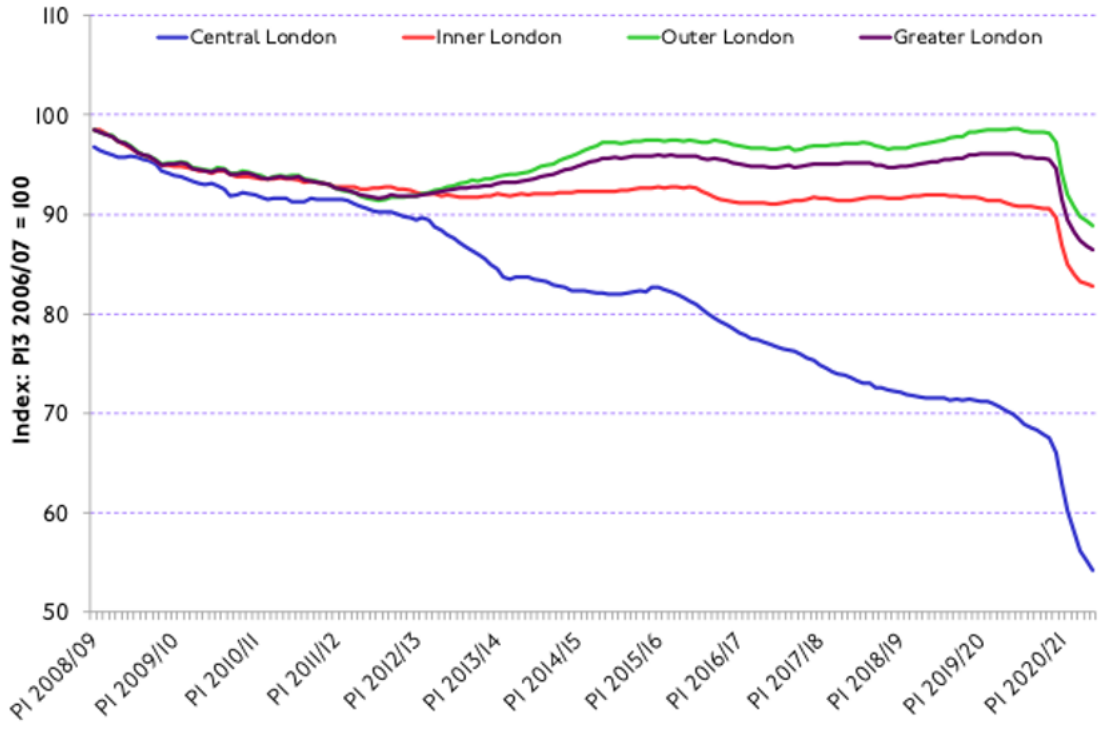
TEG TRANSPORT ECONOMISTS' GROUP

The Transport Economist

The Journal of the Transport Economists' Group

Figure 3.14 All motor vehicle traffic flows by area, 13-period rolling average, 2008/09-2020/21.



Source: TfL Surface Transport.

Editor Peter Gordon

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Contents **Pages**

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TEG TRANSPORT ECONOMISTS' GROUP

Rail passenger rights:
next steps

Dick Dunmore

Hosted by Arup on Teams

27 April 2022

Introduction

Dick Dunmore began by explaining that his talk was based on public information and, regrettably, could not describe how rail passenger rights would be managed under Great British Railways (GBR). The talk would draw on European statistics and legislation on passenger rights to explore the rationale for awarding passenger rights, passengers' priorities, practical issues and possible future approaches.

The European framework for passenger rights

Passenger rights can be seen as being intended to do for passengers what performance regimes do for operators. The European Union has gradually introduced them through Regulations for air, rail, maritime and bus and coach travel.

For rail, nearly 40% of rail users in both the EU and UK suffer disruption during a typical year, and so rights when services are disrupted are not a minority issue. In the UK some 17% of rail users experienced cancellation, 23% departure delay, and 10% arrival delay. It is likely to be the infrequent travellers who are most concerned with delays and cancellations.

The current rail Regulation 1371/2007, drafted before the emergence of smartphones and apps, is being revised to create Regulation 2021/782, applying from 7 June 2023. The revision sets out a number of themes for passenger rights which include:

- **non-discrimination between passengers** with regard to transport conditions and provision of tickets, with assistance for persons with disabilities and persons with reduced mobility (PRMs);

- **rights in the event of an accident** arising from the use of railway services and resulting in death, personal injury or loss of, or damage to, their luggage, with compensation in the event of disruption, cancellation or delay;
- **minimum, accurate and timely information in accessible format to passengers, including tickets**, and the definition and monitoring of **service quality standards** and the management of risks to the personal **security** of passengers; and
- handling of **complaints**.

The Regulations also include general rules on enforcement of these rights.

Passenger rights can be granted at many levels, including voluntarily for commercial advantage. The EU-defined minimum rights do not prevent better rights being set at international, national, local, industry or operator level. Member States may exempt urban, suburban and regional rail, bus and coach services from much of the Regulation, although local authorities such as Transport for London may include specific requirements in individual contracts for transport services.

There are differences and similarities in how the EU approaches passenger rights for the various modes. Legislation began in aviation, where journeys are often some or all of pre-booked, expensive, long, infrequent and international. However:

- Bus and coach have little control of traffic congestion, so delay is measured on departure rather than on arrival.
- Rail has few users making reservations and almost never checks passengers at boarding. This means that there is no way of identifying what individual passengers have planned, where they are, and whether they have experienced disruption.

For all modes, users have the right of complaint to the operator and, if not satisfied, the right to have their complaint reviewed by a National Enforcement Body or an Alternative Dispute Resolution process. Rail operators must report "the number and categories of received complaints and of processed complaints, the response time and the possible improvement actions undertaken".

Dick showed how a unified and consistent service for all modes of transport was offered by the Austrian statutory arbitration body, the Agentur für Passagier- und Fahrgastrechte (APF).

Certain rights may be generally considered common sense and unproblematic, such as those affecting people involved in accidents or regarding service quality standards. However, in the latter case, Regulation 2021/782's Article 29 only requires there to be standards, across a range of issues, but not the level of those standards.

Similarly, while Article 28 covering complaints seems reasonable in principle, it does not take account either that staff may not be available on some stations and trains, or that defining a complaints mechanism is not the same as achieving customer satisfaction.

Article 31 requires Member States to designate national enforcement bodies (NEBs) for enforcement of passenger rights, but cannot require them to be proactive, and they do not all appear to be effective.

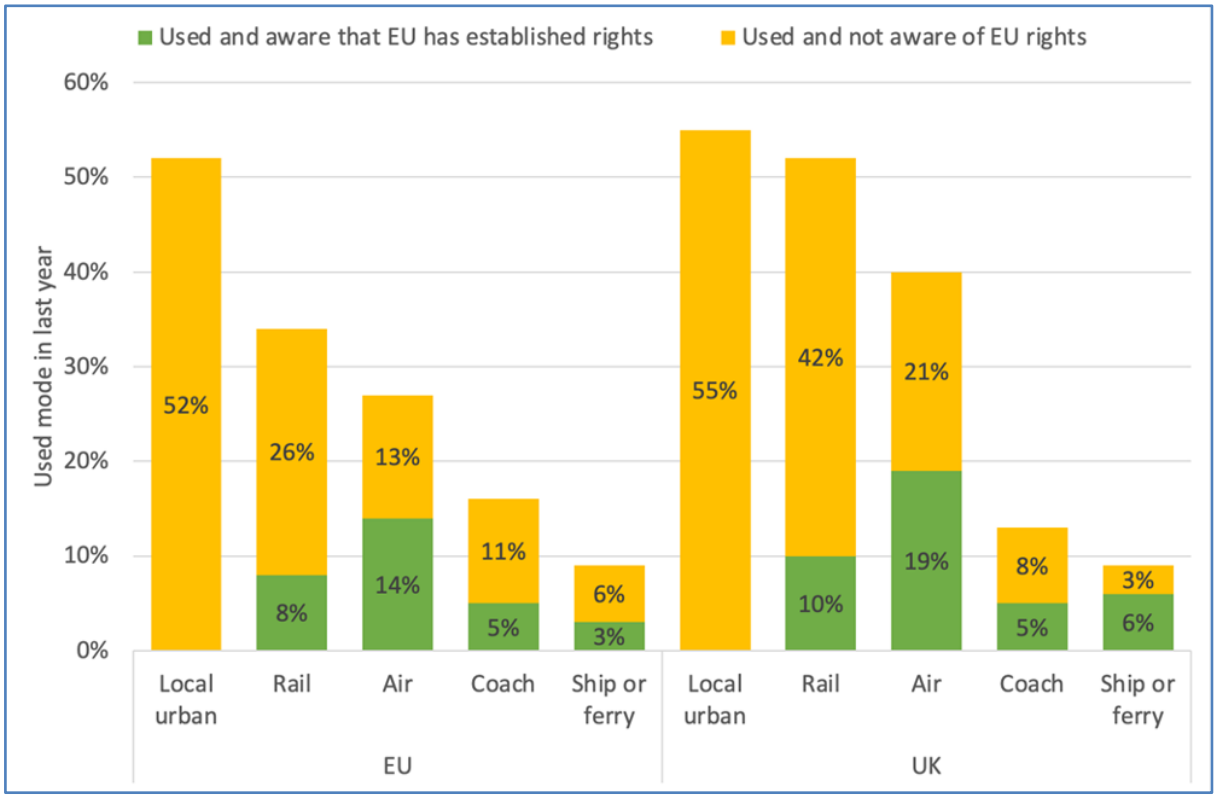
The UK framework for passenger rights

Following Brexit, Regulation 1371/2007 remains in UK law as retained European Union legislation (REUL) unless and until it is repealed or changed. Figure 1 shows how people in the UK use rail (and air) much more than the EU average, but are not always aware of their rights.

One issue is where passengers might find out about their rights. When Dick put "Rail passenger rights complaint" into Google, the first hit was an ORR page offered a good explanation of operator complaint handling and the role of the Rail Ombudsman.

For those not satisfied with the response from a train operator to their complaint, the Rail Ombudsman service provides access to a free, independent and expert service for an impartial assessment of a complaint, with fair and transparent outcomes and published case studies. **The Ombudsman's decisions are binding on service operators**, but **customers are not bound by the decisions** and remain free to pursue complaints through other channels (speaker's emphasis). The Ombudsman also provides free online resources, including helpful guides.

Figure 1: EU and UK use of rail and knowledge of their rights



Source: Eurobarometer 485, fieldwork 2019, EU-wide sample size 27,973.

ORR is also active in monitoring complaints and response times. Its website gives details, for each operator, of:

- the total number of complaints "closed" each quarter;
- the percentage "closed" within the target of 10 days; and
- the top five types of complaint.

Passengers' priorities

Transport Focus, the independent watchdog for transport users sponsored by the Department for Transport, gives some indication on its website of passengers' priorities in Great Britain. Transport Focus does regular research on passenger priorities. Four of the top ten relate to reliability and punctuality, information at stations, information on trains, and information about delays.

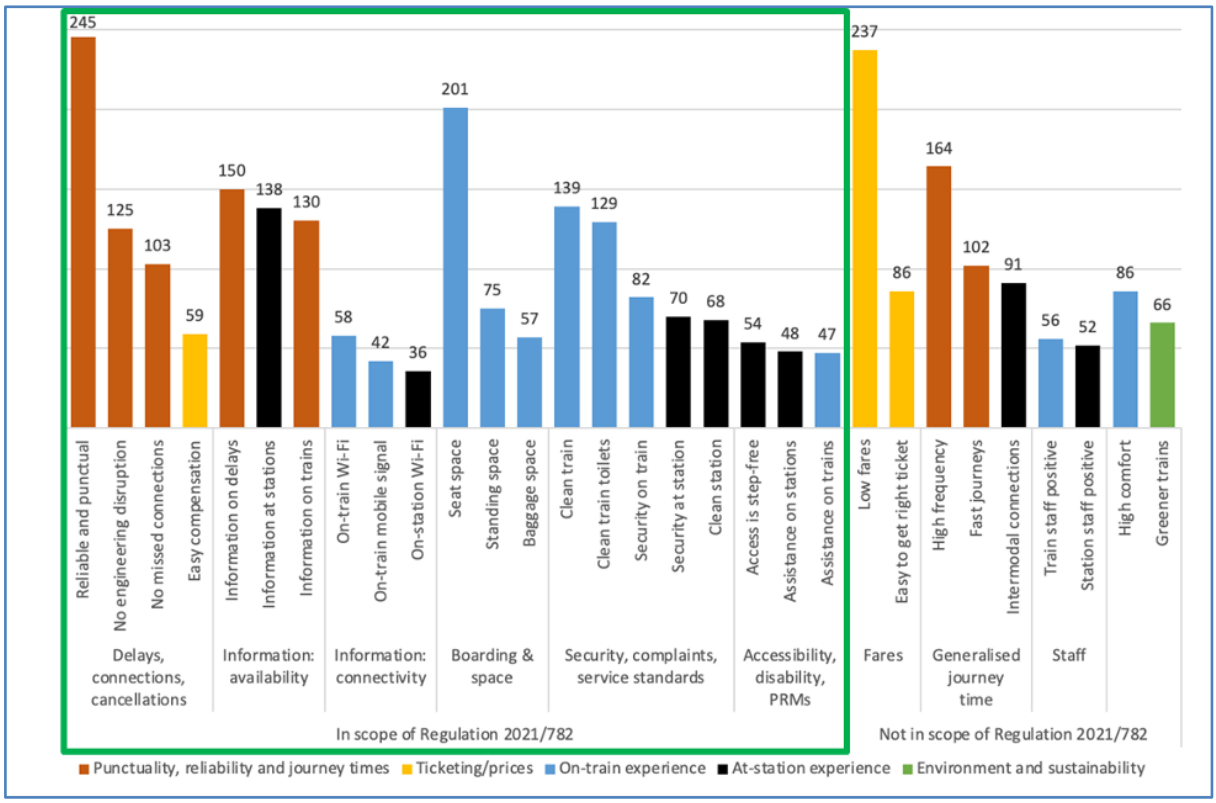
In its submission to the Whole Industry Strategic Plan (WISP), Transport Focus concluded that:

"Transport Focus's research on priorities for improvement and passenger satisfaction continually emphasises the importance of

an affordable, punctual, reliable, frequent service on which you can get a seat or, at the very least, stand in comfort. These form the 'core product' that passengers want to see improved."

Dick had mapped the Transport Focus findings to EU rights, as shown in Figure 2.

Figure 2: Passenger priorities grouped by relevant EU rights



Source: Transport Focus, regrouped by themes of Regulation 2021/782.

His analysis showed that EU rights only cover some passengers' priorities, shown within the green box, mostly related to aspects of service delivery (red), on-train experience (blue); and at-station experience (black). The issues of fares and frequency, while important to passengers, are outside the framework of passenger rights.

A significant issue is that passengers' priorities cost money:

- **Service** delivery is expensive. Greater reliability means more resilience, particularly with regard to infrastructure, but also providing space to board trains, with baggage, and in safety, while information can be difficult to deliver in real time and to personalise and target.

- **Train** quality, comfort and Wi-Fi can be improved at a cost, and more space on board means more or longer trains and eventually more infrastructure.
- **Station** accessibility and space also cost money.

Also, lower fares may hinder efforts at demand management.

When considering how passengers' rights might evolve in Great Britain, it is worth noting that passengers prefer prevention rather than compensation. Delivery of a good service is better than having to complain, or the prospect of compensation for delay, cancellation, loss and accidents. Monitoring and enforcement of standards is already done relatively well in Great Britain, and external stakeholders seem unlikely to accept less monitoring and transparency in the name of reduced regulation.

The current EU legislation imposes rights and responsibilities on types of party also defined in legislation, but if the roles of industry bodies in the UK change under Great British Railways, there is a possibility of unintentional misalignment. Legislation can be changed, but this takes time, and it should be remembered that the government aspires to remove or change 1,500 EU laws. In addition, while technology not envisaged in either existing or new EU Regulation may permit new approaches to ticketing, information, re-routing and refunds, there are bound to be a range of practical issues to be dealt with in setting up the systems.

Appraisal and evaluation of passenger rights

Dick noted that it would be desirable to appraise and evaluate passenger rights legislation and measures, whether at EU, national or local level, but this is difficult for reasons including:

- **complexity** in identifying the implications of individual rights, mitigations and exemptions, for parties including passengers, infrastructure managers, station managers, operators, local authorities, ticket vendors and tour operators;
- **poor passenger and incident data**, particularly with urban/suburban/regional travel on passes, plus ignorance and under-reporting unless passengers pursue matters beyond the operator;

- **poor cost and benefit data**, since some activities may be carried out in free staff time; and others may require wholly new staff and processes; and
- **the risk of unintended consequences**, as parties on whom obligations are imposed may adapt to minimise net financial impact, for example by offering only longer minimum connecting times.

Issues in the application of passenger rights

Non-discrimination between passengers

The broad principle of Article 5 of the EU Regulation is that conditions must be the same to all EU citizens (among other things, this means that market segmentation may not use nationality or residence as a proxy for willingness to pay). In practice, with sales channels such as websites and apps, any discrimination would have to be blatant and would be easily spotted.

In the case of non-discrimination against persons with disabilities or reduced mobility, very broad principles have been adopted. Under Article 3, people included within the scope of this provision are those "*who have a **permanent** or **temporary physical**, **mental**, **intellectual** or **sensory impairment** which, **in interaction with various barriers**, may hinder his or her **full and effective use of transport on an equal basis** with other passengers or whose mobility when using transport is **reduced due to age***." (Speaker's emphasis.) Article 21 requires that "*reservations and tickets shall be offered to persons with disabilities and persons with reduced mobility at **no additional cost**. A railway undertaking, ticket vendor or tour operator may not refuse to accept a reservation from, or to issue a ticket to, a person with disabilities or a person with reduced mobility, or require that such person be accompanied by another person, unless this is **strictly necessary in order to comply with the access rules** …*". (Speaker's emphasis.)

Complying with these requirements may not be easy. The Regulation specifies in detail how assistance can be booked and what must be provided, but in many cases, this requires a boarding ramp designed for the rolling stock being used, and

staff to deploy it on boarding and alighting. Such things can become difficult at minor unstaffed stations, as staff may need to be sent out specially. It may also be difficult to provide fallbacks if services are disrupted or assistance staff are delayed. Best practice would probably require level boarding at stations.

Information, accessible formats and tickets

As mentioned earlier, the current Regulation 1371/2007 was drafted before the smartphone and the emergence of apps for reservation, tickets and information. It requires supply of "*Minimum, accurate and timely information in accessible format to passengers, including issuing of tickets*" and in Article 11 specifies that "*Railway undertakings, ticket vendors and tour operators shall offer tickets and, where available, through-tickets and reservations*." One risk is that industry players may avoid making through-tickets and reservations available if the rights associated with them are onerous.

The new Regulation 2021/782 has 86 detailed references to information; 28 to accessible or accessibility; 24 to through-ticket; and 149 to ticket. Emerging technology may mean that, by the time the Regulation comes into effect on 7 June 2023, some rights may be easier to deliver, but this may be by means which do not meet the spirit or the letter of the Regulation.

Dick raised the issue of how best to address a number of emerging "case studies" in Great Britain. He began by highlighting the difference between using two tickets on the same journey when:

- the passenger has a season ticket or pass covering part of the journey; or
- the passenger has bought two separate single tickets, but not necessarily in a way defined as a single transaction.

If one ticket is a season ticket, the current Conditions of Carriage state that "*… if you are using a Season Ticket, daily Zonal Ticket, or another* ***area-based Ticket such as a concessionary pass, ranger, or rover, in conjunction with another Ticket*** *and the last station at which one Ticket is valid and the first station that the other Ticket is valid are the same, then* ***the train does***

not need to call at that station for your combination to be valid." (Speaker's emphasis.)

However, fares to/from London's zone boundaries are not available via all sales channels. Partly in consequence, many passengers have effectively paid twice for the travel inside the boundary. This has led to "Boundary Fares Claims" class action on behalf of passengers who object to paying twice for travel within the boundary of their pass or Travelcard validity (although in practice fares to/from the boundary need not be set lower than fares to/from London). In principle, this can be resolved by all sales channels offering tickets to/from boundaries, and ideally this could be automated further through "account-based ticketing" enabling any season tickets and passes already registered to the passenger to be taken into account in the fare calculation.

If neither ticket is a season ticket the opposite principle applies. The Conditions of Carriage state "*In order to 'split' a journey with two or more Tickets under Condition 14.2* ***the services you use must be scheduled to stop at a station*** *to allow passengers to alight and/or board that service, as permitted by the terms & conditions of the Ticket held. There is no requirement for you to alight and re-board the same service*." (Speaker's emphasis.)

A further challenge for both these ways of combining tickets is that operators or ticket vendors may not find, or offer, the cheapest combination of tickets consistent with (potentially extremely complex) passenger requirements. Websites and apps can reduce costs and let passengers explore options, but are not optimised for every possible search, such as paying from a boundary rather than at a station call, or combining peak and off-peak tickets. In addition, the rights of passengers making a single journey under two or more contracts (such as a season ticket and an add-on) may not be clear under the EU Regulation.

On the other hand, the Williams-Shapps Plan's promise of "**simplifying fares and ticketing**" might reduce confusion, regret, complaints and enforcement.

Disruption, delay and cancellation

Regulation 1371/2007 set minimum delay compensation at 50% for 120 minutes' delay and 25% for 60 minutes, but Great

Britain's "Delay Repay" is set at 50% for 30 minutes' delay and 25% for 15 minutes. Before COVID-19, compensation payments on this basis were running at around £80 million per annum.

C2C offers users of its smartcards automated delay repay, beginning at only 2 minutes delay. This is possible because the passenger touches in at the start and end of every journey on its closed network. The back-office system deduces which trains the passenger used, and identifies if and by how much they were delayed, allowing the fare to be calculated and compensation to be paid. Such a system is difficult to implement where many passengers have open tickets and/or cannot be tracked through the system, so automation elsewhere on the network is limited to train-specific tickets (so passengers who decided not to travel may receive a refund for a delay they did not experience) or journeys where the times of entry and exit can be recorded.

Refunds for disruption, delay and cancellation

A practical issue is how an operator can ensure that a passenger travels as intended, including any connections. Many rail tickets, including all Pay-As-You-Go (PAYG), are open, with no pre-agreed itinerary, and very few passengers book either successive Advance tickets or successive seat reservations. As a result, operators do not know whether and how many passengers intend to connect between any pair of trains. The TRUST train-reporting systems provides estimates of when trains arrived and departed, but cannot identify whether any passengers on them missed the implied connections between them. In any case, connections can rarely be held beyond a few minutes, as this can disrupt the entire timetable and result in more delays and compensation to other passengers.

Railways have no customer-facing staff on many trains or stations. Whatever their rights, this means that passengers with little information may need to make risky decisions in near-real time. There is no process for rail passengers to "renounce" travel, or for operators to "re-route" a restricted ticket to another train, operator or mode, except during major disruption. Other problems are that, if a passenger books through a ticket vendor or travel agent, the operator may have no contact or payment details and be unable to identify or refund affected passengers.

Refunds during COVID-19

Railways (and airlines, as commented on by the Transport Select Committee) are not geared up to organise refunds on a massive scale, such as for season tickets cancelled during COVID-19. Income from ticket sales is not held in escrow, but treated as revenue, and a right to a refund may be meaningless if the operator does not have, and cannot borrow, the funds. Staff processing refunds are few and need to be supervised but, in a pandemic, may themselves be sick or working at home.

In Great Britain, rail annual seasons are priced as 40 times as much as weekly season tickets, with the effect that there may be no refund value in the last months of their validity. However, when applying for refunds, many season ticket holders assumed that they would be refunded pro rata with the remaining period. (An analogy is that people buying two items on "buy one get one free" offers cannot return one and expect a 50% refund.)

Compensation under the Williams-Shapps Plan for Rail

As part of the envisaged "**New Deal for Passengers**", Section 42 of the 20 May 2021 White Paper sets out how "***Compensation will be simpler and easier to claim, with a consistent, modern process right across the network***."

"*When passengers are delayed, they should be properly compensated. Although the introduction of two-tier Delay Repay for delays of 15–29 minutes (a 25% refund) and over 30 minutes (a 50–100% refund) has created a clearer system in most areas, only 37% of eligible passengers claim for their delays and almost a third of Delay Repay 15 passengers are not aware of their right to claim compensation. As a first step, a simpler, straightforward claims process will be introduced to help make the experience easier for passengers*.

Delay Repay 15 is one of the most generous rail compensation offers in Europe and the government will complete its roll-out to form ***a single, national compensation approach*** *in the coming years. This will mean that wherever on the network passengers are delayed, they will receive* ***the same, straightforward claims experience****. This will make it simple to claim online and improve efficiency. Automated notifications of entitlement to claim compensation will be* ***expanded*** *to make*

it even easier for passengers. This will also enable the aim of straightforward, automated compensation ***for those who use smart ticketing options*** *to be realised in the future*." (Speaker's emphasis.)

An apparent assumption is that the low rate of claims is caused by a difficult compensation process, which must therefore be simplified, rather than passenger willingness to tolerate minor delays. Dick gave an example of being told that he was entitled to claim a refund of £1.98 for a delay which had no effect on his day. However, it is not clear how the Williams-Shapps Plan will simplify the process, given the practical issues described above.

Technology to the rescue?

Technological change is offering some scope for improvement. Dick listed a number of examples, but more will emerge.

First, trains now often remain in live information systems until they have completed their journey, rather than being removed at the scheduled arrival time.

Second, on-train monitoring equipment could record door opening and closing times, rather than estimated station arrival and departure times based on TRUST reports from the signalling system. This information could be retained to support claims.

Third, account-based ticketing could be used to collate passenger information such as railcards and accessibility needs.

Fourth, "single leg pricing", with at most three fares – Peak, Off-Peak (including PAYG), and Advance yield-managed discounted singles - would end the need to compare single and return fares and enable passengers on return journeys to mix fare and Class.

Fifth, passengers with QR-coded mobile tickets could be offered real-time re-routing, with replacement tickets sent automatically at times of disruption.

Sixth, "Fairtiq" technology (a Swiss system using passengers' mobile phone data to track their journeys and work out the payment required, including any refunds) could be used across modes, removing the need for physical barriers.

Seventh, more and improved information could be provided through apps, which allow it to be targeted and personalised.

Eighth, more and improved information is appearing on trains, including seat reservations, level of crowding, the location of working toilets, and on stations, including "Next fastest train" indicators for popular destinations.

A final challenge

To illustrate the issues to be addressed, Dick described a repeated journey from Clapham South in London to reach Windsor & Eton Riverside by 10:22.

Table 1: Timing and ticketing of an illustrative suburban journey

Time	Operator	Mode	Journey leg	Ticket/ Railcard	Fare
09:05-09:15	Transport for London	Bus or tube	Clapham South to Balham	Freedom Pass	-
09:21-09:27	Southern	Train	Balham to Clapham Junction	Full fare	£3.60 Paper £3.00 PAYG
09:38-09:59	South Western	Train	Clapham Junction to Zone 6 Boundary	Freedom Pass	-
09:59-10:22			Zone 6 Boundary to Windsor & Eton Riverside	Senior Railcard	£3.95 Paper

Note: fares to/from the Zone 6 boundary are the same as for Feltham.

Ideally, it would be possible to load a Freedom Pass, a Railcard and a credit or debit card onto a smartphone, and travel either ticketed or PAYG.

Ticketed: request 10:22 arrival at Windsor & Eton Riverside from Clapham South, be given three "boarding passes", and pay £7.55 for the incremental full (before 09:30) and reduced (extension beyond the boundary) fares. If delayed, the choice of refund or "re-routing", new "boarding passes", and payment of compensation, would all be automated.

PAYG: touch in and out (or be tracked), and have £6.95 fare deducted and, if delayed, automatic compensation.

What next?

The context is that Great Britain remains aligned with EU legislation, but Regulation 1371/2007 will be replaced by Regulation 2021/782 which comes into effect in 2023. As with everything else post-Brexit, the default outcome is passive divergence, with the active options being targeted divergence or maintained alignment, as summarised below.

Table 2: Options for divergence and alignment from EU rights

Approach			**Comments**
Passive	Diverge	Retain 1371/2007	Easy, but we would still need to comply with it!
Active		Modify from 1371/2007	Requires review of "what we want to change".
		Scrap EU Regulations	Requires review of "what we want" … unless Parliament is entitled to entrust this to Secretary of State and Ministers, or impose new rules through Great British Railways and contracts.
		Review what is devolved	Requires review and agreement of where variations through devolution are in the interests of passengers.
	Align	Adopt 2021/782	Time-consuming and politically difficult to argue that the EU's 2021 changes are just what the UK needs … but devolved administrations may adopt them anyway.

Transport is a devolved matter, and the administrations in Scotland and Wales have expressed an intention to allow their Ministers to remain aligned with EU Regulations. It is unclear how Westminster could stop these devolved administrations

extending rights such as "Delay Repay 2" on the model of C2C, resulting in no "single, national compensation approach".

Passenger rights legislation overlaps with safety, disability and consumer law, and could be enacted through other means. The issues are technically complex, and appraisal and evaluation are extremely difficult. However, the existing EU Regulation does cover many of the things that passengers want. Other than higher quality at lower fares, passengers' priorities remain:

- punctuality and reliability, including connections, with compensation seen as a second best;
- information on trains and stations, particularly when things go wrong; and
- better accessibility, especially for those with luggage, buggies and for disabled or mobility impaired people.

Granting rights is easy but delivering rights can be very difficult and/or expensive. Dick wondered whether regulating information and ticketing through legislation is compatible with rapidly changing technology. Great Britain need not apply Regulation 2021/782 from 7 June 2023, but must still decide:

- whether to remain aligned, diverge passively or diverge actively;
- whether to use legislation, or to deal with the issues through contract arrangements with train operators; and
- whether and how to standardise across nations, transport specifiers, contracts and modes.

Discussion

Peter Gordon (Editor, The Transport Economist) wanted to know whether the speaker thought that people understood the passenger rights arrangements. He used the example of flying to Switzerland on a German-owned airline which had to turn back, and he was then refused compensation. Is the legislation just too complicated? **Dick** said that the simple answer was "Yes". Even after working on the subject for several months, conversations with officials from the European Commission often revealed detailed wording, sometimes set out in other legislation, which he had not seen or fully understood. The gut

feeling among passengers may be that if they arrive late and/or without their baggage, then someone must owe them some compensation, but the legislation must allow for a range of exemptions and extenuating circumstances and is not clear cut. There is therefore ample scope for arguments between busy operational staff and distressed or argumentative passengers, neither of whom is likely to have memorised the detail of the Regulations.

Mark Sullivan (Planning and transport consultant) thanked Dick for his comprehensive presentation. He recalled his experience as a member of the TUCC for the West Midlands in 1981-94 and expressed the view that it would be difficult today for that type of consumer body to interpret and adjudicate such complex legislation. Is there now less scope for reasoned judgement from consumer bodies? **Dick** thought that this was a very interesting point. In principle, one option would be to remove the right to small amounts of compensation and instead to focus on fewer and better-analysed claims, with a more personalised response to those who have been seriously disadvantaged. The passenger might feel much more grateful for such a response than for a computerised, automated payment of a small amount. There is a difference between occasional long-distance journeys which passengers really do want to happen seamlessly, and frequently undertaken multimodal local journeys, which they may accept can go wrong from time to time and may be familiar with the alternatives. It was difficult to have one system which covered both extremes of journey types. **Mark**, in response, commented that the increased level of fares compared with 30 to 40 years ago meant that passengers had a greater expectation of compensation. **Dick** tended to agree, and noted that the removal of operator-specific fares might remove some of the complexity associated with using inflexible tickets at times of disruption.

Ernest Godward (Semi-retired railway economist) wanted to know whether there was information on the total amounts paid in compensation in other countries still in the EU. **Dick** did not recall this information being collected either in the Commission's rail market monitoring (RMMS) or in the recent Steer study on passenger rights. Neither the passenger rights nor the RMMS legislation requires operators to publish details of the amount of

compensation paid. This contributes to the difficulty of evaluating the impact of the legislation.

Mark Sullivan recalled Mike Patterson, the then Secretary of the Central Transport Consultative Committee (CTCC), making the point that when the Area Committees were abolished in 2005 their duties were all transferred to a single central body called Passenger Focus. He wanted to know who in the UK was now responsible for administering the complaints process. **Dick** explained that European legislation defines the roles of national enforcement bodies (NEBs). For certain modes in some countries, such as for buses in Czechia, Poland and Spain, enforcement is devolved to regional level. In the UK, Transport Focus is an effective national body, but its powers and responsibilities do not map well onto the EU framework. In future, the UK government will need to decide what passenger protection it wishes to enshrine in law and what consumer bodies it wants to create to carry out such functions.

Report by Gregory Marchant

Links

Regulation 1371/2007 on rail passengers' rights and obligations **https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007R1371&from=EN**

Regulation 2021/782 on rail passengers' rights and obligations **https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0782&from=EN**

Agentur für Passagier- und Fahrgastrechte (APF), Austria, **https://www.apf.gv.at/de/**

Overview of rail Compensation for Delays and Delay Repay **https://www.nationalrail.co.uk/209242.aspx**

Williams-Shapps plan for rail policy paper **https://www.gov.uk/government/publications/great-british-railways-williams-shapps-plan-for-rail**

The impact of Digital Navigation on travel behaviour

David Metz
Centre for Transport Studies, University College London

Hosted by Arup on Teams

25 May 2022

Introduction

The speaker said that he had just published a paper on Digital Navigation, commonly known as satnav, in which he had been interested for some time. He was surprised that so little had been written on the subject.

M25 case study

He began with a case study of a Smart Motorway scheme involving running on all lanes between M25 Junctions 23 and 27. New investments in such schemes had been paused for safety reasons, but he would be concentrating on the economic implications. Monitoring had been carried out before opening and at one, two and three years after opening.

Figure 1: M25 case study

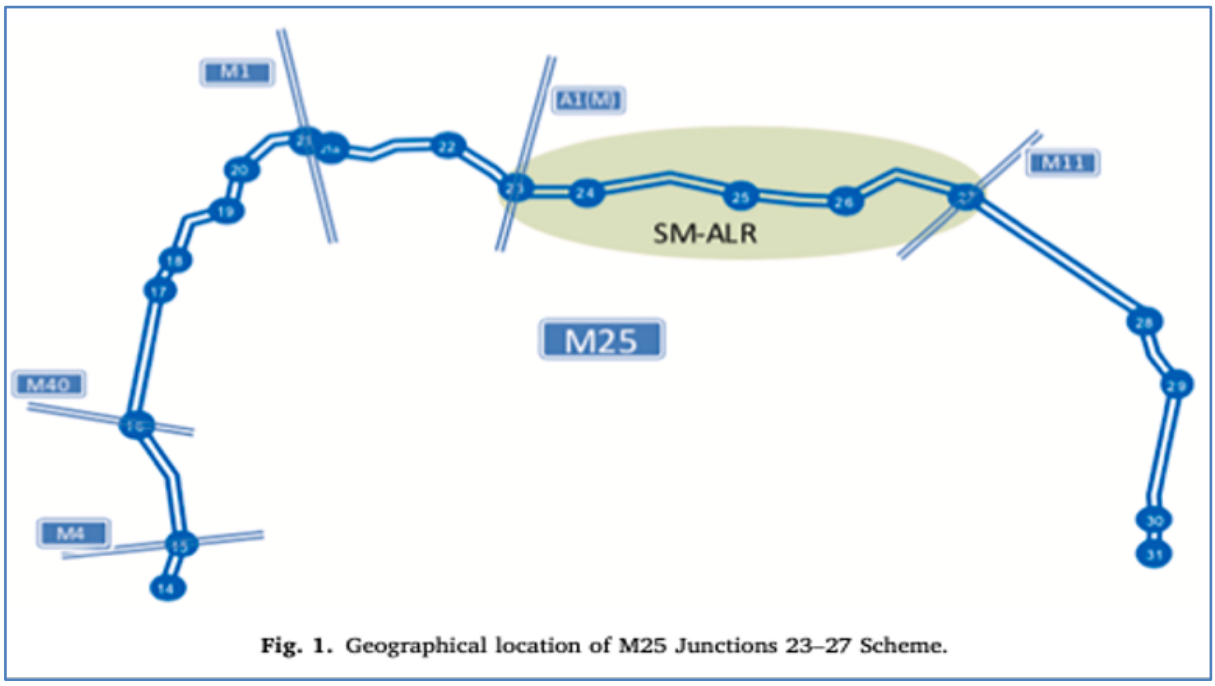


Fig. 1. Geographical location of M25 Junctions 23–27 Scheme.

The chart below shows changes in transit times by Year 3.

Figure 2: M25 case study: three-year changes in transit times

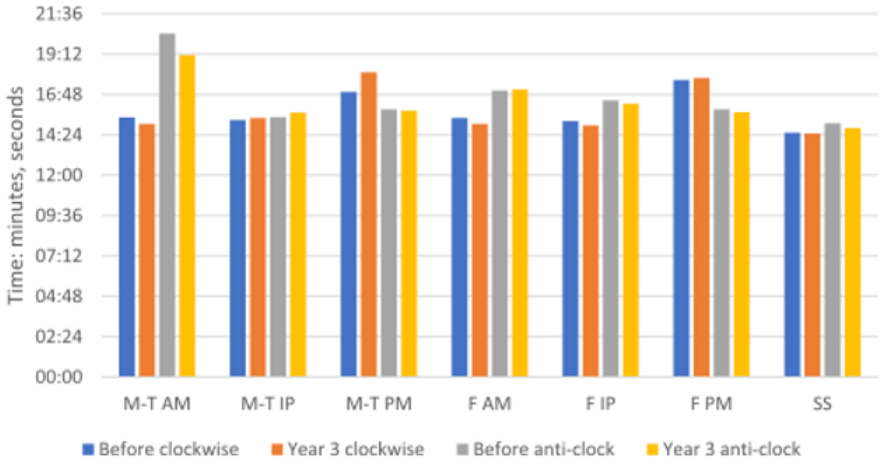


Fig. 2. Journey time Before and at Year 3 after opening, for travel clockwise and anti-clockwise, for Monday-Thursday, Friday and Saturday/ Sunday, for AM and PM peaks and for interpeak time slots (HE, 2018).

Between implementation and Year 3, there was little change in speed, despite traffic growth of 16%, far higher than regional motorway growth of 7% over the same period. Weekdays (first six clusters) saw increases of 6-19%, with weekends (final cluster) saw increases of 23%. This growth may be due to suppressed demand taking advantage of the increased capacity.

The Year 3 monitoring report concluded that "These results show that increases in capacity have been achieved, moving more goods, people and services, while maintaining journey times at pre-scheme levels and slightly improving reliability."

However, this could not have been a justification of the scheme, so the speaker made a Freedom of Information request to see the traffic modelling and economic appraisal reports.

Figure 3 below illustrates an example of the traffic modelling, showing an increase in speed from Do-Minimum (DM, blue) and Do-Something (DS, orange).

Figure 3: M25 case study: forecast speeds 2015, 2030 and 2040

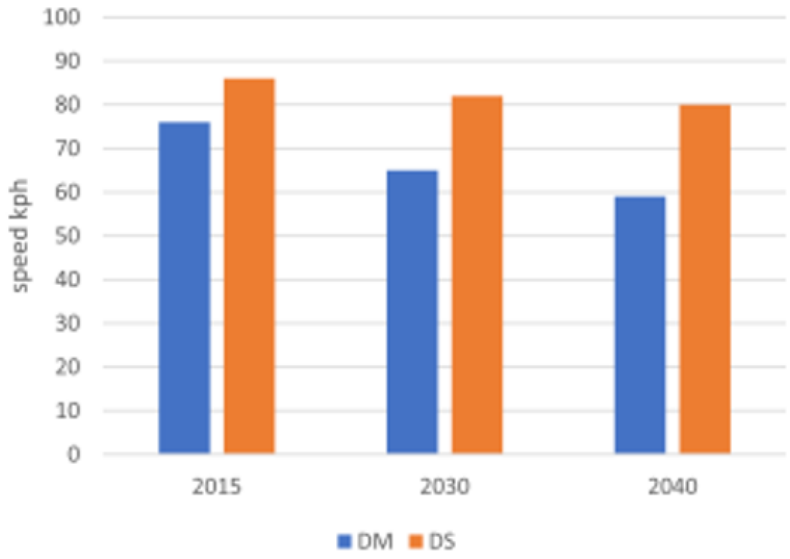


Fig. 4. Forecast speed for J23-24 AM Peak clockwise, for do minimum and do something cases.

Table 1 shows the benefits generated by these speed increases. The net benefit to business users, time savings less increased vehicle operating costs, is £437 million. Savings to commuters and others are almost entirely offset by increased vehicle operating costs.

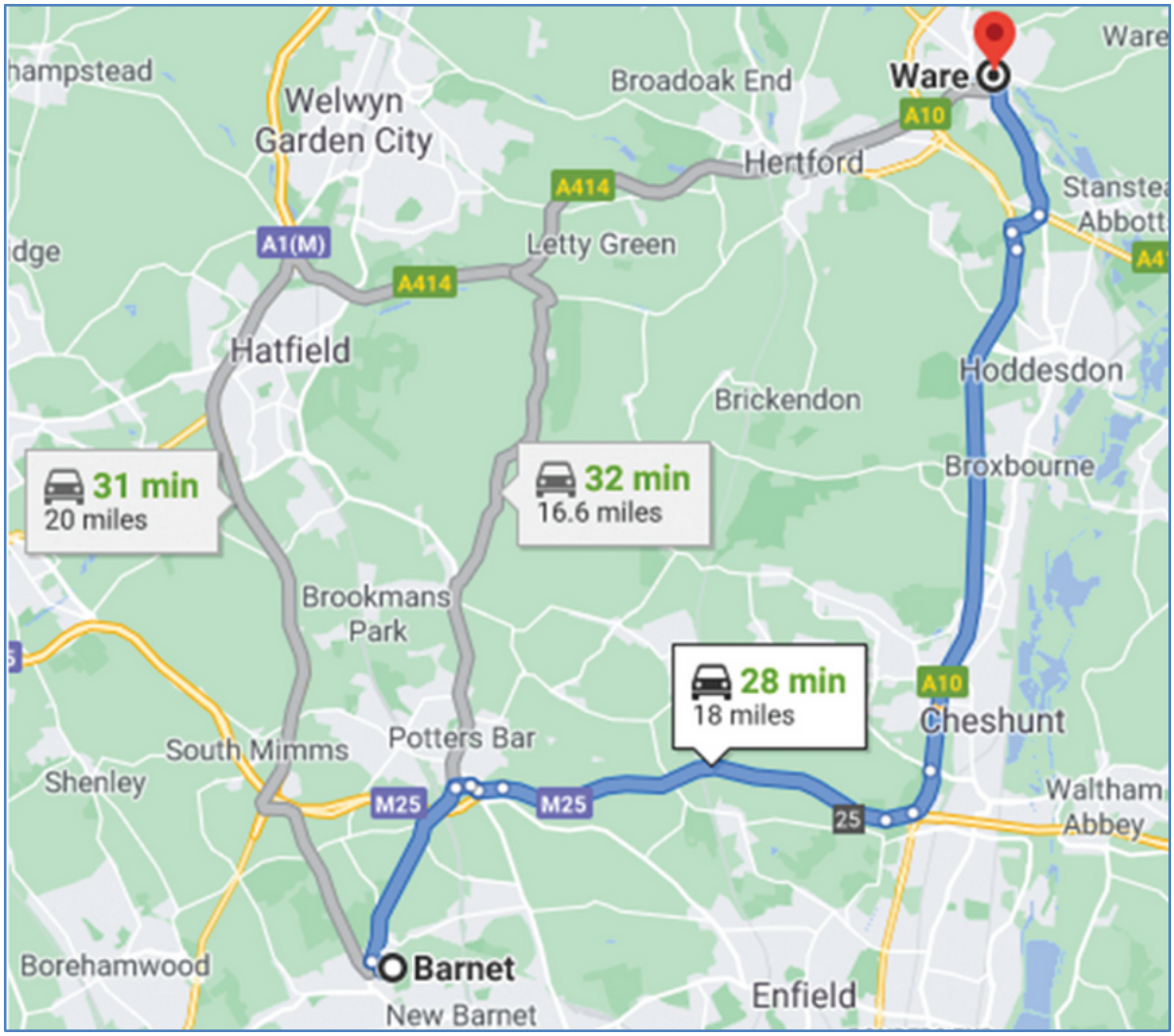
Table 1: M25 case study: Transport Economic Efficiency Benefits

£ million	**Time saving**	**Vehicle operating costs**	**Net**
Business users	475	-38	437
Consumer commuting	31	-31	0
Consumer other	123	-118	5
Total	**629**	**-187**	**442**

Note: simplified from Table 8 of Economic Appraisal.

However, vehicle occupants are saving time by driving further, as illustrated in the screenshot from Google Maps below, for a journey between Barnet and Ware. The shortest route is 16.6 miles and takes 32 minutes, but the motorway route is 18 miles but only takes 28 minutes, and there is also a third route via Hatfield. The local user has a choice of route, facilitated by Digital Navigation, but long-distance users are unlikely to divert.

Figure 4: M25 case study: the route is quicker but longer



Note: journey times calculated mid-morning.

The speaker suggested that Digital Navigation will increase motorway use by local traffic, with little benefit, but "pre-empting" benefits to longer distance traffic.

M1 case study

Another scheme involved using the hard shoulder of the M1 between Junctions 10 and 13. Traffic flowed slower in the scheme, even allowing for the use of the hard shoulder. The conclusions were similar to the M25 example, with net benefits to business users and little change to commuters and others.

Figure 5 shows how a journey from Luton to Bedford during the morning peak was 10 miles longer via the M1 but 7 minutes faster than the alternative.

Figure 5: M1 case study

It seems therefore that Digital Navigation facilitates rerouting of local traffic, negating the economic benefits of new capacity.

David thought that this is likely to be a general occurrence in or near population centres, where the strategic road network is under the greatest stress. If we had a toll system, this could be adjusted to discourage local traffic.

There is a risk of the recognised phenomenon of underestimating rerouting through optimism bias, so models need to take account of the impact of Digital Navigation. The monitoring of traffic post-opening was inadequate to confirm the forecasts of the model. The model categorises traffic that is subdivided into business cars, vans and HGV, and commuters and other local users. This level of detail is not available from the monitoring data, but is possible with data from Digital Navigation.

At an RAC Foundation seminar on "Who uses the M25?", Douglas Gilmour of TomTom and Sean Flynn of Atkins analysed anonymised data from millions of trips to reveal exactly what types of journeys are being made on the 117-mile long M25[1]. TomTom Origin Destination (O/D) Analysis uses advanced algorithms to analyse anonymised Floating Car Data (FCD) from over 600 million connected devices. This gives a good view of traffic patterns and can determine journey purpose.

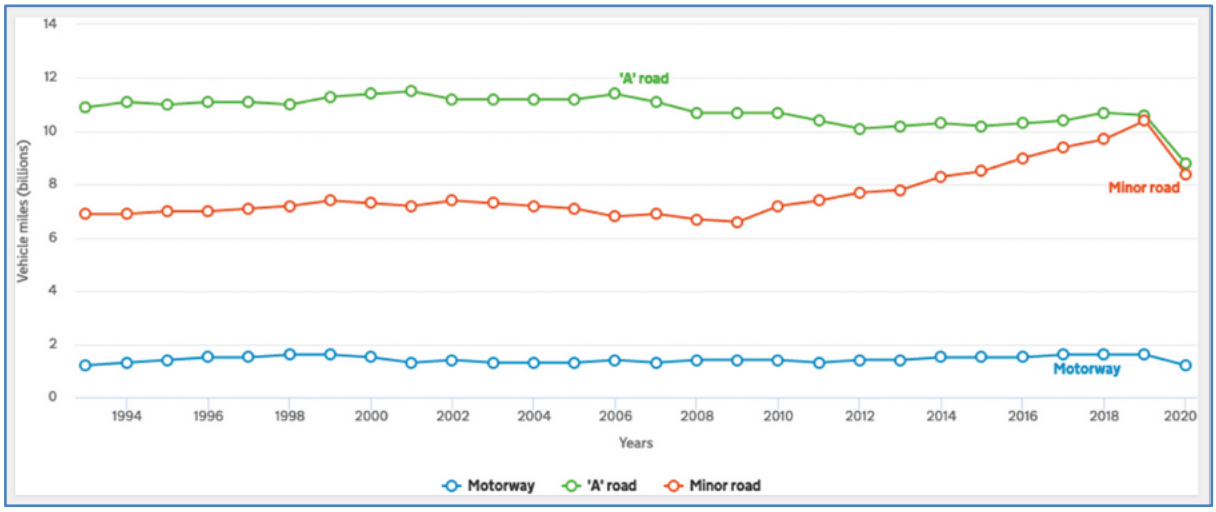
Longitudinal surveys of behaviour look at changes in behaviour over time and are rare in transport, although common in areas such as health. Tim Spector of King's College London, working with the Zoe study, has developed a smartphone app to monitor COVID-19 symptoms. This could be extended to transport and, as the participants are volunteers, they can be asked for additional data such as journey purpose.

Growth of traffic on minor roads

Revision of Department for Transport (DfT) road traffic statistics in 2019 showed increases in traffic since 2010 of 26% on minor roads and 12% on major roads.

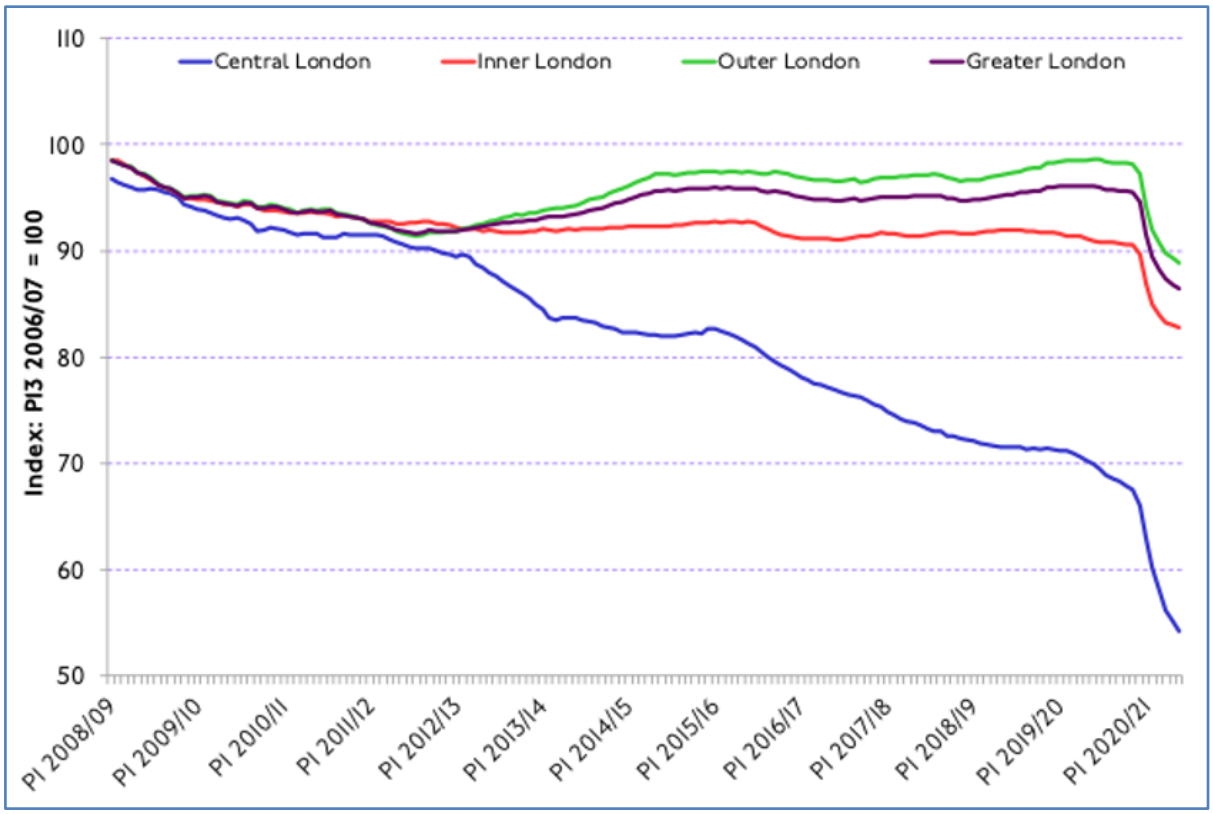
[1] A presentation and the associated slides are available at **https://www.racfoundation.org/data-driven/who-uses-the-m25**

Figure 6: Traffic in London by road type, 1993 to 2020, DfT



Source: Department for Transport, Road Traffic Statistics.

Figure 7: Traffic in London by location, 2008/9 to 2020/21, TfL



Note: all motor vehicle traffic flows by area, 13-period rolling average
Source: Transport for London (TfL) Surface Transport.

The first slide above shows DfT's data on traffic in London. Traffic for minor roads is based on representative samples, benchmarked against a larger sample every ten years to check for drift. The adjustment factor, 0.95 in 2009 and 1.19 in 2019,

reflects the heterogeneity of the sample. Huge drift over ten years means that the sample is no longer representative.

The second slide above shows TfL's data on traffic in London. TfL were surprised that the DfT data contradicted their own surveys, which showed a large traffic reduction in Central London but little change elsewhere. This may not be inconsistent, as TfL are only responsible for major roads, but it is worth further investigation.

There are a number of possible reasons for the growth of traffic on minor roads.

First, van traffic increased by 34% over the period 2010 to 2019, but it amounts to only 15% of traffic on urban minor roads.

Second, there has been some reallocation of roads space for active travel and Low Traffic Neighbourhoods, resulting in some diversion of traffic. However, the net impact is to reduce traffic.

Third, Digital Navigation extends the use of minor roads to those without local knowledge, particularly in the vicinity of congested major roads where minor roads offer an alternative route. This would explain the heterogeneity and, while it is only a hypothesis, the speaker thought it likely. This means that the policy may be contrary to policies to promote active travel, for which minor roads are well-suited.

Digital Navigation mitigates the impact of road traffic congestion, and helps spread traffic across the road network, including on unsuitable roads. There is some evidence from surveys that better information on journey times reduces uncertainty, which is what bothers road users most about congestion. The estimation of journey times has been improved through the application of Machine Learning. Digital navigation costs very little and is the best means available to mitigate the perceived impact of congestion, as we cannot built our way out of it.

Optimising road network operations

Wardrop's first principle (user equilibrium) states that under equilibrium conditions, traffic arranges itself in congested networks such that no individual user can reduce their costs by switching routes. Digital Navigation provides information about faster routes and so helps achieve this equilibrium in which, however, congestion costs are treated as an externality.

Wardrop's second principle (system optimal design) says that, under social equilibrium conditions, traffic should be arranged in congested networks such that average (or total) cost is minimised, in this case including congestion costs. This does not occur naturally, but could be put into place through design.

Could we move towards the second principle through interventions other than congestion charging, for instance by flexing the information provided by Digital Navigation? David said that there was not enough evidence for this at present, but the question was worth investigation.

Regulation

Roads and users are well regulated, including (at least in theory) Digital Navigation, which is regulated under the Road Traffic (Driver Licensing and Information Systems) Act 1989, although the legislation has never been used.

A licence is required by providers of driver information systems, to which conditions may be attached, including specifying roads not to be used and the traffic information to be provided. There is likely to be scope for network optimisation through regulation, under both normal conditions and at times of stress.

Invoking the legislation may be beneficial, and would be unlikely to conflict with business models of Digital Navigation providers.

Conclusions

Digital Navigation is making a difference to how roads are used, generally for the better:

- It is likely to divert local users to new capacity on major roads, reducing expected economic benefits. It also diverts traffic to minor roads, contrary to policy to promote active travel.
- It can provide a more granular evaluation of road investment outcomes to understand distribution of economic benefits and refine models.
- It mitigates journey time uncertainty in congested traffic.
- There is scope for regulation to prevent the use of unsuitable roads and optimise network operations.

Oddly, Digital Navigation is the elephant in the room. Its impact has generated very little consideration, although it provides an opportunity to reorient the focus of roads policy from civil engineering to digital technologies and from investment to operations. For roads, policymakers and analysts are focused on investment in civil engineering structures. This compares with aviation, where the day-to-day focus is operational in a competitive sector, whereas roads are a mostly a monopoly. The one element of roads that is competitive is road freight, particularly where it forms part of integrated logistics which manages fleet operations and tracks goods. This experience needs to be brought to bear on the totality of traffic.

There is also an opportunity to reorient transport analysis to take advantage of developments in Machine Learning or Artificial Intelligence using data generated by users of Digital Navigation. The leading protagonist is the London-based company Deep Mind, which was sold to Google, whose algorithms have been used to improve the performance of Google Maps (a figure of 16% has been quoted). The ability to analyse huge amounts of trip data through Machine Learning could be the start of a new era in transport planning.

Discussion

Peter Gordon (Editor, The Transport Economist) wondered to what extent Digital Navigation could reduce the need for infrastructure schemes in practice. **David** replied that we are making use of spare capacity although we may not like where traffic goes to. There is likely to be little increase in capacity, so yes, it is time to stop substantial road building, with a reorientation from civil engineering to improved optimisation.

David Starkie asked if the argument could be turned round to use the digital data to discover which long-distance journeys are deficient in terms of journey time, so identify where to concentrate investment? **David** agreed and was surprised that National Highways doesn't already do this. He was concerned about adding capacity to the strategic network which attracts local users.

Chris Castles (independent consultant) noted that we experienced fundamental issues for a long time. **David** replied

that we need more discussion on the topic. He thought that conventional transport modelling will become obsolete. It is hard to know how much confidence to have in modelling. **Chris** said that DfT was slow to pick up new ideas. **David** said that the problem with HS2 was that the scheme was about benefits for the North, but the modelling looked at journey time reductions.

David van Rest said that there was opportunity for control by changing speed limits, which could change behaviour, but he was not sure whether this was a good thing or not. Is it worth doing? **David** said that smart motorways included the means to control traffic. It was suggested that speed on the M1 reduced as traffic was being deliberately slowed to smooth out the traffic. However economic planning examines time saving benefits, whereas the real benefits were access improvements. Perhaps models should be constrained to keep long-run journey times constant.

Tali Diamant (Atkins) said that data was real time: what is the direction of causality? **David** said that the models have regard to historical experience and can incorporate this. However, we don't know how they do it, as there is a lack of transparency.

Mark Sullivan asked about how to stop the system sending people down rural roads. There will be a number of other cities worldwide where this will be happening. Has David seen similar effects abroad? **David** replied that he has been looking at the literature and has not come across much, although there is concern that this has been happening in Los Angeles. He was amazed by the lack of literature worldwide on the impact of Digital Navigation: this compares with Uber, where licencing authorities can demand information in many cities (but not in London).

Report by Peter Gordon

References

David Metz (2022). The Impact of Digital Navigation on Travel Behaviour, UCL Open Environment, Vol. 4(1). DOI: 10.14324/111.444/ucloe.000034

David Metz (2021). Economic benefits of road widening: Discrepancy between outturn and forecast. Transportation Research Part A, 147, 312-319.

http://drivingchange.org.uk/disappointing-economic-benefits-from-widening-the-m25/

http://drivingchange.org.uk/widening-the-m1-motorway-between-junctions-10-and-13/

david.metz@ucl.ac.uk

Review: transport economics on YouTube

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

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The proliferation of online content creates a wide range of sources on fact, opinion and criticism of transport which can be thought-provoking. One example is YouTube, a few examples from which are summarised below.

The first thing to say is that, while there are some gems available on YouTube if you search hard enough for them, the recommendation algorithm assumes that a user wants more of the same, and that if you want something different you may have to go a long way down, but it's worth putting in the effort. Content creators say how they have to tailor their content, for instance by limiting the length, in order to get picked up by the YouTube algorithm and indeed have to release frequent videos in order to remain on the radar. Sometimes less might be better.

This review will not consider trip reports and the like which are not concerned, even loosely, with transport economics but will rather four sites that may be of interest to the transport economist. There are far more available, and I may well be missing some very interesting content. Don't stop at the highlighted sites!

Wendover Productions, run by Sam Denby

https://www.youtube.com/c/Wendoverproductions/videos

According to Wikipedia the site has over 3.52 million subscribers and more than 533 million total video views. It covers a range of topics, frequently including transport. Videos are fast paced and discursive – often the opposite of the typical Discovery channel documentary - and generally raise a large number of interesting issues. This reviewer generally finds them thought provoking and stimulating. There is also a "younger brother" "Half as Interesting", which is more lightweight but can still be a fascinating watch.

Railways Explained

https://www.youtube.com/c/RailwaysExplained/videos

Compared to Wendover productions this has a modest 72,500 subscribers, although many of the videos have over 200,000 views. Like most YouTubers, he releases frequent videos (up to one a week), not all of which are concerned with transport economics. "Shinkansen is Coming to Texas?" on the Dallas-Houston Bullet Train Project is interesting, with a good analysis of the project, and discussion on its viability that goes well beyond the edited press release that is too common these days.

https://www.youtube.com/watch?v=xFqc925Whj8

The ridership analysis shows 16.7 million auto, 0.8 million air and 2.8 million high speed rail trips for 2026, with 25.9, 0.2 and 13.6 million respectively forecast for 2050. Your reviewer checked the number of passengers between the two Dallas and two Houston area airports in 2019, which totalled 2.86 million including transfer passengers: how many of the total were point to point? So relatively little traffic is expected to come from air (this is the USA after all), not the impression you would get from many reports, and 2050 ridership will be under half that achieved by Virgin Trains West Coast at its peak. The video also gives estimated construction costs and revenue totals. The viewer can draw their own conclusions. They are similar videos on other routes including California high speed rail.

RMTransit and CityNerd

https://www.youtube.com/c/RMTransit/videos

https://www.youtube.com/c/CityNerd/videos

Both sites are produced by individuals who are obviously convinced of the benefits of public transport and, I suspect, will largely be viewed by the converted. RM Transit looks at a wide range of cities and transit issues and can be very interesting, although like many YouTube channels can be a bit "samey". The same is true of CityNerd and, while he also makes some interesting points, the content can be a predictable after a while.

Review by Peter Gordon

TEG Committee 2022-2023

Chair

Tali Diamant +44 (0)7976 931192 **Tali.Diamant@atkinsglobal.com**	Atkins

Treasurer and Membership Secretary

Gregory Marchant +44 (0)1273 621522 **gregorymarchant.teg@outlook.com**	4 Seymour Square Brighton BN2 1DP

Secretary, Webmaster and Programme Coordinator

Dick Dunmore +44 (0)7715 771321 **dick_dunmore@hotmail.com**	43 Gaskarth Road London SW12 9NN

Journal Editor

Peter Gordon +44 (0)1895 678803 **petersgordon@blueyonder.co.uk**	39 Haslam Close Uxbridge Middlesex UB10 8TJ

Committee members without portfolio

Adriana Moreno Pelayo +44 (0)20 7755 6261 **Adriana.MorenoPelayo@arup.com**	Arup
Iris Ning +44 (0)20 7755 5072 **Iris.Ning@arup.com**	Arup
Carol Smales +44 (0)20 3054 8204 **carolsmales@tfl.gov.uk**	Transport for London

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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Contents **Pages**

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