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**Bus economics**

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## Chapter 2

### Bus Economics

Peter White

#### **2.1 Introduction**

This chapter sets out the basic principles of economics of bus operations, examining costing and pricing concepts. Other factors affecting demand and market share *vis a vis* other modes are considered. The impacts of different regulatory systems are then examined. The main emphasis is on evidence from Britain, given the extensive experience of different regulatory systems and the research literature available, but international aspects are also examined, notably through cases with sharp variations in regulatory practice (especially Chile) and the growing internationalisation of the contract market. The main focus throughout is on 'local' bus services (i.e. those stopping at frequent intervals, mainly kerbside, handling short passenger trips), but reference is also made to the experience of express coach deregulation which has produced somewhat different outcomes to that of local buses.

#### **2.2 The structure of operating costs**

##### *2.2.1 The typical pattern in Britain*

Table 2.1 shows a recent estimate of the percentage composition of local bus operating costs in Britain, based on work by the TAS consultancy. It can be seen that the largest element is those costs related directly to staff, at 60% of total costs (of which drivers comprise about 40%). Components related to distance run (fuel and spare parts) are approximately 20%, and costs associated with vehicle provision, i.e. depreciation and leasing, form about 10%. Overheads comprise about 9%. Staff-related costs tend to form a larger proportion in the case of operators in London and the South East, reflecting higher staff earnings, and the other elements by definition form a smaller proportion (but are not lower in absolute terms).

<TABLE 2.1 HERE>

A broadly equivalent pattern may be assumed in other countries of similar real income per head levels, although the fuel cost component will vary according to taxation policy (see further discussion below). The fuel element also varies more sharply within a given country in the short term, due to fluctuations in world oil prices. In lower-income countries (such as India) labour forms a smaller proportion of the total, and fuel a relatively larger one.

It follows from this structure that most costs vary by time, rather than distance as such. The purely distance-based element (fuel, tyres and spares) is relatively small, in the order of 20%. Nonetheless, unit costs continue to be expressed usually in terms of distance, both in operators' own data and those published by government. However, the value of time-based costs as better indicator was pointed out over sixty years ago (Buckpitt, 1949). The other important component is that associated with vehicle provision, normally expressed as a charge per vehicle per annum. Where a fleet is directly owned, this will comprise the depreciation charge due, or where leased, the leasing charge. Overhead costs, and those for administrative staff, are also generally allocated on a vehicle numbers basis, since the scale of depots and administrative structure are largely determined by this. A distinction may also be drawn between 'peak vehicle requirement' (PVR), i.e. the number of vehicles in service at the busiest period (typically the morning or afternoon peak, Monday to Friday), and total fleet size (which also includes vehicles undergoing maintenance). Typically a well-maintained fleet renewed at regular intervals will have an availability of about 90% - i.e. a PVR of 90 would correspond to a fleet operated of 100 – but may be lower where older fleets are operated.

As a simple measure of unit operating costs, total bus-kilometres run may be divided into total costs to give an operating cost per bus-kilometre run. While useful in assessing trends over time (as in British data discussed further below) and making cross-sectional comparisons (subject to broadly similar operating conditions being applicable) this is a poor guide to the allocation of costs within an operation. It also measures an intermediate output (bus kilometres), rather than the ultimate output being produced (passenger trips or passenger-km), which is affected by average load carried. Government data published in Britain also cover cost per passenger trip (which do not distinguish trip length effects). In London, a more comprehensive approach is found, TfL publishing estimates of total resource cost (including capital) per passenger kilometre by all public transport modes, averaging about 23 pence in 2014-15 (TfL 2015, table 5.1)

### *2.2.2 Allocating costs within a network*

In allocating costs to specific parts of an operation (such as a particular route or time period) the following factors will also apply:

1. The PVR for the service, determining both vehicle capital costs and overhead allocation. Labour costs for peak-only operations may also be higher per hour worked, due to difficulties in scheduling efficiently for this purpose (even where 'split shift'

working is followed, average labour cost per hour is normally higher than for 'straight shift' work). Hence, operations carried out mainly at peak periods tend to have much higher unit costs per bus-km than those running for most of the day.

2. Average speed attained, since the higher the speed the lower the time-based costs per km run.
3. Vehicle size. Capital costs, fuel consumption and maintenance clearly rise with vehicle size, although not necessarily *pro rata*. Labour cost may also vary, although this will depend on the pattern of local working agreements – for example, in the immediate post-deregulation phase in Britain (from 1986) much lower rates were often negotiated for 'minibus' drivers (locally defined), encouraging widespread adoption of this vehicle type. However, in the longer-term, a market-based wage will tend to reflect the local labour market rather than vehicle size as such, and in Britain this regional variation is now much more noticeable than the vehicle size component, removing an artificial incentive to the use of smaller vehicles. While total operating costs rise with vehicle size, unit costs per passenger place-km generally fall sharply.
4. Unit costs at periods of low demand (typically early mornings, evenings, and Sundays; and all-night where such operations are run) will often be lower in bus-kilometre terms, especially if a marginal or escapable costing approach is adopted, since costs of overheads and vehicle provision have already been incurred in meeting peak demand. However, wage agreements may vary (e.g. higher rates for Sunday work), affecting the degree to which marginal operating costs per hour run are lower or higher than weekday work. In many cases, although costs per bus-km are lower than the overall average at such times, cost per passenger trip may be high due to poor loadings, often resulting in such services being provided only on a tendered basis even where 'commercial' services operate over the same route during Monday-Saturday daytime periods.

Growing congestion, and the need to ensure service reliability, may thus increase costs even where no increase in service frequency takes place. For example, a route with a round trip time of 60 minutes and headway of 6 minutes would require 10 buses and drivers. Even a very small increase in round trip time (up to 6 minutes) would thus increase this to 11 buses (i.e. 10%), so that total cost will rise by about 8% (if 20% of costs are distance-related), and unit cost per bus-km likewise. The most effective means of reducing costs, irrespective of ownership or regulatory pattern, may simply be to increase speeds, through bus priorities and reducing dwell time at stops (for example, by minimising cash fare payment, now completely eliminated in London). Increased congestion also tends to worsen fuel consumption and increase emissions. Recent work by Begg (2016) has shown dramatic increases in scheduled bus journey times over the long term in a number of urban areas, with direct effects on passenger demand (due to greater in-vehicle journey time), and operating costs, plus large secondary impacts where fares are then raised to reflect higher costs.

In contrast to evening and Sunday work, the ‘inter-peak’ period (that between approximately 0900 and 1600) often attracts reasonably good loadings (notably due to free concessionary travel for older people), and the avoidable cost of cutting services substantially below the peak levels at such times may be small, especially if shift-working agreements involve commitments to minimum shift time and pay. Coupled with the high marginal costs of peak-only operation, this has resulted in most operators in Britain offering a similar service level throughout the period between around 0800 and 1800 with only small enhancements at the peaks, often to meet school travel demand, rather than adult journeys to/from work. Recent aggregate data indicates little variation in the number of journeys operated within this period, but a sharp drop in the evenings, especially outside London (Department for Transport 2014).

### *2.2.3 Economies of scale*

A further consequence of this cost structure is that few economies of scale in direct operating costs may be expected, since the main components (drivers, other staff, fuel and spares) simply rise in proportion to service output. One might expect some economies of scale by depot size, as overheads are split between more vehicles, but the enquiry by the then Competition Commission (2011) only found some limited evidence for economies of scale by depot size<sup>i</sup> (for ‘small’ depots). In the light of this, the consolidation of the industry post-deregulation into five major operating groups may seem surprising. It should be borne in mind, however, that large organisations may have bargaining power with suppliers in purchase of fuel, spares and vehicles not available to smaller operators. They may also be able to raise capital more easily (either by being seen as lower-risk by lenders, or being able to raise equity capital on the stock market), and find insurance easier to obtain (or cover some risks such as vehicle fire and theft internally).

## **2.3 Operator income and profitability**

The principal source of operator income in Britain is revenue from passengers, whether through cash transactions on the vehicle, or off-vehicle ticketing. In addition, compensation is received from local authorities for the net cost (mainly in lost revenue) of offering concessionary fares to certain passenger categories (principally those aged over about 60). The ‘fuel duty rebate’ introduced in the 1970s offset much of the duty payable on fuel, at a level of 80% until recently – the effect of this was to greatly reduce net fuel costs incurred, affecting in particular marginal costs of services. The grant is now known as ‘Bus Services Operator Grant’ (BSOG), and is based on a more complex formula, incentivising fuel-efficient vehicles and smartcard tickets, but to a large extent remains as a rebate on fuel duty. In defining a ‘commercial’ service an operator thus includes all three sources of income. Likewise, where contract payments are received for particular services, this forms part of an operator’s business income. Practice in other countries varies, often with compensation paid for low fares levels offered to many categories of passenger<sup>ii</sup>

A return on capital invested will be expected. Where capital has been raised by loan finance, this will appear as a 'cost', but where equity capital is employed it will be in the form of dividend paid out of profits.

A simple measure of profitability is the return on sales (ROS) margin, usually defined as earnings before interest and taxation (EBIT) as a percentage of total revenue. This provides a quick measure for comparing profit margins over time and between operators. However, a more appropriate measure may be the return on capital employed (ROCE). This raises somewhat more complex questions of placing a value on the assets of the business, examined in some detail in the then Competition Commission report on the industry<sup>iii</sup> (2011).

## **2.4 The demand for bus services, and elasticity values**

### *2.4.1 Major trip purposes and other market features*

The demand for local bus services is characterised by a wide mix of journey purposes, and not dominated by the adult journey to work to the extent that may be assumed. Table 2.2 shows data from the National Travel Survey (DfT 2015) indicating the composition of local bus demand by trip purpose, and the share which bus holds of travel by all modes for that purpose.

**<TABLE 2.2 HERE>**

It can be seen that shopping forms the largest single element of bus journeys (25.4%), and also a purpose within which bus holds its second highest market share (8.6%). As a proxy for peak demand, the work and education trip purposes may be taken together (37.2% of all bus trips). The trips for all other purposes, which, broadly speaking, occur at other times, form a majority of total bus trips (62.8%). This mix produces a fairly good balance of peak and inter-peak demand, albeit with the risk that dependence on shopping as a trip purpose may be affected by the shift of activity away from traditional urban centres and growth in internet shopping. It should be noted that work trips are somewhat longer than those for other purposes, and thus form a greater share of bus travel when total passenger-km are used as the base.

The NTS also indicates the relatively higher share of demand taken by local bus among the youngest and oldest age groups, namely those still in education and younger adults, and those who are retired. Market penetration in the working-age adult group is more limited.

A correlation may also be found between car ownership, income levels and bus use. Typically, bus use is concentrated in lower income groups and inversely correlated with car ownership. Hence, rising car ownership will, *ceteris paribus*, cause a reduction in bus use. It should be borne in mind, however, that a considerable scatter is seen around the broad trend, with certain areas, such as Poole, Oxfordshire and Brighton & Hove, having higher bus use (trips per head per annum) than would be expected from a linear regression of bus trip rates against car ownership (KPMG 2016, figure 22). Furthermore, even for a given pattern of income and car ownership, bus operators may be able to substantially influence demand action to improve service quality.

#### 2.4.2 Elasticities of demand

A consequence of the relatively local nature of demand, and limited modal alternatives available, is that short-run demand elasticities for bus travel are relatively low. Typically, for price an average short-run elasticity of about -0.4 may be assumed (a 10% real fares rise would cause a drop in demand of about 4% over about one year), and for service level (expressed as bus-kilometres run) a value of about +0.4 (i.e. a 10% increase in service level would cause a 4% increase in demand). For this purpose, changes in bus-kilometres run largely correspond to changes in service frequency, although they will also reflect changes in network size and periods of time services are operated. There is some evidence of variations around these averages associated with trip purpose (Balcombe et al 2004) and peak/off-peak periods, although not always conclusive (Molnar and Nesheim 2010). Very short trips (below 2 km) may be more price-sensitive due to the ease of modal substitution by foot or cycle. Evidence from recent service improvements in Australia and New Zealand (Wallis 2013) indicates much higher service level elasticities with respect to vehicle-km run for periods such as evenings and weekends, of up to 1.1. A wider review of pricing issues is provided in the chapter by Mulley and Batarce.

Over a longer period, elasticities tend to be of greater magnitude since greater scope exists for substitution by travellers—for example, bringing forward a car purchase decision, or changing travel patterns to reduce frequency of non-work trips.

A further consequence of these elasticities is that, at least in the short-run, operators may be able to increase fares in real terms yet nonetheless obtain a net increase in revenue (for example, if 100 trips are made at £1 per trip, revenue is £100. A price increase of 10%, to £1.10, would cause a demand reduction to 96 trips, but the new revenue level would be  $96 \times 1.10 = £105.6$ ). Likewise, a reduction in service, if producing a *pro rata* reduction in costs, would reduce total cost by 10% but with a lesser reduction in revenue. However, given the evidence of much higher price elasticities in the long-term, such an increase could come close to being self-defeating. For example, if the long-run elasticity were about -0.80, the net increase in revenue would be reduced to about £1.20.

## 2.5 Developments prior to deregulation

The effects of external changes and the industry's response may be traced from the 1960s, as bus demand declined from high levels in the 1950s, due to the impact of growing car ownership. The initial effect was a reduction in demand, to which operators responded by increases in real fares and cutting service levels. These in turn caused further decline (a 'vicious circle' effect) but nonetheless restored a revenue:cost balance. Further impacts were caused by real cost increases, especially as labour costs rose, stimulating further service reductions and/or fare increases. Furthermore, reductions in service levels at off-peak periods did not necessarily produce *pro rata* cost savings (for reasons connected with cost structure, as noted above). The clearest attempt to reduce cost per bus-km was by replacing on-board conductors by one-person-operation (opo), although this saving was to some extent offset by increased running time due to extra dwell time at stops, and service quality was worsened due to slower in-vehicle journeys.

Innovation may also have been deterred by the regulatory system which protected existing operators, and made competition (either through bidding for service contracts, or 'on the road') very difficult. Having said this, some useful innovation had occurred during the 1960s and 1970s, notably through adoption of 'Travelcard' ticketing, in which cards giving unlimited travel within designated zones and periods to the holder avoided the need for cash transactions on-vehicle, and also stimulated additional travel through convenience and the zero marginal cost of extra trips. This was most noteworthy in the West Midlands, which introduced this policy at the same time as a marked shift to opo from the early 1970s (thus avoiding substantial increases in dwell time), soon followed by other Passenger Transport Executive areas. London did not follow suit until the 1980s (White 2009).

Powers to finance bus services enabled public authorities, especially those in the then metropolitan counties, to reduce fare levels and increase service levels, thus offsetting the negative effects of car ownership (using the elasticity effects described above), most notably in South Yorkshire, but this incurred high levels of public expenditure, and there were concerns about 'leakage' occurring in payments to inefficient incumbent operators. A further consequence of the regulatory system had been the deliberate encouragement of 'cross-subsidy' in which profitable operations offset losses elsewhere within the same operator's network when applied on a large scale, for example between low car-owning housing estates and more affluent suburbs. This was clearly regressive, in that the lower income areas tended to be those in which bus operation was profitable. However, the shift under deregulation may have been taken too far, treating daytime and evening markets as separate, whereas over the same route these often comprise different legs of trip chains made by the same individuals.

## 2.6 Deregulation in Britain



### *2.6.1 The outcome of express coach deregulation*

The first major change in Britain came about through deregulation of the express coach system in October 1980 under the Transport Act of that year. Both local buses and the coach sector had been regulated under the Road Traffic Act of 1930, but its effects may have been more marked in the latter sector, which began to develop somewhat later than local buses. By 1930 an intensive local bus network already existed in most areas, the main effect of the Act being to enable consolidation of such operators into larger regional companies without fear of further competition. Concurrently, express coach development may have been limited at a critical early stage (nonetheless express coaches competing with rail were able to continue, in contrast to the virtual prohibition of such services in most mainland European countries).

In addition to factors affecting costs described for local bus services above, seasonality had major effects on vehicle utilisation, and thus on unit costs. Direct operating costs per vehicle-km were typically lower than those for local buses, due to much higher average speeds. Price elasticity is generally higher in the express coach sector, in the order of -1.0 in the short run (White, 2001), due to the greater degree of modal competition (at least on trunk routes) and mix of trip purposes, with a high proportion of discretionary travel (such as visiting friends and relatives).

The 'deregulation' was extensive, removing previous controls on routes operated, timetabling and fares charged. However, quality regulation of safety-related aspects was strengthened through the operator licensing system.

The outcomes of express coach deregulation included a large growth in ridership, of about 50% by 1986, with strong price competition on the trunk routes and an overall reduction in price levels. Frequencies, network coverage and service quality were improved. Although there were some cases of service cuts in low-density regions due to loss of cross-subsidy, the overall effect may be judged as generally beneficial. In particular, lower-income users gained, both through the coach service offer itself and effects in stimulating lower prices competition for the off-peak discretionary market by rail. However, the impacts of smaller operators were limited. While many entered the market on deregulation, these were often short-lived. The principal operator, National Express, remained dominant. A major factor may have been the importance of network effects, offering interconnecting services at major hubs, and the marketing strength of large operators. Access to terminals was also a factor. A fuller review is provided by White and Robbins (2012).

The decision to deregulate local bus services under the Transport Act 1985 may have been influenced by the success of the coach deregulation. However, its outcome also suggested that simplistic views on the scope for smaller operators to compete may not have been valid, but this lesson did not appear to have been drawn. Furthermore, the different context (notably the mix of trip purposes and resultant price elasticity) may have made extrapolation of the express coach outcome to local buses questionable.

### *2.6.2 The main components of local bus deregulation in Britain*

One difficulty in analysing the impacts of local bus deregulation is the near-simultaneous abolition of the metropolitan counties from 1 April 1986. This removed the powers of such authorities to provide high levels of comprehensive financial support, resulting in large fare increases and some service cuts, notably in South Yorkshire. Deregulation of local bus services as such followed from 26 October 1986. As in the case of express coaches, it removed controls over routes and timetables. Fares regulation had been largely removed under the 1980 Act, but with limited effect in operator behaviour. In contrast to express coach, a route registration process has remained in place, hence an inventory of routes and timetables can be compiled. A period of notice was stipulated (42 days) for operators register a new service, or amending the route or timetable of an existing service.

It thus became easier for new operators to enter the market, simply by obtaining an operator licence, and then registering the service(s) they planned to run. While an operator licence specified the number of vehicles an operator was allowed to run at any one time, this was based primarily on adequacy of maintenance facilities (and, later, financial resources) rather than forming a quantity limit on the industry as a whole.

Although often associated with deregulation, privatisation was not coincident with it (indeed, in the express coach case, the intensive competition between National Express and British Rail in the early 1980s took place when both were in public ownership). However, central government took the initiative to privatise those operators directly under its ownership (the National Bus Company in England and Wales, and Scottish Bus Group within Scotland). Municipal operators (those owned by local authorities, mainly in larger urban areas) were permitted to continue in public ownership, but as “arm’s length” businesses, hence taken out of direct political control, and separately managed from the local authority as such. They were not permitted to receive general subsidies, and had to bid for contracted services on the same basis as other operators. In practice their owning authorities were often willing to accept lower profit margins than required in privatised companies. Over time, most of the municipal operators have been privatised, including all of those in the former metropolitan counties. However, those remaining have often provided high quality services – for example, both Reading Buses and Lothian Buses [Edinburgh] have won several awards at the annual UK Bus Awards in recent years.

London was not subject to deregulation, and a comprehensive public authority was retained. Bus operations were shifted from the monopolist London Regional Transport (LRT) to a mix of local subsidiaries of that body (all later privatised), and operators new to the London market, gaining service contracts through competitive tendering, creating incentives to control costs and raise service quality, LRT specifying the service level to be provided. A common fare scale was retained, and a ‘gross cost’ contract system adopted, in which

revenue was retained by LRT. Each route formed a separate contract, thus making it easier for smaller operators to enter the market (in contrast to network-wide contracts in French cities, for example). The London system thus formed an experimental (albeit unintentional) 'control' case against which the fully-deregulated system elsewhere could be compared. However, London is also subject to many specific features which make direct comparisons, even with the larger conurbations, difficult. A preferable approach would have been a genuine experiment in which some of the other conurbations had been subject to a system of control similar to that in London. This would also have avoided the issue of potentially compensating private operators where a form of re-regulation is now proposed through quality contracts (discussed further below).

Under the deregulation of 1986 it was assumed that most services would be operated commercially, i.e. user fares, fuel duty rebate (now BSOG) and concessionary fare compensation would cover all costs (including a profit margin for the operator). It was accepted, however, that a number of services could not be provided on this basis, especially in low-density rural areas. Provisions were therefore introduced for contracted services to be provided in such cases. The local authority specifies the service(s) to be provided, fares typically following commercial services in the same area. These generally fill gaps in the commercial network, both in low-density areas, and also during times of day (typically evenings and Sundays) when a commercial service is not registered. The commercial and tendered services thus display considerable intermixing rather than forming separate networks. Most provision is through competitive bidding, but powers also exist for 'de minimus' negotiated contracts when smaller sums are involved. Unlike provision of statutory school transport and compensation for concessionary travel, powers for tendered services are purely discretionary, not mandatory, and there is no general obligation on local authorities to ensure a particular level of service – indeed, several now make no provision for tendered services whatsoever. In practice, about 80% of local bus-kilometres outside London have been operated commercially, the balance tendered, with some fluctuation from year to year.

### *2.6.3 Outcomes of local bus deregulation*

These may be divided into two main periods:

- (a) 1986 to about 2000, characterised by a phase of intensive (but generally not sustained) inter-operator competition, an increase in bus-km run, and a very sharp reduction in real unit cost per bus-km (both in London and the deregulated region). However, ridership losses continued, which combined with increased bus-km run, resulted in a marked drop in average load outside London, and an approximately stable cost per passenger trip made. In London, loadings were retained, resulting in a similar drop in cost per passenger trip to that in cost per bus-km. Total public expenditure fell sharply.
- (b) About 2000 to the present. The rate of passenger decline outside London slowed, with a more stable network and greater focus on service quality, together with the effect of

universal free travel for older people. In London, marked growth in service levels and other factors resulted in a very large growth in ridership. However, cost per bus-km has risen substantially (both within and outside London) and public expenditure has grown rapidly – outside London mainly due to concessionary compensation and within London due to a shift from a break-even position to one involving very high levels of support.

Tables 2.3 to 2.5 provide fuller details of trends in service output, fares, ridership, and unit costs; operator income composition; and public expenditure. Limitations are imposed by some discontinuities in data available, notably for unit costs in London after 2007. However, some recent data published by TfL (2015) does enable an estimate of trends in real cost per bus-km between 2010-11 and 2013-14, suggesting a reduction of about 3% in real terms, albeit from a fairly high absolute level<sup>iv</sup>. Note that 1985/86 is taken as a ‘base year’, i.e. prior to the effects of both metropolitan counties’ abolition and introduction of deregulation.

#### <TABLES 2.3 TO 2.5 HERE>

The sharp drop in real unit costs per bus-km, of about 45% by 1999/2000, both in London and the deregulated areas (White 2014), may be explained by several factors:

- Large staff reductions, especially in engineering and administrative functions;
- Increased productivity of drivers, partly through ‘flattening out’ of peak:off-peak service ratios, producing better driver and vehicle utilisation during the working day;
- Use of smaller vehicles, notably minibuses;
- Changes in working conditions and pay, with marked regional variations.

Whereas before 1986 operators had made incremental service cuts in response to lost ridership, and cut out conductors, deregulation and the threat of competition had a marked effect in forcing a rethink on the whole pattern of working. As services had been cut back, central engineering workshops and administrative structures had not necessarily experienced proportionate reductions. Increased service levels, especially between peaks, reversed a long-term trend of decline in provision. One may thus consider the effects of deregulation (outside London) and competitive tendering (within London) in respect of cost per bus-km and increased service levels to be beneficial. However, poorer wages and working conditions represented a loss to workers in the industry. Furthermore, insofar as some of them became eligible for forms of family public assistance due to low incomes, some of the cost savings in the transport budget may have been offset by increased public spending elsewhere.

The substantial increases in costs since 2000 may be attributed to:

- A need to improve wages and working conditions, in order to recruit sufficient staff, especially up to the recession in 2008. The recent KPMG study (2016, page 26) indicates a 21% rise in bus driver weekly real earnings between 2000 and 2013. Very marked regional differences exist, with some areas displaying high living costs (such

as London and Oxford) needing to offer substantially better conditions than elsewhere;

- A need to insert additional vehicles and drivers into running schedules as congestion worsened, simply to maintain the same frequency (as illustrated earlier), and also ensure adequate reliability Whereas in the earlier phases of deregulation, the Traffic Commissioners were largely concerned with safety matters, increased emphasis has been placed on running reliable services in accordance with the timetable registered, and applying penalties where this has not been done. In the London case, explicit incentives are built into contracts (using the excess waiting time indicator). This has been particularly noteworthy in the last three years. The KMPG study (2016, figure 9) indicates a broadly stable productivity in terms of bus miles per member of staff between 2004/05 and 2013/14, in contrast to the improvement shown during the earlier phase of deregulation.
- Increases in some other costs, such as insurance.

Despite these increases, real unit costs per bus-km remain substantially below those in 1985/6.

In terms of ridership and passenger benefits, a much more mixed picture emerges. As table 2.3 shows, while aggregate service levels improved, fare levels rose substantially in all sectors. The especially large increase in the metropolitan areas was partly due to the abolition of met counties, but nonetheless real increases continued in that sector, and also elsewhere. Whereas competition succeeded in bringing down costs, and increasing total service output, it did not produce aggregate fare reductions, even where operations had been fairly close to break-even prior to deregulation and some of the reduction in costs might have been passed on in lower fares. Where competition developed, it appeared to be based largely on service frequency, rather than fare levels as such (van der Veer, 2002), hence approximating to classic oligopolistic behaviour. A probable factor is the low short-run price elasticity, meaning that lower fares would produce an aggregate reduction in industry revenue despite ridership growth (compared with the higher elasticity in the express coach service, which produced an approximately stable real total revenue where fare changes occurred). Furthermore, given the disutility of waiting time, passengers tend to board the first bus to arrive rather than wait a possibly uncertain period for one with lower fares.

Underlying these changes were negative factors affecting bus ridership, notably rising car ownership, which has an effect irrespective of bus industry regulation or ownership. One means of looking at this effect is to consider the NTS evidence on bus trip rates by car ownership. In the case of non-car households, bus trip rates were little changed in the period to 1992-94 (White 1997), consistent with the effects of rising real fares and increased service levels offsetting each other (as one might expect, given the similar percentage changes, and magnitude of elasticities). However, in car-owning households the bus trip rate declined.

The contrast with London is very clear. Within the first phase, broadly stable ridership was retained. In the second phase, analysis is made somewhat more complex by the effects of major improvements in service level. Briefly, the growth appears to be greater than applying existing elasticity values for fare and service changes would suggest, also affected by factors such as the more comprehensive nature of the service (growth has been fastest for evening and Sunday use), reduction in the share of trips made on cash fares and their subsequent complete elimination (improving speed and reliability), extensive bus priorities, etc. External factors have also been favourable in the London case, notably a broadly stable car ownership per head from the mid-1990s, compared with strong growth (from a low base) in some of the older conurbations elsewhere. Population growth and a high level of economic activity have also assisted bus use.

## **2.7 Evaluating the outcomes of deregulation and competition**

The effects on producers, workers, consumers and public spending can be brought together by using cost-benefit analysis, or by modelling of changes. These may necessitate a 'counterfactual' case being proposed against which the outcomes are assessed. An early approach by the author (White 1990) indicated that a net benefit might be estimated from the London outcome, but negative in areas outwith London and the former Metropolitan Counties ('mets'). In the case of the mets, a benefit emerged from deregulation as such, due to a reduction in costs, treating separately the effects of large fare increases following met counties' abolition. A much more recent analysis by Preston and Alumtairi (2014) indicates a similar outcome (dependent on modelling frameworks employed). Cowie (2014) uses disaggregate data at the level of individual operators to identify five clusters of performance, suggesting that only two of the clusters (representing about 30% of the cases) was a net user benefit observed..

A major issue arising is the role of competition, which has greatly diminished since the early phase of deregulation. The Competition Commission found that only 2.5% of services experienced effective head-to-head competition over their whole length<sup>v</sup> Given the aggregate nature of data available, it is not always possible to examine localised evidence where competition has occurred to see whether better outcomes were provided, as this would entail analysis at a route or corridor, rather than area, level: for example, the attitude surveys by Transport Focus cover somewhat larger areas than individual corridors, and it would be impracticable to increase sample size on the scale required (House of Commons Transport Committee 2012). While individual examples can be found of competition inducing improvements in service levels and/or lower fares (Colson 1996), the overall effects appear limited. In many cases, a commercially-viable service may be sustainable for one operator, but demand is not sufficient to support two or more operators in the long run. Hence at the local level a monopoly often exists, irrespective of whether the operator is locally-owned, or part of a larger group.

These issues were examined in the extensive study carried out by the then Competition Commission (2011). Factors inhibiting competition included the problems of setting up an operating base in the 'territory' of another operator, and the tendency of users to board the first bus to arrive. Despite limited evidence for economies of scale, consolidation in the industry has produced an outcome in which about 70% of the turnover is represented by five large groups (Stagecoach, First, Arriva, Go Ahead, National Express). The Commission found that these groups collectively produced a rate of return on capital employed of 13.5%, 3.8 percentage points above the 'normal' cost of capital of 9.7%.

A number of 'remedies' were examined by the Commission (albeit not including the option of London-style contracting in its final report, despite considering this as an option at an earlier stage of its enquiry). These included scope for more extensive inter-operator ticketing (dominance by a major operator of products such as travelcards may make market entry by small operators more difficult), easier access to bus stations, and a more open process for net cost bidding. Changes introduced to date have been more limited, primarily relating to station access. It also planned to extend the 'block exemption' to competition rules which otherwise inhibit inter-operator ticketing, and to make operation of pay as you go smartcards within this framework easier.

A particular issue arising from the monopolistic nature of local operations and the low demand elasticities is that an operator can substantially increase real fares and/or cut services, while facing little threat of competition, even though the operator is not pursuing 'anti-competitive' actions as such. It would therefore be possible for an operator to transfer a substantial consumer surplus into a producer surplus. In the long run, however, higher elasticities may make this course of action less attractive, as the underlying core market is diminished. Conversely, an innovative operator could also achieve a similarly high profit margin (at the level causing concern to the Competition Commission) by offering an attractive service, increasing revenue and profit margin by increasing passenger volume at a given fare level. These issues are examined in more detail elsewhere by the author (White 2014).

A particularly noteworthy case has been that of First Group, which followed a policy similar to the first hypothetical example described above. Current management has adopted a very different approach, candidly describing the previous image of the company as "...starved of investment, with a culture of cuts and price hikes.." (Fearnley 2015). In some cases, First has faced direct competition from other operators within the same area, whose market share has grown as a result, notably with Stagecoach in Sheffield. In other areas, there has been relatively limited direct 'on the road' competition, but nonetheless a marked change in management approach has been evident. This has been assisted by the regular attitude surveys carried out by Transport Focus, which have measured indicators such as 'Value for Money' (VfM) by named operator as well as area. Particularly poor results were observed for First in the Greater Manchester area (where it is dominant in the northern half of the conurbation), and Bristol. These have stimulated substantial fare reductions by First, resulting

in a marked change in VfM ‘satisfaction’ – for example, in the Bristol area from 33% in 2012 to 61% in 2014 (Transport Focus 2016). This has been associated with substantial ridership growth. One can thus argue that explicit comparisons with performance elsewhere may cause management action, even in the absence of direct competition. In effect, a self-correcting mechanism may exist, albeit applying on a very long timescale.

The extent to which a larger number of operators serving a given area will stimulate higher bus use can be tested by comparing bus trip rate per head with the degree of market concentration. Government data in Britain now show market shares within each local authority area in England (albeit measured by numbers of registered bus [vehicular] trips, rather than passenger volumes). Expressing this in the form of a Herfindahl index indicates no systematic correlation between low concentration and high bus use - if anything, the opposite can be seen in cases such as Brighton & Hove (KPMG, 2016, figure 24). It should be noted, however, that a low degree of concentration may merely imply a large number of operators running within a given area – they may simply serve different parts of that area (as in Surrey, for example) rather than running in direct ‘on the road’ competition (but greater competition for tendered services in such cases would be beneficial to local authorities in controlling costs).

A further aspect of competitive behaviour is whether competition will necessarily arise to restore conditions where an incumbent had caused the local market to diminish through high fares and/or low service levels. An argument can be made that ‘success’ rather than ‘failure’ may attract competition, since a growing market can be more attractive to a new entrant (if one expects a market share of 10%, then in absolute terms this will be greater in a growing market than a declining one, and hence more likely to justify commercial operation). One can see in the case of Nottingham, which has an exceptionally high rate of bus use per head, not only competition between two local incumbents who have stressed marketing and service innovations (Nottingham City Transport and Trentbarton) but also saw entry by local independents, notably ‘Yourbus’.

## **2.8 Experience in other countries**

In many respects the closest equivalent to the almost complete deregulation in Britain was that in Chile, especially the capital Santiago, from the late 1970s. The conditions this produced resulted in a very marked shift to a regulated system under public contracts. However, severe problems arose when the whole network was recast in one step as ‘TransSantiago’, in 2007 (Munoz and de Grange 2009). In contrast, the approach in the regulated London market has been one of incremental change in the network.

There are a few other cases of attempting to follow the deregulation of local bus service as such in countries of similar income per head to Britain. A deregulation of local bus services in Sweden in 2012 enabling the introduction of additional services, produced very little effect (Rye and Wreststrand 2014), perhaps not surprising given the comprehensive public network already offered, and low population density outside major cities. However, the positive



outcome of the express coach case in Britain has been followed by deregulation or extensive liberalisation in several other European countries, notably Sweden and Norway, followed more recently by Germany (in 2013) and France (in 2015). Germany in particular has displayed very rapid growth (Augustin 2014), an initial phase of very strong inter-operator competition being followed by some consolidation and emergence of dominant operators. Stagecoach-owned Megabus expanded strongly, both in international services as such, and operation of wholly domestic express coach services within other EU states, although many of these services have now been taken over by the dominant German operator, Flixbus.

While ‘on the road’ local bus deregulation on the British model has not been followed elsewhere in Europe, there is concern regarding the value for money in supporting services of incumbent operators, and a shift to competitive bidding. In Scandinavia in particular, this has followed the London model of route-by-route contracts. The growth of a contracting market has also stimulated greater internationalisation of an industry which was previously dominated by publicly-owned domestic operators. For example, Arriva (formerly in British ownership, now a subsidiary of DB) expanded into several other EU member states. Within London’s very large market, substantial shares are held by non-UK operators (RATP of France, Abellio of the Netherlands, Comfort Delgro of Singapore and Tower Transit of Australia). A recent shift to competitive tendering in Singapore has resulted in Go Ahead securing gross cost contracts, and the Israeli co-operative Egged has gained contracts in the Netherlands.

## **2.9 Future policy implications**

Reverting to the British case, a strong debate continues as to whether the London model could be adopted elsewhere, especially the other major conurbations. Powers to introduce ‘quality contracts’ set out under the Transport Act 2000 and Local Transport Act 2008 have had no effect in practice to date. A proposal to introduce such a scheme in Tyne & Wear (T&W) was reviewed by a three-person panel, which indicated a negative outcome was likely overall. In particular, the loss of future profits by incumbent commercial operators was considered a major factor (Local Transport Today 2015), and if such compensation were to be paid, this would impose very high costs on the public sector.

## **2.10 The Bus Services Bill 2016**

In May 2016 the British government introduced a Bus Services Bill. At the time of writing (September 2016), it has been debated in the House of Lords (House of Lords 2016), with further stages yet to be completed. Enactment in 2017 appears probable.

The tone of the Bill is noteworthy for its marked contrast with the focus on competition *per se* in the 2011 report of the Competition Commission, and statements by its successor body, the Competition and Markets Authority (C&MA). The emphasis is on greater co-ordination

of services, with mechanisms set out both for franchise-style operation, and more extensive partnerships between operators and local authorities. In brief, the main components are:

1. 'Advanced Quality Partnership Schemes' In contrast to existing statutory partnerships these would not depend on new infrastructure provision. Specified service standards may include frequency and/or timing. Maximum fare controls are also proposed. These powers would enable a greater degree of co-ordination than under previous competition policy, although common fare scale cannot be set.
2. 'Franchising schemes' can be adopted by Combined Authorities (CAs) with elected mayors, and by other types of authority (but in the latter cases the Secretary of State's consent would be required). The requirements for consultation and audit are much less onerous than those arising in Tyne & Wear case. There would be no explicit compensation to existing operators for loss of profits, but no powers to take assets such as vehicles or land. However, a scheme could be revoked with six months' notice on criteria including 'financial difficulties' for the authority (this could create substantial uncertainty for operators). The franchising authority would have powers to obtain information from operators for a period of up to five years before a proposed franchise, including trips, fares, revenue, and bus-kilometres run, thus removing some of the problems found in T&W case.
3. 'Enhanced Partnership Plans and Schemes'. These create scope for greater co-ordination, but without full franchising. They would be area rather than corridor-based. A scheme may specify requirements on frequency and/or timing, and some other aspects (but not control of fares, except prices of multi-operator tickets). Registration of services to be with local authority.
4. Registration of Bus Services. Where an operator seeks to vary or cancel a registration, details are to be supplied of passenger trips, fare paid and revenue to the local authority [this removes an incumbent advantage which has existed for many years, enabling an operator which has deregistered a service on which it knows the revenue to make a net cost bid on this basis]
5. A new power would prohibit local authorities from setting up new bus companies in England (despite evidence of good performance from some companies in this category, as noted above)

Responses from the operating industry generally favour the partnership approach rather than franchising, although a number of operators which have focussed on the latter approach (such as RATP Dev, and Tower Transit) have favoured its expansion.

## **2.11 Conclusions**

The cost structure of local bus operation indicates little potential for direct operational economies of scale. However, where fairly complete deregulation has been attempted, as in the British case, consolidation into large groups has been observed. The extent of direct competition has been patchy, and in most cases the market appears insufficient to support more than one operator on a specific route in the long term. This in turn creates a danger of exploitation by increasing fares and/or cutting services, which on the road competition does not necessarily emerge to correct (but management attitudes may be influenced by evidence

from other areas). It must be emphasised, however, that the aggregate nature of data available in Britain inhibits examination of competition effects on demand at a very local level.

Much clearer evidence exists for the potential to improve efficiency and reduce costs within a comprehensive framework through a system of competitive tendering (as in the London case), as is being increasingly adopted elsewhere.

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<sup>i</sup> See paragraph 9.181 of the Commission's report. A 'small' depot was defined as one handling fewer than 3.8 million passengers per annum – at 100,000 passengers per vehicle per annum, this would correspond to 38 vehicles.

<sup>ii</sup> A review of definitions is currently being conducted by UTIP (International Union of Public Transport)

<sup>iii</sup> See Part 10 of the Commission's report

<sup>iv</sup> Author's calculations from data in TfL 2015 pp 81 and 103, adjusted to real terms by RPI

<sup>v</sup> Competition Commission report, para 11.11(b)