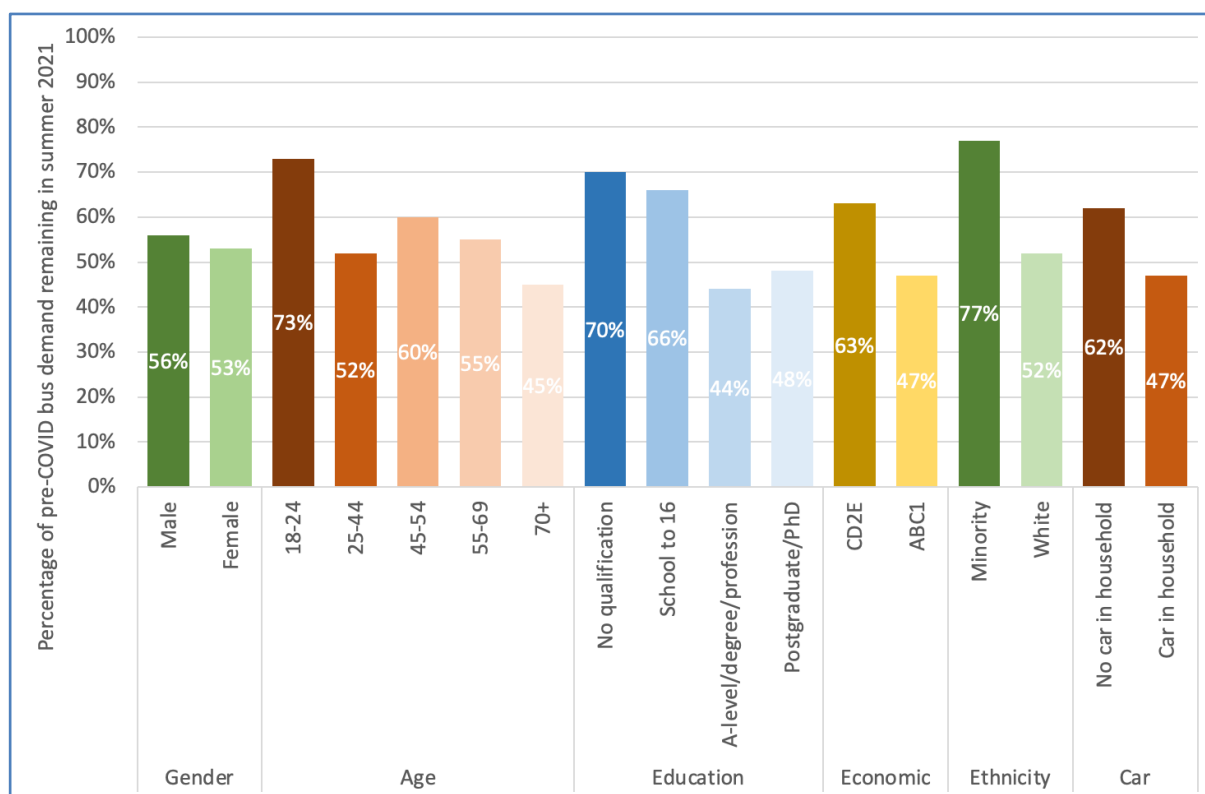


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Recent developments in local bus services, the taxi/PHV market, and the role of smaller vehicles

Peter White

At University of Westminster and on Blackboard Collaborate

28 September 2022

Introduction

Peter began by explaining that, following his presentation of February 2021, his talk would focus on:

- recent developments, including the National Bus Strategy (NBS) for England, Bus Service Improvement Plans (BSIPs), Enhanced Partnerships (EPs), franchising, post-COVID demand recovery, and the resulting challenges;
- the taxi and private hire vehicle (PHV) market, and comparisons with the USA and France;
- the role of smaller vehicles, notably for high frequency operations, demand responsive services, and the scope for automation; and
- overall policy questions including the optimal roles of each mode and the appropriateness of competition policy.

The position in February 2021

Peter summarised the situation he described in February 2021¹.

Bus use in 2021 continued to be affected by long-term trends such as rising car ownership, but there had been a more positive picture in areas of traditionally low bus use, such as the South West and East of England. There had also been a positive effect of improved interurban services and Park and Ride (P&R).

Over the last decade there has been a drop in shopping trips, previously the most important bus passenger journey purpose, and the highly-peaked journeys to education (20%, mainly school travel) was now as important as journey to work (20%).

¹ See The Transport Economist, Volume 48 Number 1, Spring 2021, pages 13-31.

There was low ridership due to the COVID-19 lockdowns, but there had been government support for service continuation, and some recovery, although ridership is still not back to 100% of pre-COVID levels.

The National Bus Strategy (NBS)

“Bus Back Better: National Bus Strategy for England”, published in March 2021, marked a reversal of previous policies in areas such as cross-subsidy, which was now explicitly encouraged, and a move away from competition in the market place. While it applies only in England, there has been similar thinking in Scotland and Wales.

The NBS puts a strong emphasis on bus priority and more comprehensive evening and Sunday services. There is a very positive view of future potential, but it is not clear how positive rhetoric can be turned into practical outcomes.

Powers specified in the Bus Services Act 2017 as discretionary have now in effect become compulsory. To secure long-term funding, all 79 Local Transport Authorities (LTAs) are required to adopt either:

- enhanced partnerships (EPs); or
- franchising.

LTAs were also required to produce Bus Service Improvement Plans (BSIPs) describing their strategy.

There was a surprising lack of a requirement for bid totals to be made public in BSIPs, and in general there has been little economic evaluation despite the existing Transport Analysis Guidance (TAG) approach. This may reflect the timing constraints of the bid process. LTAs were also required to consult the public in preparing their BSIPs, to identify user priorities.

Enhanced Partnerships

Adoption of an enhanced partnership is dependent on a majority of operators agreeing to the proposals by the LTA, to which they may object.

Registration of services is with the local authority, to whom powers are delegated from the Traffic Commissioner.

In practice, at the time of the NBS, there was only one enhanced partnership, in Hertfordshire, which had been running for less than a year.

Partnerships create scope for greater coordination without full franchising, on an area rather than a corridor basis, but requiring support from operators.

Schemes may specify requirements on frequency and/or timing, and some other features such as the appearance of vehicles. There may be a requirement to harmonise the zones and validity periods of tickets, but not fares which, other than multi-operator tickets, are still subject to competition rules.

There are powers for LTAs to obtain “relevant information” from operators running local services within the partnership area.

From the perspective of passengers, the resulting service may be similar to franchising.

Franchising

The Bus Services Act 2017 provides for schemes similar to those in London, with one or more public authorities specifying the network and level and structure of fares.

Mayoral Combined Authorities (MCAs) with elected mayors have powers to adopt franchising, but other authorities require the consent of the Secretary of State.

There is a requirement for consultation and audit, but this is much less onerous than under previous legislation. There is also no explicit compensation to existing operators for loss of profits. There are, however, no powers to take over vehicles or land such as depots.

Contracting would not necessarily take the same form as London, which has single route contracts, as illustrated by the current proposals in Manchester.

As with the London model, where there is a need to deal with cross-boundary services, there is provision for service permits for services not covered by franchise contracts, with a right of appeal to a Traffic Commissioner.

There are powers for the franchising authority to obtain information from operators for a period of up to five years before

a proposed franchise, including trips, fares, revenue, and bus-kilometres run, although this information need not be published. This removes some of the problems found in a Tyne and Wear case under the Local Transport Act 2008.

In marked contrast to the Transport Act 1985, the final version of the Department for Transport guidance² explicitly envisaged the possible introduction of cross-subsidy for rural services.

BSIPs and EPs: outcomes to August 2022

In April 2022 it was announced that 31 of the 79 BSIP bids had been successful and were allocated a total of £1,084 million funding for a mix of capital and revenue spending. There were also City Regional Sustainable Transport Settlements (CRSTSs), including components for bus, for seven city regions outside London. Funding was subject to further discussions with the LTAs concerned before funds were granted, although settlements are now emerging, such as Oxfordshire in mid-August.

Many bids and approvals included lower and simpler fares, such as for younger people. The BSIPs reveal wide variations in the child/adult age boundaries set commercially by operators, which often appear arbitrary.

The impact of COVID-19

The government generally discouraged use of public transport, including bus, during the COVID-19 pandemic.

Service supply also fell during lockdown as a result of both reduced staff availability affecting short-term reliability, especially in 2022, and deliberate service cuts. Some types of service were suspended or drastically reduced, including low-frequency rural, community transport, and Park and Ride, which was permanently withdrawn in Maidstone and much reduced in Cambridge.

² This was also implied in the draft guidance preceding the 2016 Bill itself. See Peter White, Prospects in Britain in light of the Bus Services Act 2017, Research in Transportation Economics, Volume 69 (2018) pages 337-343. Guidance for BSIPs issued on 17 May 2021 suggested that “[overprovision on some urban corridors](#)” should be reduced “to boost under provision elsewhere” (page 17).

By May 2022, total ridership relative to pre-COVID levels was around 84% outside London and 82% in London, with better recovery at weekends than on weekdays. Outside London:

- from late July to late August, recovery was to 84% at weekends and 66% on weekdays; and
- in the first full week in September, recovery was to 88% at weekends and 79% on weekdays, probably reflecting the restarting of school trips.

The overall numbers conceal variations by operator type: Transdev in Yorkshire and Delaine in Lincolnshire have reported recovery to around 90% of pre-COVID demand.

Within the numbers, however, operators reported only around 65% recovery in concessionary passengers, with possible factors including reluctance to go out, changing shopping patterns, and a shift to car. Given that much concessionary demand is interpeak, this means a peakier overall demand³.

Ridership during the working week reveals a mixed picture. A drop in work journeys, and a shift to hybrid patterns, may mean a bigger drop in travel on Mondays and Fridays than during the middle of the week, particularly for rail.

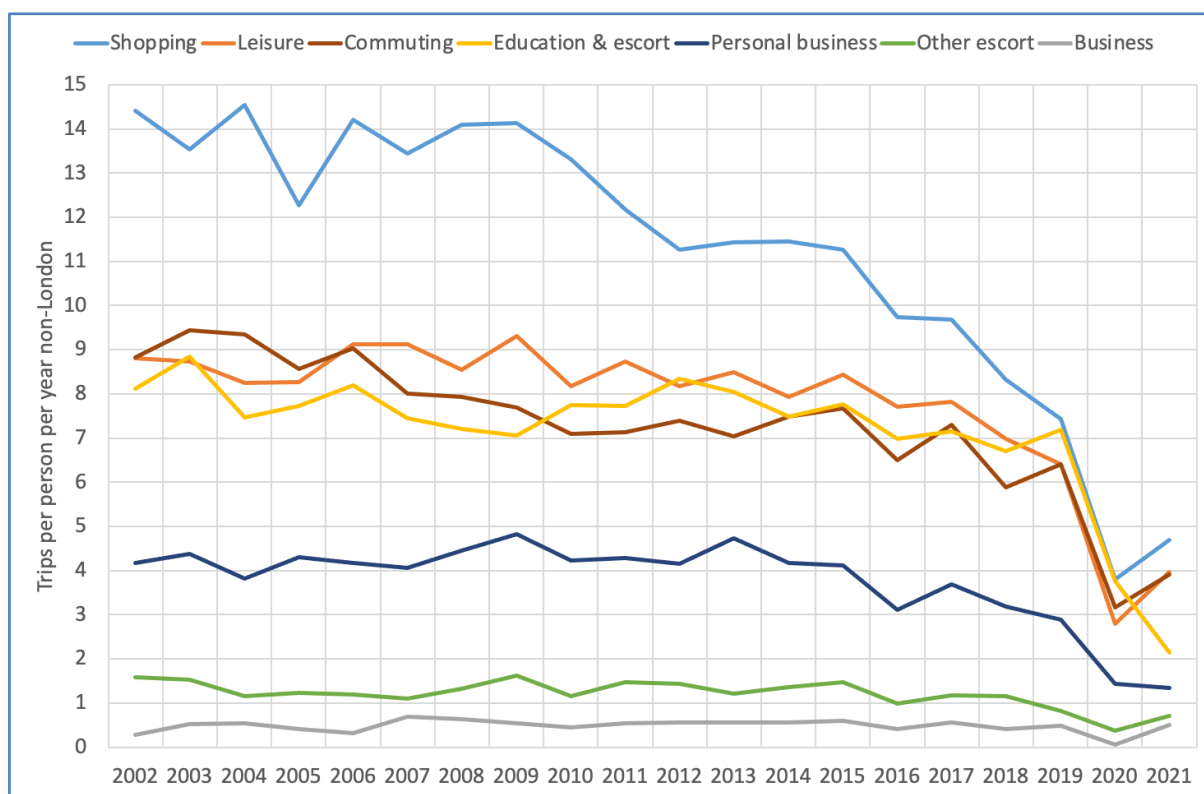
Figures 1 and 2 show National Travel Survey data on trip rates of the population of England by purpose since 2002:

- Outside London, where shopping is the largest single trip purpose; and
- In London, where education has become the most important trip purpose, accounting for over 30% of all trips.

Note that the reported bus trip rates are for the population of England, subdivided by whether trips are in or outside London, not the trip rates of Londoners and others.

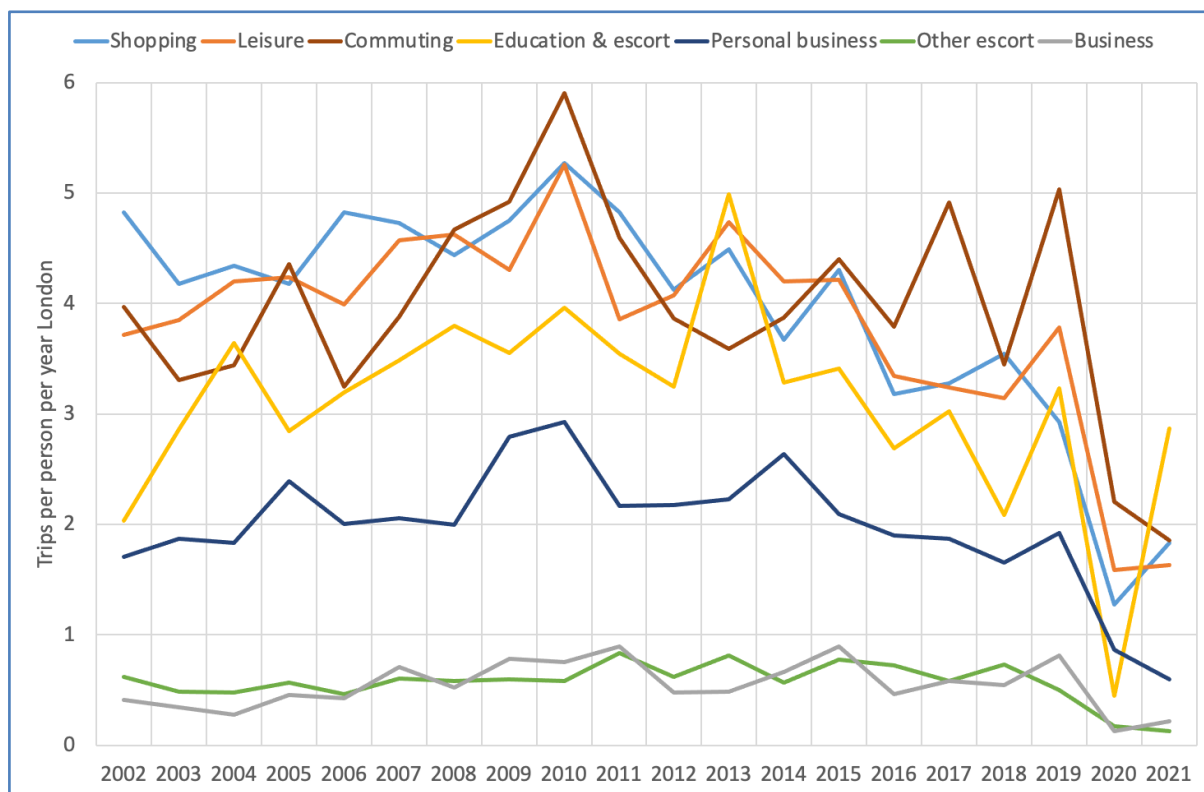
³ Bus Concessionary Travel Survey, Transport Focus, June 2022.

Figure 1: England trip rates by purpose: trips outside London



Source: National Travel Survey Table 0409.

Figure 2: England trip rates by purpose: trips in London



Source: National Travel Survey Table 0409.

Nonetheless, in summary:

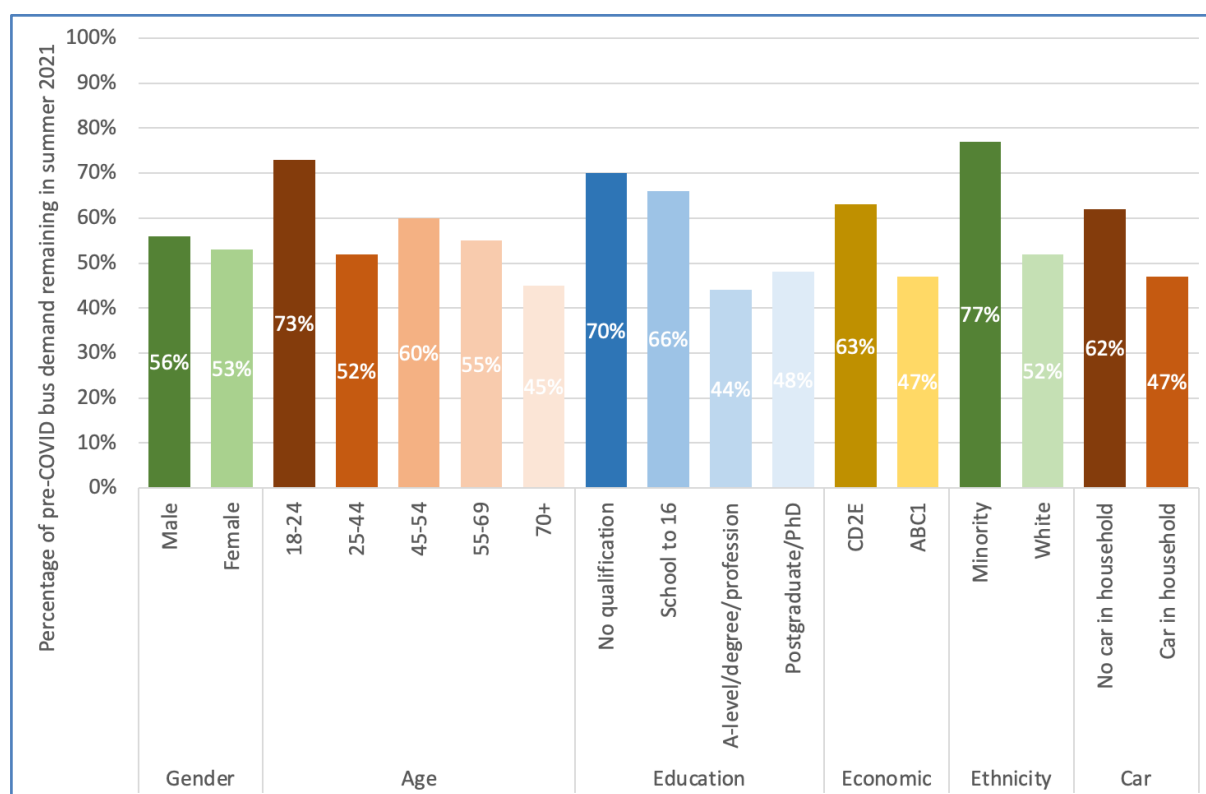
- School travel, rather than employment, may be becoming more important in determining the height of the peak.
- The journey to work peak may only be reached on three days a week.
- Interpeak travel may also be lower.

The overall effect is that a larger proportion of weekly demand occurs during the highest midweek peaks.

Anable and others carried out a longitudinal survey⁴ of adults in summer 2020, late 2020 and summer 2021 in ten areas.

They analysed the drop in use of public transport illustrated below for bus (in every group there had been a greater drop in rail use than bus use). Overall, this suggests less travel by users who have a choice and greater reliance on a captive market.

Figure 3: Summer 2021 bus demand and pre-COVID levels



Source: Anable et al.

⁴ Jillian Anable, Linos Brown, Iain Docherty and Greg Marsden, Less is More: Changing travel in a post-pandemic society, CREDS/DecaboN8. Centre for Research into Energy Demand Solutions, March 2022.

The individuals surveyed reported a marked change in working patterns, with more working from home and mixed-week working. By June 2021, 47% of the then former bus users and 66% of former rail users worked from home. They also identified that non-users were more concerned than users about the perceived health risks.

Bus service funding

Before COVID-19, around 12% of bus-kilometres outside London had been contracted and the remainder had been run commercially from user fares, compensation for concessionary travel, and Bus Service Operators Grant (BSOG).

The advent of COVID-19 meant high levels of funding to ensure service continuation. Local authorities continued compensation for concessionary fare and contracted payments for school travel at previous levels, but there was no funding to the coach sector.

Levels of funding were scaled down in anticipation of passenger recovery, but the deadlines for terminating it have been extended as recovery has proven to be lower than expected. Scottish and Welsh governments gave good notice, but central government in England left it late, in one case until 10 August 2022 to agree a further six months from 4 October 2022, by which point much time had been wasted in preparing for cuts.

In January to March 2023 there will be a three-month trial of a maximum adult single fare of £2.

Smaller vehicles

Peter noted an apparent contradiction in the development of economic activities:

- There has been a long-term trend rise in real earnings, making labour-intensive production more costly. Many services are moving to self-service to improve labour productivity, including payment in shops and internet banking. On buses, there has been a shift to contactless payment.
- Despite this, there has been marked growth in both the supply of taxis and private hire vehicles (PHVs) and the availability of home delivery of goods and food.

Peter wondered whether the user benefits and potential external costs are reflected in prices.

Taxis and private hire vehicles (PHVs)

These vehicles are of up to eight seats, but typically smaller:

- Taxis have metered fares, are permitted to ply for hire, and there are powers to limit their numbers, used by 28% of authorities in 2013, falling to 25% in 2022.
- PHVs negotiate fares, but must be pre-booked, and there are no powers to limit their numbers.

In London, neither taxi nor PHV numbers have been limited, but both are subject to licencing. However, the legal situation is confused, especially outside London, and lacks comprehensive reform.

The Transport Act 1985 legalised sharing of taxis at the initiative of the driver, and the operation of taxis as buses on scheduled routes, but little use has been made of these options.

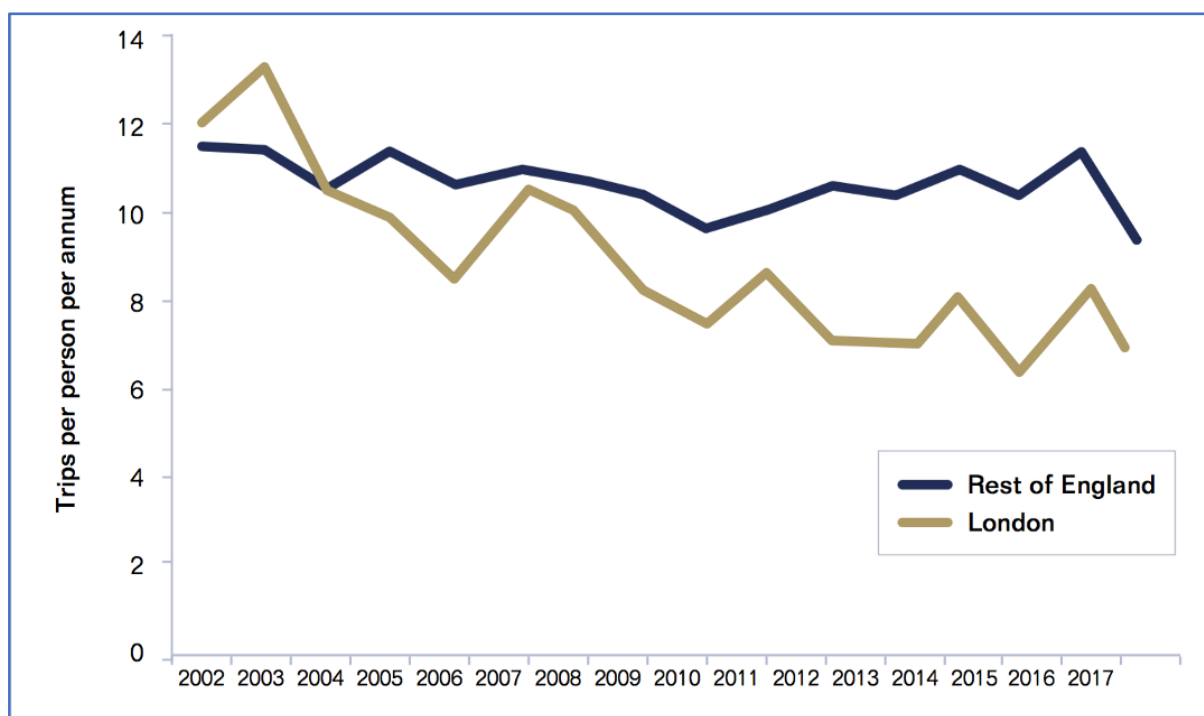
National Travel Survey data reveals a number of points about taxis/PHVs:

- Use is around 1% of trips by all modes, including non-motorised. Total expenditure is similar to bus, because it is much higher per trip.
- Use is higher in carless households and low-income groups.
- Use is mainly by younger groups and females.
- Taxi use is peaked late on Friday and Saturday nights, for leisure trips.

Figure 4 shows London and non-London trends in trips where taxi is the main mode, rather than a feeder to a longer journey. Figure 5 shows England data, but distinguishes trips and stages.

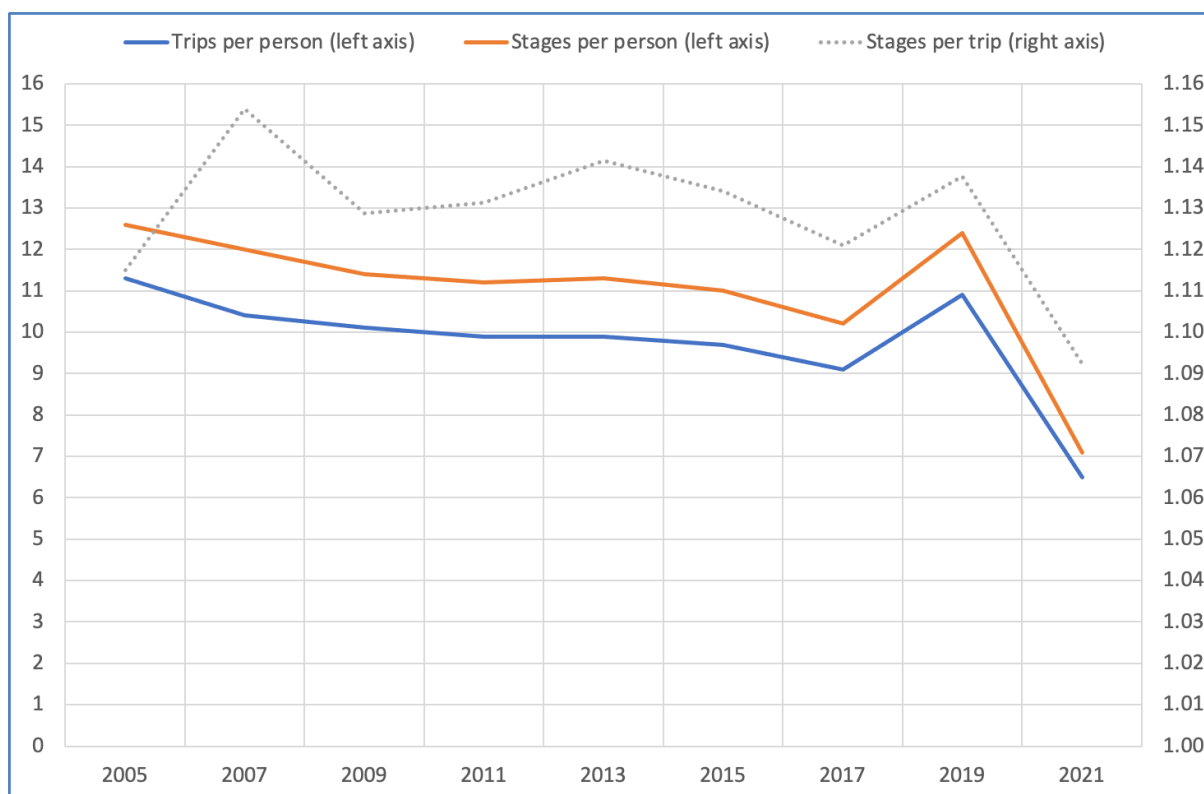
Figures 6 and 7 show data in vehicles licensed. However, Peter noted that the total number of vehicles licensed may be a poor indicator of supply, and suggested that a better indicator would be hours or kilometres in service, neither of which is available. Operators provide no passenger trip data which could be used for reconciliation checks with the National Travel Survey.

Figure 4: Taxi and PHV usage trends



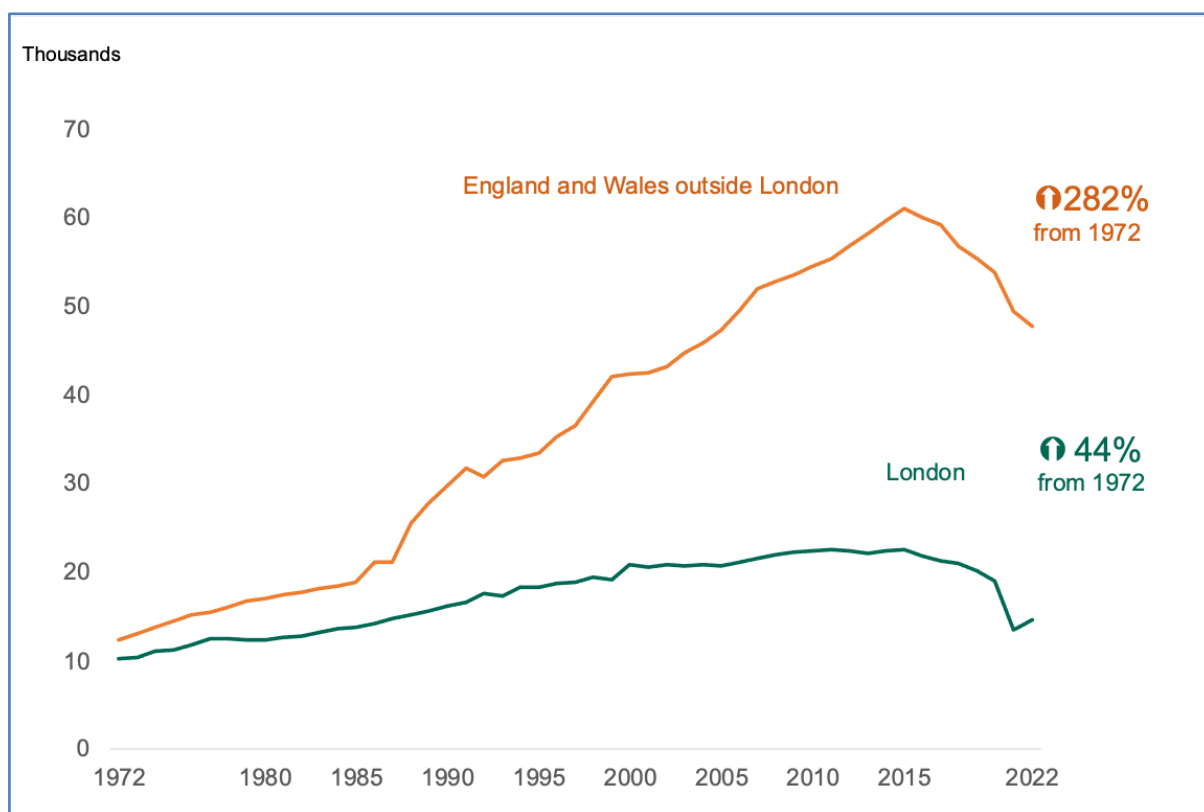
Source: National Travel Survey.

Figure 5: Taxi and PHV usage, England 2005-2021



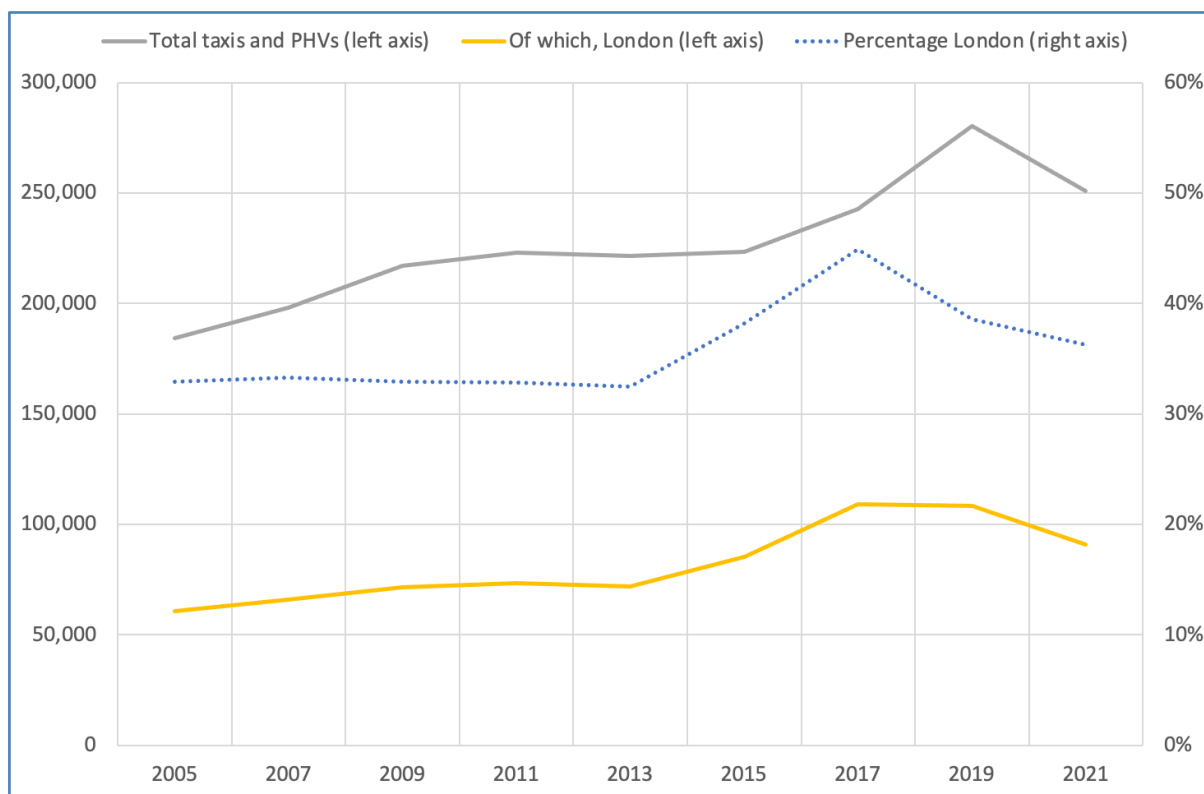
Source: National Travel Survey Table 0303.

Figure 6: Taxi (only) supply, England and Wales 1972-2022



Source: Taxi and Private Hire Vehicle Statistics, England 2022, Chart 2.

Figure 7: Taxi and PHV supply, England and Wales 2005-2021



Source: Department for Transport, Table TAXI0101a.

Vehicle utilisation

Even allowing for modest population growth, comparing the decline in trips in Figures 4 and 5 with the rise in supply in Figures 6 and 7 suggests that there has been a trend decline in trips per vehicle per year.

For 2019, before COVID-19, NTS data showed around 680 million passenger trips. With 280,000 vehicles (Figure 7) this equates to around 2,400 trips per vehicle per year or 6.6 per vehicle per day. Total travel per person was 59 miles, equivalent to 11,700 person-miles per vehicle per year or 32 person-miles per vehicle per day. Loaded vehicle miles will be lower because some passengers travel together. If one assumed an average speed of 20 miles per hour, and an average passenger load of 1.5, this would suggest that the average vehicle is only in passenger service for around one hour a day. It has also been reported⁵ that Uber drivers in London, Nottingham and Glasgow spend 35% of their time cruising for work (in at least some cases, positioning to where they think they are most likely to be offered a passenger), 23% driving to a pick up, and only 42% of the time carrying a passenger.

This analysis depends on a number of assumptions, but suggests that taxis may make relatively poor use of road space if they are only carrying a passenger 42% of the time.

Vehicle provision

Provision also varies with geography, as shown in Figure 8. Provision is generally highest where there is more fixed-route public transport, which may reflect the probability of securing a sequence of booked trips⁶. This may also correlate with car ownership levels.

⁵ John Siraut, We must prepare for a driverless future – however it plays out, Local Transport Today 1 Nov 2021, pages 22-23.

⁶ The highest reported provision was in Wolverhampton, but PHVs registered there may provide services over a wide surrounding area.

Figure 8: Number of vehicles per thousand people



Source: Taxi and Private Hire Vehicle Statistics, England 2022, Chart 4.

It is not clear how much of the drop in bus passengers (Figures 1 and 2) can be attributed to growth in taxi and PHV supply (Figures 6 and 7), but studies by both KPMG⁷ and Chris Cheek⁸ suggest a small impact.

In London, there may have been additional factors, such as the exemption of PHVs from the congestion charge, removed in 2020, and stricter age limits on licensed taxis. Transport for London (TfL) data suggests there are around 400,000 trips per day from 2011 to 2019, or 145 million per year, more than double the NTS estimate of only 7 trips per person per year (Figure 4). Even the TfL data would imply only around 1,500 passengers per year, or 4.1 per day, per vehicle, with even fewer loaded trips.

⁷ KPMG, Trends in English bus patronage, report to CPT Sept 2018; and Trends in Scottish bus patronage, report to CPT (Scotland), Nov 2017.

⁸ Chris Cheek, The Bus Demand Jigsaw 2020, Passenger Transport Intelligence Services Ltd. April 2020, pages 57-62.

The entry of Uber and others

New entry by Uber and other “platforms” is not identified within NTS data as the vehicles are licensed in the same way as any PHVs. However, there are large international firms in a market traditionally dominated by smaller local operators. The “platforms” provide benefits such as greater security through vehicle tracking and driver/customer identification. There have, however, been at least two contentious issues:

- the status of drivers as self-employed or, as found in a 2021 High Court case, employees; and
- fair competition compared with the regulation of fixed route public transport over issues such as drivers’ hours.

Scope for encouraging taxi-sharing

A 1973 study⁹ found that some sharing of taxis has long occurred, such as when a family or work group travels together with a single hirer.

In 1986, organised sharing between strangers, with separate fares paid to the driver, was legalised. This could in principle improve average load, revenue per vehicle-kilometre, and the use of road space. However, its workability depends on closely matched destinations and timings from a common origin such as a station or airport. It is offered by Uber Pool and others, which may be more effective than on-street hire sharing.

However, sharing appears to have limited impact in practice, possibly because of cultural factors, although it may also reduce total revenue if each use would otherwise have hired separately.

Taxis and PHVs in the USA

The USA saw rapid growth following the introduction of Uber and the other platforms, but from a lower base than the UK. The Union of Concerned Scientists¹⁰ indicated a growth from 1.4 billion trips in 2012, almost all by taxi, to 4 billion trips in 2018,

⁹ S R Lowe, Alternative Taxicab Systems: A London Case Study, Transport Studies Group, PCL, 1973 (two volumes).

¹⁰ Union of Concerned Scientists (US), Hail-Riding’s Climate Risks: Steering a Growing Industry toward a Clean Transportation Future, February 2020.

of which only 0.65 million were by taxi, broadly comparable with the UK rate of 12 stages per capita. In addition, the National Household Travel Survey (NHTS), broadly equivalent to NTS, estimated a 2017 mode share of 0.7%. Hence US growth could be seen as converging on UK levels. The difference may reflect stricter initial regulation, which was tighter in (for example) New York than London.

Usage in the USA, as in the UK, appears to peak late on Friday and Saturday nights¹¹. Evidence from New York indicates little use of shared PHV services, and a large increase in low-occupancy travel¹². A Californian sample indicated that 26% of non-pooled trips by ride-hailing were diverted from taxi¹³.

Usage of road space is significant, with 2-13% of vehicle-miles in downtown areas by taxi and PHVs, on average producing 69% more pollution than the trips displaced, with non-pooling trips 47% more polluting than car trips, due to the dead mileage¹⁴. One recent study¹⁵ showed that there is more dead mileage between calls when more operators enter the market, which suggests that having a few large operators may be most efficient.

Taxis and PHVs in France

A 2009 study¹⁶ found that a restrictive and protectionist regulatory system deterred new entry and resulted in a low supply measured on a per capita basis. Taxi use was limited mainly to higher income groups, with a wider mix of trip purposes than in London.

¹¹ Rick Grahn, Sean Qian, H Scott Matthews and Chris Hendrickson, Are travelers substituting between transportation network companies (TNC) and public buses? A case study in Pittsburgh, *Transportation* (April 2021) Vol 48, pp977–1006. See also Chandra Bhat et al, Forecasting of empty trips by ride-hailing vehicles, presentation at TDM Conference, Napier University Edinburgh, June 2019.

¹² Schaller Consulting, *Unsustainable? The growth of app-based ride services and Traffic, Travel and the Future of New York City*, New York, February 2016.

¹³ Union of Concerned Scientists, cited above.

¹⁴ Union of Concerned Scientists, cited above.

¹⁵ Daniel Kondor et al, The cost of non-coordination in urban on-demand mobility, *Nature.com Scientific Reports* 2022.

¹⁶ Richard Darbéra, *Où vont les taxis?*, Descartes et cie, Paris, 2009.

A 2011 study¹⁷ reported strict price and quantity control in all French cities, and little growth in numbers in preceding years. Licences were estimated to be worth €100,000 or a profit of €7,000 per year.

In 2009 Paris was an example with a strict quantity limit on licensed taxis but no equivalent on PHVs, with 2.63 taxis and PHVs per thousand people, compared with 8.47 in London.

Overall, there seems to be a strong case for reform, quite apart from any pressure from Uber¹⁸.

Demand-responsive transport (DRT)

Demand-responsive transport has two objectives: “planning” area coverage for a specified accessibility level; and “ridership” growth through an attractive service. It has a similar cost structure to fixed-route minibuses, plus the costs of operating the booking system and directing the vehicles.

Experience in Great Britain suggests that DRT cannot be commercially viable and there is limited scope for it even in supported urban networks. “ArrivaClick” runs in Ebbsfleet, Leicester, Liverpool and Watford. Oxford’s “PickMeUp” – an attempt to operate largely commercially – and Transport for London’s trials in Ealing and Southall both ended in 2020, TfL commenting “we also learnt that demand responsive buses are not a more cost-effective way of supporting the necessary reduction in car use and congestion in outer London than existing bus subsidies”¹⁹. Transport for Wales’s “fflecsi” service in Newport gained some favourable customer responses but had high costs and ended in September 2022²⁰, although the data obtained on underlying demand helped reshape fixed routes. The main remaining urban area is in New Lubbethorpe in Leicester, where a new operator has taken over from Arriva, running with developer support and a fixed route to the city centre.

¹⁷ Maya Bacache-Beauvallet and Lionel Janin, Taxicab licence value and market regulation, Transport Policy vol 19 (2011), pages 57-62.

¹⁸ The Uber Files, The Guardian 11 July 2022, pages 2-9.

¹⁹ Transport for London Bus Action Plan March 2022, page 67.

²⁰ Transport Focus, Fflecsi – the experience of Demand Responsive Transport in Wales, August 2022.

Any role for DRT must therefore be in serving low-density areas and periods of demand, including urban fringes and rural, but it will still require high public expenditure per trip. This can be appraised in the same way as fixed route services, such as by using the value per bus trip in TAG Table 1.3.18. Lincolnshire's "Call Connect" is probably the most extensive case, with around 300,000 trips per year before COVID-19. However, this is fewer than the trips on one upgraded interurban route, from Lincoln to Skegness, and means low trips per vehicle per year.

Someone commented that DRT is often useless for commuting because it is too cumbersome to request a regular trip.

One possibility may be to integrate DRT with fixed-route services for coverage in evenings or on Sundays.

Breakeven loads for buses, cars and bicycles

Bus advocates often show a picture of a bus next to as many cars as it has seats, implying much better use of road capacity, but this is not realistic. Illustratively, a full peak period bus steadily emptying in the peak direction and returning empty will only achieve an average load factor of 25%, although it will have little dead mileage. NTS data on bus- and passenger-kilometres before COVID-19 suggests an average bus occupancy in Great Britain of around 10.8 (14.4 in London, 9.4 elsewhere), averaged over all routes, times of day and directions. Outside London, average passenger trip length is higher and hence average boardings per bus-kilometre are lower.

Typical Passenger Car Unit (PCU) values are 2.5 for a bus, 1 for a car, and 0.5 or 0.25 for a bicycle. These suggest that if a peak car has 1.2 occupants, a bus uses road space more efficiently than a car if it carries at least 3 passengers and more efficiently than a bicycle if it carries 5-10. These passenger loads are well within bus capacity and less than average peak direction loads.

Average loading and energy consumption and emissions data per vehicle-kilometre suggests that buses and coaches perform marginally better than cars, vans and taxis, with greenhouse gas emissions 7% lower in 2015, falling to 3% lower in 2018²¹, but

²¹ Derived from Transport Statistics Great Britain (TSGB) Tables 0101 and 0306.

the relative performance of bus and coach will be much better in the peak.

A second environmental issue is local emissions damaging to health, including PM2.5 and NOx. Euro VI standards produce very sharp reductions in NOx, following earlier reductions in other pollutants, and buses are subject to stricter standards in operation than cars and particularly diesel cars. Concerns about buses in Clean Air Zones (CAZs) may be excessive.

With the move to electric vehicles, the latest TAG assumptions are 0.2207 kWh per kilometre for electric cars and 1.1798 kWh per kilometre for public service vehicles (PSVs), 5.3 times the car figure, which with an average car occupancy of 1.6 implies an energy breakeven PSV load of 8.6 passengers.

Electric buses are more capital-intensive than diesel buses, with roughly twice the initial cost, reflected in depreciation or leasing charges, but lower variable costs of energy and maintenance. This difference strengthens the need for high utilisation.

Do electric buses attract more users?

There has generally been a positive response to electric buses and evidence of lower noise and pollution. It is, however, less clear whether they have attracted significant extra use.

A November 2021 survey by Stagecoach of 2,217 adults including regular, infrequent and non-users suggested that if existing fares were maintained, electric buses would result in 1.0-1.7 million new bus users and 9.1-10.7 existing users using bus more. There is, therefore, a case for before and after monitoring where electric buses are introduced.

Measuring bus utilisation

Department for Transport data gives local operator bus stock of 39,600 plus 1,900 minibuses excluding coaches (Table 0601) in 2019, and 2.336 billion bus-kilometres in 2018-19, implying an average of 56,000 bus-kilometres per bus per year. At first sight, average bus loads can be raised by cutting off-peak services, but this would worsen vehicle utilisation and raise unit costs per bus-kilometre.

Passenger trips per bus may be a more useful measure, with 4.787 billion trips per year (Table 0103) giving 115,000 trips per bus per year, or around 2 boardings per bus-kilometre: averages would be higher in London and lower elsewhere. As a rule of thumb, a well-used urban network outside London might achieve 100,000 boardings per bus per year.

Table 1: pre-COVID passenger trips per vehicle per year

Vehicles	Passenger trips per year	Source
London buses	240,000	2018-19 passengers, fleet of 9,142
First Glasgow buses	120,000	Technical press reports
DRT services	5,000-20,000	Oxford PickMeUp is the higher figure
Taxis and PHVs in London	1,500	TfL trip data, DfT fleet data from TAXI0105

Measuring user journey time variability

Passengers who are planning journeys need to take journey time variability into account, particularly where they have a fixed arrival time, at work or an appointment, or can only accept a very low risk of late arrival²².

Variations in in-vehicle ride time are important to understanding how passengers experience, and must allow for, unpredictability. One component of delivered journey time measurement is Excess Waiting Time (EWT), a difference between the average journey time timetabled and delivered used by Transport for London. For DRT, it would be possible to measure the variability between request and vehicle arrival time, and in-vehicle time due to intermediate pick-ups.

²² See, for example, Forth et al, Transport for West Midlands (TfWM), Real Journey Time: A new understanding of bus passenger experience; measurement and applications, Paper at Transport Practitioners' Meeting 2018.

Policy questions

Peter asked whether there was a need for more coherent regulation of services by smaller vehicles, such as:

- removal of remaining quantity licensing for taxis;
- harmonisation of taxation (there is VAT on taxis and PHVs but not other modes); and
- consistent service registration processes.

He also wondered whether road pricing would improve outcomes by incentivising efficient use of congested road space, whether by cars, taxis or PHVs.

There was likely to be a continued role for conventional fixed-route buses, complemented by taxis and other modes for specific demand segments.

Competition policy still constrains bus more than rail in areas such as joint ticketing, making it difficult to coordinate fares in Bus Service Improvement Plans and Enhanced Partnerships. It does not, however, take account of large international groups:

- Taxis and PHVs were previously thought to lack economies of scale, but this is not the case with the platform model.

Long-distance coach networks may be dominated by a major operator at national level, as with National Express, or even at international level, as with FlixBus, as will be discussed in the October 2022 meeting. (See next report starting on page 24.)

However, the domestic regulatory environment makes it difficult to create groups which can grow this size. The Competition and Markets Authority (CMA) objected to the merger of National Express and Stagecoach despite provisions to meet competition concerns. Stagecoach was subsequently sold to the German group DWS, Go-Ahead was sold overseas, and there have been bids for FirstGroup. This could leave National Express as the only large domestic operator.

Discussion

David Metz (Online) asked about innovation, which has emerged in sectors such as banking and healthcare. In a regulated environment, how are those with new ideas, such as

Uber, allowed to innovate? **Peter** said that there has been valuable innovation in areas such as predicted pick up and arrival times and passenger security, but not in the fundamental mode of operation, which is still mainly single driver with low occupancy. Safety regulation is also improving: the 1985 Act introduced some quality checks in areas such as vehicle quality and driver criminal records.

Tim Elliott (Independent) said that in Guildford and Woking, taxis always leave their lights on but appear to be occupied: they are rarely or never hailed on street, and there is little dead running. **Peter** said that Maidstone had a very restricted supply in the 1980s: PHVs and taxis were in some cases run by the same firm, so most bookings were by phone or at ranks. Only big cities really do on-street hailing. **Tim** found the data for London puzzling: if an average vehicle has only 1,500 trips per year, to cover costs and provide a reasonable income suggested an average fare of £30-40, which did not seem plausible. **Peter** said that this may have contributed to the large drop in supply²³.

John Cartledge (Online) thanked Peter for the presentation and asked three questions. First, are BSIPs all similar, or are there marked differences in originality and innovation? **Peter** said BSIPs had generally aimed to address dissatisfaction with illogical fares and poor information. Many have set targets for recovery and then growth, but without supporting modelling. In general, they were good, especially considering how fast they had been prepared. Second, what consequences might follow from transferring registration from Traffic Commissioners to local authorities? **Peter** did not expect this to make much difference. Third, does the wide variation in the quality of roadside infrastructure, such as stops with space, shelter and real time information, have any impact on demand? **Peter** said that the "soft factors" study had examined and valued some of these features about ten years ago. **Peter** then asked **John** what his experience had been on the enhanced partnership in Hertfordshire. **John** said there had been disputes about services

²³ Following the meeting, a check on DfT statistics revealed that about 20% of drivers have worked part-time, and this has been consistent over the last ten years. This figure would probably be for a traditional London taxi driver, and might be higher for PHV drivers, especially if they also used the vehicle as a personal or family car at other times.

crossing the boundary between Hertfordshire and London. Most of the publicity had focused on electric buses in Stevenage and demand-responsive services in the northeast of the county.

David Starkie (Online) thanked Peter for a good talk and asked whether any statistics were available on the proportion of hybrid or electric vehicles. **Peter** explained that hybrid vehicles combined a smaller engine with an electric motor and battery, offering higher peak power and acceleration and an ability to store energy from braking, and typically offered a 20% fuel saving. They are, however, more complex to maintain, and operators preferred to switch direct to the simpler electric vehicles. Data was available (as shown in the post-meeting note on the next page) but rapidly became outdated.

Peter Gordon (Editor, The Transport Economist) said that services near his mother's home in Wiltshire had been cut and wondered what was the most likely explanation. **Peter** said that this was probably due to lack of staff, and that passengers preferred an infrequent but reliable service to a notionally frequent but unreliable one. In the longer run, after the effects of COVID-19 on passenger mix and journey times have worked through, there will no doubt be permanent adjustments to the network.

Robert Barrass asked whether the licensing system incentivised reduced carbon use and polluting emissions? **Peter** said that Euro VI standards were very strict, but the absence of an upper age on buses meant that many were still Euro III or Euro IV, although in some cases it was possible to retrofit newer and cleaner equipment (as shown in the post-meeting note).

Gregory Marchant (Online) thanked Peter for a fascinating talk and wondered whether anything was known about the impact of cycle and scooter hire on bus usage. **Peter** was not aware of any. Department of Transport data suggests that a lot of cycle hire is on summer weekends, with an atypical mix of trips. E-scooters and E-bikes could act as feeders to bus travel.

Report by Dick Dunmore

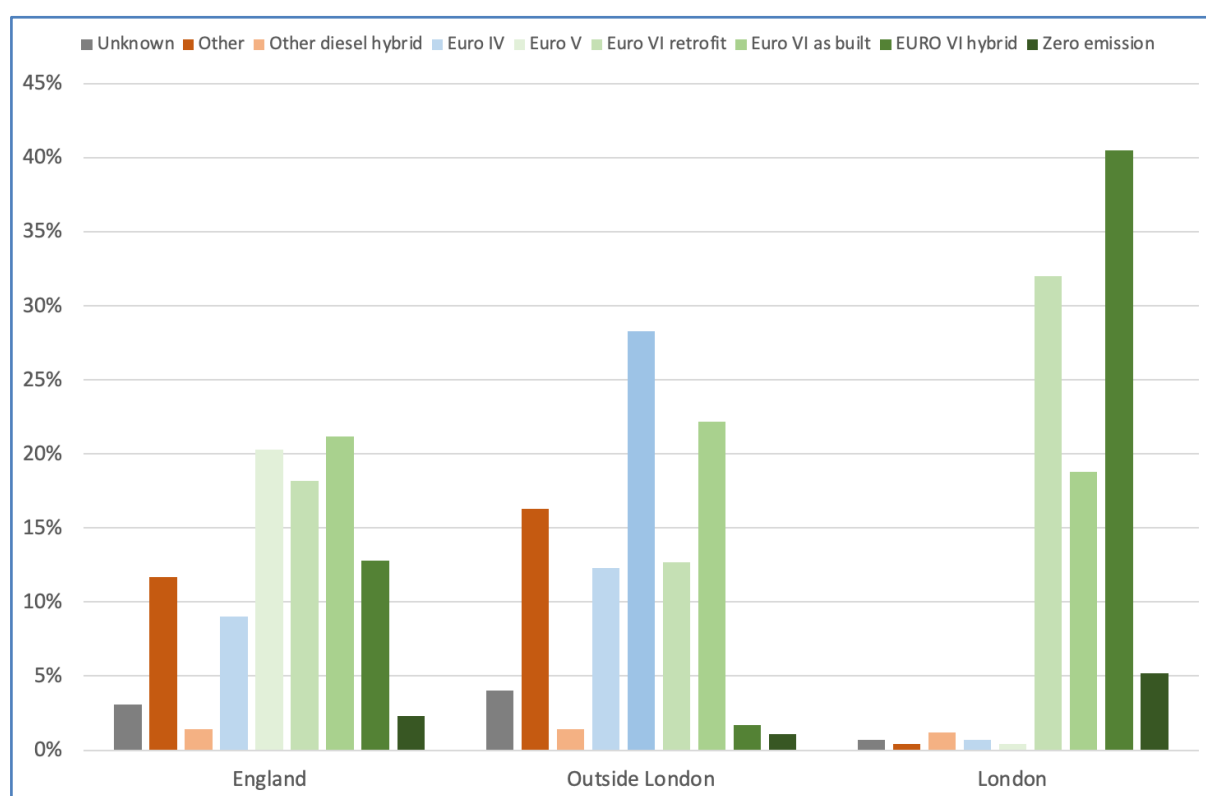
Post-meeting note

Following the meeting, Figure 9 below was derived from Department for Transport Table BUS0609 for March 2021:

- In England as a whole, 52% of buses (including hybrids) met the Euro VI standard and 2%, mostly battery-electric, were zero-emission, all shown by bars shaded green.
- Outside London, only 37% met Euro VI, but 28% met Euro V and 12% met Euro IV, both shown by bars shaded blue.
- In London 91% met Euro VI and 5% were zero-emission.

Note that the zero-emission fleet has grown since March 2021.

Figure 9: Bus emissions standards in March 2021



Source: DfT. Note that the zero-emission fleet has grown since March 2021.

Forty years' experience of express coach deregulation in Britain

Peter White (Emeritus Professor, University of Westminster)
and Tim Reynolds (Consultant)

At University of Westminster and on Blackboard Collaborate

26 October 2022

Introduction

Peter explained that the talk built on a number of sources.

The Polytechnic of Central London (PCL) and University of Westminster (UoW) have long done work on the express coach sector, including papers by White and Robbins in Transportation 1986 and Research in Transportation Economics 2012. Tim Reynolds completed an M Phil study at UoW reassessing the overall outcome of deregulation since 1980.

Peter and Tim's paper "Forty years' experience of deregulated express coach services in Britain" was published in Research in Transportation Economics, Vol 94, September 2022. The presentation would summarise this paper, with further updating and reference to related issues.

Coach was an example of a sector not receiving direct support during COVID-19 lockdowns, resulting in almost complete closure of the network in England and Wales, with subsequent rebuilding.

Definitions

Peter noted the need to define how a coach differs from a bus, and the various types of coach service:

- **Coaches** are vehicles not carrying standing passengers, usually of a high-floor layout, and wider seat pitch than local buses, typically a single-decker seating about 46, but also in 3-axle, midicoach and double-deck forms. Vehicles of up to 12 metres able to run at 70 mph, but longer vehicles are limited to 60 mph in the revised Highway Code of September 2021, banned from third (fastest) lane on

motorways, and subject to stricter EU drivers' hours rules than local services.

- **Express** services, the main focus of the talk, carry passengers at separate fares over a minimum distance of 15 miles (circa 25 kilometres) measured in a straight line, usually on a fixed route and schedule. Average speeds and utilisations are much higher for express buses (150,000 kilometres per annum for National Express) than local buses (55,000 kilometres per annum), probably resulting in lower costs per vehicle-kilometre despite using more expensive vehicles. Sections of express services carrying intermediate shorter trips are registered as "local" and are eligible for Bus Service Operators Grant (BSOG) in England and Scotland, or Bus Service Support Grant (BSSG), in Wales.
- **Excursion and tour** services operate to advertised destinations, also at separate fares, sometimes including other facilities such as food and accommodation in the price charged to customer.
- **Contract** involves regular work for an education authority or employer providing school or works services.
- **Private hire** operation comprises the vehicle being hired out as a whole to an organisation such as a sports club.

Many smaller operators, and some National Express subsidiaries, undertake a mix of these types of work.

The market in England before the pandemic

Peter provided a brief overview of the market as it stood in 2019.

Over time there has been a decline in the seasonal express and holiday market (shown in Figure 1 below), with an increase in travel between the main cities and growth in the student market, generating weekend travel over most of the year.

Over the five years 2015 to 2019, before the onset of the COVID-19 pandemic, National Travel Survey (NTS) data for England (Table 0317) showed that bus and coach carried around 4% of all trips over 50 miles (80 kilometres), rising to 5% for trips from

250-350 miles, with an average trip length of about 100 miles. Note that NTS surveys residents and excludes foreign tourists.

NTS also shows that few used express coach ("non-local bus", Table 0313) in 2019. Reported frequency of use in trips per year was 88% 0-1 trips, 6% 1-2 trips, 4% 2-12 trips, and only 1% 12-24 trips, with 1% "other". Infrequent travel makes it difficult to market new brands or services to existing or potential travellers, creating a barrier to entry.

Excluding the London commuter market, the dominant journey purposes are holidays, day trips, and visiting friends and relatives (VFR). National Express has a strong role serving airports, probably for similar journey purposes, and there is a strong student market.

There is evidence of a fairly high short-run price elasticity of around -1, suggesting that fares are generally close to revenue-maximising.

Peter and Tim then outlined the history of the sector since the 1930s through:

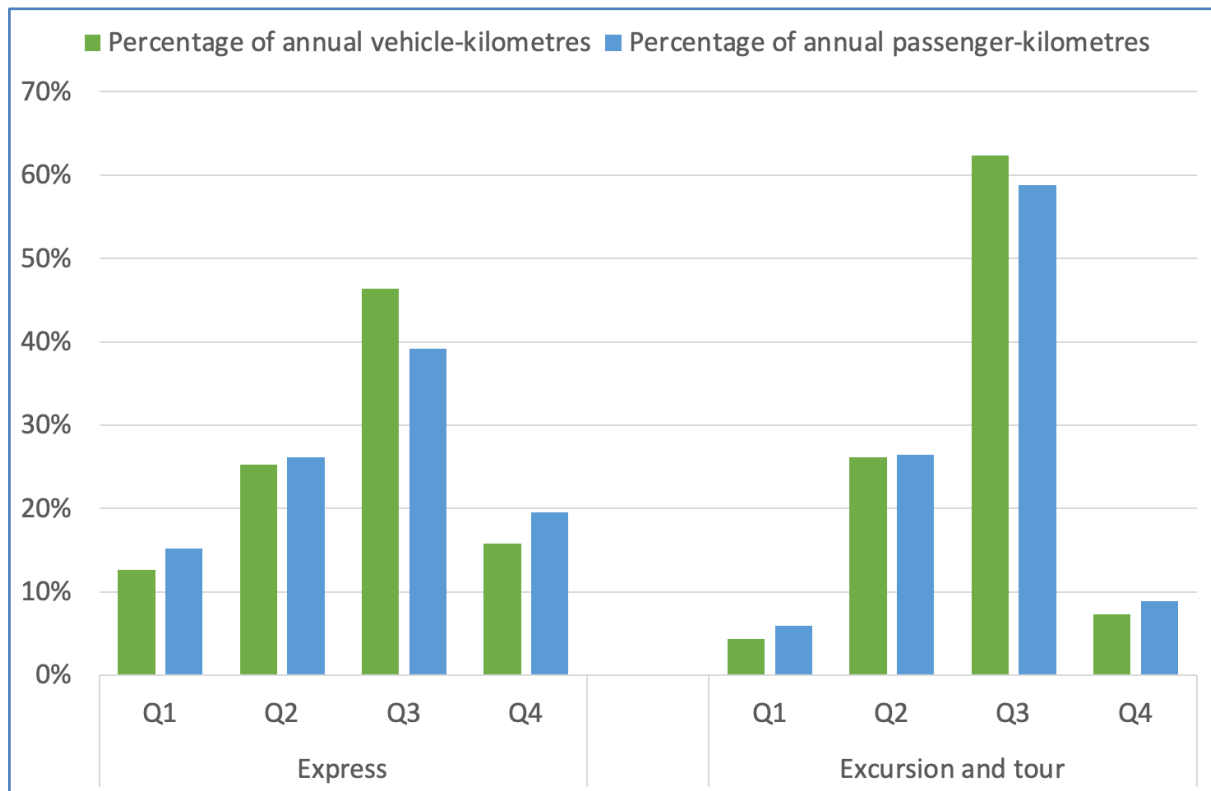
- deregulation in 1980;
- National Express privatisation in 1988;
- subsequent new entry, and
- the effects of the COVID-19 pandemic in 2020.

The market in Great Britain, 1949 and 1950

Data from the 1930s onwards show that both supply of, and demand for, express and excursion and tour services were highly seasonal, presumably reflecting the paradigm of holidays in the summer months.

The availability of statistics has declined over time. Transport Statistics Great Britain (TSGB) included data on annual vehicle-kilometres, passenger trips and passenger revenue by service type until 1984, when the service types were combined, but by 1992 even data on passenger journeys had been dropped. The Department of Transport no longer collects or publishes data even on vehicle-kilometres.

Figure 1: Seasonality of coach services in 1949 and 1950



Source: Public Road Passenger Transport Statistics, Great Britain, 1949 and 1950

Deregulation in 1980

Tim explained how the Conservative Government of the 1970s and 1980s focused its energy on deregulating industries, from heavy industrial processes through the telecommunications and beyond. The transport industry was no exception, and both the bus and coach industries became deregulated, starting with coach.

The government had three main aims:

- removal of bureaucratic restrictions;
- a need to ensure that everyone gained good access to transport; and
- provision of maximum choice for the user (passenger) through competition.

Anticipated outcomes were:

- choice, with multiple operators competing on multiple corridors;

- lower cost travel, through competition and no abnormal profits;
- cost burden shift to the private sector, generating efficiency and balance; and
- social welfare gain (see work by Douglas) as a result.

However, a critical assumption was contestability, a dynamic equilibrium with the market remaining open to entry and exit, stable with no abnormal profits and a balance due to the continuing threat of new entry. The economic foundations were Adam Smith's invisible hand theory and laissez-faire (balancing point), and Contestable Market Theory (CMT) developed by Baumol (et al) in 1982, which relied on three criteria:

- zero entry and exit costs (no sunk costs);
- technology and information available to new entrants; and
- the absence of economies of scale.

Tim noted that it was far from clear whether any of these criteria would actually be met in the express coach sector, where there were considerable start-up costs, and operations and (in advance of the internet) marketing (posters and printed advertisements) and sales (ticket offices) were all easier for operators large enough to have multiple staffed locations. In addition, while CMT was seen as a key to maintaining market equilibrium by policymakers, as the mere threat of entry would maintain a competitive environment, the non-neoclassical theory would imply a result similar to perfect competition without the requirement for multiple small firms in the market. In other words, if the market was constrained by the threat of competition, rather than actual new entry, there might be few small operators and little new entry or direct competition.

Since 1930, scheduled express and excursion and tour services (but not contract or private hire) had required Road Service Licences (RSLs) specifying routes followed, timetables and fares. The RSL system protected incumbents and railways and encouraged consolidation, but was still more liberal than many European states which banned coaches from competing with rail. The Transport Act 1980 removed price and quality control and required only a simple route notification procedure, which was

abolished in the Transport Act 1985. Quality controls were strengthened through operator licensing, which improved bus and coach safety standards and was followed by a sharp drop in casualty rates.

From deregulation on 6 October 1980, National Express dominated the market. However, a number of independent express services emerged, including the "British Coachways" consortium, and some niche services showed remarkable staying power in the face of fierce competition. Initial milestones included that:

- There was an initial flurry of 71 services by 45 operators, possibly facilitated by existing capacity becoming free after the summer peak shown in Figure 1.
- 66% of new entry was in the range up to 150 miles, which allowed a return day trip within permitted drivers' hours.
- By January 1981, 36% of the routes had closed.
- By 1983, 68% of the routes had closed, and 23 services by 14 operators remained.
- Scotland contrasted with the rest of the UK, with competition sustained until the 1990s.

The key corridors for competition were the west country and Anglo-Scottish routes, and independent firms innovated in passenger facilities and comfort.

National Express had been able to anticipate competition by restructuring its network and offering very low fares on trunk routes. Its dominant role was also assisted by its access to the established Victoria Coach Station in London, while British Coachways and others used a temporary site near Kings Cross.

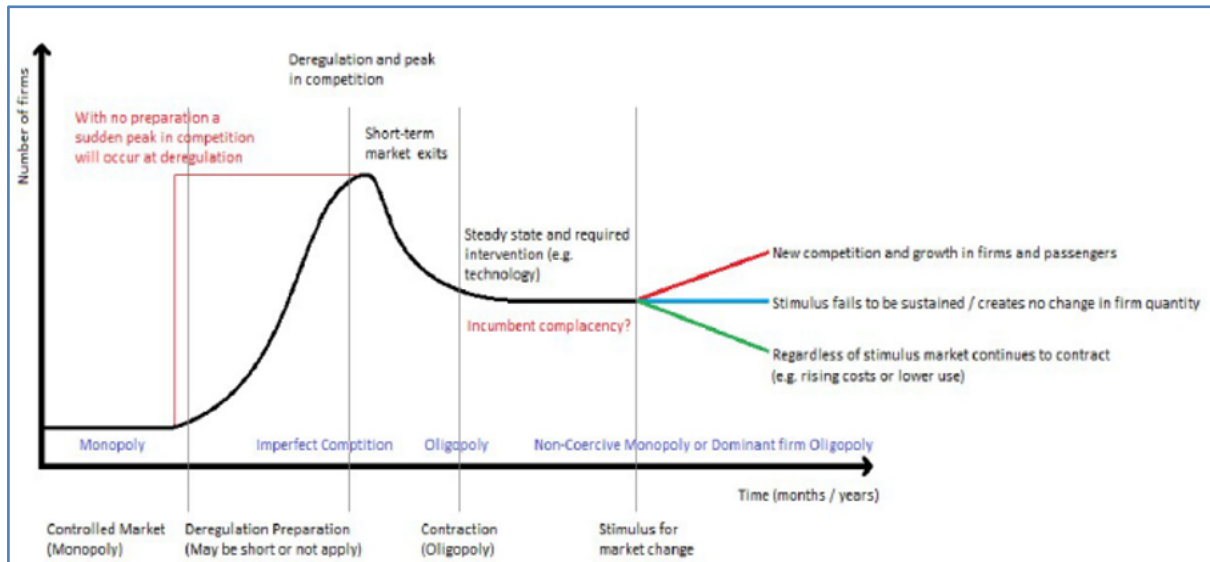
Many entrants were short-lived, or later absorbed by NE, with the only significant operator remaining being Berrys of Taunton serving the west country and London. Some routes moved to a partnership approach with NE.

Taking NE ridership as a proxy for the whole network, passenger trips grew by around 50% between 1980 and 1986. The policy was therefore successful in terms of lower fares, improved services, passenger growth and offering competition to rail, but

not the anticipated outcome of many small operators and, in the longer run, there was a contraction of lower-density services.

Tim presented the theoretical model of the deregulation cycle, based on this experience in Great Britain and similar market liberalisations.

Figure 2: A theoretical model of the deregulation cycle



The key long-term issue is which line on the right emerges:

- The red line (top) is new competition and growth in firms and businesses.
- The blue line (centre) is when the initial stimulus is not sustained and produces no change in quantity.
- The red line (bottom) represents continued contraction, with rising costs or falling use.

The privatisation of National Express (NE) in 1988

Peter explained that NE remained in state ownership, competing mainly with British Rail, also state-owned, until 1988, when it was privatised through a management and employee buyout (MEBO). It then pushed real fares sharply upwards which, consistent with a short-run price elasticity close to -1, resulted in broadly stable revenue. Independent competition, which had been predicted by CMT, did not prove effective in constraining fare rises. In 1992 it became a PLC, reversing the fares increases and restoring passenger growth.

NE also made a shift to other operators running services under its brand on gross cost contracts with incentives, specifying common vehicle types but owning few vehicles itself (other than those used on airport operations) although the size of the owned fleet has since increased. It also acquired independents, especially in the airport markets, where it acquired Flights Coaches (of Birmingham) and Cambridge Coach Services. It subsequently also expanded into local bus services, rail franchises and overseas operations.

From the early 2000s to 2017 (after which published data consolidated coach with other UK bus operations), NE was consistently profitable, despite the growth of Megabus (discussed next), with operating margins rising from around 6% to around 12%, and real fares stable. The contracting model allowed a small asset base and hence a return on investment of 30% in 2000 for coaches and still 12.4% for the Group as a whole in 2019.

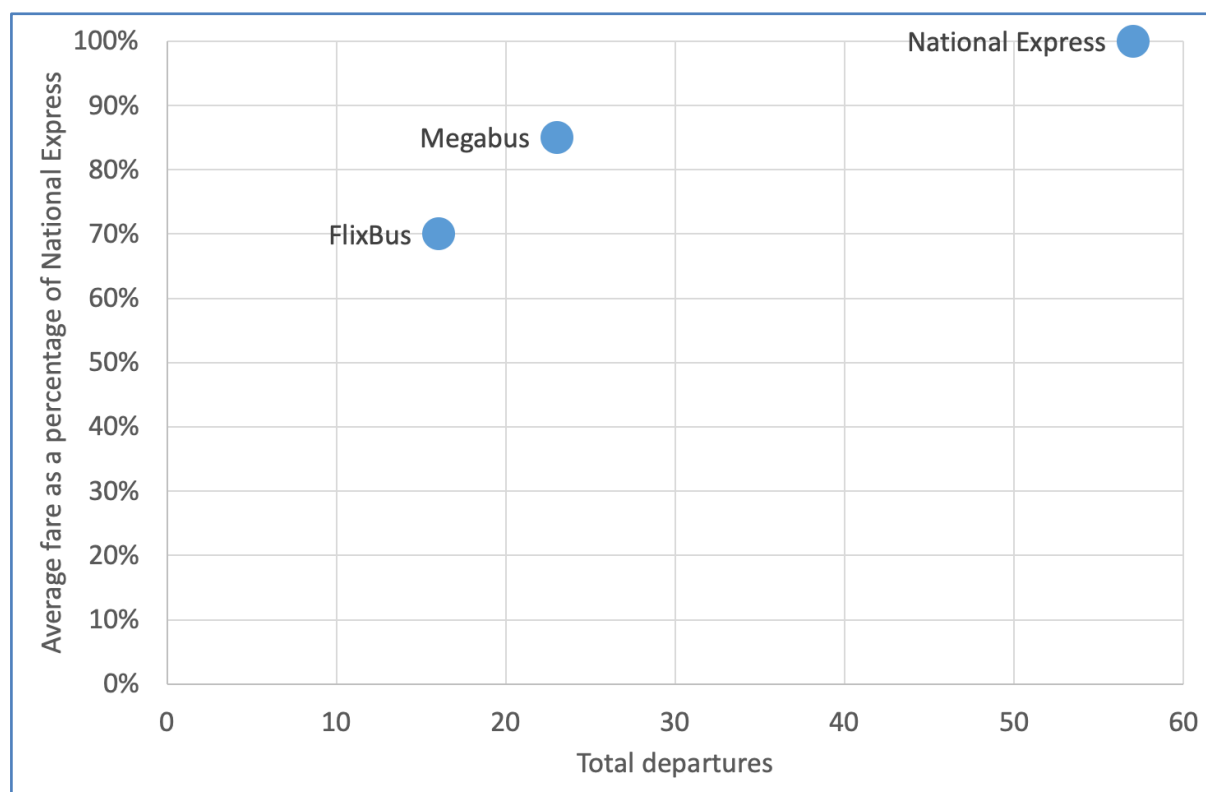
New operators and direct competition

In 2003, Stagecoach started its Megabus subsidiary, with a model of online bookings and yield management, and targeting the student market. It is mostly directly operated by Stagecoach, although there is some contracting in. It was initially loss-making but in 2008 carried 2 million passengers and was profitable, and now carries around 4 million passengers per annum.

In 2013, Germany deregulated journeys between end points more than 50 kilometres apart and not connected by a regional rail service with a journey time under an hour. Start-up FlixBus grew rapidly and soon became dominant in most of the markets it was able to enter, including France. In March 2016 it began international services to the UK and in July 2020 it entered the domestic market, contracting in local operators under its brand. It operates on major trunk routes to and from London and a few cross-country links, largely duplicating other operators, except for a Manchester-Cambridge-Paris overnight service. A recent addition is between Glasgow and Aberdeen. It typically operates at lower frequencies and fares than the other operators, and reduces frequencies midweek, a pattern now adopted by NE and Megabus.

Figure 3 below shows the results of analysis of services and fares requested six days ahead for travel from London to Birmingham, Bristol, Cardiff and Leeds on a Thursday in February 2022. The operators all offer similar journey times, except for Megabus routes to Bristol and Cardiff which call at Heathrow en route.

Figure 3: Frequency and fares on multi-operator routes



The findings are consistent with earlier research that lower frequency operators offer lower fares²⁴. However, each operator charges a wide range of fares: to Bristol, NE charged £4.90 to £12.90, with an average of £7.55, and on another date Megabus charged one journey at £2.95 with several journeys at £3.95.

Market shares

The total annual express market in Great Britain is now around 25-30 million passenger trips, although this includes some local traffic, particularly on Scottish Citylink:

²⁴ David Thompson observed the effect in coaches, and it has also been observed in multiple countries in rail (Study on the prices and quality of rail passenger services, Steer Davies Gleave for European Commission, April 2016, Figure 6.2).

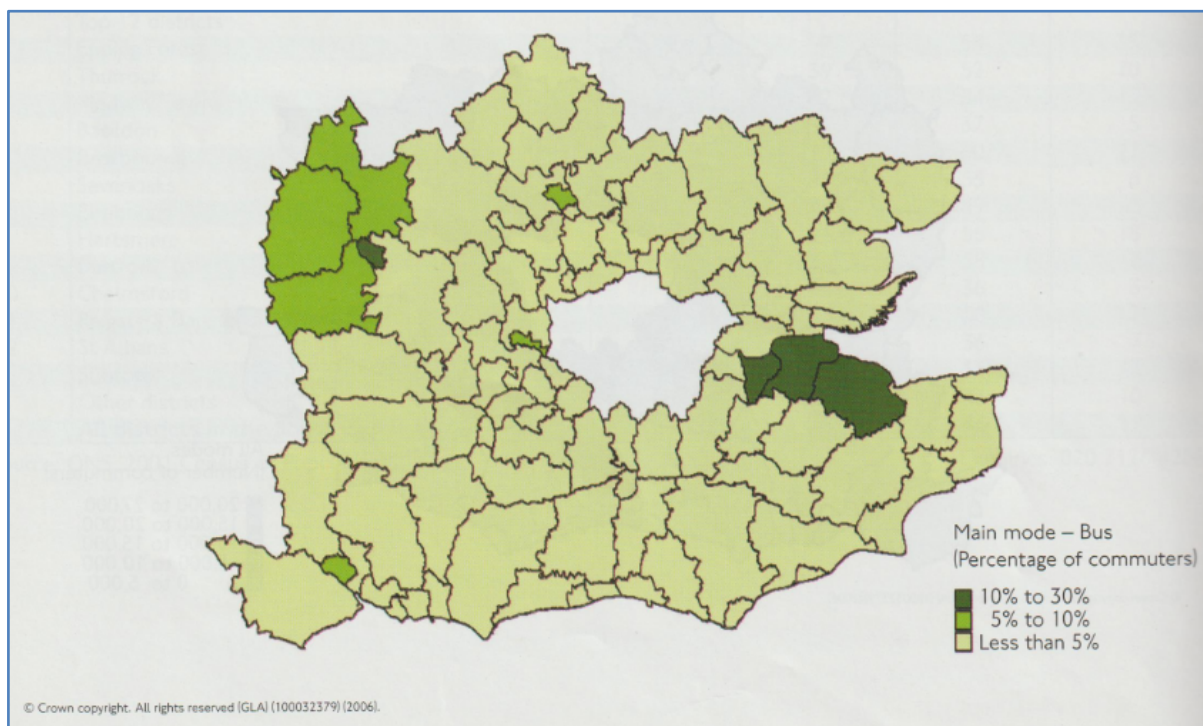
- National Express carries around 20 million trips (stable over the last decade except for a dip in 2012 when state-funded concessionary fares were withdrawn).
- Megabus carries around 4 million trips.
- Scottish Citylink carries 2-3 million passengers and provides most services in Scotland.
- In Northern Ireland, where market entry is effectively prevented, there is a strong role for publicly-owned Translink, which operates Goldline services.

Other operators include Berrys Coaches from the west country, smaller independents and, until 2020, Snap demand-responsive services. FirstGroup introduced Greyhound services from 2009 to 2015, but they had little effect on service provision.

The London commuter market

The London commuter market had grown strongly in the 1980s, particularly where rail services were poor or new housing was remote from rail. The economics of peak-only operation were improved by using high specification vehicles suitable for excursion and tour and private hire work between the peaks and at weekends.

Figure 3: Percentage of commuters with bus as main mode



There is frequent commuting on 24-hour services between Oxford and London. There was substantial commuting from south Essex and Southend in the 1980s and 1990s, and strong demand remained from north Kent, routing via Canary Wharf, where the largest operators King's Ferry and Clarkes of London, have been acquired by NE.

Services were suspended during COVID-19, with limited reintroduction, but NE withdrew in December 2021, apparently due to the effects of congestion and changing working patterns, with January 2022 peak journeys at only around 15% of the pre-pandemic level, according to Peter Bradley of the UK Coach Operators Association (UKCOA).

The Scottish market

Scottish Bus Group ran trunk routes to London, but was slow to exploit the market within Scotland following the major motorway development in central belt. After 1980, this led to major innovation by independents, including Stagecoach.

There was subsequent consolidation into larger firms and the eventual creation of the Scottish Citylink joint venture between ComfortDelGro and Stagecoach operating in similar fashion to National Express, with operations through contractors. There are also some internal services run by Megabus and (pre-pandemic) the up-market "Citylink Gold" on long-distance routes from Aberdeen and Inverness.

Demand has been boosted by free older persons' concessionary travel on express services for Scottish residents within Scotland.

Scottish Citylink coordinates timetables with Megabus and Park's of Hamilton on common routes. Services extend to low-density regions in the Highlands as well as trunk routes in the central belt, and a high proportion of route mileage is registered as "local".

The airport market

Until the early 1980s the British Airports Authority (BAA) was hostile to coach services at airports such as London Heathrow, but then became much more positive, partly because they made

much more efficient use of road space (such as the tunnel into the Heathrow Central Terminal Area) than cars.

The first services were mainly diversions of existing services from the M4, but there was a subsequent growth with dedicated routes to Heathrow, Gatwick and Stansted. By the 1990s, there was a higher share of land-based access from South Wales, the West of England and the West Midlands by coach than by rail via Reading (Heathrow Express rail services opened in 1998, but there is no firm date for the Western Rail Link to Heathrow from Reading). As of 2019, airport services represented a third of National Express activity.

Revenue, yield and profitability

Average 2019 yield per passenger trip appears to have been around £7 for Megabus and £14 (200% of Megabus) for NE.

Jules Duberga, who attended the meeting, had also shown a large difference from sampling websites in 2018, with £11.93 for Megabus and £17.14 (144% of Megabus) for NE full fares, excluding airport services²⁵. However, actual yields with child and discounted fares would have been lower, and yields may vary by time of year and route, with lower fares on heavily-used trunk routes.

There is evidence of higher fares on low-density routes without competition: Duberga had found an average price of £16.99 where there was one operator and £13.37 where there was competition. Douglas had found something similar in 1987. However, this may mean excess profits, or merely reflect how low-density routes have lower load factors and, if not able to use motorways to raise speeds, higher costs per vehicle-kilometre.

There is a strong market for coach travel between central London and its airports, which supports competition between NE and independents.

At Luton, where there is no direct rail link, the long-established Arriva Green Line 757 route to Victoria was ousted in 2013 following an offer by NE to pay the airport a much higher share

²⁵ Competition analysis of the UK intercity coach market: A structural econometric model. International Journal of the Economics of Business, Duberga (2020).

of coach service revenue (up to 20%, compared to Arriva's 2.5%), implying high profitability. A subsequent High Court case raised the issue of control of access to airports, and the Arriva service was reintroduced. This contrasts with strong competition policy on city centre stations.

At Stansted, where the rail link operates for limited hours, access by coach operators is also controlled.

This is a possible case of airports extracting economic rent (where subject to "single till" regulation, airports are expected to extract rent from services such as parking and retail to cross-subsidise landing charges), but does not necessarily imply that non-airport routes are as profitable.

Peter noted that there are parallels with the domestic air market, with wide variations in price levels and degree of competition. Low-density and cross-country services with smaller aircraft tend to have higher fares than low-cost carriers on the trunk routes between London and Edinburgh and Glasgow. However, Flybe had failed to make these routes profitable, and ceased operations in March 2020, just before the lockdowns during the pandemic.

Innovation

Deregulation in 1980, which predated yield management, resulted in immediate innovation in service attributes by new entrants to distinguish their product from NE:

- Cotters Anglo-Scottish had onboard videos and premium seating.
- Trathens provided onboard catering.
- Scottish services used higher specification coaches.
- Stagecoach offered continental "double-deck" coaches.

At the time, these innovations in quality generally lasted longer than other entrants focusing on a cost-cutting model. In addition, the incumbent reacted by merging with Trathens and creating the "Rapide" routes numbered in the 5XX series which were developed and expanded to all long-distance services.

As the deregulated market settled, however, innovation in service quality slowed as cost-based competition took over.

There was sporadic new entry with innovation, such as Bakers Dolphin services with onboard catering and booked seats.

However, the most important innovation was technology and particularly e-commerce, with the entry of Megabus and then FlixBus with the low-cost airline model of online marketing, sales and yield management.

From 2009 to 2015, First Bus operated the Greyhound brand, initially focusing on high levels of social media interaction with users, personalised service, and yield management, although the service ultimately failed because its devolved management never built a network with connections.

In 2017, Thomas Ableman inaugurated the “Snap” product, which consolidated requests from individuals and then hired coaches from high-quality operators, with calling points convenient to the users. The main operations were London-Bristol and London-Nottingham, and the service had carried 220,000 passengers by June 2019 (around 1% of NE’s annual passengers) but ended with the pandemic. NE introduced a similar “neon” product focused on events, as dedicated services to festivals such as Glastonbury have become a major innovation in recent years.

Most recently, FlixBus’s entry has been based on a mix of technology and low cost.

Unsuccessful innovations have included Megabus overnight sleeper coaches, Citylink Gold, and early attempts to include Uber-style coach products. Onboard catering has largely been dropped as cost becomes critical (Citylink Gold was not reintroduced after the pandemic). While passengers find onboard facilities useful, most prefer low prices, which are needed to compensate for the longer journey time relative to other modes. Competition has now reverted mainly to price, with little innovation other than limited NE trials of premium seating. In addition, sustained market entry requires strong financing: Megabus and FlixBus have succeeded where Greyhound and Snap have not.

Electric operation and alternative fuels

The sector has already delivered a marked reduction in emissions due to the adoption of Euro VI standards. There has been some interest in biofuels and hydrogen and, since October 2020, Ember has operated battery services between Edinburgh and Dundee, supported by Scottish government grants for new vehicles, to which have recently been added Glasgow to Dundee, with other routes planned.

Experience in Europe

Sweden and Norway have long had deregulated services, including to airports such as Stockholm Arlanda and Oslo Gardemoen which are remote from the cities they serve.

German deregulation in 2013 was followed by rapid growth to around 24 million passengers by 2015, with numerous competing operators until FlixBus merged with MeinFernbus and now has around 90% of the market through contracting in services operated under its brand and pricing. (Unlike UK practice, the merger was not investigated by the competition authorities because total turnover was less than €500 million.)

French deregulation in 2015 under the “loi Macron” also resulted in strong growth and some consolidation, with the market now dominated by FlixBus and BlaBlaCar bus, which absorbed SNCF’s Ouibus in 2019. In 2017 there were 2.2 billion passenger-kilometres on scheduled services.

In Ireland, state-owned Bus Éireann offered an extensive express network, but liberalisation has seen many competing operators, including FirstGroup’s Aircoach services to Dublin airport, analogous to those to London Heathrow.

In contrast, Spain has a long-established network, especially in regions with poor rail coverage, and a number of major operators such as Alsa, part-owned by NE. National and regional authorities procure services by competitive tender (analogous to Great Britain’s rail franchising) although the policy was reviewed by the state competition authority in 2019.

Tim presented a table summarising the various deregulation models in date order, reproduced as Table 1.

Table 1: Summary of European deregulation models

Process	Great Britain	Sweden	Norway	Germany	France
Liberalisation stages	1	2	2	1	2
Liberalisation completion date	1980	1999	2003	2013	2015
Strong incumbent network operator	✓	✗	✓	✗	✓
Rail ownership at liberalisation	Public				
Rail incumbent ended	1997	1999	Still dominant public incumbent		
Operator licence	✓	✓	✓	✓	✓
Notice period	✗	✗	✗	Notify schedule	✗
Distance threshold kilometres	48	100 or across county border	None	50 or 1-hour regional rail	100
Level of technology at liberalisation	Low	Medium	Medium	High	High
Duration of consolidation	5-8 years	4-6 years	3-5 years	2-3 years	2 years
Large operators now in market	3	2	3	1	3
Estimated current market structure	Dominant firm oligopoly	Oligopoly		Non-coercive oligopoly	Oligopoly

Experience in North America

North America has a very low-density rail network, and long-established networks of Greyhound and Trailways, but saw the emergence of new carriers such as BoltBus.

More recently there has been UK and European involvement:

- Stagecoach entered the market with Megabus, but this was sold to US-owned Variant in 2019.
- Greyhound was acquired by First in 2007, but sold to FlixBus in October 2021, when it was carrying 16 million passengers per annum.

Coach is weak relative to air and car competition but strong relative to rail. The Chaddick Institute of DePaul University, Chicago, estimates that total annual coach trips are around 60 million, or nearly 0.2 per inhabitant, against around 0.4 in Great Britain.

The impacts of COVID-19

COVID-19 had a drastic impact on the industry from late March 2019 due to the first lockdown.

In Scotland, frequencies were cut but most services are now restored to 2019 levels, probably due to the effects of payments due to local service registration and free concessionary travel compensation.

In England and Wales, almost all express services ceased from 6 April 2020, but there was a recovery from mid-July 2020, with Megabus and NE reintroducing basic networks. NE's services subsequently expanded rapidly, especially to airports. Typically only window seats were sold, reducing capacity by around 50%. By August 2020, NE was running 30% of the previous mileage. The subsequent lockdown in early 2021 had similar impacts and recovery.

The effect on the tour sector was much more dramatic, with the collapse of Shearings and other operators.

NE results for 2021 showed that passengers peaked at pre-pandemic levels in November 2021 with an occupancy rate of 66%, but "extremely low passenger volumes" on airport services. Total UK coach revenue was down 48% on 2019, or

36% down during the peak. NE half-year results to June 2022 confirmed the recovery, with an expectation of return to profit by year end, and third-quarter results reported 78% load factor on “core city operations” (70% in 2019), with demand in “well in excess” of 2019 on some routes, and yields 8% up on 2019.

The airport market has now recovered, with most services reintroduced and some new services, such as east Kent to Stansted, and “about 64% of pre-pandemic patronage” by mid-2022.

Many NE low-density and cross-country routes suspended in early 2020 were formally deregistered in 2022, resulting in further concentration on core routes and airports. There is very little sign of other operators replacing the closed routes.

In Scotland, Citylink reported an operating loss of £0.3 million in the year to 30 April 2021 and a profit of £0.4 million in the year to 30 April 2022.

Outcomes in other countries appear to have been broadly similar. In France, which had three lockdowns, Laroche reported that 2020 demand was only 35% of 2019 demand²⁶.

Merger plans

A Stagecoach/NE merger was proposed in September 2021, with estimated savings of £35 million, or 2% of total turnover. Concerns of dominance due to the role of Megabus were met with a proposal to transfer it and the Falcon Bristol-Plymouth service to ComfortDelGro from late February 2022. Nonetheless, the Competition and Markets Authority (CMA) effectively prevented the merger.

Subsequently, Stagecoach was sold to DWS of Germany in May 2022. Megabus and Falcon services were transferred to Scottish Citylink from September 2022. Stagecoach also raised its share of Citylink from 35% to 37.5%, the majority being held by ComfortDelGro. There has been little other change in services or the role of contractors.

²⁶ The effect of COVID-19 on long-distance transport services in France, Regional Science Policy & Practice, F Laroche (2022), Pages 1-20,

Coach infrastructure

Lack of a need for specialist infrastructure can be an advantage in enabling access to many points without fixed investment, but may result in coaches receiving poor treatment in traffic management:

- Intermediate stops on scheduled services are often poor, although there have been specialist “coachway” interchanges at Milton Keynes (M1 Junction 14) and High Wycombe (M40 Junction 4).
- City centre terminals are also often poor, as in Cardiff, and there was strong opposition to moving London’s main terminal from Victoria, where it remains, to Royal Oak.

Coaches require little road space, but perceptions are often inaccurate: Polytechnic of Central London’s 1988 bus and coach survey found that coach and non-local buses were only 1.5% of vehicles over a 12-hour day, and did not reach 5% even in Buckingham Palace Road. Buses and coaches, with a value of 2.5 Passenger Car Units (PCUs), use road space much more efficiently than cars, but good data on average loads would be required to support a case for more priority.

Discussion

Ola Faleti (Online) asked whether the National Travel Survey (NTS) only covered travel on National Express and Megabus, and hence excluded other operators, such as those providing school journeys in London. **Peter** noted that some private schools in London charge fares to pupils, and these services are registered with Transport for London. NTS is based on travel diaries completed by respondents in households, and should include all travel, although school travel is categorised as “other private”. NTS omits travel by non-residents such as foreign tourists.

Peter Gordon (Editor, the Transport Economist) had two questions. First, how had dynamic pricing in rail affected long-distance coach. **Peter** said that the approach had developed in parallel in both modes, and that it was not possible to identify a change in one due to the other. Second, how was the decline in possession of driving licences by younger people affecting

coach? **Peter** said that this had strengthened the market, particularly for student travel.

David Starkie asked whether the competition authorities had been concerned by consolidation? **Peter** said that this had not generally been the case, except for the creation of Scottish Citylink, where there was a requirement that an independent operator take over some routes, although it continued to coordinate its timetable to provide connections. There had, however, been investigations where a coach service and directly competing rail franchise had come under common management.

Tim Elliott noted that National Express had only been created as a single brand in 1973 when the National Bus Company consolidated its services. If the 1980 deregulation was expected to offer a return to more operators and more competition, it had not delivered them. **Peter** replied that the National Bus Company had been created in 1969, following state ownership of the Tilling group and British Electric Traction (BET), and that this had resulted in further consolidation.

Dick Dunmore noted that experience in Europe had been that liberalisation had led to rapid dominance rather than to competition. The ability of FlixBus to take advantage of deregulation in Germany, France and Italy meant that it was Europe's dominant operator even without liberalisation in Spain and some other EU states. **Peter** added that neither Spain nor the Netherlands had liberalised their domestic markets.

Mark Sullivan (Online) asked how the reaction of rail to coach competition varied by location and time. Does the multiplicity of rail operators mean that there is no coordinated competitive approach by rail as a mode? **Peter** pointed out that rail operators often used the same strategy: because of their higher speed than coach, they could sell cheap tickets on post-peak rail departures which would still arrive at times comparable with peak coach departures. In addition, other rail users had benefitted from the resulting lower fares. The converse was true on services to Heathrow, to which direct coach services could often be faster than rail via London, and operators could charge a premium fare. **Dick Dunmore** noted that coach operators use a similar strategy to serve points in large cities which were not readily reached by rail. In Stockholm, Vy's Flygbussarna has

three routes to the city, diverging to Central, Liljeholmen and Brommaplan, giving many more direct connections than the rail services. In London, National Express connected Stansted to London via M11 (Stratford, Bow, Mile End, Whitechapel and Liverpool Street) and via A1/M1 (Golders Green, Finchley Road, St Johns Wood, Baker Street, Marble Arch and Victoria). **Peter** noted that National Express connects Stansted and Stratford every 20 minutes throughout the night, with a journey time of 50 minutes.

Austin Smyth congratulated Peter and Tim on their talk and had two questions. First, what were the lessons for consumers? **Peter** said that they had often benefitted, but that towns with no rail services have also often lost their coach services. Second, had rail and coach been treated fairly during the COVID-19 pandemic? **Peter** noted that towns remaining on the rail network after the Beeching cuts in the 1960s received at least some subsidised rail service, while those reliant on coach often lost all services. **Austin** noted that, in Ireland, Bus Éireann's network had been "decimated" by competition, including the loss of all cross-border services except those operated by Northern Ireland's state-owned Ulsterbus.

Adriana Moreno Pelayo (Arup) asked what was the future, and what might be the next disruptors? **Peter** noted that road congestion is gradually weakening coach's competitive position. The logic of the third lane ban on motorways was difficult to understand, but either road pricing or high occupancy vehicle (HOV) lanes could be a major change. **David Starkie** asked why vehicles over 12 metres long were limited to 60 mph. Peter was unsure, and noted that this made it effectively impossible for such coaches to overtake HGVs.

Report by Dick Dunmore

Clyde and Hebridean Ferries

The impacts on Island Communities

Dominic Walley (Connected Economics)

Hosted by Arup on Teams

23 November 2022

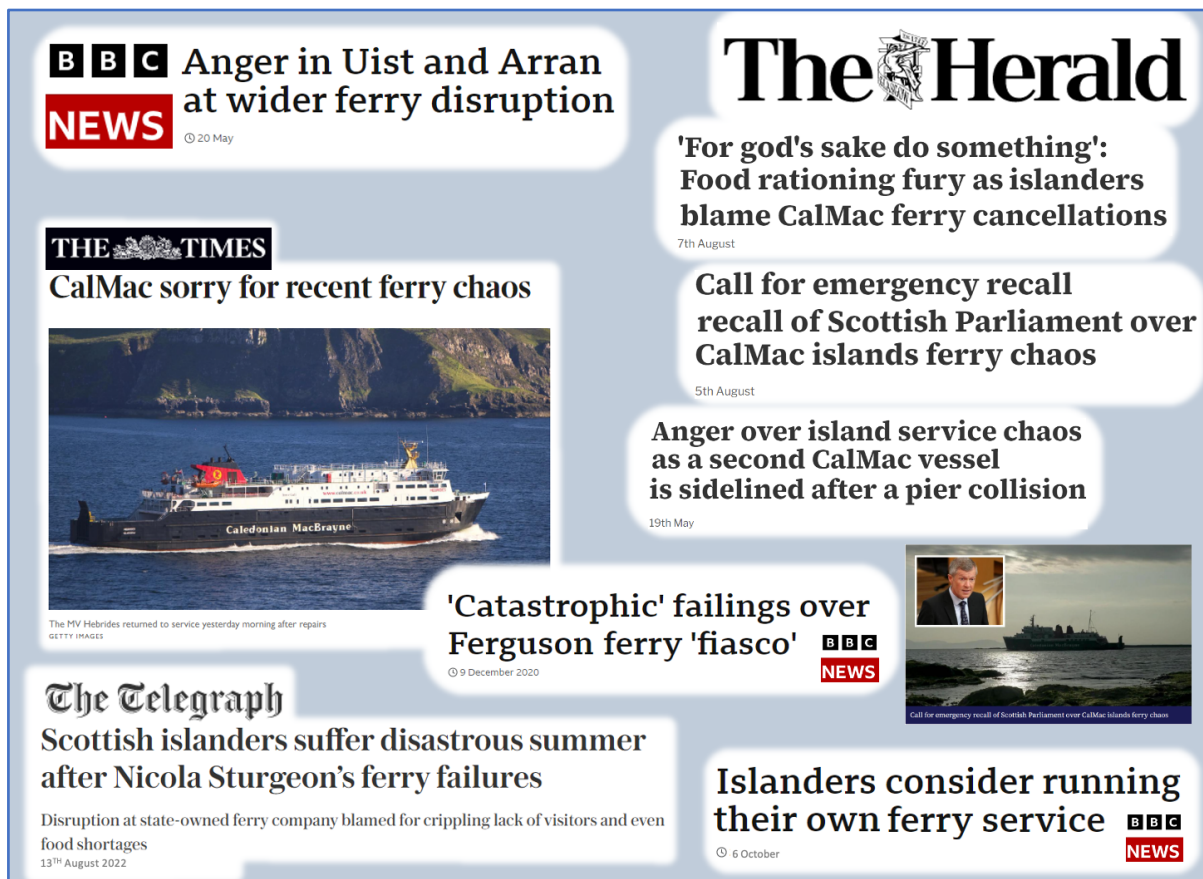
Introduction

Dominic began by explaining his background in economic appraisal. His talk would be based on a recent study for the Ferries Community Board, and funded by operator CalMac, carried out in collaboration with CEBR including Robert Beauchamp, who was in the online audience.

Background: markets, services, fleet and issues

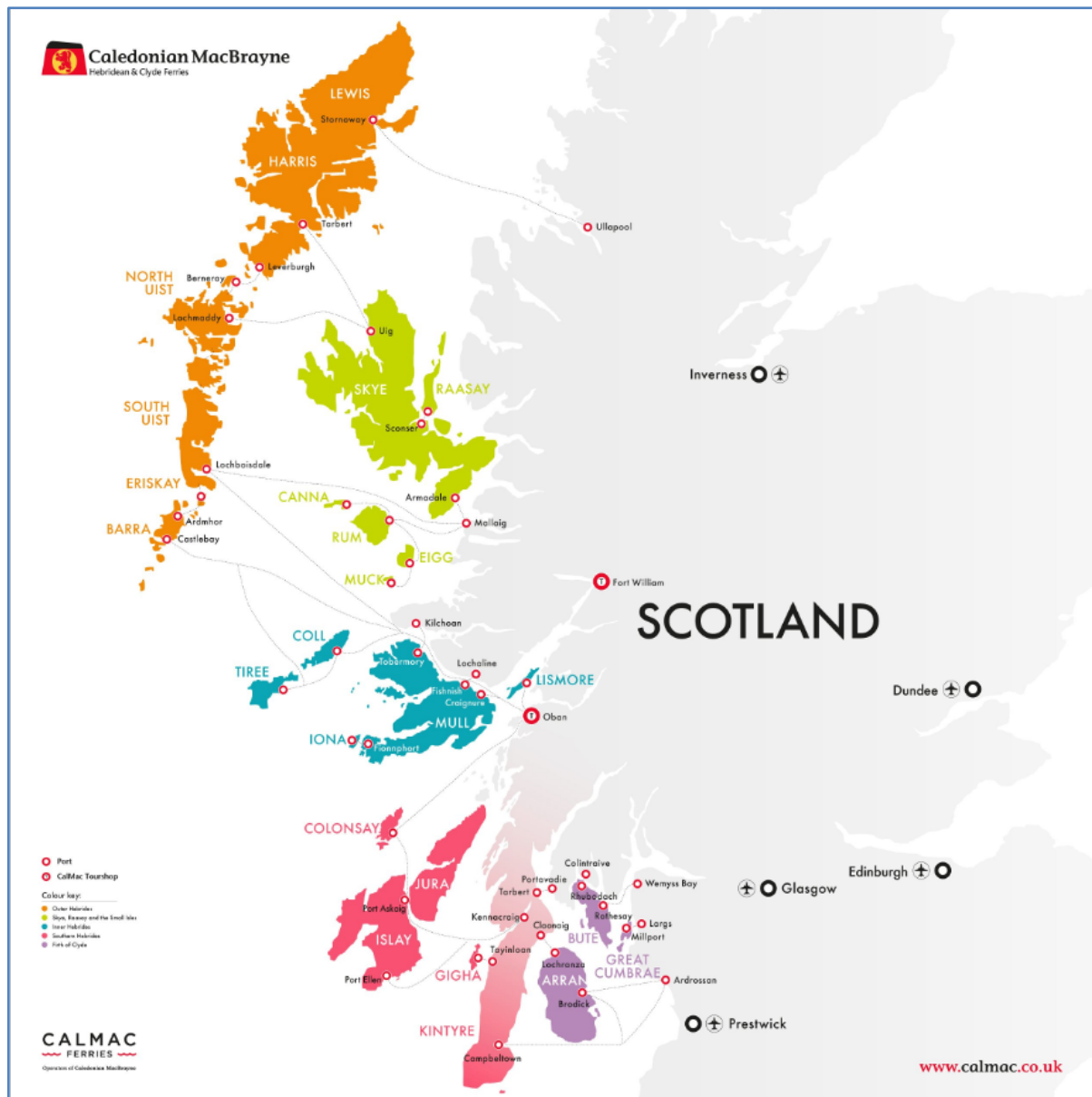
Dominic began with a collage of recent news of the ferries.

Figure 1: Ferries in the press



Caledonian MacBrayne (CalMac) operated 23 routes, centred mainly on Oban, with 34 vessels, most of them roll-on/roll-off (RORO) but with some exceptions. They used 19 ports operated by Caledonian Maritime Assets Ltd (CMAL) and 35 operated by others including councils and the private sector.

Figure 2: The Caledonian MacBrayne network



Note: other ferry services include the Corran ferry, funded by Highland Council, and commercial services to and from Dunoon.

The study had begun in 2019 but, because of the pandemic, which had contributed to the difficulties faced by the ferries, had not been completed until 2022. The study was now published at <https://www.calmac.co.uk/article/8574/CalMac-Ferries-Socio-Economic-Impact-Report>.

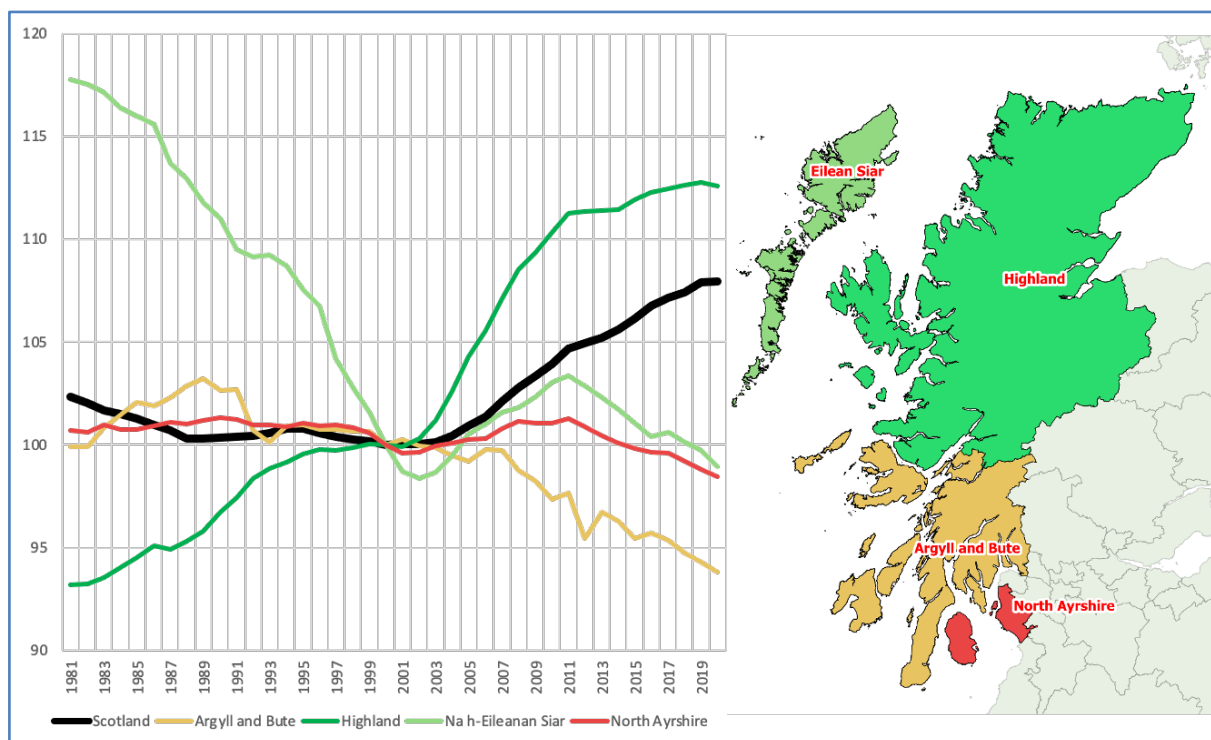
Dominic stressed that he was not competent to comment on safety issues. In addition, the study remit did not cover issues of organisational structure, which had potential implications for issues such as competition, the subsidy regime and the ability for one route to provide cover to another.

Population

The environment in which the Clyde and Hebrides ferry services operate is complex. Scotland's west coast has a wild and rugged coastline forged over hundreds of millions of years.

The area is now populated by small and remote communities. The west coast island population is around 33,000, of whom 20,000 are on Lewis. The mainland settlements north of Glasgow are also small, with only around 8,500 in Oban.

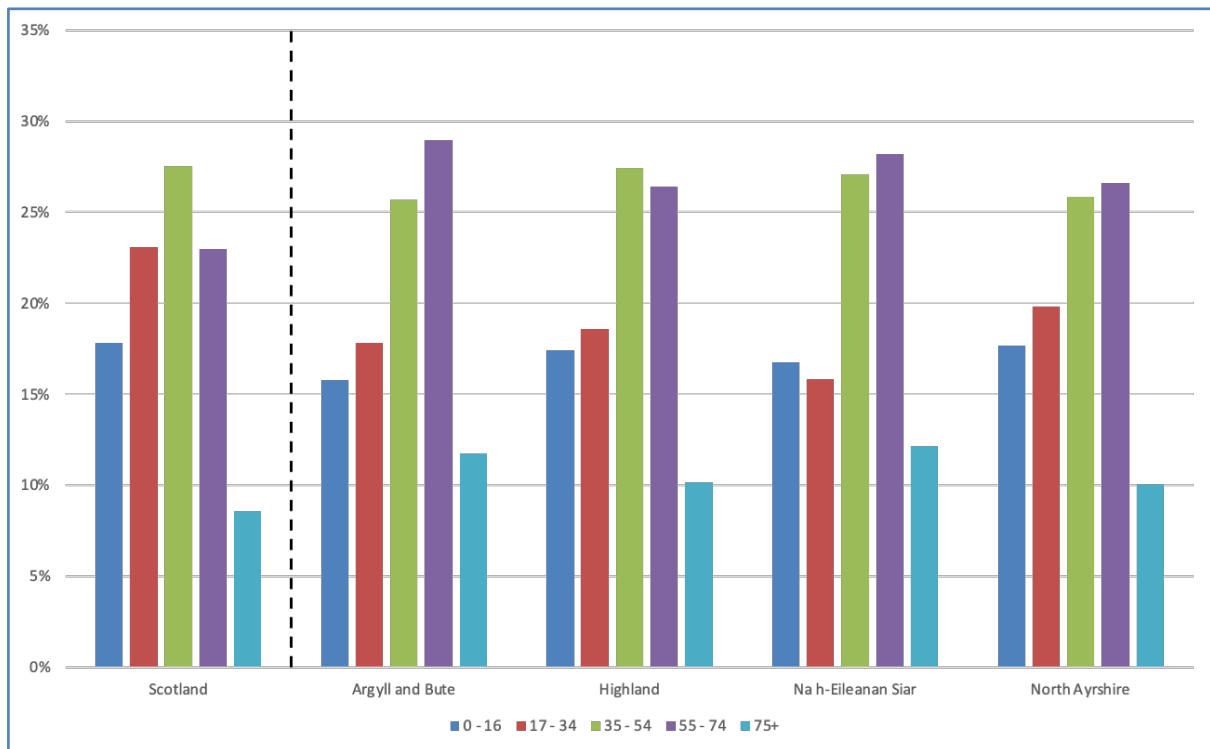
Figure 3: Index of resident population, 2001 = 100



While the highland population (dark green) had been growing, including Skye, connected to the mainland since 1995 by bridge, there has been a history of decline in the island population, most obviously in Eilean Siar (the Western Isles) shown in light green.

Compared to Scotland as a whole, each part of the region has fewer people under 34 (dark blue and red) and more over 55 (purple and light blue).

Figure 4: Share of population by age group, 2020



Young people tend to leave, but some return in later life.

Demand

The overall mix of demand including relatively little business travel or freight, and was dominated by around:

- 40% leisure, mainly on long routes;
- 30% commuting, mainly on short routes; and
- 20% tourists.

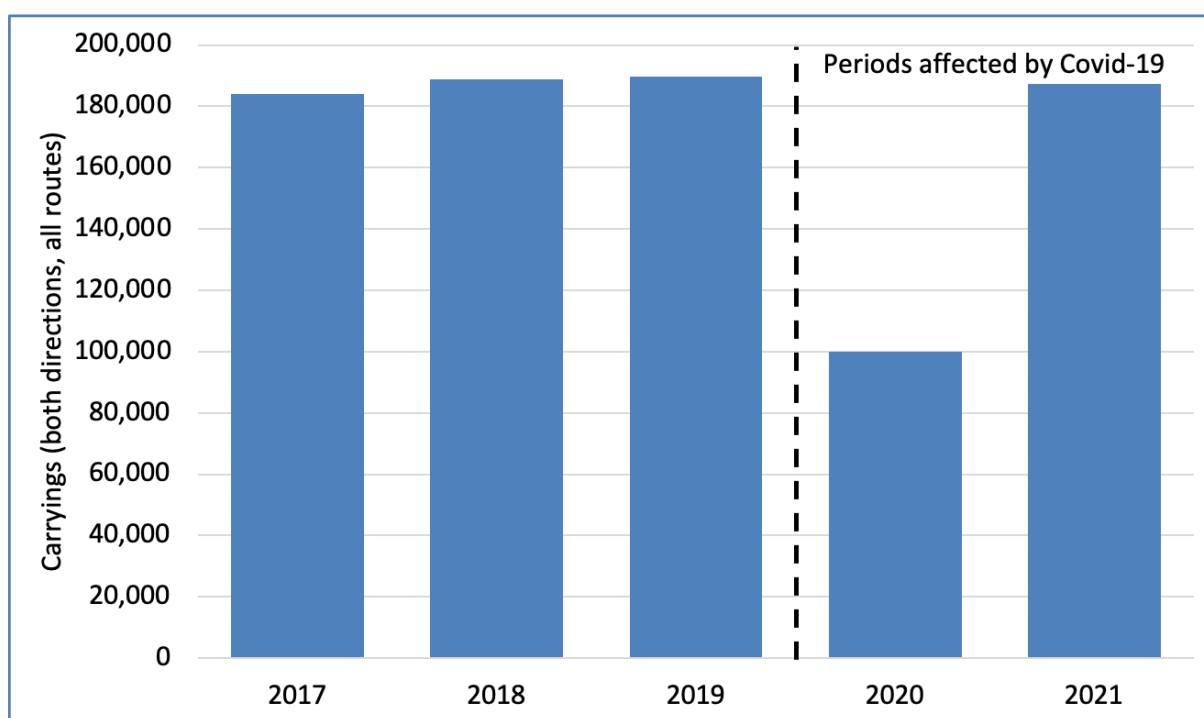
However, the economies of the islands vary widely. For example:

- Islay has a large sector manufacturing whisky.
- Barra is heavily dependent on tourism.

Factors such as the passenger/vehicles mix, seasonality and market segmentation therefore all vary widely between routes.

The fundamentals of ferry design mean that they can normally carry many passengers, but relatively few vehicles, capacity for which is therefore the principal constraint. Before the pandemic, demand had grown to around 190,000 cars, or around 5-6 car trips per head of island population, with around 5.8 million passengers carried. This volume had been recovered by 2021.

Figure 5: cars carried by year, all routes



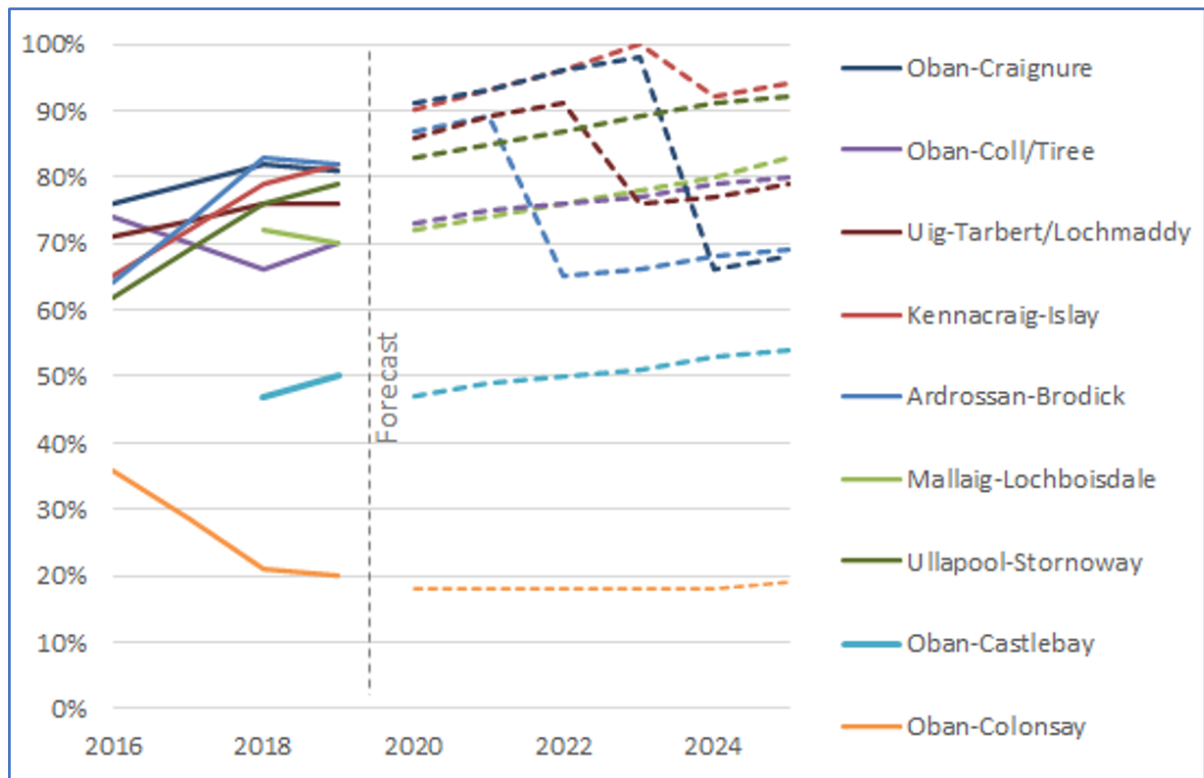
Given the observed growth, two new vessels were ordered to relieve capacity constraints on the Isle of Arran and the “Skye Triangle” of Uig, Lochmaddy and Tarbert. Hull 801 MV Glen Sannox and Hull 802 are in the pipeline, but builder Ferguson Marine went into administration in 2019 and was taken into public ownership. They are now five years late – launched in 2017 but not yet in use – and 2½ to 3½ times over budget. They were designed to use either diesel or LPG, but are now expected to be put into service with the latter not working. The procurement of these two ferries has taken up much political energy and management focus.

Capacity

Delays to the delivery of the new vessels mean that demand is close to capacity, as shown in Figure 6.

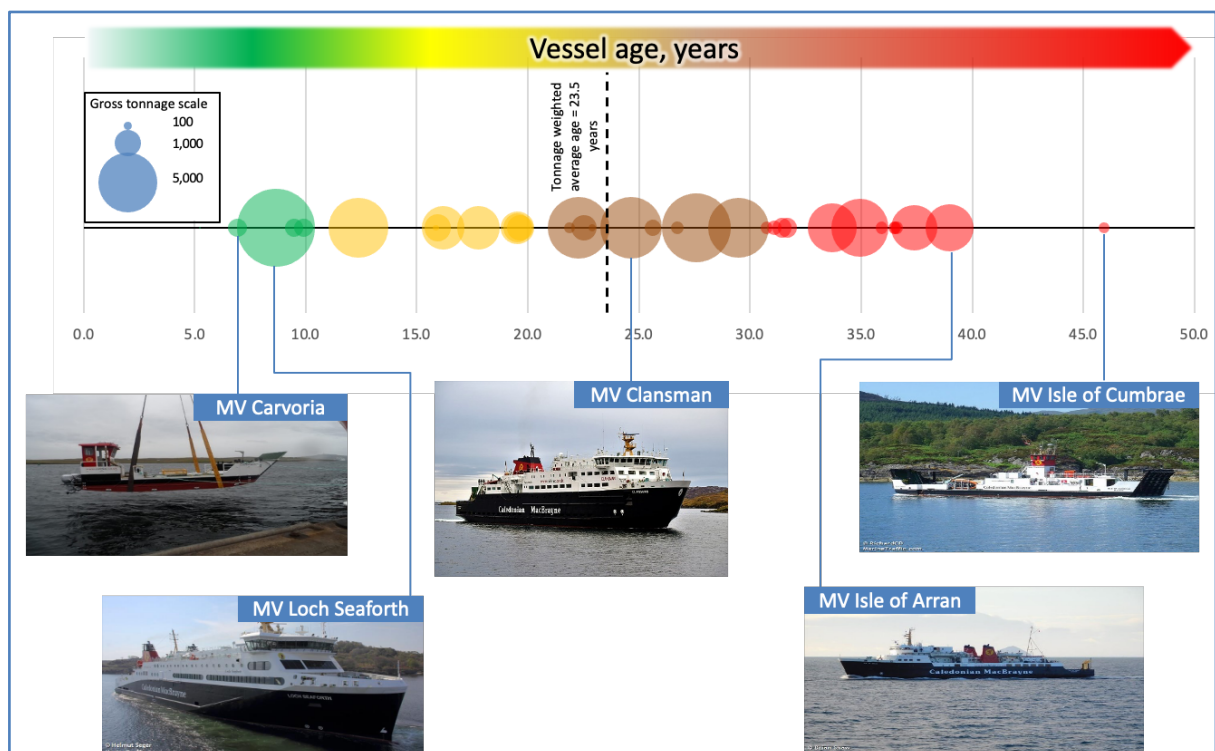
Even in 2018, many routes were close to capacity, and as demand grows there is an increasing chance of no capacity being available on either the first or second sailing after arrival. The MV Glen Sannox should have relieved Arran’s Ardrossan to Brodick services by 2022, Hull 802 should relieve the “Skye Triangle” services by 2023, and further new ferries should relieve the Mull and Islay services by 2024.

Figure 6: Capacity utilisation in the peak nine weeks



Replacing an ageing fleet

Figure 7: The fleet is ageing



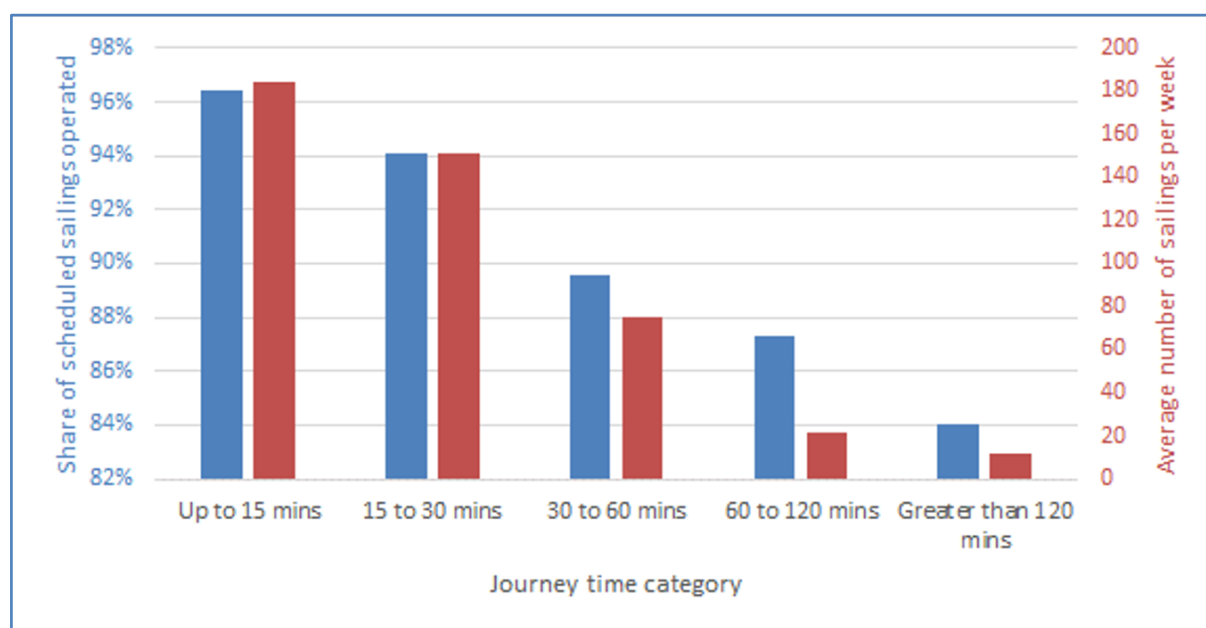
Lack of replacements mean that the fleet is not only inadequate but also ageing. Taking five examples from Figure 7.

- Built in 2017, MV Carvoria is the newest and smallest of the fleet, with a length of 12 metres and capacity for 12 passengers and a car. It is used between Oban and Kerrera.
- Built in 2014, MV Loch Seaforth is a relatively large ferry, 120 metres long with a capacity for 143 cars and 700 passengers. It was built for the crossing between Ullapool and Stornoway.
- Built in 1998, MV Clansman is typical of the fleet, and is used between Oban and Coll and Tiree.
- Built in 1984, MV Isle of Arran operates between Ardrossan and Arran, and replacement by the Glen Sannox is due.
- Built in 1976, Isle of Cumbrae operates across Loch Fyne between Tarbert and Portavadie.

Reliability

An ageing fleet had contributed to declining reliability, particularly on longer routes. Figure 8 shows how both service frequency and service reliability, measured by the share of scheduled services operated, decline with scheduled crossing time.

Figure 8: CalMac reliability and frequency by crossing time



Services are generally most reliable on short crossings, where the additional waiting time due to a single cancellation (or a full load with no spare space) may be relatively small. However, reliability declines with longer crossings, and on crossings longer than two hours, which often have only one sailing each way per day, around one service in six is cancelled. This has a major impact for those making connections such as to flights, or awaiting deliveries of equipment or supplies. As an example, each day North Uist imports around 35 tonnes of fish food and exports around 30 tonnes of salmon. Delays in either direction are a big issue, but difficult to include in a standard appraisal.

Costs

In addition to the above issues, the costs of the Clyde and Hebrides Ferry Service (CHFS) ferry franchise are ballooning through a combination of the fare subsidy and the RET and rising maintenance costs. Costs rose from £46.9 million in 2007/8 to £133.8 million in 2016/17, equivalent to a compound annual growth rate of 12%.

Organisation

Dominic stressed that organisation of the ferry services was not part of the remit, but there were a wide range of stakeholders, as shown in Annex Figure 2.

Summary

Dominic summarised the above:

- rugged and difficult to serve geography;
- low population density and depopulation;
- diverse economies and communities;
- diverse route network, fleet, infrastructure and operations;
- monopolistic state provider has absorbed the competition;
- complex governance and accountability;
- ageing fleet and infrastructure;
- increasing subsidies; and
- delays in bringing new money, ideas and infrastructure.

The study

The study had built on, and had a similar title to, a 2015 report²⁷ commissioned to demonstrate how important the CalMac services were to the islands and the economy.

Figure 9 below summarises the study aims and research methods, which included extensive passenger surveys and stakeholder interviews.

Figure 9: Study aims and research methods

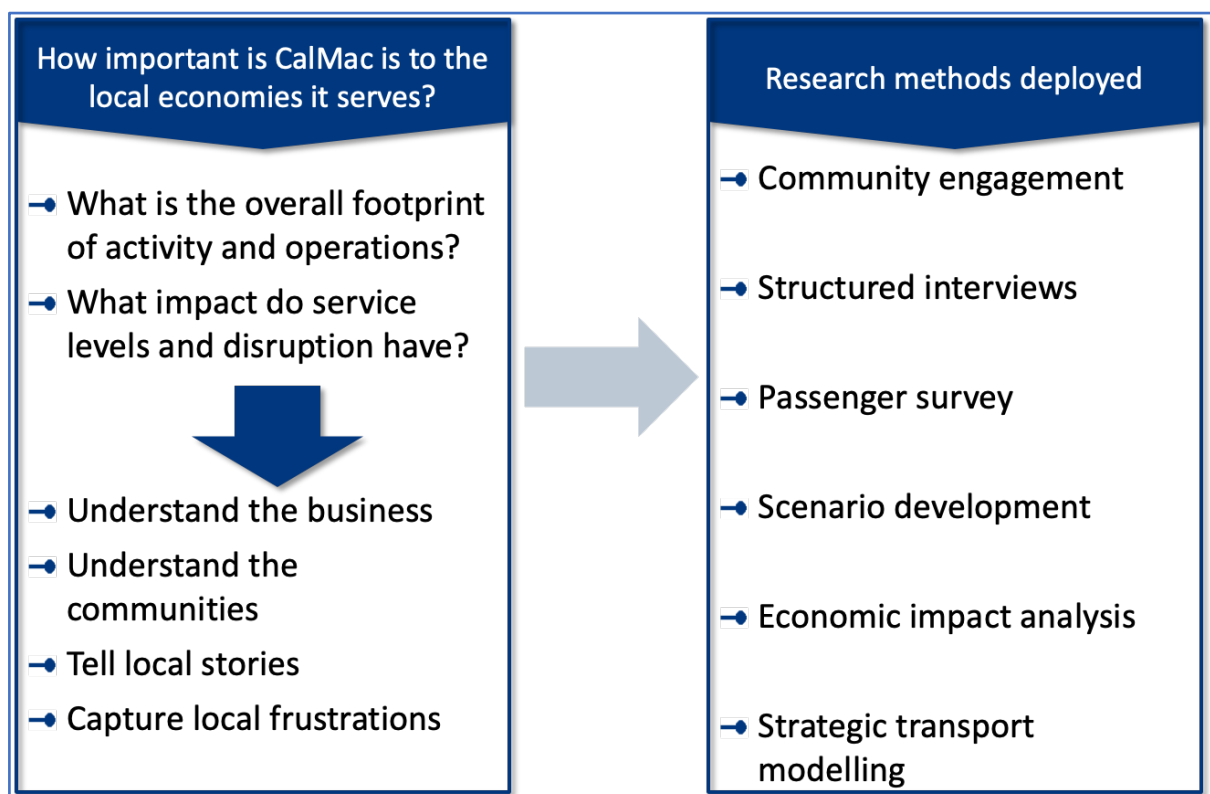
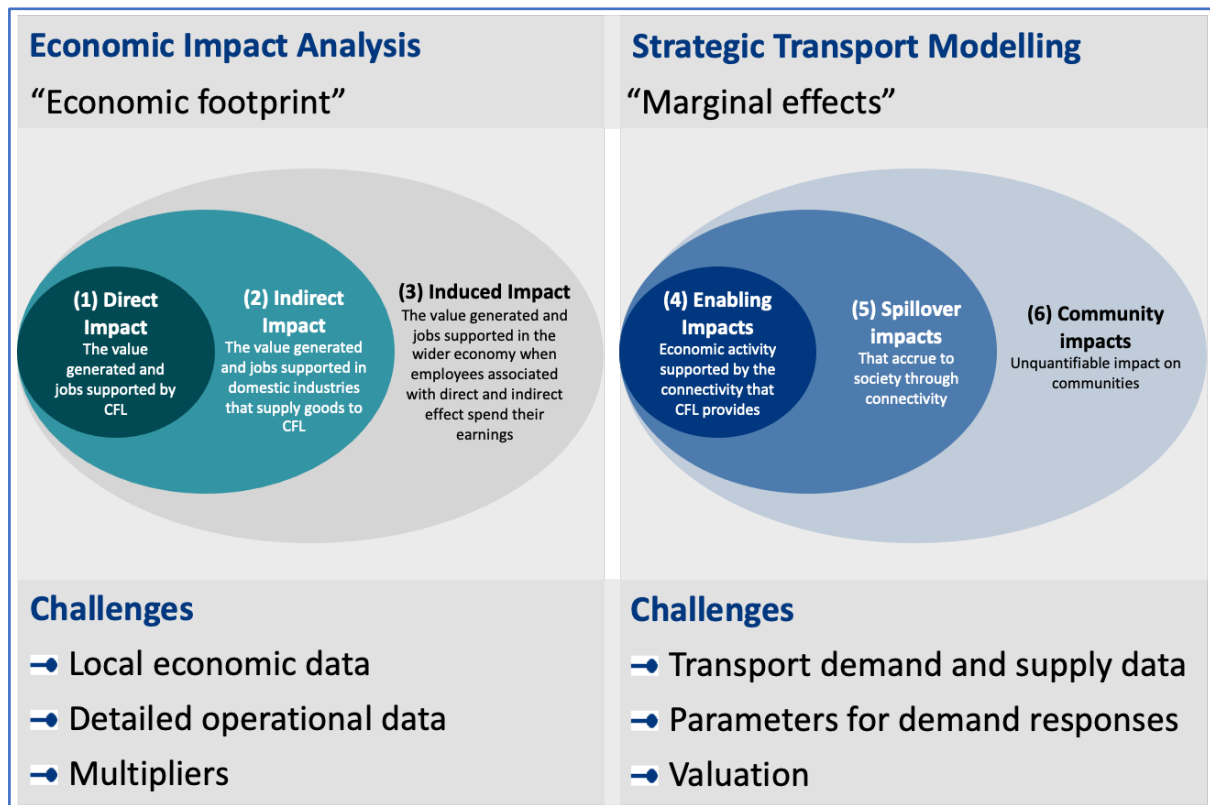


Figure 10 shows the twin track quantitative approach:

- Economic Impact Analysis looked at the current situation.
- Strategic Transport Modelling looked at potential change.

²⁷ The Economic and Social Impact of CalMac Ferries Ltd on Scotland, A report to CalMac Ferries Ltd from the Fraser of Allander Institute, April 2015, <https://www.calmac.co.uk/article/3313/New-study-reveals-economic-impact-of-CalMac-services>

Figure 10: Study twin track quantitative approach



In the Economic Impact Analysis, the assessment of the “Economic footprint” was broadly the same as in the 2015 study, but this faced a number of challenges:

- Economic data was poor at the local level.
- Detailed operational data required for bottom-up analysis was not available.
- Multipliers were difficult to estimate. What impact was local, Scottish or global?

In the Strategic Transport Modelling, a key issue was the marginal effects of improving services, but this led to other challenges:

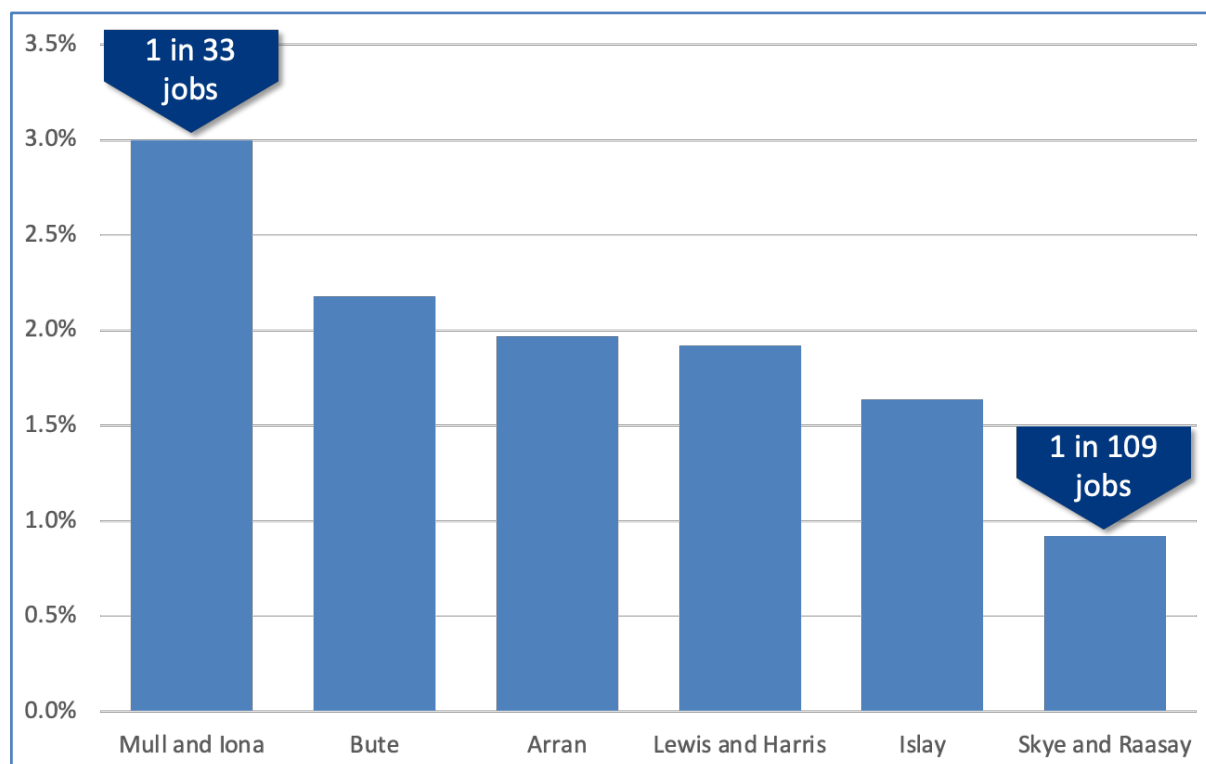
- It was very difficult to collect and model transport demand and supply data, which depends on vessel details including factors such as mezzanine decks and turnaround times.
- There was little evaluation to provide evidence of parameters for demand responses.
- For valuation, there was no equivalent of rail’s Passenger Demand Forecasting Handbook (PDFH), and reliability, and the extent for delay, were much bigger issues than in rail.

Employment

Measured in full time equivalents (FTEs) during 2019-20, 1513 were directly employed by CalMac, many of them on the mainland, with 359 indirectly employed, and 460 induced, an overall total of 2,333 of a multiplier of around 0.6-0.7. This excludes new procurement, such as work at Ferguson Marine on new vessels.

Figure 11 shows the share of employment on some islands supported by CalMac operations during 2019-20. This meant that there were also many informal contacts: on some islands, many locals could see the ferries come and go, and observe the traffic, queues and the effects of the weather, and would also know someone working in the ferry sector.

Figure 11: share of local employment supported by Calmac



The strategic transport model

The study's strategic transport model was based at route level and took into account generalised cost.

- Demand was segmented according to evidence of different travel behaviours.

- Operational details were limited to journey times, daily frequency, capacity, reliability and fare, although pricing per vehicle means that fares per person decrease with party size.
- Parameters for the “route groups” were set from third party work and survey work.
- The model made a time snapshot in 2032, with growth assumptions to drive the discounting process.

The outputs depend on the input assumptions, such as that the MV Glen Sannox and Hull 802 entering service in all scenarios.

In the pessimistic scenario to 2032, the MV Loch Frisa, bought from Norway, joins the Oban-Craignure route, cascading the MV Coruisk to Mallaig-Armadale, but there is a worsening of reliability as the fleet and infrastructure age.

In the optimistic scenario to 2032, two new Islay ferries enter service, with a cascade, wider fleet replacement improves reliability, and there is a streamlining of the booking and boarding systems.

Relative to the pessimistic scenario, the optimistic scenario generates £70 million and a 6% increase in patronage, or 350,000 passengers. The estimated present value of the benefits stream (PVB) over 15 years to 2047 is around £600 million.

Unanswered questions and way forward

Dominic ended with a summary of the unanswered questions:

- Data:
 - Economic data is largely based on economic or demographic size, not on policy importance.
 - There is poor passenger origin-destination data in the transport models.
- Behavioural responses:
 - There are few high-quality evaluation studies.
 - The evidence remains weak, partly because ferries are a niche market.
- Modelling and appraisal:

- Cost modelling at a route level is complicated by vessel interoperability and cross subsidy, which was in any case outside the study remit.
- In future, cost modelling and benefit modelling – at least a strategic level – could support assessment of route level or service group level analysis. This would increase transparency over investment decisions.

Looking forward, there was a need for:

- systematic evaluation of the principal agent problems, particularly to examine proposals for local control and specification or the proposed dedicated Lewis operation;
- examination of the role of competition, although there has been limited competition both for the CHFS franchise or from private operators competing on individual routes; and
- “universal service provision” arguments, such as whether this could be based on detailed appraisal or would have to a matter of specifying and funding a minimum service level.

Discussion

Simon Temple asked if the report was public. **Dominic** confirmed that it was. **Simon** also asked about the impact of the Road Equivalent Tariff (RET). Had it made it easier to commute and helped counter depopulation? **Dominic** said that RET was conceived and rolled out over a decade, on the basis of an assumption that there would be two new vessels and a cascade to eliminate capacity bottlenecks. The overall effect had probably been to move passenger traffic to cars, and to make it much easier to take campervans onto the islands but, in the absence of the new ferries, growth was leading to capacity problems. The islanders like a cheaper service, but their current priorities were reliability and capacity. At present, RET did not seem to be the optimum tariff strategy, at least not until the capacity constraints are relieved, but it had the potential to reduce the “island premium” arising because everything had to be imported or exported. However, alternative structures such as cheaper fares for “locals” raised other issues: did these include only those who live permanently on the islands, or those with second homes there, or workers who commute onto them? Who is a local?

David Metz asked to what extent unreliability was related to bad weather? **Dominic** said that there was some evidence on the effect of the weather, and that the increasing frequency of extreme events is visible in increasing unreliability, although some islanders argue that the operators are becoming more risk-averse. There is also a link between vessel type and capability. For example, the community on Mull has suggested setting up a competing service with fast catamarans, which are lower and have less windage than the existing ferries, and might be able to operate when they cannot. The associated issues, including safety, are complex, and a lot of detailed analysis, which might need to be specific to each route and vessel, would be required. **David** also asked how ferries and other transport such as rural buses can be compared as means to sustain communities. Is there a formal rationale for how such decisions are made? **Dominic** said that it was difficult to assess the links between increased subsidy, improved services, and propensity to stay on the island, particularly given such a heterogeneous market. More widely, how could ferries and buses be compared with other interventions, such as the provision of arts centres?

Peter Gordon (Editor, The Transport Economist) asked three questions. What is the overall operating ratio of the services? **Dominic** said that around 30% of costs were covered by the fare box and the remaining 70% was subsidy, which had grown slightly as a result of RET. **Peter** also asked about the effects of seasonality of demand? **Dominic** said that the study report documents show, over the network as a whole, winter service levels are around 60% those in the summer. The quieter winter period was traditionally used to take ferries out of service for heavy maintenance and refit, although routes such as Islay had less seasonality, as traffic was dominated by trucks to and from the distilleries, which work all year. However, more work was needed as reliability worsened with age, and it was harder to get through an entire season without some down time. **Peter** also wondered whether franchising of ferry services was possible, and whether any market testing had been done? **Dominic** said that EY had touched on this in the Project Neptune report, which had been published in redacted form in October 2022, and had looked at comparators including Norway, New South Wales and

British Columbia²⁸. However, with both unbundling and privatisation ruled out, no market testing had been done, effectively eliminating anything other than the status quo or greater integration. Specifically, there was no immediate scope to separate operations into bundles of routes with similar-sizes ferries.

Ed Thompson agreed that they were crucial to the islands. He noted the differences between the shorter and longer routes and wondered whether the findings and outcomes varied with the type of route. **Dominic** said that segmentation had been critical to the study, but the finer the segmentation chosen, the less disaggregate data was available to support it. For example, at a route level, data was not available split by detailed origin/destination or by journey purpose, so the study had settled on characterising behaviour at a route group level, for which survey information provided adequate sample sizes. Much also depended on what new vessels were delivered and how existing ones were cascaded between routes, but it was hard to be sure what routes could use common equipment and there was in any case no detailed cost data by route. **Robert Beauchamp** of CEBR, who also worked on the study, said the modelling route groups could create counterintuitive effects. For example, Skye and the Small Isles of Canna, Eigg, Muck and Rum are both served from Mallaig, but Skye has a bridge: if a ferry fails, the first response is to close its Mallaig to Armadale route: this leaves south Skye connected to Mallaig, but only by a three-hour road journey via Kyle of Lochalsh, Invergarry and Fort William.

Peter White asked if there was scope to buy in vessels new or secondhand from elsewhere, such as Norway? **Dominic** said that a Norwegian ferry, the Utne, had been bought, renamed MV Loch Frisa, and used on the most congested route, from Oban to Criagnure on Mull. Other purchases had been considered but had fallen through, and lead times to entry into service could be long.

Tom Worsley said that the talk had been fascinating, but note that 98% reliability would presumably not only add capacity but allow islanders and business to reduce the costs of mitigating

²⁸ <https://www.transport.gov.scot/publication/strategic-framework-of-options-for-the-chfs-network-project-neptune/>

the effects of disruption. Could the appraisal be expanded to take into account these additional benefits? **Dominic** said that this was a good question, which the team had tried to answer bottom up, using interview responses on the behaviours which had been necessary to deal with disruption. Islanders and businesses knew the costs they were incurring, but these were not included in investment decisions. Farmers reported that they had to hold twice as much feedstock as would be needed with a reliable service, and some businesses had duplicate warehousing at each end of a crossing, so that goods could be held during disruption. Many had two freezers so that they could store more food. It was, however, hard to assess all the varied mitigations tailored to the needs of each person and business affected: data was poor, so the study team had used short cuts to estimate effects. In summary, appraisal was a challenge.

Tali Diamant (Atkins) asked if the study scope and findings would have been different if the client had not been CalMac. Might competitive entry or a different structure have been examined? **Dominic** noted that it is for clients to define the scope of studies they fund, but many constraints were imposed by the policy of the current Scottish government. On competition, Western Ferries used to operate to Islay and Jura, but subsidised CalMac services were introduced which meant that they ceased to be commercially viable, although Western Ferries still operate a service across the Clyde to Hunters Quay which competes with CalMac. It was difficult to establish a counterfactual of an environment in which competition was possible and sustained. Structure was outside the study remit.

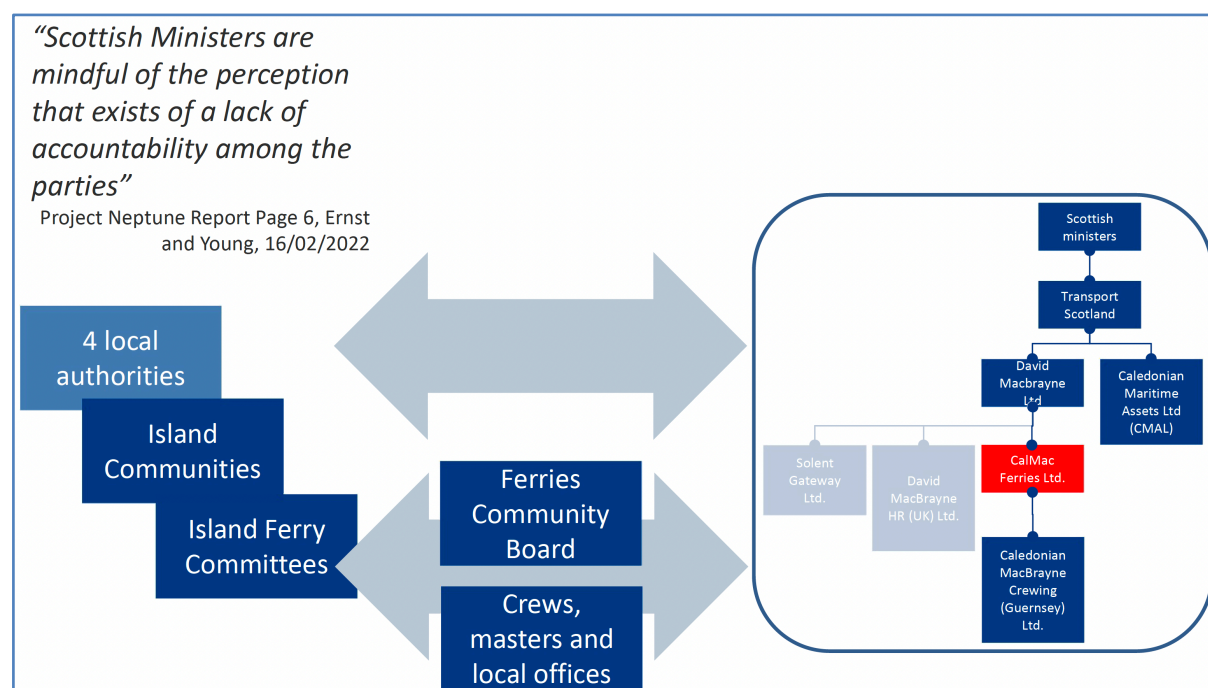
Gregory Marchant thanked Dominic for the insights in the talk, which he had found absolutely fascinating. Were there any lessons transferrable from Norway and other Scandinavian countries? **Dominic** said that comparisons of the fleets and their reliability had been carried out, and that some comparisons had been carried out by EY in the Project Neptune report, which explained how other arrangements worked, but it would be for a reader to draw conclusions on what might be optimum in Scotland under different policies. One suggestion ruled out had been to have a unit based at Stornoway with a remit set by Comhairle nan Eilean Siar (Western Isles Council), not Transport Scotland.

Annex: history and organisation

Annex Table 1: The history of the CalMac network

Year	Event
1851	David Hutcheson & Co start operating steamer services between Glasgow, Oban and Fort William.
1889	Caledonian Steam Packet Company starts operating services from Gourock.
Late 1960s	Both companies nationalised and public financial support introduced.
1973	Companies merge to form Caledonian MacBrayne.
2006	Infrastructure and operations split to form CMAL and CalMac Ferries Ltd. Operations put out to tender.
2015	CalMac won the Clyde and Hebrides Ferry Service (CHFS) operations contract for 2016 to 2024.

Annex Figure 1: The current organisation of ferry services



Report by Dick Dunmore

Review

The views expressed are those of the reviewers and should not be attributed to the Transport Economists' Group

British Rail: A New History

Christian Wolmar

Published by Penguin Random House UK (394 pp)

ISBN 978-0-241-45620-0

Christian Wolmar's book, published in June 2022, is an easy read and provides a range of insights into many aspects of the railway including innovation, organisation, industrial relations and government oversight.

It charts the life of British Rail from four worn-out engineering-led regional businesses in 1948 to a group of market-focused sector businesses in 1993.

Forty-five years in thirteen chapters

Chapter 1, "The Sparks Effect", illustrates the process of the electrification of the West Coast Main Line from Manchester to London in 1966. Thereafter the book illustrates the debates such as innovation – diesel, electric and fixed formation trains, colour light signalling, continuously welded rail – and employment, the unions and working practices.

Chapter 5, "The changing shape of the train", describes the transition for locomotive haulage to fixed formations, including the over-ambitious Advanced Passenger Train and the iconic High Speed Train. Procurement began with regional "barons" specifying and building what they wanted. This was transformed to sectors asking a competitive market how they would meet a requirement. The trend is now towards a limited number of global suppliers offering variations on established product lines.

Chapter 8, "All change", describes the three main railway unions, ASLEF, the NUR and TSSA, their disputes with management, and their rivalries with each other. The fixed eight-hour day – 00:00-

08:00, or 08:00-16:00, or 16:00-00:00 – lasted until the 1980s, when higher pay was made conditional on flexible rostering with shifts of 7-9 hours. Despite a difficult industrial relations environment, BR reduced its staff from 640,000 in 1948 to 109,000 by 1993, an average reduction of 10,000 a year, through a combination of disposals, downsizing and productivity gains.

Chapter 13, “Epilogue”, explores how the “rationale” for the privatisation structure which ended British Rail emerged not from the experience of sector management but from the perceived urgency to choose a model which supported competition and complied, if unnecessarily enthusiastically, with European Directive 91/440/EEC. It quotes from the White Paper “Great British Railways: The Williams-Shapps Plan for Rail” which *“set out a catalogue of mistakes which had been made in breaking up British Rail”*, noting that *“the tone of the White Paper suggests that it was a party other than the Tories who created the privatized structure and kept on propping it up in various ways over the intervening quarter of a century”*.

The book illustrates many other enduring themes, including the understanding of the costs and benefits of rail services, the organisation of the industry, and its linkages with government and, ultimately, the Treasury. I add my own comments below.

Costs, revenues and benefits

In the early days of British Rail, the focus was on reducing deficits, primarily through cost reduction, with little or no consideration of revenue growth or external benefits.

The 1963 Beeching Report’s *“back of the envelope”* feel was based on passenger counts for one week in April 1961, skating over the complexities of how branch line passengers contribute main line revenue, and missing the summer peak holiday traffic. This provoked outrage but there was, at the time, little awareness or debate of the costs and economic, social or environmental benefits of retaining and maintaining rolling stock and crew for a brief seasonal peak.

The 1983 Serpell Report’s maps of “Options” for reducing the network further were much derided, but few now realise how poor data and tools were by modern standards. Ministers and

Serpell were entitled to ask what network could be profitable. I was a junior member of the team that tried to find out. The only inputs available were those used to report the financial performance of the sectors: aggregate revenues and direct costs by profit centre and infrastructure costs by section of route. They were provided on a few sheets of paper, and we retyped them into a wardrobe-sized PRIME 300 computer with 512 kB of memory and two washing machine-sized hard drives storing 80 MB each. We wrote FORTRAN code to estimate the effects of removing poorly-performing services using "segment directories", a data storage format unique to PRIME. Until BR could store and manipulate and cost and revenue data at a much more disaggregate level, this was the best that could be done.

A little knowledge of the structure of railways' costs explains why Beeching and Serpell's attempts to model the cash savings from removing services were doomed to be wrong with such simple models. If services are cut, fuel may be saved within hours, maintenance within weeks, and staff within months, but rolling stock costs are sunk, with little saving until the next renewal, and infrastructure costs are both sunk and joint, with little saving until the infrastructure is closed or "shrink-wrapped" around the services which remain²⁹. In summary, short run marginal costs may be much lower than long run decremental costs, but it was, and remains, impracticable to model a gradual contraction of a whole railway. This cost structure suggests using assets until they are life-expired and then deciding whether to replace them or close the service, but this provides no guide on how to appraise replacement investment on routes which perform well³⁰.

Chapter 12, "The pinnacle", shows how the agenda moved from cost-cutting to commercialism, ending the need for such calculations. Chris Green's total route modernisation was not about cost-cutting by scattered cuts to stops, frequencies or routes, but about integrated packages of renewal of infrastructure, rolling stock and services. In 1990, Chris

²⁹ Competing airline, coach and bus operators, in contrast, pay infrastructure charges, and often lease vehicles, and are not expected to consider the effect of operational cutbacks on the finances of the infrastructure and leasing businesses.

³⁰ Decades later, when appraising the replacement of life-expired HSTs with IEPs, neither life-extension to 80 years nor ending long-distance services was a meaningful base case.

commissioned a review of the growing Network SouthEast. I devised a model with inputs including not only cost and revenue by route but also assumptions on demand trends, fares, price elasticities, capacity, acceptable crowding levels and the capital costs of the additional rolling stock and infrastructure which would be required to achieve them as demand grew. The model was built in Lotus 123 and produced charts of demand, crowding, the resulting timing of new investment, and hence financial projections, but the PCs of the day only had enough memory to model one route at a time and then consolidate the outputs with macros. One clear conclusion was that higher fares would reduce demand, and hence the need for investment ... but the fares needed to cover not only operating but also capital costs would be unacceptable. Since then, there has been a growing ability to predict the financial and economic consequences of better services on the existing network. There remains, however, limited confidence in the forecasts of the much larger costs and benefits of wholly new lines, such as the Channel Tunnel and High Speed 1, East West Rail, and High Speed 2.

Organisation

Chapter 2, "The inheritance", explains how British Rail began as six vertically-integrated regions. Civil, mechanical and electrical engineers built and maintained the assets, which were handed each day to the operations staff to provide a train service. This model paid little attention to customer markets and their needs.

After flirting in 1974 with a change to eight "territories", the engineering-led regions gave way to market-based sectors. By 1991, Paul King articulated the distinct rationales for the three passenger businesses: InterCity could be profitable; Network SouthEast could break even, because London's roads could never carry all its commuters; and Regional Railways could not, because more and more potential passengers had become car owners and users³¹. The problem remains, however, that

³¹ This three-way "sectorisation" – driven by markets and the stock tailored to serve them – mirrors European railway legislation for "long-distance" and "urban, suburban and regional rail passenger services". Sectorisation has been more pervasive and durable than franchising, which in the EU is largely confined to devolved urban, suburban and regional services, as a "safety valve" for authorities not happy with the incumbent.

Network SouthEast is too small to serve all London “commuter” markets but too large to avoid serving many “regional” markets.

The sectors first brought from, and then absorbed, the regions’ engineering and operating resources. There was broad consensus that this was the best structure yet, although it was never tested as a means of delivering wholly new lines.

Privatisation studies rejected regional and sectoral models in favour of splitting infrastructure and operations, with the latter divided into franchises based on the sectors’ service groups. Since privatisation, however, franchises have continually been “remapped”, in the process creating in Govia Thameslink Railway (GTR) an operator larger than many national railways in Europe. Network Rail’s internal organisation has proved no more stable: as of 2022 it has 14 routes in 5 regions, partly to deal with the growth of services (freight, CrossCountry, TransPennine Express, Thameslink and now the Elizabeth line) crossing internal boundaries.

The organisation of the industry remains in play. The underlying problem is that the railway is too big to be run as a unit, but every internal boundary is a barrier to the communication, coordination, and consensus desirable for efficient operation. Changing (or new) markets mean reconfiguring fleets, and hence operators, to serve them, and the infrastructure manager must then reorganise as best it can to face these operators.

Governance and government

Finally, the railways will continue to deal with government. After franchising, there was a brief hope that net subsidy would gradually decline to zero, and the Franchising Director could be left to report what income he had to offer to the Exchequer and to agree how much should be passed back to the railway’s customers through lower fares, higher quality or new services. This could never have lasted, as a combination of rising passenger demand and unwillingness to raise fares to suppress it meant more capital investment, funded by running up an eventual debt of £55 billion on the “Network Rail credit card”.

The continued need for public funding means that, unlike other regulated utilities which are fully funded by their customers, someone in the industry – whether Franchising Director,

Strategic Rail Authority, Office of Rail and Road or Great British Railways – must ask for money from government, which in turn must check what is affordable and value for money. Somewhere between the Treasury and the passenger there must be an interface between giver and taker.

The challenge remains

This book is no exception to the rule that journalists identify issues and problems but may leave it to others to make decisions and find solutions. It does, however, articulate the nature and scale of the challenges now faced by the Great British Railways Transition Team.

Review by Dick Dunmore

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The Transport Economists' Group, formed in 1973, provides a forum for people involved in transport economics to meet regularly and discuss matters of mutual interest. Membership is open to economists working in transport and others whose work is connected with transport economics.

The aim of the Group is to improve the quality of transport management, planning and decision-making by promoting lectures, discussions and publications related to the economics of transport and of the environment within which the industry functions.

Meetings, held at Arup's Central London HQ at 13 Fitzroy Street from September to June (except December), consist of short papers presented by speakers, drawn from both within the Group's membership and elsewhere, followed by discussion.

The Group's Journal, "The Transport Economist", is published three times a year reporting on meetings and other activities of the Group. It reviews recent publications of interest and contains papers or short articles from members. The Editor welcomes contributions for inclusion in the journal, and can be contacted at petersgordon@blueyonder.co.uk.

The current membership of over 150 covers a wide range of transport modes and types of organisation. Members are drawn from transport operators, consultants, universities, local and central government and manufacturing industry. All members are provided with a full membership list, updated annually, which serves as a useful source of contacts within the profession. Applications from people in all sectors are welcome.

Applications for membership should be made on a form which can be downloaded from the Group's website at www.transecongroup.org.

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