

Report on Public Transport Provision in Rural and Depopulated Areas in the United Kingdom

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1. Introduction

In drawing lessons from experience in the United Kingdom, it is useful to firstly examine some of the overall differences between the UK and Finland, both in respect of aggregate statistics and structure of the public transport system. The following statistics indicate the main comparisons.

Table 1. **Comparative statistics on Finland, United Kingdom and EU**

	UK	Finland	EU27 average
Population (2012) (million)	62.99	5.40	
Area (1,000 km ²)	243.80	338.40	
Population density (persons/km ²)	258.40	15.95	116.00
GDP per head (Purchasing PowerParity, PPP) (2011)	109	115	100
Percentage population change 2011-12	+0.8%	+0.5%	+0.3%
Person-km travelled ('000m) (2011)	767.50	77.40	
Person-km per head (2011)	12.185	14.331	
Modal split of motorised land transport (2011)			
Passenger cars	85.4%	84.6%	82.7%
Bus & Coach	5.9%	9.7%	11.2%
Rail	7.4%	5.0%	7.0%
Tram & Metro	1.4%	0.7%	1.6%
Car ownership per head	0.466	0.551	0.483

Source: EU Transport in Figures: Statistical Pocketbook 2013. European Commission, Luxembourg, 2013. Tables 1.1, 1.5, 2.3.3, 2.3.4, 2.3.5, 2.3.6, 2.3.7 and 2.6.1

In many respects the main indicators are very similar (GDP in PPP terms, overall modal split, car ownership levels), with the very striking difference in population density, that for Finland being less than one tenth of the UK figure. In these circumstances it is not surprising that car ownership per head is somewhat higher (by 18.2%), and likewise total distance travelled per person (by 17.6%).

An implication of these contrasts is that even areas regarded as 'low density' within the UK might not be classified as 'low density' by Finnish standards, and this may affect transferability of results.

2. Structure of the Passenger Transport Industry in the UK

The term 'United Kingdom' (UK) refers to the whole of Great Britain and Northern Ireland, but for most purposes this text will deal with Great Britain (GB), comprising the island covered by England, Scotland and Wales. The population of Northern Ireland is approximately 1.5 million. There is also a substantial difference in the structure of the industries, in that Northern Ireland retains a

largely state-owned structure through the holding company Translink, which operates the rail system, rural and interurban buses & coaches (Ulsterbus) and the Belfast city network (Metro). In these respects it has more in common with the adjoining Republic of Ireland than the rest of the UK.

Within Great Britain, the passenger transport industry has been largely privatised, and the bus and coach sector also subject to deregulation.

Rail industry

Network Rail (NR): a state-controlled body owning the infrastructure (track, signalling, stations, etc.). Funding is derived from access charges paid by train operating companies, but an increasing share comes direct in grants from the state. Hence, in order to estimate costs of different parts of the network it is necessary to apportion the state grant to them. It is effectively ‘nationalised’ in that the government guarantees borrowings, which are now made from the Treasury.

Train Operating Companies (TOCs): these operate passenger train services over specific parts of the network for which they have franchise contracts with the Department for Transport (DfT). The contracts specify a level of service to be operated, and a net grant to be paid to each company per annum based on its franchise bid (with adjustments to allow for other factors, notably variations in GDP). In a few cases a ‘premium’ is paid back to the state (i.e. total revenues exceed costs), although this is somewhat artificial due to the element of direct grant support for NR’s costs (above). However, companies operating in low-density regions generally receive a large net grant (for example, Scotrail, Northern Rail, and Arriva Trains Wales). In other cases, a mix of low-density routes and higher-density flows are handled by the same franchise (for example, East Midlands Trains, covering the London – Sheffield main line and adjoining regional services).

There are also some open-access operators, which do not have franchise agreement with DfT, but run commercially at their own risk on selected long-distance routes. Freight operators are important in terms of track capacity needs in some areas, but constitute only a small part of NR’s access charge income.

Rolling Stock Leasing Companies (ROSCOs). Almost all passenger rolling stock is owned by leasing companies, rather than the train operators themselves, who pay an annual lease charge for each vehicle. Hence, TOCs incur very few capital costs (rolling stock being leased, and infrastructure provided by Network Rail). A very small operating profit margin may thus suffice to give a high rate of return on capital.

The rail network has remained broadly stable since the early 1970s (following extensive closures of low-density routes in the 1950s and 1960s), and a number of improvements have been made to rural and regional services, notably in terms of frequency, rolling stock quality and opening of additional local stations. In some cases, additional assistance has been provided by local authorities for enhancements, and the ‘Community Rail Partnership’ (CRP) concept has enabled volunteers to assist with matters such as non-operational station staffing, and publicity. Some route reopening has also occurred, the most substantial example of which will be the Borders Railway, running south from Edinburgh to Tweedbank, due to open in 2015. From time to time, the concept of ‘micro franchises’ has been put forward, whereby low-density rural lines might be operated by a separate company from the main franchise holder for that part of the network, possibly with different staff working conditions & pay, and operating methods, but no such examples have emerged.

Bus and Coach Industry

In common with Finland, the British industry includes an extensive express coach network competing with rail, as well as local and regional services.

Express coach services were deregulated in 1980, with both price and quantity restrictions being removed. Subsequently, local bus services (except in London and Northern Ireland) were deregulated from October 1986 under the Transport Act 1985. Much of the industry has been subsequently privatised, but this process has not been universal. The two state-owned operating groups (National Bus Company in England and Wales, Scottish Bus Group in Scotland) were privatised in the late 1980s and early 1990s, and most of the urban operations owned by the local authorities have also been privatised, although about 11 remain. There is also a substantial sector of the industry which has remained in private ownership throughout, notably the smaller 'independent' operators often based in rural areas. These have always been particularly active in the 'non-scheduled' market (such as school contract work and private hire) but also operate scheduled local public services.

Prior to deregulation, substantial growth had occurred in the net financial support provided to bus operators via central government and local authorities, especially in some of the larger urban areas. As part of the deregulation process, operators were required to indicate what services they would run 'commercially', i.e. those on which all costs would be covered by passenger revenue, fuel duty rebate and concessionary fares compensation. The 'fuel duty rebate' was a rebate then paid of most of the duty (80%) normally paid on diesel fuel – for example if the usual duty were 50p per litre, then 40p would be rebated (paid back) to the operator. This applied only to scheduled local bus services, not long-distance coach services, or private hire, etc.

Concessionary fares compensation is the sum paid to operators where the local authority requires the operator to charge a lower fare (or no fare at all) to selected groups of passengers (mostly older people). This is based on the principle of 'no better off, no worse off', i.e. the financial position of the bus operator should be the same as if they had charged the normal fare to that category of passengers (most of the compensation is to allow for the net revenue loss, but allowance is also included for extra capacity costs where incurred: in most cases the concession applies only after the morning peak period, and capacity costs are assumed to be marginal, making use of empty seats). Hence, a 'commercial' service might receive about 80% of its income from passenger fares, the rest from the other two categories. Note that the fuel duty rebate has been replaced by Bus Service Operator Grant (BSOG), which serves a similar role, but also includes incentive payments for use of smartcard ticketing, low carbon vehicles, etc. It takes different forms in Scotland and Wales, in the former now being based on bus-kilometres run, rather than fuel consumed (this is of benefit to rural services, which tend to be more fuel-efficient: a criticism of BSOG is that it tends to favour urban services, which have poorer fuel efficiency).

It was accepted that not all services would be commercially registered, and that local authorities would wish to ensure provision of other 'non-commercial' services, especially to aid the mobility of those without access to cars. Prior to the deregulation effective from October 1986, operators were asked to give several months' notice of services they intended to register commercially (specifying route and timetable, but not fares). Local authorities then had the opportunity to identify gaps in this network, and invite operators to bid for services to cover them. It was expected that most such operation would occur in rural areas, but in practice a more complex pattern emerged - for example, a rural service between two towns might be registered commercially for operation in the Monday to Saturday daytime period, but not during evenings or Sundays. Even in urban areas, some services were likewise registered on a part-day/part-week pattern. The effect, therefore, is that we do not find separate 'commercial' and 'tendered' services, but a complex mix.

The great majority of non-commercial services are secured by competitive tendering, in which the local authority specifies the service to be provided and invites bids. The lowest-cost bidder is (in most cases) then awarded the contract. This may mean, for example, that one operator runs a route during the Monday –Saturday daytime period, and another during evenings and Sundays. There is also provision for 'de minimus' grants, where (within a fixed upper limit) local authorities and operators can negotiate an agreed price, rather than a competitive tendering process occurring (for example, to

divert an otherwise commercial route via an additional village, rather than contract a separate service for that purpose). About 20% of total local bus-km has been tendered in the period since deregulation, and 80% run commercially. The tendered percentage is generally higher in lower-density areas, as might be expected (in 2012-13, 14% in metropolitan areas, 23% in the rest of England).

The Transport Act 1985 also introduced some other changes with potential significance for rural areas:

Sections 12 to 16 reformed the regulation to taxi and private hire vehicle (PHV) services. These changes potentially introduced a mode intermediate between ‘bus’ and ‘taxi’ in terms of regulatory categories, which could be useful for low-density flows, especially in rural areas. However, developments to date appear to be very limited (see section 5 of this paper).

Sections 19 and 22 of the 1985 Act introduced wider scope for community transport operators to provide scheduled public services, and clarified the legal position. Services run under section 19 do not accept concessionary fare passes as they are not public transport services and do not have to register a route or area of service with the Traffic Commissioner. They can now be used by members of the public on the grounds of the remoteness of the area they live in, although people who use them are normally members of a scheme (e.g. a registered charity offering Dial-a-Ride services). They are typically used by people in really remote rural areas, or for intra-urban journeys by people with disabilities. Section 22 services have to register a route or area of service with the Traffic Commissioner (as for conventional bus services) and be subject to checks by the Vehicle and Operator Licensing Agency. They must accept concessionary fare passes, and are marketed and advertised like a public transport service. Anyone can use them (so long as their journey corresponds with the registered area of operation)

Prior to this, from the early 1970s, some services had developed in rural areas which were provided by community transport groups, typically running minibuses of up to 16 seats, driven by volunteers. These provide both private hire and local scheduled services open to the general public, often in low-density areas not served by conventional bus operators (for example, the ‘Cuckmere Community Bus’ in East Sussex). The Minibus Act of 1977 clarified their legal status, and also that of minibuses owned purely for use by designated groups (for example, operated by charities to serve particular categories of user, or schools for their won pupils, etc.). These not-for-profit organisations are also able to employ paid staff, and bid for tendered services. However, this has raised concerns about fairness of competition with bus and coach operators who have to meet the fuller quality licensing requirements (for example, the EU requirement that each driver holds a Certificate of Professional Competence) who are also bidding for such services.

The term ‘demand responsive service’ is used to cover a wide range of services with flexible routing, which can be operated under the types described above, or as fully-registered bus services provided by a commercial operator (although very few of the services themselves are commercially viable and most rely on local authority support). Typically, smaller vehicles are used (8 to 16 seats) with all passengers pre-booking their trips in both directions. Some services are largely fixed routes with minor deviations on request (for example the ‘Call Connect’ service between Louth and Horncastle in east Lincolnshire). A more common pattern is that vehicles circulate within a defined area, usually centred on a market town, as applies to the great majority of the ‘Call Connect’ services in Lincolnshire (a concept sometimes referred to as ‘many to one/one to many’). These provides links into the town itself, and also interchange with trunk ‘Interconnect’ conventional bus services providing inter-urban links (for example, at Spilsby and Horncastle on the Skegness- Spilsby - Horncastle – Lincoln route). An element of many-to-many links (e.g. from one village to another) may also be provided. Almost all of rural Lincolnshire is now covered by Call Connect services where fixed routes do not operate; the main exceptions being around Lincoln (see www.lincolnshire.gov.uk).

Such services provide much greater flexibility than conventional fixed-route bus services, enabling, in effect, a higher level of service to be provided over an area within a given budget. However, there are some limitations, notably the pre-booking requirement which may be inconvenient for some users in contrast to simply turning up at a stop for fixed-route timetabled service. A distinction should also be drawn between demand-responsive services which provide door-to-door links (e.g. calling at the homes of users), which may clearly be of great benefit to those unable to walk to the nearest stop, and those which serve a convenient picking-up point in a rural settlement (akin to a traditional fixed-route bus stop).

Trends in the bus and coach industry

The overall effect of the deregulation was to encourage a radical reduction in operating costs (for all types of bus services), which eventually resulted in unit cost per bus-km in 1999/2000 being about 45% below those for 1985/86 (i.e. the year immediately before deregulation) in real terms. A number of factors contributed to this:

- Use of smaller vehicles, with lower capital, maintenance and fuel costs
- Radical changes in operating practices by existing operators, associated with the threat of competition (both on commercial and tendered services). Sharp reductions were made in administrative and engineering staff, and driver schedules made more efficient.
- Greater variation in wage levels and working conditions. National negotiations with trade unions were replaced by local negotiations, resulting in wage rates reflecting local labour markets. This may have been particularly beneficial in some rural areas, in which a much lower wage rate was still sufficient to recruit staff.

However, the shift to smaller vehicles was somewhat artificial, and in many cases has been reversed, especially within urban areas. Nonetheless, many lower density and rural routes are now operated by relatively small vehicles (such as the Optare ‘Solo’ seating around 25-30 passengers).

From 2000, unit operating costs in the industry have increased, notably due to the need for better wages and working conditions to recruit staff (although large regional variations remain), but nonetheless remain approximately 25-30% below the 1985/86 levels in real terms.

The DfT publishes statistics at an aggregated level, rather than for individual operators. Data are also published at a more local level, indicating bus trips per head of population by local authority area (but a substantial time series is not available). A separate ‘rural’ series is not available, but statistics are provided for the ‘rest of England’, i.e. excluding London and the six metropolitan areas (the six largest conurbations within England outside London). Note, however, that much of the bus ridership in this category will be within urban areas rather than rural or lower-density areas. More recent data is for ‘England outside London’, i.e. including the metropolitan areas.

Table 2. **Bus Industry trends since 1985/86**

	From 1985/86 to 2007/08 inclusive	2007/08 to 2012/13 inclusive
	Rest of England	England outside London
Passenger trips	-16%	- 2% *
Bus-km run	+ 42%	- 2% *
Real fare index	+30%	+ 8.2% *
Real cost/bus-km	-34% (to 2006/07)	+17.7%
Real cost/pax trip	+ 6% (to 2006/07)	+19.1%

Notes: Real’ changes to 2007/08 are measured at 2007/08 prices.

*still corresponds to ‘rest of England’ area.

Changes to 2007/08 inclusive derived from DfT Public Transport Statistics Bulletins to 2008 incl. Changes between 2007/08 and 2012/13 derived from DfT tables BUS 0103 (pax trips), BUS0407a (cost per pax trip), BUS0405 (fares index) (real changes being measured at 2012/13 prices). Separate series are shown due to changes in definitions from 2008 in cost data.

The sharp decline in cost per bus-km is clear. The large increase in bus-km run was associated with use of smaller vehicles and improved frequencies. The passenger trips reduction is associated primarily with growth in car ownership over this period. Note, however, that the real fares index grew by about 30% to 2007/08, i.e. while competition (or threat thereof) may have affected costs, there has been little direct ‘on the road’ competition, especially in rural areas, and even where this has occurred has tended to focus on service levels rather than price.

The effect of the large rise in bus-km run and reduction in passenger trips was that the average load carried per bus-km fell dramatically, and cost per passenger trip rose by 6% to 2007/08. It rose further, by 19.1% between 2007/08 and 2012/13, but in this case mainly due to the rise in cost per bus-km.

It should be noted that ridership trends have been affected by the large extension of concessionary travel. From 2001 a compulsory national scheme was introduced in which the concession fare for older and disabled users could not be more than half the fare otherwise charged. This was extended, firstly in Wales and Scotland, to provide entirely free travel after the morning peak period, and likewise for the local area of residence within England from April 2006. From April 2008 concessionary pass holders in England could travel throughout England free of charge during the eligible periods. There is strong evidence for a large increase in the take-up of passes, as well as for increased travel by those previously holding a half-fare pass. It is likely that the extension of free concessionary travel was the main factor, offsetting the effects of rising car ownership during this period. Concessionary passenger journeys as a percentage of the total bus passenger journeys in the non-metropolitan areas in England rose from 31% of all trips in 2007-08 to 36% in 2011/13 (DfT Table BUS0105). However, a large increase in public expenditure has occurred as a result.

From the bus operators’ viewpoint, the composition of gross business income does not vary as much as might be expected. For example, in 2009/10, the main elements were as shown in Table 3.

Table 3. **Composition of Operator Income in 2009/10**
(percentages)

Category of region	Passenger revenue	Gross support*	Conc comp	BSOG
London	47	34	12	6
English Metropolitan areas	56	10	23	10
Rest of England (inc. rural)	52	20	20	9

Source: DfT Table BUS0501a (NB Discontinuity from previous series)

Note: * includes local authority associated expenditure (e.g. administration of service tendering process)

Evidence from the National Travel Survey (NTS)

The National Travel Survey (NTS) in Britain is exceptionally comprehensive, having been conducted continuously since 1988, enabling both annual changes and seasonality to be monitored. A large sample of households is interviewed each year. A very good response rate (approx. 60%) is obtained for a seven-day travel diary in which trips by all household members are recorded. All modes and trip purposes are covered (apart from international travel). Until the end of 2012 (the period for which data below have been extracted) the whole of England, Wales and Scotland was sampled, but since the start of 2013 England only.

Data are classified by type of area in which respondents live. For this purpose, 'rural' was defined as settlements of under 3,000 people (which could include some smaller towns as well as villages and smaller settlements). As one would expect, residents in such areas tend to have much higher car ownership than in larger urban areas, even among the lowest income groups, and the public transport market share is lower. Nonetheless, public transport continues to play a significant role.

Table 4 below shows an expanded version of NTS Table 9903, helpfully provided by DfT. This is based on a broader definition than shown in the NTS published tables, by including within the 'public transport' the category of 'private bus' (i.e. a bus or coach hired for use by a particular group of passengers, rather than carrying passengers at separate fares. Most of these are probably school services, the provision of contract 'works' services for particular employers having declined markedly in recent years). Trip rates are averaged over two successive years, due to sample size limitations. The overall trip rate in rural areas by public transport has remained broadly stable, at 53-59 per person per annum, the net reduction being mainly in 'private bus'. 'Local bus' has remained broadly stable (falling from 30 to 28). Growth in concessionary travel by bus will have affected trends during this period (see above). Taxi/PHV use has remained remarkably stable at 5 or 6 per person per annum.

Table 4. **Expanded data from NTS Table 9903 for rural areas** (trips per person per year)

Year	Private bus	Local bus	Rail	Taxi/PHV	Other pub	All public
	12	30	9	5	3	59
2003-04	11	30	9	5	2	57
2004-05	12	29	10	6	2	59
2005-06	11	28	10	5	3	57
2006-07	10	28	10	5	2	55
2007-08	10	29	9	5	1	54
2008-09	10	29	9	5	2	55
2009-10	11	27	9	5	2	54
2010-11	10	29	9	5	2	55
2011-12	9	28	9	5	2	53

Source: Special tabulations from DfT provided at author's request, May 2014. NB Trip rate for each mode rounded to nearest whole number.

In addition to recording trips made, the NTS also includes an interview with each household sampled, in which general background data (such as car ownership) is obtained. This includes a stated estimate of walking time to the nearest bus stop, and the frequency of service provided. Published NTS data then indicate percentages of the population living with given walking times of the nearest bus stop, and also an 'availability indicator', defined as the percentage living both within 13 minutes' walk of the nearest stop, and with at least an hourly daytime service. As might be expected, a much higher proportion of the urban population lives within a short walking time of the nearest stop, and also has a high level of service, but it is noteworthy that the rural levels have improved considerably in recent years. The national average value for the 'accessibility indicator' for buses is very high, largely influenced by levels in urban areas – the overall average rose from 90% in 2002 to 91% in 2012, but the large improvement in rural areas, from 46% in 2002 to 61% in 2012, is noteworthy, probably influenced by improved levels of rural services and especially demand-responsive provision (source: NTS Table 0801).

Under the 2011 census, revised definitions for rural areas have been adopted (NB data above are all based on the earlier NTS definition of settlements under 3,000 population), in which distinctions are drawn between 'rural towns and fringe', and 'all rural villages, hamlets and isolated dwellings'.

These have been used in an assessment of travel indicators by the DfT, drawing on NTS data from 2008 to 2012 by area type¹.

3. Development of demand-responsive services

The development of demand-responsive services has been stimulated by improvements in route planning software which enables more effective and efficient planning of journeys in response to users' requests received at fairly short notice prior to trips being made. Replacement of low-frequency fixed-route services by demand-responsive services circulating in the same area may provide better service coverage within the same budget. The Lincolnshire example cited earlier is probably the most extensive in Britain, both in the areas covered and periods of operation (typically about ten hours per day, Mondays to Saturdays). Elsewhere, such services tend to have more limited coverage, both spatial and temporal.

However, unit costs per passenger trip are often very high, even when netting out fare receipts, in the order of £4-£6 or even higher in some cases. They do not necessarily form a cheaper alternative to fixed route buses when usage (as distinct from area coverage) is taken into account – in other words, demand-responsive services may enable a planning objective to be achieved more readily within a given budget (e.g. that all residents of a rural area should be served at a given level of accessibility), but on a cost per trip basis (taking usage into account) may still be very costly. An admittedly extreme example is the case of the 'Shropshire Link' services, introduced in November 2008 to cover much of the rural areas within that county, in replacement of fixed-route services (the proportion of the population with a service at least two days per week rose from 57% to 95%)². However, costs were very high, in the last full year of operation (2011/12) totalling £571,000 versus income (including concessionary compensation and school contract work as well as passenger fares) of only £64,000. Average support per passenger trip was approximately £19 in 2013³, and all services have now ceased (although some limited replacements have been provided in certain cases).

It does not necessarily follow, therefore, that demand-responsive services or other innovative types are necessarily a cheaper option than conventional services (although this will depend on density of demand - see below) and when severe expenditure cuts are being made could easily be withdrawn.

A useful review of recent research on DRT services is provided by Loughborough University⁴, 'DRT for DRT'. This summarises the results of a project undertaken in the period 2010-2013. An overall review indicated 369 DRT schemes which had been operated during the period 1997 to 2012 by 59 organisations in Britain. The number operating at any one time has risen sharply from under 50 in the late 1990s to a peak of over 250 in 2010, but subsequently had shown some decline, associated with funding cuts. The future could see either more cuts, or scope for a wider role as conventional transport declines, for example in response to mobility needs for an ageing population. Modelling of

1. Department for Transport 'Transport and Accessibility to Services'. Report to DEFRA, January 2014
2. Bus & Coach Professional 9 January 2009, p8
3. Bus & Coach Professional 2 August 2013.
4. Loughborough University. Developing Relevant Tools for Demand Responsive Transport: 'DRT for DRT' final newsletter, Summer 2013.

demand (trips per user per week) for the Call Connect services in Lincolnshire (as described above) indicated a negative relationship with population density, but positive for mobility impairment and travel for work. An enhanced demand model was calibrated from two areas, one of which was rural. This indicated a willingness for both car users and existing bus users to use a DRT service (providing door-to-door access), at a higher fare than existing bus fares. The research also indicated potential new markets and products for DRT in rail station and airport access, workplaces outside the urban core for employers, and an integrated DRT supply for the general public.

4. The appropriate role for smaller vehicles

As indicated in section 5 of this report dealing with taxis, there is extensive evidence of growth in supply and use of taxis Britain, but most of this appears to be of the traditional 'single hirer' form, rather than use of innovative service types such as shared taxis or taxibuses which could be of value in rural areas.

There is also extensive experience of demand-responsive services, although in many cases these incur much higher total operating costs (and public expenditure) per passenger trip) than the average for conventional rural bus services.

Scope for wider use of taxi-based options was examined in a report published by the former Commission for Integrated Transport in 2008⁵. This reviewed demand-responsive and shared taxi schemes in a sample of UK rural areas, and also elsewhere in Europe (especially the 'Traintaxi' and 'Regiotaxi' in the Netherlands). It proposed a county-wide experimental scheme in Britain, integrating taxi, community transport and demand-responsive services. It also noted some of the constraints on taxis, notably the small licensing areas in which they are permitted to operate, the application of Value Added Tax (VAT) to taxi fares (which does not apply to bus fares) and lack of eligibility for BSOG. Work undertaken in conjunction with this study is described by Mulley⁶, especially in respect of the scope for shared taxi services, indicating lower unit costs elsewhere in Europe than in the UK.

Clearly, one problem which arises in making comparisons between the different options available is that density of demand will affect unit costs. Demand-responsive and taxi-based modes may be much more expensive than a supported bus service due to lower densities of demand which they are serving - conversely it would be illogical to use them to substitute for a fixed-route bus service where that was cheaper - so some form of like-with-like comparison is needed. In this respect, a very useful synthesis has been provided by Wright⁷, drawing on experience of a number of experiments in the 'FLIPPER' pilot projects in Europe. He examined costs per passenger trip, as related to density of demand, deriving the following broad guidance:

5. Commission for Integrated Transport 'A New Approach to Rural Public Transport' November 2008
6. Mulley, C. 'Promoting social exclusion in a deregulated environment: extending accessibility using collective taxi-based services' *Research in Transportation Economics* Vol 29 (2010), pp 296-303.
7. Wright, S. 'Designing flexible transport services: guidelines for choosing the vehicle type' *Transportation Planning and Technology* 2013 (Vol 36, no 1) pp 76-92

Table 5. Indicative guidance for vehicle choice related to density of demand

Trips per vehicle hour x trip length [i.e. passenger-km per vehicle-hour]	Suggested vehicle choice
Less than 10	Taxi
Between 10 and 20	Taxi(s) or flexible minibus – choice will depend on availability and relative costs locally
Between 20 and 50	Flexible minibus, with lower degree of route flexibility at the higher end of the range
Greater than 50	Largely fixed route bus, with limited deviations

Source: derived from Wright 2013, Table 4

5. Taxi regulation issues

Taxis in Britain form a substantial part of the total public transport market, especially when considered in terms of revenue rather than physical passenger trips. Their current role in rural areas appears to be limited, but potentially they could play a more substantial role as a mode intermediate between bus and private car.

Main features

Some basic definitions:

- A taxi ('hackney cab') is a vehicle licensed to 'ply for hire' on street, with a metered fare scale. There are usually some quality controls on drivers & vehicles (in addition to the usual legal requirements for driving licences, vehicle insurance, etc.), and sometimes on the quantity of taxis licensed in a specific area. A 'taxi' is a vehicle of up to 8 seats.
- Private Hire Vehicle (PHV) – or 'Minicab' in London. A vehicle offering pre-booked trips only, not metered. The price is agreed between the operator and the customer
- Outside London, these distinctions are less marked (as many taxis are pre-booked by phone call, for example). Some terms are used more generally e.g. 'cab', to cover both types of service, and users may not always distinguish between them (hence in the National Travel Survey they are combined in a single category). The growing use of mobile phone apps also makes the distinction between the two categories less meaningful than before.

In Britain, quantity licensing never applied to PHVs, but was applied extensively to taxis, and remains in a number of areas (discussed further below).

There is a wide range of quality controls, from very strict in London (covering driver licensing, taxicab design, and extensive understanding of the inner London road network, known as 'The Knowledge'), to very minor elsewhere.

Several market sub-sectors may be defined. 'Taxi ranks' are places set aside specifically for taxis to pick up customers, usually at points of concentrated demand (airports, railway stations, town centres, etc.). Vehicles queue in order of arrival. 'Street cruising' describes the case where empty taxis may run along streets, with a sign indicating that they are available for hire, and pick up passengers at the roadside on request. This is most common in central and inner London, and other large cities. The

‘pre-booked’ market is probably the largest both for taxis and (by definition) PHVs, with bookings made by calling at an office, by phone, etc. ‘Radio circuits’ provide a means by which calls from a wide range of potential users can be offered to individual taxi drivers, identifying the driver closest to the point from which the customer wishes to be picked up. Many taxis are run by owner-drivers or very small businesses, and these provide a means of efficiently combining calls from many customers.

It should be noted that efficient and profitable operation of taxis and PHVs rests on securing a succession of calls during the period of a driver shift, which may be aided by use of radio circuits, etc., and are most likely to arise in areas of high-density demand. Hence, while taxis and PHVs may appear attractive in rural areas by virtue of vehicle size, demand density makes this difficult to justify commercially.

Overall trends

Overall trends in Britain indicate a large increase in supply of licensed taxis over the last thirty years.

Table 6. **Trends in taxi licenses in the United Kingdom**

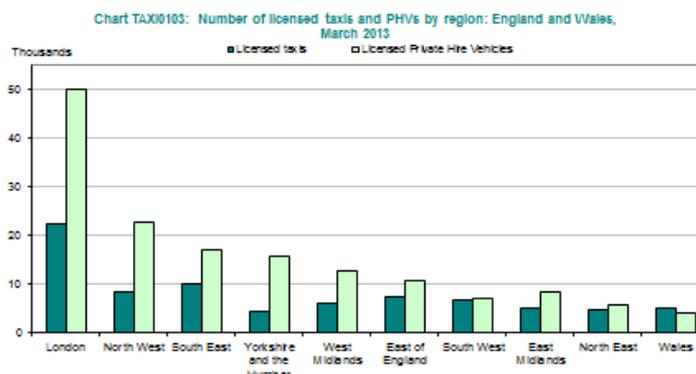
Year	1981	1992	2005	2011	2013
London	12,600	17,600	20,800	22,600	22,200
England & Wales (outside Lon.)	17,800	31,800*	47,200	50,400	55,700

Note: * 1991 figure: all districts licensed only from 1986

More drivers than taxis are licensed in London. This a traditional feature, linked with double-shifting and part-time working: for example, an owner-driver might drive their own vehicle for one shift, then rent it to another driver for a second shift within the same day. In 1981 the ratio of drivers to vehicles was 1.41, but this fell to 1.15 in 2013. Outside London, more taxis than taxi-only driver licences (37,600 in 2013). However, there are also many cases of ‘dual’ taxi/PHV driver licensing outside London (78,300 dual licences in 2013).

As can be seen, usage peaked in 1998/2000, and has fallen slightly since but still remains well above the level of 1985/86. Hence growth can be seen in both in supply and use, higher in the former. A supplementary expanded tabulation of NTS Table 9903 has been helpfully supplied by the DfT, giving a breakdown of the trip rates per person by each mode, by type of area; from 2002/03 to 2011/12 (two years’ data are combined, given limited sample size from a single year). This indicates that taxi/PHV trip rates are typically highest in metropolitan built-up areas, followed by London and large urban areas, but substantially lower in small urban (3,000 to 25,000 population) and rural areas (under 3,000), as shown on page 18.

Figure 1. Number of licensed taxis and PHV's by region in 2013



Sources: Transport Statistics Great Britain 1992 table 5.9 [data for 1981 and 1992] and Department for Transport Statistics table 'Taxi0103' [2005 to 2013], from which the chart below is derived

It should be borne in mind that the number of vehicles licensed in an area may not be best indicator of supply – for example, as taxi numbers grow from a low base, double-shift working may be reduced. Hours of service operated (e.g. vehicles x hours per vehicle per day in operation) is a more useful indicator, but not usually available.

Trends in PHVs are less clear than for taxis due to lack of comprehensive licensing in the past. The total in England & Wales (excluding London) was 84,500 in 2005 (versus 47,200 taxis) and 102,700 in 2013 (versus 55,700).

Operators are licensed separately for PHVs, as well as drivers (for taxis, licensing applies to individual drivers and vehicles only). In 2013 in England & Wales there were 16,100, including London. PHV-only drivers totalled 88,300.

In London, in 2005 there were 2,300 PHV operators, 40,000 vehicles, and 38,000 drivers licensed (Full licensing was only introduced in 2004). In 2013 there were 3,200 operators; 49,900 vehicles; and 67,000 drivers (This growth being an effect of the full roll-out of the licensing system, and real growth. There is also high driver turnover). [Source: DfT Table 'Taxi 0103'].

In addition to the growth in the supply of taxis and PHVs, their total usage has also grown strongly. NTS data (for taxis and PHVs combined) indicates the following average rates per person per year.

Table 7. Average usage rate for taxis and PHV's

Year	Trips	Miles
1975/6	n/a	13
1985/86	7	27
1998/2000	13	63
2008	11	54
2009	11	56
2011	10	55
2012	10	53

Sources: NTS 2008 tables 3.1, and 3.2, and earlier years; tables 0304 and 0305 in 2009, 2011 and 2012.

Note: Published data are rounded to the nearest whole number, which particularly affects the number of 'trips' shown. The National Travel Survey (NTS) is a very comprehensive household-based survey, covering all household members and all modes of travel, which has run continuously since 1988

As can be seen, usage peaked in 1998/2000, and has fallen slightly since but still remains well above the level of 1985/86. Hence growth can be seen in both in supply and use, higher in the former

A supplementary expanded tabulation of NTS Table 9903 has been helpfully supplied by the DfT, giving a breakdown of the trip rates per person by each mode, by type of area; from 2002/03 to 2011/12 (two years' data are combined, given limited sample size from a single year). This indicates that taxi/PHV trip rates are typically highest in metropolitan built-up areas, followed by London and large urban areas, but substantially lower in small urban (3,000 to 25,000 population) and rural areas (under 3,000). For example, in 2011/12 these were:

• London Boroughs	8*
• Metropolitan Built-up areas	18
• Large urban areas (over 250,000)	12
• Small urban (3,000 – 10,000)	5
• Rural	5

*This figure may be affected by lower response rates in London

The pattern in previous years from 2002-03 was similar (rural never exceeding 6). It would thus appear that rural taxi/PHV usage is lower than the national average, rather than this mode acting as a substitute for other public transport.

The national average trip rates indicate a substantial share vis a vis local buses, which had 75 trips and 408 miles per person per year in 2009 (including London) – taxi & PHV rates as a percentage of bus rates were thus 13% on both indicators (for rural areas, the trip rate share was marginally higher at 17%, but note effects on trip rates of rounding). In terms of user expenditure, due to much higher cost per passenger trips for taxis and PHVs, these modes are of similar importance. For example, in 2001 user expenditure per trip was approx. £3.30 (from NTS), giving a total taxi/PHV revenue approx. £2320m (versus £2900m for local buses). In 2002/03 about 18% of all weekly household non-motoring transport spending was on taxis/PHVs (versus 17% for bus & coach fares, excluding combined bus/rail tickets). The overall average trip length for taxis/PHVs was 4.7 miles (7.5 km) in 2009, similar to that for local bus.

Given the higher cost per trip for taxi/PHV than local bus, one might expect usage to be concentrated mainly in higher-income groups. However, this is not the case. Higher use is found in members of non-car-owning households: in the 2002-2003 NTS, 28 trips per person per year for these respondents (of which 7 were for shopping), versus 7 for members of car-owning households (of which less than 1 was for shopping). NTS data also indicates a concentration of taxi/PHV use among younger age groups and females. The peak demand occurs late night on Fridays and Saturdays, associated with leisure trips, especially those returning from urban entertainment centres.

Only a very small proportion of people use taxis/PHVs at high frequency. 2007 patterns from NTS data for the whole sample indicate:

• 3 or more times a week	2%
• Once or twice a week	8%
• < once a week, > once or twice a month	5%
• Once or twice a month	13%
• < once or twice a month, > once or twice a year	14%
• Once or twice a year	15%

- Less than once a year, or never 43%

Likely factors behind the growth

The interesting question that arises is why a labour-intensive mode in a high-income country should experience both increasing supply and increasing usage. One would normally expect such activities to be associated mainly with countries in which low real incomes are found (note the role of 'paratransit' in many developing countries), but as car ownership rises, a reduction in such labour-intensive activity might be expected. A number of factors may explain these trends:

1. Supply-side effects. Due to loss of employment in traditional industries, unemployed workers may have sought taxi/PHV driving as an alternative occupation. This may be found in areas such as those in which coal mining or steel-making employment declined in the early 1980s, for example. More recently, a general growth in 'self-employment' has been noted in the British economy (of which taxi/PHV driving can be seen as one example), following effects of the economic recession.
2. Changes in bus service provision, following the Transport Act 1985 (see discussion below). There was a period of unstable provision of bus services (even though total bus-km run increased), and cuts were made in evening and weekend services (when leisure demand is at its highest). Although greater stability has returned to the bus network, evening and Sunday services levels in many areas remain low.
3. A growth in the 'night time economy', following relaxation of rules on licensing of premises serving alcoholic drinks. There has been a rapid growth in total drinking activity (especially among young adults), and also later into the night (previous licensing rules typically imposed closure at about 2300, but this is now later in many areas, with a demand for return trips home around 0100-0200). Even when better evening bus services were operated, they did not run at these times (and very few areas outside London offer substantial all-night public transport services).
4. Increased awareness of the dangers of 'drink driving' and enforcement of regulations, resulting in those who have drunk alcohol being unlikely to attempt driving their own cars.
5. Some 'trading up' from bus to taxi travel as real incomes rose (prior to the recession) - for example, someone shopping by bus may find it convenient to travel to the shops by bus, but then return home by taxi with their load of shopping (hence high taxi/PHV use for shopping trips by those in non-car-owning households, above).
6. Concerns re personal security, especially for late night travel (this may apply, for example, to employees of restaurants and bars, as well as customers returning home).

The regulatory framework

The regulatory framework for taxis and PHVs stems from a number of laws, and there has been no comprehensive reform so far. However, the Law Commission has undertaken a review, results of which were published on 23 May 2014⁸, discussed further below.

The main law regulating taxis outside London is very old-established – the Town Police Clauses Act of 1847. PHVs were not formally regulated until Local Government (Miscellaneous Provisions) Act of 1976. Furthermore, these laws were permissive (i.e. enabling local authorities to exercise licensing powers, but not compelling them to do so). Generally speaking, licensing powers are applied

8. The Law Commission. Taxis and Private Hire Services. Report to Parliament, published 23 May 2014, available at <http://lawcommission.justice.gov.uk/areas/taxi-and-private-hire-services.htm>

at the lowest level of local authorities (districts within two-tier authorities, Metropolitan Boroughs in the larger cities outside London, and unitary authorities where there is no two-tier structure). This results in each authority covering a relatively small area. London is a marked exception, with a single licensing authority (Transport for London, TfL) covering the whole Greater London area (over 8 million people).

The Transport Act of 1985 was designed principally to reform the system of control for local bus services, introducing the concept of ‘deregulation’, but as part of this change it was desired to introduce powers to permit shared taxi and taxibus operations. This made it necessary to make taxi regulation compulsory for all districts (a small number, mainly in more remote areas, had not previously exercised their powers to do so). The main changes were as follows:

Section 10: Taxi sharing at separate fares, i.e. in which the driver would charge a separate fare to each passenger (as distinct from passengers sharing the costs among themselves). Previously only one person was deemed to be hiring the taxi (the ‘single hirer’). However, the impacts of the changes appear to have been very small.

Section 11: Permits advance hiring of Taxis and PHVs at separate fares (likewise, impacts appear very limited).

Section 12: Permits ‘taxibuses’ (in which vehicles licensed as taxis can run scheduled local bus services, charging separate fares for each passenger, without the need for the full licensing requirements that apply to bus and coach operators). Routes can be registered by the operator as a commercial venture, or as a tendered service for a local authority. The Local Transport Act of 2008 extended this to PHVs.

Section 15: Enabled extension of licensing areas to match those of current local authorities (previously a number of examples existed where smaller authorities had been merged to form a single authority, but the inherited licensing powers applied only within each of the areas of the former authority, rather than over the whole of the new authority’s area). Once such areas have been merged, it is not possible to reverse this process.

Section 16: Enabled licensing authorities retained right to limit numbers where ‘no significant unmet demand’ was observed. This was in marked contrast to the general approach of the 1985 Act, which completely removed previous quantity licensing for local buses, and it might have been expected that similar limits would have been removed for taxis. While authorities wishing to retain such limits had to establish a case for doing so, unlike buses, no timescale was set for making changes, or to justify the status quo. It was not possible for authorities not already imposing quantity limits to introduce them, but where a quantity limit has been applied, an authority had the options of retaining it, raising the limit, or abolishing it altogether. In a few cases, authorities who had removed quantity limits later re-imposed them, as indicated in the Law Commission’s report⁹. Note that London, while applying strict quality controls, has never imposed a quantity limit on the number of licensed taxis.

Note that PHV licensing was still not comprehensive.

These changes potentially introduced a mode intermediate between ‘bus’ and ‘taxi’ in terms of regulatory categories, which could be useful for low-density flows, especially in rural areas. However, developments to date appear to be very limited.

The effect of encouraging removal of quantity limits has been very gradual. Data for all taxi licensing authorities in England and Wales (excluding London) is regularly collected by the DfT. The latest data covers the situation at 31 March 2013. Excluding those not responding to the DfT survey, 220 authorities imposed no limit, but 86 did so (71.9% and 28.1% respectively). Higher proportions

9. The Law Commission. Taxis and Private Hire Services. Report to Parliament, published 23 May 2014, available at <http://lawcommission.justice.gov.uk/areas/taxi-and-private-hire-services.htm>

imposing a limit can be observed urban areas, and in the North West, Yorkshire & Humberside, and South East regions (inferences by the author from DfT table 'Taxi 0106'). Ideally, it should be possible to observe whether there is correlation between removal of such limits and greater-than-average growth in taxi usage. However, given the very complex pattern of small districts taking different approaches to licensing, it would be difficult to match NTS data to such areas (due to sample size limitations). It is therefore not practicable to identify growth in use due to removal of quantity limits from the broader factors discussed above.

Another means of looking at supply of taxis and PHVs is to examine the absolute number of licensed vehicles, expressed as an average rate per 1,000 population. At March 2013 these were (for England and Wales [E&W] as a whole):

- Taxis as such – E&W average 1.4 (London 2.7, major urban 1.1, large urban 1.3, lowest in rural areas at 1.0 to 1.1)
- PHVs as such 2.7 (London 6.0, major urban 3.8, large urban 2.3, rural 1.0-1.6)
- Combined total of taxis & PHVs 4.1 (London 8.7, major urban 4.8, large urban 3.6, rural 2.3-2.7)

Definitions are based on district characteristics (i.e. the level at which taxis and PHVs are licensed): 'Major Urban' districts were defined as either 100,000 people, or 50% of their population in urban areas with a population of more than 750,000.

'Large Urban' are defined as districts with either 50,000 people, or 50% of their population in one of 17 urban areas with a population between 250,000 and 750,000.

'Rural' encompasses a range between 'significantly rural' (districts with more than 26% of their population in rural settlements and larger market town, to 'rural-80' – districts with at least 80% of their population in rural settlements and larger market towns. Differences between them are relatively small, except that 'significant rural' has a higher ratio for PHVs, at 1.6.

It can be seen that the rural levels are generally substantially lower. Rather than taxis/PHVs being, in aggregate, a substitute for conventional public transport, there is positive association between high levels of taxi/PHV provision and also of conventional public transport provision and use in the larger urban areas.

Given that taxi numbers have been limited in some areas, but no such limits apply to PHVs, examples can be found where compensating growth has taken place in PHV numbers to offset a lower limit for taxis as such.

BOX. A case study: Maidstone

Arising from earlier work at the University of Westminster (and its predecessor, the Polytechnic of Central London), the district of Maidstone can be used as an example. Maidstone is district of 155,000 population (2011 census) in the county of Kent (south east of London). The district includes the town itself (the majority of the population), which is the administrative centre for the county, and also covers an adjoining rural fringe area, the overall district population density being relatively lower at 390 per sq km (2011 census). A taxi user survey was firstly undertaken in 1986 (coincident with a study of the effects of bus regulation under the 1985 Act), at a time when the taxi supply was very limited, only 24 vehicles (approx. 1 per 4,000 population within the urban area). Hence, under the 'no significant unmet demand' criterion, a survey was carried out to see whether this limit could be justified¹⁰. Observations were made at taxi ranks, operators were interviewed, and taxi users were invited to fill in a self-completion questionnaire. In addition, household surveys were carried out at six clusters within the district (including two within the rural fringe) to examine both bus and taxi use: none of the rural residents in the sample reported taxi use.

It was found that little on-street hiring took place except at ranks (railway station, shopping centre). There was large overlap in the roles of taxis and PHVs in meeting phone requests – both types of vehicle were often run by same firms. About 90% of the taxi trips were within the town and its suburbs.

There was little evidence of problems caused by the low supply (e.g. customer queuing time at ranks, or excessive time waiting for a vehicle after a phone request). However, it may be the case that users' expectations adjusted to the low level of taxi supply.

In principle, the best way test whether demand is being suppressed may be to increase the number of licences and monitor use (but the latter is very rarely done). In practice, a small increase was granted by council, but even so taxi numbers had only reached 39 in 2005.

However, Maidstone also displayed a high ratio of PHV licences to population, such that the overall (taxi + PHV)/population ratio by 2005 was similar to the then national average of about 2.8 per 1,000 (on the same definition as the figure for 2013 for 'other Urban' of 3.5). It may thus be the case that high PHV provision offsets some of the problems created by low taxi numbers, although some problems may still persist due to inability of PHVs to ply for hire on the street.

Effects of limiting numbers

A consequence of limiting numbers, as found in many countries, is that not only are users affected by limited supply, but other factors also arise. The driver and/or vehicle licences (known as 'plates', 'medallions' etc.) are limited in number by the public authority. They thus acquire a scarcity value, and may be 'traded' (unless that practice is specifically prohibited). In effect, entry to the market becomes attainable by purchase of an existing plate from a currently licensed operator. This could be seen as prima facie evidence of suppressed demand, since a large operating surplus may be needed to finance the cost of such a purchase by a 'new' operator. Possibly the highest price at present is that for a New York 'Medallion' at around 640,000 USD¹¹.

This pattern may become self-perpetuating, in that new operators who have bought plates then have a vested interest in ensuring that scarcity value remains, so that they in turn sell on a plate in due course to another new entrant.

10. R.P.Turner and P.R.White 'Taxis into Buses: determining 'unmet demand' for taxis: a case study of Maidstone' ATCO [Association of Transport Coordinating Officers] News, no 40, April-May 1987, pp 16-18

11. T.Cetin and K.A.Eryigit 'The economic effects of government regulation: Evidence from the New York taxicab market' Transport Policy Jan 2013 (Vol 2) pp 169-177.

However, cases have arisen where such restrictions have been abolished overnight, notably Dublin, as described by Dr Sean Barrett¹². This occurred following a legal decision abolishing the previous strict limit applied since 1978. The total number of taxis went up from 2,722 in 2000 to 8,609 in 2002 (+216%), and with similar impacts in other Irish cities (i.e. to approx. 6/1,000 population, approaching the very high London taxis/PHV ratio of 8.7 quoted above).

Prior to this, the licence plate price had reached 90,000 Irish Pounds (approx. 80,000 GBP) in 2000. This could be seen as a loss of an ‘investment’ by those who had ‘purchased’ licences. A ‘hardship fund’ was set up to handle this problem, although in practice used to only a limited extent. Unfortunately, little data appears to have been collected on taxi usage (which probably grew less than the supply), but one indication is the cuts subsequently made in all-night bus services in Dublin (previously extensive queuing for taxis had been observed at such times).

Total taxis/hackney cabs in the Irish Republic from 11,239 in 1998 to 29,053 in 2008¹³: based on a population of about 4.5 million, this gives a ratio per 1,000 population of about 6.3.

There is also evidence from France, where strict price and quantity control applies in all cities, with little growth in numbers in recent years. Studies by Bacache-Beauvallet & Janin¹⁴ indicate an estimated average weighted value per licence 100,000 euros, equivalent to an economic profit of 7,000 euros per year to each driver. They estimate that if demand were wholly inelastic to volume of supply (number of taxis), an increase in licences of about 20% would eliminate this. In practice, demand will grow as licences increase. Estimates were derived from a large sample of cities with a secondary market for licences, indicating that a 1% increase in the number of licences depreciates their value by 0.3% , giving an estimated elasticity of demand of 0.78 (passenger trips with respect to the number of licences).

Work by Richard Darbera¹⁵ has examined Paris as an example of imposing continued strict quantity limits on the number of licensed taxi (and with no equivalent to PHVs). He estimates taxis +PHVs per 1,000 population in Paris 2.63 (compared with 8.47 in London at the time of his study). Equivalent ratios for taxi + PHV drivers were 2.76 and 8.60 respectively. These supply differences were correlated with average taxi + PHV trips per person per year at 6 and 14 respectively. A particularly marked relationship was found when examining use by income group quintiles. In London, approx. 12 trips/head/year in were observed in the four lowest quintiles, and about 18 in highest, but in Paris, about 4 in the four lowest and 12 in highest. A wider mix of trip purposes was also observed in London.

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- 12 Papers at ECMT Round Table 133, Paris, April 2005 ‘(De)Regulation of the Taxi Industry’ (published March 2007)
Sean D. Barrett ‘Regulatory capture, property rights and taxi deregulation - a case study’ [Dublin example]
Peter Bakker ‘Deregulation of the taxi industry : Experience in the Netherlands’
Jon-Terje Bekken ‘Experiences with (de-)regulation in the European taxi industry’ [case studies from Norway, New Zealand, Netherlands, Sweden]
Denis Cartier ‘Quebec : the role of taxis in public transport’
Catherine Liston-Heyes and Anthony Hayes ‘Regulation of the Taxi Industry : Some Economic Background’
13. Coach and Bus Week 21 Oct 2009
14. Maya Bacache-Beauvallet and Lionel Janin ‘Taxicab licence value and market regulation’ Transport Policy Vol 19, Jan 2012, pp 57-62
15. Richard Darbera ‘Taxicab regulation and urban residents’ use and perception of taxi services: a survey in eight cities’ Paper at World Conference on Transport Research, Lisbon, July 2010

Effects of deregulation on demand

While correlations can be found between levels of supply and use (as in the London and Paris comparison above), establishing a cause-and-effect relationship when specific changes occur in licensing policy is more difficult. As indicated earlier, an increase in the supply of vehicles and/or drivers is not necessarily proportionate to service level offered (for example, there may be less double-shifting, shorter hours worked, etc.).

In the case of cruising and rank availability service level offered is a function of the number in circulation at any one time. Hence user benefits may be observed through shorter waiting times (and also, less directly, in response time to phone requests).

In many markets, one would expect deregulation to produce price competition, as well as an increase in supply. This would give direct financial benefits to existing users, and also stimulate additional demand from new users. However, even where taxi numbers are not limited, taxi fares still generally regulated, at least for the permitted maximum fare for a given distance, etc. (for example, in the London case). This may not be so much a form of direct economic regulation as desire to protect the user from exploitation.

Even where price controls are lifted, there is, to date, little evidence of spontaneous price competition. One problem is that of the user effort required to ‘search’ for price differences – for example to make comparisons between different vehicles in a rank. The perceived effort involved may offset the monetary saving to the user. A parallel may be drawn with the outcomes of local bus deregulation in Britain following the Transport Act of 1985. Most competition has taken the form of frequency and quality of service, rather than directly on price, partly because a bus user foregoing the use of an ‘expensive’ bus which arrives first at a stop will experience additional (and possibly uncertain) waiting time for the following ‘cheaper’ bus. Unless the price differential is very large, the tendency is to board the first bus to arrive.

Within the taxi/PHV sector, price competition may be more effective in pre-booked and phone markets, than on-street or at ranks. It is also noteworthy that mobile phone apps are now being placed on the market which enable users to make quicker price comparisons (and also between taxis and PHVs), which could result in substantially greater scope for price competition in future, although there is little evidence on impacts to date.

A possible outcome of deregulating both price and quantity could be that more taxis/PHVs are operated, but each secures a lower average utilisation (trips/vehicle/day) if demand does not grow *pro rata*. Operators might then have to increase fares to maintain total revenue. This outcome could produce a high service level at high fares, with benefits to customers with a high income and thus a high value of time, but losses to low income customers. Efficiency of vehicle use would decrease.

The ECMT Round Table (no 133) in Paris in 2005 (4) provided a number of observed outcomes:

Work by Bakker examined outcomes of deregulation in the Netherlands: a rise occurred in taxi numbers, but vehicle hours offered fell, and real fares increased. Usage remained approximately stable.

Deregulation in Sweden in 1990, as analysed by Bekken, produced an increase in fares, and more vehicles, but with fewer trips per vehicle (i.e. similar to the indicative outcome described above). There was little effective competition in rural areas (where taxis play an important role in contract services for school and social transport, and hence competitive bidding would be of benefit to public authorities).

Bekken also analysed the case of Norway, where fares had been deregulated in 2000, but quantity control retained. Competition was observed between despatching centres rather than driver-operators. Fares had generally increased, but with substantial differences between firms.

Other issues in the British case

Since many of the regulatory powers are permissive, inconsistent quality requirements are often seen between different local authority areas, and there may be a case for a more consistent minimum standard.

The position regarding quantity limits remains ambiguous. As mentioned above, about 28% of authorities in England and Wales still have them. Should there be a general encouragement to remove the remaining quantity controls, and if so, on what timescale?

Many local authority boundaries cover only a limited area, especially among the smaller unitaries. If taxis and PHVs are limited to picking up and setting down only within these limited areas, this reduces potential driver and vehicle utilisation.

Experience of the changes introduced under the 1985 Transport Act.

The changes introduced under this Act (described above) enabled a number of service innovations to be made. The extent to which these have been adopted is highly variable, and while many press reports document the introduction of such services, their duration, and levels of use, are much less clear. Overall, it would be fair to say that the vast majority of taxi use is probably still of the ‘single hirer’ form in which one person is deemed to be the customer, and relatively little use is made of shared taxi and taxibus provision. However, a number of examples have developed:

- ‘Taxibus’ feeder services to Chiltern Rail in Bicester – running fixed routes at peak times, flexible routes off-peak (these were successful within the town, but not in the adjoining rural area). By late 2003 these were carrying 50,000 passengers a year¹⁶. Chiltern Rail is an operator running routes North West from London, on which rapid growth in usage has been observed in recent years, associated with enhanced service levels. Bicester is a town which has developed as a commuter settlement for London, but station parking capacity imposes constraints on use of car as a mode of access.
- Stagecoach Fife ‘Yellow Taxi’ experiment. Stagecoach Group is one of the major public transport operators in Britain, owning many regional bus companies, including that covering the Fife region (north of the River Forth) in Scotland. This is connected to Edinburgh via the Forth Road Bridge, over which frequent bus & coach services are operated. The ‘Yellow Taxi’ was an 8-seater shared taxi, offering a service to Edinburgh at a premium fare to the same operator’s buses, aimed at a new market segment. It began in August 2003. However, profitability was poor, and the service was withdrawn in September 2005, despite carrying about 1,000 passengers per week¹⁷. A similar service was introduced at Petersfield in Southern England in November 2004, as a feeder service to the South West Trains rail service (also a Stagecoach subsidiary) linking that town to London. This was also unviable commercially, carrying only 20 passengers per day and was withdrawn in 2005¹⁸.

16. London Transport Users’ Committee, Performance Monitoring Report on National Railways in the London Area for quarter 3, 2003-04 (Oct-Dec 2003), published May 2004

17. Transit, 29 August 2003, p5; Transit 23 September 2005, p 5

18. Transit, 9 September 2005, pp 1,15

- Taxibus feeder services to Oxford – London coach services at Lewknor on the M40 motorway. Very frequent express coach services are operated between Oxford and London by two operators (Stagecoach and Go Ahead), and a spontaneous form of ‘park and ride’ developed at Lewknor, a minor junction on the motorway in a rural area, at which coaches call on request. Development of car feeder traffic encouraged several flexibly-routed taxibus feeders, which commenced in 2005, but these largely reverted to a fixed route operation: the service from Stokenchurch ceased in January 2007, although a service from Watlington continued until replaced by a fixed route in June 2007, as was a service from Little Milton and Garsington¹⁹
- Taxibus feeder to Peterborough station, on the London – Newcastle main line, operated in conjunction with the GNER franchise from July 2006, but ceased at the end of that franchise about one year later²⁰.
- Development of commercial airport – hotel minibus feeders on a fixed timetable but with flexible routing should be an appropriate role for taxibus or shared taxi operation, and can be found in many other countries, but impacts of services under the 1985 Act appear limited. A service was operated for some years between Edinburgh Airport and the city centre by the public sector local bus operator (as a premium fare direct alternative to its own airport express bus service), but was abandoned due to poor financial performance, and a private buyer could not be found. National Express coaches operated its ‘dot2dot’ demand-responsive service between Heathrow Airport and central London hotels, but this was also financially unviable. It was sold to another operator in 2009, but no longer runs as a scheduled service.
- A Taxibus service between Liverpool city centre and its airport, launched in early 2014 by a local taxi firm, following a similar service to a major football ground (Anfield) in August 2011. An hourly off-peak service was offered (since reduce in frequency) at a fare lower than the airport bus service.

In addition, a number of public authorities and rail operators have developed websites and/or mobile phone applications which enable users to order a taxi or PHV to access a station, or to provide a feeder trip from a station. These provide the user with greater certainty of service availability, and personal security (through ensuring that only licensed operators are used). Examples include Transport for London, and Abellio Greater Anglia’s ‘Cab & Go’ service (which requires booking at least two hours in advance). However, they appear to be mainly or entirely for single-hirer bookings, rather than taxi sharing as such.

The Law Commission proposals

As mentioned earlier in this report, the Law Commission has recently completed a study reviewing taxi and PHV regulation in England and Wales, and has proposed a new Parliamentary Bill to introduce a harmonised and consistent approach. They propose retaining the taxi/PHV distinction based on method of booking the journey, with a requirement that bookings should be made through a ‘licensed dispatcher’. Cross-border working (crossing local authority area boundaries) would be made easier, and national minimum standards introduced, although local authorities would still remain responsible for licensing, and be able to set taxi fares. Taxi operators would be able to use vehicles of higher capacity (up to 16 seats) in certain cases. The Commission envisages that authorities should continue to be able to set quantity limits on taxi licences, and that in cases where such quantity limits already apply, that transferability of licence plates should be permitted to continue. It also proposes

19. Omnibus Society Southern Area bulletin, March 2007 (p9) and May/June 2007, pp 15,16

20. Transit, 22 July 2006, p2; and Coach & Bus Week 23 July 2008, p6.

that areas not currently imposing quantity limits should be able to do so (but without enabling trading of plates in such areas).

Some broad conclusions on taxis

The British experience of taxis and PHV operations in last thirty years indicates that, despite rising car ownership, a substantial growth has occurred in both supply and use of this mode. This may have been encouraged by removal of quantity restrictions on taxis in some areas that previously applied but disaggregating this effect from wider factors is difficult.

Broad international evidence also suggests weak case in principle for maintaining quantity limits, which may restrict user choice and result in artificial profits being made by incumbent operators. However, the case for removing price regulation is much less clear (although growing use of mobile-phone apps may stimulate more price competition in any case, by reducing the distinction between taxis and PHVs).

The reforms in Britain under the Transport Act 1985 enabled a number of innovative service types to develop, including shared taxis and taxibus operations. Potentially, these could fill gaps in meeting low-density demand, especially in rural areas. However, the extent to which they have done so is variable. While there are many examples of such services being introduced, the extent to which they are sustained commercially (or found worthwhile as tendered services) appears highly uncertain, and very little data has been collected on their level of use. A further factor is that the overall supply of taxis/PHVs in rural areas (per 1,000 population) is much lower than in urban areas, reflecting the lower density of demand and hence scope for commercially-viable operation, but this in turn means that relatively few taxis/PHVs are based in such areas from which innovative service types could be developed. It may be the case that further initiatives, besides those initiated by individual operators, are needed to stimulate such activity. For example, it may be in the interests of a public transport operator such as a railway to improve feeder services to stations in low-density areas, or for public authorities to encourage alternative means for providing access to health facilities, etc.

6. Specific initiatives in rural public transport provision in Britain

A number of initiatives have been introduced in recent years, with varying degrees of success

Postbuses

In some countries the postal service operator is also a major bus operator (for example, in Switzerland). In Britain, it has never played a major role, but from the 1970s a considerable number of services were operated. These were provided by using existing postal vehicle runs, normally those collecting post from local post offices, public mail collection boxes, etc. and taking them to the regional sorting office, typically in a market town. This might provide 2-3 runs per day (fewer on Saturdays), dependent on the frequency of postal collection. Initially, such services were provided largely at marginal cost, replacing a small van with a minibus. Availability of grants in the 1970s (fuel duty rebate, and also a 50% grant toward the cost of a new bus) largely covered the extra costs involved. However, a later shift to a more realistic costing approach by the Post Office, and withdrawal of the new bus grant, made these services less attractive financially, and local authority

support was required for continuation. The routing of services was often indirect, resulting in unattractive journey times. In some cases, a demand-responsive service is now provided, giving users a much wider choice of journey times and potentially more direct journeys (for example, replacing the Post Office routes in Lincolnshire), and the few remaining examples are found in remote areas of Scotland. However, where settlement patterns in a low-density area effectively place most of the population on a linear corridor (for example, along a coast road, or a valley) this option might still be appropriate in some cases.

Volunteer-driven minibuses

As mentioned in the main text above, the legal position of such services was clarified under sections 19 and 22 of the Transport Act 1985. The first such schemes were introduced in the early 1970s, in some cases with the assistance of existing regional bus company in the area who found it impracticable to provide services for some settlements using conventional vehicles and paid drivers (For example, the Eastern Counties subsidiary of NBC in Norfolk). Typically, a mix of scheduled public services, excursions and private hire activity might be undertaken, with different service patterns according to the day of week.

A number of such schemes have been sustained in several areas, but they are not particularly comprehensive in their coverage in rural areas as a whole. One constraining factor may be the need to ensure that a sufficient ‘pool’ of volunteers can be recruited to cover the service requirements, and that volunteers can be replaced over time (for example, much volunteer work may be undertaken by ‘active retired’ people in their 60s. As they age, they may no longer be able to meet the requirements imposed, and fresh volunteers need to be recruited. This may also be affected by the shift to an increase in retirement age from regular work). In some cases, cultural factors might be important; dependent on whether there is a tradition of public benefit volunteer work in the society as a whole (this affected, for example, scope for extending this concept to rural areas in Japan).

Enhancement of commercial ‘conventional’ bus services

In many countries, the bus operating industry has been relatively slow to adopt new concepts in marketing and product development, and this may apply to rural services as well as those in urban areas. In addition to examining scope for different types of service, it is also worth considering a more positive approach to conventional bus provision.

Such scope does not necessarily enable very low density rural areas to be served, but may strengthen the role of existing services, enabling a higher level of commercially viable service to be retained than would otherwise be the case (and/or services with a level of public support per trip within an acceptable threshold).

Types of improvement may include:

- a) Higher specification vehicles. The cost of improved seating, lighting, interior finish etc., is very small vis a vis the majority of costs, which are largely determined by driver wages, fuel consumption, mechanical specification, etc. In some cases, it may be worthwhile reducing seating density (given low average loads now found) to improve comfort – for example, Arriva group has introduced its higher-specification ‘Sapphire’ services on some routes with 3 seats across the width of a vehicle rather than the usual four. Wi-Fi facilities can also be added at low cost. Overall, a modest rise in ridership (around 5-7%) may be sufficient to cover the additional costs incurred.
- b) Better marketing and information. Timetable publicity, provision of maps, etc. has often been poor. Improvements in information technology enable much more comprehensive information

to be provided at low cost, notably through messaging to mobile phones, etc. Use of social media (such as Facebook or twitter) enable short-term changes (for example, due to weather conditions) to be disseminated to users prior to travel.

- c) Greater attention to service reliability (which may be particularly important for low-frequency services), through realistic scheduling.
- d) Where demand justifies it, offering regular-interval services (e.g. every hour), which are more easily memorised by users without the need to consult a timetable for each journey made.

These factors are not unique to rural operations, but may be particularly beneficial, in particular improved in-vehicle comfort and passenger information. The main potential may be in enabling improvements to interurban services, which attract usage from both town-to-town traffic and that to/from intermediate villages. This can be seen in the Lincolnshire 'Interconnect' network for example, but also in other areas. One consequence is that some villages, which happen to lie on interurban routes, now have very good levels of service (up to every half hour or even better), often the best they have ever enjoyed. However, a much greater disparity of service frequency may now be seen between these villages and those in more isolated areas, where such scope for upgrading does not readily exist.

A noteworthy example of upgrading a rural network in relatively low density is the 'Norfolk Green' company (now a subsidiary of Stagecoach) serving the west of Norfolk, which has developed improved frequencies and interurban links in a rural area characterised by a low density of population and in some cases very poor services previously.

Government funding of service experimentation

In addition to initiatives which arise from commercial activity, voluntary groups, or local authority actions, central government may initiate innovations through a centrally-funded programme. A number of such initiatives have taken place in Britain since the late 1960s, the most substantial of which were the 'Rural Bus Challenge' (RBC) and 'Rural Bus Subsidy Grant' (RBSG), introduced in 1998 (both of which have now ceased). The former applied to new types of services, usually for a three-year period. For example, these have included many of the earlier demand-responsive services, and some interurban improvements (such as Lincoln - Skegness service within Lincolnshire). Bids were invited by central government, which then made awards on merits of each case. The RBSG (allocated on a per capita basis to local authorities with population densities below a specified threshold) was generally used for more conventional types of service, enabling existing networks to be extended, and/or time periods in which services operated (for example, at evenings and weekends).

Considerable innovation was produced by these grants, some of which has been sustained. However, it is important that outcomes of such innovations are carefully monitored if lessons are to be learned from their introduction. It is also desirable that it is possible for such services to be sustained following the initial period of funding (subject to sufficient usage being generated to justify this). A problem arising from some RBC services, for example, was that the level of support per trip was very high, making it difficult for service support to be continued from local authority budgets following the initial funding period.

Car sharing schemes

The high levels of car ownership in rural areas potentially enable the needs of those without cars to be met by offering provision for specific journeys. This is not usually a simple matter of offering empty seats already available (average car occupancy rates are such that total empty seats would exceed the demands of those without car access), since the needs for those without cars would not

necessarily match the times or locations when empty seats are available. It is therefore necessary to make direct arrangements to match up the needs of those without access to other transport, and willingness of car drivers to provide lifts. One should also distinguish between provision of car seats to those without access to cars and ‘car sharing’ in the sense of encouraging more efficient travel by those with cars to improve occupancy levels (for example, encouraging two people each travelling as drivers as sole occupants to a place to work to share a car for this purpose).

Since the Transport Act of 1980, constraints on permitting coverage of costs incurred by those providing the car service have been removed (provided that no profit is made). The contribution may come either directly from the person being given the lift, and/or a public body (such as a local authority) co-ordinating the provision of such a service.

In a number of low-density areas, car sharing schemes may provide a fairly comprehensive service, for a wide range of trip purposes. In others, it may be focused more specifically on particular requirements, such as access to health facilities. As in the case of volunteer minibus services, one issue in the provision of such services may be the presence of a ‘pool’ of volunteers, and the ability to replenish these as existing volunteers are unable to continue may be an important factor in securing continuity of service.

Integration of public school and social services transport

The major statutory responsibility for provision of school transport held by local authorities creates a substantial level of resources which can also be used for other types of service provision. Likewise, resources provided for social services transport, typically minibuses, in some cases with special facilities (such as wheelchair access) creates a further set of resources. Considerable scope may exist for integrating such services with the general public network, especially where the local authority is involved in providing substantial financial support. In many cases, institutional barriers may exist, for example the separate contracting of school and public services, even within the same authority, may result in the full scope for such integration not being attained.

The integration may take the form of complementary service patterns at different times of day (for example, resources required for the school peak may be used to provide shopping and other journey purposes at other times of day). In other cases, more direct integration may be possible - for example by placing school trips and other journey purposes on the same vehicle (e.g. a morning peak journey into a market town).

7. Economic evaluation of rural transport options

In contrast to the assessment of transport infrastructure projects, and major urban transport expenditure, there is relatively little systematic appraisal of rural transport options, much of it being based on fairly arbitrary criteria. For example, in the British case, much of the expenditure in rural areas is determined by statutory obligations, notably those with respect to free school travel and concessionary fares. The majority of a local authority’s expenditure in this respect is typically determined by free travel for older school pupils (those aged between 8 and 16, living above 3 miles from their nearest appropriate school), and the obligation to provide free concessionary travel (apart from the Monday-Friday morning peak) to those who are disabled or above 60 (although the policy is

a national one, compensation to operators is paid at the local level). This has resulted in the discretionary element of spending being much reduced. In some areas, it has even been proposed to abolish the funding for tendered rural services altogether (for example, in Cumbria). One can also see reductions being made in the discretionary element of education transport spending, for example to fund pupils above the statutory leaving age of 16 who are still in education, and/or services to religious denomination schools.

It is noteworthy that many rural areas proposing to make radical cuts are incurring relatively low cost per passenger trip on the services concerned (as an average) – for example £1.35 in North Yorkshire²¹, and about £1.33 in Herefordshire²².

A fairly crude approach has thus come to be adopted toward evaluation of tendered rural bus service support, typically using an average value for the net support per passenger trip (i.e. after taking account of fares revenue). Guidelines used by local authorities are typically in the range of £2 to £6. However, this does not take into account user benefits in any systematic form, except insofar as different degrees of importance may be attached to different trip purposes – authorities may, for example, give higher importance to journeys for work and medical purposes than leisure trips, although this is not necessarily reflected in an explicit differentiation in the net support per trip regarded as acceptable. An improvement has been made recently, following work by the Mott Macdonald consultancy and the Institute of Transport Studies at the University of Leeds, which sought to determine the economic benefits of retaining bus service provision, by identifying ‘social impact’ benefits per return trip for those bus journeys which would not otherwise be made. These were estimated at 2010 values and prices as £3.84 for a concessionary pass holder and £8.17 for a non-holder²³, values which are similar to some of the crude average thresholds used as cost-effectiveness measures by local authorities currently. This guidance has now been incorporated into ‘webtag’, the web-based guidance on forecasting and evaluation methods provided by the Department for Transport²⁴.

It should be noted that these values relate to trips that would not otherwise be made, and when a rural bus service is withdrawn it does not necessarily follow that all trips on it would cease - some might take place via alternative bus services, demand-responsive operations, etc. A default value of 21% is suggested in the guidance, although this appears to relate to evidence from additional trips being generated (as distinct from diverted) to an improved bus service. In the case of cuts in a rural service, with few alternatives available, it might be reasonable to assume more substantial effects would arise from elimination of a service: for example, only half of the trips would still be made. Taking the guidance figure of £8.17 for a return trip by a non-concessionary pass holder (above) then one could assume that a value of £4.08 for a one-way trip would be applicable. If it is assumed that half of the trips would no longer be made, then a value of £2.04 per one-way trip applied to all trips on the current tendered service to be withdrawn could be inferred. By the same logic, a value for a concessionary pass holder trip no longer made would be about 96p. Assuming a 50:50 split of concessionary/non-concessionary travellers, the overall average would be about £1.50 at 2010 prices. Factoring up to 2014 prices using a webtag guidance²⁵ GDP deflator of 8% between 2010 and 2014 would bring this value to about £1.62. It is too early to say whether this guidance is being applied in

21. Bus & Coach Professional 31 January 2014, p5

22. Inferred from Herefordshire data quoted Coach & Bus Week 19 March 2014, p10.

23. Monetising the social impact of bus travel. Mott MacDonald, March 2013

24. Department for Transport. TAG unit A1.3 User and Provider Impacts, updated May 2014, available at <https://www.gov.uk/government/publications/webtag-tag-unit-a1.3-user-and-provider-impacts-may-2014>

25. DfT ‘Webtag data book’ May 2014, ‘Annual Parameters’ table.

any systematic form - for the moment short-term budget constraints are likely to be more critical - but it could provide a more informed figure for a threshold net subsidy per trip.

The current financial pressures also raise the question of whether the free travel for older users is necessarily sensible, since it could result in some rural dwellers having a free pass, but no services on which to use it. Indeed, in some areas passholders have suggested that a reversion to a lower fare (e.g. half price) rather than free travel would be a preferable alternative to no service at all, but the DfT has been unwilling to permit any local flexibility. One must also question whether it is sensible to retain the rail network at its present size, given the very high funding for some rural routes which, if redeployed to bus services, could support an entire network in the area concerned.

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