

ECONOMIC RESEARCH CENTRE

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**ROUND
TABLE
35**

ORGANISATION OF
REGIONAL PASSENGER
TRANSPORT

EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT

PARIS 1977

ECONOMIC RESEARCH CENTRE

**REPORT OF
THE THIRTY-FIFTH ROUND TABLE
ON TRANSPORT ECONOMICS**

Held in Paris on 28th and 29th October 1976
on the following topic :

**ORGANISATION OF
REGIONAL PASSENGER
TRANSPORT**

EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT

The European Conference of Ministers of Transport (ECMT) was instituted by a Protocol signed at Brussels on 17th October, 1953. It comprises the Ministers of Transport of the following 19 countries : Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and Yugoslavia (associated countries: Australia, Canada, Japan ; observer : United States).

The purposes of the ECMT are:

- to take whatever measures may be necessary to achieve, at general or regional level, the maximum use and most rational development of European inland transport of international importance ;*
- to co-ordinate and promote the activities of International Organisations concerned with European inland transport (rail, road, navigable ways), taking into account the work of supranational authorities in this field.*

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ORGANISATION OF REGIONAL

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1. INTRODUCTION, DEFINITIONS

This paper is intended as a basis for discussion among transport economists taking part in a Round Table organised by the European Conference of Ministers of Transport. For the discussion to be fruitful, one should start by circumscribing the topic. With this end in view, some definitions are now presented.

"Regional transport" means transport within some particular region. The region may be large or small, but it must always constitute a socio-geographical entity. By convention, wholly urban regions will be deliberately disregarded, since their transport problems have already been dealt with on other occasions and consideration will be confined to rural or mixed rural/urban regions.

Trips wholly within a single region automatically fall into the "regional" category. Trips between two towns in different regions, however, do not. There is some uncertainty in the case of the inter-regional trip with a terminal leg in one region. The latter cannot be ignored when dealing with regional transport.

Passenger transport organisation is usually approached from public transport standpoint, on the assumption that no special organisation is needed for individual transport. "Public transport" is used in a very wide sense, covering all types of transport in which a number of people, not confined to one particular family or group, make the same journey together (origin to destination). This concept includes school and work buses and other special services, shared taxis, and demand-actuated bus services. A distinction can be made between general public transport, which is accessible to the public as a whole, and special-purpose public transport reserved to particular groups of people. The first category includes regular bus services, shared taxis and dial-a-bus services; the second includes special services for schoolchildren and work people.

The organisation of transport can be considered from the standpoint of the operator, and from that of the user. In the place of users, who can neither be consulted nor exert influence as a homogeneous group, we shall for convenience, put the authorities, or other body taking decisions on what transport facilities are to be provided and how they are to be operated.

The need for government intervention in regional transport is not confined to situations where the public transport system as a whole is making a loss, which is true of many countries today. Even if an overall profit is being made, it may be that only some part of

the regional services is in the black. In that case a choice has to be made between running only the busy lines or else having government support to maintain reasonable coverage for the region as a whole.

The present paper is not restricted to particular modes of transport. Regional transport facilities do, generally, take the form of bus, branch railway or tram services; but the main railways, inland waterways, and road transport in other forms than buses, are also involved to some extent.

A Round Table provides time for only a short discussion. To help prepare for this, the present paper advances a number of theses. It should be emphasized that these are suggested only as possible topics to facilitate the discussion, not to restrict it to a few preselected points.

2. REGIONAL TRANSPORT NEEDS

Regional transport needs are usually scattered rather thinly over the whole of a region and so transport flows are usually light. It would probably be fair to say that regional transport needs are of a kind that can best be met by individual forms of transport (walking, bicycle or car).

But cars will never be available to every single member of the population, and those who normally have access to a car may sometimes be unable to use it, or may not wish to. If the distances are too long for walking or cycling, a need will be felt for public transport.

The kind of region we are dealing with here is generally structured around one or more centres performing functions such as shopping, education, hospitals etc, but not, usually, with any great concentration of employment. As a result transport demand varies through the day with peaks when children are going to or coming from school. The pattern is different in urban areas where schools, even at secondary level, are usually nearer home but where there is greater geographical concentration of work.

Whereas public transport is necessary in urban regions mainly because the dense traffic in central areas cannot be catered for by cars alone, the problem in rural areas is more likely to come from the needs of people who do not generally have the use of a car.

Thesis 1: Thorough knowledge of regional public transport needs is essential for efficient transport organisation

However obvious this may seem, systematic research on transport is still very rare.

The result of this may be services poorly tailored to passenger needs - which cannot be expected to promote the use of public transport or to improve its financial performance.

Decisions about the provision of a public transport network are important enough for in-depth research. Annual operating costs of the network are high and, on some routes, cannot be covered by proceeds. A further consideration is that the availability or otherwise of a particular service may have far-reaching effects on geographical relationships: making some schools impossible to reach for example. On financial grounds, it may easily be said that there is no justification for public transport facilities to serve certain places, but such conclusions should not be reached without full knowledge of the facts.

The first socio-geographical study of regional transport in the Netherlands was carried out in 1940 under the direction of Dr. H.J. van Zuylen, then teaching geography in a Rotterdam secondary school, and now Director of the Rotterdamse Tramweg Maatschappij (RTM), a regional transport undertaking in South West Rotterdam.

Very detailed surveys were made of population characteristics and also of travel purposes and habits; pupils at the school and students at the College of Economics took part in the field work(1). From 1942 onwards, timetables were gradually brought into line with the findings of this research.

Work on the survey was affected by wartime conditions and the availability of unpaid personnel. With today's techniques, however, usable findings could be achieved with a smaller team.

A socio-geographical study of transport needs is always a better guide than a request from a regional or local authority; facilities provided in response to such requests are not always used very heavily because the people asking for the service too often go on using their cars.

3. THE ORGANISATION OF UNDERTAKINGS

Perhaps the main disadvantage of public transport is that it is somewhat inflexible: services have to be arranged in advance and cannot be adapted instantly to every form of demand that may arise. This is a particularly serious disadvantage in regional transport with its thinly spread networks and low frequencies.

To mitigate this, so far as possible, it is important that the undertaking which operates the service should be closely acquainted with transport needs in its region, and with any deviations from the normal pattern. Services should be arranged to suit occasional

1) See: H.J. van Zuylen, Streekvervoer en zijn verzorgende functie, The Hague, 1946.

changes in school timetables, public holidays, market days, sporting events etc.

These "operating units" should be able to provide extra or special facilities, so as to avoid situations in which the normal services become overloaded or, worse, no transport is provided at the end of some event. Here the operator needs to develop an active attitude and to find out about coming events, instead of waiting until he is informed or asked to provide facilities.

The same applies when the ordinary timetable is being prepared. The undertaking should make contact with every organisation whose activities could generate a transport demand and with representatives of the population as a whole, not only to identify every transport requirement but also to make people understand that it is "their" local train or bus not that of some remote, mysterious officialdom incapable of responding to their needs.

This would seem to argue for the small and medium sized undertaking as against the larger or national concern but it would be wrong to conclude that large undertakings are ruled out because of the need to be in close touch with the region.

One approach might be to divide up operations into separate districts, each with a considerable degree of independence including budgetary responsibility.

Although the geographical scale for these districts should not be too large, the same does not apply to technical and ancillary aspects such as the purchase and maintenance of vehicles, administration, fixed plant and R & D. These afford scope for economies of scale, and the larger undertaking is in a stronger position when dealing with suppliers.

Similar advantages can of course be obtained, to some extent, by independent operators forming groups or else pooling their resources.

Clearly, the undertaking cannot be large and small at the same time. A choice must be made. Broadly, there are three possibilities:

- large undertakings allowing considerable regional independence;
- separate undertakings for each homogeneous region, with co-operation on a larger scale for certain general functions;
- one operating enterprise for each region, with a centralised undertaking for buying and maintaining vehicles, administration, etc.

My own preference, at present, would be for the latter solution, though I would not wish to rule out the others.

Thesis 2: Regional transport should preferably be run on the basis of a separate undertaking for each homogeneous region; alternatively, the operational districts of large undertakings should be given a considerable measure of independence.

Considering the advantages of any particular pattern of organisation, the effort required to alter an existing structure should not be overlooked. No decisions can therefore be taken that fail to take each country's existing structure into account.

We now come to the question of the ownership for such undertakings. The pattern here varies considerably from country to country: national undertakings owned by the State or the national railways, undertakings owned by the regional or local authorities, and private-sector undertakings ranging from joint-stock companies quoted on the stock exchange to small family firms. Combinations are also found.

The considerations leading one country or another to favour public or private ownership of the means of production naturally lie outside the bounds of this introduction. We shall endeavour to identify some of the considerations strictly in terms of transport economics.

It follows from what has been said above about the structure of the undertakings that they need to be of a minimum size: at least large enough to service a homogeneous region. Only in a very small region (small island, mountain valley) can the owner-operator business meet this requirement. Furthermore, the family structure of a firm of this kind does not offer sufficient stability in quality of management. This is liable to vary considerably from one generation to another, and to affect both costs and quality of service.

The undertakings should be large enough to be able to employ managers of the right calibre, whilst avoiding the cumbersome procedures of the very big organisation. Research, especially operational research, would be needed among existing undertakings of various sizes, in order to establish the optimum size range.

An undertaking can, in theory, be either privately or publicly owned. In the latter case, ownership may be at regional, local or central level. Private enterprise is sometimes advocated as being more efficient, whilst public-ownership is claimed to ensure that greater account is taken of the general interest.

Unfortunately the matter is not so simple: if it is decided to fund a private firm's operating deficit the entrepreneur will soon tend to concentrate more on quality of service than on efficient operation.

Although the public sector undertaking should in theory be operating with a view to serving the general interest, one tends to

find in practice that general interest is generally confined to that of the undertaking. Public enterprises can in certain circumstances constitute an even stronger "interest group" than private groups. It is preferable to have a clear-cut division of responsibilities: the authorities should be responsible for ensuring that regional transport is properly organised, in the light of demand from other "general interest" sectors, and for providing undertakings with the necessary financial resources. The responsibility of the undertaking should be to operate the service, within the general constraints laid down, as efficiently as possible. Whether the capital is provided by private individuals or by the authorities matters little; more important is that the management should be capable, and that there should be some financial mechanism preventing all the financial "ups and downs" from being automatically passed onto the authorities.

Regulation 1191/69/CEE of the Council of European Communities on Public Service Obligations contains a compensation procedure which could very well be one answer: the amount is determined in advance and can only be revised on the basis of certain factors which must also be specified in advance. It should be noted that this regulation is not yet compulsory for transport undertakings providing essentially regional services.

Although no straight preference for private as opposed to public ownership may emerge on economic ground, we should still consider whether there is anything to choose between the various levels of public authority in which ownership can be directly or indirectly vested.

If regional undertakings are chosen, it would appear reasonable, on the face of it, to have them owned by the regional (or local) authorities. But if that is ruled out, because of the structure of the country, the financial position of the regional authorities or historical background, indirect state ownership is also a possibility. In this case, a "National company for regional transport" centralising the ancillary functions mentioned above, and acting at the same time as a holding company for the regional undertakings, will be more satisfactory than having the national railways own the regional transport undertakings. The main function of the railway is to manage a national and even international transport network; running regional transport is liable to become a secondary activity(1) serving the interests of the main activity.

Even if there is a "national company", a structure of regional subsidiary undertakings may be regarded as preferable to a single

1) Witness the very term "secondary" lines.

large enterprise. In the latter, organisation would be too unwieldy for the operating units to have the necessary flexibility.

4. THE ROLE OF THE AUTHORITIES

As already pointed out, regional public transport needs are such that, even if public transport as a whole is a financially sound operation, many villages would not be served unless the authorities intervened.

In most countries, national or regional authorities have taken pains to encourage the provision of transport services. In the case of regional transport they began by supplying capital for the construction of tramways and secondary railways; next, regional bus networks were organised with the object of providing the whole of a region with a satisfactory service on a basis of cross-subsidisation; by and large, the stage now reached is that of the authorities meeting any deficits.

Although such activities are widespread, there is apparently no trend towards harmonization of the standard of service, which varies considerably from country to country. In the present state of our knowledge, the fact is that there is no objective procedure for determining what the standard of service should be, and especially, for deciding whether a service needs to be introduced or not. My own view is expressed in the thesis below, based more on land-use planning policy than on transport policy.

Thesis 3: The authorities should ensure that every centre of population or activity which fits in with their land-planning policy should be linked to the public transport network.

This thesis is not without ambiguity, as it is hard to provide a rigorous definition of "a centre of population". Two houses would certainly not be enough; but what about 30? (A similar difficulty arises over centres of activity.) Agreed definitions will have to be adopted, and so far as possible they should be standard throughout a given country.

The decision to introduce or maintain a service should also lay down a minimum standard for quality of service; this minimum should be determined carefully as a function of the demand for transport.

Above this minimum standard, the usual resources of transport policy, in particular cost-benefit analysis, should be used to determine quality of service and mode of transport (train, tram, bus, minibus, shared taxi).

In financing regional public transport, two methods can in principle be adhered to: one based on dissociating the different services and providing specific compensation for the operating

deficit on each. The other is based on "cross subsidisation" among the services provided by the undertaking with compensation for the overall deficit only.

Although the second method is simpler, and less expensive for the authorities if some services are profitable, it has several disadvantages. First, the financial cost of maintaining a given service cannot be directly compared with the usefulness of the service or with alternative ways of providing it. Secondly, services covering their costs will be required to produce a surplus to offset (perhaps only in part) losses made by other services. Price formation in the profitable services is therefore adversely affected and the quality of service suffers.

Prices having risen above the level of costs, a number of passengers will resort to other modes of transport which are more expensive for the community but less expensive to the user. This leads to an economic loss for the community.(1)

Since decisions on whether to introduce or maintain a service, and on schedules and fares, are usually made case by case, it may be agreed that:

Thesis 4: Every decision to introduce an unprofitable service and on how it is to be operated should be accompanied by an estimate of its financial implications and of how it is to be financed.

It can be inferred from this thesis that the authority deciding on the provision and quality of a service should also shoulder the responsibility for it.

It is very difficult to give any general rules determining whether the regional or central authorities should be responsible for regional transport. The choice will depend on the degree of structural centralisation in the individual country. But regional services should not be allowed to extend over the territories of two authorities, as this would lead to overlapping responsibility. It is also important that decisions on transport in general should to some extent run parallel with decisions on land-use planning

5. REGULAR SPECIAL-PURPOSE SERVICES

Alongside general public transport services, there are regular services for particular groups of users: workmen, school-children, hospital visitors, theatre goers, etc. These services are organised when a requirement of the same pattern regularly occurs, and cannot be adequately met by the general services.

1) See A.M. Milne, *The Economics of Inland Transport*, London 1955, p. 151.

At first sight there appears to be no reason why individuals with the same regular transport requirement should not arrange for buses on routes and at times to suite themselves. But since regional transport requirements are low, especially in thinly populated regions, such services will have the result of still further reducing the flow of public transport.

Organisation of special services independently of the general services may introduce overlapping, but may also cause the general services to close down because what is left of demand no longer justifies maintaining them.

It is important, therefore, to start by assessing the total transport needs of the region, and then to see how a transport network can best be organised to satisfy them all. If modifications to scheduled general services (time and possibly routes) enable special needs to be met there will be no need to introduce special services.

"Prevention is better than cure". In decisions on the location of activities which generate a demand for transport, it is important to bear the configuration of the public network in mind, in order to avoid siting schools, hospitals, old people's homes, etc., away from reasonable routes for regional or local public transport.

Even when a special service really is necessary, the regional network operator should be given a prior right to provide it, so as to make better use of his vehicles and labour. This is especially important for services needed outside public-service peak periods. On the other hand, giving first refusal to the network operator even when his costs are higher, would be clearly taking the principle too far.

Thesis 5: Special purpose services should only be considered if regular services cannot be adjusted to cover the requirement. Even then preference should be given to the public service operator.

6. THE FUNCTION OF NATIONAL RAILWAYS

Buses are the most usual mode of regional transport. In some regions the services most used are those served by trams or secondary railways sometimes narrow-gauge. Generally, the same undertaking operates this kind of bus and rail service.

Regional services operated by the national railway on the other hand, are independent of regional undertakings. Although there is some co-ordination, national railway inter-city and regional services are generally regarded as the primary mode and buses (and secondary railways where applicable) as a literally secondary mode which has to adjust accordingly. This situation is particularly noticeable in countries where the railway undertaking provides bus services to

supplement or replace its rail services alongside the bus services of the regional undertaking.

It is true, of course, that regional transport needs are largely limited to the region itself and that regional transport operators rightly lend a readier ear to the effective demand for their services than to the wishes of the central railway administration or even the central government itself.

The national railways, on the other hand operate regional services more as feeder lines for the inter-city network than as main lines in a regional network. Furthermore, the two operators may sometimes regard one another as competitors.

It is important to analyse transport services in terms of function rather than mode, but there is no absolute necessity to transfer slow train services to bus operators. Infrastructure maintenance and the provision of rolling stock and crews can usually be more efficiently handled by the railway undertakings. Time-tables and fares should be arranged for the regional services as a whole. In the case of slow trains using main lines, account must of course be taken of the constraints imposed by the long-distance traffic, and also of the essential need to provide good connections with expresses. But this latter requirement applies to buses as well as trains.

The ideal solution to the problem of connections between national and regional networks would be to have slow trains and buses arriving a few minutes before inter-city trains, and leaving a few minutes afterwards. This would allow rapid changing between national and regional networks, and within the regional network, as well as quick turnaround for crews and rolling stock.

In this way, the railways can take their proper place in regional transport without prejudice to the idea of a genuine regional network. Duplication can be avoided both in the use made of vehicles and in ancilliary services: traffic control, ticket sales, waiting rooms, etc can be used both for trains and for buses.

By viewing regional services as a whole, transport quality can be better balanced without giving priority to any one mode. In some countries, the temptation is to maintain a poor-quality but expensive rail service instead of introducing a better and less expensive road service and this policy, not a very rational one at first sight, would at least be brought more clearly into the daylight.

But perhaps the most important result of integrating the modes in this way would be to make the railway service fit the needs of the region better.

Thesis 6: The regional services operated by a national railway should be integrated with, and operated as part of, the regional public transport network.

This should be put into effect through contracts between the railway company and the regional transport operator under which the former would perform certain services for the latter. Relations with passengers would be handled by the regional undertaking.

7. "INTERMEDIATE" MODES OF TRANSPORT

We have already drawn attention several times to the fact that the scale of the transport requirement is sometimes very small. It may be so small as to rule out any regular bus service and to make it less expensive to provide transport by taxi than to run buses with very low or even zero rates of occupation. But using taxis for every individual or group would be too expensive. Some form of transport in between the bus and the taxi is therefore needed and some, though not all, of the possibilities are now considered.

Demand-actuated bus services

The capacity(1) of the usual bus is between 40 and 45 seats, maximum dimensions being laid down in traffic legislation. In low-traffic areas particularly, this capacity is only needed for some peak services.

Peak requirements permitting, lower-capacity buses and even eight-seater minibuses (officially classified as cars) can be used. This policy reduces the cost of the vehicle but not usually the driver's wage. Seat-kilometre costs will therefore be much higher but so will rates of occupancy.

This policy is only worthwhile when large-capacity vehicles are not needed for peak demand; replacing large buses outside peak periods only could mean doubling the number of vehicles in use.

Since reducing vehicle capacity can be only part of the answer, another step in the same direction would be to reduce the frequency. A straight reduction in frequency would make the service less attractive and would reduce demand still further, to such a low level that the service would have to be withdrawn. This has led to the introduction of demand-actuated services which operate only when there are passengers to use them.

In this system, buses go out only when there are passengers, sometimes taking predetermined routes although in more sophisticated versions of the system, the route is modified to suite the places passengers come from or want to go to.

1) Double-deckers and articulated buses carry more of course.

To organise these services, users' precise needs must be ascertained in advance. The user must therefore inform a control centre that he wishes to travel; he is then advised of the approximate time when a bus can be expected at the desired pick-up point. This is difficult when passengers into town or a regional centre have to be collected from scattered points. Optimum routes can be worked out only if all the requests within a particular time interval are known. This means first recording all requests at the outset and then calling would-be passengers back, which is not a very satisfactory procedure. Computer systems are being used to tell immediately, in the light of all applications already recorded, the best way of meeting an individual request.

For travelling the other way, the problem is less complicated. Departure times can even be fixed in advance, possibly on a regular basis, the route being decided when the bus actually sets off.

It would not be very satisfactory to replace just one route with a demand-actuated service because then the operator would in practice be obliged to keep a large number of vehicles in reserve putting them on the road only if maximum demand occurs. Since costs varying with mileage make up a very small part of total costs, the saving in mileage would hardly offset the cost of the control centre.

Where there are several routes in the same region, however, the demand-actuated service may be a worthwhile alternative. In a region originally served by four bus routes radiating from the same centre, it could easily happen for two demand-actuated buses to be enough for all destinations. In this instance there is a choice between reducing the number of vehicles in use or increasing the frequency.

The demand-actuated system may be described as a service between fixed points with no definite route and no rigid schedule. The type of vehicle generally used is the mini-bus.

Shared taxis

While the demand-actuated system is generally the offspring of an ordinary bus service, the problem can also be approached from the other extreme, the taxi.

As mentioned above, it can sometimes be less expensive to carry all passengers by taxi than to run buses, but this means that individuals who do not know one another must be persuaded to travel together in the same car: that briefly is the idea behind the shared taxi.

There are various ways, some official and some less so, of grouping passengers in the same taxi. The driver may approach people apparently waiting for transport and a "market" may develop (at railway stations or in main squares), but requests can also be channelled through a taxi control centre.

In fact the difference between a shared taxi and the demand-actuated bus is more a matter of point of departure than of the result: in both cases one vehicle with no schedule and no fixed route, transports several passengers not belonging to any specific group.

Neighbours' help

Where there is no public transport, people without cars and faced with too long a journey to walk or cycle must either take a taxi - which may be costly - or borrow someone's car.

Even when public transport is available, the idea that people who have no car form a "captive market", as assumed in forecasting models, is not strictly true. Parents take their children to school, friends are collected from the station and drivers occasionally give lifts to people going their way.

In the absence of a public transport service this would no doubt become more prevalent so that it would be going too far to say that people with no car would be completely paralysed without public transport.

Even so, making part of the population dependent on voluntary help from neighbours is hardly a satisfactory answer. Firstly, how to pay for the service could be an awkward problem. Secondly, people living in more or less isolated way would have difficulty in obtaining transport, and the difficulty would be even more acute for people not known in the locality.

It may therefore be felt that car sharing on this basis cannot validly take the place of the authorities' obligation to provide public transport.(1)

Shared use of resources

It is impossible to achieve reasonable rates of occupancy for buses in thinly populated areas. With gradual reduction in frequency traffic is lost to other modes and the service may have to be withdrawn altogether.

Demand-actuated services or shared taxis may improve the rate of occupancy per seat-kilometre offered, but can hardly improve the productivity of drivers, who account for a major proportion of the costs.

The problem of underemployed resources is not peculiar to transport. In thinly populated areas, shops and craft trades are in a similar position, using only part of their working hours productively with unsatisfactory financial results. Much the same is true of a great many public services.

1) See Thesis 3, page 15

These are already instances of different types of activity being combined in the interests of better financial results. Why should transport not be included? There would be no disadvantage if a shop were closed for a few hours each day because its owner was driving the mini-bus into town, to the station or to the bus stop for the few passengers requiring the service.

Objections would no doubt be made to this type of arrangement, especially by the trade unions. It would be argued that part-time drivers represent unfair competition to the professional driver, reducing his chances of finding work.

Clearly the part-time public transport driver should have to comply with the same safety rules as his full-time counterpart. For the rest, to employ someone for part of his working hours to drive a mini-bus would enable him to earn a reasonable living. The arrangement would allow not only public transport services but other types of activity threatened with extinction to be maintained. The alternative would doubtless be the end of public transport altogether and perhaps of the other activities as well.

Whilst it might be normal for a regional transport operator to subcontract some of his services to a coach firm, it would be less normal to have an agreement with the local baker to provide passenger transport, perhaps at irregular times, with the mini-bus he also uses for deliveries.(1)

Implementation of the second thesis(2) might involve the community in exorbitant costs if scheduled bus services were provided in all cases. In fact, this thesis is based on the view that public transport services ought to be reinstated on many discontinued routes. The use of mini-buses instead of buses can make no radical change in the economics, because of the high share of costs that wages represent and the need for a control centre for demand-actuated services. It would therefore appear that the only way to carry out the second thesis is to innovate along the lines of the suggestions already made.

1) A regional undertaking in Britain has made a mini-bus available to a local committee to provide a service for a group of villages where some of the inhabitants take it in turns to be driver.

See: Michael W. Jackson "Bus system experiments and development", a paper for the conference on "Passenger Transport in the Environment", Construction Industry Conference Centre Limited, P.O. Box 85, High Wycombe, 1976 (page 85).

2) See page 13

Thesis 7: On thinly-trafficked routes, the possibility of semi-public forms of transport, including systems based on the shared use of manpower and vehicles, should be considered in place of bus services.

8. FARES

Regional public transport fares are usually based on length of journey. As well as the ordinary ticket, there may be return tickets, season tickets, day tickets, weekly, monthly and yearly tickets, reductions for children and old people, families, etc., different undertakings having different structures. For regional branches of national railways, fares are usually computed on the same basis as for the inter-regional network and this may even apply to bus routes replacing a rail service.

As a result, parallel services do not always have a common fare system: a ticket purchased from one undertaking may not be valid on the services of another. Even the structure may be different: where a particular journey can be made either by train or by bus, the one-way ticket may be cheaper on the bus, and the return cheaper by train. Also, certain reduced fare facilities may be applicable on only one mode.

Another frequent occurrence is that travellers having to change vehicle, have to buy a fresh ticket especially when vehicles belong to different undertakings. This may become expensive if there is a fixed charge or if there is a sliding scale for fares. The inconvenience of having to change and the time this takes is thus aggravated by the fact that the journey generally costs more than if it had been made direct.

Operators may argue that it is reasonable for a passenger using two vehicles to have to pay more than another making a journey of a similar length direct: the former - uses two vehicles and two drivers, the latter uses only one. However, the need to change does not arise in response to passengers' wishes but for reasons of operating efficiency i.e. to enable as many passengers as possible to make their journeys direct. There is therefore no justification for penalising those who do have to change.

When regional public transport is organised on an all-modes basis, fares should have a common structure throughout the region, whatever the mode.

No attempt will be made to consider the various approaches to pricing, a subject deserving study of itself, but it is clear that whatever system is chosen should be applied to all modes. It is especially important that for any journey which can be made by alternative modes of transport, there should be no difference in fare, apart from quality of service surcharges (first class on the railways, express buses).

This would allow all passengers to use the available transport regardless of type of ticket.

Within each region, then, there should be a single fare structure, and the structures in different regions ought to be similar, too. This should not rule out national, long-distance tariffs on regional services. Being able to buy a through ticket is regarded as an advantage, and the necessary provision should be made where warranted by demand and when it is feasible to issue the tickets (a bus driver could hardly be expected to issue multi-mode tickets for journeys all over the country).

The possibility of a single fare structure both for regional and inter-regional transport should not be ruled out.

Areas to which regional fares are applied could be combined into larger areas for long-distance transport. No such system has ever been implemented up to now, and a number of problems would arise owing to the different structure of the long-distance market, and its costs. Harmonization of public transport fares could best begin with urban and regional services, inter-regional fare structures being held over to a later stage, since the prospect is not yet very clear.

The general fare structure, should, in principle, apply to regional transport services across the board, but special rates could be introduced just for certain routes or modes. Group travel for example could cost less by rail than by road and therefore lower fares could be charged since carriages can be added on in the former case.

In conclusion, a homogeneous organisation for regional public transport should be accompanied by a homogeneous fare structure, since fares are an important aspect of the transport system's "image" as perceived by the user. Higher fares are justifiable, however, for higher-quality services or where cost structures are different. National long-distance fare structures can be applied to certain terminal journeys on regional services.

Thesis 8: In principle, a uniform fare structure should be applied to all regional transport services. Extra charges or reductions, however, may be envisaged where there are marked differences in market situation or cost levels.

9. SUMMARY AND CONCLUSIONS

The organisation of regional passenger transport has been discussed in this paper as primarily a public transport problem involving, therefore, considerations of an economic nature regarding the optimum organisation of such trips (other than by car or bicycle or on foot).

To be optimal, organisation has to be demand-oriented. An undertaking may be organised to function with great efficiency, but this will be pointless if the services provided do not meet effective demand.

In rural regions, transport needs are thinly spread over a large number of routes. It would be unrealistic, particularly in thinly-populated regions, to try to provide general public transport facilities on all such routes. The routes on which public transport facilities are to be provided should therefore be chosen with great care. The choices may affect social relationships throughout the region, and should therefore be based on a socio-geographical survey and on a comparative study of the number of operating models.

Network configurations and timetables should be based on a detailed knowledge of the region. This is also necessary in day-to-day operating management but the knowledge required for this will not come from scientific surveys but from very close contact with local life.

It follows therefore that: (a) scientific analysis of the area's socio-geographical relationships is needed and (b) operational management needs to be decentralised down to the region.

This should not be taken to imply that regional undertakings are absolutely essential. Existing structures are very difficult to alter and it might also suffice to confer a large measure of autonomy upon the regional operating units of a national undertaking. The author's preference, nevertheless, would be for a structure of independent regional undertakings with national undertakings responsible for technical and general matters.

Though public transport cannot admittedly be provided in every possible case, this ought not to lead to the isolation of villages and other small population centres. The authorities should follow a consistent policy towards transport and land-use planning. If they wish to establish or maintain a settlement, they should provide certain services: drinking water, electricity, telephone, schools and public transport as well.

Transport should, moreover, be provided at lowest cost to the community. If the usual type of service cannot be justified, systems should be considered like the demand-actuated bus services, or the regional transport undertaking should hire a local business, not necessarily a transport operator, to make a limited number of trips between the village or villages which might otherwise be isolated and a regional centre or an ordinary public transport stopping place.

Still with a view to providing a transport service accessible to the whole of the population at minimum cost to the community, we

have suggested limiting special services for particular groups to the minimum, giving regional public transport enterprises preference as the providers of such services.

All-stations trains have a regional transport function and should be integrated with regional transport buses. Technical operation may still remain the responsibility of the railway company but quality of service, fare structure, marketing etc., should be that of the regional transport undertaking. In this way, rail services can be incorporated in the regional network and there will be no duplication.

If a genuinely integrated system is to be achieved the general fare structures for regional transport should be uniform for all modes of transport, i.e. a ticket or card for a trip from point or zone A to point or zone B should be useable on all facilities that can be deemed to provide a service between the two.

Uniform regional fare structures need not exclude mileage-based fares, which in certain cases may be better suited to the cost levels or market situations or special rates above or below the ordinary fares e.g. first class railway travel, or special reductions on certain modes.

This introductory note does not set out to offer the undertakings or the authorities general formula for optimising the organisation of regional transport from the economic standpoint.

The great diversity of socio-geographical structure as between one region and another suggests that none could ever be put forward.

An optimal pattern of organisation can be arrived at only after carrying out field research to suit each case - and repeated at regular intervals - since regional structures are not static.

All this paper sets out to do is to offer some guidelines to be followed; the most important conclusion is probably that the starting point should be the transport needs of the region, and that the techniques of transport should not be allowed to exert any decisive effect on its organisation.

SUMMARY OF THE DISCUSSION

1. RATIONAL ORGANISATION OF SUPPLY

A satisfactory method of organising passenger transport at regional level must be based primarily on demand, but today demand too often comes up against a supply which has been made unalterable by the arrangements for co-ordinating transport. The result is a feudal system of long-standing sources of supply which have not developed in line with the population's requirements or with conditions for optimum management.

The gulf between demand and supply in this respect is also partly due to political interference and in many cases demand has been clearly manipulated. Consequently it is necessary to ascertain real demand by objective criteria and not only the demand which is expressed through a kind of censorship and inevitably incomplete and subjective. In recent years this point has been of increasing importance, because public opinion has been becoming more alive to the supply of public transport.

Demand can be better explored by several methods and along several converging avenues. Moreover there are in any case already sources of supply which have fashioned demand, so that as much account as possible should be taken of the existing situation.

A first step might be to calculate an overall objective for a given community together with accessibility indices which would give threshold values for demand.

A better knowledge of demand would make it possible to rationalise supply and marshal arguments against certain vested interests. In any case a policy decision will be required regarding the services to be provided and the funds to be committed for them. In many cases the main problem will be how to switch from a transport operators' policy to a transport policy.

The practice of granting road transport franchises tied to one route or line involves transferring railway-type constraints to a road service with all the resulting obstacles to rational operation. A franchise to operate one line seldom leads to optimum utilisation of personnel and equipment and thus often gives rise to waste which more flexible arrangements might partly or entirely obviate.

Other losses to the community inherent in present-day systems are overlapping on more or less parallel routes and especially extensions or alterations to lines following on new urban developments. Nor are railways always fitted rationally into a regional transport system (injudicious use of railway technology, failure to co-ordinate timetables with road services, different fares, etc.).

One of the aims of a good regional transport policy must inevitably be to use existing resources so as to supply a range of services which satisfies both users and transport operators.

It is preferable to plan the grant of operating rights by areas or classes of service rather than by lines and the grant of these rights should be based on stated terms and conditions and a fares system reflecting standards of service, quality and capacity.

The supply of transport should be presented, at least to the user, as a single facility for the whole region, thereby perhaps excluding certain subjective influences.

Usually demand is studied only when the financial situation of a service becomes untenable, but much can also be done to rationalise services whose financial situation is less precarious. Moreover, when operation is at regional level it may be possible to offset routes with light traffic against routes with heavy traffic.

It might be thought that good management might be stimulated by periodically putting lines or services out to tender, but in practice there may be serious objections to doing so. If each line is put out to tender separately, there may be no bidders for some lines, in which case one has to call for comprehensive tenders, but this means putting out to tender parts of the network which are already served by existing undertakings and thus running the risk of killing the latter.

There is a middle way between static and revolutionary policies which has the additional merit of better meeting the requirements of centralised management. It consists in putting commercial operation in the hands of a central authority and technical operation in the hands of enterprises which sell services in the form of vehicle/kilometres to the central management. This arrangement is already adopted more or less in certain cases and allows optimum service to be provided at a cost to be decided on, if possible without changing the enterprises' existing facilities for the purpose.

Some participants considered that the freedom of individuals and businesses to choose where they will establish themselves in an area cannot automatically involve an obligation to provide public transport for them, as otherwise schemes for more and more scattered urban development would lead to increasing deficits from running services with decreasingly satisfactory supply-demand ratios. It would then be necessary either to accept a certain discipline in

land-use planning, or to give up the idea of providing a transport service for the whole area, and it seems conceivable that in future the inhabitants of some new development areas will be warned and told that they will only be given a transport service if their demand for transport reaches certain minimum figures.

All the possible transport arrangements clearly raise a question of supervision of the service provided and of how subsidies are spent so as to prevent the emergence of monopolies and the automatic refunding of deficits.

Lastly, it goes without saying that the benefits derived from public passenger transport services in a region are not entirely due to transport operations and that whether they pay their way is only one yardstick for judging their social value.

2. STRUCTURES OF ENTERPRISES

Sometimes the size of a region chosen for planning purposes is already determined by the geography of the country, e.g. a flat country cannot be compared with a country with long valleys or intersected by rivers.

Furthermore, the correct demarcation of a region for a transport system depends largely on the customer. As is well known, there is a field of attraction around a regional centre and, while different zones may be superimposed on it (industry and various kinds of services such as schools, shopping facilities and hospitals), a transport service area will nevertheless be the optimum when it coincides with a unit of regional life.

In addition, the existence of a region is also a result of existing transport connections and changes in the latter may affect the power of attraction of one centre as compared with other centres.

As regards how to solve the problems raised by transport between regions, there are a number of pragmatic solutions which make them much less difficult. First, it may be taken that fast inter-urban transport is monopolised by the railways between points covered by train services. Secondly, several undertakings may jointly operate an inter-regional service and this arrangement is found even in international services; it is simply a question of splitting up the operations between the undertakings concerned. Thirdly, the supply of inter-regional transport can be greatly improved by a coherent system of transfer facilities supervised by the public authorities. This question often arises when franchises are granted for operating separate lines, which then draw up their timetables regardless of whether they fit users' transfer requirements.

The size of a transport undertaking also has an influence on its spirit of enterprise; when its franchise covers only one line, it cannot develop as much initiative as if it operated over a whole area.

In larger regions it is desirable to start by taking stock of all the transport resources in the region. Some participants considered that these resources included railways and air services, while others regarded a region as something smaller, but in this matter much would depend on the structure of the country and how it defined an area.

If railways are included in a system of regional transport services, certain problems may arise when the aim is a thorough integration of the latter, such as the different employment conditions of the various staffs which will be working together.

The Round Table discussion went further into two schemes deserving of special attention.

The first scheme was to grant regional franchises, the advantages being a more rational service and a more coherent supply of transport to the user, since the transport undertakings could then adjust better to changing requirements. However, some participants considered that this type of franchise involved a serious risk of creating monopolies which could not subsequently be withdrawn and even of leading to undesirable collusion between an undertaking and the authority which ought to control it. Incidentally mention was made once again in this connection of the difficulty of combining widely differing employment conditions within a single operating system.

The second scheme took more account of existing arrangements and used them more rationally; thus a single charterer would employ different operators who would sell him their services (usually in terms of vehicle-kilometres). This scheme would take better account of the non-conventional services often found operating more or less alongside the scheduled services and increasingly organised or run by local authorities.

In the case of the scheme whereby decentralised undertakings worked within a centralised technical organisation there were also supervision requirements to ensure that the latter organisation functioned in accordance with the interests of the subcontractors and correctly vis-à-vis the users.

The Round Table was of the opinion that neither of the two schemes was in theory preferable to the other and that in practice the one chosen would depend on the legal, economic and geographical conditions prevailing in a given region.

On the other hand the Round Table considered that the present practice of granting fragmented franchises for single lines was

rarely the optimum solution and that in any case an ad hoc authority should ensure coherent operation. Depending on the scheme chosen (centralised or decentralised operation), this supervisory authority would have to see that transport services were adapted to new requirements, for which purpose unduly long concessions did not seem advisable. When operation was decentralised, the co-ordinating authority would also have to ensure that the smaller enterprises kept alive and active.

In addition it seemed desirable to transfer to the regions the funds required by the subsidisation policy, which in turn helped to finance investment and the cost of operating lines.

3. ORGANISATION OF SPECIAL-PURPOSE SERVICES

If there are various special-purpose services in parallel with the scheduled public transport services, there may be difficulties at regional level due to insufficient rationalisation.

Normally such special-purpose services should not exist, provided that the capacity of public transport is sufficient to meet requirements properly.

The main problem is how to achieve improved vehicle turnround over the whole of the region and to do this it is not always desirable to close down special-purpose services. The problem can sometimes be solved better by making these services provide complementary supplies of transport.

The main point is to prevent social waste and here again the co-ordinating authority has an important part to play. It must have an overall view of transport supply and demand and try to balance them as well as possible by means of an optimum arrangement which will inevitably involve a policy option.

When tackling this problem in detail one must distinguish between the different types of special-purpose transport which often pursue different objectives and do not have the same institutional basis.

Special-purpose services for factories and schools often help in recruiting manpower and pupils. They become indispensable for enterprises which have difficulty in finding skilled labour and are then obliged to fetch workers from their homes, sometimes in very isolated places.

The demand for this type of service later became diversified and specialised. In order to reduce costs and rationalise routes, increasing use is made of mini-buses or vans driven by one of the workers, thereby economising a chauffeur.

In addition, an increasing number of new businesses have been set up outside urban centres, with the result that they have either no public transport service or an inadequate one.

In other cases factory working hours do not suit users of the scheduled service and the result of such different user requirements as to time and place is often that there are two types of service (special-purpose and scheduled), neither of which is used in a satisfactory manner. In such cases considerably improved results can be obtained by schemes for co-ordinating timetables or routes.

Incidentally it will be noted that special-purpose services have usually been initiated by large-scale industrial undertakings, as small-scale undertakings cannot run them, so that in the overall organisation of a system of transport services there may be an element of protection for small-scale industries or craft trades to be considered.

In some cases it is easier to satisfy a weak demand with special-purpose services than with scheduled services. Conversely, peak periods often tend to be bunched, in which case a better co-ordination of the different supplies of transport may boost the total service available to all users.

From the legal point of view, many special-purpose services are free of charge or enjoy a private status which protects them from any interference or attempt to co-ordinate them. Nevertheless it would often be desirable to give an existing special-purpose service an additional task (e.g. to carry other passengers, to extend the route from factory to town centre, etc.). Indeed the problem of weak demand is most easily solved when one can avoid providing a service to meet it which involves unduly high personnel costs.

In addition it would seem possible to make more use of existing passenger transport services for carrying some retail consignments of commodities.

In conclusion the Round Table considered that this type of problem should be studied case by case and that the solution should always aim at an optimum utilisation of the capacity supplied.

4. HOW TO COVER DEFICITS

In dealing with this subject the Round Table wished first to distinguish three types of financial operation:

- a) cross-subsidisation within individual managing units;
- b) savings on any wasteful expenditure;
- c) subsidisation proper.

However, these different operations could not encroach on investment, if the danger was to be avoided of allowing the supply of transport to become out of date.

As regards cross-subsidisation, what had already been said about the size of enterprises was relevant, namely that an optimum size was one which left no more scope for rationalisation. In practice this size varied from case to case and there were even situations where there would be no scope for rationalising a line, if it were incorporated in a larger system.

Rationalisation may take various forms. First, lines may be grouped together so as to have vehicles running empty as little as possible and minimise turnround delays. Then there are sizes which enable optimum use to be made of standby vehicles (e.g. running special buses for several successive market days held in different places in the region). Again there are optimum sizes to be considered for workshop capacity and the stock of reserve equipment. Thus a careful distinction should be made between what a line costs and certain effects which rationalisation may have on the system as a whole. Indeed calculations of costs broken down entirely by lines are not always reliable (e.g. it is difficult to credit this or that line with a reduction in empty running or waiting time achieved by group operation of lines), so that problems of associated costs may arise.

While rationalisation may lower the overall cost of a system, the problem becomes more difficult when services running at a heavy loss have to be supported financially by other services, a situation often encountered in running some railway systems.

If compensation is excessive, all control over the economic efficiency of the services supplied is lost and insufficient correlation is maintained between supply and demand.

Consequently a clear distinction should be made between rationalisation which allows of some compensation, and book-keeping compensation designed to wipe out certain excessive deficits. In the latter case it is better to subsidise the loss-making service directly, after which the subsidy may be reduced by matching supply as well as possible with demand.

The transport services required of an undertaking should preferably be checked periodically, because the justification for them may change quite quickly.

There is also scope for rationalisation outside transport undertakings, e.g. by adopting standards for equipment which are followed outside the region and by a road transport organisation which can provide various facilities for public transport (reserve corridors, priority crossings, synchronised traffic lights and stopping places located accordingly).

If the subsidisation of transport services is to be controlled effectively, two choices must first be made, the first being a

choice of accessibility thresholds and the second a choice of tariffs.

The level of accessibility thresholds may be of vital importance in some thinly populated and/or low-income areas and, if public transport is withdrawn (e.g. because it does not pay), there is often a flight from the villages, unemployment for the women and young people and a lack of personnel to provide a minimum service on the spot. In these cases it is advisable to apply criteria to public transport like those applied to other normal services such as roads, electricity supply, etc.

5. SUPPLYING A WEAK DEMAND

The heart of this question is of course the payroll, since it is often out of all proportion to the yield from the traffic. In this connection an interesting alternative is often to give people part-time employment in public transport, a solution which in many cases also enables valuable craftsmen to continue to make a livelihood in small villages.

Actually this arrangement is already in use by some transport undertakings, which employ paid staff working part-time for them and the rest of the time as craftsmen, innkeepers, etc.

However, such arrangements should be used more widely and should introduce certain innovations.

Here two types of arrangement may be distinguished, the first of which maintains some forms of organised public transport, even if only demand-actuated, while the second is to stimulate mutual aid schemes.

Where a demand-actuated bus service is not practicable for relatively long distances in thinly populated areas, it is easier to plan arrangements more like mini-cab or taxi services. In this case services operating more or less on request can be combined with postal deliveries or supplied by the owner of a taxi (or mini-bus) who would be subsidised for the purpose.

Closer co-operation between different official departments which have vehicles (their own transport services, the Post Office, schools, etc.) could also provide better services in a region where demand was weak.

Meanwhile the use of public transport is sometimes reduced by the relatively high fares charged; more and more passengers are forsaking it, so that it has increasing difficulty in keeping alive. The vicious circle could be broken, if private cars had lower fixed costs and higher variable costs, when the incentive to use public

transport would be stronger. In practical terms that could be arranged by including various taxes in the price of petrol which are at present levied on traffic (an annual tax) and on the purchase and maintenance of vehicles (TVA).

In the absence of public transport in the traditional sense of the term there are always the possibilities of car-pooling and other mutual aid arrangements which, moreover, are already fairly widespread in some areas.

It should be noted, however, that these types of transport should not be encouraged when public transport is available which can satisfy the demand concerned, as otherwise there is clearly a risk of handicapping public transport still further. It is therefore important to choose the cases carefully in which to launch ad hoc supporting schemes.

Such schemes are devised more or less spontaneously and would require to be encouraged and controlled. They are in fact a planning policy option designed to maintain a rural population in situ, so that it would be desirable for some subsidies to be tailor-made and to co-ordinate better all the different schemes. Detailed information and telephone facilities are indispensable, if mutual aid schemes are to work properly.

In some countries such schemes encounter obstacles, e.g. higher insurance premiums, and here again official action is required to encourage and supervise them.

In conclusion the Round Table considered that in many cases the methods of providing transport needed to be revised and that the money spent on running scheduled services would often suffice to finance a system which was more individualised and better suited to meet demand.

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