction between operation of urban and suburban services on the one hand and inter-city services on the other would facilitate specialisation of coaching stock; high capacity would be the paramount consideration on short runs, and better amenities on longer ones. This must not be taken to mean that vehicles on short-runs should be lacking in comfort, it simply means that specialisation should be more clear-cut.

In short, part of the fleet no longer matches up to requirements; it remains to be seen whether such vehicles should be replaced by others or by a quicker turnround of more recent stock.

In this context, attention must also be drawn to the possibilities of international co-operation (cross-frontier route "welding"; assignment of coaches to certain lines on adjacent networks).

4. Attractive timetables

The car-owning potential user must be faced with a sufficiently attractive supply of train services.

The daunting prospect, for the uninitiated, of finding one's way through the timetable is often in itself a barrier to the effective use of rail. The timetable should look more like a straightforward catalogue than a detailed and complicated set of regulations. It would be most useful to have a public opinion poll on this topic since such publications are after all intended for the public.

Another, more serious, handicap inherent other than private transport is that the fact that convenient hours of departure or arrival are not always available.

This aspect has already been implicitly dealt with in the foregoing sections. Briefly, a distinction has been made between routes with a low density of traffic where the continuance of rail services may be open to question and high-density routes where optimal service must be provided.

Questions of frequency and speed are essentially a matter for the customer. It lies with the supplier to consider the optimal economic arrangements to cater for this demand.

Frequency depends on distance (intervals between trains should be tightened up as the length of haul decreases) and on the scale of demand. In principle, the scale of demand should attain a certain threshold for the continuance of a rail service to be justified as road takes precedence for any low traffic flow.

Given that this threshold is attained, a frequent service at regular intervals can be recommended for medium distances. This arrangement substantially simplifies operations and dispenses the need for the user to make enquiries about elaborate timetables.

In this connection it must be borne in mind that, on medium distances, frequency and regular intervals are at least as

important as speed. The important thing is that the benefits of fast running should not be offset by long waits.

A frequent train service of course implies well-designed connections between lines with heavy traffic flows. The homogeneous character (and regular tempo) of the entire system can be much stimulated by eliminating low-density stations and halts on trunk lines; at the same time, the operator also gains additional capacity.

Briefly, train services should be restricted to lines and stations where demand is adequate. This demand must be met by reference to criteria that are suitable for the age of the motor car (which itself constitutes a permanent "transport supply"). As a corollary, speed and regularity can make it necessary to have ancillary services (postal services and luggage) handled by special trains. Ancillary services of this kind are a frequent cause of delay. The costing of alternative procedures might clarify this point.

G. IMPROVEMENTS TO SUPPLY BY INVESTMENT IN NEW OR DEVELOPMENT PROJECTS

1. The future outlook at long range

As any investment must inevitably be related to a distant future (a period of construction followed by a period of use) it is important to have some guidelines as to the transport context in the years to come.

Without venturing into hazardous speculations a few general trends can be identified:

(a) Better living standards: this will strengthen the demand for a higher level of service and widen the opportunities for a more carefully discriminating fares policy. Much will depend, however, on the public image that the railways shape for themselves (public service as a hallmark of quality).

(b) More leisure: this will generate new travel needs, but it will be important to ensure that these do not take the form of traffic peaks. Less work and more leisure should logically give possibilities for spreading passenger movement more evenly throughout the day and throughout the year; this is incidentally part of an important sociological problem (to strive against humdrum uniformity in ways of living).

(c) Development of activity in the tertiary sector: whilst expanding trade this will also reduce industrial employment and so may lead to a different pattern of passenger movement. It should be borne in mind that, in contrast to the conventional pattern of "industrial society", a better integration of areas allocated to housing and to the tertiary sector is essential.

(d) Regional planning: the main point is to safeguard certain future prospects; in practice this means earmarking certain alignments.

On present form, urban development is leading to a considerable increase in urban dwelling areas.

This urban sprawl raises problems for public transport as it diminishes the effective performance of concentrated routes on the urban network and of rail terminals on the inter-city network. It will generate a growing need for trips involving two successive modes (park and ride).

In a more general context, the growing size of urban populations raises the problem of where development will stop. Certain developments involving inextricable problems for traffic in particular and, more generally, the environment in which we live, cannot be contemplated without misgivings.

2. High speed transport

Much discussion is centred on this particular topic nowadays.

The two most urgent aspects are:

- preservation of alignments;
- contacts with a view to creating a homogeneous network on a European-wide scale.

The question of high-speeds having been dealt with at the Eighth Round Table and being now under consideration at international level, attention need only be drawn, for the purposes of this paper, to the major impacts on investment policy.

As a particular technology may be adopted at a later stage, the most urgent need is to safeguard alignments on routes where duplication of track or higher speeds are warranted in the light of cost/benefit analysis.

However, it would be desirable to combine the construction of these new lines with developments on the urban-planning side. High-speed transport does indeed appreciably alter the yardsticks by which suburban and regional distances are measured. It opens the way for an entirely new line of thinking in the design of new towns as off-shoots of large conurbations. With high-speed transport, the population overspill can be installed in towns about 100 kilometres away. Though speed provides a first-class link (which is essential for trade) distance and cost preclude the large-scale development of daily commuting. This last constraint is a firm safeguard for the economic and social-development of the new township. In the event, the latter could well be an existing town of average size, and this would be a far from insignificant benefit as regards environmental amenities (but would imply some adjustments to the old town centre).

High speed also has an indirect impact on development investment on certain lines. Once it is possible to duplicate a given line with a new one, useful opportunities for specialisation on the old line become apparent; such prospects may affect various plans for increasing capacity (e.g. additional track or electrification) on the existing line. In a broader context, the introduction of a new line may alter routing patterns on a whole section of the network and so allow appreciable simplification which helps to offset the investment needed in the new line.

This argument plainly shows how investment planned on too short a time scale may clash with the overall economic strategy of a long-term investment programme.

3. The impact of car-ownership

Quite obviously, access to rail for car owners and rail/road transport call for solutions beyond the scope of ordinary replacement investment. The main aspects of this problem are set out in a previous section and need only be mentioned here pro mem.

4. Traction

The possible prospect of new high-speed lines means that some circumspection must be shown in the definitive choice of a means of traction that electrification implies.

Apart from this, electrification encrusts the railway more firmly into the landscape and the implications of this may be costly if the alignment has to be adjusted (e.g. for higher running speeds or owing to new urban development) at a later stage.

These points should be borne in mind in profitability appraisals, more especially when an electrification project applies to duplicate routes or to those where maximum speeds may seem slight in the light of future requirements.

Due regard should more particularly be paid to the following points:

- expected trend of freight and "specific" passenger traffic which will continue to be handled on existing lines;
- high-speed services on new lines which, in many cases, will branch off from or extend into existing electrified track (which means that the productivity of electrification would be reduced if non-electric trains are used for these fast services). It should also be borne in mind that, in this event, investment would be needed for a large fleet of new trains.

Everything considered, it seems advisable to mark a halt in the electrification of main trunk lines and concentrate electrification, to start with, on complementary sections, i.e. an arrangement which makes for the rationalisation of motive power in a given area.

5. New services

Apart from high-speed services, as there may be cases where new lines or the reopening of closed lines is called for, it always seems unfortunate to give up an alignment definitively (in the course of a closure) before being aware of long-term development projects.

Patterns of land-use, location of industry and other activities are subject to so much change that a rail network can no longer be regarded as an immutable factor.

Some urban or suburban extensions may relieve pressure on capacity of parallel inter-city lines. More direct changes may occur as a consequence of development in certain areas as this may create new demand; what is more, a substantial increase in freight traffic may have a favourable impact on passenger train costs.

European integration will expand certain traffics which are now at a low ebb (e.g. between seaports and between these and their hinterlands).

Links with airports must also be borne in mind. In the early stages, these were treated as branch lines, but the present inclination is rather to serve an airport by realignment of an existing line.

The adaptation of the railways to the future geographical pattern (location of industry, housing, etc.) will to some extent condition their share of the market. Long-range assessment of this future function calls for a knowledge of the broad outlines of future environmental and behavioural patterns of living, thus implying the need for development plans and economic and social planning. Failing these essential elements, any investment or any radical transmutation might well be a shot in the dark. It would indeed seem most difficult to prepare for the future whilst remaining unaware, through lack of foresight, of what the future will be.

CONCLUSION

This brief review by no means covers the entire range of measures which could reduce rail passenger traffic costs or increase its revenues, nor are the details of such measures investigated in depth. The only aim is to provide a basis for an exchange of views to which each participant can contribute his experience.

As the respective situations of E.C.M.T. country networks sometimes differ widely, a selection should be made among these elements with a view to the ultimate adoption of those which, at international level, may contribute to the integration of the railways in a competitive transport system.

III. FREIGHT MARKET

INTRODUCTION

The main theme of this section of the paper is the need to establish planning machinery in which the government, railway administrations and other related bodies can co-operate to form a long term plan for rail freight services. It is argued that a special examination is necessary, rather than simply allowing market principles to take over, because of the need to establish a firm financial basis on which the railways can build an efficient freight system and to allow governments to consider the full implications of a free freight market. The evidence presently available indicates that, in general, rail freight

traffic will face a severe challenge when exposed to free competition; however, again on the basis of incomplete information, there do not seem to be strong reasons to continue to restrict the freight market.

In view of the constraints imposed by the requirement to consider passenger and freight problems in one paper, the area of discussion is limited to two fields:

the first section concentrates on general characteristics and trends;

the second, seeks to examine the general options that exist for governments in deciding their future requirements for railways in the field of freight transport.

As the paper is not intended to review railway operational questions, insofar as strategy is discussed, it is aimed to illustrate the need for, and the possible range of, a thorough review of policy options.

The current economic position of the railways freight business is unclear and analysis has to proceed with very limited data. However, the information available suggests that railway freight traffic, with exceptions, is not viable(1). Uneconomic operation is not a new phenomenon but in the last decade the financial position of European railways has deteriorated, due mainly to a constant increase in competition, particularly from road transport. This leads to a main aspect of the "exploratory" section, the justification of government action to protect the railways against the full weight of competition. Despite government protection, railways have continued to lose ground to road haulage(2) and, in an attempt to stem the tide, have held rates at levels below a viable figure; the wisdom of this policy now appears dubious in the light that "quality" rather than cost is thought to be the major modal split determinant.

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- (1) "Viability" will be taken to imply a surplus of receipts over real costs; commitments arising from mistakes in the past are clearly not the concern of the economist dealing with efficiency.
 - (2) The close control of public road haulage did not affect the growth of haulage on "own account" which accounted for a substantial part of the rise of the transport of goods by road.

The question of market regulations and its implication for economic efficiency has been dealt with at previous Round Tables(1); here, it is necessary to examine some of the possible reasons why the railways should be protected from the full vigour of competition. Although no specific study is available which examines the consequences, direct and indirect, of a possible transfer of rail freight to other modes, there appears to be no strong case to argue that rail freight confers substantial external benefits that justify protection.

The second section proceeds on the assumption that market principles are to be adopted for the rail freight business and an examination is made of the requirements that this will impose on management; this stresses the prime importance of the need to apply scientific management principles. Whatever the role the railways can devise for themselves in a profit oriented environment will require capital investment for new equipment; with this in mind, it is vital to provide a well reasoned case, examining all relevant options, in support of the justification for further public capital for the railways. As the railways' past performance has not been financially impressive, its proposals must satisfy the same financial and economic criteria that are laid down for other public sector works. In particular, to avoid distortion in the market, investment should be examined in the light of the average rate of return being earned in other sectors of the freight market.

It is suggested that the requirements railway management will have to fulfil will justify a "Corporate Plan" for the whole of its freight activities; this plan must, of course, be integrated into the overall plan for the railways to ensure that passenger and freight services are "allocated" their "correct" amount of track space (the word "allocated" is used because the presence of social factors makes a simple financial trade off impossible).

Given the arguments for the establishment of a "Corporate Plan", the basic options that exist are for a large or a small network. Clearly the requirement of overall profitability will determine, to a large extent, the size of the network. However,

(1) Round Tables 11 and 12 on regulation of capacity in, respectively, the Road Freight Market and in Inland Waterways, E.C.M.T., 1971.

an examination of some of the basic factors that will affect future strategy is relevant because of the light that this may throw on the general direction in which the railways will be affected by a movement into a free market.

Without very considerable market research, it is impossible to form a reliable view of what the future of a single traffic flow on the railways will be. Although the development of computer simulation models is now permitting the evaluation of various alternatives in great detail, the techniques of operation research depend on the quality of originating data that is used and it is naive to look for too much too quickly from this source; hence, there is a need to develop a managerial framework in which basic data is assembled and options are prepared for evaluation.

In the interim period, prior to entering a free market, the railways will clearly still require government assistance but the extent of the assistance should be examined in the light of the degree to which decisions taken now prejudice the course that a comprehensive review can recommend(1). For the railways, the hardest part of the exercise may be to accept that the dictates of profitability mean that long established principles and practices have to be abandoned; for the government, the question of making a firm decision and being able to keep to it may pose a similar problem. However, unless the realities of the situation are faced, it is difficult to escape the conclusion that rail freight will become an increasingly expensive embarrassment to state exchequers and fail to make a proper contribution to an efficient transport system.

(1) It may be argued that the losses currently sustained in freight operation are insupportable; however justified this view, it would be wrong to take any action which prejudiced the final decision.

SECTION I

The Railways' position in the freight market: the need for State intervention

1. The freight market

The close connection between the rate of growth of industrial production and the volume of freight transported is well known(1); as well known is the failure of the railways to receive a proportionate share of the increase in the freight market. The actual decline in railways' competitiveness has been at least partly concealed by the efforts of numerous governments to protect the railways from the full effects of competition. France and Germany generally follow a restrictive policy; the United Kingdom and Netherlands favour a free market. During the last decade, the financial position of the railways has generally worsened, notably in Western Germany. Although competition has increased considerably, passenger services in urban areas and over long distances have generally increased their traffic and have produced better results than freight; in addition, substantial "social benefits" can be claimed from many urban services.

In this section, a brief review of the market will be given; this will be followed by an analysis of official intervention in the operation of the market.

2. Recent changes in the freight market

In the last decade, railway freight traffic has grown at a far slower rate than industrial production (see Table 1)(2). The table shows that French and German railways have done better than those in the Netherlands and the United Kingdom; this seems due

(1) In terms of ton-milage the railways' performance improves:
1958-1967

GERMANY	Index industrial production	+ 70	rail ton kms.	+26
FRANCE	" "	+ 60	" " "	+19
ITALY	" "	+117	" " "	+31
UNITED KINGDOM	" "	+ 7	" " "	-20

(not adjusted for loss of coal traffic)

(2) W. SCHNEIDER and G. PRECHT - "Elaboration of Models for Forecasting the Demand and Need in the Transport Sector" - Round Table No. 5 E.C.M.T., Paris 1969.

substantially to government control of the market. The fundamental problem that the railways have had to face is the stagnation, or even decline, in their "staple" users - coal, iron and steel industries. This has caused particular problems financially because in the market for manufactured products, the railways have found themselves unable to influence market rates and have been forced to take rates primarily governed by their competitors. The railways' problem seems to have had its cause in the inability to compete on terms of quality with road hauliers; delivery time, which is particularly important to reduce inventory costs, has been a relatively bad point for the railways(1). The transition from being the carrier of first importance to second, third or even fourth place has been particularly difficult for the railways to accept; the problems that they have experienced might indeed have been better handled by an acceptance of the position and attempt to make the best of the areas where they were competitive.

3. The economic position of rail freight

The assumption has been made thus far that railway freight operation is unprofitable; it seems unlikely that many will question this general assumption. However, as railway accounts are not published in a manner that readily allows the position of passenger traffic to be distinguished from freight, it is difficult to put a precise figure to freight losses. Some information is available from the United Kingdom and France and this is shown in Table 2. The table shows that in the United Kingdom only the railways' staple traffic, coal, which, as recently as 1965, represented 60 per cent of the traffic, covers even its direct cost; the loss on traffic in small consignments is particularly noticeable. Further light on this question comes from an examination of the changes in passenger and freight earnings since 1958. This shows that, in general, passenger charges have gone up at a faster rate than freight; this can be due to a variety of reasons, changes in the composition of the traffic, government action, etc. but the extent to which the railways have been pressed by their competitors must play a part. During the same period, there has been an increase in the operating costs of passenger and freight traffic.

(1) B.T. BAYLISS and S.L. EDWARDS - "Industrial Demand for Transport" H.M.S.O., 1970. Table 53 shows that 74 per cent of goods dispatched by road were delivered before the second day whereas the rail figure was 35 per cent.

The two main drawbacks that the railways have in the freight field is the need for transshipment and their affinity to "marshalling yards"; these drawbacks impose a heavy "fixed cost" on rail movements. With these handicaps the railways are particularly unlikely to be competitive for short distance traffic but over longer distances the advantages of the railway in terms of speed and low haulage costs come into play. Given this, it is instructive to examine the statistics that are available on the changes in the modal split of international freight traffic as in this field the railways should do well. However, as Table 3 shows, the railways in France and Germany have done no better than to maintain approximately their share of the market although they have managed to win additional traffic to take the place of coal.

In summary, the position of the railways in the freight market is as bad as the figures indicate and there are no special features that mitigate in the railways' favour. Table 4 summarises the position.

TABLE 1

Railway freight traffic and industrial production

(m. tons)

YEAR	W. GERMANY				FRANCE				ITALY				NETHERLANDS				UNITED KINGDOM			
	A	B ₁	B ₂	B ₃	A	B ₁	B ₂	B ₃	A	B ₁	B ₂	B ₃	A	B ₁	B ₂	B ₃	A	B ₁	B ₂	B ₃
1965	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1966	102	91	93	89	106	98	95	98	111	102	100	102	106	93	91	94	102	94	95	89
1967	100	93	91	94	109	101	93	103	122	109	100	109	111	93	82	100	101	88	88	87
1968	111	101	100	97	113	100	91	103	129	109	100	109	123	93	73	94	108	91	88	95

A = Index of Industrial Production

B₁ = Rail Freight - total

B₂ = Rail Freight - coal

B₃ = Rail Freight - minus coal

SOURCES: - A: U.I.C. Tableaux et Graphiques
adjusted to base 1965

B₁: U.N.O. Annual Bulletin of Statistics
for Europe

B₂: E.C.M.T. Council of Ministers Report
and Railway Accounts

NOTE: B₂
— 1965 = W. GERMANY 28%
B₁ FRANCE 18%
ITALY 5%
NETHERLANDS 39%
UNITED KINGDOM 59%

TABLE 2

Analysis of revenue and assessed costs - by types of traffic -
British Rail and S.N.C.F.

BRITISH RAILWAYS

£ million

TRAFFIC	GROSS RECEIPTS	1966		GROSS RECEIPTS	1967 (Differences)	
		DIRECT	TOTAL COSTS		DIRECT	TOTAL COSTS
Coal	103	18	-10	-12	-3	-1
Iron and Steel	35	- 2	-14	- 3	-1	-1
Other	61	-12	-36	- 5	-2	-4
Sundries	25	-17	-25	- 3	-1	-1
				-23	7 worse	7 worse

Source: B.R.B. Annual Report and Accounts 1968

S.N.C.F.

Frs. million

	SUNDRIES TRAFFIC BY 'FAST TRAIN'	SUNDRIES TRAFFIC BY 'SLOW TRAIN'	'FULL' WAGON LOADS	TOTAL
Receipts	240	914	4,597	5,751
Marginal Charges	309	956	3,365	4,630
Total Charges				6,740

Source: Ministère des transports.

Où Va La Politique des Transports?

Edition du C.I.T.E. Paris 1968 - Tableau C.

TABLE 3
Rail share of selected international traffic
groups

		1963	1968
		(m. tons)	(m. tons)
<u>FRANCE</u>			
Solid Fuel	TOTAL	24	16
	RAIL	13 (54%)	8 (50%)
Metals and other	TOTAL	15.6	23.2
Manufactured Goods	RAIL	6.4 (41%)	10.1 (44%)
		1962	1967
		(m. tons)	(m. tons)
<u>GERMANY</u>			
Solid Fuel	TOTAL	40	36
	RAIL	20 (50%)	15 (41.5%)
Metals and other	TOTAL	27.5	47.6
Manufactured Goods	RAIL	9.2 (33%)	4.2 (30%)

NOTE: Excludes transit traffic.

Distribution of international traffic by mode

		1962				1967			
		(m. tons)							
	TOTAL	RAIL	ROAD	I.W.T.	TOTAL	RAIL	ROAD	I.W.T.	
<u>France</u>	109	20 (18%)	6 (6%)	8 (7%)	232	42 (18%)	37 (16%)	29.2 (13%)	
<u>Germany</u>	142	24 (17%)	11 (8%)	42 (30%)	273	50 (18%)	30 (11%)	106 (39%)	

Source: U.N.O., Annual Transport Statistics.

TABLE 4
Distribution of freight traffic by mode 1963-1968

COUNTRY mode % YEAR		FRANCE			WEST GERMANY			ITALY			NETHERLANDS			UNITED KINGDOM		
		Rail	Road	Inland water-way	Rail	Road	Inland water-way	Rail	Road	Inland water-way	Rail	Road	Inland water-way	Rail	Road	Inland water-way
1963		55	32	10	47	21	29				12.6	23	61	30	68	-
1964		49	31	9	44	22	29							29	70	-
1965		45	32	9	42	22	30	25			10.0	23	63	27	72	-
1966		42	34	8	40	23	30	26			8.0		64	26	72	-
1967		45	39	9	39	23	31				8.0	23	65			
1968					38	23	30				7.0	23	64			

Source: Annual Bulletin of Transport for Europe, U.N.O.

NOTES: West Germany: excludes short distance road transport (under 50 kms).

4. Government regulation of the freight market

European railways have traditionally been closely associated with the central government; this led to the problems that are now being faced in establishing realistic accounts for the railways. Important for the railways' freight business has been the numerous restrictions imposed on the free operation of road haulage. Restrictions imposed on the free operation of road haulage date mainly from the 1930s when the combination of reliable road vehicles and large numbers of men unemployed and able to drive led to a rapid increase in the numbers of vehicles on the road. This caused concern for the level of incomes in the industry and the possibility of increased accidents; the interests of the railways were also affected. The railways argued that whilst they were controlled by the government in their freedom to operate commercially, the road hauliers were free of restrictions and, in addition, did not pay their "fair" share of the costs of their infrastructure. The claims of the railways did not pass unheard, especially by treasuries faced with the prospect of providing money to finance increasing railway deficits; a system of regulation was established that imposed many restrictions on public road hauliers.

The economic wisdom of restrictions on road haulage is much doubted and in the United Kingdom, Switzerland and Sweden restrictions, save those concerning safety and other social questions, have been swept away. This paper is not concerned directly with the wisdom of restrictions on road haulage(1) only to the extent that these concern the railway. The justification for controls on competition that protect the railway can be looked for in a number of areas:

- (a) the environment;
- (b) economic development;
- (c) road safety.

These factors are much discussed but there appears to be a lack of evidence available relating to the magnitude of any of them. Although it is clear that there would be some social costs, mainly in congestion and safety, involved in transferring traffic

(1) There is a mass of economic research on this subject, e.g. WALTERS A.A. - "Integration in Freight Transport", London: Institute of Economic Affairs, 1968.

from rail to road, it appears unlikely that these are substantial. Statistics indicate(1) that the railways could not physically take more than a fraction of the total volume of traffic now passing by road, but conversely a complete transfer of rail freight to road would not add enormously to road traffic flows; this latter point is especially true when one recalls that much rail freight passes between large towns that are, or soon will be, connected by motorways. On external grounds, therefore, there is no general case to provide support for uneconomic railway freight activities.

One further external factor that is not readily quantified is the problem of staff redundancy if the railways have to operate viably. Railways are, in most countries, large employers frequently with a long railway background and a high average age. This imposes a number of problems. First, the "skills" of railway operation are rather specialised and staff are not easily transferred. Second, large concentrations frequently occur in areas where unemployment exists. The extent of the problem can be seen from Table 6 below.

TABLE 6
Railway staff

<u>COUNTRY</u>	<u>1969</u>	<u>1963</u>
W. GERMANY	386,000	440,000
FRANCE	307,000	335,000
NETHERLANDS	26,000	29,000
ITALY	170,000	183,000
UNITED KINGDOM	275,000	441,000

NOTE: U.I.C. Stats: December, 1969
B.R.B. Annual Report and Accounts, 1969

The table indicates that considerable reductions have been made in railway staff in the last decade. These reductions seem to have been accompanied with a minimum of difficulty by careful railway and government planning. The following points need to be considered:

- (1) In the United Kingdom (1969) a complete transfer of rail freight other than coal and steel products would add under 1 per cent to road traffic flow: however, the effect would differ from region to region hence the value of a study for a particular area where railways are important.

- (a) the railways should not be burdened with costs resulting from redundancy or retirement of staff; this would serve only to impede efficient market operation;
- (b) in certain cases, on opportunity cost grounds, the government could decide to retain railway facilities where staff would otherwise be unemployed - the reason for this should be stated explicitly, the railways fully compensated and an approximate time limit set;
- (c) government industrial policy could be directed to establishing new industries in areas where heavy railway redundancy occurs or to establishing re-training courses for railway workers.

A combination of policies along these lines should reduce the economic, if not political, problems associated with railway redundancy. In many areas, staff will in any case be freed where demand exists for labour and the men will be absorbed fairly easily(1).

Having considered the most tangible external arguments, we are left simply with the argument that a large railway system is justifiable for passenger traffic and "national emergencies" and that, given this, rail freight can be maintained with the passenger service. If the view that social benefits justify a national, as opposed to urban, passenger service is accepted and there are many doubts on this, there still exist problems. Firstly, the capacity to operate freight services on a system that is slimmed down to the level that is required only for passenger services could be very limited; the railways in the United Kingdom have engaged in a large scale of "surplus" equipment(2) that has achieved substantial economies especially when new equipment is being installed. Secondly, the high speed passenger train; even now the speed gap between normal freight

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- (1) For a study on the problems created by the rapid run down in the size of railway workshops in the United Kingdom see: P. LESLEY COOK - "Railway Workshops, the Problem of Contraction" - Occasional Paper. Cambridge University, Department of Applied Economics.
 - (2) The removal of surplus capacity has been promoted by special government assistance. For details see: Railway Policy CMND 3439, H.M.S.O., 1967.

services and the present generation of passenger trains is causing line occupation problems. If, as hoped, the substantially reduced journey times by the new generation passenger services comes about, the demand for passenger space will further increase. Therefore, in the future, freight services are unlikely to have the use of much "free" track space and if the evidence from the United Kingdom and France is representative, as many freight flows fail even to cover their direct costs, the requirement to meet infrastructure costs will pose problems.

5. Fundamental characteristics of railway freight operation

In order to judge railway performance and potential it is worth considering the basic characteristics of rail freight operation; these are well known and in the circumstances under review, it is essential not to lose sight of them. The major advantage of the railways is the ability to carry large amounts of goods in units with low haulage and staff costs. However, the railways are subject to increasing returns and need high volumes to be competitive. The need to amalgamate traffic into large units and the obvious inability of the railways to lay tracks everywhere being major disadvantages - the need to group individual wagons in marshalling yards and to tranship goods to road vehicles for delivery to non-connected centres. The transhipment problem is being tackled by the use of the I.S.O. container and high capacity cranes; the problems of marshalling is, therefore, the major remaining drawback to efficient operation.

The distance over which the railway is competitive cannot be determined by any average calculation as the nature of each traffic movement is different; in favourable circumstances, the railways can compete on distances as low as 10-15 miles; on other occasions they cannot compete at 200 miles. However, considering the market as being composed of three sections, the following points can be deduced.

(a) Parcels traffic

The normal mode of conveyance here is to group the units into consignments suitable for the trunk haul vehicle. The railways are, in theory, at no disadvantage here but in practice the financial results of this operation have not been satisfactory. In the United Kingdom, the railways incurred a very large deficit while their nationalised competitors in road haulage managed to earn a profit. As

there are economies of scale to be gained in this business, there is much to be said for a rationalisation of facilities which would make the best use of road and rail(1). The theory would be for the railways to provide long distance trunk carriers and road vehicles links that were too short or too lightly trafficked for the railways. As there is a steady increase in the volume of parcels business, if the railways can provide reliable trunk hauls at a competitive price, they should secure a substantial business in this field.

(b) Loads of "wagon load" size less than train load

Most of the present rail traffic is in single wagon loads; this is the area where the railways are most subject to competition. The basis of this traffic has been from and to private sidings. A certain amount of this private siding traffic is likely to continue but the types of industries that have traditionally used private sidings are not the most rapidly growing(2) and the use of a private siding does impose disadvantages in comparison with road haulage. In the past, private siding users have benefited from low demurrage rates that allowed them to detain railway equipment far longer than they would be able to detain road vehicles; as railway wagons become increasingly expensive, detention time must be reduced and this is likely to further reduce the use of private sidings for the carriage of manufactured products in small quantities. The railways look to transfer traffic to container services, but, even here, as British Rail has discovered, profitable operation is difficult. Container depots must be conveniently located and capital costs of installations kept to a minimum. It is hardly economic sense to employ a large lorry to take a container 10 to 15 miles to a depot and another one to

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- (1) The institution of a completely free market would do much to bring maximum efficiency; if efficient pricing were a political possibility they would be grounds for some entry barriers to enable full economies of scale to be earned.
 - (2) Well over 1/2 total tonnage handled on private sidings in France in 1962 was connected to energy and minerals - this represented less than 1/6 of sidings - average traffic per siding was under 40 tons per week. P. 138/9 Annuaire Statistiques des Transports, 1968.

deliver it 200 miles away when one lorry would suffice. The answer comes back to reduction of cost which must include transshipment cost; this can normally be achieved only with large volumes of traffic(1).

In short, in this field the steadily increasing costs of private sidings to the railways and their owners will reduce their numbers to those that deal with heavy volumes; here, the railways will have to find ways of providing services that are as efficient as other modes.

(c) Train load traffic

Much is made of the potential of this mode of operation but the basic features of its operation must mean that industries that employ it must be the exception rather than the rule. The scope for train load operation lies mainly in the field of liquids and minerals but here the railways have to survive in the sector that is too large for road haulage operation but still too small to make it economical to construct a pipeline or cableway, etc. Therefore, although this is fundamentally the field of transport in which the railways are best able to provide competitive services, the scope is limited to a relatively small number of large industries that produce in sufficient bulk to enable a train of 400-500 tons minimum to be assembled. Oil, coal and other minerals, even motor cars, are possibilities and clearly the railways must attach much importance to this traffic especially as the equipment used is normally provided by the firms concerned and does not require railway investment.

In summary, nowhere does it seem the railways have much scope for complacency. They are competing, on the one hand, against the road haulier who is able to exercise a close and direct control over his activities and hence provide a high standard of service; on the other hand, against the pipeline and the inland waterway which, although suffering from the same basic problems as the railways, have the advantage of lower unit cost. In this situation, the railways need to concentrate on what

(1) This does not necessarily imply large volumes of container traffic; there can be instances where small volumes are viable. This would require a low cost terminal and the operation of combined container and other traffic trains to achieve low unit costs on the trunk run.

resources they have on those sectors of the market where they are best able to compete - parcels groupage for long trunk hauls with all other work handled by another, possibly subsidiary, body; containers of all sorts that can be quickly transhipped (possibly lorries also, but this is fundamentally less economic than containers except in the case where flows are too small for transshipment); block loads, which need not be a complete train load. To provide quick and efficient transits, assembly points, not marshalling yards in the traditional form, can be established to amalgamate various traffic blocks into long trains giving low unit cost. Concentration in these fields seems to offer the best hope of finding a profitable basis for the operation of freight traffic.

6. Summary

The main argument in this sector is the need to establish clearly what the railways are to do in the field of freight transport. In the first place the government must decide what part it wants the railways to play. From general economic arguments it seems that the limitation of state intervention in the market and the creation of free competition, with strong regulations to ensure safety, etc., has much to recommend it. However, should the government take another view, and until a research study to discover what, if any, real "external" benefits rail freight confers is available - the governments seem short of evidence, this should be clearly set out and any subsequent changes incorporated in the same manner(1).

On the assumption that the government would wish the railways to behave in a normal commercial pattern, it is argued that the railways should face the problems that exist for them in all the sectors of the market and concentrate on those fields that they are best able to compete in. A policy founded on the strength that the railways have in certain fields seems more likely to bring the hope of profitable operations than continuing to expend resources across a wide range of markets and in every part of the country.

(1) Although not discussed here, consideration might be given to the "social costs" of rail freight operation - particularly its large requirement for land in city centres, noise, traffic congestion at depots and the restrictions it places on locational freedom.

SECTION II

Preparation for entry into a free market

1. The interim period

The previous section concluded that there were no strong reasons for restricting the commercial freedom of the railways. One of the advantages of a commercial criteria for railway freight operations will be the incentive that freedom gives to railway management to make the most efficient use of railway assets. However, as the railways are likely to require fairly substantial changes in many fields and as they are a public body, the government must always exercise overall control over their activities. The absence of important external elements in railway freight activities argues for a very loose form of government control directed only to ensuring that the railways make efficient use of national resources. Although every country will have its own system of control for railways that best fits its particular circumstances, there are some general problems; this section aims to discuss some of these.

Although the final entry of the railways into a free market is accepted, the interim period in which the railways adapt themselves and the final form of their accounts can only be settled after a joint exercise to determine their economic potential. The government will have to decide on the form of the railways pricing and investment policy and to decide what financial target to set for the industry. Finally, the railways should prepare a "Corporate Plan" for their freight activities that will form the basis of their activities in a free market.

2. The joint planning process

If the railways are to be expected to act efficiently in a free market they will require a capital account adjusted to their real earning potential. To carry out the adjustment to the capital account will require the railways to co-operate with the government in the preparation of detailed revenue and cost forecasts for the various sectors of their activities. The co-operation of government officials in this work will be necessary not only because of the need to ensure that these forecasts are prepared on an accepted base but also because the government may be able to provide information on underlying trends in the economy and possibly in other sectors of the transport industry.

For the railways, research studies in future demand for their services will form the basis of work to be progressed for the final "Corporate Plan".

3. Government policy decisions

The E.E.C. has laid down regulations regarding the compensation of railways for non-commercial activities (normalisation of accounts)(1); before a free market can be constructed it is essential that the transport operators pay the real costs of their activities. In addition to these general measures, governments will need to consider a number of questions relating to the railways' status as State-owned enterprises. The main requirements will be to give the railways a realistic capital structure and to set them a performance target. Both these questions are complex and in considering freight problems alone, further complexities arise due to the difficulty of separating freight and passenger accounts. Due to complex problems of joint operation, short of separating freight and passenger activities, there appears little direct action the government can take to ensure efficient freight operation. (It might also be considered that direct action was inappropriate in these conditions.)

The two main areas where the government can operate to ensure efficient operation of services are:

- firstly, setting the financial target for the railways;
- secondly, investment control procedures.

It is arguable whether the government would wish to take any more active part in controlling railway affairs than in the two points mentioned; however, this issue must be considered; the basic aim of this work, to encourage efficiency, could be jeopardised if rail freight is allowed to operate at below its real cost for any length of time.

Setting a financial target requires, in the first place, forecasts of the railways' future profit potential under the new market conditions. This will enable an estimate to be made of the size of the capital structure the railways can support; clearly the more pessimistic these forecasts are, the more leeway is given to the railways in regard to the profit targets set for the various parts of the business.

(1) E.E.C. Regulation 1191/69 - (Public Service Obligations)
E.E.C. Regulation 1192/69 - (Normalisation of Accounts)

The government must attempt to steer a narrow path between setting the railways an impossible task which will create considerable problems in the future and being too liberal to give a positive stimulus to management.

Investment control

Investment control will be necessary on a number of levels:

firstly, to ensure the railways follow the government's general macro-economic policy;

secondly, to ensure that resources are being used in accordance with government transport requirements.

Both these points apply whether the railways are self-financing or not. The first point is debatable and can be thought of as interference in the free running of the industry and an unfair burden in relation to competitors. However, in practice, the degree to which the railways rely on government funds, or at least backing, for investment should compensate the railways for whatever harm they suffer. On a more detailed level, the government may, depending on the exact method in which the railways raise capital, require the use of the discount rate which it lays down for appraisal of schemes involving public resources; the rate of discount will, in practice, have two functions to allocate funds between the public and private sectors and to provide a way of selecting competing railway projects. The government must agree a basic framework of investment appraisal with the railways to ensure that:

first, a project offers the highest rate of return of those available now and in the foreseeable future (i.e. a delay would not be preferable);

second, the project, as submitted, represents the best scheme to meet the aims intended;

third, the project fits into the overall aims of the "Corporate Plan".

Such investment control procedures impose problems for the railways, particularly in cases where it has been argued that investment analysis is unnecessary in connection with the replacement of existing assets. This argument must be rejected or the railway will change only very slowly. The problem is to devise a simple ranking of services and isolate those sections of route and services which have a dubious profitability; all investment on

these sections would then be grouped and the change in net revenue with and without the section considered(1). It is essential that some practical solution to this problem is found and all investment brought under economic control.

If satisfied that the railways' investment control satisfies the rules, and having approved the "Corporate Plan", there appears to be no further useful purpose for the government to intervene in management when the financial targets are reached. If the railways fail to reach their financial target, there is no reason why the government should step in with further aid; rather, the railways should cut back their investment and dispose of non-economic assets, like land, to reach viability. An essential part of a comprehensive examination of railway finances and a full scale adjustment to market conditions should be the acceptance by railway management that henceforth they will be expected to survive without recourse to government aid.

4. Pricing policy

The other basic question which the government must settle concerns railway pricing policy. In many countries railway prices have been controlled and published, mainly due to a fear of railway monopoly. However, for a free market, it is clearly impossible to control railway charges by statute. The risk of monopoly exploitation by the railways is very small as in almost no market does the railway appear to have an inelastic demand in terms of price or cross-elasticity(2).

The question of pricing is tied up with the target which the industry is set. The following points might help to settle a pricing policy:

first, road haulage is highly competitive with low entry barriers - monopoly profits are not likely to exist;

- (1) An extension of separate accounts to freight services on the same pattern as unremunerative passenger services in the United Kingdom would serve as a base. The main problem is to allocate "contributory revenue" i.e. revenue accruing outside the cost centre, but if services were simplified into a pattern of main connections, this difficulty would be greatly eased.
- (2) With coal, in the short term, demand is presumably inelastic; if the railway attempted to sharply increase prices, it is likely the result would be a further contraction in the industry.

second, firms will always be in a position to undertake transport on their own account if they feel that transport is inefficient - the absence of economies of scale in road transport makes such a move perfectly acceptable in economic terms;

third, commercial firms competing with the railway will be earning at least enough to cover their costs including normal profit - if the railways are required to meet their costs and satisfy a discount rate based on normal profit in the road haulage industry, this will give a minimum of distortion.

In practice, setting railway prices is most difficult and considerable improvements, as well as managerial incentives, are probably gained by leaving railway prices to find their market level with the aid of local managers. There is little scope for monopoly pricing and setting of tariffs at a local level would fit in well with a policy of "profit centres" to encourage managerial efficiency; hence, there is much to be said in favour of complete freedom for the railway in this respect with possibly some form of appeal body to consider complaints from customers and report to the Minister concerned.

5. Conclusions

With government policy established, the railways should be able to start detailed preparation of their "Corporate Plan" designed to meet the government targets. The "Corporate Plan" will need to consider as a short term aim the railways' need for a large cash flow to provide self financing for new investment; in the long term, the "Plan" should aim to use the best technical and commercial forecasts to prepare detailed market strategies that follow the main aims of the organisation. This, and the government decisions, will take a fairly considerable time period and normal prudence should dictate in this interim period that no commitments for capital investment are entered into which could bias future decisions and fail to be remunerative in the new market conditions.

The railways have been dogged by the problem of long run costs which considerably limit their freedom of manoeuvre; if the "Corporate Plan" can make progress in the direction of reducing the railways' rigidity, this will be an important aid to market planning. A special aspect of the "Plan" that might concern

governments is to ensure that assets, particularly land, currently vested with the railways, are put to their best use. However, this is a question much involved with politics and outside the scope of this study.

SECTION III

Future railway developments in the freight market

Passing through the interim adjustment stage, what prospects face the railways in a free market? The two primary factors that play the major roles in determining the position seem to be:

firstly, the changes in prices and operation needed to achieve railway viability;

secondly, the extent to which a free market will intensify road haulage competition.

This chapter begins with a brief review of future changes in the market and their relevance to the railways' problems; evidence on the factors that influence modal split is also relevant here as this throws some light on the quality of service the railways have to compete with. The problems in raising prices or increasing traffic, assuming marginal cost is low, appears to be considerable and the railways will require a complete review of all possibilities of raising prices and changing operating methods to reduce costs. The question comes back to the results of a "Corporate Plan" which must consider all possibilities of equating costs and revenue. The way to viability may involve difficult decisions but if the railways are to capitalise on their prime advantage of potentially low unit costs they should be prepared to operate a basic freight network with characteristics best suited to the economic potential of railways.

1. Developments in the freight market

To date, the railways have not been successful in combatting the challenge of road haulage for the transport requirements of manufacturing industry; this problem, combined with the decline of the coal industry, lies at the heart of the railways' difficulties. The railways have been unable to prevent the expansion of road haulage because of factors outside their control - dispersion of industry, the short distance of many journeys - and by their problem of offering a competitive quality of service. Quality of service(1) has a "trade off" relationship against

(1) For a review of "quality of service" factors affecting modal choice, see: C.H. SHARP - "Public and Private Decisions in the Allocation of Goods Traffic", Loughborough University: Symposium, 1969.

price but as many of the products of the consumer goods industry have a high value in relation to transport costs, the resulting ratio of direct to "indirect" (damage, inventory, etc.) costs is unfavourable to the railways. Although the railways have held freight rates down, they have clearly not reduced them to competitive levels(1). A further problem, mentioned later, is the question whether shippers are able to make optimum decisions in complicated "trade off" situations.

Future developments in the freight market are not likely to bring any new problems for the railways. The decline of the coal industry will continue to reduce coal traffic and a radical attempt by the railways to increase net revenue is likely to be counter-productive in further increasing this trend. [It should be noted that the rate of decline appears much influenced by socio-political considerations; thus depending on government action, there may be scope for increasing net revenue by providing efficient "block-train" operation(2).] In the rest of the energy sector forecasts indicate a steady growth in transport requirements but undoubtedly pipelines will meet most of this demand. Although the railway traffic in oil has increased, this could be a short term phenomenon as some flows reach the point where construction of a pipeline is worthwhile. With the situation in the steel industry clouded by the development of integrated plants the railways may find that they depend on the fast growing manufactured goods sector for new traffic(3). This, again, leads back to the problem of how to make headway in this field. Clearly with the aid of heavy investment in new equipment and computers, the railways will improve their service, but at what cost? If the end result is a railway system simply able to produce the same type of product as road haulage can now, will the investment be worthwhile?

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- (1) "Où va la politique des transports", 1968, La documentation Française: shows that between 1958 and 1967 rates per ton/km decreased by 6 per cent in real terms on the S.N.C.F.
 - (2) A scheme in the United Kingdom was not as successful as originally thought, mainly, it seems, because of poor co-ordination between the coal, electricity and railway industries.
 - (3) For a forecast to 1975 of European freight demand, see "15th Annual Report and Resolutions" of the Council of Ministers, E.C.M.T., 1969 and subsequent Reports.

Table 2 indicates that general freight rates in the United Kingdom and France will have to rise substantially to cover even direct costs at their current level. As an increase in real cost will inevitably lose the railways' traffic, they will be faced with the problem of attempting to reduce costs to a level to accord with the new traffic level. This situation emphasises the need for careful planning with accurate assessment of market elasticities and the shape of the relevant cost curves.

It is clearly established that as long as G.N.P. keeps rising, the demand for transport will increase, a situation which should basically favour the railways with their increasing returns to scale. However, on the basis of recent performance, in a free market the railways would be unlikely to make any substantial gains in traffic. A forecast of the total size of the market is not very useful, but with the changes consequent upon entry into a free market it is particularly difficult to make reliable estimates of the traffic on individual modes. Even in the comparative stability of the past ten years, forecasts have tended to underestimate the speed with which road transport has gained and railway transport has lost traffic(1).

At this time when a free market is a possibility, there are also technical and social developments that make cost predictions extremely difficult. A particularly important development is the standard I.S.O. container which is playing an increasingly important role in sea transport and may well do so also in land transport. The advantage of the use of large numbers of I.S.O. containers is that they permit the installation of quick but expensive transshipment equipment from road to rail at low costs (for high volumes). Initial estimates(2) in the United Kingdom predicted a very bright future for container transport on rail with a traffic of 40,000,000 tons by 1973 (at the time about 75 per cent of the general freight traffic). Now estimates are that traffic flows will be much lower and that break-even point between road and rail averages around 250 miles. Although in Europe the container has still to make a major impact, the railways have been slow to provide efficient methods of handling container traffic; there is still a possibility of a major breakthrough in coming years. In other modes, developments are also

(1) See the forecasts contained in the 12th Annual Report of Resolutions of the Council of Ministers, E.C.M.T., 1963.

(2) British Railways Board - "The Reshaping of British Railways" H.M.S.O., 1963.

continuously underway, in road transport there is a possibility of larger, more powerful vehicles but also of increasing restrictions on quality grounds(1). All these factors make forecasting a specially difficult problem at the current time.

2. Railway strategy

A number of recent studies have thrown some light on the direction in which the railways might look, if they wish, to improve the quality of service; speed of delivery and damage were particular problems singled out by a survey on the attitude of transport managers(2). A large scale study sponsored by the United Kingdom Government(3) indicated that the most often quoted reason for firms switching from rail to road was slowness and unreliability of rail delivery. Possibly as important was the information that a substantial number of shippers were not making cost comparisons; checks revealed that over 25 per cent of the goods sampled were not dispatched by the least cost mode.

On the evidence of these surveys, the railways have to consider two important points:

- first, how to improve the quality of their services;
- second, how to convince shippers that the railways are competitive.

The second point argues possibly for government action to improve the quality of transport managers especially in industries where transport costs are relatively low or competition is very weak. In this field the railways are likely to be at a disadvantage in comparison with the small road haulage operator who can keep a close touch on his principle customers and their views of his services.

Neither problem has a simple answer, although the essential difficulty is clear, the proliferation of small lots that the railways carry and the consequent need to group these into units at numerous marshalling yards. The railways' solutions are to improve the marshalling yards and install computer equipment to monitor wagon movements; whatever the chances that measures are successful, their profitability must remain doubtful.

(1) Previous Round Tables have stressed the need for these "social" improvements to be evaluated in a cost/benefit framework before application.

(2) Sharp opp. cit.

(3) B.T. BAYLISS and S.L. EDWARDS, opp. cit.

Reverting to the basic characteristics of railway operation (Section II), their principle advantage over road haulage is the ability to move large quantities of goods at very low unit cost, trains of 2,000 tons are perfectly possible. Baumgartner(1) has demonstrated, in theoretical terms, that substantial economies can be derived by operating heavy trains. However, the difficulty with operating trains of 2,000 tons is the need to hold traffic for possibly considerable periods before a train is complete. This difficulty could be overcome in a number of ways:

First, by concentrating traffic on a limited number of trunk arteries, even if this meant increased mileage, the marginal movement cost is very low and the possibility of making savings on infrastructure costs is opened up.

Second, grouping various types of traffic together, e.g. oil, block container services. This practice raises objections on the basis that the block services are timetabled while other services run on demand. However, the institution of regular scheduled services would be possible if traffic was concentrated and the quality of service would be very much improved. Reliability could be guaranteed without very costly computer control equipment as the principle of operation would be to avoid intermediate regrouping of trains, i.e. a section of a train for point X would be assembled at A with sections Y and Z; these would run together to point J when the portion for X would be detached to join a train going forward without marshalling. The essence of this system would be to serve only a limited number of main points from which local services or road delivery could operate as economically desirable. A two-tier service could be offered: traffic for the first tier would have wagons supplied at a guaranteed time and delivery also guaranteed; the second tier service would supply wagons within a limited number of days and offer guaranteed delivery within a few days. This would offer a range of services with different qualities to suit individual shippers, as the number of contacts made by the railway on this system would inevitably be reduced but average traffic volume increased.

A solution along these lines may also be compatible with the new generation of high speed services that are likely to appear in the 1970s. One of the major planning problems that the

(1) Baumgartner, J.P., "Les Coûts du Mouvement des Transports de Marchandises par Chemin de Fer". Rail International No.1, January 1970.

railways face is to decide on the use of high speed services to maximise profits; this planning process must take freight services into account and should an intensive high speed passenger service appear the best possibility, available time for freight operation will be much reduced.

The development of new computer-based simulation techniques will enable different strategies to be evaluated in the "Corporate Planning" process. The main essential is to be completely realistic in the development of options, starting, perhaps, as a base from an evaluation of the consequences of a complete abandonment of all freight except company trains. A solution can be arrived at as a result of a logical and careful process of analysis, the railways can be sure that their future would be as carefully thought out as any for industry and probably better than most.

3. Conclusions

Future changes in the nature of the market may be neutral in their impact on the railways. There should be a steady increase in the demand for transport which will present opportunities to replace losses on traditional traffics. Road haulage competition will increase but it has been argued that competition mainly takes the form of quality differentials; the increasing government attention on safety and other factors will also impose some restrictions. The basic problem is whether the railways can, economically, improve the quality of their service.

With a sophisticated system of computer control, an improvement in the chronic difficulties with freight operation should be possible, but the system would be very expensive, especially for a "loss making" business. A more conservative, and hopefully safer, approach has been suggested here; to concentrate on main traffic centres only, utilising the railways' ability to operate at very low unit costs on heavily used routes.

Whatever approach is adopted, it is hardly necessary to say that the success of a free market would be jeopardised by a failure of the railways to be profitable. If the strategy adopted is for a large system, it is unlikely that the government would not grant further aid, thereby making a free market pointless, and an incidental benefit of a small system would be that its failure would cause much less confusion in the market.

SECTION IV

Conclusions

One of the major themes of this paper is the need for government and railway administration to co-operate in the establishment of a planning machinery that can chart a clear future for railway freight services; in view of this, the arguments against using a "crystal ball" to lay down what will happen to rail freight are particularly compelling. On the basis of the information available, it is not possible to do more than make some general points on the effect of a free market on the railways.

Firstly, in the present financial position of the railways, there can be no purpose in entering a free market without a complete settlement of the "non-commercial" elements in the railways situation by the government. This should also be accompanied by a realistic examination of the railways' capital accounts as they relate to freight traffic and an adjustment of these to accord with the railways' net revenue position. Without an agreement on these matters any entry into the market will be self-defeating as it will confer no effective stimulus to management efficiency and continue the present system of the railways depending on the government to provide financial assistance.

Secondly, the railways cannot be expected to adjust to the new conditions in a very short space of time; their network and commercial practices have been adjusted on altogether different criteria. Even when the government regularises the railways' financial position, there will still have to be a period in which the railways can complete the transition to a market-orientated organisation with all the background work in market research and planning that this requires.

These are essential points for the government to consider. What emerges from the consideration will depend on the state of the individual railway concerned.

For their part, the railway administrations should realise that their former operating methods, however technically satisfactory they may be, cannot continue unless they cover costs. If the governments are prepared to adopt a "holding company" type arrangement with the railways and provide capital for investment, on the basis of past performance, any public appeal for capital,

as feasible on the passenger front, would be very optimistic. Applications must be backed with appraisals of the highest quality and the first importance must be attached to the preparation and execution of investment plans. It has been argued that subject to the railways satisfactorily assuring the government that their investment planning machinery was satisfactory, the government should be interested only in the macro-economic aspects of the railways' investment policy, the total amount invested, and in its public accountancy duties. This may be thought of as an unfair restriction as compared with the private sector who have free access to capital, but in view of the size and risks in railways investment, to hope for any other form of arrangement would be unrealistic.

In the foreword to the paper, it was stated that no attempt to prognosticate on railway operation would be made; possibly the discussion on the network size infringed upon this. However, the discussion of the future network size concerns all the fundamental problems that face the railway and it was hoped to air some of these. Without having a satisfactory statistical case, the view that is put forward in the paper can be attached with full justification. The view that the operation of railway freight traffic is of no importance to the environment may be too extreme, a research study of the implications of the withdrawal of rail freight facilities that were not viable in an important industrial area seems justified to settle the question(1). However, it is valid to repeat that the trend throughout Europe is towards "internalising" the social costs that are incurred by road haulage; with this development, the question takes on an aspect outside transport and becomes involved with regional development. Without any detailed knowledge of the relevant elasticities and the shape of the railways' long-run supply curve, it is impossible to predict whether an expansionist policy is well founded. The argument for a pragmatic approach, or it might be called pessimistic, depends on the evidence that the railways find competition from road transport increasingly difficult to match and remain viable. To remove the main barriers to effective

(1) There may be something of a parallel here with the situation of areas that are heavily dependent on coal mining; in the United Kingdom a study was carried out to establish the social costs of the closure programme for the mines (it is believed that the report was not published).

competition, requires heavy investment to which a considerable risk must be attached. In view of the fact that the railways are at their best on long hauls with high volumes, the way to profitable operations seems to be to build on this firm base of services between large centres in sufficient volume to operate regular, direct services, i.e. avoiding marshalling yard. The operation of such services would give a high quality product that could be successfully marketed against road transport. As only major flows would be catered for, it would be possible to build up a fleet of modern wagons at a cost far below a complete re-equipment of the fleet. The basic reliability and to reduce scale of operation would also reduce the range of computer controls now thought necessary. Opposed to this possibility is the view that the railways must market a "comprehensive product" that provides an alternative in all, or nearly all, situations to the large shipper. This view seems to be akin to the idea of "loss leaders" and clearly the practice is an accepted commercial device. The main practical argument for this view, in relation to the railways, seems to be that private sidings will not be worthwhile for the industrialist if they are not extensively used. The answer to this seems to lie in the possibility of substantial cost reductions from the type of operation proposed; these should make the continued use of a siding worthwhile and if not, the high capacity is always available.

The solution to this problem will be the major question for the railways administration entering a competitive market. The answer can only come when the gaps in our knowledge concerning elasticity and the supply curve are filled. Until then, the railways position is in doubt but with a suitable transitional period, both government and railways should be able to answer these questions and certainly a considerable degree of freedom for the railways should result.

SUMMARY OF THE DISCUSSION

I. DESCRIPTION OF THE PRESENT SITUATION FOR ALL MEANS OF TRANSPORT

The participants in the Round Table were keenly concerned from the outset to show clearly how the existing state of affairs differed from a market economy.

The essential feature of a market economy is the user's freedom of choice between modes of transport receiving strictly neutral treatment from government authorities.

In a context such as this, the task of the railways is the optimal and lasting satisfaction of requirements according to profitability criteria.

Expressed in these terms, the market economy seems an idealistic - even utopian - concept. However, the first point is whether (as the title suggests) other modes of transport are themselves already in a market economy. The Round Table accordingly reviewed the problems arising in this respect.

In the case of air transport prices are fixed on a concerted basis, some airlines are subsidised, research costs are partly borne by other budgets (such as Defence) and in many cases infrastructure costs are not entirely met by air transport operators. On the other hand, low fares for charter flights do not seem to fall outside the free market framework as they are essentially a commercial device which is, or could be, imitated by other modes.

Where road transport is concerned, the following points deserve special mention: infrastructure costs for heavy vehicles, observance of social legislation and road safety rules, environment problems and various practices (running counter to actual needs) as regards international licensing. Moreover, in contrast to air transport, road transport involves internal competition. Though the full application of regulated rates does leave something to be desired, this is not an essential aspect of the market system as such, a market economy being quite conceivable without fixed rates.

In the case of inland waterway transport (which involves considerable differences from one country to another) there is practically no compensation for infrastructure costs in respect of artificial inland waterways. Cost-benefit analysis would be appropriate before proceeding with investment of this kind.

In actual practice, inland waterways are often a means of creating, at the community's expense, artificial competition between modes. Users ask to be provided with these waterways in order to create a permanently irreversible state of affairs which puts competition "outside the market". What is more, the Mannheim Convention raises difficulties in this connection that are well familiar.

The distortion of competitive conditions is worsened by two recent trends: first, claims for the development of inland waterways to enable them to accommodate large-capacity craft and secondly, a policy involving subsidies for the scrapping of old craft.

In such circumstances, the railways can hardly hold their ground on a purely competitive basis. One means of defence would be to withdraw preferential railway rates before work begins on an inland waterway project duplicating a railway line.

A distinction must also be made between capital costs and operating costs. In the long run, the latter often exceed the former. Even if an investment has been made regardless of the economics of the case, this is not a good enough reason for loading oneself with operating costs afterwards; in plain words, this could mean abandoning operations on certain routes.

II. PASSENGER TRANSPORT

A. Distinction between short and long-distance services

Roughly speaking, transport services can be classified under three heads as follows:

- (1) inter-city services which can be operated on a purely commercial basis;
- (2) urban and suburban services. These are not necessarily loss-making. If they are running at a loss, they may serve as a means of income redistribution but - to a much greater degree - they are a substitute for effective urban planning. Moreover, financial viability in this area pre-supposes the application of market principles to all modes and, hence, the introduction of road pricing;
- (3) rural services the cost of which must be borne by local authorities.

This classification largely overlaps other sub-divisions, the main features of short-distance services being journey-to-work trips, and transport provided on a so-called "public service" basis. In any event, if the railways are asked to provide services which do not cover their costs, the need for an appropriate normalisation of accounts follows as a matter of course.

As public transport is invariably a less costly investment than private transport for high-density flows, it is reasonable enough that the State should finance the construction of new lines in conurbations. Capacity available on existing urban and suburban lines - which is sometimes insufficiently used - must also be borne in mind.

In the urban transport sector, competitive practices (especially between public transport services) should preferably be abandoned in favour of optimal co-operation arrangements embracing all modes of public transport.

Where this is operationally feasible, suburban railway lines should preferably be transferred to other operators. This split between short and long-distance operations can however run into technical difficulties because of overlapping traffics on the same lines.

It seems important to determine by means of cost-benefit analysis how far transport contributes to proper land-use planning or whether it serves as a substitute for it, in which case profitability can be judged only by reference to a socio-economic appraisal.

As a conclusion to all this, the Round Table judged that:

- (1) mass, own-track, transport alone provides adequate capacity at acceptable economic cost in conurbations;
- (2) transport in conurbations should not be judged by reference to free market principles but to cost-benefit analysis;
- (3) normalisation of accounts should be carried out for each distance category separately in order that losses incurred on some traffics will not be imputed to others that are remunerative.

B. Demand

From a commercial standpoint, passengers fall into two categories: those who can hardly afford the fare and those for whom a high standard of transport service is the main consideration. This raises an awkward problem of differential services for the railways.

Price elasticity for city traffic and for inter-city business trips is seen to be slight. It is fairly high for "non-business" 'inter-city' traffic (young people - recreational travel).

At long-term, however, the problem of price elasticity arises in different form (e.g. choosing where to live by reference to transport cost).

Apart from this, elasticity of demand according to quality standards is a most important consideration. If the operator's public image (which has a bearing on long-term demand) is to remain untarnished, it is important to refrain from providing services below a certain standard.

Generally speaking, the diversity of the market calls for more refined research.

C. Traffic Peaks

This is a complex problem and some of its effects have a considerable impact on the transport system, but it is sometimes

argued that traffic peaks are a necessary evil and, for this very reason, more use should be made of public transport. From an economic standpoint, however, this puts the problem the wrong way round.

In practice, peaks are becoming sharper and working hours increasingly standardised; the same applies to the timing of leisure activities. Little has been done to prevent this. It seems that this matter cannot be left to private initiative as the people concerned are too widely scattered to do anything about it. Action from above is therefore needed.

Theoretically, a market economy provides the framework for keeping the disbenefits within bounds. For instance, surcharges could be levied at peak hours. More generally speaking, a profitability criterion should imply constraints on extensions of capacity catering only for peak demands.

In practice, the problem embraces far-ranging economic and social policy considerations: traffic is only a particularly conspicuous end result. The psychological implications of a standardised (i.e. "dehumanised") way of living and the economic consequences as regards amortisation of equipment of all types should be systematically studied. Such equipment (serving economic, social, cultural and other purposes) is increasingly costly and, at the same time, its working life is narrowed down. The real cost of this state of affairs should be more carefully measured and it should then be possible to adopt a more suitable pricing policy.

Effective reform implies profound changes in many fields (e.g. changes in the system of monthly rentals for accommodation at holiday resorts, adaptation of school holidays, adjustments to work shifts, conversion of reduced working hours into additional days off, shorter and more evenly spread working hours throughout the day, etc.).

D. Operations on an International Scale
(Studies: Equipment and supplies)

This topic is closely connected with economic problems at national level. Effective rationalisation is obtainable only by inter-governmental commitments.

As regards studies, the participants in the Round Table considered that a single "European Office" (not to be confused with

a merger embracing existing suppliers) would have very good effects on standardisation and grouping of orders. The scale of future investments requirements adds even more weight to this line of thinking. But there can be drawbacks as regards the sterilisation of technical progress (as this is not an inevitable process) and the prior harmonisation of safety regulations.

As the main point is to go forward and not try to have "all or nothing" it would be useful to look more carefully into the economic impact of bulk contracts and a steady flow of orders. In too many cases, the railways have served as an industrial production stopgap. However, the grouping of orders, highly desirable as it is for the railways, raises problems for industry in each country. It lies with governments to deal with this, in particular by the allocation of tasks.

Some countries are in an exceptional geographical and/or technical position; British Railways, for instance, seem less affected in this respect.

The conclusions drawn by the Round Table were as follows:

1. That the creation of a single international planning and design office should be encouraged (this does not apply to certain countries whose interest in such a venture is too small).
2. That this Office should handle the grouping of orders.
3. That purchasing policies should be practiced on a purely commercial basis.
4. That market research should be developed (on this last point, it was emphasised that the decision as to the service to be supplied lay with the Commercial Department, the technical departments being concerned with the "production" process).

E. Replacement Investment

The adjustment of supply to demand raises problems of efficiency as regards the former (involving changes of mental outlook at every level).

Major traffic surveys may contain valuable information that the railways do not always make full use of. In any case, the development of marketing methods seems essential.

F. Initial or Extension Investment

Here, the question arises as to how far such costs should be borne by the community. If separate balance sheets could be

drawn up for urban traffic and inter-city traffic, this would clarify the issue. Next, for all modes of transport, there remains to decide the policy to be adopted as regards the pricing of infrastructures.

Profitability cannot be truly judged except at social-economic level (cost/benefit analysis); some participants considered that the question as to who must pay and how is a secondary issue and a matter of political choice. However, this must not lead to a privileged position for certain modes of transport.

There is an obvious need for the formulation of a uniform investment policy at European level.

As investment of this kind is inevitably long-term and as the corresponding operations must continue beyond this over a much longer period, some hard thinking is needed as to what future generations will consider to be the optimal satisfaction of their needs. This problem calls for an inter-disciplinary approach.

In view of these considerations, the Round Table was logically induced to formulate some recommendations as to the future network. It considered above all that European-wide technical compatibility was a primary and fundamental aspect.

Existing projects are restricted to certain lines not constituting a network; this is not necessarily a handicap insofar as requirements can be determined by market studies.

It lies with the railways to give special attention to the future network. The days when railway networks could be regarded as having reached their final shape are passed. That is why suitable planning and design institutions must be provided. A good many studies have indeed already begun and the real need is rather for a more thoroughgoing, international and systematic approach.

It lies with governments to consult together on investment projects and refrain from undertaking isolated ventures which would tie them down at longer term.

III. FREIGHT

A. The market

The participants in the Round Table considered that the introductory paper was perhaps pessimistic on this point; in any event, the non-viability of freight traffic is not an established fact.

However this may be, equal terms of competition must first be laid down and the next point is to try to trace future trends; for instance, the trend of labour costs may be a decisive factor in the shaping of future operating procedures.

Because of the incidence of joint costs, effective results are not always obtained simply by shedding loss-making services: the elimination of a service does not necessarily imply the elimination of all the relevant costs.

As regards competition, it is rather disquieting for the railways to see their share of total traffic decline while their labour costs are rising fast. This raises the whole problem of adapting the supply of transport services to match the market (it being assumed, of course, that the market is functioning as it should).

The railways do not sufficiently gain a footing on new markets and are sometimes handicapped in this respect by the thinly scattered location of new activities (which are not linked to the railway). Furthermore, quality of service is an increasingly important factor and, for many traffics, far outweighs considerations of price.

If governments judge it necessary to subsidise certain transport rates, such subsidies should logically apply to those whose costs are lowest to start with.

If decisions as to infrastructures are made without reference to the transport system (i.e. without sufficient research on expenditure commitments or on the impact that such projects will have on competitors' receipts) the economics of the transport system are disrupted. Transport services cannot be expected to operate in accordance with market economy principles if the economic basis is distorted from the start.

B. Quality of service

Price is not the decisive consideration for consignments attaining a certain commercial value. Users expect quick delivery

and, even more so, reliability. On this point, the general adoption of a computer control system on an international basis would settle the question of information on the delivery of consignments.

The railways must put their services in step with the output of goods; this means that freight must be disposed of quickly, regularly and safely. Paradoxically, the make-up of trains is such that it is easier to do this for bulk transport (i.e. unit trains).

In order to provide a high standard of service, suitable equipment - catering for the needs of Movement and Operating Departments alike - is essential.

C. Parcels traffic

Unless this traffic covers at least its marginal cost, it cannot be fitted into a free market framework.

Some railways have given it up, others are attempting to have it handled by subsidiaries. Even if this does not eliminate the deficit where the community is concerned, the advantage lies in straightening the railways' operating account.

Though there is still a good deal of room for rationalisation, the fact remains that this type of traffic calls for a large and increasingly expensive work force. There are also problems of co-ordination (e.g. with postal services). Everything considered, the solution should be sought with an eye to realistic pricing policy. The subsidising of demand generates superfluous services (e.g. sending presents instead of cheques).

The Round Table considered that this sector needed financial aid if it is to balance its accounts. As regards the future, more rationalisation and co-ordination will be needed or else the service must be abolished. If it is retained, the fullest freedom of operation must be claimed.

D. Train load traffic

There is little to be said on this point. "Door to door" hauls with permanently-coupled trains are a most attractive proposition. However, the pattern of demand (e.g. the declining coal trade and the installation of steel works near the sea) is such that the growth of this traffic is very slow. Competition from inland waterway operators is plainly fierce.

E. Wagon-load traffic

This heading also covers groups of wagons and so embraces a whole range of combinations from single wagons to train-load lots.

Changes are now taking place. Wagon-loads requiring two transshipments (i.e. in two railway yards) can be regarded as a dying practice. On the other hand, the participants considered that wagon-load traffic between private sidings still had a future.

It may be asked whether all the traffic which involves shunting or handling in marshalling yards is viable in the long-term having regard to its slowness (i.e. the many wagons to be handled) and to labour costs. The participants considered that no complete substitute was perceivable as things stood at present. As regards existing traffic, several railway administrations considered that only 10 per cent of all the traffic carried by rail is containerisable. It is not easy to see how this percentage will develop at medium and long term.

The existing scheme of things will be affected by two kinds of changes. First the tendency towards scattered location of new industries; secondly, the steady increase in long-distance traffic.

There is a genuine problem of marketing with regard to cross-frontier traffic. The railways are frequently unaware of the average of length of haul for international traffic and of the share of this latter traffic that hauls between private sidings account for.

Thus, the realities of transportation overstep national railway frameworks. More international co-operation and integration is needed in the fields under review. Every railway administration is over-inclined to look at the problem solely with an eye to the financial implications for its own network and this hampers co-operation in the field of international traffic. The "territorial" character of the railways is also a handicap for certain kinds of transport policy. This particularly applies to countries where transport operators competing with rail export their services whereas those of the railways stop at the frontier.

By way of conclusion, the Round Table judged that in a market economy there were appreciable chances of development for international traffic by rail. The railways should benefit from

this opportunity if they institute new forms of co-operation, especially those that have a bearing on their present financial interests. It lies with governments to encourage and facilitate these new forms of co-operation.

IV. IMPLICATIONS REGARDING INVESTMENT

In the event, everything depends on the modal split envisaged and the policy adopted. This brings us back to the postulates of transport policy and, more particularly, to the essential requirement of equal treatment for competitors.

It is also important to obtain better information for guidance on investment policy. In particular, cost/benefit analysis should be developed in order that allowance for the social element may be made in the market economy framework.

The market economy alone is not a sufficient criterion to justify investment decisions. Proper means of appraisal are required and this implies more elaborate criteria.

ANNEXE BIBLIOGRAPHIQUE

BIBLIOGRAPHICAL ANNEX

GENERALITES - GENERAL

1. BRITISH RAILWAYS BOARD - The Reshaping of British Railways.
London, H.M.S.O., 1963
2. CHAPULUT, Jean Noel, FREBAULT, Jean, PELLEGRIN, Jacques -
LE MARCHE DES TRANSPORTS. Paris, le Seuil, 1970.
144 p.
3. LE CHEMIN DE FER FEDERAL ALLEMAND ET LE PLAN LEBER -
(Die Bundesbahn und der Leber-Plan) par H.M. OEFTERING.
"Die Bundesbahn", n° 21, Nov. 1967. Traduction S.N.C.F.,
Paris, n° 136-67. 23 p. multigr.
4. LE CHEMIN DE FER, MODE DE TRANSPORT A RENDEMENT CROISSANT,
par le Groupe des Chemins de Fer des six pays des
Communautés Européennes. Paris, Société Nationale des
Chemins de Fer Français. 1967. 47 p. + 33 p.
5. LES CHEMINS DE FER BELGES ; SITUATION ACTUELLE ET PERSPEC-
TIVES D'AVENIR - Bruxelles, Société Nationale des
Chemins de Fer Belges, 1962/ 70 p.
6. COLLEGE D'EUROPE, BRUGES - Les Chemins de Fer et l'Europe.
Rédaction I.B.R. Kormoss. Recueil des cours du Centre
européen de perfectionnement du personnel des chemins
de fer. Bruges, De Tempel, 1969. 2v. carte, tabl.
(Cahiers de Bruges, N.S.18)
7. COMMUNAUTES EUROPEENNES. COMMISSION - Rapport sur l'Etude
prévue par l'article 3 de la décision du Conseil
65/270/CEE du 13 mai 1965, présenté par la Commission
au Conseil. Bruxelles, 1969. 408 p. + 178 cartes, tabl.
/C.E.E. SEC (69) 700 final/
8. CONFERENCE EUROPEENNE DES MINISTRES DES TRANSPORTS. -
Elaboration de modèles de prévision de la demande et du
besoin en matière de transports ; rapport de la 5ème
table ronde d'économie des transports. Paris, 1969.
68 p. multigr. /CEMT/RE/TR(69)11/ Ref. bibliogr.
9. CONFERENCE EUROPEENNE DES MINISTRES DES TRANSPORTS -
COMITE DES SUPPLEANTS - Rapport sur l'évolution de la no-
tion de service public dans les chemins de fer. Paris,
1958./CM(68)247 (15ème rapport annuel et résolutions du
Conseil des Ministres, C.E.M.T., Paris, 1968. p. 53-57)

10. CONFERENCE EUROPEENNE DES MINISTRES DES TRANSPORTS.
COMITE DES SUPPLEANTS - Rapport sur les investissements dans les transports intérieurs de 1953 à 1967. Paris, 1969. /CM(69)267/ (16ème rapport annuel et résolutions du Conseil des Ministres, C.E.M.T., Paris, 1969. p. 191-262)
11. DELACARTE, Louis - Le Chemin de fer d'après demain. Conférence prononcée à Liège le 11 janvier, 1968. Liège, Chambre de Commerce Française, 1968 19 p.
12. FRANCE. COMITE INTERMINISTERIEL DES ENTREPRISES PUBLIQUES.
Rapport sur les entreprises publiques, avril 1967. /Paris, La Documentation française, 1968/ 131 p. Travaux du Groupe de Travail du Comité Interministériel des Entreprises Publiques, présidé par S. NORA
13. GUIBERT, R - La réforme des Chemins de Fer français : ses principes, ses objectifs, les conditions de son succès, "Rail International". N° 7-8, juillet-août 1970, p. 463-472
14. FRANCE. MINISTERE DES TRANSPORTS - Où va la politique des transports ? La S.N.C.F. : éléments d'information. Paris, Edition du C.I.T.E. 1968. 140 p.
15. JOSSE, Paul- Effets des interventions spécifiques de l'état sur l'organisation et l'efficacité des entreprises de transports. Aspect théorique. /Paris/ Conférence Européenne des Ministres des Transports, 1969. 66 p. multigr. /CEMT/SYMP(69)5/ Rapport présenté au 3ème Symposium International sur la Théorie et la Pratique dans l'économie des Transports, Rome, 23-26 septembre 1969
16. LEBER, Georg - Das Verkehrspolitische Programm der Bundesregierung ; notwendige Massnahmen zur Ordnung und Gesundung des deutschen Verkehrswesen /Bonn 1968/. 47 p. "Sonderdruck aus dem Bulletin des Presse und Informationsamtes der Bundesregierung, nr. 20/1968".
17. M. RAYMOND MONDON A PRESENTE LE PLAN DE REFORME DE LA S.N.C.F. "L'Officiel des Transporteurs", n° 767, 31.7.1969, p. 1218-1221
18. NEDERLANDSE SPOORWEGEN - Spoor naar '75 ; plan voor de toekomst van N.S. in de Nederlandse samenleving in de jaren 1970-1975. Utrecht, 1969. 71 p.
19. NORDRHEIN WESTFALEN. MINISTERIUM FÜR WIRTSCHAFT MITTELSTAND UND VERKEHR - Vorschläge für Verfahren zur langfristigen Vorausschätzung des Güter und des Personenverkehrs für den Generalverkehrsplan Nordrhein-Westfalen. /Dusseldorf/ 1967. 138 + 90 p. multigr.
20. NORTHWESTERN UNIVERSITY. TRANSPORTATION CENTER - Technological change and the future of the railways ; selected papers from a three-day conference conducted by the Transportation Center ... Ed. Robert S. Nelson, Edward M. Johnson. Evanston Ill. /1961/ 239 p.

21. OKU, T., KATOS., NELSON R.A., SCHULDINER D.N. - Etudes et analyses de transport dans le cadre de l'économie nationale, y compris le problème de concurrence et de coordination entre les modes de transport. Rapport présenté au troisième Symposium International de Cybernetique Ferroviaire : TOKYO. 12-17 avril, 1970. Session D. "Rail International" N° 5, mai 1970 p. 332-339
22. RED NACIONAL DE LOS FERROCARRILES ESPAÑOLES. Plan decenal de modernización, 1964-1973. Madrid, 1964
23. RENZETTI, Giuseppe - Effets des interventions spécifiques de l'état sur l'organisation et l'efficacité des entreprises de transport. Aspect pratique. [Paris] Conférence Européenne des Ministres de Transports, 1969. 40 p. multigr. [CEMT/SYMP(69)47] Rapport présenté au 3ème Symposium International sur la Théorie et la Pratique dans l'économie des transports, Rome, 23-26 septembre, 1969
24. ROYAUME-UNI. MINISTRY OF TRANSPORT - Railway Policy. Presented to Parliament by the Minister of Transport by Command of Her Majesty, London, H.M.S.O. 1967. 69 p. tabl. (Cmd. 3439).
25. ROYAUME-UNI. MINISTRY OF TRANSPORT - The transport needs of Great Britain in the next twenty years; report of a group under the chairmanship of Sir Robert Hall. London, H.M.S.O., 1963. 27 p.
26. SANTORO, F. - Sullo sviluppo della domanda di trasporto "Ingegneria Ferroviaria", n° 10, Octobre 1969. p. 795-799
27. VAN ZUYLEN, H.J. - Organisation et aménagement pratique des transports régionaux aux Pays-Bas. "Revue U.I.T.P.", n° 3, 1967, p. 229-234
28. VORSCHLAGE ZUR RATIONALISIERUNG DER OSTERREICHISCHEN BUNDESBAHNEN. Erstattet von einer Kommission von Zehn Hochschulprofessoren. Wien [Bundesministerium für Verkehr] 1967. multigr. Président de la Commission : Prof. Leopold L. ILLETSCSKO
29. YUGOSLAVIE : MODERNISATION ACCELEREE DES CHEMINS DE FER. "Journal pour le Transport International", n° 18, 2.5.1969 p. 2016

TRANSPORT DE VOYAGEURS - PASSENGER TRANSPORTATION

30. J. ARTAUD-MACARI. Les services de transport de voyageurs à courte distance. "Equipement-Logement-Transports". n° 39, mai 1969. p. 32-36

31. CONFERENCE EUROPEENNE DES MINISTRES DES TRANSPORTS. Impact des possibilités de transports terrestres à grande vitesse sur la demande de transport : aspects méthodologiques et conséquences au niveau des programmes d'investissement. Rapport de la 8ème Table Ronde d'Economie des Transports /Paris/ 1970. 108 p. Rapporteur A. DE WAELE. Bibliographie p. 79-96. portant essentiellement sur l'économie des grandes vitesses ferroviaires.
32. CONFERENCE EUROPEENNE DES MINISTRES DES TRANSPORTS. COMITE DES SUPPLEANTS - Rapport sur les prévisions de la demande des transports de voyageurs jusqu'en 1975. Paris, 1967. /CM(67)5/ Résolution du Conseil des Ministres, vol. 17, 1967. p. 145-212.
33. ETATS-UNIS. INTERSTATE COMMERCE COMMISSION - Investigation of the Costs of Inter City Rail Passenger Service. Washington D.C. 1969. pg. mult. Report transmitted to the Senate Committee on Commerce.
34. EVANS, Andrew W. - Intercity travel and the London Midland electrification. "Journal of Transport Economics and Policy", Vol. III. N° 1. January, 1969 p. 69.
35. FONTGALLAND, Bernard, de - Chemin de Fer et Dessertes Intervilles. "Transports" N° 139. février 1969. p. 37-44
36. FRANCE. COMMISSION DES TRANSPORTS POUR LE 6EME PLAN - Etude de transports terrestres à grande vitesse sur l'axe Paris-Sud-Est. Paris, 1970. "Etude menée par le Groupe fonctionnel 'Voyageurs'" Président : Roger Coquand.
37. FRANCE. MINISTERE DES TRANSPORTS. - Perspectives d'avenir des transports routiers de voyageurs en zone rurale ; rapport à Monsieur le Ministre des Transports. /Paris, 1968/. 18 p. + 8 p. multigr. Rapport de la Commission présidée par R. COQUAND
38. HOLLANDER, Stanley C. - Passenger Transportation ; Readings selected from a marketing viewpoint. East Lansing, Mich., Michigan State University, Graduate Scholl of Business Administration, 1968. 685 p.
39. HYMAN, G.M., WILSON, A.G., - The effects of changes in travel costs on trip distribution and modal split, London, Centre for Environmental Studies, 1968. 14 p. (Working papers, 21)
40. IFO-INSTITUT FUR WIRTSCHAFTSFORSCHUNG, MUNICH - Die voraussichtliche Entwicklung der Nachfrage nach Personenverkehrsleistungen in der Bundesrepublik Deutschland bis zum Jahre 1980. Berlin. Duncker und Humblot, /1967/. 136 p. (Schriftenreihe des Ifo-Instituts für Wirtschaftsforschung, nr. 66).
41. DAS LEITPROGRAMM DER D.B. FUR HOHERE GESCHWINDIGKEITEN AUF HAUNBAHNEN - DER WIRTSCHAFTS LICHTSTE WEG ZU KURZEREN FAHRZEITEN. "Die Bundesbahn", n° 12, juin, 1969. p. 559-568. carte, diagr. tabl.

42. MATHEMATICA, PRINCETON N.J. - Studies in travel demand. Vol. V. Prepared for Northeast Corridor Transportation Project. U.S. Dept. of Transportation. Washington D.C. Princeton N.J. 1969. 285 p.
43. MERCADAL, M. - Rapport préparé pour la 3ème Table Ronde d'Economie des Transports de la C.E.M.T. Choix du moyen de transport ; motivation psychologique, approche économétrique. Puteaux, Centre d'Etudes et de Recherche sur l'Aménagement Urbain, 1968. 83 p.
44. METROLINERS : THE PAYING CUSTOMERS LOVE THEM. "Railway Age", June 2nd, 1969. p. 18-19
45. NATIONAL RESEARCH COUNCIL, WASHINGTON. HIGHWAY RESEARCH BOARD - Social and economic factors affecting intercity travel /by/ Vogt, Ivers and Ass. Cincinnati, Ohio. /Washington, D.C./ 1969 68 p. (National Cooperative Highway Research Program. Report n° 70)
46. NEUMANN, Noel. Métrazur ; la desserte cadencée des vacances. "La Vie du Rail", n° 1256 ; 6 sept. 1970 p. 9-14.
47. PONSONBY G.J. - London Transport Policy : Coordination through competition. London, Institute of Economic Affairs, 1969, 66 p. (Hobart Paper 49).
48. RESEARCH PROJECTS Ltd., LONDON - Modal Choice : Studies of the use and non use of public transport in the Greater London area. Commissioned by Dept. of Highways and Transportation, Greater London Council, Ministry of Transport, London Transport Board. /London/ 1969. 2 v.
49. SOCIETE D'ETUDES ET DE RECHERCHES EN SCIENCES SOCIALES, PARIS. La desserte cadencée métropolitaine ; étude psychosociologique préalable à la mise en service de métrolor. /Paris/ SERES, 1969. 91 p. Enquête effectuée pour l'O.R.E.A.M. Lorraine.
50. TESSIER M. - Les liaisons intervilles à très grande vitesse sur infrastructures ferroviaires nouvelles et le projet Paris-Lyon. "Revue Générale des Chemins de Fer", numéro spécial, janvier 1970, p. 3-10. cartes.
51. TESSIER M. - Les recherches sur les liaisons intervilles à très grande vitesse aux Etats-Unis - "Revue Générale des Chemins de Fer", novembre 1969. p. 649-654.
52. LE TRANSPORT FERROVIAIRE DE PASSAGERS EN EUROPE : VERS UN NOUVEL EQUILIBRE ? "Bulletin de l'Institut du Transport Aérien". Paris. N° 10, 9.3.1970. p. 243/245.
53. WALRAYE M. - L'analyse de la demande. "Revue Générale des Chemins de Fer", numéro spécial, janvier 1970. p. 84-98.

TRANSPORT DE MARCHANDISES - FREIGHT TRANSPORTATION

54. BAYLISS, B.T., EDWARDS, S.L. - Industrial demand for Transport. Prepared for the Ministry of Transport. London, H.M.S.O., 1970. 162 p.
55. CLASEN, Bernhard. Rationalisierungsvorteile und Wettbewerbsbeschränkungen durch Kooperationsformen im Verkehr. Göttingen, Vandenhoeck u. Ruprecht, 1970. 224 p. (Beiträge aus dem Institut für Verkehrswissenschaft an der Universität Münster, Heft 61). Bibliogr. p. 215-224.
56. COMMUNAUTE ECONOMIQUE EUROPEENNE. COMMISSION DES TRANSPORTS- Rapport fait au nom de la Commission des Transports adopté par le Conseil le 22 juin 1965 et sur les propositions faites par la Commission de la C.E.E. le 27 octobre 1965 relatives à l'introduction d'un système de tarif à fourchettes. Rapporteur M. de Gryse. (Strasbourg, Parlement Européen/ 1966. 121 p. multigr. (Parlement Européen. Documents de séance, 1965-1966. Doc. 115).
57. C.E.M.T. COMITE DES SUPPLEANTS - Rapport sur la prévision de la demande des transports de marchandises jusqu'en 1975. Paris, 1968. (CM(68)10/ (15ème Rapport annuel et résolutions du Conseil des Ministres, C.E.M.T., Paris, 1968. p. 87-124).
58. C.E.M.T. COMITE DES SUPPLEANTS - Rapport sur les incidences de la conteneurisation sur les chemins de fer. Paris, 1969 (CM(69)9/ (16ème rapport annuel et résolutions du Conseil des Ministres, C.E.M.T., Paris, 1969. p. 125-143).
59. L'ETUDE DE MCKINSEY POUR INTERCONTAINER. "Journal pour le Transport International", n° 31. 29.5.1970 p. 2547.
60. FENELLI N. - L'accesso al mercato dei trasporti delle Comunità Europee. "Ingegneria Ferroviaria" n° 9. Sept. 1969. p. 717-720.
61. GRENZEN DES WETTBEWERBS IM VERKEHR. "Zeitschrift für Verkehrswissenschaft". n° 2. 1968. p. 65-78.
62. HUILIER, Daniel l' - Le coût de transport : l'analyse économique et l'entreprise face aux mouvements de marchandises. Préface de Gérard MARCY. Paris, Editions Cujas /1965/. 469 p. (Connaissances économiques) Bibliographie : p. 447-453.
63. JOY, Stewart - Pricing and costing on railways, a new approach. Paper delivered at the University of Wisconsin, 16 October, 1970. (London, 1970 2/ 24 p. multigr.
64. KORSAETH, Jan-Erik - Air freight ; an analysis of the present situation and future evolution with its consequences for road and railway transport. Paris, Conférence Européenne des Ministres des Transports, 1970, 52 p. (C.E.M.T. DOC/CS(70)14).

65. McCALLUM, George E. - New Techniques in Railroad Rate-making. Pullman, Wash., College of Economics and Business, Bureau of Economics and Business Research, Washington State Univ., 1968. 146 p. (Study n° 4) Bibliogr. p. 141-148.
66. McKINSEY - La containerisation, clé du transport à bas prix ; rapport établi par la compagnie McKinsey pour le compte de l'administration des Docks britanniques. Traduction condensée du document par la Société Nationale des Chemins de Fer Français, service de Documentation. [Paris] 1967. 23 p. + ann.
67. MARCHÉ DES TRANSPORTS ROUTIERS ET RELATIONS RAIL-ROUTE. "Transports", n° 115 Oct.-Nov. 1966 (N° spécial). Présentation par Prf. WICKHAM. Articles de SEIDENFUS, H., GUIBERT, R., CHIGONIS, H., FATTON, M., FORGET, J., COTTINET, P., DOUSSET, J.
68. MORTON, Alexander, L. - A statistical sketch of intercity freight demand. Washington D.C. Highway Research Board, 1969. p. 47-65. (H.R.B. n° 296).
69. MOTOR TRUCKS IN URBAN AREAS. Automobile Manufacturers Association, Detroit 1969.
70. MULLER, J.C. - A propos de l'offre de Transport ; considérations sur la concurrence et la structure de l'offre dans les transports. [Paris, 1969 ?] 112 p.
71. RAILWAY DEVELOPMENTS IN SWEDEN; QUALITY OF SERVICE AND TECHNOLOGICAL IMPROVEMENTS. "International Railway Journal" Vol. IX. N° 11. p. 31-34.
72. RAILWAY SYSTEMS AND MANagements ASSOCIATION, CHICAGO III - The measure of railroad freight service. Chicago, III. [1968] 97 p.
73. RAPPORT DE LA COMMISSION COQUAND SUR LA REORGANISATION DES TRANSPORTS DE DETAIL. "La Vie des Transports", n° 1194. 21.2.1970. p. 8. Texte intégral dans L'officiel des Transporteurs, n° 752, 15 dec. 1968. p. 1859-1875.
74. ROYAUME-UNI. MINISTRY OF TRANSPORT. The transport of freight Presented to Parliament by the Minister of Transport by command of Her Majesty. London, HMSO. 1967. 27p. (Cmd. 3470)
75. SANTORO, F. - Ancora sul regolamento comunitario per la concorrenza nel mercato trasporti. "Ingegneria ferroviaria" n° 1. Jan. 1969. p. 35-39.
76. SEIDENFUS, H. - La réglementation des transports routiers professionnels de marchandises et son importance pour la concurrence entre la route et la voie ferrée (une comparaison des expériences néerlandaises et allemandes) "Transports", octobre-novembre 1966. p. 331-333.

77. SOCIETE D'ETUDES TECHNIQUES ET ECONOMIQUES, COURBEVOIE.
Etude pilote sur l'axe Paris-Le Havre transports de
marchandises. Etude effectuée à la demande du Service
des Affaires Economiques et Internationales. Courbevoie,
1968. 3v.
78. TOWNSEND, Henry - Studies on the demand for freighth
transportation. Vol. III "Two Models of Freight Modal
Choice". Prepared for the Northeast Corridor Transpor-
tation Project, U.S. Dept. of Transportation, Washington
D.C. Princeton N.J. Mathematica 1969. 104 p.
79. UNION INTERNATIONALE DES CHEMINS DE FER - Rapport sur
l'Introduction de l'Attelage Automatique dans les
Chemins de Fer européens, préparé à l'intention de la
Conférence Européenne des Ministres des Transports.
/Paris/ 1968. 36 p. multigr.
80. UNIVERSITAT MÜNSTER. INSTITUT FÜR VERKEHRSWISSENSCHAFT -
Die Einordnung des Werkverkehrs in die Verkehrswirtschaft.
Göttingen, Vandenhoeck und Ruprecht, 1970. Meyer,
Gerhard, /et al/. 214 p. (Beiträge aus dem Institut
für Verkehrswissenschaft an der Universität Münster,
Heft 60).
81. UNIVERSITAT MÜNSTER. INSTITUT FÜR VERKEHRSWISSENSCHAFT -
Marktmacht und marktbeherrschende Verhaltensweisen
im Verkehr. Göttingen Vandenhoeck & Ruprecht, 1966.
115 p. (Beiträge aus dem Institut für Verkehrswissen-
schaft an der Universität Münster, Heft 42).
82. WILLEKE, Rainer, ABERLE, Gerd - Der Werkfernverkehr auf
der Strasse im System einer gesteuerten Wettbewerbsord-
nung in der Verkehrswirtschaft. Düsseldorf, Handelsblatt,
1968. 61 p. (Forschungsberichte des Instituts für
Verkehrswissenschaft an der Universität zu Köln, H. 12).

ANNUAIRES - YEARBOOKS

83. BRITISH RAILWAYS BOARD - Annual report and accounts ...
London, HMSO.
84. CHEMINS DE FER FEDERAUX SUISSES - Rapport de Gestion ...
/Berne/.
85. DANSKE STATSBANER - Arsberething .. Annual report ..
1. April .. til 31 Marts /Kobdenhaven/ Trykt i
Aarhus Stiftsbogtrykkerie.
86. DEUTSCHE BUNDESBAHN - Geschäftsbericht der Deutschen
Bundesbahn. Geschäftsjahr ... /Frankfurt am Main/.
87. FERROVIE DELLO STATO - Relazione per l'anno ... Roma,
Direzione Generale Ferrovie dello Stato.
88. FERROVIE DELLO STATO - F.S. ... /Roma/
89. NEDERLANDSE SPOORWEGEN - Jaarverslag ... /Den HAAG/

90. NORGES STATSBAKER - Driftsberetning ... [Oslo]
91. NORGES STATSBAKER - N.S.B. ... [Oslo]
92. OSTERREICHISCHE BUNDESBahn. Geschäftsbericht der Osterreichischen Bundesbahnen für das Jahr ... [Wien]
93. RED NACIONAL DE LOS FERROCARILES ESPANOLAS - Memoria correspondiente al ejercicio de ... [Madrid]
94. ROYAUME-UNI - MINISTRY OF TRANSPORT. Passenger transport in Great Britain ... London, HMSO ...
95. SOCIETE NATIONALE DES CHEMINS DE FER BELGES - Rapport présenté par le Conseil d'Administration ; rapport du Conseil des Commissaires ... [Bruxelles]
96. SOCIETE NATIONALE DES CHEMINS DE FER FRANCAIS - Assemblée Générale des Actionnaires ... Rapports, exercice 19...
97. SOCIETE NATIONALE DES CHEMINS DE FER FRANCAIS - La S.N.C.F. en 19.. [Paris]. Fait suite à Activité et productivité de la S.N.C.F. en ...
98. STATENS JARNVAGAR - Facts about S.J. [Stockholm] Swedish State Railways.
99. STATENS JARNVAGAR - Sveriges Järnvägar ... Stockholm.
100. UNION INTERNATIONALE DES CHEMINS DE FER - Statistique internationale des chemins de fer, année Edition français, Paris, 19..

