



Surface Connectivity: assessing the merits of the Airports Commission's options for UK aviation

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October 2014



INDEPENDENT
TRANSPORT
COMMISSION

Published by the Independent Transport Commission

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Acknowledgements:

This report was authored by Dr Tim Ryley of Loughborough University and by Dr Alberto Zanni. The research and report were developed in consultation with the ITC project Steering Group, chaired by Dr Stephen Hickey, and comprising Simon Linnett, Dr Matthew Niblett, and Professor Peter Jones.

The authors would like to thank a range of stakeholders for their assistance during the development of the report. They would particularly like to thank Richard Higgins (Gatwick Airport), Simon Earles (Heathrow Airport), Mark Bostock (Heathrow Hub) and Chris Moores (Transport for London).

The ITC would also like to record its gratitude to its Core Benefactors, a list of whom can be found on the main ITC website. The views expressed in this paper are those of the authors and do not necessarily represent the collegiate view of the ITC.

October 2014



Foreword from the ITC Project Chairman

The Airports Commission will shortly decide whether to recommend expanding airport capacity at Heathrow or Gatwick. The aim - which the ITC welcomes - is to improve the UK's global connectivity. However, decisions on runways have big implications for surface transport: how people and goods get to and from the airport itself. Expanding an airport without an adequate surface access strategy would deliver only half the solution.

This issue has attracted far less public scrutiny than other dimensions of the aviation debate. The ITC has therefore commissioned this report which highlights the importance of surface access and raises a number of challenging issues that we believe must be addressed:

- a) A good surface access strategy must reflect not just the additional airport-related journeys but also the underlying increase in transport needs from rapid population growth in SE England. This will place stress on access networks to airports regardless of new runways and makes the need to upgrade this infrastructure essential.
- b) The targets for modal shift, from private cars to public transport, are ambitious, and investment as well as a range of policies will be required to achieve them. Could forms of pricing support both?
- c) Several major surface improvements to both Gatwick and Heathrow are already planned or proposed. It remains unclear, however, just how much additional capacity will be needed once underlying population growth, the additional demand (from passengers, staff, freight, etc.) from an expanded airport, and a significant switch to public transport are all factored in. Robust modelling of these combined effects is urgently needed to test the adequacy and cost of surface transport proposals.
- d) Good integration between the airport and surface transport modes, including rail, tube, road, coach and taxi, will be critical for passengers. Achieving this raises issues such as integrated ticketing, local transport 'hubs', and ensuring that airports are well integrated with the national transport network, including HS2. The ITC's parallel work on High-Speed Rail has shown the importance of joined-up planning - noting that rival airports, such as CDG and Schiphol, have integrated their HSR stations within the airport.
- e) Planning and then operating "joined up" transport to and within major airports is complex. It involves a host of organisations, including planning authorities, property owners, infrastructure providers and service operators. The report questions whether enough attention has been given to the governance arrangements for successful delivery. Who has the strategic leadership role and can ensure that plans are aligned across all modes, thereby providing a service that is more than the sum of the parts?

Surface access fit for purpose is the essential corollary of any major airport expansion. We fear that these issues have not yet received the public attention they deserve. As the Airports Commission approaches its final conclusions and recommendations, it is essential that it addresses them transparently and robustly.

Dr Stephen Hickey
Chairman of the Aviation working group
Independent Transport Commission





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Executive Summary

Introduction

1. The ITC welcomes the work of the Airports Commission and the ensuing lively public debate on how best to meet the UK's aviation connectivity needs over the next few decades.
2. In its previous reports *Flying into the Future* (May 2013) and *The optimal size of a UK hub airport* (February 2014) the ITC highlighted the key issues and challenges, including the importance for the UK itself in continuing to host one of the world's prime hub airports.
3. Understandably, much of the public debate has been around specific aviation issues, such as future demand and the ways in which the industry could develop in future years. The impacts of aviation on local communities - particularly noise and other environmental impacts - have attracted widespread attention.
4. By contrast, the question of what needs to happen to surface transport - road and rail - if either of the remaining short-listed airports is to expand significantly, has received less attention. Yet this is a vital issue. No-one simply flies: all airline journeys start and end with surface journeys from the individual's home (or other place of origin) to their final destination. So expanding the airport itself only addresses part of the problem of improving UK connectivity.
5. The Airports Commission will reach its final conclusions and recommendations in the summer of 2015. The ITC welcomes its recognition of the importance of surface transport but has a number of major concerns:
 - these key issues have not yet received the attention they deserve in the public debate;
 - on the evidence of our work so far, the information and data publicly available on the scale of the surface transport implications, challenges and how they might be resolved remains worryingly limited and inconsistent;
 - aviation passengers (and staff) want and need seamless, easy, "joined-up" end-to-end journeys, embracing both the surface elements of their journey (train, coach, tube, bus, car, taxi etc) and the flights themselves. But it is unclear whether we have the capacity to ensure this happens.

We are, therefore, publishing our report with the aim of highlighting more widely the importance of this under-researched aspect of the aviation debate; and have addressed our recommendations primarily to the Airports Commission, since it is now essential that these issues are transparently addressed as it develops its final recommendations to Government.

6. The report raises four main issues: the scale of the surface access challenge; the importance of the "last mile"; the challenges of delivery; and a broader concern about integrated transport planning in the UK.



The scale of the surface access challenge

7. The report highlights the potential scale of the surface access challenge and the limitations of the currently available information and data:
- the backdrop to the aviation debate, and its surface transport implications, is that the population of London and South-East England is rising anyway. London's population is expected to grow by 13% by 2022 alone. So surface transport capacity would need to expand regardless;
 - expansion at either Gatwick or Heathrow will add many new passengers on the ground as well as in the air. Gatwick estimate that their total passenger numbers could rise from around 34 million in 2013 to perhaps 60 million in 2030 and 87 million in 2050. Heathrow expect that their passenger numbers would rise from around 72 million (of whom around 45 million use surface transport - others are transferring flights) to around 100 million by 2030. The numbers using surface transport would rise from 45 million to around 68 million;
 - in addition, however, both airports rightly want to see a significant shift of passengers from road to public transport (primarily rail and tube). Gatwick aims to increase the proportion of passengers using public transport from around 42 per cent (2011) to around 60 per cent by 2040, or in absolute terms from around 14 million to possibly 40 million. Heathrow estimates that the numbers using public transport would rise from around 19 million to around 34 million (or at least 50%). Delivering such a shift will be a major challenge in itself requiring, for instance, better public transport to and from airports outside normal hours; and perhaps controversial measures such as charges for "kiss and drop" car trips, with the income used to subsidise public transport improvements;
 - expansion would also have implications for staff travel and freight (both goods serving the expanded airport itself and air freight). Staff journeys form a surprisingly large proportion of total journeys. Both airports want to encourage staff to switch to greater use of public transport. There appears to be little published data on the potential freight implications.

8. Modelling the *combined* impact of all these factors in a comprehensive, consistent and robust way for both airport options is difficult with the information currently available. But it is clear that the aggregate increase in the number of journeys, on both public transport and the roads, is potentially very significant.
9. The other side of the coin is how the increased demand for surface transport would be met, and at what cost. Here the available data has proved even more fragmentary.
10. Both airports suggest that most of the increase can be satisfied through existing and already planned additional capacity, such as improvements to Thameslink, Gatwick Express, the opening of Crossrail and other schemes. It appears that both airports envisage investing around £800-900 million in surface access, largely in local motorway adjustments, but recognise that this assumes no need for more far-reaching (and expensive) schemes beyond those already planned. It is not clear from the available data how far the planned new capacity would simply meet population growth and other existing pressures, and how far it will create genuine, adequate headroom for large numbers of new airport passengers and people switching modes.
11. We note the lack of publicly available transparent and comparable data as a matter of concern, and hope that the Airports Commission will publish such data before it reaches its final conclusions. Expanding an airport without sufficient clarity on the adequacy and affordability of associated surface transport improvements would be a major failure.
12. We therefore recommend that the Commission publishes clear and transparent estimates both of the cumulative extra demand which would follow from expansion, and also whether the currently planned or proposed surface transport improvements will be sufficient for the next 30+ years. We note that some airports (but not Heathrow or Gatwick) already use financial incentives to discourage private vehicles, and that this also creates potential new funding streams for improved public transport. We recommend the Commission includes this issue in its proposals.

The last mile

13. As well as raising questions about surface transport capacity, the report highlights the importance of the “last mile” (to or from the airport), in terms of design, customer experience, and the potential for innovative technology. All passengers want an easy, straightforward, fast “last mile” (or “first mile” for arrivals), but depend on a host of organisations responsible for particular elements of their experience, including airlines, airports, border controls, bus, coach, tube and train companies, as well as rail and road infrastructure providers.
14. Technological solutions might include simple but comprehensive information and advice; integrated ticketing across modes; innovative transport between terminals or between terminals and car parks; and “virtual” meetings to greet or say farewell to passengers. We recommend that these solutions are considered.



Organising to deliver

- 15.** The report highlights not just the issues and opportunities airport expansion could raise in relation to surface transport but also the challenges of design and execution. Even at the local level, these issues cross the roles and responsibilities of a wide range of public and commercial bodies and are not within the straightforward control of the airports themselves. If the full benefits of airport expansion are to be realised by customers and by the UK more broadly, it is essential that all the players – including the airports and the airlines; local and national roads authorities; those responsible for both rail and tube infrastructure and services; and those developing coach and taxi services – all align their plans and collaborate effectively on delivery.
- 16.** We therefore recommend that the Airports Commission addresses not only where airport expansion should take place but also whether the governance infrastructure is adequate to ensure that the full benefits for passengers are realised during the planning and execution stages.

National infrastructure planning

- 17.** A feature of this review, prompted particularly by the Heathrow options, has been the way in which the UK's major transport infrastructure issues appear to be addressed in distinct silos. Arguably the two biggest transport projects currently under consideration - a new runway and High Speed 2 (HS2) - have potentially significant interrelationships and opportunities; but the remits for both are being considered separately and are not well integrated.
- 18.** From the ITC's research on High Speed Rail it is clear that in many other countries - including Holland, Germany and France - airport and high-speed rail projects are considered in tandem. Airports at Schiphol, Paris and Frankfurt, for example, incorporate major stations into the airport design, with direct services to multiple destinations, expanding connectivity for all and increasing the access and appeal of the airport for domestic users.
- 19.** We understand the history and the particular issues in the UK context. But it is nonetheless disappointing that even the *possibility* of ensuring true integration between an enhanced hub airport and the UK's major new railway spine appears to have been lost, reflecting the way in which each project has been handled through separate mechanisms and on separate timetables. Integrating the two in the manner common elsewhere may or may not have been the optimal solution in the UK: but the apparent absence of deep analysis and debate - comparable to the separate debates about both HS2 and a third runway - reflects poorly on the UK's approach to major infrastructure planning. We recommend that the Government reflects on this experience and considers what better mechanisms might be needed to strengthen cross-modal planning for major infrastructure proposals.

20.

Finally, there is a longer-term issue about aviation business models and national surface infrastructure. The airlines' normal business model - as we reported in *The optimal size of a UK hub airport* - makes it cheaper today to get from (say) Manchester to (say) Singapore by flying to Heathrow (or another global hub) to connect to the long-haul leg than to get there by train. Once HS2 is established many more places will be quickly connected to Heathrow; and it will be quicker for those in the South East to access airports in the Midlands and North. Looking ahead, therefore, new opportunities will appear for airlines to develop new business models, embracing surface transport as well as domestic flights. We recommend that the Airports Commission considers the scope to encourage or provide incentives to airlines to develop such new business models.



I. Introduction

- 1.1** In May 2013, the ITC (Independent Transport Commission) produced a report on the issues surrounding the UK's aviation infrastructure needs entitled: *Flying into the Future. Key issues for assessing Britain's Aviation infrastructure needs*. The ITC considers that one of the key elements necessary for good 'connectivity' to a hub airport is surface transport¹. As part of the next phase of their aviation research, the ITC has commissioned this report.
- 1.2** The aim of this report is to assess the surface transport aspects of each of the proposals short-listed by the UK Airports Commission in its interim report published in December 2013². It should be noted that this report primarily uses publicly available information.
- 1.3** The Airports Commission's Interim report set out the nature, scale, and timing of steps needed to maintain the UK's status as an international hub for aviation, alongside recommendations for making better use of the UK's existing runway capacity over the next five years. The short-listed options (from the 52 received) selected for further analysis and assessment, in accordance with their potential to deliver the needed capacity, flexibility and resilience, were:
- 1.** Gatwick: A new runway over 3,000m in length located south of the existing runway to permit fully independent operation (proposed by Gatwick Airport Ltd).
 - 2.** Heathrow (i): A new 3,500m runway to the NW of the existing airport to permit fully independent operation (proposed by Heathrow Airport Ltd).
 - 3.** Heathrow (ii): An extension of the existing northern runway to the west, lengthening it to at least 6,000m, enabling it to be operated as two separate runways: one for departures and one for arrivals (proposed by Heathrow Hub Ltd).
- 1.4** The Airports Commission originally included a Thames Estuary proposal in their December 2013 document, supported by the Mayor of London. It involved the construction of a new hub airport East of London on the Isle of Grain. This proposal was rejected in September 2014 following further feasibility and impact studies³.
- 1.5** The general objectives the Commission set up, in terms of surface access, to guide the submission of proposals are⁴:
- To maximise the number of passengers and workforce accessing the airport via sustainable modes of transport;
 - To accommodate the needs of other users of transport networks, such as commuters, intercity travellers and freight;
 - To enable access to the airport from a wide catchment area.

1 ITC, *Flying into the future - Key issues for assessing Britain's aviation infrastructure needs*. (London: Independent Transport Commission) 2013. Section 4.1, p.48.

2 AIRPORTS COMMISSION 2013. Interim Report - 17 December 2013.

3 AIRPORTS COMMISSION 2014. Inner Thames Estuary Airport: Summary and decision paper. September 2014.

4 AIRPORTS COMMISSION 2014. Airports Commission: Appraisal framework consultation. Airports Commission. Section 4. Surface Access, pp.50-54.

1.6 All organisations that submitted a proposal to the Airports Commission were asked to include details of their surface access strategies⁵. The Commission's report contains a number of proposals for surface access improvements to airports in the South-East that could, although not a substitute for increased capacity in the long-term, improve short-term constraints by making a more efficient use of existing capacity. These are:

- The enhancement of Gatwick Airport Station (as well as improvements to the Gatwick Express service).
- The development of a strategy to improve road and rail access to Gatwick Airport.
- The development of a proposal to improve the rail connection between Stansted Airport and London.
- The provision of direct rail access into Heathrow from the south.
- The provision of smart-ticket facilities at airport stations.

1.7 On 26 November 2013, Sir Howard Davies, Chairman of the Airports Commission, sent a public letter to the UK Chancellor George Osborne urging him to take particular consideration of surface access improvements to airports in England. The letter presented a number of recommendations for surface access investments across a number of airports in the UK, and would require more than £2bn of investment. In particular, Sir Howard stated:

"In the interim there is a strong case for attaching a greater strategic priority to transport investments which improve surface access to our airports. Surface transport improvements can encourage more use of airports which currently have spare capacity, improve the passenger experience, and make airports more attractive to airlines... There are also environmental benefits to be gained through surface access investment. If we are to reconcile the twin objectives of meeting aviation capacity needs and remaining on course to meet the UK's environmental goals, we need to do more to support a shift towards the use of public transport, particularly rail."⁶

1.8 The assessment in this report of the surface access aspects of these proposals is undertaken in the following sections:

- 2.** A review of the surface connectivity needs of any major airport
- 3.** The current surface access situation at Gatwick and Heathrow
- 4.** Future surface access developments
- 5.** Surface access implications
- 6.** Conclusions and recommendations

5 AIRPORTS COMMISSION 2014. Airports Commission: Appraisal framework consultation. Airports Commission.

6 Sir Howard Davies to The Rt Hon George Osborne MP, 26 November 2013, accessed at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263208/surface-access-letter.pdf



2. A review of the surface connectivity needs of major airports

- 2.1** The task has primarily involved desk research reviewing the surface connectivity needs of major airports, using a range of academic and industry sources. Much of this builds upon a recent UK surface access project undertaken by the research team (the ABC project⁷).

Introduction to surface access and connectivity

- 2.2** For airports, facilitating surface connectivity means receiving more travellers and therefore increasing profitability. It is known that airlines take surface connectivity into account when choosing between different airports. From the passengers' point of view, the journey to the airport (surface access) represents the first stage of their trip, and a very important one, given the issues they may face if they miss their flight, and the monetary and psychological consequences incurred. Similarly, arriving passengers want to get to their final destinations quickly and easily. A traveller is subject to constraints for surface access, in particular luggage and the departure time of the flight. For flight departures, passengers must allow necessary time to walk from either the parking or the public transport terminal to the main airport building.
- 2.3** It should be noted that hub airports have different surface access requirements to non-hub airports, given the different operations taking place on their premises. In particular, hub airports normally have a larger proportion of passengers transferring from one flight to another than non-hub ones. These passengers put less pressure on the surface access infrastructure.
- 2.4** Airports therefore need to integrate effectively in the multimodal transport network in order to survive and prosper. Intermodal integration describes a system in which passengers can complete a journey connecting different modes in a safe and efficient (seamless) way⁸. This is particularly complicated in the UK as even the same mode is often provided by different organisations, sometimes with conflicting interests, making the integration efforts even more challenging.
- 2.5** It is necessary to define good surface access. Ideally, each airport should be reachable in the quickest and most convenient way by those who want to use it. This would mean fast, direct, public transport services from a large number of locations. Public transport services need to be designed to meet air travellers' needs, so that there is space for luggage, step free access and provision of information. In situations where non-road-based public transport is unfeasible then a goal should be congestion-free road access, with a preference for more sustainable travel, such as by coach, to access the airport.

7 The Engineering and Physical Sciences Research Council (EPSRC) project (EP/H003398/1): Airports and Behavioural Change (ABC): towards environmental surface access project. The project, conducted between 2009 and 2012, had a focus of encouraging better environmental behaviour for surface access journeys, together with the development of sustainable transport solutions.

8 VESPERMANN, J. & WALD, A. 2011. Intermodal integration in air transportation: status quo, motives and future developments. *Journal of Transport Geography*, 19, 1187-1197.

2.6

Vesperman and Wald⁹ interviewed a number of airport managers across the world (including at Heathrow, Stansted and Manchester) about intermodal integration for surface access travel. Based on these interviews, the authors categorise airports based on the following main motives behind offering (or boosting if already present) a multimodal surface access system:

- Increase catchment: for a number of airports (generally situated in densely populated areas), an improved and integrated surface access system will above all increase the airport's current catchment area.
- Enable growth: for some other airports (generally mid-size European airports), general growth is the main focus; for some it is the increase in the pool of possible clients; for others it is the provision of a better service to their customers.
- Alleviate congestion: this is the main motive for (generally US but also at London Stansted) other airports in the sample, where car is the most dominant mode for surface access.
- Target customers: the attention of these airports (mostly European, including Heathrow and Manchester) is addressed to their customer needs, since they believe a good offer of multi-modal access options is what their customers prefer. Remote baggage check-in facilities are also offered by some of these airports.

Surface access modes of transport

2.7

We can categorise the different modes of transport for surface access to airports as follows:

Public transport options (could be a dedicated airport service or not):

- Rail longer distance (normal or high speed train)
- Rail shorter distance
- Metro or light rail, generally shorter distance
- Local bus
- Express busway
- Coach



Private car options:

- Car as a driver
(short-stay, medium or long-stay parking, or meet-and-greet parking services)
- Car as a passenger, with the driver also flying
- 'Drop-off/pick-up' (also known as 'kiss & drop', 'kiss & fly' or 'meet & greet'), with car as a passenger and the driver not flying. The driver (and other people not traveling by air) may drop-off the air travellers and drive away, or decide to park their car.
- Lift-share scheme, i.e. driving to the airport together with other travellers who are not necessarily on the same flight (but most probably on a similarly-timed one). These schemes, and relevant computer or smartphone applications, already exist across Europe, generally for long distance travel, and could be adapted for airport users.

Hybrid options:

- Taxi and minicabs
- Private shuttle bus from hotels or conference centres
- Private coach services from tour operators or other organisations
- Demand Responsive Transport (DRT) services. These are a hybrid between a taxi and a bus¹⁰

2.8 It is estimated that 65% of journeys to airports in Europe and the US are made by private cars, with this figures rising to 99% for certain smaller regional airports¹¹. In general, the travel method that has the greater impact on traffic and congestion, and consequently on both air quality and carbon emissions, is 'drop-off/pick-up' since this generally involves four trips. Taxi and minicabs also involve four trips although they may well be transporting other passengers somewhere on the return trip. Some airports in the UK charge drivers for drop-off/pick-ups (London Luton is an example). Trying to reduce these journeys can be difficult, however, as drop-off/pick-up trips provide direct connectivity between home and airport, and is also attractive to those who wish to be seen off or welcomed at airports by family members or close friends. Detailed modal data for UK airports are not available, however Table 1 reports information for the public/private split for the UK airports included in the latest (2012) CAA Passenger Survey.

10 Airport surface access trips have been highlighted as a possible DRT market niche for development in a recent DRT research project. For further information see www.drtfordrt.co.uk and the paper: RYLEY, T.J., STANLEY, P., ENOCH, M.P., ZANNI, A.M. and QUDDUS, M.A. (2013) An evaluation of Demand Responsive Transport as a form of sustainable local public transport. Paper accepted for publication in the 'Research in Transportation Economics' journal.

11 BUDD, T., ISON, S. & RYLEY, T. 2011. Airport surface access in the UK: a management perspective. *Research in Transportation Business & Management*, 1, 109-117. See also VESPERMANN, J. & WALD, A. 2011. Intermodal integration in air transportation: status quo, motives and future developments. *Journal of Transport Geography*, 19, 1187-1197.

Table 1. Mode of transport used by departing passengers – 2012

Airport	Terminating passengers	Private %	Public %	Other %	Total %
Gatwick	31,467,000	56.1	43.6	0.3	100.0
Heathrow	43,950,000	59.2	40.6	0.2	100.0
City	2,950,000	49.5	50.0	0.5	100.0
Luton	9,365,000	66.2	33.1	0.7	100.0
Stansted	16,645,000	48.8	50.9	0.2	100.0
Birmingham	8,483,000	80.2	19.2	0.6	100.0
East Midlands	4,024,000	90.7	9.0	0.2	100.0
Manchester	18,978,000	84.2	15.5	0.3	100.0
Bristol	5,805,000	81.6	18.1	0.3	100.0
Cardiff	985,000	91.1	8.9	0.1	100.0
Exeter	675,000	95.0	4.8	0.2	100.0

Source: CAA (2013)¹², Tables 7.1 & 7.2. 'Other' category includes walking and cycling

Note: Percentages have all been rounded to 100.

2.9 Table 1 shows a clear distinction between London airports, where the share of travellers using public transport reaches as high as 51% for Stansted, and the non-London airports, where this share at best reaches 19.1% at Birmingham Airport.

2.10 Of the surface access modes, it is the drop-off/pick-up trips that contribute the most in terms of CO₂ emissions, as estimated by Miyoshi and Mason¹³ using 2009 Manchester Airport data. Their carbon calculations showed that drop-off/pick-up passengers constituted 37% of surface access travellers, but contributed 44% of CO₂ emissions. It was estimated that the marginal cost of the damage caused by CO₂ per person using drop-off/pick-up trips to-and-from Manchester airport was £0.72 per person (based on a price of carbon at £51 per tonne).

12 CAA 2013. CAA Passenger Survey Report 2012. London: Civil Aviation Authority (CAA).

13 MIYOSHI, C. & MASON, K. J. 2013. The damage cost of carbon dioxide emissions produced by passengers on airport surface access: the case of Manchester Airport. *Journal of Transport Geography*, 28, pp.137-143.



Factors affecting surface access mode choice

- 2.11** The Civil Aviation Authority (CAA) asked respondents (in a 2011 survey) to indicate the main reason why they had chosen to fly from a particular airport¹⁴. Surface access was generally the main reason. 'Nearest to home' was the top reason chosen by 31% of UK leisure passengers at the four major London airports, and 'route network' as the third one by 18% of leisure passengers (33% and 20% were the respective figures for UK business passengers).
- 2.12** In general, access time and travel cost appear to be the most important determinants of surface access choice. Access time is defined as the time necessary to reach the airport from the airport users' home or workplace. Then, it is necessary to add to the access time the service time: the latter includes time from the airport transport terminal or parking to the main terminal building, check-in, passport and security control as well as walking to the gate for boarding¹⁵. The service time is often overlooked and the perception of airport transport interchanges not being situated close enough to the check-in areas can play a role in determining travellers' resistance to use public transport.
- 2.13** Passengers will apply to their decision of departure time a safety margin, in order to accommodate possible delays, if travelling by car or public transport. Frequency (and waiting times) and departure times of public transport services therefore become another important determinant¹⁶. In addition, the number of interchanges has an important role. It has been estimated that adding an interchange to a rail service, while keeping the journey times constant, would reduce demand by 40% of the initial level¹⁷. Business travellers assign a higher value to this safety margin than leisure ones¹⁸.

Family & friends drop-off

- 2.14** As part of the ABC project, we analysed the results of a survey carried out in 2012 among more than 1,000 people in the North of England about their surface access travel to airports (some did use London airports, but the majority of their trips were to Manchester Airport, followed by a number of smaller regional airports). Almost 30% either tend to agree or strongly agree with the statement "It is important for me to be welcomed by my family/friends/partner at airports". We also asked respondents whether airports should charge people who drive to an airport to pick-up or drop-off other passengers, and 70% disagreed with the idea.

14 CAA 2011. Passengers' airport preferences. Results from the CAA Passenger Survey. Working paper November 2011. London: Civil Aviation Authority (CAA). pp. 21-22.

15 KOSTER, P., KROES, E. & VERHOEF, E. 2011. Travel time variability and airport accessibility. *Transportation Research Part B: Methodological*, 45, pp. 1545-1559.

16 KEUMI, C. & MURAKAMI, H. 2012. The role of schedule delays on passengers' choice of access modes: A case study of Japan's international hub airports. *Transportation Research Part E: Logistics and Transportation Review*, 48, pp. 1023-1031.

17 LYTHGOE, W. F. & WARDMAN, M. 2002. Demand for rail travel to and from airports. *Transportation*, 29, pp. 125-143.

18 TAM, M. L., LAM, W. H. K. & LO, H. P. 2009. Incorporating passenger perceived service quality in airport ground access mode choice model. *Transportmetrica*, 6, 3-17. See also KEUMI, C. & MURAKAMI, H. 2012. The role of schedule delays on passengers' choice of access modes: A case study of Japan's international hub airports. *Transportation Research Part E: Logistics and Transportation Review*, 48, pp. 1023-1031.

The problems with public transport

- 2.15** Public transport has an added difficulty over private car/taxi in that it involves an additional two stages in a return journey in order to access the bus/tube/train station to and from home. A range of transport modes are used by passengers to access these stations.
- 2.16** Difficulties are often faced by elderly passengers when accessing airports in general and by public transport in particular. Given the projected ageing of the population in the UK, it is important to meet the needs of elderly (as well as any other passenger with mobility difficulties). Perceived safety, the presence of convenient places for storing luggage and user friendliness have been identified as the most important factors determining public transport use to reach the airport¹⁹.
- 2.17** Luggage has been identified as one of the principal constraints for a greater use of public transport and as such air travellers tend to take up more space on public transport than other users. Step-free access services and stations, storage facilities and appropriate luggage racks on board can help, but there remains a segment of travellers for whom luggage will always be the main determinant in seeking alternatives to public transport. Remote check-in facilities in transport terminals might ease this issue for some.

Improving the 'last mile'

- 2.18** Even with the best surface access options to the airport terminal(s), the ultimate challenge remains to make the 'first and last miles' as easy and convenient as possible for all types of passengers the airport intends to serve. One example is the development of the PRT system from the business car park in Terminal 5 at Heathrow Airport. The Ultra personal rapid transit (PRT) is an innovative on-demand system with small, driverless, electric vehicles run on a designated guideway from the Terminal 5 business car park to the main terminal²⁰. It began operation in 2011 and is the world's first Ultra system.

19 CHANG, Y. C. 2013. Factors affecting airport access mode choice for elderly air passengers. *Transportation Research Part E – Logistics and Transportation Review*, 57, pp.105-112.

20 See <http://www.heathrowairport.com/about-us/partners-and-suppliers/retail-travel-services>



Ticketing improvements

- 2.19** It is important to consider that a significant proportion of surface access trips in the UK are undertaken by foreign nationals. While 'seamless' travel to/from airports is of critical importance for all people involved, it gains even greater importance for travellers who are in a foreign country, and who therefore have less familiarity with its language and transport network. The Airports Commission suggests paperless tickets for surface access rail travel. This would make much simpler for travellers to organise their surface access trips to and from the airports in the UK, although some people still like to have a paper ticket and some groups, such as the elderly and those not familiar with the concept, may struggle with the idea of ticketless travel. There is a particular issue, recently highlighted by the consumer magazine *Which?*²¹, but played down by rail operators, about the complexity of ticket machines at UK railway stations. Some airlines do help their passengers by selling rail or coach tickets on board for various destinations around the airport. Paperless on-line tickets (which are available for most coach operators) can help²², as well as a greater interaction between ticketing for flights and surface access (code sharing between air and rail).
- 2.20** There is an issue normally facing arriving passengers who wish to buy an advance (normally longer-distance) rail fare from UK airports. Uncertainty over the actual arrival of the flights makes it very difficult to decide at which time it will be possible to catch a train service and this often puts travellers off the public transport option, especially when walk-in fares are particularly expensive. The constraints around advance tickets also apply to onward travel, especially for those who have to travel further away to reach the relevant rail station.

21 WHICH? 2013. Train ticket machines aren't working. Which? - 13 Feb 2013 - <http://www.which.co.uk/news/2013/02/train-ticket-machines-arent-working--310742/>.

22 The Gatwick Express now allows customers to buy ticket online and either print them or show them on their smartphone (<http://www.gatwickexpress.com/en/tickets-and-fares/buying-tickets/>). The same options now apply to the Heathrow Express service (<https://www.heathrowexpress.com/tickets-deals>). This is, however, not available for other services from/to the airports, although a number of rail companies are introducing smartcard ticketing for some of their tickets or for part of their routes. This would, though, only have an impact on UK, or frequently visiting foreign passengers.

Airport management

- 2.21** Ensuring high quality end-to-end surface access involves a wide range of organisations, of which the airports themselves are only one. Airports generally only own the land they are built on, but in terms of surface access decision-making they have to deal with a range of stakeholders, including local and national authorities, and a wide array of transport operators. Nonetheless, airports are doing intense work to create partnerships with providers and are aided by the statutory role of the Transport Forum in delivering Airport Surface Access Strategies.
- 2.22** Airlines are the airport's main customers and can play a key role influencing airport management and operations. Major airlines, for example, are particularly keen to use airports that are well connected with city or business/employment centres through a range of options.
- 2.23** Although all the players are ultimately interested in promoting seamless, integrated, surface access for passengers, ensuring this happens in practice is difficult with multiple players, each with their own constraints and commercial priorities. Even airports can face conflicting pressures: for instance, an increase in public transport connectivity may generate a rise in profitability due to more passengers, but might also be detrimental to other important sources of income such as car parking fees, and may dissuade an airport to promote more sustainable modes of surface access transport.

The resilient airport

- 2.24** Importantly, while last winter (2013/14) was relatively mild in the UK in temperature terms, it was the wettest since 1910²³, and a number of storms hit various regions in the UK causing considerable disruptions to transport infrastructure. The winters of 2009/2010 (the coldest for 31 years) and 2010/2011, were particularly severe in the UK, as well as across Europe, and travel disruptions, in particular, were estimated to cost £280m per day to the UK economy during those periods²⁴. It is therefore agreed that airports need to maintain a high level of resilience towards extreme weather conditions, which often cause delays as well as cancellations, especially at airports operating close to full capacity as is the case of Heathrow²⁵. Flooding, as an outcome of extreme weather conditions, can also affect airports, as demonstrated by the disruption at Gatwick Airport on Christmas Eve 2013²⁶.
- 2.25** Resilience has, of course, to be extended also to surface access operations, since guaranteeing flights under very uncertain conditions is not particularly useful if passengers cannot reach the airport. As noted already, the issue of surface access is a challenge since it falls under the control of the airport in a very limited way, and therefore airports need to liaise with the relevant authorities in order to maintain and boost resilience.

23 PRESS ASSOCIATION. 2014. UK suffers wettest winter on record.

24 PRIOR, J. & KENDON, M. 2011. The disruptive snowfalls and very low temperatures of late 2010. *Weather*, 66, 315-321.

25 PEJOVIC, T., WILLIAMS, V. A., NOLAND, R. B. & TOUMI, R. 2009. Factors affecting the frequency and severity of airport weather delays and the implications of climate change for future delays. *Transportation Research Record: Journal of the Transportation Research Board*, 2139, 97-106.

26 GATWICK AIRPORT. 2014. Disruption at Gatwick Airport. Christmas Eve 2013. Report by David McMillan to the Board of Gatwick Airport Limited. Available at: http://www.gatwickairport.com/PublicationFiles/business_and_community/all_public_publications/2014/McMillan_report_Feb14.pdf



Other airport users

2.26 It is important to note that travellers are not the only airport users whose needs impact upon surface access infrastructure. Decisions on airport location or expansion also need to take into consideration surface access trips by airport staff as well as by the staff of those businesses located around airport areas. Research using data from Surface Access Strategies of the large UK airports shows that employee travel often has a higher proportion of private car trips than passenger trips for journeys to-and-from airports.²⁷ The high proportion of airport employees travelling by private car is attributed to shift-working, which makes the planning of public transport services for them more complicated. Other factors that may contribute to this may be the free car parking available to staff, the dispersal of employee locations across the airport site, and the lack of control of the airport on staff travel given that the majority of them do not work directly for the airport.

2.27 A further important user of surface access to airport infrastructure is freight transport. First of all, airport facilities and businesses do receive a considerable amount of supplies every day. Second, air freight needs to be transported to and from airports in order to reach their destinations. As indicated in the Airport Commission's interim report, freight transport growth or decline is generally directly linked with passenger trends. Any increase in airport capacity, and consequently in passenger numbers, is then likely to bring about an increase in freight transport as well. Currently, Heathrow is the UK's most important origin of freight transport (1.422 million tonnes, 63% of freight from UK airports in 2013), most of which is carried as belly-hold (95% of freight in 2013) and long-haul routes (93% of freight in 2013 was on international flights outside the EU region)²⁸.

27 HUMPHREYS, I., ISON, S., FRANCIS, G. & ALDRIDGE, K. 2005. UK airport surface access targets. *Journal of Air Transport Management*, 11, 117-124.

28 Civil Aviation Authority. UK airport statistics 2013. Tables 13.1, 14 & 15. Available at: <http://www.caa.co.uk/default.aspx?catid=80&pagetype=88&sglid=3&fld=2013Annual>

Is technology the answer?

- 2.28** Technological advances will have a major impact on surface transport in the coming years. Examples include alternative fuel vehicles and the development of autonomous vehicles, as promoted by the UK Government (e.g. through OLEV – Office for Low Emission Vehicles - and the newly-formed Transport System Catapult), which will impact the way in which individuals travel by motor car²⁹.
- 2.29** In the ABC survey we looked at the potential of technological developments to reduce the impact of 'drop-off/pick-up' trips. Among the technologies reviewed, three-dimensional television-based communication (so-called telepresence systems) could play a role in the future. This could take different forms with, for example, travellers using small pods to see off their families through video connection, just before boarding a plane. Results from the ABC project North of England survey showed that while 25% said that a telepresence system would not make any change to their willingness to be dropped-off or picked-up at airports, about 20% said it could, with 50% not sure. 35% said that an electronic tagging system for their luggage would make them more willing to use public transport to travel to-and-from airports. 30% also said they would be likely to use a lift-share system to travel to-and-from airports.



Summary

- 2.30** This review of surface connectivity has generated the following key points:
- i. Factors affecting passenger surface access transport mode choice include luggage and early departures.
 - ii. Air travellers want quick, direct, easily-accessed, affordable journeys between their start/end points and the airport; they also want convenient facilities for their luggage.
 - iii. Airports and airlines also want good surface connectivity for commercial reasons.
 - iv. Historically, airports have largely relied on car-based travel (and taxis), with buses and trains seen as supplementary, but this is becoming less sustainable for environmental and capacity (congestion) reasons. The challenge now is to increase simultaneously the numbers going to/from (expanding) airports and to shift modes to public transport.
 - v. Public transport facilities are important for good surface connectivity, particularly in relation to interchange, the 'last mile' and associated access time to the airport terminal.
 - vi. There is a particular problem with drop-off/pick-up trips to-and-from airports since these have the greatest negative environmental impacts, such as on CO₂ emissions and congestion.
 - vii. There is a need for the integration of surface access ticketing (e.g. addressing the problem of inflexible advance rail tickets when passengers do not know flight arrival times at the airport).
 - viii. In addition to passengers, surface connectivity is important for airport staff and air cargo companies.
 - ix. There are a range of associated stakeholders involved: airlines, other organisations on-site at the airport, transport operators and policy-makers.
- 2.31** This raises a host of complex challenges, including:
- The potential need for major new investment, especially in public transport infrastructure but also in car-based facilities such as roads and parking.
 - The need to convince passengers (and staff) actually to switch behaviour to public transport, achievement of which will depend on ease of access, ease/simplicity of payment, and ease of connectivity not just at the airport but with the broader national and local transport networks.
 - Organisational challenges since the stakeholders (e.g. airlines, airports, surface infrastructure, bus and rail operating companies, and local authorities) all have key roles but no-one actually owns the relevant assets or controls what happens – and many fail to see it as “their” problem.

3. The current surface access situation at Gatwick and Heathrow

3.1 This section presents the current surface access situation at Gatwick and Heathrow; the two airports included within the Airports Commission's shortlist. It includes an examination of journey times using catchment data for the two airports. The purpose of this section is to provide background statistics for the two airports using policy documents (e.g. Surface Access Strategies) and to develop a baseline of surface transport modes for subsequent analysis. As shown in Section 2.9 (Table 1), both airports have a public transport modal share for passengers (43.6% Gatwick, 40.6% Heathrow) for the year 2012 that is high in comparison with other large UK airports but similar in proportion to the other London airports.

Gatwick Airport

3.2 Gatwick is the second busiest airport in London and the UK with 34.2 million passengers in 2013³⁰, the vast majority of them origin/destination, and therefore travelling to and from the airport rather than transferring to another flight.

3.3 In terms of surface access, Gatwick airport has direct rail services to over 120 UK stations. An additional 700 stations are accessible with just one interchange. Gatwick Airport Station has undergone a major enhancement programme, with the recent addition of a new platform. In December 2013, the UK Government announced a £50m contribution to help develop the railway station concourse, which is not dependent on a second runway being built³¹. Through this scheme, planned for implementation in 2020, the station would become more user-friendly, especially for passengers with reduced mobility or carrying heavy luggage.

3.4 There are currently 360 daily rail services between the airport and London, used by 13 million passengers annually (10% more than in 2009). These services include: the premium Gatwick Express, connecting the airport to London Victoria in 30 minutes with a non-stop 15-minute frequency (this represent 50% of services passing through Gatwick Airport Railway Station); Southern Trains to Victoria via East Croydon and Clapham Junction, as well as to London Bridge; Thameslink services to London Bridge, Blackfriars, Farringdon (where Crossrail passengers will be able to interchange for services to Gatwick); and St. Pancras International (interchange with HS1) on the Thameslink route. There are also good connections to other cities in the wider South-East area, as well as to Luton and Bedford to the north of London, Reading to the West and Brighton, and other important centres on the South Coast. In addition, there are between 450 and 500 bus and coach movements daily (currently operated by 3 main companies), with direct services to about 30 destinations in England and Wales, including Victoria Coach Station.

30 CAA 2014. Passenger numbers at UK airports increase for the third year in a row - CAA news 13 March 2014. Civil Aviation Authority (CAA) . Available at: <http://www.caa.co.uk/application.aspx?catid=14&pagetype=65&appid=7&mode=detail&nid=2342>.

31 GATWICK AIRPORT LIMITED 2014. A Second runway for Gatwick - Our April 2014 Runway Options Consultation. Section 2.3, p34.



3.5

There are direct coach services to Heathrow and Stansted airports. In total there are 16 Express coach services from Gatwick Airport (which have between 2 and 22 daily departures)³². Seven local bus services connect Gatwick with centres in its immediate vicinity, including the Fastway bus services (by Metrobus) between the airport and Crawley, Redhill, and Three Bridges (which have between 2 and 134 daily departures)³³. These are buses running on a combination of dedicated lanes and guided busways, with improved infrastructure and information systems. Finally, in terms of road connections, the airport lies right next to the M23 and connects to the M25 through it, while the A23 connects it with Croydon and Central London.

3.6

Table 2 shows a steady increase in public transport share over the 4 years between 2007 and 2011, with rail contributing the most to this. There has been a steady decline in the proportion of private car trips, down from 47.7% in 2007 to 42.4% in 2011. However, the total number of passengers at Gatwick, as at most UK airports, dipped following the recession but is now increasing, hence the reduction from 35.2 million passengers in 2007 to 32.0 million in 2009 and then the increase to 33.3 million in 2011. The total number of passengers has subsequently continued to grow but the distribution by surface access is not currently published.

Table 2: Mode share of passengers using Gatwick 2007-2011

Method	2007		2009		2011	
	Number	%	Number	%	Number	%
1 Private car	16,774,182	47.7	14,746,929	46.1	14,107,752	42.4
2 Car rental	703,320	2.0	543,813	1.7	598,914	1.8
3 Taxi/ Minicab	5,204,568	14.8	4,574,427	14.3	4,425,309	13.3
4 Bus/ Coach	2,145,126	6.1	1,983,318	6.2	2,229,291	6.7
5 Rail	10,198,140	29.0	9,980,568	31.2	11,811,915	35.5
6 Other	105,498	0.3	127,956	0.4	99,819	0.3
Total	35,166,000	100	31,989,000	100	33,273,000	100
Total public transport (categories 4 & 5)	12,343,266	35.1	11,963,886	37.4	14,041,206	42.2

Source: Percentages from Gatwick Airport Limited (2012)³⁴. Total passenger numbers from the CAA reports for the year. Mode share numbers have been calculated from these figures. **Note:** The total percentages have been rounded up to 100.

32 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. Appendix 1, Table 4, p83.

33 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. Appendix 1, Table 5, p83.

34 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. Appendix 1, Table 1, p83.

- 3.7** Of the 21,109 people who work at the airport, 65% travelled to it as car drivers in 2011, 4.5% as a passenger, 11.4% by rail, 11.8% by bus and coach, and the remaining by taxi, walking or bicycle (1.6% was the figure for cycling). The figure for car drivers was as high as 78% in 1997³⁵.
- 3.8** It is estimated, assuming that staff on average worked 220 days per year (full-time – no estimate is available for the proportion of part-time workers), then the 21,109 staff would have made 9.28 million return journeys per year, 27.9% of all trips to the airport (including 33.27 million passenger trips).

Heathrow Airport

- 3.9** Heathrow Airport is a major aviation hub and the UK's largest airport in terms of passenger numbers (72.3 million in 2013)³⁶, 45 million of them using the surface access infrastructure (the remainder were passengers connecting between flights). It is, however, operating near capacity, and the situation will worsen if the predicted increase in air travel demand takes place.
- 3.10** Heathrow Airport has a range of public transport options for access, with a railway station, London Underground stations, and bus and coach stations. As stated in the Sustainable Transport Plan for Heathrow³⁷, Heathrow Express provides a direct, premium-rate service to central London, with trains running every 15 minutes to Paddington, supported by Heathrow Connect, an economical stopping service that serves staff and passenger catchments in west London. The underground service is the Piccadilly Line which directly connects the airport (three terminal stops) to central London.
- 3.11** It is estimated that there are more than 500,000 bus and coach movements in and out of Heathrow every year³⁸. Around 25% of bus and coach passengers are just passing through the Central Bus Station without catching a flight. The importance of the bus and coach hub is seen in a route network serving over 75 major towns and cities with 31 bus routes having a combined frequency of over 80 buses an hour. The Sustainable Transport Plan also states that Heathrow Airport has direct access from the M25 and M4 and is within 10 miles of the M40 and M3 (p17).

35 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. Appendix 1, Table 3, p83.

36 CAA 2014. Passenger numbers at UK airports increase for the third year in a row - CAA news 13 March 2014. Civil Aviation Authority (CAA) <http://www.caa.co.uk/application.aspx?catid=14&pagetype=65&appid=7&mode=detail&nid=2342>.

37 HEATHROW AIRPORT 2014. Sustainable Transport Plan 2014-2019, p17.

38 HEATHROW AIRPORT 2014. Sustainable Transport Plan 2014-2019, p17.



3.12

Table 3 shows the modal split of Heathrow Airport non-transfer passengers for surface access trips. As with surface access trips to Gatwick, there has been a steady decline in private car use, but more of a reliance on tube and bus/coach travel than Gatwick, which is more rail dependent. Interestingly, there has also been an increase in taxi / minicab use to-and-from Heathrow Airport.

Table 3: Surface access at Heathrow: modal split trends 2003-2013

Non-transfer passengers	2003		2008		2013	
	Number	%	Number	%	Number	%
1 Private car	14,414,666	35.9	13,292,216	30.9	11,757,889	26.4
2 Hire car	1,244,720	3.1	1,204,473	2.8	1,257,304	2.8
3 Taxi / Minicab	10,158,525	25.3	11,227,405	26.1	13,112,354	29.4
4 Bus / Coach	5,059,186	12.6	6,065,380	14.1	5,645,257	12.7
5 Tube	5,621,318	14.0	6,882,701	16.0	8,165,409	18.3
6 Rail	3,573,552	8.9	4,172,637	9.7	4,494,505	10.1
7 Other	120,457	0.3	129,051	0.3	116,928	0.3
Total	40,152,273	100	43,016,879	100	44,549,646	100
Total public transport (categories 4-6)	14,254,057	35.5	17,120,718	39.8	18,305,171	41.1

Source: Surface Access Team at Heathrow Airport.

Note: The total percentages have been rounded to 100.

- 3.13** From just over 76,000 Heathrow staff travelling to work (2013 Travel to Work survey), 50.9% travel as 'car driver alone', 25.0% by public bus/coach and 9.4% use the Underground³⁹. There has been, however, a longer-term decline in car driver alone travel (from the 2008 survey), with an increase in the number of staff using the car share system, as well as using the cycle hub. The Heathrow Cycle Hub initiative provides free cycling training (both riding and maintenance), improved cycling parking facilities, information about best cycling routes to and from the airport, and a bicycle shop within the airport offering subsidised bikes, accessories and parts, as well as free servicing for staff members.
- 3.14** It is estimated that, assuming staff on average worked 220 days per year (full-time – no estimate is available for the proportion of part-time workers), then the 76,000 staff (an exact value is not in the Sustainable Transport Plan report) would have made 33.44 million return journeys per year, 42.9% of all trips to the airport (including 44.42 million passenger trips).

Catchment analysis

- 3.15** Airports need to be able to define their catchment area which shows where passengers are travelling from. In Europe, the catchment area is assumed to be comprised of all statistical regions whose centre was located within 100 kilometres (62.5 miles) from the airport⁴⁰. Travel times are naturally important and in the case of London, a large and often congested city, it appears that a considerable segment of passengers do accept a travel time to an airport of about 90 minutes⁴¹.
- 3.16** An interesting analysis of catchment areas and surface access travel times for the four main London Airports is given in a recent report by the Civil Aviation Authority (CAA)⁴². Figures 1 and 2 below illustrate the catchment areas for Heathrow and Gatwick respectively. It shows visually that Heathrow Airport has more of a catchment area spreading westwards, whilst Gatwick Airport has more of a catchment spreading southwards from London

39 HEATHROW AIRPORT 2014. Sustainable Transport Plan 2014-2019, pp. 20-21.

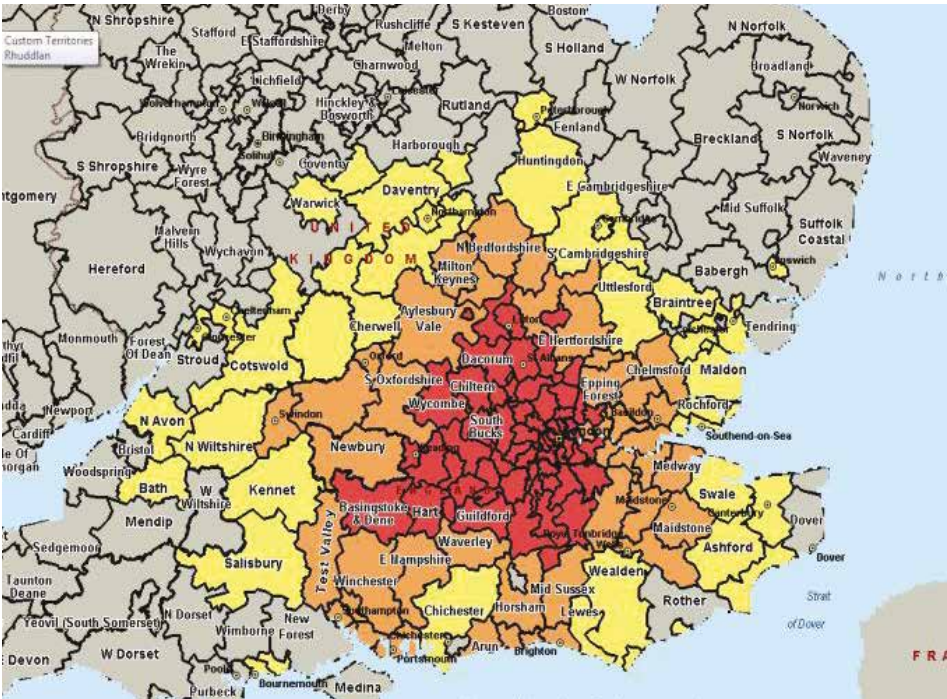
40 MAERTENS, S. 2012. Estimating the market power of airports in their catchment areas - a Europe-wide approach. *Journal of Transport Geography*, 22, 10-18.

41 CAA 2011. Catchment area analysis. London: Civil Aviation Authority.

42 CAA 2011. Catchment area analysis. London: Civil Aviation Authority.

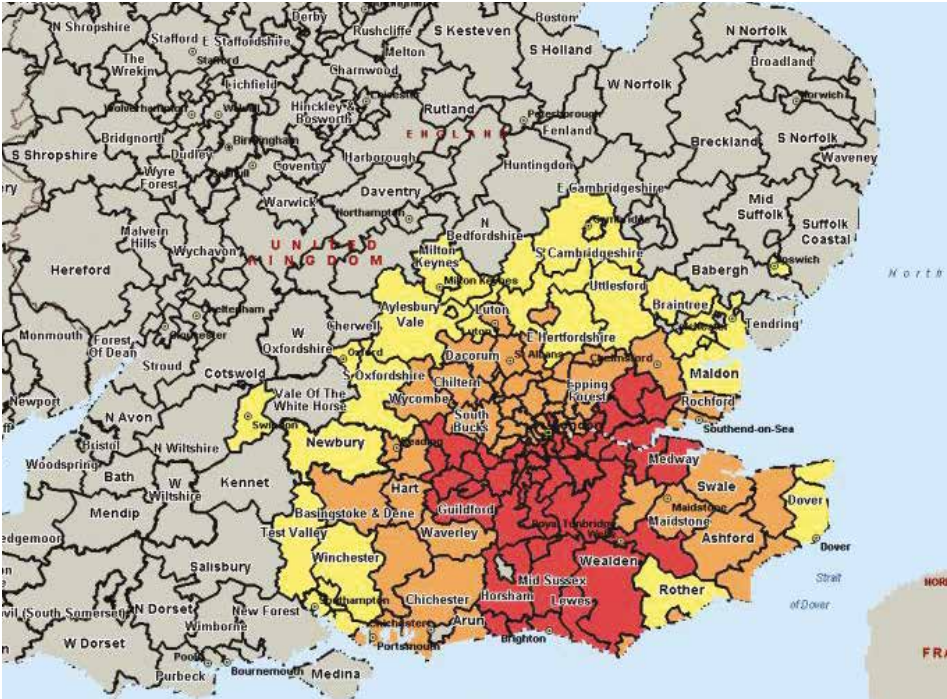


Figure 1. London Heathrow surface access travel time map



Source: CAA (2011). Red: 60 minutes; Orange: 90 minutes; Yellow: 120 minutes

Figure 2. London Gatwick surface access travel time map



Source: CAA (2011). Red: 60 minutes; Orange: 90 minutes; Yellow: 120 minutes

3.17 Table 4.1 shows this catchment area for the two airports by origin / destination based on 2012 CAA data at a United Kingdom level, and then Table 4.2 shows the sub-area details for the majority coming from the South-East England region (number 6 in table 4.1).

Table 4.1 Origin / destination data to-and-from Gatwick and Heathrow airports from locations across the UK (CAA data, 2012)

Region	Gatwick		Heathrow	
	000's	%	000's	%
UNITED KINGDOM				
1 East Midlands	544	1.7	1,301	3
2 East of England	2,671	8.5	3,654	8.3
3 North East	57	0.2	101	0.2
4 North West	174	1.0	297	0.7
5 Scotland	64	0.2	101	0.2
6 South East	25,299	80.4	32,953	75.0
7 South West	1,521	4.8	3,008	6.8
8 Wales	400	1.3	824	1.9
9 West Midlands	466	1.5	1,206	2.7
10 Yorkshire and the Humber	228	0.7	466	1.0
11 Ireland	26	0.1	11	0.0
Total	31,449	100	43,923	100

Note: Percentages have been rounded to 100.



Table 4.2 Origin / destination data to / from Gatwick and Heathrow airports from locations across the South East of England region (shown as number 6 in Table 4.1)

Region	Gatwick		Heathrow	
	000's	%	000's	%
SOUTH EAST OF ENGLAND PLANNING REGION				
1 Bracknell Forest	89	0.4	159	0.5
2 Buckinghamshire County	319	1.3	742	2.3
3 City of Portsmouth	293	1.2	193	0.6
4 City of Southampton	268	1.1	538	1.6
5 East Sussex County	767	3.0	240	0.7
6 Greater London	13,861	54.8	22,602	68.6
7 Hampshire County	1,005	4.0	995	3.0
8 Isle of Wight	70	0.3	67	0.2
9 Kent County	2,212	8.7	804	2.4
10 Medway	274	1.1	91	0.3
11 Milton Keynes	75	0.3	229	0.7
12 Oxfordshire County	484	1.9	1,270	3.9
13 Reading	209	0.8	574	1.7
14 Slough	57	0.2	330	1.0
15 Surrey County	2,145	8.5	1,880	5.7
16 The City of Brighton and Hove	961	3.8	296	0.9
17 West Berkshire	90	0.4	194	0.6
18 West Sussex County	1,819	7.2	949	2.9
19 Windsor and Maidenhead	169	0.7	574	1.7
20 Wokingham	132	0.5	227	0.7
Total	25,299	100	32,953	100

Source for both tables: CAA report: Tables 4.3a, 5.6 & 5.7

Note: Percentages have been rounded to 100.

- 3.18** Looking at the catchment areas, both Gatwick and Heathrow airports have the majority of their passengers from London and the South East of England. Passengers from London and the South East are greater in number for Heathrow Airport (32,953,000 passengers compared to 25,299,000 passengers for Gatwick) but higher in proportion for Gatwick Airport (80.4% compared to 75.0% for Heathrow).
- 3.19** For areas outside London and the South East, the next three highest areas in order of proportion are the same: first the East of England, second the South West, and third the East Midlands. For all three areas Heathrow Airport has more passengers, although Gatwick Airport has a slightly higher proportion of passengers travelling from the East of England (8.5% compared to 8.3% for Heathrow Airport).
- 3.20** Of passengers from the 'South East of England' region, most come from London, particularly for Heathrow Airport (68.6% compared to 54.8% for Gatwick Airport). Gatwick also has a strong catchment area (all over 5.0%) for Kent, Surrey and West Sussex. Heathrow Airport's next largest catchment areas are Surrey and Oxfordshire.
- 3.21** The surface connectivity varies from different locations in the London and the South-East. The ITC 'Flying into the Future' report includes journey time assessments, by car and public transport, from four locations in London (Wimbledon, Lewisham, Walthamstow & Wembley Central) to Gatwick and Heathrow⁴³. These are shown below in Table 5.

Table 5. Travel times from various London locations to Gatwick and Heathrow airports

Station of origin	Fastest time to Gatwick airport	Fastest time to Heathrow Airport (T5)
PUBLIC TRANSPORT		
Wimbledon Rail Station (SW London)	43 minutes (Train) – 1 change	51 minutes (Tube & Train) – 1 change
Lewisham Rail Station (SE London)	50 minutes (Train) – 1 change	1 hour & 5 minutes (Tube & Train) – 3 changes
Walthamstow Central station (NE London)	1 hour & 4 minutes (Tube & Train) – 1 change	58 minutes (Tube & Train) – 2 changes
Wembley Central station (NW London)	1 hour & 15 minutes (Train) – 1 change	51 minutes (Tube & Train) – 1 change
CAR		
Wimbledon Rail Station (SW London)	56 minutes (28 miles)	49 minutes (18 miles)
Lewisham Rail Station (SE London)	1 hour & 7 minutes (41 miles)	1 hour & 0 minutes (23 miles)
Walthamstow Central (NE London)	1 hour & 33 minutes (37 miles)	1 hour & 7 minutes (29 miles)
Wembley Central (NW London)	1 hour & 24 minutes (55 miles)	37 minutes (14 miles)

Source: derived from ITC 'Flying into the Future' report (2013), Figures 4.1 and 4.2, updated data for September 2014, travel times set at 13:00 hours (based on National Rail Enquiries/Transport for London journey planner and AA Route Planner).



- 3.22** The travel times for both public transport and car travel are all between 37 minutes and 1 hour 33 minutes, which means that travel from all four locations to-and-from the two airports is relatively competitive between public and private transport. For public transport, Gatwick Airport is quicker to access from SW and SE London, but Heathrow is quicker from NW London. For car travel, Heathrow Airport is much quicker to access from NW and NE London; for the other two locations, the timings are very similar.
- 3.23** For both airports, time-wise from all locations the public transport options are competitive with car travel. However, all of the public transport services require at least one change, and this analysis does not take into account the trip from origin location (e.g. home) to the initial public transport stop or station.

Summary

- 3.24** This section has provided a baseline for the subsequent analysis. Passenger numbers making surface access trips, once inter-lining passengers are taken out, have been determined for the two airports: around 34 million per year at Gatwick Airport, and 45 million at Heathrow Airport.
- 3.25** There is an underlying surface access trend for Gatwick and Heathrow of public transport increasing from around 40%, whilst car travel is reducing. It would be interesting to know how much higher this could rise to, given that for many surface access trips public transport is not an option.
- 3.26** Rail connectivity to-and-from Heathrow and Gatwick airports is not easy for those outside London. Road connectivity for both airports is affected by the M25 and other nearby motorways
- 3.27** For many trips there is not a currently public transport choice between modes, apart from that part of London where competition exists between Heathrow Express (and Heathrow Connect) and the Underground for passengers. It is thought that, given the faster and more expensive service by Heathrow Express, this option attracts more business than leisure travellers. Conversely, the Underground is more likely to attract leisure travellers. Having a range of modal choices improves resilience and convenience for travellers.
- 3.28** Staff travel represents a significant proportion of journeys to and from both airports, particularly Heathrow. It is not clear from the data the proportion of staff working directly for the airports or for other related firms, and their precise work location on the airport site.

- 3.29** Both airports currently draw around three-quarters of their passengers from London and the South East, which generally have more public transport options. Most parts of this area can access the two airports within 90 minutes.
- 3.30** For many passengers, Gatwick is quicker to reach by public transport than by car, particularly from South London, whereas the opposite is true for Heathrow, demonstrating how public transport upgrades are particularly needed to access Heathrow airport.
- 3.31** The publically available data raises further questions. For example, it is not clear how many of the private car trips are by the less sustainable drop-off / pick-up trips. In addition, it would be useful to know more about the specific reasons for the recent increases in public transport usage (rail for Gatwick, tube for Heathrow), as well as the increase in taxi use at Heathrow Airport. The catchment analysis has provided some useful insights, and a further analysis would be to examine areas by population and economic activity.



4. Future surface access developments

4.1 This section presents the proposed future surface access developments for the three options under consideration by the Airports Commission: Gatwick Airport, Heathrow Airport and Heathrow Hub. Section 4 also examines the links with interconnecting infrastructure.

Surface access options for a short-listed proposal: Gatwick

4.2 The Gatwick proposal (**Option 1**) that the Airports Commission is considering is for a new 3,000m runway built to the south of the existing one, but far enough (at least 1,035m) from it to allow for the two runways to be operated separately. New terminal facilities and taxiways would link the two runways. As the current single runway is predicted to reach capacity within the next ten years, an enlarged Gatwick could also accommodate a possible further growth in point-to-point traffic and, according to the Commission's forecast, operate at 70% capacity in 2030, and up to 95% in 2050.

4.3 The cost of this option is estimated by the Airports Commission to be £10-13 billion in the period to 2030 (taking into account enhanced surface access), and it is lower than the two Heathrow options short-listed by the Commission. With current local noise impacts considerably lower than Heathrow, this expansion would not adversely affect a large number of people living in the adjacent areas, and certainly less than at Heathrow.

4.4 In their proposal⁴⁴, Gatwick Airport states that the surface access needs generated by the increased number of passengers (60 million in 2030 and up to 87 million in 2050) would be absorbed by the already planned increase in capacity generated by the various rail and road projects already planned or proposed, which would be needed irrespective of the expansion. The airport has surface access targets by the year 2040 for 60% of passengers to travel to or from the airport by public transport, and for 50% of staff to travel to work by sustainable modes. Table 6 shows the current modal split for 2011 (shown in Table 2) and two hypothetical future modal splits, based on the 2030 (60 million) and 2050 (87 million) passengers. For both hypothetical scenarios, the surface access modes are fixed at 2011 levels, apart from rail transport which increases in order to account for the remaining passengers.

Table 6. Current and projected future modal split data for Gatwick Airport

Year	2011		2030		2050	
Summary	Current situation (Table 2)		Set target as 60 million passengers – fix 2011 numbers & new passengers all rail travel (5)		Set target as 87 million passengers – fix 2011 numbers & new passengers all rail travel (5)	
	Number	%	Number	%	Number	%
1 Private car	14,107,752	42.4	14,107,752	23.5	14,107,752	16.2
2 Car rental	598,914	1.8	598,914	1.0	598,914	0.7
3 Taxi/Minicab	4,425,309	13.3	4,425,309	7.4	4,425,309	5.1
4 Bus/Coach	2,229,291	6.7	2,229,291	3.7	2,229,291	2.6
5 Rail	11,811,915	35.5	38,538,915	64.2	65,538,915	75.3
6 Other	99,819	0.3	99,819	0.2	99,819	0.1
Total	33,273,000	100	60,000,000	100	87,000,000	100
Total public transport (categories 4 & 5)	14,041,206	42.2%	40,768,206	67.9%	67,768,206	77.9%

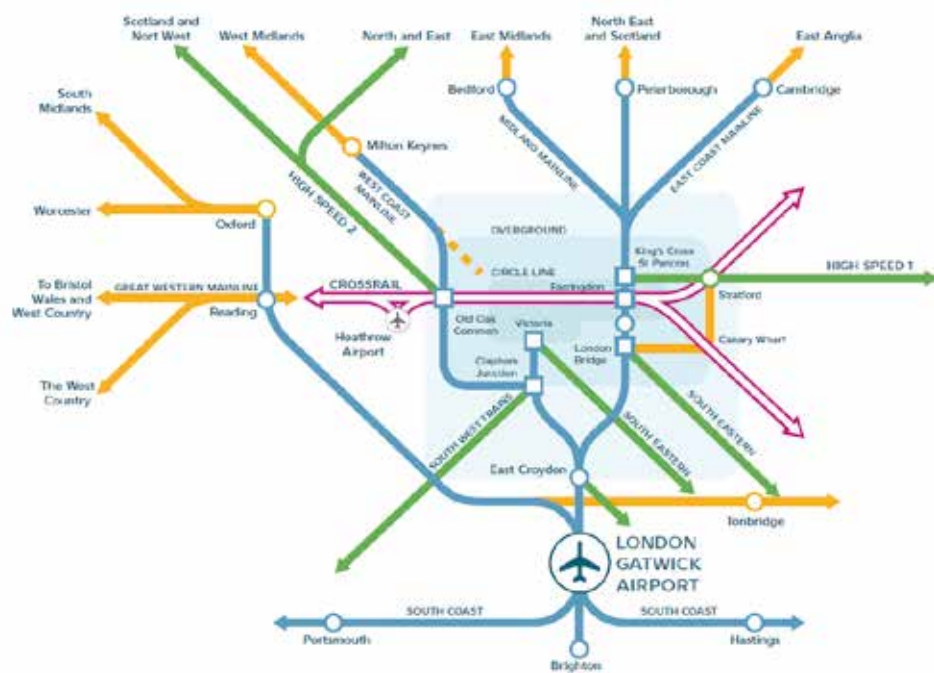
4.5 Table 6 shows that rail has around three times (2030) and six times (2050) the current number of passengers. Public transport as a whole makes up over three-quarters of the mode share for 2050. Table 2 shows that the mode share of private car travel is currently falling for surface access trips to-and-from Gatwick Airport, but it could be argued that this would be off-set by the road developments in the proposals, and that many of the passengers would not be able to access the new rail services.

4.6 The expansion will certainly put extra pressure on the surface access infrastructure, despite the improvements already suggested by the Airports Commission. The development of Gatwick Airport railway station will make it more suited to air passengers and the situation will also be enhanced by improvements on the Brighton mainline. There would be Gatwick Airport connectivity to HS2 via Old Oak Common, plus a possible future link to HS1 Ashford. More details are included in the airport surface access strategy plan⁴⁵ (Figure 3 below shows the enhanced Gatwick Airport connectivity):

- Thameslink upgrade: this will provide 50% additional capacity by 2018, as well as a new half-hourly direct connection to Cambridge and Peterborough (committed and ongoing).
- Improvement works to Redhill station: this enhancement will also add capacity on the Gatwick to Reading link, with services then going up to Oxford. This is part of the Great Western franchise and will increase Gatwick Airport connectivity westwards (committed and planned).
- New services to Milton Keynes via Clapham Junction and Old Oak common (to link in the future with HS2): this enhancement, together with the previous one would increase the number of rail stations with a direct service to Gatwick to 175 (proposed).

- Improvement to East Croydon, Victoria and London Bridge railway stations as well as improvements on the Brighton mainline (planned): this will also add capacity and increase the resilience of the network.
- Better connections to Kent and South Coast with more direct services (planned).
- Gatwick railway station enhancement: improve the station concourse, increase platform capacity, and improve accessibility (committed and planned).
- Retention of premium non-stop Gatwick Express service with the new Thameslink franchise (planned).

Figure 3. Gatwick Airport future rail connectivity (in 2018, direct and via one change)



Source: Gatwick (2014)⁴⁶. Key: Blue = direct rail connections; Yellow = existing network accessible via one change; Green = proposed network accessible via one change; Purple = Crossrail.

4.7 A number of bus and coach improvements are also planned, including new and better services to Kent, Surrey, South and East London and the South Coast. The Surface Access Strategy also mentions in general terms improving the bus/ coach passenger experience and facilities, and enhancing and expanding infrastructure provision⁴⁷.

46 GATWICK AIRPORT LIMITED 2014. A Second runway for Gatwick - Our April 2014 Runway Options Consultation. Figure 6, p.35.

47 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. p.60.

- 4.8** In terms of road links, the following improvements would, according to the airport, provide the surface access network with extra capacity, safety and reliability⁴⁸:
- 1.** Free flow crossing at Dartford on the M25
(to be completed in Spring 2015 – cost £48 million - £62 million)
 - 2.** Smart motorway junctions 5-7 on the M25
(completed in 2014 – cost £129 million)
 - 3.** Controlled motorway between junctions 7-8 on the M25 (completed in 2019)
 - 4.** Smart motorway junctions 8-10 on the M23 (completed in 2021)
 - 5.** A23 carriageway widening between Handcross and Warninglid
(to be completed in late 2014 – cost £77 million)
- 4.9** Other improvements to the road network in the immediate vicinity of the Airport would be provided in an expanded scenario. These would include new access roads to both the current North and South terminals, and a new junction to link to the A23. Car parks will be added next to the M23 junction in order to make them more accessible. New walking and cycling routes will also be built.
- 4.10** In terms of the road network, again the Airport believes that improvements already funded and elsewhere (and listed above) would be able to absorb extra capacity, given that the Airport contributes less than 10% of total peak traffic at the M25 and 15% of the traffic beyond 3km from the Airport on the M23⁴⁹. Similar to the case of public transport, extra traffic from the London area, given the vast majority of travellers use public transport, could be absorbed with the planned improvements. More complicated would be the situations for travellers using the wider M25 coming from the M3, M4 and M40, as well as those coming from Kent and the East, although the removal of toll stations at Dartford crossing could certainly help by adding capacity and reduce travel time uncertainties.
- 4.11** An important part of the Gatwick proposal, relating to passenger experience and connectivity, is the construction of a multi-modal transport hub, the 'Gatwick Gateway', from which a circular train will link the different terminals (the existing North and South and an additional one) with transfer times of about 3-4 minutes for each terminal. The new transport interchange will also integrate road access to the Airport, bus and coach services as well as walking and cycling routes⁵⁰.

48 HIGHWAYS AGENCY 2014. Highways Agency's major road schemes programme. <http://www.highways.gov.uk/our-road-network/managing-our-roads/improving-our-network/major-projects/highways-agencys-future-delivery-programmes/> for 2 and 5. Also <http://www.highways.gov.uk/roads/road-projects/dartford-crossing-remote-payment-scheme/> for 1; <http://assets.highways.gov.uk/our-road-network/route-strategies/London%20Orbital%20and%20M23%20to%20Gatwick.pdf> for 3 and 4 (no cost information)

49 GATWICK AIRPORT LIMITED 2014. A Second runway for Gatwick - Our April 2014 Runway Options Consultation. Section 2.3, p38.

50 GATWICK AIRPORT LIMITED 2013. Airports Commission: Proposal for providing additional runway capacity in the longer term - Gatwick Airport Limited response p.24.



4.12 The Airport aims to achieve a service quality rating for surface access of 4.5 out of 5 when the airport reaches 40 million passengers a year. In particular, it would like to collaborate with the new Thameslink franchise to improve the Gatwick Express service⁵¹ with more user friendly and accessible trains, an extended timetable and fewer services continuing or departing from Brighton in order to avoid capacity conflict between airport users and commuters at peak times.

Surface access options for a short-listed proposal: Heathrow Airport

4.13 Projected costs for Heathrow expansion (under the two shortlisted runway configurations) are an estimated at £15.6bn, of which £11.1bn is airport infrastructure, £0.9bn is surface access, and £3.6bn is community compensation and environmental mitigation⁵². The £15.6bn would be privately funded with Government support for other surface access improvements also required, estimated at £1.2bn. We first discuss the shortlisted (**Option 2**) consideration of a new runway to the north-west, with increased capacity of up to 260,000 ATMs a year, as proposed by Heathrow Airport Ltd.⁵³.

4.14 Heathrow Airport Ltd. makes its case for expansion in terms of surface access travel by pointing to a number of schemes and improvements (Figure 4 below shows the enhanced Heathrow Airport rail connectivity):

- *Crossrail* (operating from 2019)
- the upgrade of the *Piccadilly line* (a committed improvement)
- *the Western rail link* (expected by 2021)
- *the Southern rail link* (gaining political support)
- HS2 (with Heathrow connected by 2026 and services to the North starting from 2032).

The Heathrow Airport proposals also include improvements to the M25 between J14 and J15 to improve the flow of through traffic using new collector distributor roads to carry M4 and Heathrow traffic. Bus improvements include increasing the number of 24-hour bus routes serving Heathrow and increasing frequency of routes to the south of the airport. There is an interesting proposal to explore the introduction of a congestion charging zone with hypothecation of funding towards major infrastructure and local sustainable transport projects⁵⁴.

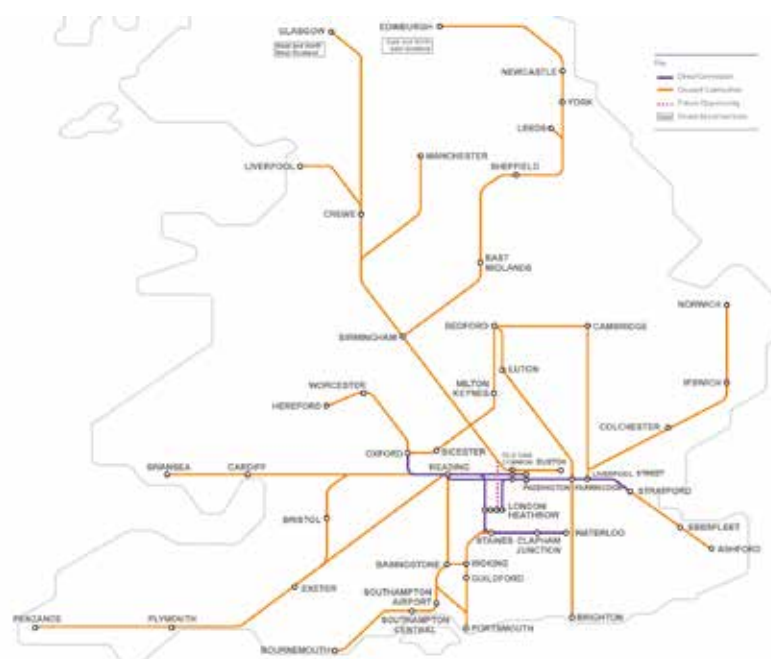
51 Gatwick Express was recently named as the worst airport rail service in the UK in a survey run by the consumer magazine Which?, while Virgin Rail operated connection to Birmingham Airport was rated as the best WHICH? 2014 - 25 Feb 2014 - <http://www.which.co.uk/news/2014/02/gatwick-express-bottom-in-airport-trains-survey-355799/>.

52 HEATHROW AIRPORT LTD 2014. Taking Britain further. Heathrow's plan for connecting the UK to growth, May 2014, p8.

53 HEATHROW AIRPORT LTD 2014. A New Approach - Heathrow's options for connecting the UK to growth, January 2014, p22.

54 HEATHROW AIRPORT (2014). Taking Britain Further. Heathrow's plan for connecting the UK to growth. Submission to the Airports Commission in May 2014.

Figure 4. Heathrow Airport's future rail connectivity



Source: Heathrow Airport Ltd

4.15 The Airport claims that such improvements would upgrade connectivity by bringing a further 3 million people within a 60-minute public transport journey time from the airport. In their proposal, Heathrow Airport Ltd also highlight demand management strategies to increase public transport share for surface access travel. These include further developments to Heathrow Airport's importance in terms of a coach and bus hub, information technology for real time information, marketing and incentives for public transport use, more efficient taxi use, the Heathrow Cycle Hub, an expansion of the staff car sharing schemes (already the largest in the world) as well as a reduction in the number of car parking spaces for employees. Initiatives to boost a further consolidation of freight vehicle movements in and around the airport are also under preparation. Table 7 shows some examples of the travel time savings that these schemes should deliver⁵⁵. It shows considerable travel time savings.

Table 7. Journey times to Heathrow Airport from some areas of London and UK cities – journey times expressed in minutes

Origin	Current journey time (minutes)	Journey time with new infrastructure (minutes)	Saving (minutes)
Birmingham	130	49	81
Glasgow	333	218	115
Edinburgh	325	218	107
Manchester	190	68	122

Source: adapted from Heathrow Airport submission to Airports Commission⁵⁶

55 HEATHROW AIRPORT 2013. Airports Commission: Long-term hub capacity options - Heathrow Airport Limited response. London: Heathrow Airport p.14.

56 HEATHROW AIRPORT 2013. Airports Commission: Long-term hub capacity options - Heathrow Airport Limited response. London: Heathrow Airport p.14.



4.16

Table 8 shows the current modal split for 2013 (shown in Table 3) and two hypothetical future modal splits to years 2030 and 2040, using data from Heathrow Airport submitted to the Airports Commission in May 2014⁵⁷. As with the situation for Gatwick Airport, Table 8 demonstrates the large increase in the number and proportion of those travelling by public transport to-and-from Heathrow Airport between now and 2040, up from 18.2 million passengers per annum (40.9%) to 48.8 million passengers per annum (58.0%). Much of this increase will come from passengers traveling by train. Even though there is a rise in the number of passengers travelling to the airport by car, from 13.1 million passengers per annum to 20.5 million passengers per annum, the modal share falls from 29.5% to 24.3%.

Table 8. Current and projected future modal split data for Heathrow Airport

Year	2013 (shown in Table 3)			2030		2040	
	Number	%		Number	%	Number	%
1 Private car	11,681,167	26.3	1 Kiss & fly	11,100,000	17.1	12,900,000	15.3
2 Hire car	1,421,283	3.2	2 Park & fly	6,100,000	9.4	7,600,000	9.0
3 Taxi / Minicab	13,058,034	29.4	3 Taxi	13,700,000	21.1	14,800,000	17.6
4 Bus / Coach	5,596,300	12.6	4 Bus / Coach	8,500,000	16.8	14,500,000	17.3
5 London	8,127,960	18.3	5 London	6,700,000	10.4	9,000,000	10.7
6 Rail	4,441,508	10.0	6 Rail	16,500,000	25.5	25,300,000	30.0
7 Other	133,245	0.3					
Total (non-transfer passengers)	44,415,082	100	Total (non-transfer passengers)	62,600,000	100	84,100,000	100
Total car (1-2)	13,102,450	29.5	Total car (1-2)	17,200,000	26.5	20,500,000	24.3
Total public transport (categories 4-6)	18,165,769	40.9	Total public transport (categories 4-6)	31,700,000	52.7	48,800,000	58.0

Note: Percentages have been rounded to 100

Source: Heathrow Airport Limited

Surface access options for a short-listed proposal: Heathrow Hub

- 4.17** The other Heathrow shortlisted proposal, put forward by Heathrow Hub Ltd (**Option 3**) would extend the northern runway to the west, with an increased capacity of up to 190,000-210,000 in phase 1 (by 2034)⁵⁸. It also involves the construction of a new multi-modal transport hub terminal just north of the Airport, the Heathrow Hub (as proposed by Heathrow Hub). This would be on the Great Western Mainline, providing, in the eye of the proposers, 'seamless connection' between rail, Crossrail, HS2, road and air. This new facility, located on a 200 acre site about 3.5km north of Terminal 5, with direct connection to the M25 (and possibly with the M4), would have a number of passenger services, including secure baggage storage and handling, as well as a direct connection to the different airport terminals⁵⁹. Car parks, bus stops and other facilities could also be relocated around the Hub.
- 4.18** The original Heathrow Hub proposal also envisaged altering the route of HS2 so that it ran through the new Hub, rather than requiring a separate spur; and a direct link to HS1 (enabling, amongst other benefits, a direct link to the Eurocarex: the proposal for a Europe-wide overnight freight network)⁶⁰. This configuration is illustrated in Figure 5. Since then the original proposals planned for HS2 has moved on, and it is not clear whether these options remain viable. However, the hub concept would remain under this option, even if HS2 was linked by a spur rather than a through-service⁶¹. A decision on the Heathrow spur will not be taken until after the Airports Commission reports in 2015⁶².
- 4.19** Both of the Heathrow Airport proposals require adaptation to the M25 that will cause some disruption to road users. Heathrow Airport Ltd proposal requires tunnelling under the M25, Heathrow Hub requires deviations of the M25 and construction of 10 kms of new motorway.

58 HEATHROW HUB LTD 2013. Submission to Airports Commission – Long Term Options - By Heathrow Hub Ltd and Runway Innovations Ltd. Report prepared by URS, Aviation Economics and Glead, p9

59 HEATHROW HUB LTD 2013. Submission to Airports Commission – Long Term Options - By Heathrow Hub Ltd and Runway Innovations Ltd. Report prepared by URS, Aviation Economics and Glead.

60 LOW, J. & BOSTOCK, M. 2013. Double up on Heathrow. Report, Centre for Policy Studies.

61 HEATHROW HUB LTD 2013. Submission to Airports Commission – Long Term Options - By Heathrow Hub Ltd and Runway Innovations Ltd. Report prepared by URS, Aviation Economics and Glead.

62 HOUSE OF COMMONS LIBRARY. Railways: high speed rail (HS2). Available at: www.parliament.uk/briefing-papers/sn00316.pdf

Figure 5. Heathrow hub connectivity with the railway and underground network



Source: <http://heathrowhub.com/how-it-works/>

Interconnections with potential transport infrastructure projects: Crossrail and High Speed Rail

- 4.20** In the case of the UK, it will be very important that whichever option is short-listed, it will also part of a national integrated transport plan, linking to other projects such as the London Crossrail schemes (1 and 2) and the High Speed Rail network (HS1 and HS2).
- 4.21** Crossrail 1 will be a new railway line through central London, due to begin operations in late 2018 (with the full route operational from late 2019). Its main purpose is to increase rail capacity by 10% and connect the east to the west of the city. A north to south route, Crossrail 2, is currently being consulted upon by Transport for London⁶³.
- 4.22** The Crossrail 1 route will run over 100 kilometres from Reading and Heathrow in the West, to Shenfield and Abbey Wood in the East. New tunnels for 42 kilometres are being built underneath central London and nine new stations will be built. Crossrail estimates that 95% of journeys will have a step-free origin and destination station⁶⁴. Crossrail 1 will impact airport surface access in London and the South-East as it will add a connection from Heathrow to various locations in central London, with additional links to the underground and rail networks. In particular, Crossrail 1 will directly connect Heathrow Airport with the City, through Liverpool Street and another important major employment centre in Canary Wharf. Crossrail 1 will also improve surface connectivity to the West of Heathrow Airport, particularly to Maidenhead and Reading. It should also be noted that Crossrail could also affect surface access to Gatwick, since it will pass through Farringdon station, where passengers will be able to change to the Thameslink line in order to reach Gatwick Airport.

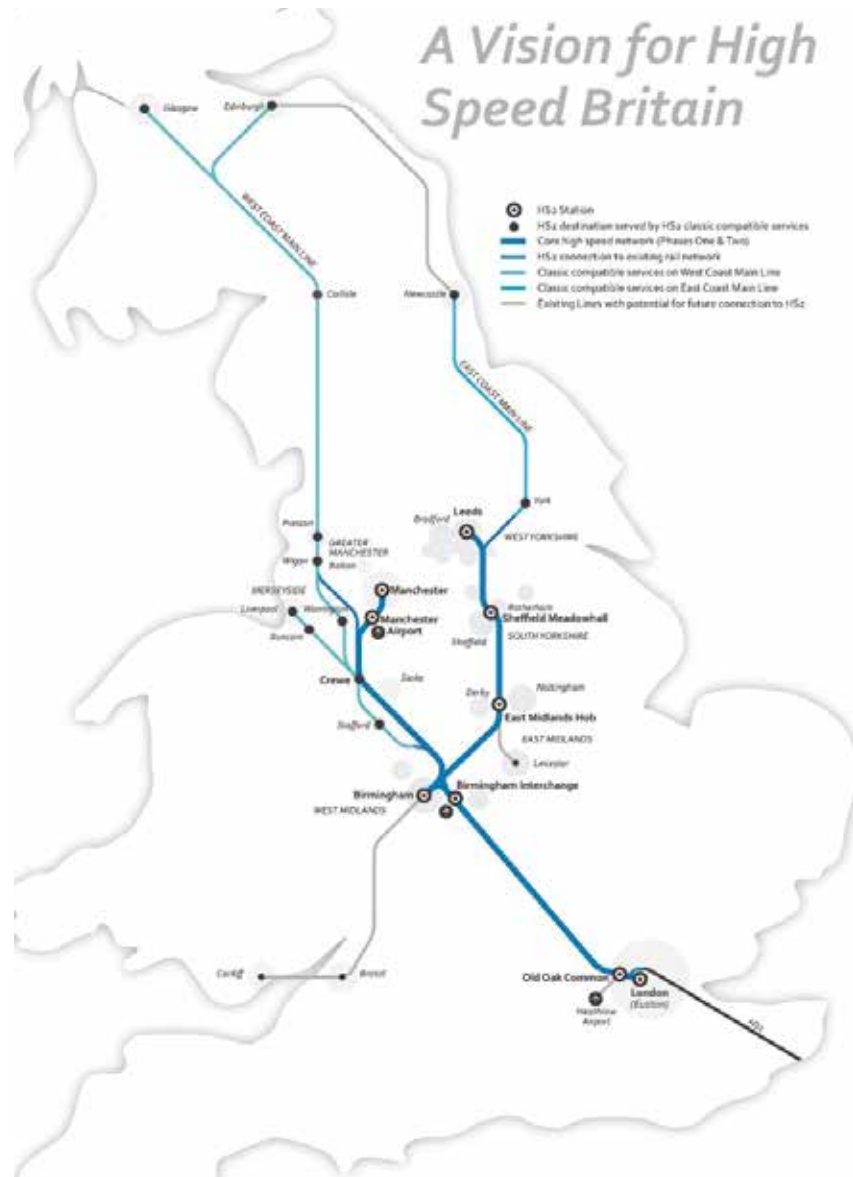
63 TRANSPORT FOR LONDON. Crossrail 2. Available at: <https://www.tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/crossrail-2>

64 CROSSRAIL. Crossrail in numbers. Available at: <http://www.crossrail.co.uk/benefits/crossrail-in-numbers>

4.23

High Speed 2 (HS2) represents a planned high speed train line between London Euston and Birmingham (Phase 1 – expected to open in 2026), with a new station built at Curzon Street and subsequently Manchester Piccadilly via Manchester Airport and Leeds (Phase 2 – expected to open in 2032) in a Y-shaped route (see Figure 6). Phase 1 will also involve the construction of two new stations, one at Old Oak Common in west London, and another in the proximity of Birmingham Airport. HS2 aims to improve both journey time and capacity on the existing network. Journey times from London to Birmingham would be reduced from 1hr 21 minutes to 49 minutes, to Manchester from 2hrs 8 minutes to 1hr 8 min, and to Manchester Airport from 2hrs 24 minutes to 1hr and 3 minutes. One of the main purposes of the line would also be to free space on the existing congested rail network for both passengers and freight.

Figure 6. Proposed route for the High Speed 2 rail network



Source: DfT Policy Paper (2013)



4.24 In operation, with the spur, Heathrow Airport will be 53 minutes away from the Birmingham Interchange (down from the current 2 hrs 13 minutes), 1 hr 28 minutes away from Manchester, and 1 hr 18 minutes to Manchester Airport (down from the current 3 hrs 8 minutes, and 3 hrs 24 minutes, respectively) and 1 hr 38 minutes from Leeds (down from the current 3 hrs 12 minutes), opening an important market in the Midlands and North of England. Reductions in journey times to the North will also be enjoyed by Gatwick through the link at Old Oak Common to HS2.

Summary

4.25 Proposals to ensure adequate surface access for an expansion of either Gatwick or Heathrow Airports have focused on public transport improvements, particularly for rail travel to-and-from the airports. The investment in rail infrastructure is welcome, but we remain to be convinced about where it can take the predicted large numbers of extra travellers accessing an airport. In addition, the ease of travel from some origins when interchange is involved, and the role of frequency and the time of services that are important for surface access trips, need to be considered. It is also important that any increase in freight use is transferred using rail-based rather than road-based surface travel.

4.26 All of the proposals have a commendable focus on the design of surface access 'hubs' for the important last quarter mile of passenger journeys in terms of integration of the various transport modes and the accessibility of passengers from the surface transport to the check-in facility. In particular, the Heathrow Hub is a novel and welcome proposal. It would have benefited from a direct link to HS2, although the spur remains a viable option.

4.27 Given the lack of the data that is publically available on some of the aspects associated with the surface access, it is hoped that a rigorous analysis of the surface access options will be undertaken by the Airports Commission based on their appraisal framework⁶⁵.

5. Surface access implications

5.1 This section discusses the overall surface access implications of the proposals, bringing together the current with the proposed, with some context and questions following the literature review (**Section 2**), current conditions (**Section 3**), and the various proposals (**Section 4**). The key issue in this Section is to explore how realistic and adequate the current plans are to handle the increased (and mode-shifted) number of surface journeys. It is split into the following sections:

- Background trends in population and travel demand
- The validity of the public transport targets: the case study of Gatwick Airport
- The validity of the public transport targets: the case study of Heathrow Airport
- The impact of HS2 on surface access connectivity
- Achieving a modal shift away from the private car and towards public transport

Background trends in population and travel demand

5.2 Changes to surface access travel need to be viewed against background trends in population and travel demand. The UK population was 63.2 million at the time of the 2011 Census⁶⁶ and is predicted to rise to 67.2 million in 2020⁶⁷. London, the East and the South East regions are all projected to grow at a much faster rate than other English regions; London in particular is set to grow by 13% over the 10 year period to mid-2022⁶⁸.

5.3 In transport terms, the number of passengers from UK airports increased over the previous year (2013)⁶⁹, following a dip caused by the recent recession, but it is set to grow over the coming years. For surface transport, there has been a significant rise in rail travel in London and South East of England, and a corresponding stagnation in car driving since the late 1990s in London⁷⁰. This has been reflected in the recent modal shift trends in surface access at Gatwick and Heathrow airports (Section 3). We believe it is important that the Airports Commission makes clear its assumptions about a) the underlying growth in surface access travel and b) what is additional element that would be generated by airport expansion. In turn, we also urge the Commission to be clear about the likely costs of surface access solutions and the appropriate balance between financing these from the public purse and by the airports.

66 ONS, 2011 Summary: UK Population Projected to Reach 70 Million by Mid-2027. Available at: <http://www.ons.gov.uk/ons/rel/npp/national-population-projections/2010-based-projections/sum-2010-based-national-population-projections.html>

67 ONS, 2011 UK Censuses, in, Office for National Statistics. Available at: <http://www.ons.gov.uk/ons/guide-method/census/2011/uk-census/index.html>.

68 ONS, 2014 Statistical bulletin: 2012-based Subnational Population Projections for England. Available at: <http://www.ons.gov.uk/ons/rel/snpp/sub-national-population-projections/2012-based-projections/stb-2012-based-snpp.html>

69 Civil Aviation Authority 2014. Aviation trends. Quarter 1. 2014. London. Available at: http://www.caa.co.uk/docs/80/AviationTrends_Q1_2014.pdf

70 JONES P., and Le VINE S., 2012. On the Move: making sense of car & rail travel trends in Great Britain (Independent Transport Commission et al.). Available to download at www.theitc.org.uk/docs/47.pdf



Validity of the public transport targets: the case study of Gatwick Airport

- 5.4** The stated objective of the airport surface access strategy is to achieve 45% share of public transport in a single runway scenario, and 50% in a two runway scenario. However, Gatwick's CEO declared recently that 60% should be the target by 2040⁷¹ and this target was then confirmed by the latest consultation document made public by the airport - 10% would be the specific target for bus and coach (20% for staff) by 2040 and 15% would be target for private car usage⁷².
- 5.5** Importantly, Gatwick Airport's management considers that the additional number of passengers in the expanded scenario, and the consequent increase in surface access trips will be absorbed by the planned enhancement to both the rail and road network without requiring major additional investment, such as, the construction of a new rail link. The improvements to the Thameslink route will certainly add considerable capacity, with more frequent services and longer carriages and this, together with an enhanced Gatwick Express service could very possibly absorb at least the initial extra passengers travelling from Central and South London (Gatwick currently contributes to 4% of current peak demand into London with this percentage predicted to increase to 5% in an expanded scenario). Whether the added capacity will be enough in a 2030 scenario is debatable given the magnitude of the passengers that will come from Central London (26 million in 2030 if the proportion of London passengers remains the same – 22 million of which would come by public transport, again if the proportion remains the same). This is open to debate. For example, passengers from central London will double requiring an extra 100% capacity: Thameslink could provide 50% of this but whether the rest would be covered by other services from London Victoria, as well as buses and coaches, is difficult to say.

71 Stewart Wingate speech at the Gatwick for Growth event, London, Tuesday 25 March 2014
The Shard, London

72 GATWICK AIRPORT LIMITED 2014. A Second runway for Gatwick - Our April 2014
Runway Options Consultation.

5.6

In relative terms, it has to be noted, that currently the vast majority of travellers coming from Central London travel by public transport (82.1% was the figure in 2011) and while it is possible this figure is going to increase, it is more likely to stay approximately the same. The increase in absolute terms will however be substantial. What the improved rail connection would probably do is to increase public transport share from other areas. These include Brighton and Hove, whose share of public transport users is currently at 46%, and could certainly be improved given that it has been declining in recent years, the rest of the Sussex Coast whose share is currently at 29%, and especially Kent, whose public transport share is currently as low as 9% given the lack of fast direct services. For travellers coming from the M4/M40 corridor (Thames Valley and beyond) the current public transport share of the market is 29% of passengers, and this could certainly improve given the enhancements of the rail link between Gatwick and Reading. Whether a considerable extra number of passengers from that region and beyond (for example, in the scenario of reduced operations at Heathrow) could be absorbed is, however, debatable, since trains wanting to avoid London would pass through Reading and Guilford, while trains from the wider South-West could go through Salisbury, Horsham and Crawley reaching Gatwick via the South. It should be noted that connections from the west and south-west to Gatwick are a rather complicated. There used to be a direct connection between Brighton to Reading and beyond going to Gatwick, and other services from Brighton to Bristol via Salisbury. Some of these routes could be reinstated but it is quite difficult to achieve. The links not through London could also face problems given their limited capacity to accommodate passengers who would like to use an expanded Gatwick as a result of the extra destinations it serves.

Validity of the public transport targets: the case study of Heathrow Airport

5.7

Before (see Table 3) we noted that the current (2012) share of public transport users at Heathrow is 40.8%. With about 45 million passengers currently arriving at Heathrow via the surface access infrastructure, this means that more than 18 million of them are arriving by public transport. In an added capacity scenario in 2030 with 100 million passengers, Heathrow Airport indicated that an additional 15 million passengers will use the surface access public transport infrastructure, bringing the total to 34 million and raising the share of public transport users to 50%⁷³. In particular, the following infrastructure developments as well as demand management measures discussed above are predicted to contribute to an increase of 10% in public transport mode share by 2030, broken down as follows:

- 2.3% - new coach routes
- 1.2% - 'enhanced Crossrail'
- 0.7% - Western rail connection
- 0.7% - Southern rail connection
- 1.2% - demand management initiatives listed above
- 3.7% - 'background change to 2030'



5.8

New and enhanced coach and local bus connectivity will also contribute towards modal shift. In the view of the proposers, these initiatives, together with the infrastructural development will help to achieve a 'more than' 50% share of public transport usage by 2030⁷⁴. These figures have to be read by taking into consideration the predicted passenger number increase as a result of expansion. The magnitude of these changes would be considerable, especially for Central London, currently the origin and destination for more than 50% of Heathrow passengers. TfL has questioned the assumption that extra demand can be absorbed with minimal investment, since even an upgraded Piccadilly Line would only see crowding reduced but not eliminated, and the same would apply to the Great Western mainline (which will be used by Crossrail for some of its approach)⁷⁵. It should also be noted the TfL has similar concerns for absorbing extra demand with minimal investment from the Gatwick Airport proposals, in this case relating to the Brighton mainline.

5.9

In terms of traffic around the airport, the Heathrow Airport proposal states that the increased public transport share, increased car occupancy rate, and limited staff car parking supply would make the predicted increase in passenger related traffic (due to the increased number) offset by the reduction in staff travel. The proposal also states that surface access management should have the objective to maintain current traffic levels beyond 2030 under their expanded scenario. This is also repeated in the latest airport proposal document (p.7) where it is stated that "Heathrow will be able to deliver more flights without increasing the traffic on the road"⁷⁶. This is a sensitive issue, because Heathrow is situated next to one of the most congested sections of the UK motorway network. Heathrow Airport and TfL have expressed differing views on the contribution of the Airport to the traffic around it, as well as over the possibility of increasing public transport usage and reducing private car usage in an extended scenario⁷⁷. TfL believe that Heathrow expansion could generate a significant increase in vehicle trips on the surrounding road network, possibly on a scale requiring extra lanes on extended sections of the M4 and M25⁷⁸. It should be noted that surrounding traffic is also a sensitive issue for Gatwick Airport which, like Heathrow, is situated close to congested sections of the national motorway network.

74 HEATHROW AIRPORT LTD 2014. Taking Britain further. Heathrow's plan for connecting the UK to growth, May 2014. Volume 1. Technical submission p207.

75 TfL 2013. Airports commission response. Long and short to medium term proposal. The Mayor of London's review of submissions. London: Transport for London.

76 HEATHROW AIRPORT LTD 2014. A New Approach - Heathrow's options for connecting the UK to growth - January 2014.

77 BOURN, R. 2013. Heathrow and surface transport stress. London: Campaign for Better Transport.

78 TFL 2013. Airports commission response. Long and short to medium term proposal. The Mayor of London's review of submissions. London: Transport for London.

The impact of HS2 on surface access connectivity

5.10 It is important to note that, according to a recent publication⁷⁹, given the growth in rail travel demand from large international airports, they could be considered equivalent to, or even larger than, cities in terms of demand generation, strengthening the case for connecting them much more closely to the (possibly high speed) national rail network. Connecting the important European airports to the (preferably) high speed network is also one of the objectives in a recent EU transport strategy white paper⁸⁰. In an earlier paper⁸¹, the same authors argued that connecting Heathrow to the High Speed rail network could replace about 20% of landing and take-off slots. This is higher than the figure of 10% quoted by Transport for London (TfL) in their proposal to the Airports Commission⁸². It is not, however, straightforward to predict the impact of international high speed services on modal choice, especially for an insular country like the UK (with routes to Europe limited by capacity constraints in the Eurotunnel).

5.11 High Speed Rail becomes very competitive with aviation for journeys below 4 hours, although its potential to substitute for air travel depends on a number of factors⁸³ and is worthy of further investigation. It is also interesting to note that Eurostar has just announced the addition of longer trains to boost capacity as well as a number of new direct routes not only to new destinations in France, but also in the Netherlands, Germany and Switzerland. The Eurostar monopoly on routes through the Channel Tunnel is also due to end with the German state railway company DB set to start running services through the tunnel in the next two years⁸⁴.

79 BANISTER, D. & GIVONI, M. 2013. High-Speed Rail in the EU27: Trends, Time, Accessibility and Principles. *Built Environment*, 39, 324-338.

80 EUROPEAN COMMISSION 2011. White Paper - Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system, Brussels.

81 GIVONI, M. & BANISTER, D. 2006. Airline and railway integration. *Transport Policy*, 13, 386-397.

82 TFL. 2014. A new hub airport for the UK - Available: <http://beta.tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/a-new-hub-airport-for-the-uk#on-this-page-6>.

83 For an interesting and recent review of high speed potential to alter mode share on certain routes please see BORJESSION, M. 2012. Forecasting Demand for High Speed Rail Centre for Transport Studies, Stockholm.

84 ODELL, M. & MARRIAGE, M. 2014. Eurostar lifts capacity to enter new markets. *The Financial Times* - 5 March 2014 - <http://www.ft.com/cms/s/0/09860196-a44a-11e3-9cb0-00144feab7de.html?ftcamp=crm/email/201436/nbe/Transport/product&siteedition=uk#axzz2vArv5ZNN> (require subscription).



- 5.12** Heathrow surface connectivity would have greatly benefited from being located directly (or at least as close as possible) on HS2 rather than served by a spur⁸⁵. This is assuming that there would have been easy (as short as possible, well signed-posted and step-free) connectivity between the High Speed Rail services and the shuttles to the different terminals. Any rail services should be as frequent as possible in order to reduce to a bare minimum the time (as well as the potential psychological and monetary) costs of passengers failing to catch a particular service. A spur would in fact add an interchange: a particular penalty for passengers with reduced mobility or carrying heavy luggage, as well as increasing travel times. In particular, a spur could make planning for passengers even more complex since they will have to match their arrival time at the Old Common station with the times for the services on the spur (assuming they will be not as frequent as the services from Heathrow Hub to the different terminals). This will therefore increase uncertainty as well as the appeal of using rail to reach the airport. The perceived ease of transfer will be of particular importance to increase public transport modal choices because, as we have seen in Section 2, passengers normally using the car often cite complexity, uncertainty, lack of reliability, number of interchanges, as well as costs, as the main deterrents from using public transport to reach the airports.
- 5.13** Interestingly, the proposed HS2 network will link three major UK airports - Heathrow, Birmingham and Manchester - with relatively short travel times between them, and therefore create the possibility of new forms of competition in UK aviation. Gatwick will not be located directly on this network. The way in which HS2 might encourage competition between Birmingham, Manchester and Heathrow airports, and potentially attract airport passengers northward as well as southward along the route might be a new and significant factor in the future geography of UK aviation, mitigating fears of overly influential airports in the southeast.
- 5.14** A further issue in relation to HS2 is the possible effect of 'landhubbing', whereby travellers from other parts of Britain might use an improved rail system to get to Heathrow and Gatwick airports (rather than fly to Schiphol, and hub from there, for example). This kind of behavioural shift would depend not just on engineering (fast and easy surface access to a UK hub from other parts of the country) but - importantly - on the pricing policy of the airlines themselves. One major attraction of travelling to global destinations via a European hub rather than a UK one is that it is commonly cheaper to do so. Adding the price of an HS2 ticket would make the UK "offer" even less competitive. However, with the surface engineering in place airlines would at least have the potential scope to develop alternative pricing options to attract passengers to their UK flights. The ITC's recent research has looked at how this works in France and the Netherlands⁸⁶. We note, for example, the arrangement that SNCF and Air France have for joint rail-air tickets at Paris Charles de Gaulle airport⁸⁷.

85 INDEPENDENT TRANSPORT COMMISSION 2014. Capturing the value of High Speed Rail. Lessons from Europe: The Lille Symposium 2014.

86 INDEPENDENT TRANSPORT COMMISSION 2014. Capturing the value of High Speed Rail. Lessons from Europe: The Lille Symposium 2014.

87 AIR FRANCE. Air & rail connections. Available at: http://www.airfrance.co.uk/GB/en/common/resainfovol/avion_train/reservation_avion_train_tgvair_airfrance.htm

Achieving modal shift away from the private car and towards public transport

- 5.15** There needs to be a deeper discussion on the ways in which airports can achieve the modal shift they desire, particularly given the focus on public transport developments within the airport proposals and the associated ambitious level of the targets set to increase public transport usage. To achieve this it will, in our opinion, also be important to disincentivise private car use further, possibly through increased charging on-route (congestion) or at the destination (car park). Drop-off / pick-up trips could be particularly targeted as currently happens at Luton Airport.
- 5.16** A new charge - possibly based on the London congestion charge - is an option, which would have behavioural and financial benefits. It could also be used to subsidise public transport users, although this could depend on co-operation between a variety of different operators. This report endorses the congestion charge proposals as put forward by Heathrow Airport. We urge the Airports Commission to look at this issue rather than follow the build-to-meet-demand principle so frequently adopted by transport planners.

Summary

- 5.17** There is much debate on the public transport targets set by the airports, and although admirable, it is at present hard to see how they will be delivered, particularly when increasing the size and capacity of an existing airport will naturally attract people from further afield: a group we know are more likely to use cars.
- 5.18** High Speed Rail has been shown to be a viable competitor with aviation in parts of Europe and perhaps there has been a missed opportunity under current HSR proposals in not having more direct and close links with the two airports under consideration.
- 5.19** It could be suggested that more dramatic measures will be required to encourage sufficient modal shift away from the private car to meet targets, perhaps through a charge for drop-off / pick-up trips.

6. Conclusions and recommendations

6.1 This section presents the report's conclusions and recommendations for policy makers.

6.2 There are a number of key messages we would like to highlight from the report:

- High population growth in London and the South East (as shown in **Section 5**) will place stress on surface access to airports regardless of whether new runways are built - this makes it important that upgrades to these surface transport networks are considered in addition to those schemes already planned and committed.
- The targets that the airports are setting for modal shift are ambitious (**Section 4**), and a range of policies will be required to achieve them (including possibly congestion charging on cars to subsidise public transport). There are wider questions about surface transport and whether the transport is demand-led or supply-driven. If it is demand-driven private car traffic will increase, and yet all of the airport proposals are expecting most new passengers to use public transport. Perhaps the Airports Commission or another body should set limits on the amount of private car traffic (perhaps limiting this to no increase on 2014 levels).
- As highlighted in the literature review (**Section 2**) there is a particular issue with drop-off / pick-up surface access trips, the largest contributor to emissions and congestion. It is possible that some form of charging could help to reduce this activity, and technological innovations could also be used to reduce the need for these trips.
- Good modal integration will be critical to achieving a successful surface access system. In this context (discussed in **Section 5**), it is notable that continental rival airports, such as Charles de Gaulle and Schiphol have integrated their HSR station within the airport, while in the UK our airport and HSR strategies do not appear to be similarly integrated.
- Complex governance issues are associated with delivering these proposals, such as the range of stakeholders involved (**Section 2**) and the Heathrow Hub difficulty of putting an interchange on land outside the airport (**Section 4**).

6.3

Finally, a series of “I” recommendations have been put forward to promote surface connectivity whichever airport proposals are developed. The following are suggested:

- i. **Investment** is provided at a scale to ensure an efficient and effective surface access system.
- ii. **Infrastructure** for surface access is planned, cost-effective and delivered on time. There is an ownership issue too. We have noted that surface access planning is complex given that most of the infrastructure is out of the control of the airports. This issue particularly affects the Heathrow Hub proposal as the hub is projected to be located on land which is not owned by the airport. This could create management problems as well as conflicts in terms of revenue from car parking facilities.
- iii. **Integration** is necessary, in order to ensure travellers have a straight-forward, easy, end-to-end journey experience. This requires all of the various authorities and companies involved to plan and operate services with this goal from the outset. It may require clearer governance structures to ensure it happens.
- iv. **Information** on surface access travel is readily available to passengers.
- v. **Interchange** is efficient to ensure that there are not time (and often cost) penalties for changing surface access transport method. This is particularly important given that many of the public transport trips to Heathrow and Gatwick airports, including with a new HS2, are not direct, involving a change of service (interchange).
- vi. **Innovation** in terms of technology is applied for surface connectivity (telepresence and baggage-tagging are covered in the Section 2 literature review).
- vii. The environmental **impact** of surface access will need to be fully accounted for, particularly from drop-off / pick-up trips. While the impact on the environment could be assessed for the area in the immediate vicinity of the airport (with difficulties concerning attribution of traffic as well as passengers to the airport rather than local traffic movements) it is difficult to give a more holistic approach of the environmental impact of surface access given the distances some travellers cover to reach the airport
- viii. Successful **implementation** of the surface access schemes is crucial so that the proposals can be delivered on time and within budget.



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October 2014

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INDEPENDENT
TRANSPORT
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Published by the Independent Transport Commission

October 2014

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