The decline in population means reduced demand for services in those areas and thus reduced supply unless government subsidy is forthcoming.

Operator attempts to influence demand

In most cases the causes of the changes in demand cannot in themselves be affected by the operator, but the transport company can try to influence the effect on its own operations or finances. There are two ways in which this can be done:

1. Price changes to encourage new travellers or to attract travellers away from other operators. The objectives of all operators are to maximise revenue and to compete more effectively in the whole travel market. In many transport areas the peak problem and its associated costs can also be influenced by pricing policy (see below).
2. Improvements in the quality of service in terms of:
   frequency – to gain more passengers by increasing convenience;
   reliability – to help passengers and encourage regular traffic;
   comfort – to match the quality of vehicle seating and cleanliness with the home environment;
   feeder lines to extend the service area;
   speed increases, for instance through electrification of railway lines or high speed train services;
   regular interval clock face departure times to provide an easily remembered timetable. This has been exploited by British Rail,
   eg Swansea to London ex Paddington – on the hour
   ex Swansea – 35 minutes past the hour,
   but on some local London services the service interval varies and can lose passengers to more frequent and regular underground competing services.

Why the peak problem is particularly bad in transport

There are various reasons why the problem in transport is particularly bad.

1. The transport product cannot be stored; it must be supplied when required and consumed immediately. Therefore, if a bus, train or plane has spare capacity when it leaves, this cannot be used later for the *same* journey. A similar problem occurs in freight transport.
2. Peak demand occurs on the London underground and British Rail commuter services into London from Monday to Friday. It is often the case that only ten loaded train journeys per week in total (five into the central business district and five out) are made by Southern Region train sets. To achieve a frequency which copes with demand, a far greater number of peak trains is required compared with other times. In consequence there is over-supply in off peak. British Rail's Network South-East has up to 60 per cent of its rolling stock in sidings over a weekend and during the day or evening. The London underground could have a similar problem, but the central area demand justifies a higher off peak frequency on most lines on cost/revenue criteria. Costs of depreciation, tunnel and track maintenance and some staff are not eliminated, and if variable costs are exceeded by revenue the service is justified. This same cost/revenue relationship does not exist on Network South-East.
3. Transport has a derived demand, whose patterns are determined by the pattern of activities with which the demand is associated. For example, the journey-to-work peak results from working hours being mostly from 07.30–16.30 or 09.00–17.00, resulting in a peak at the start and end of the working day (Monday–Friday). In the case of holiday traffic, the peak demand for aircraft and terminal space for travellers to Spain, and the peak demand for coach seats, additional trains and road space on West Country trips, lasts from June to September with a super peak on August weekends.

   Freight transport operators face a peak demand for beer deliveries (summer and Christmas) and ice cream (summer) which results in fleets with unused capacity in the off peak. The Post Office avoids this by hiring Christmas service vehicles, some from coach companies (which are often in an off peak period), to meet the Christmas peak from mid-December. There are daily peaks for retail outlets such as Marks & Spencer and J. Sainsbury, which require deliveries to stores by 07.00 hours; milk deliveries have an early morning peak, as do newspapers.
4. There is a cost implication – if, for example, a vehicle or train is used all day, costs are spread over 18 hours. With a peak-period-only operation, the costs must be covered in that period, for example four hours or two fare-earning journeys. The same principle applies to seasonal peaks. Peak services can therefore be loss making if the price charged is not enough to cover the additional costs. On a marginal basis, off peak operations may be more profitable, although demand in terms of passenger miles per vehicle per train/bus is less.
5. The sequential nature of vehicle running (an example of indivisibility of supply) leads in the morning to full 'into-town' vehicles which are nearly empty on return journeys towards the suburbs. The difference is often only one of scale from outbound Chester buses to northbound trains from King's Cross Station, London, following high load factor inbound journeys. The reverse is true in the evening. Buses or trains may make only one peak trip in the morning with a high load factor, but some may make two, thus spreading the peak capacity and reducing the total capacity requirements. The indivisibility of supply resulting from rack capacity, vehicle size and train size makes the problem more difficult.

Examples of the peak problem in practice

Commuter service operation in London

A typical Network South-East electric multiple unit (emu) operated by the Eastern Region of British Rail would make only one high yield peak journey during the morning and might spend the rest of the day operating low load factor services, or be out of service until the evening peak when it would make a high load factor outbound journey. On its return morning journey out of the London terminus it might run empty to the depot.

Bus operations in a large provincial town[10]

This analysis is based on the use of vehicles and the prospects for cost/revenue ratios of operating under different criteria. Traditionally, bus companies have tried to satisfy peak demand and have run at a loss as a result. If these circumstances changed and a decision was made to operate only the number of vehicles required for the whole of the working day (ie to exclude peak only vehicles), then the financial position would be substantially changed.

Heathrow Airport

London Heathrow Airport provides a further example of peak operations in its handling of its intercontinental traffic. Previous to the opening of Terminal 4 all such traffic was processed through Terminal 3. The morning peak is a problem but such is the demand for aircraft arrival times at the start of the day (especially for business travellers) that high landing charges have not made any great impact.

Peak pricing by package tour operators reflects two areas of leisure operations – airlines and hotels – which are hit by the peak demand for their services in the period July to August.

The customer who travels to Spain on 31 July is a peak period traveller and involves the operator in additional costs. Consequently, he should expect to pay a premium price for his holiday. Most leisure travel is very competitive with a high elasticity, but the summer family traveller on a holiday to the sun will find all operators offering the same price pattern. They have to travel when the schools are closed, and demand is likely to be more inelastic. Both these elements are taken into account by travel operators when pricing their holidays. This form of price discrimination is dealt with in more detail in Chapter 3.

Reducing the peak – possible action by the operator

The foregoing examples illustrate situations where peak demand incurs costs by the operator and where, in some circumstances, that full cost is not being

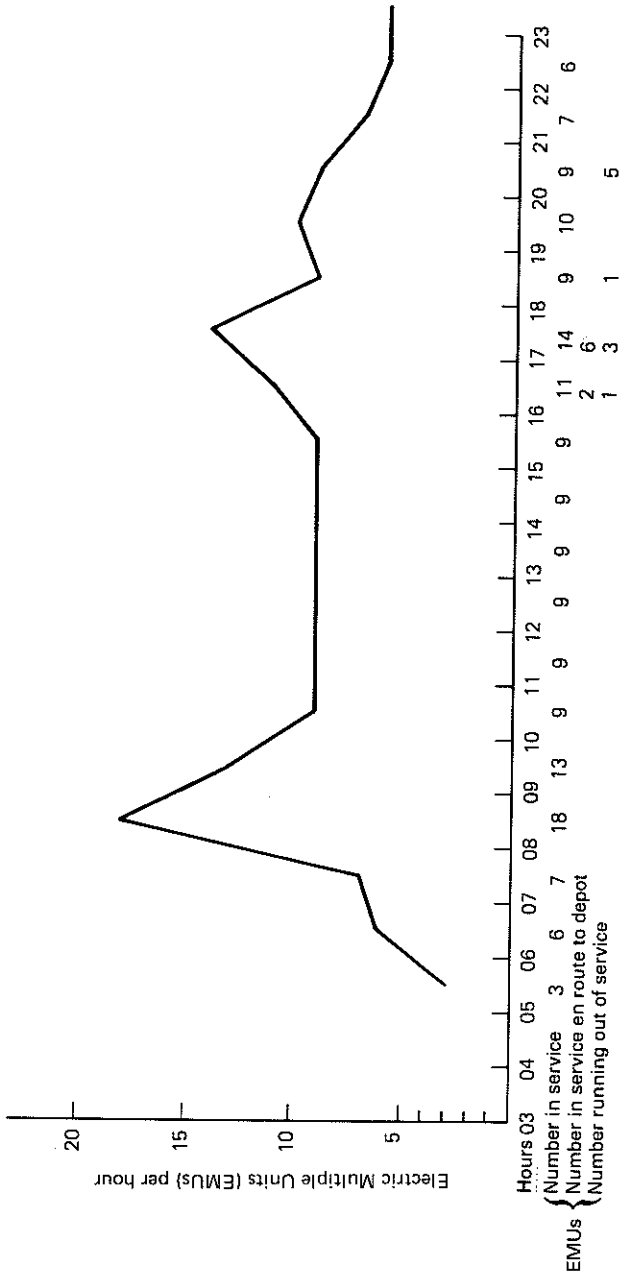

Figure 1.1 *Number of London suburban train units in operation up line to King's Cross/Moorgate (Monday–Friday)*

Source: British Rail[11]

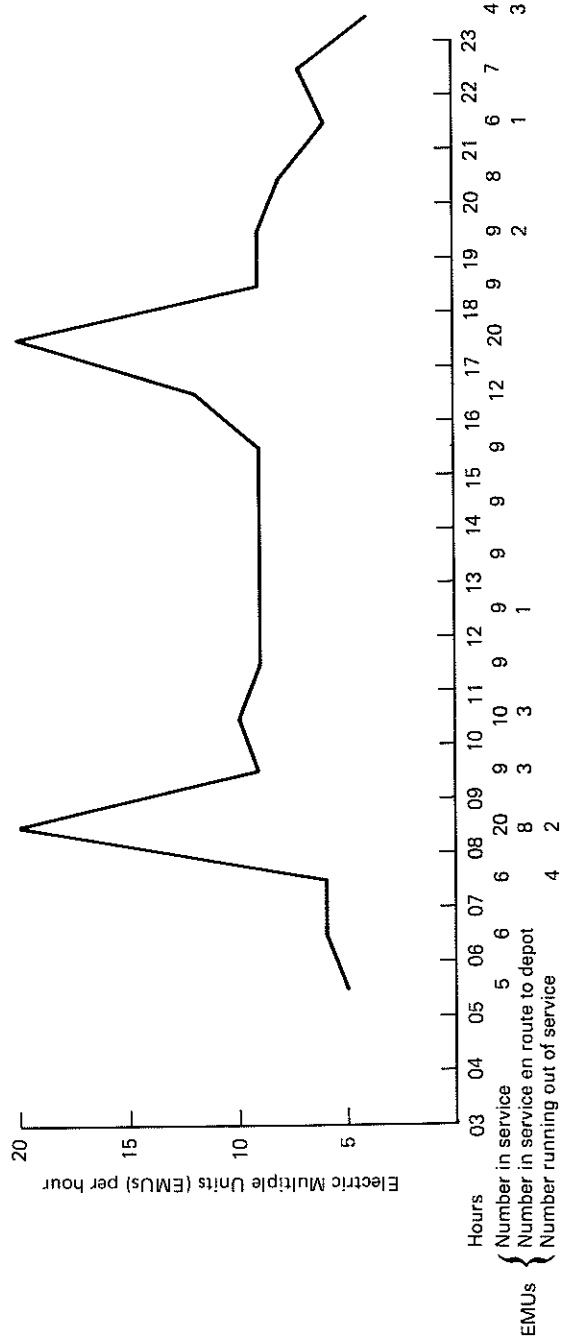

Figure 1.2 *Number of local train units (EMUs) in operation down line from King's Cross/ Moorgate (Monday-Friday)*

Source: British Rail[11]

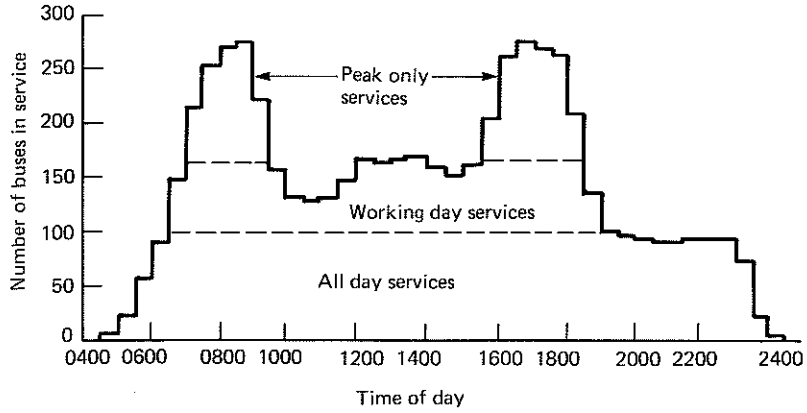

Figure 1.3 *Bus requirements for weekday bus operations in Bradford*

Source: Bradford Bus Study

Table 1.2 *The main 'layers' of weekday bus operation in Bradford Resources required to operate weekday service for each layer*

	All day	Working day	Peak	Total
No of vehicles	99	65	111	
Cumulative	99	164	275	
% of total vehicles	36	24	40	100
Cumulative %	36	60	100	
Total payable hours	2087	892	672	3651
% of hours	57	25	18	100

Source: Bradford Bus Study 1976

Table 1.3 *Financial performance*

	Satisfying peak demand (peak service approach)	All day and working day service layers only
Operating costs	26,000	12,970
Revenue	18,500	10,320
Reallocated revenue (1)	–	2,454
Total Revenue	18,500	12,774
Profit (Loss)	(7,500)	(196)
Cost/Revenue Ratio	0.71	0.98

Source: After Bradford Bus Study 1976. Reanalysis of data extracted from Tables 6.14 and 6.15

(1) Assumes reallocation of 30% of revenue to spare capacity during or either side of peak. Other 70% changes mode

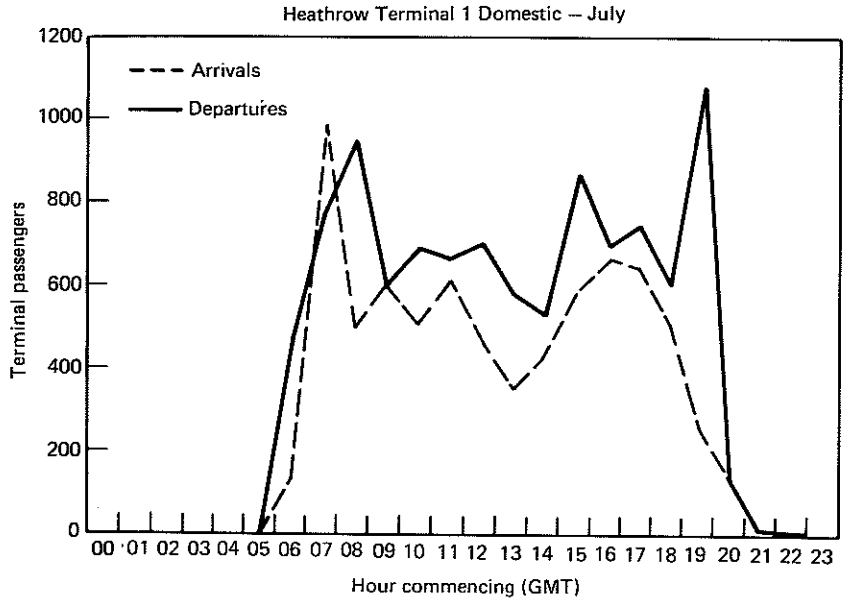

Figure 1.4 *Hourly pattern of traffic over a busy day in 1985 averaged over the peak month*

Source: British Airports Authority, Patterns of Traffic at the BAA Airports – 1985 Planning Department 1986. (Report P86/316)

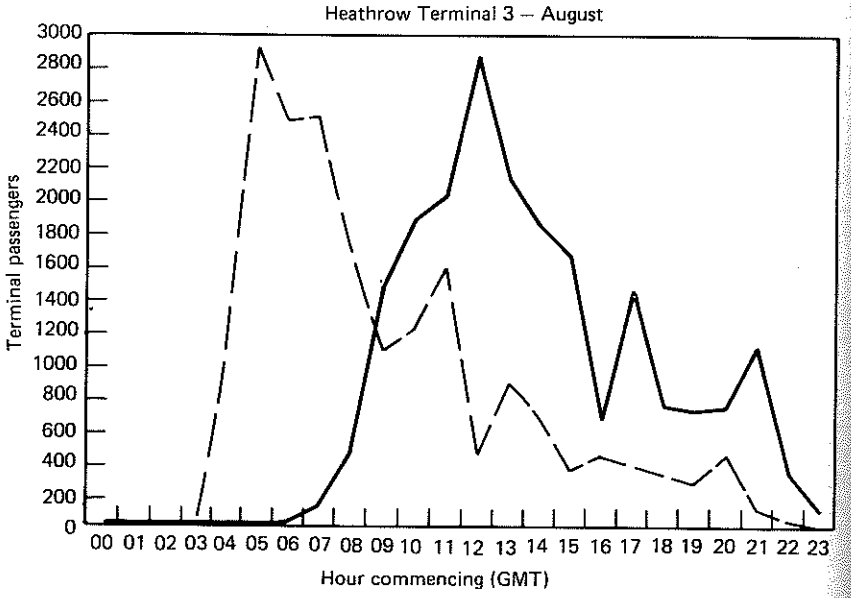

Figure 1.5 *Hourly pattern of traffic over a busy day in 1985 averaged over the peak month*

Source: British Airports Authority, Patterns of Traffic at the BAA Airports – 1985 Planning Department 1986. (Report P86/316)

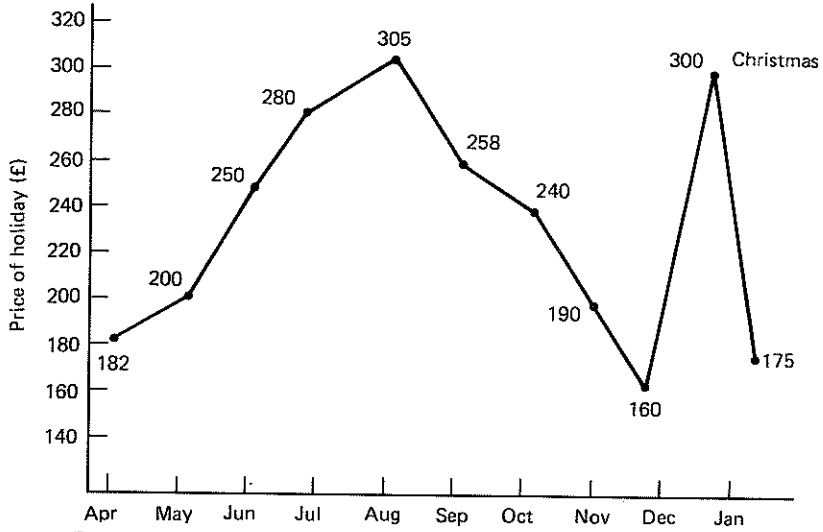

Figure 1.6 *Package holiday prices in peak and off peak periods*

Benidorm: Costa Blanca Spain
Hotel Rosamar full board. UK Airport: Gatwick
Departure month from London (Gatwick) Airport
Source: Thomson Holidays Limited (Winter Sun 1986–87); Rank Holidays (Wings Summer 1986)

paid by the customer. There are a number of options which an operator can choose to reduce the impact of the peak on its operations.

First, the operator can decide not to provide the facility thus producing a financially, though not necessarily socially, better result. British Rail provide fewer extra summer services than they did ten years ago partly because demand has fallen, but also because of the cost of maintaining a back-up fleet of rolling stock to cover such demand. The interworking of services can also result in certain departures being overcrowded because the diesel multiple unit set in use is adequate only for the remainder of its day's work. Some Friday afternoon peak journeys from London and a Crewe–North Wales service[8] provide examples of a decision not to provide the service. In the latter case, if new rolling stock whose capacity can be interworked becomes available (eg British Rail 'Sprinter' units with 18 more seats) then the problem may be solved.

In freight operations, the haulier has a contract to move goods at a given time and the price of the contract to the customer will reflect any peak operations of this type. Companies supplying haulage services to Marks & Spencer have delivery schedules clearly specified and since M & S is more keen on quality than competitive pricing,[12] these additional costs are likely to be catered for. The Post Office, faced with an increasing peak at Christmas time, brought forward its last guaranteed posting date and thus reduced the need for extra vehicles. By not hiring extra freight vehicles costs are cut, but

the service level is reduced as a result of spreading the delivery over a longer period and flattening out the peak.

Other techniques have been adopted by operators to flatten out the peak or fill in the trough between peaks:

1. Pricing through off peak discounts or a peak surcharge. Even if this policy does not flatten the peak, it may increase the overall demand level which may be a better alternative in revenue and profitability terms.
2. Flexible hours are not popular with workers generally for family and social reasons. In some cases, however, they have been negotiated with education authorities to move the schools' transport peak, primarily in the afternoon.
3. Out-of-service running on contra peak flow vehicles may enable an extra peak journey and thus reduce the number of peak vehicles and crew.
4. Out-of-town industry and schools have been suggested as filling seats on out-of-town services and inbound evening services. This is not always a solution since the new demand pattern may not coincide with the radial route pattern.
5. Private commuter operators can be used to supplement the existing operators. They are able to use low cost vehicles and staff or use vehicles for a commuter service to the city centre, then for private hire during the day (09.30 to 16.30), and finally on an evening commuter service out of town. Some of the early results of the Transport Act 1985 show that some peak services will be put out to tender if demand is to be met.
6. Bus lanes reduce bus journey times.
7. The use of fully depreciated (usually older) buses, trucks and rolling stock at peak times, thus eliminating part of the financial burden of spare vehicles.

The policy which is most likely to produce increased revenue and (as most off peak costs are marginal or variable) increased profitability, is one aimed at filling in the off peak. This is particularly true if the basic system is retained (for example the London mass transit systems).

The current fare structure in London does provide for off peak travel at a lower cost for single tickets and for short period travelcards. The proposals first introduced in 1982[13] identified the 'core commuter' as the most important customer and provided a slight discount on his basic fare from home to work but with 'free' additional travel within the zones on his card. This had two prime objectives both of which it has achieved:

1. Increased overall patronage resulting from the convenience of a travelcard.
2. The increased use of bus and underground (and train with a capitalcard) services during the off peak day, evening and weekend periods.

ELASTICITY OF DEMAND

Introduction

The term elasticity is one which may seem complex, but is clearly illustrated by the day to day marketing of the transport industry in the various advertising campaigns seen in the media.

Consider the range of British Rail return fares per person from London to Bristol (December 1986):

First class	£47.00	Saver	£16.50/£22.00
Second class	£30.40	Family saver	£6.50
			(2 adults, 2 children)

The reasons for these differences are what price elasticity is about. In this case it will be the responsiveness of passengers or potential passengers to the prices on offer. The changes in those prices have to be measured to determine the extra passengers and extra revenue which will be achieved from this type of fares policy. Elasticity has a wider role than price, however. It is defined as the response of demand for a product to the change in one of its determinant factors. Rail passenger demand, for example, will be influenced by:

fares in relation to other prices;
fares in relation to other operators' fares and to car running costs;
consumers' income;
unemployment level;
car ownership level;
reliability and service level;
British Rail's image.

Demand is the amount of a service or product bought by a consumer. Only effective demand is of interest to the economist; that is demand which can be put into effect because the consumer is able to pay. The price of the services on offer and the income of the consumer will be important determinants of whether the consumer is able to buy. Once the purchasing power element is decided, the consumer then looks for service characteristics and value for money. Market demand is the aggregate of all individual consumers' demands, and it too will be determined by the same factors.

The effects of price elasticity

This is the responsiveness of consumers to changes in the transport operator's own price. Generally it is applied to new consumers entering the market.