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CHAPTER 21: Inter-city modal competition

Roger Vickerman

Introduction and background

The market for inter-city travel has received much less attention than those for urban or regional travel markets. In part this is because it is much more diverse and complex ranging from travel between two adjacent towns or cities less than 20km apart to longer distance travel between major conurbations, including those involving international travel, that may be hundreds or thousands of kilometres apart. Understanding the demand for such travel is more difficult as journeys are typically made less frequently than regular commuting trips that dominate urban travel markets, and are more likely to involve multi-modal trips where access to, for example, major rail stations or airports becomes a key element in journey planning. Historically the markets for inter-city travel were highly regulated with, in many countries, the state ownership of railways and airlines protected by strict licensing of, for example, long-distance coach services. The growth of inter-city highway networks from the 1950s followed by deregulation of airlines and coach services from the 1980s and more recently liberalisation of the market for rail services has changed patterns of provision and competition. This has come alongside social change that has made families more mobile and the growth of a long-distance market for visiting family and friends at the same time as a growth in longer distance weekly commuting as labour markets have become more open. Against this background this Chapter explores the extent of changes in inter-city travel markets over recent decades and how regulation and competition has dealt with these changes in a range of countries including the US, UK and other European Countries.

The economic pressures through an emphasis on agglomeration and the social pressures through increased mobility have increased the focus on inter-city transport and the associated large-scale infrastructure projects such as major highways, high-speed rail and airport development. This focus underlies most of the discussion in this chapter as it provides the basis for much of the change in the regulatory structures that govern the various modes of transport. Some recent work has questioned the appropriate scale of such developments suggesting that evidence in the UK points to the importance of densification within larger city regions rather than linking more distant centres (Arbabi et al., 2019)

Trends in inter-city travel

Analysis of the US 1995 American Travel Survey by McGuckin (2013) was used as the basis of a comprehensive report into interregional travel by the Transportation Research Board (2016). This showed clearly how distance, trip purposes and travelling party composition all had significant impacts on both trip generation and mode choice. Overall the average number of such trips per year was 7 with typically 2 to 2.5 trips for business purposes and just under 5 for other purposes. Single households were the least travelled (5.9 trips per year) and couple households the most frequent travellers (7.5 trips per year) closely followed by families with all children 5 years or older (7.3 trips). Age also played a part with those aged 50-64 being the most frequent travellers and those aged 80 and over the least. Trip frequency also increased steadily with income. Trips by one adult were 41% for business but those by two or more adults were 13% for business and those with at least one child only 7%. Distance affected both trip generation and mode share. Almost 80% of all trips were between 100 and

500 miles, 11% were over 1000 miles. Up to 600 miles the use of private vehicles dominated though falling from around 95% for trips less than 200 miles to around 60% for those between 500 and 600 miles. Over 600 miles the use of air increased from around 55% of those trips 600-700 miles to around 70% for those between 1000 and 1100 miles and almost 90% for those 1500 miles and more. Adults travelling alone were much more likely to use public transport (air, bus or train) than either a group of adults with no children or those travelling with children. The last group were the most likely to use a private vehicle and the least likely to use air or especially bus.

Long-term analysis of the UK National Travel Survey (Department for Transport, 2018) shows that the average distance travelled per person per year rose by 46% between 1972/73 and 2018 from 4,476 miles to 6,530 miles although there had been a 9% fall since the highest point of 7,211 miles in 2003. Over the whole period the number of trips only rose by 3% and the implied average trip length therefore rose from 4.7 miles to 6.6 miles an increase of 41%. Looking at individual modes of transport, car driver trips fell by around 10% and annual mileage by around 12% between 2002 and 2018 with average trip lengths falling a small amount from 8.43 miles to 8.23 miles. Public transport bus trips outside London fell by 29% between 2002 and 2018 but mileage fell by less with average trip lengths rising from 4.6 miles to 5.3 miles. On the other hand, rail trips increased by 64% and mileage by 41% so average trip lengths fell from 35.8 miles to 30.9 miles.

The number of trips of over 100 miles has remained fairly constant at between 6 and 8 per year since 2002 whilst those of between 50 and 100 miles has fallen slightly from 14 to 12 and those between 10 and 50 miles stayed fairly constant at between 140 and 150 trips per year. Trips of between 1 and 10 miles showed a 9% fall from 658 to 577, but those of less than one mile remained fairly constant at around 250.

Looking only at trips of over 50 miles around 80% of trips were made by car for journeys under 150 miles. Over 150 miles the proportion of trips by car fell steadily to less than 50% over 350 miles; that by rail increased from around 15% of trips of 50-75 miles to around 25% of trips of between 250 and 350 miles but then falls again as air dominates non-car trips of over 250 miles taking a 33% share.

Whilst rail travel has shown a remarkable increase in many countries over the past two decades, this growth appears to have slowed or even reversed in the most recent years. To some extent this mirrors a decline in commuting into large rail-served cities, although rail's share of this market has held up or even increased. It is difficult to separate inter-city travel from total non-work travel, but there are indications that off-peak rail travel has been falling in cities such as London, New York and San Francisco (Rail Safety and Standards Board, 2019). Visit Britain data suggests that this is in part due to a decline in the attractiveness of city centre attractions such as museums and art galleries whilst visits to historic properties, farms and gardens showed an increase (Rail Safety and Standards Board, 2019). The reasons for this apparent change are varied. Large cities have become less attractive destinations, especially for families, because it is suggested of the fear of crime and terrorism. The previous growth is often attributed to changes in lifestyle with increased mobility and the increased likelihood of extended family members living in different urban areas. The cost of housing in major cities coupled with the availability of urban public transport has made car ownership less likely for single adults and couples without children thus increasing the propensity for rail usage (Independent Transport Commission, 2018a; Rail Safety and

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Standards Board, 2019). But this change may prove to have been a shift in such relationships rather than the start of an on-going trend.

One further dimension to this is the shift toward more tele-commuting. The decline in peak-period travel (Independent Transport Commission, 2018b) is indicative of this trend and is coupled with an increase in longer-distance commuting as commuters seek cheaper housing and an improved lifestyle when they don't need to make daily commuting journeys. This affects rail market planning as season tickets, based on an assumption of daily return journeys, lose their attractiveness. Although, as Mokhtarian (2003) has pointed out, there is evidence of a strong degree of complementarity between increased telecommunications and travel overall.

Regulatory frameworks

Historical background

Historically inter-city travel was highly regulated in most countries. In Europe there was a general requirement to protect state-owned railways from predatory competition. In part this was seen as necessary to protect the public service requirement to maintain little used links that often used cross-subsidies. The development of aviation was usually promoted by state-owned flag-carrier airlines that were protected by restrictive entry barriers and serving largely state or local authority owned airports (see chapter 3). Longer-distance bus services or express coach services were not common in all countries. Often the operators were at least part-owned by railway companies, as in the UK, and strictly regulated by a licensing system that allowed objections from potential competitors.

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Deregulation and the encouragement of competition started in the 1980s (Zhang et al., 2011). The 1978 Airline Deregulation Act in the US started the deregulation of aviation that led to the growth of the low-cost no-frills operators (see chapter 3). These operators developed new business models that took away complex inter-lining operations and focussed on the most profitable links using hub and spoke operations, but often without guaranteed interchange. The deregulation of aviation followed in Europe where the emphasis on competition of the European Single Market allowed for the development of third country and cabotage operation instead of complex bi-lateral agreements and the creation of a single European airspace coordinated air traffic control. These changes coincided with the changing markets for both business and leisure travel leading to a remarkable upsurge in air travel. In the EU-27 air travel in terms of numbers of passengers grew by 36% between 2007 and 2018 (Eurostat, 2019). For those countries where a longer time series is available (such as Germany, France and the UK) we can see a more than three-fold increase in air passengers between 1993 and 2018. Movements between the UK and other EU countries increased by this same factor over this period and by all modes by 7.1% between 2008 and 2018.

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At the same time the development of high-speed rail from 1981 in France and 1992 in Spain with slower and less coordinated developments in Germany, Italy and some other countries led to a displacement of air travel, particularly in the range of 400-600km, by the new modes, which also gained substantial inroads in some longer distance routes. Total passenger-kilometres by high speed rail increased more than 7-fold from 1990 mainly through the addition of new lines in more countries but in France, the original European high-speed network carried 234% more passengers by 2015 than in 1990. But high-speed rail was not just a competitor for air, it became an asset to airlines as rail could be used to substitute for

shorter distance movements acting as feeder services and freeing up less profitable airport slots for more lucrative international and intercontinental routes. Crozet (2013) shows how at excess times over air of up to 2 hours rail typically takes a 50 per cent or greater share of the market, falling quite rapidly to 20 per cent or less at a 3 hours excess time over air. Nash (2013) quotes data showing that with rail station to station journey times of up to about 4 hours rail typically captures a 45 per cent or greater market share and up to about 2hrs 30 minutes the rail share is typically 80 per cent or greater.

Bus and express coach markets

The inter-city bus or coach market has been one of the more interesting developments in recent years. This market was very heavily regulated in most countries such that there was virtually no such market in some, such as France (Blayac & Bougette, 2017).

In Europe the UK was the first to deregulate the market in 1980 (White & Robbins, 2012). There was already a significant network of long-distance coach services, mainly operated under the name of “National Express” and owned by the nationalised National Bus Company (NBC) and operated by its subsidiary companies with standardised liveries and national marketing. This network was in turn inherited from a network operated through complex joint operations of the regional bus companies that had been brought together in 1968 to form NBC. This covered all of England and Wales but a similar network was operated by the nationalised Scottish Bus Group in Scotland which also operated Anglo-Scottish services in collaboration with NBC. All of these services operated under a licensing system that had originally been introduced in 1930. This served in part to protect the railways from direct competition as they could object to proposals to run parallel services. Generally, coach services were cheaper but slower than rail services and therefore effectively differentiated the market except where coach services were provided directly on routes that were not served by direct trains. This was particularly the case for summer services to seaside resorts. The 1950s marked the heyday for this type of traffic before the increase in car ownership removed large parts of the market. The big change was the development of the motorway network during the 1960s that allowed the acceleration of journey times and increased the potential competition for rail in journeys between large cities such as London to Birmingham.

The 1980 deregulation changed all that. Licensing of specific inter-city routes was abolished and operators were free to run services with only a simple advance notification although quality control through operator licensing was enhanced. Other than an operator licence there are few barriers to entry into the express coach market so the expectation was of a big increase in competition. The main problems new entrants often faced was access to bus stations that were often controlled either by local authorities or incumbent bus operators. For example, the main Victoria coach station in London was owned by National Express until 1988 when it was taken over by London Transport. National Express continued to operate services mainly on a franchised basis for individual services but serving as a national marketing agency to maintain the idea of a national network. The lack of this network of booking agencies in the pre-internet era also hampered the growth of independent operators. Very quickly the era of competition was replaced by consolidation as National Express asserted its dominance, though interestingly one of the new entrants, Stagecoach, rapidly became a major group for local bus operation following the deregulation and privatisation of NBC in 1986. Stagecoach also re-emerged as a coach operator with its Megabus operation focussing on a specific segment of the market, students, using online booking and providing direct services to university campuses. Some specific routes also saw the development of high-frequency coach services not provided by National Express. These developed in

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particular where rail service was relatively poor, such as between London and Oxford where two companies provided competing services running several times an hour and offering on-board services such as refreshments and wi-fi. However, improvements to the rail service making it more reliable and competitive and increasing road congestion that caused unreliability to coach operations led to one of the operators leaving the market in 2019. Competition between the two coach operators has however continued in direct services to airports, where rail connections are poorer.

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A similar pattern emerged in Germany after deregulation between 2009 and 2013 (Dürr & Hüschelrath, 2017). A number of new operators entered a market that had previously largely been controlled by a bus operating subsidiary of Deutsche Bahn (DB), the state-owned rail operator. Unlike the UK a number of these new operators were foreign owned, including some of the post-privatisation UK bus operating groups (including Stagecoach's Megabus), although DB also participated in the form of ICBus. Gradually, however, the market has consolidated with one operator, Flixbus, dominating after the takeover of Megabus and merger with the early leader MeinFernbus. Flixbus has also developed international routes building on the success of the joint venture Eurolines and entered the French and US markets. The market has continued to show some instability and is now threatened by a German government plan to reduce VAT on rail tickets, designed to promote the environmental benefits of rail, which may lead to cuts to more marginal services.

The French market was much less well developed and rail also offered a lower priced and less speedy alternative to the full-service TGV over key routes through its low-cost operation called Ouigo which focused on the market often taken by long-distance coach. However, there has been a gradual introduction of competing long-distance coach services since deregulation in 2015 (Blayac & Bougette, 2017). Interestingly one of the main entrants was the national rail operator SNCF using a low risk franchised model under the name Ouibus competing with the German operator Flixbus and the largely state-owned Transdev operating as Isilines alongside its existing international operations Eurolines. These three operators control over 85% of the French market, but the Transdev operators have much the largest share.

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The situation in the US has been rather different (Augustin et al., 2014). The generally poorer quality of long-distance passenger rail services away from a few key corridors such as the Northeast Corridor between Washington and Boston, and the earlier completion of a national inter-state highway network, led to a well-developed coach network mainly provided by two operators Greyhound and Trailways. This was regulated in a similar way to that in the UK prior to 1980, requiring operators to prove that any new service was not detrimental to existing services and to avoid predatory pricing. Deregulation, or reregulation as Augustin et al. (2014) call it, occurred in the Bus Regulatory Reform Act of 1982. This allowed for freedom of entry and exit and greater freedom on fares but retained the right of existing operators to object to new services. Early price wars destabilised the incumbents such as Greyhound and Trailways as new entrants were attracted. The US coach market had also suffered from the rise of the low-cost airlines competing for the low-income student and older persons cohort. The perceived attractiveness of this market led to attempts at entry by UK based groups such as Stagecoach (through its Megabus subsidiary) and FirstGroup (which had a 50% stake in BoltBus. But these proved to be difficult to sustain and the US operations of Stagecoach were sold in 2019, although the Megabus brand was retained.

Hence the pattern of initial aggressive competition followed by consolidation and the emergence of a single dominant operator seems to have occurred in most countries.

Inter-city rail markets

The development of the rail market in Europe has been dominated by the European Union's various railway packages and a move towards privatisation and competition (Nash, 2011, 2015; Preston & Robins, 2013). The EU policies have had two main strands in the passenger market, vertical unbundling and the introduction of competition (European Commission, 2016). Vertical unbundling involves the separation of track management and the provision of services. This may involve separation of ownership as in the UK or simply a clear accounting separation with the objective of providing equal terms of access to any operator removing the presumption of privileged access to an incumbent operator (Cantos et al., 2010). Competition can either be for the market through a franchising system typically involving a group of regionally coherent services or in the market through the right of open access (Nash, 2011; Competition and Markets Authority, 2016). Competition was initially seen as the key to allowing rail to compete against airlines in the international market through a requirement for interoperability. This has been achieved through various joint ventures between the national rail companies such as Eurostar or Thalys creating direct services between major cities over routes that favour rail over air such as those in the Paris, Brussels, Cologne, Amsterdam and London region of North-west Europe. These joint ventures have gradually been consolidated into a single entity controlled by SNCF, the French railway operator. There are similar joint operations in transalpine routes.

Only in the UK has there been a wholesale privatisation of the entire passenger service. In other countries such as Germany regional services have been franchised and in France such services have been placed under the control of regional authorities. But in the UK all services, both long distance inter-city services and regional services, have been franchised since 1996. The franchise system has been revised several times since 1996 (Nash, 2015) and is again under review. This has mainly affected such elements as contract length and the allocation of revenue risk between the government and the operator. The main inter-city routes have proved to be the most susceptible to contractual problems including default, and one, the East Coast Main Line between London, Yorkshire, the Northeast and Edinburgh, has had to be taken back into public ownership on more than one occasion, most recently in 2018 (British Broadcasting Corporation, 2018). All franchises have tended to be subject to the winner's curse problem where over-optimistic revenue forecasts have led to excessive bids that have not allowed for potential changes in the macroeconomic environment. Inter-city rail demand has proved to be particularly difficult to forecast and although a basic relationship with GDP growth was the main driver in the past, this relationship has also become less stable in recent years and the most recent franchise awarded has attempted to allow for risk sharing on this basis (Department for Transport, 2019).

Interestingly the UK franchises have encouraged international participation including state-owned rail operators from other EU countries. Although open access is allowed for there has been relatively little open access entry; those that have occurred have focussed on the provision of direct services to destinations (typically middle-sized towns and cities) off the mainline routes rather than direct competition for the core markets. With minor exceptions, where franchises compete over historic alternative routes, there has been little attempt to provide differentiated services for segmented markets using secondary routes or terminals.

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The UK has been slower than other countries in developing new high-speed rail routes (Givoni, 2006). In part this has been due to the relatively higher speeds achieved on conventional routes and these have been successful in helping the renaissance of rail without the levels of investment seen for example in France or Spain (Chen & Hall, 2011). In the case of the one relatively short dedicated high-speed line between London and the Channel Tunnel, HS1, the international services are totally segregated from the domestic ones and the regional services that use the line are integrated into the regional franchise so there is no real competition. The current plans for the proposed HS2 network between London, Birmingham, Manchester and Leeds also foresee the high-speed services as being integrated in the relevant franchise. The announcement for this new franchise for the West Coast main line makes provision for the incumbent operator to assume responsibility for HS2 services in due course (Department for Transport, 2019). The rationale for this is in part the importance of integrating all long-distance services so that cities away from the new line can benefit from direct services using the line. It also avoids the potential problems of traffic, and hence revenue, abstraction from an existing franchise holder. The provision of direct services off a high-speed line has been seen as important in growing markets in France (Bonnafous, 1987; Vickerman, 1997). Only in Italy has there been open access use of new high-speed lines with a private operator, NTV, competing with the state-owned operator Trenitalia over core routes albeit using secondary terminals in some cities (Croccolo, 2013).

Whilst some countries such as Sweden have encouraged competition for the incumbent operator SJ over longer distance routes, others, such as Germany, have kept the main inter-city network for the national operator, DB, using franchising for regional or secondary routes. Germany is demonstrating, however, how a national rail operator can be used as an instrument of wider public policy by reducing the VAT rate on train tickets from 19% to 7% from January 2020 as a means of lowering the price of rail travel, relative to other modes to promote environmental policies (BBC, 2019). This is a relatively rare example of trying to promote inter-modal competition; most regulatory and competition policies have been intra-rather than inter-modal.

Inter-city rail travel in the US, except for some long-distance commuting lines around major metropolitan areas, is now relatively undeveloped compared to the European situation, in contrast to the important role of the railways in the early development of the US (Fogel, 1964). This is in part due to geography with much greater distances and relatively lower population densities such that air travel has a greater competitive advantage than for example in Europe. Higher levels of car ownership and the development of the Interstate Highway network from the 1950s onwards (Altshuler & Luberoff, 2003, Chapter 4; Friedlander, 1965) also provided strong competition for railroads over shorter distances. But it also reflects the greater dominance of freight traffic on US railroads with freight operators owning and having priority use of tracks. It also reflects the earlier moves to remove subsidy in the interests of creating a level playing field for transport although Amtrak was established as a government-owned operator of longer distance passenger services (Winston, 2006). Only in the north-east corridor between Washington and Boston, does the geography lend itself to a reasonably frequent inter-city rail service that can compete with air, and although speeds have been increased this is not high-speed rail under the normal definition of segregated track capable of speeds of 250km/h or greater. There are similar linear networks in Florida and California, both of which have developed plans for high-speed rail, although these remain controversial and have been slow to come to fruition (Perez Henriquez & Deakin, 2017).

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Competition and regulation in inter-city transport markets: a synthesis

In some respects, inter-city transport markets demonstrate the greatest potential for competition between modes of all transport markets. Over shorter distances of up to around 200km car, bus and rail can all provide reasonably competitive offerings. The balance will shift according to such factors as the ease of access to rail stations or the existence of uncongested highways offering bus and car faster journey times. Over longer distances of up to 600km (or more) rail (especially high-speed rail) and air will be the main competitors. The level of interaction between city-pairs depends on city size and intervening distance and that will determine the likely density of service offered and the number of viable competitors that can be supported. The traditional development of transport services, often with the protection of some degree of regulation, allowed operators to cross-subsidise between more and less profitable routes. This was justified on the basis of maintaining at least a minimum level of service to all communities. In some cases, this may also require some form of public subsidy justified under a public service obligation (Ponti, 2011; Quinet & Vickerman, 2004, pp181-4). This goes back to the early days of rail where early private rail companies in the UK were required, as part of being granted the rights to develop a rail route, to maintain a minimum level of service often referred to as 'the Parliamentary train'. As noted earlier, regulation of bus services was often prompted by the need to maintain this basic rail service level.

The first real challenge to this system came in the UK with the publication of the Beeching Report into British Railways in 1963 (British Transport Commission, 1963). Growing deficits prompted the government of the day to question the public service obligation ethos and treat the railways as a business of which the less profitable or loss-making parts should be closed. Rail was also seen as an old-fashioned mode likely to be replaced by road over shorter distances and air over longer distances and therefore not something to be a priority for investment. This was similar to the situation in the US but contrasts with the decisions made first in Japan and then in France to invest heavily in new forms of rail using new dedicated tracks and allowing for higher speeds. It could be argued that these were in fact completely new modes of transport replacing traditional rail rather than just an investment in rail, but the level of integration with existing rail networks was important in determining the success of high-speed rail.

This coincided with the move to deregulate the key competing modes of bus and air, removing the protection of the railways from, in some cases, any competition. Allowing free competition from modes that have lower barriers to entry than rail as they do not require dedicated infrastructure, leads to cherry-picking of the most profitable routes. The first effect is one of aggressive price or service-level competition between rival operators within each mode. This leads to the emergence of a dominant operator within that market after which prices rise and service levels fall. This battle to become the dominant modal operator has consequences for the other modes in the market which also see profit margins squeezed affecting their ability to invest to compete. The question here is the extent to which transport markets are genuinely contestable, the criterion for effective competition (Gagnepain et al., 2011; Small & Verhoef, 2007, pp.205-8).

From the perspective of public authorities and regulatory agencies, the focus is normally on the situation within each mode, ensuring free and fair competition between operators, but this can have unintended consequences on other modes in the market. Often in city regions this effect is minimised by the creation of an overall transport authority that seeks to avoid wasteful competition by allowing competing operators to compete for the market by, for

example, a franchising system rather than within the market. This allows for the development of an integrated multi-modal transport network and a comprehensive multi-modal ticketing system. The multiplicity of public authorities often makes this more difficult in the inter-city context. Whilst some wider regional systems do exist, such as the various “Tarifverbund” in Germany, these are more concerned with integrating the smaller towns in the hinterland of a major city rather than the links between major cities. The creation of smart tickets such as the Oyster Card in London allows for a similar integrated ticketing across a wide area that increasingly includes journeys to towns in the employment catchment area as well as services wholly within the metropolitan region. There are very few examples of nationwide ticketing systems that integrate both urban and inter-urban trips, one such being in the Netherlands where the OV-chipkaart can be used on all public transport. In the UK the “plus bus” ticket allows rail travellers to purchase an add-on that can be used to complete a journey by bus in selected towns and cities.

Ultimately, however, inter-city transport has not been subject to the same degree of integration as in urban areas. The desire to promote competition within modes and reduce the cost of public subsidy has led to a piecemeal approach in most countries. It is only in cases where there is an overwhelming need to integrate services due mainly to geography (Switzerland and Norway being obvious examples) is there an attempt to provide a national transport service using the most appropriate mode for each link on a network. Attempts to coordinate timetables have, for example, been seen to be anti-competitive by the Competition and Markets Authority in the UK.

But, as argued above, this reflects the fact that much less is known about the pattern of demand for inter-city travel, making it more difficult both to forecast future demands and understand the potential for substitution and complementarity between modes. That inter-city journeys are more likely to involve a degree of inter-modality increases the problem of designing appropriate regulation and overall policy. Two areas for further research are identified as improving the coverage of such trips in regular national travel surveys and deriving better information on the cross-elasticities of demand between modes. Traditional diary methods are an inefficient way of collecting detailed data on less frequent longer-distance trips. Harnessing big data sources such as mobile phone records is one way of tracking mobility that is being experimented with. Evidence on responsiveness to travel costs usually comes additionally from expenditure data and ticket revenues. These are less effective in measuring elasticities when journeys involve multiple modes which are charged for separately or when separate services are bundled and sold through integrating agencies. Simple cross-elasticities do not measure the complementarity between modes which is essential to ensure that regulatory practices keep pace with the changing markets for travel. Furthermore, the growth of on-line selling with variable fares under yield management makes linking expenditure and actual travel more difficult. Much remains to be done in really understanding this particular aspect of transport.

Covid-19 has had a major impact on inter-city travel markets and thrown into sharp relief some of the underlying issues in these markets. The lockdowns imposed in many countries came with, if not an outright ban on travel, an exhortation to avoid all but essential travel, to work from home where possible, and to conduct business by means of electronic conferencing. The closure of hotels and recreational facilities virtually stopped all business and leisure travel. The imposition of social distancing rules also reduced effective capacity in public transport vehicles to less than 20 per cent of normal. Ridership fell to around 5 per cent of normal. Rail timetables were drastically reduced and many inter-urban bus services

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were suspended. Entire fleets of aircraft were grounded and international rail services cancelled or drastically reduced as borders were closed to all but essential travel. Most governments offered some financial support to transport operators; in the UK rail franchises were suspended and replaced by management contracts that compensated operators for services run and bus operators were given support grant that compensated on the basis of a fixed sum per kilometre actually run.

As life gradually returned to something approaching normality at the end of the strictest period of lockdown public transport services faced continuing problems. Social distancing meant that effective capacities on trains and buses remained limited and most countries mandated the wearing of face masks. Some governments even maintained an official position that public transport should be avoided where possible, leading to worrying rises in car commuting. Whilst financial support has in most cases remained in place, transport, and especially less essential inter-city transport, is competing with many other claims on public budgets. It seems likely that any return to the status quo ante will take a long time for transport, probably two to three years if not longer. It seems unlikely that a sticking plaster solution of the type of financial support used in the initial stages to preserve some basic public transport service can be maintained over such a period. It is more likely that private sector operators will continue the retrenchment that had already been seen prior to the pandemic. This suggests that the public sector will need to make a wholesale reappraisal of the way public transport is provided and that could lead to the end of the deregulated competitive model that had become the norm in many countries. The emergency occasioned by the pandemic could be a catalyst for much more fundamental changes. Understanding the demand for inter-city transport in this changed situation will become even more essential.

References

- Altshuler, A., & Luberoff, D. (2003). *Mega Projects: The Changing Politics of Urban Public Investments*. The Brookings Institution.
- Arbabi, H., Mayfield, M., & McCann, P. (2019). On the development logic of city-regions: inter- versus intra-city mobility in England and Wales. *Spatial Economic Analysis, 14*, 301-20
- Augustin, K., Gerike, R., Martinez Sanchez, M.J., & Ayala, C. (2014). Analysis of intercity bus markets on long distances in an established and a young market: the example of the US and Germany. *Research in Transportation Economics, 48*, 245-254
- Blayac, T., & Bougette, P. (2017). Should I go by bus? The liberalization of the long-distance bus industry in France. *Transport Policy, 56*, 50-62
- Bonnafous, A. (1987). The regional impact of the TGV. *Transportation, 14*, 127-137
- British Broadcasting Corporation (2018). East Coast train line to be put into public control. Retrieved January 24 2020 from <https://www.bbc.co.uk/news/business-44142258>

- British Broadcasting Corporation (2019). Germany plans €54bn climate deal amid 500 protests. Retrieved January 24 2020 from <https://www.bbc.co.uk/news/world-europe-49767649>
- British Transport Commission (1963). *The Reshaping of British Railways*. The Stationery Office.
- Cantos, P., Pastor, J.M., & Serrano, L. (2010). Vertical and horizontal separation in the European Railway industry and its effects on productivity. *Journal of Transport Economics and Policy*, 44, 139-160
- Chen, C.-L., & Hall, P. (2011). The impacts of high-speed trains on British economic geography: A study of the UK's InterCity 125/225 and its effects. *Journal of Transport Geography*, 19, 689-704.
- Competition and Markets Authority (2016). *Competition in Passenger Rail Services in the UK. A Policy Document*. Retrieved January 24 2020 from https://assets.publishing.service.gov.uk/media/56ddc41aed915d037600000d/Competition_in_passenger_rail_services_in_Great_Britain.pdf
- Croccolo, F. (2013). *New entry in the Italian high-speed market*. Discussion Paper 2013-29, International Transport Forum. OECD.
- Crozet, Y. (2013). *Performance in France: from appraisal methodologies to ex-post evaluation*. Discussion Paper 2013-26, International Transport Forum, Paris: OECD
- Department for Transport (2018). *National Travel Survey, England 2018*, London: Department for Transport. Retrieved January 24 2020 from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/823068/national-travel-survey-2018.pdf
- Department for Transport (2019). West Coast marks new partnership model for rail. Retrieved January 24 2020 from <https://www.gov.uk/government/news/west-coast-marks-new-partnership-model-for-rail>
- Dürr, N.S., & Hüschelrath, K. (2017). Patterns of entry and exit in the deregulated German interurban bus industry. *Transport Policy*, 59, 196-208
- European Commission (2016). Fourth Railway Package. Retrieved January 24 2020 from https://ec.europa.eu/transport/modes/rail/packages/2013_en
- Eurostat (2019). Air passenger transport statistics. Retrieved January 24 2020 from <https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do> (avia-paoc)
- Fogel, R. M. (1964). *Railroads and American economic growth: Essays in economic history*. Johns Hopkins University Press.
- Friedlander, A.F. (1965). *The Interstate Highway System. A Study in Public Investment*. North Holland.

Gagnepain, P., Ivaldi, M., & Muller-Vibes, C. (2011). Industrial organization of competition in local bus services. In A. de Palma, R. Lindsey, E. Quinet & R. Vickerman (Eds.), *A Handbook of Transport Economics* (pp 744-762). Edward Elgar.

Givoni, M. (2006). Development and Impact of the Modern High-speed Train: A Review. *Transport Reviews*, 26, 593-611

Independent Transport Commission (2018a). *Wider Factors affecting the long-term growth in Rail Travel*. Independent Transport Commission.

Independent Transport Commission (2018b). *What is the Contribution of Peak and Off-Peak Travel to the Urban Economy*. Independent Transport Commission.

McGuckin, N. (2013). *Intercity Travel Market Analysis*, Committee for a Study of Intercity Passenger Travel Issues and Opportunities. Retrieved January 24 2020 from <https://travelbehavior.us/documents/65.pdf>

Mokhtarian, P. L. (2003). Telecommunications and travel: The case for complementarity. *Journal of Industrial Ecology*, 6, 43-57.

Nash, C. (2011). Competition and regulation in rail transport. In A. de Palma, R. Lindsey, E. Quinet & R. Vickerman (Eds.), *A Handbook of Transport Economics* (pp. 763-778). Edward Elgar.

Nash, C. (2013). *When to invest in high-speed rail*. Discussion Paper 2013-25, International Transport Forum. OECD.

Nash, C. (2015). Rail, in *Handbook of Research Methods and Applications in Transport Economics and Policy*, ed. C. Nash. Cheltenham, UK and Northampton, MA: Edward Elgar. Pp. 359-370

Perez Henriquez, B.F., & Deakin, E. (2017). Institutional evolution and the politics of planning HSR in California. In B.F. Perez Henriquez & E. Deakin (Eds.) *High-Speed Rail and Sustainability: Decision-making and the Political Economy of Investment*. Routledge.

Ponti, M. (2011). Competition, regulation and public service obligations. In A. de Palma, R. Lindsey, E. Quinet & R. Vickerman (Eds.), *A Handbook of Transport Economics* (pp. 661-683). Edward Elgar.

Preston, J., & Robins, D. (2013). Evaluating the long-term impacts of transport policy: the case of passenger rail privatisation. *Research in Transportation Economics*, 39, 14-20

Quinet, E., & Vickerman, R. (2004). *Principles of Transport Economics*. Edward Elgar

Rail Safety and Standards Board (2019). *Understanding the drivers that impact travel behaviour*. Rail Safety and Standards Board.

Small, K.A., & Verhoef, E. (2007). *The Economics of Urban Transportation*. Routledge.

Transportation Research Board (2016). *Interregional Travel: A New Perspective for Policy-Making*, Transportation Research Board Special Report 320. TRB.

Vickerman, R. (1997). High-speed rail in Europe: experience and issues for future development. *Annals of Regional Science*. 31, 21-38

White, P., & Robbins, D. (2012). Long-term development of express coach services in Britain. *Research in Transportation Economics*, 36, 30-38

Winston, C. (2006). The US: private and deregulated. In In, J. Gomez-Ibanez & G. de Rus (Eds.), *Competition in the Railway Industry* (pp 135-152). Edward Elgar.

Zhang, A., Zhang, Y., & Clougherty, J.A. (2011). Competition and regulation in air transport. In A. de Palma, R. Lindsey, E. Quinet & R. Vickerman (Eds.), *A Handbook of Transport Economics* (pp. 797-821). Edward Elgar.