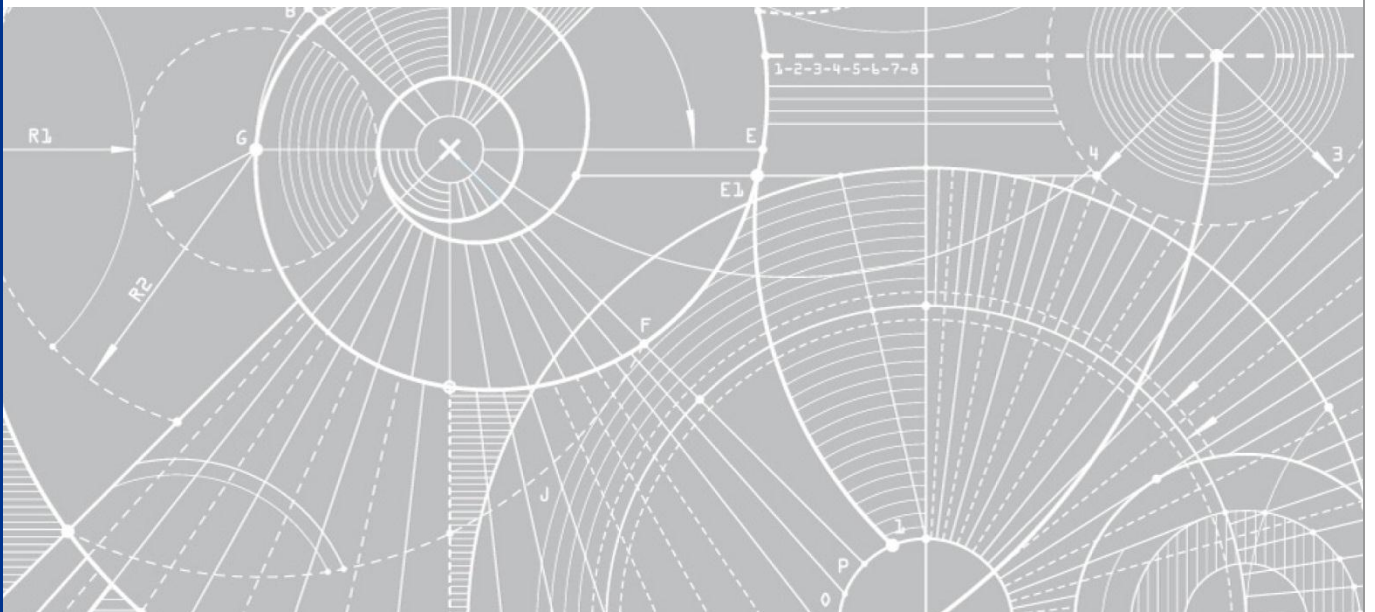


# **Appraisal Framework Module 4. Surface Access: Demand Management Study**

AIRPORTS COMMISSION

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## Document Control Sheet

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## 1. Introduction

### 1.1 Background

- 1.1.1 The Airports Commission (AC) was established in 2012 by the UK Government to examine the need for additional UK airport capacity and to recommend how any additional capacity requirements can be met in the short, medium and long-term. The AC is due to submit a Final Report to the UK Government by the summer of 2015, assessing the environmental, economic and social costs and benefits of various solutions to increase airport capacity, considering operational, commercial and technical viability.
- 1.1.2 Shortly after its inception, the AC issued tenders for support contracts to engage independent technical advice on a range of aspects of the Commission's work. Jacobs together with sub-consultants Leigh Fisher and Bickerdike Allen Partners were appointed as the sole supplier on the Airport Operations, Logistics and Engineering Support Contract (ref: RM1082), which runs throughout the AC's lifespan up until the summer of 2015.
- 1.1.3 A key milestone in the AC's operational life was the delivery in December 2013 of an Interim Report. Following a general call for evidence, the Interim Report detailed the results of analysis of the capacity implications of forecast growth in UK aviation demand and a preliminary appraisal on a long-list of proposals put forward by scheme promoters to address the UK's long-term aviation connectivity and capacity needs – this work is described as Phase 1. The associated appraisal process identified three short-listed options, two focussed on expanding Heathrow Airport and one on expanding Gatwick.
- 1.1.4 These short-listed options were then subsequently further developed and appraised during a Phase 2 assessment, which was published for consultation on the 11<sup>th</sup> November 2014. The Phase 2 assessment with respect to surface access constituted a static appraisal using spreadsheet-based demand-forecasting models, which were developed primarily to assess the surface transport capacity implications of each expansion option. Following feedback from the AC's surface access stakeholders (the Department for Transport (DfT), the Highways Agency (HA), Network Rail (NR), and Transport for London (TfL)), further assessment of the surface access implications of the three expansion options, involving dynamic modelling, was undertaken during the Phase 2 consultation period, which ended on the 3<sup>rd</sup> February 2015.

### 1.2 Public consultation

- 1.2.1 The aforementioned Phase 2 consultation resulted in the AC receiving approximately 75,000 responses on the three short-listed options for expansion at Heathrow and Gatwick. The sources of the responses were wide-ranging and included (but were not limited to) members of the public, businesses, scheme promoters, local government, and campaign groups. The consultation covered a broad spectrum of issues relating to potential expansion at Heathrow and Gatwick, including surface access provision.
- 1.2.2 Following an initial review of the responses by the AC, Jacobs were provided with a list of those received from the consultees in Table 1-1. The AC's Secretariat considered that these respondents raised issues that required support from Jacobs to address. A review of the responses by Jacobs identified approximately 600 comments relating to surface access.

**Table 1-1: Reviewed consultation responses**

Consultee	
Buckinghamshire County Council	Kent County Council
Charlwood Parish Council	Mid Sussex District Council
Crawley Borough Council	Network Rail
East Sussex County Council	Reigate & Banstead Borough Council
easyJet	Richmond Heathrow Campaign
Fiona Mactaggart MP	Royal Borough of Kensington & Chelsea
Gatwick Area Conservation Campaign	Royal Borough of Windsor & Maidenhead
Gatwick Airport Limited	Slough Borough Council
Haywards Heath Town Council	Surrey County Council
Heathrow Airport Limited	Tandridge District Council
Heathrow Hub Limited	Transport for London
Horsham District Council	Virgin Atlantic
Hounslow Council	West Sussex County Council
Independent Transport Commission	

- 1.2.3 Each of the comments were recorded and categorised by their content. This approach allowed for the identification of recurring themes within the comments and made it possible to understand some of the key areas of concern for consultees. The approach informed the need for any additional analysis that would be required to support earlier phases of work such that the issues raised by the consultees could be suitably addressed.
- 1.2.4 Following an initial review of the surface access comments the AC identified four areas of additional analysis. These were as follows:
- Surface access freight impacts at Heathrow and Gatwick;
  - Road and rail resilience impacts at Heathrow and Gatwick;
  - Demand management impacts at Heathrow;
  - Road capacity sensitivity impacts.
- 1.2.5 This report describes the further work undertaken on the potential impact of **demand management measures in reducing car use at Heathrow Airport**. The comments received from consultees concerning demand management are listed in Appendix A of this report. A qualitative review of demand management options was undertaken, and the potential impact on mode share of some measures was tested using the mode share/trip distribution models developed during Phase 2 and subsequently enhanced during the Phase 2 consultation window for the dynamic modelling work-stream.
- 1.2.6 As with all the surface access assessments undertaken for the AC, the analysis undertaken was mindful of the three objectives set out in the AC's Appraisal Framework:
- **Objective 1** - to maximise the number of passengers and workforce accessing the airport via sustainable modes of transport;
  - **Objective 2** - to accommodate the needs of other users of transport networks, such as commuters, intercity travellers and freight; and
  - **Objective 3** - to enable access to the airport from a wide catchment area.

## 1.3 Methodology overview

- 1.3.1 The basis of the demand management testing was the core Heathrow North West Runway scenario described in the dynamic modelling Appraisal Report i.e. Heathrow with an additional runway in 2030 assuming the AC's Carbon-Traded Global Growth annual passenger forecast and a mid-range passenger/staff ratio (the mid-point between the AC's low and high staff productivity forecasts for the airport). Further details on these assumptions can be found in the dynamic modelling Appraisal Report. All tests were undertaken on the AM peak hour (0800-0900) and PM peak-hour (1700-1800) models to ensure consistency with the WELHAM inputs derived for the dynamic modelling work-stream.
- 1.3.2 As with all previous surface access assessments, the testing described in this report was undertaken with reference to a Core and an Extended Transport Baseline, which together listed transport infrastructure and services expected or likely to be in place by 2030 regardless of any airport expansion that may be delivered in the UK – these baselines are summarised in Appendix B.
- 1.3.3 The Core Baseline only included those schemes that were fully committed and funded when the Phase 2 assessment commenced. The primary focus of all the analysis was on the Extended Baseline, as by 2030 it was judged very likely that further enhancements to the UK transport network would have been delivered above and beyond the works that were fully committed at the beginning of Phase 2.
- 1.3.4 Constructing an appropriate Extended Baseline for a 2030 assessment involved making significant assumptions about the likely state of the transport network by that time, and this was a central factor in the decision not to extend the scope of the surface access assessment to include later years. There is currently a high degree of uncertainty surrounding some of the included schemes, not just in terms of their delivery but also their final form and characteristics, which in some cases are continually evolving as development work is progressed. The assessment detailed in this report was based on the best assumptions on the state of the 2030 transport network at the time of writing, and was informed by discussions with the AC's stakeholders before the Phase 2 assessments were published for consultation.

## 1.4 Report structure

- 1.4.1 The remainder of this report is structured as follows:
- Chapter 2 explores the pros and cons of various demand management measures that could be introduced at Heathrow Airport in future, with reference to the submission received by the AC from Heathrow Airport Ltd (HAL) in 2014;
  - Chapter 3 provides analysis of the impact of introducing a charge on airport passengers travelling to the airport by car, using the spreadsheet-based mode-share/trip-distribution model developed during Phase 2 and refined during the Phase 2 consultation window;
  - Chapter 4 summarises the findings of the study and draws some broad conclusions on the potential impacts and issues of introducing further demand management at the airport.

## 2. Future options for demand management at Heathrow

### 2.1 Overview

2.1.1 The demand management measures currently in place at Heathrow are summarised in Appendix C of this report – current measures were categorised as follows:

- **Positive measures** i.e. those involving a 'carrot' to attract use of non-car modes - the Free Travel Zone currently in place around the airport is an example of such a measure;
- **Negative measures** i.e. those involving a 'stick' to discourage car use - the implementation of parking charges is an example of such a measure;
- **Efficiency measures** i.e. those that do not necessarily encourage a shift to more sustainable modes but reduce the impact of road-based modes through more efficient operation - a car-sharing or taxi-matching initiative would be an example of such a measure.

2.1.2 In this chapter, future options are explored with reference to the proposals contained in HAL's submissions to the AC in 2014. These proposals can be summarised as follows:

- Positive measures to encourage sustainable travel:
  - The development of 'Onward Travel Zones' in all terminals to provide support to passengers planning and making journeys, particularly by Public Transport;
  - The provision of better information for passengers, including real-time information with accurate arrival times and multi-lingual services;
  - The expansion of the Free Travel Zone along bus corridors serving local communities, along the lines of the recent extension to Stanwell Moor along the 557 bus route;
  - Further development of the Cycle Hub to provide a full service facility with shower/changing facilities and fast, frequent PT connections to all parts of the airport;
  - The provision of additional Cycle Hubs at key entrances/employment locations to the south and east, enabling fast and easy access for cyclists;
  - Improvements to the cycle network both on the airport and around it, in consultation with local authorities, cycling groups and stakeholders such as Sustrans;
  - The promotion of personalised travel plans for staff to increase awareness of travel choices, including the introduction of plans for every new employee;
  - The expansion of staff discount offers to new PT services, including TfL services;
- Negative measures to discourage car use:
  - The potential introduction of a congestion charge zone around the airport;
  - The effective enforcement of parking restrictions on terminal forecourts through the implementation of the South East Airports Task Force recommendation to establish an airport specific parking enforcement regime;
  - The introduction of new staff parking policies including the central management of permits, needs-based allocation, charges based on usage of facilities rather than a fixed cost, and incentives to encourage staff to give up permits;
  - The reduction of staff parking spaces and parking pass availability over time as the measures described above result in a mode shift to public transport;
  - In tandem with local authorities, the development of schemes to prevent employee parking on local roads, including the introduction of Controlled Parking Zones (CPZs);
- Efficiency measures to reduce traffic impacts:

- Matching passengers to drivers that have dropped off at the airport, reducing unnecessary traffic movements;
- Supporting taxi sharing by matching passenger journeys to similar destinations, with scheme membership based on prescribed passenger service standards and vehicle environmental performance;

2.1.3 The remainder of this chapter details Jacobs' assessment of the pros and cons of these measures using the three-category structure defined above.

## 2.2 Positive measures to encourage travel by sustainable modes

### *Improved information*

2.2.1 Evidence from the 2013 employment survey conducted by Ipsos Mori certainly suggests that more could be done at the airport in terms of advertising and marketing to increase awareness among staff of the existing measures in place to encourage the use of sustainable modes. The survey indicated the following proportions of all staff at the airport were aware of each of the existing schemes:

- Free Travel Zone = 61%;
- Carshare scheme = 47%
- Heathrow Express discount = 41%
- Bus service discounts = 35%;
- Cycle Hub = 30%;
- Heathrow Connect discount = 29%.

2.2.2 In this context, HAL's proposal to introduce a Personalised Travel Plan (PTP) for every new member of staff is a positive step and should increase the up-take of such offers and the related services to some extent. The 2013 employment survey indicated that less than 1 in 10 employers at the airport provided PTPs for staff. The impact of workplace PTPs on car demand/mode share is however highly dependent on a wide range of factors including location, catchment, the availability of free parking, the viability of alternative modes, and the organisational capacity/expertise to deliver a successful and comprehensive programme, and it is therefore difficult to forecast the impact of such a scheme at Heathrow.

2.2.3 Previous research undertaken for the DfT on the impact of Smarter Choices in 2005 suggested that the introduction of PTPs can result in a reduction in car driver trips of anything up to around 15%<sup>1</sup>, but it would appear that the top end of this range reflects a favourable context in terms of the factors listed above as well as a low baseline in terms of the measures that are already in place when the programme begins. The highest shift away from car achieved in any of the UK programmes studied occurred in Southwark for example, where the Public Transport offer is relatively good. In areas outside London, the maximum reduction appeared to be around 10%. The relatively high proportion of staff that work outside peak hours at Heathrow when compared with other workplaces also poses a challenge to achieving further mode shift targets through the delivery of a PTP programme in isolation.

2.2.4 The extent to which knowledge of positive demand management measures correlates with the current viability of a journey to Heathrow by sustainable modes is also unclear from the available data and as a result, the impact of a PTP programme on overall car demand at the airport may be limited if not accompanied by an expansion of the offer to include additional transport services, for example those

1

<http://webarchive.nationalarchives.gov.uk/20100304134509/http://www.dft.gov.uk/pgr/sustainable/smarterchoices/ctwwt/ter5personalisedtravelpl5767.pdf>



provided by TfL, and also more significantly, the introduction of increased costs to car travel to the airport – the feasibility of such measures is discussed later in this chapter.

#### ***Further Public Transport incentives***

- 2.2.5 The HAL submission includes a proposal to extend staff fare discounts to include TfL services, presumably including Crossrail, the Piccadilly Line and London Bus services. As indicated in Appendix C, at present the discounts only apply to bus services from outside London, some National Express and Railair coach links, Heathrow Express and Heathrow Connect. The submission also includes a proposal to extend the Free Travel Zone in consultation with local authorities, increasing the number of staff and passengers who could potentially travel to the airport free of charge.
- 2.2.6 In terms of impacts, introducing discounts on TfL services may significantly increase Public Transport mode share among airport staff. The 2013 employment survey indicated that a total of 41% of all staff live in the three London Boroughs of Hounslow, Hillingdon and Ealing, and that car/motorcycle mode share from each of these boroughs is 41%, 44% and 44% respectively. Among car users from these boroughs, 59-63% indicated that they used the car for convenience and 54-59% indicated that they did so to save time, but only 11-17% indicated that they used the car because there were no alternatives. Also, 21% of drivers in Ealing and 14% in Hounslow indicated that one of the main reasons why they drove to work was that it was 'cheaper'.
- 2.2.7 Furthermore, although no breakdown by borough was published in the 2013 survey report, some 26% of all staff who used the car to access the airport indicated they would consider switching to Public Transport if discounted tickets were available. Given that discounted bus tickets are already available to many locations outside London, it could be assumed that a higher proportion of London-based respondents would consider switching with the introduction of discounted fares, although the results may be partly related to a lack of knowledge of existing incentives among many staff as indicated earlier in this section. It is noted that more direct bus services and increased service frequencies were both stronger incentives to switch to PT than discounted tickets.
- 2.2.8 HAL's approach when it comes to PT discounts for staff involves the payment of a negotiated subsidy direct to the PT operator, which is likely to be related to the following key factors:
- direct negotiation with the operator allows HAL the opportunity to reduce the level of compensatory payments made to operators, on the grounds that a discount is likely to increase patronage on public transport services, thus benefitting the operator;
  - in contrast to subsidies for public bus services for example, direct reimbursements to employees for travel are only generally non-taxable for business-related journey purposes and not commuting – thus, a direct reimbursement to employees would have tax implications that would be potentially complicated to resolve given the range of employers located at the site.
- 2.2.9 HAL currently administer the sale of the Heathrow Travelcard, which provides discounts on independent bus and coach services, suggesting that the propensity to negotiate directly with the operator is not directly related to a desire to reduce its administrative role, although it would seem likely that the administrative costs are a factor considered during negotiations.
- 2.2.10 TfL at present offer a range of concessions on travel on PT services in London, including discounts for students, the elderly, apprentices, war veterans, and people registered with Job Centre Plus<sup>2</sup>. However, no discounts are currently offered to staff at any individual employers, and the current concessions offered are based on TfL policy objectives related to accessibility and making PT available to all – the reduction in fares offered to the groups described above are therefore designed specifically to overcome identified barriers to travel.

<sup>2</sup> <http://www.tfl.gov.uk/fares-and-payments/adult-discounts-and-concessions>

- 2.2.11 This raises the very real possibility that TfL may refuse to enter into negotiations on policy grounds because, for example, of the precedent that it may set for other employers seeking discounts for their staff. Also, if negotiations were opened, the level of compensatory payment may become an issue if TfL was unwilling to share any of the cost of implementing such a scheme with the airport operator.

## 2.3 Negative measures to discourage car use

### *Passenger parking management*

- 2.3.1 Appendix C of this report identifies that in terms of parking tariffs for airport passengers, those levied currently at Heathrow are broadly more expensive than those levied at Stansted and Gatwick, particularly in terms of the long-stay/business parking rates. However, the analysis indicated that more could potentially be done to discourage short-stay parking activity through charging – rates in premium car parks located close to terminals were higher at Gatwick for stays of between 2 and 9 hours for example, while at Stansted the standard tariff for stays between 1 and 4 hours was higher.
- 2.3.2 Added to this, parking is currently free for up to 2 hours in long-stay facilities at Heathrow (an incentive that does not appear to be offered at Gatwick) and use of the drop-off forecourt areas at the airport is free of charge. At Stansted, as at many other airports in the UK, a fee is levied for use of the forecourts, and this is discussed in more detail later in this section.
- 2.3.3 The more substantial ‘offer’ at Heathrow when compared with other airports in the UK, associated with being the UK’s recognised hub airport, should provide the airport operator with some latitude for increasing parking charges to discourage short-stay parking activity, and this latitude should widen if runway capacity at the airport was increased in future. Raising parking charges would also likely increase parking revenues at the airport, although as indicated in Appendix C, commercial and other revenue of this nature is subject to a net revenue per passenger cap imposed by the CAA so the airport operator may view parking charges as a zero-sum game in this respect. A recent report by the CAA does however indicate that the contribution of parking to non-aeronautical revenues is lower at Heathrow, at 18% of the total, than typically witnessed at other UK airports, where a range of 24-35% is more typical<sup>3</sup>.
- 2.3.4 Previous analyses of parking price/demand elasticity suggests that incrementally increasing tariffs in town and city centres does typically lead to an increase in parking revenue, as the cumulative impact of the increased fare paid by users is typically not off-set by the corresponding reduction in demand. At airports, passenger demand may well be less elastic for incremental changes in price than that observed in town and city centres as a result of the higher Values of Time (VoT) associated with airport trips, resulting in higher revenue increases as a result of tariff changes. However, the potential impact of price points, thresholds above which a significant drop in demand occurs, would need to be carefully considered when setting new tariffs.
- 2.3.5 The likely transfer of parking activity to remote privately-controlled facilities would need to be accounted for, as well as the propensity for constraints on passenger parking resulting in a sub-mode shift to taxis or ‘kiss and fly’ rather than a more desirable switch to PT. This issue was highlighted by the airport operator in their submission to the AC in 2014, which also rightly identified that taxi and ‘kiss and fly’ trips typically have more of an impact on traffic congestion as a result of the associated empty vehicle trips that are generated.

### *Forecourt charging*

- 2.3.6 One mechanism that could be considered to mitigate for the impact of taxi and ‘kiss and fly’ trips is forecourt charging. This is currently very popular at airports in the UK, with many already levying some

<sup>3</sup> [http://www.caa.co.uk/docs/78/HeathrowFinalReport\\_Redacted.pdf](http://www.caa.co.uk/docs/78/HeathrowFinalReport_Redacted.pdf)

form of charge for pick-up and drop-off activity, as shown in Table 2-1. A prominent example of such a scheme is the Express Set Down at Stansted Airport, details of which are provided in Figure 2-1.

**Figure 2-1: Pick-up/drop-off charges at Stansted Airport<sup>4</sup>**

*A charge of £2 for the first 10 minutes plus £2 for every subsequent minute is currently applied to vehicles using the Express Set Down pick-up/drop-off forecourt outside the terminal entrance at Stansted Airport, with no return allowed within 30 minutes subject to a £20 fine.*

*Residents and Hackney Carriage/Private Hire vehicles registered in Uttlesford and East Herts Districts currently qualify for a 75% discount on all charges (i.e £0.50 for the first 10 minutes plus £0.50 for every subsequent minute). However, for security reasons, vehicles carrying disabled blue badges are NOT exempt from paying the charge.*

*The qualification criteria for the discount are being revised from the 1<sup>st</sup> June 2015. All Hackney Carriages and Private Hire vehicles will be excluded from this date, but all residents within a 10-mile radius of the airport will qualify. The overall scale of the discount will also be reduced from 75% to 50%.*

*Entry and exit to the Express Set Down area is controlled by barriers, with users paying on exit – a ticketless Automated Number Plate Recognition (ANPR) system records entry and exit times to calculate duration of stay. Unattended vehicles, even those left for short periods of time, are towed away by police and a fine is levied to retrieve the vehicle.*

*Real-time signage is employed to direct road users to the short-stay and the mid-stay car parks – in the latter, pick-up/drop-off activity is free for up to 1 hour and £1 for between 1 and 2 hours, and the car parks are connected to the terminal via a shuttle bus with a one-way journey time of 5 minutes and a frequency of 10 minutes.*

- 2.3.7 However, as indicated in Table 2-1, in many instances (for example Stansted, Edinburgh, Liverpool, Luton and Newcastle), forecourt charging is off-set through the provision of free short-stay parking elsewhere on the airport site, usually in long-stay car parks, with terminal access typically provided via a shuttle bus service.
- 2.3.8 Free alternative drop-off/pick-up areas provided elsewhere on airport sites means that the average additional cost to kiss-and-fly trips is likely to be lower than the quoted prices and the impact on congestion is therefore more likely to be limited to the roads serving forecourts directly, rather than necessarily resulting in a significant mode shift either from kiss-and-fly to other car-based modes or to PT. At Heathrow for example, the retention of free parking in the long-stay car parks for up to 2 hours would mean that the main impact of a forecourt charging scheme may simply be to transfer vehicle trips from the forecourts to the long-stay parking areas.
- 2.3.9 This suggests that in most cases, forecourt charging is often introduced as a means of tackling congestion issues on the forecourt itself rather than necessarily encouraging a general mode shift to public transport among airport passengers and visitors. Revenue from forecourt charging would also likely be classified as commercial revenue according to the airport operator's economic regulation licence, and would therefore be subject to the net revenue per passenger cap determined by the CAA.

<sup>4</sup> <http://www.stanstedairport.com/transport-and-directions/driving-to-stansted>

Table 2-1: Summary of forecourt charging at UK airports

Airport	Pick-up charge	Drop-off charge	Free alternative	Fees <sup>5</sup>
Aberdeen	✓	✓	✗	Short Stay car park: £1 for up to 15 minutes; £3 for 15-30 minutes
Belfast City (George Best)	✗	✗	n/a	Short Stay car park: free for up to 10 minutes; £2.70 for 10-30 minutes
Belfast International	✓	✓	✗	Drop off/pick up zone: £1 for up to 10 minutes Short Stay car park: £1.50 for the first 15 minutes
Birmingham	✓	✓	✗	Drop off/pick up area: £1 for up to 10 minutes
Bournemouth		✓	✗	Drop off zone: £2.50 for up to 30 minutes
Bristol		✓	✗	Drop off area: £1 for up to 20 minutes
Cardiff	✓	✗	✓	Drop off area: free for up to 10 minutes Pick up area: £1 for up to 20 minutes Long stay 1: free for 20 minutes (shuttle bus)
City of Derry	✗	✗	n/a	First 10 minutes: free outside the terminal and in the Short Stay car park
Dundee	✗	✗	n/a	Long stay car park: free for 30 minutes Short stay car park: £1.50 per hour
Doncaster Sheffield (Robin Hood)	✓	✓	✓	Drop off/pick up: £1 for up to 15 minutes Short Stay car park: free for up to 15 minutes
Durham Tees Valley	✗	✗	n/a	Car Park: free for up to 3 hours
East Midlands International	✓	✓	✓	Drop off area: £1 for up to 10 minutes Short stay car park: £2.40 for up to 30 minutes JetParks Plus: free for up to 1 hour (shuttle bus)
Edinburgh	✓	✓	✓	Drop off zone: £1 for up to 5 minutes; £3 for 5-10 minutes Pick up zone: £2.90 for the first 15 minutes Long stay car park: free for the first 10 minutes
Exeter International	✓	✓	✓	Car Park 1: £1 for 30 minutes Car Park 4: free for the first 10 minutes (shuttle bus)

<sup>5</sup> [http://www.caa.co.uk/docs/2200/Airport\\_Charges.pdf](http://www.caa.co.uk/docs/2200/Airport_Charges.pdf); <http://www.eastmidlandsairport.com/emaweb.nsf/Content/pickupanddropoff>

Airport	Pick-up charge	Drop-off charge	Free alternative	Fees <sup>5</sup>
Glasgow	✓	✗	✗	Pick up area: £1.50 for 10 minutes Drop off area: free of charge
Glasgow Prestwick	✗	✗	n/a	Terminal pick up/drop off area: free for the first 5 minutes; £1.50 for 6-15 minutes
Humberside	✗	✗	n/a	Drop off/pick up area in the Short Stay car park: Free for up to 15 minutes
Inverness	✗	✗	n/a	Short Stay car park: free for up to 20 minutes
Leeds Bradford	✗	✗	n/a	Free parking for 1 hour, 3-4 minutes walk from the terminal
Liverpool	✓	✓	✓	Express drop off/pick up: £2 for up to 20 minutes Drop off 2: free for up to 20 minutes
London City	✓	✗	✗	Drop off in the terminal forecourt: free Pick up in the Short Stay car park: £6 for 30 minutes
London Gatwick	✓	✗	✓	Drop off only in the terminal forecourts: free Pick up in the Short Stay car park: £3 for up to 30 minutes Drop off/pick up in the Long Stay car park: free (shuttle bus)
London Heathrow	✓	✗	✓	Pick up in the Short Stay car park: £3.50 for 30 minutes Drop off in the terminal forecourts: free Free parking for up to 2 hours in long-stay car parks
London Luton	✓	✓	✓	Priority Set Down: £2 for 15 minutes Mid Stay car park: free for up to 30 minutes (shuttle bus)
London Southend	✗	✗	n/a	Short Stay for Drop off/pick up: free for the first 5 minutes; £3 for 5-25 minutes
London Stansted	✓	✓	✓	Express Set Down: £2 for 10 minutes Mid Stay car park: free for 1 hour (shuttle bus)
Manchester	✗	✗	n/a	Drop off/pick up: free outside Departures Short Stay car park: £2.90 for up to 30 minutes
Newcastle International	✓	✓	✓	Express parking: £1 for up to 10 minutes Medium Stay car park: free for the first 15 minutes
Newquay	✗	✗	n/a	Free in the car park for first 10 minutes; £1 for 10-30 minutes
Norwich International	✗	✗	n/a	Short Stay car park: free for the first 15 minutes; £2 for 15-30 minutes
Southampton	✗	✗	n/a	Short Stay car park: free for 10 minutes; £3.30 for 10-30 minutes

### **Staff parking**

- 2.3.10 The summary of current staff parking arrangements in Appendix C indicates that at present, the annual staff parking tariff at the airport is £635, and this cost is levied by the airport operator to tenants rather than direct to their employees. Therefore, it is not clear that this cost is passed directly on to airport staff, suggesting that for some, parking on-site is effectively perceived as free of charge.
- 2.3.11 In their 2014 submission to the AC, HAL indicated that they intended to introduce new staff parking policies including the central management of permits, needs-based allocation, charges based on usage of facilities rather than a fixed cost, and incentives to encourage staff to give up permits. These measures would be accompanied by a reduction of staff parking spaces and parking pass availability over time as the measures described above result in a mode shift to PT, and the accompanying introduction of ancillary traffic management, notably CPZs, in neighbouring areas to prevent displaced employee parking.
- 2.3.12 The measures outlined above, if implemented effectively, could significantly reduce employee parking and associated traffic demand at the airport, and a joined-up approach involving the introduction of PTPs and further incentives promoting sustainable modes as described earlier in this chapter represents in theory a sound strategy for reducing employee traffic impacts.
- 2.3.13 In terms of technical feasibility, there are many examples of web-based parking management systems already in operation at institutions that control a large employee parking stock, such as universities and health-care facilities. These systems can be established to be fully flexible in terms of allocating permits to registered users with price differentials or restrictions applied to fulfil policy objectives based on a wide range of criteria including income, mobility, shift hours, and access to PT services – an example is the system in place at Loughborough University, where staff parking permits are priced based on staff grade and vehicle emissions band category<sup>6</sup>. Such systems can be GIS-linked in order to identify home addresses that are within 400m of a PT interchange for example, and users registering for permits with such addresses can either be charged more or prevented from purchasing a permit.
- 2.3.14 Given that the majority of staff at Heathrow park in a small number of facilities controlled by HAL, it would therefore appear that such a system could be implemented relatively easily, particularly since an airport ID card is already a requirement to obtain a parking permit.
- 2.3.15 The main obstacles to its introduction would appear to be the price control regulations that the CAA currently imposes on the airport operator, and the response of airport tenants to an alternative staff parking management proposal. As indicated in Appendix C, protocols have been agreed between HAL and the Heathrow Airline Operators' Committee (AOC) governing the rates charged by HAL for Other Regulated Charges (ORCs), including staff parking. These protocols, based on conditions in HAL's economic regulation licence issued by the CAA, specifically tie the cost of permits to maintenance and prohibit the cross-subsidisation of income. This suggests that it may be difficult for HAL to implement a system that would be truly effective in terms of making car an unattractive choice for employees compared to alternative modes without a) the CAA allowing an amendment to the terms of the airport's economic regulation licence with regard to staff parking (the current licence expires at the end of 2018); and b) encountering strong resistance from its tenants.
- 2.3.16 Unless binding targets associated with runway expansion are set for reducing staff parking activity at Heathrow and the use of tariffs as a policy lever for achieving these targets is endorsed by the CAA, the main driver underpinning the objectives of a staff parking management system is likely to be the linkage between staff parking revenues and maintenance/operational costs. This must cast doubt on the effectiveness of such a system in delivering a significant reduction in traffic demand at the airport.

<sup>6</sup> <http://www.lboro.ac.uk/services/security/traffic/>

### **Road user charging**

- 2.3.17 Another measure referenced in the HAL submission is congestion charging. The May 2014 submission indicates that *“to support the use of public transport and more efficient use of cars, we will consult on a congestion charge zone for Heathrow. This would only be introduced once suitable public transport alternatives are in operation. We would wish the proposals to be appropriate and fair so that, for example, appropriate exemptions are in place which could include disabled passengers, taxis or local communities. Such a concept could bring significant benefits, helping to reduce traffic movements to Heathrow, reduce emissions and support more sustainable travel patterns”*.
- 2.3.18 The submission goes on to state that *“a congestion charge has the potential to generate significant revenues that could retrospectively fund contributions to major rail, London Underground and road infrastructure improvements. Revenues could also fund sustainable travel initiatives, public transport service improvements and local community transport projects. We will complete further feasibility work to determine the geographical extent of the zone, charging levels and any legal powers required to implement a system”*.<sup>7</sup>
- 2.3.19 Existing road-based congestion charging schemes at airports generally take the form of tolling on access roads rather than zone-based charging, although in practice this is generally also the case for most city centres and urban areas where congestion charging schemes are currently in operation. For example in cities such as Stockholm and Milan, a congestion charge is levied using a series of electronic toll gates on a cordon across all access roads into the city centre, and vehicles are charged only for crossing the cordon. The London Congestion Charging Zone (CCZ), introduced in 2003, is something of an exception as all eligible vehicles making trips covering any part of the zone (including those that start and finish within the zone) are charged rather than just those crossing the zone boundary.
- 2.3.20 Research undertaken for this study found no evidence of any airport anywhere in the world with an area-based system similar to the London CCZ in place, but tolling on access roads to some airports effectively creates a cordon where the number of approach roads are limited – a good example of this is Incheon International Airport in South Korea, which is located on an island with only two highway connections, both of which are subject to tolls, meaning that all vehicles trips to and from the airport with the exception of those starting and finishing on the island itself can be charged.
- 2.3.21 At other airports, tolls are often levied for express routes to the airport but drivers have the option of using other, slower routes free of charge. A good example of this is Brisbane Airport in Australia, where a charge is levied on the Airport Link M7 motorway tunnel connecting the airport with the CBD, but drivers can access the airport for free via alternative routes. The online payment portal provides details of tolled and non-tolled routes from different areas of the city to the airport, highlighting the journey time savings of using the tolled route.
- 2.3.22 Table 2-2 provides some examples from around the world where airport access roads are subject to tolls. Although each scheme is unique to some degree, the table suggests that there are a number of consistent elements to all the exemplars summarised, as follows:
- Tolls are typically levied by the relevant traffic authority rather than the airport operator, and are generally applied on the public highway approaches to the airport rather than on roads within the airport boundary;
  - Airport access tolls are typically charged as part of a wider programme of tolling covering urban roads, rather than being specifically targeted at airports;
  - Modern systems generally utilise a network of purpose-built Automatic Number Plate Recognition (ANPR) cameras to identify vehicles driving on roads where the charge is imposed, negating the

<sup>7</sup> Heathrow Airport Ltd (May 2014), ‘Taking Britain further – Heathrow’s plan for connecting the UK to growth (Volume 1)’ – page 221

need for vehicles to slow down or stop at toll booths, and payment is usually made through online portals;

- Schemes tend to be implemented where there are a small number of express routes to airports, with limited options for alternative routes.

- 2.3.23 It should be noted that no airport in the UK is currently subject to any form of road tolling with the exception of forecourt charging, which is described earlier in this report and tends to be referred to in relevant literature as a parking charge rather than a road user charge.
- 2.3.24 Since the HAL submission did not provide any details of what a congestion charging zone around Heathrow may look like, the remainder of this section considers the pros and cons of a range of scheme options identified by Jacobs. It should be noted that these schemes are indicative and hypothetical in nature, and further development work would be required to identify the optimal proposal for each scheme, let alone the overall feasibility and benefits/costs. It should also be noted that the schemes identified are presented independently for the sake of clarity in this report but are not necessarily mutually exclusive.
- 2.3.25 It is reasonably clear from looking at road charging/tolling exemplar schemes from around the world that the introduction of a congestion charging area or toll-ring around Heathrow Airport will be technically feasible. In the past, the requirement to locate toll booths on the highway may have resulted in physical space issues on certain approach roads, but the use of ANPR technology and online payment portals is now well established for highly complex schemes such as the London CCZ, meaning that charging can now be implemented on the narrowest of access roads.
- 2.3.26 The use of ANPR technology also means that it is now a relatively straight-forward process to implement variable hours of operation and time-variable charging, and also to allow discounts and exemptions for certain road user groups. The latter can be achieved either on the basis of specific vehicle identification or through recording road user behaviour – for example, the island of Lidingö in Stockholm is only accessible to the wider road network in Sweden by driving through the city centre congestion charging zone, and so vehicles passing through the Lidingö toll gate are exempt if they are recorded at another gate within 30 minutes. Residents and visitors on the island are therefore subject to a charge if they drive into the city centre but are exempt if they are making through-trips to/from other locations.
- 2.3.27 In contrast to technical feasibility, the question of commercial viability is more difficult to assess at a high level given the range of variables influencing traffic volumes on the network. However, research suggests that city centre schemes at least do appear to generate substantial operating profits that in the long-term cover implementation costs and provide a source of funding for other transport enhancements. TfL's 2013/4 Statement of Accounts indicates that total revenue from the Central London CCZ during the financial year was £234.6m, 4.9% of TfL's gross income. Total costs including toll facilities, traffic management, administration, support services and depreciation were £85.4m over the same period, resulting in a net annual income of £149.2m, an increase from £132.1m in 2012/3. A wide range of variables would determine the commercial viability of a scheme around Heathrow, including its geographic extent, times of operation, available reductions and exemptions.



Table 2-2: Highway tolling at airports

Airport	Scheme description	Tariff (Car/LGV)	Enforcement system	Toll Authority	Payment details
Brisbane	Main route to airport tolled	AU\$4.62/AU\$7.83	Automatic Detection	BrisConnections - Private Company	Automatically charge from prepaid account, or pay online with a set time period. One way, round trip and day passes available. Charge varies by route
Sydney	Fast route to Northern Sydney/business district	AU\$6.42/AU\$12.84	Automatic Detection	Roads and maritime Services (Government Authority)	Automatically charge from prepaid account, or pay online with a set time period. Charged Northbound (away from airport) only. Other routes available.
Orlando	Fast Route to Airport. Part of statewide tolled freeway network.	US\$0.50	Barrier/Automatic Detection	Central Florida Expressway Authority	\$0.50 Cash or payment using E-Pass electronic system
Houston	Part of county wide tolled network. Airport Connector tolled.	US\$1.25	Barrier/Automatic Detection	Harris Country Toll Road Authority	\$0.10 saving with EZ-Tag electronic system. Some entry/exit ramps are EZ TAG only ramps.
Narita (Tokyo)	Fast Route to Airport. Part of nationwide tolled expressway network.	Varies by distance (charged by km)	Ticketed or Electronic Payment	Highway Authority	Ticketed or electronic payment
Kansai (Osaka, Japan)	Fast Route to Airport. Part of nationwide tolled expressway network.	Varies by distance (charged by km)	Ticketed or Electronic Payment	Highway Authority	Ticketed or electronic payment
Incheon (South Korea)	Airport on island, both entry ways tolled.	Incheon Bridge 6,000 KRW, Incheon IAE 7,600KRW	No information available	No information available	No information available
Madrid	Main route to airport tolled, part of national tolled motorway network	Varies by distance. Main access road €1.00	Ticketed or Electronic Payment	Highway Authority	Ticketed or electronic payment.
O.R. Tambo (Johannesburg)	Fast route to airport tolled, part of national tolled motorway network. Alternative route available.	Varies by Distance	Ticketed or Electronic Payment	National Road Agency	

- 2.3.28 The proposed road network around Heathrow associated with the North West Runway scheme is shown in Figure 2-2. The key changes and improvements proposed as part of the airport expansion scheme can be summarised as follows:
- Realignment of the M25 and associated motorway access roads between junction 14a and 15, including a new tunnelled section beneath the proposed third runway – this includes reconfigured access to the motorway to increase segregation of local traffic and reduce weaving;
  - Realignment and reconfiguration of access to T5 from M25 junction 13/14, creating a counter-clockwise loop between the terminal, the M25 and the Southern Perimeter Road;
  - Construction of a new tunnel providing direct access between the Southern Perimeter Road and the CTA; and
  - Diversion of the A4, between Colnbrook and the Emirates roundabout, around the proposed third runway footprint.
- 2.3.29 The pros and cons of different road-user charging options have been explored in the context of the above road layout serving Heathrow with the North West Runway in place. The following options have been considered:
- Motorway tolling – implemented on the M25 and M4/M4 Spur approaches to Heathrow;
  - Wider area ‘toll-ring cordon’ – entry/exit gates introduced on roads around the airport excluding motorways, for example the A4, A312, A30, A3044, Staines Road, Fagg’s Road, Sipson Road, Hatch Lane;
  - Wider area ‘zone-based charge’ – similar geographic scope to the wider area cordon but covering all vehicle trips made within the designated area rather than those just crossing the cordon boundary;
  - Public highway access ‘toll-ring cordon’ – entry/exit gates on the relevant arms of junctions on the public highway that connect with the airport’s perimeter road network;
  - Private airport road ‘toll-ring cordon’ – similar scope to the above but with gates introduced on private roads within the airport boundary.
- 2.3.30 A preliminary high-level review of the options above identified the pros and cons of each listed in Table 2-3. In very broad terms, both the benefits and the costs/issues associated with each scheme appear to increase with the geographic scope.

Figure 2-2: Heathrow North West Runway Local Road Layout

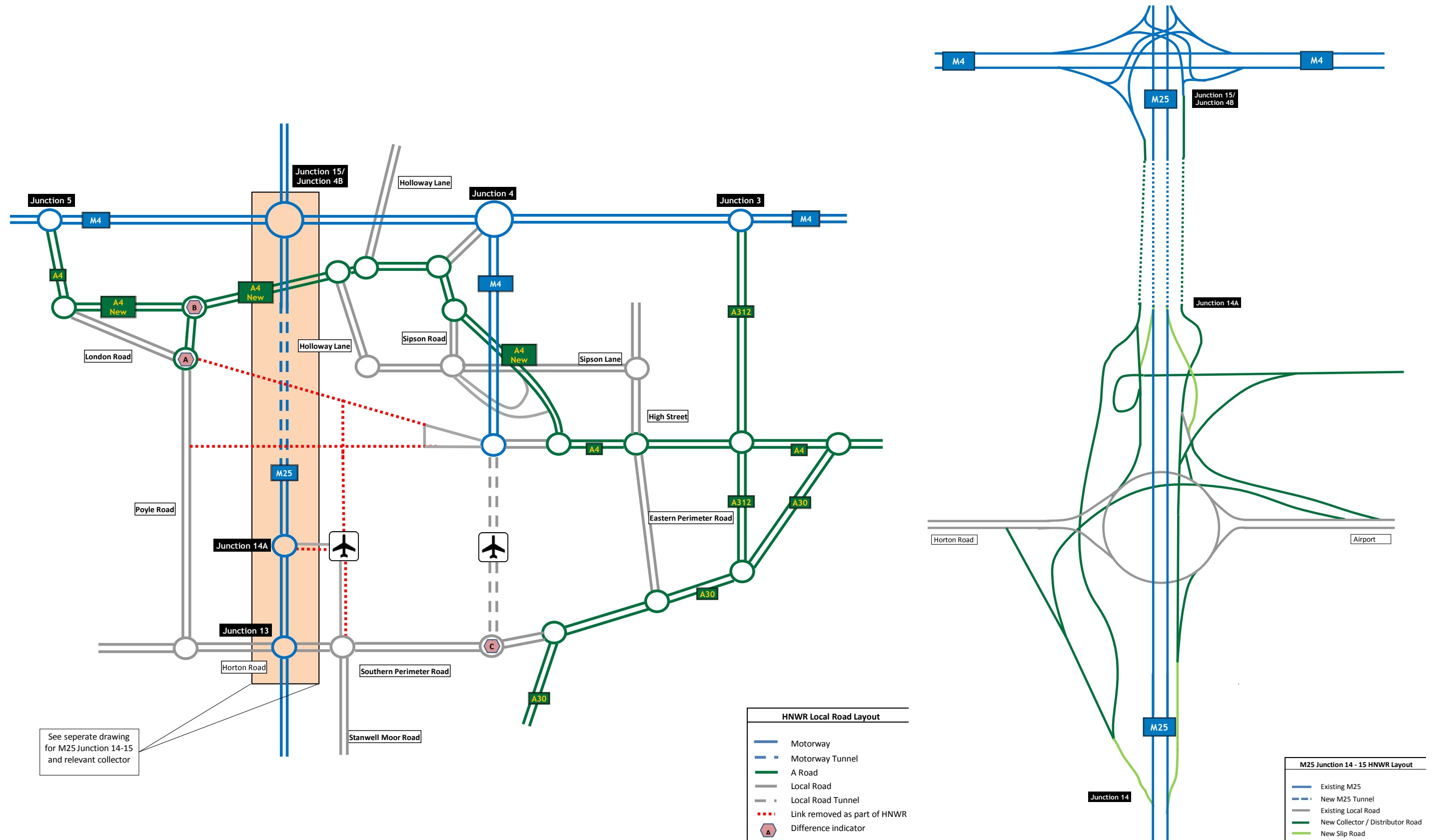


Table 2-3: Pros and cons of road-user charging scenarios at Heathrow Airport

Charging option	Pros	Cons
Motorway 'express route' tolling	Potential to significantly reduce both background and airport-related traffic levels on heavily congested sections of motorway	Significant ancilliary traffic management likely to be required on local and regional strategic alternative routes
	Good revenue potential due to high traffic flows	Strong opposition likely from regional and national motorist lobbies
	Relatively low direct costs when compared with a zone/cordon-based scheme due to low number of gateway points	No legislative framework currently in place
	Single traffic authority (Highways Agency) with overall responsibility for implementation and management	Limited impact on airport car users from areas with strong PT offer (i.e. London) Requires external government support to implement
Strategic cordon tolling	Potential to reduce both background and airport-related traffic levels on local roads around the airport	Ancilliary traffic management likely to be required around zone boundary
	Would reduce traffic impacts related to remote parking at airport, including that related to adjacent land-uses	Depending on boundary location, could increase traffic congestion issues in adjacent town centres and around public transport interchanges, particularly stations on the GWML, Piccadilly Line and Windsor Lines (if SRA is introduced)
	Good revenue potential due to high current traffic flows	May also significantly increase background traffic flows on motorway and A-road network providing strategic alternative routes
	Legislative framework already in place (Greater London Authority Act 1999/Transport Act 2000)	Likely to be strongly opposed by local residents and businesses unless exemptions are offered
	Depending on boundary, could be implemented by single authority (TfL)	Requires external government support to implement
Strategic area tolling	As per strategic cordon tolling, but with additional traffic-reduction/revenue benefits due to capture of additional trips	As per strategic cordon tolling but with additional implementation/management costs
		Scheme also likely to face stronger opposition from local residents than cordon tolling unless exemptions are offered

Charging option	Pros	Cons
Public highway access tolling	Relatively cheap to implement (only currently 10 access points from the public highway to the perimeter road network that are unrestricted for general traffic)	Likely to require significant ancilliary traffic management measures around airports, including around nearby public transport interchanges
	Could be implemented by single authority (TfL) – 5 of the 10 aforementioned access points are direct from the TLRN and a further 3 are from borough roads within the GLA area	Permission would be required from the Secretary of State to complete a toll-ring cordon covering accesses direct from the M25 and M4 to the airport road network
	Legislative framework already in place (Greater London Authority Act 1999)	Scheme would only impact directly on airport users - limited/no impact on background non-airport traffic
	Likely to be less opposition from local residents and businesses if appropriate ancilliary traffic management measures are implemented	Will not impact on airport users who park remotely from the airport site, including those driving to adjacent airport-related facilities such as hotels and warehousing
Airport-boundary cordon tolling	Single authority (HAL) with overall responsibility for implementation and management	Likely to require significant traffic management measures on public highways around airports, including around nearby public transport interchanges
	Likely to be less opposition from local residents and businesses if appropriate ancilliary traffic management measures are implemented	Scheme would only impact directly on airport users - limited/no impact on background non-airport traffic
	Cheaper to implement than a strategic cordon/area-based scheme	Will not impact on airport users who park remotely from the airport site, including those driving to adjacent airport-related facilities such as hotels and warehousing
	More limited requirement for political support when compared with a wider area scheme or one affecting the public highway	

### ***Airport operator access charging***

- 2.3.31 The most straight-forward option appears to be the private airport road ‘toll-ring cordon’. The capital costs would be relatively low (for example at present there are only 10 unrestricted vehicle accesses to the perimeter road network at the airport) and since the geographic coverage would be limited to private roads owned and managed by HAL, the assumption would be that the airport operator would fund, implement and manage the scheme.
- 2.3.32 In regulatory terms there is little to prevent the airport operator from levying a charge for usage of its own road network other than general competition law, which would only be a factor if the charge was interpreted as excessive in terms of fulfilling its objectives. Income from such a scheme would likely be categorised as commercial revenue by the CAA under the current economic regulatory framework governing price controls at the airport. This means a toll would likely impact on the net revenue per passenger cap imposed by the CAA, but the ‘single till’ approach to calculating the cap (accounting for total income from a wide range of revenue streams) means it may be reasonable to assume that no conditions would be placed on the level of the charge levied.
- 2.3.33 Also, in theory if all road users are charged, the impact in terms of encouraging a mode shift away from car among airport users is likely to be more significant than a forecourt charge that would only impact on kiss-and-fly and (potentially) taxi trips. Since the scheme would only target airport users, it also appears unlikely that it would face significant opposition from local residents and businesses outside the airport boundary, many of whom may well support such an initiative to help relieve congestion on roads in their area.
- 2.3.34 However, there are a number of obvious limitations with such a scheme. The geographic extent means that there would be no impact in terms of encouraging a reduction in background non-airport traffic around Heathrow, nor would airport users who park remotely from the site be affected. In fact, the implementation of a scheme that only covered the roads in the immediate vicinity of the terminals would likely lead to increasing pressure on remote parking areas and also add an incentive for private operators seeking to increase remote parking capacity, which would need to be controlled by local authorities. In addition, it would also likely lead to an increase in pick-up/drop-off and informal parking activity at transport interchanges in the vicinity of the airport, the control of which would have knock-on costs and implications for traffic authorities.
- 2.3.35 A privately-controlled scheme would also have disadvantages related to pricing and the distribution of revenue. HAL in their submission indicated that the proceeds could be fed into a ‘Super Public Transport Levy’ that could be used to retrospectively fund rail upgrades. However, it would appear likely that income from such a scheme would be identified as ‘non-aeronautical revenue’, and would therefore be accounted for by the CAA in its assessment of airport charges, off-setting the revenue-raising benefits of the scheme to a degree. In addition, the management of revenue in this way may create issues with flexibility in terms of guiding the allocation of resources to tackle priority transport issues. Revenue would also inevitably be targeted more at issues directly affecting airport operations rather than at meeting wider transport objectives.
- 2.3.36 In addition, as with parking, the setting of tariffs would likely be dictated to a significant extent by the operators’ perception of the commercial implications. This may lead to the impact of the scheme being compromised by, for example, exemptions or discounts offered to airport staff or freight-handling companies using the cargo terminal at the airport.

### ***Public sector airport access charging***

- 2.3.37 The aforementioned pricing and revenue distribution issues would be resolved if a similar scheme was implemented at junctions linking the public highway with the airport road network and managed by the public sector. The most obvious organisation to deliver such a scheme would appear to be TfL – 5 of

the 10 current unrestricted vehicular accesses to the airport's perimeter road network are direct from the Transport for London Road Network (TLRN) and a further 3 are from borough roads in the GLA area. In effect, this scheme would be similar to the one proposed by Ken Livingstone, the Mayor of London in 2003<sup>8</sup>. The same regulatory powers used to implement the Central London CCZ<sup>9</sup> could be applied in this case to deliver the scheme, which would not legally require the support of local authorities in the area – the CCZ was implemented in Central London despite strong opposition from Westminster Council, regardless of the fact that the Council controls a significant proportion of the roads within the zone<sup>10</sup>.

- 2.3.38 However, the limitations of the scheme with regard to its geographic scope, described above, would still apply, and public sector management of a scheme would present its own issues. The two strategic road accesses to the site at present involve direct connections from the M25 and the M4 to the airport road network via motorway spurs – although the alignment of these accesses would change with the introduction of either airport expansion proposal, the broad characteristics (i.e. the provision of a motorway connection direct to the airport road network) would be retained in both cases.
- 2.3.39 This means that a public sector-managed cordon or toll-ring scheme around the airport would essentially involve charging on Highways Agency trunk roads. There is limited provision in current legislation for charging on trunk roads, and the Secretary of State would need to grant special approval if a TfL-led scheme was to be extended to cover the motorway accesses<sup>11</sup>. While it is not necessarily the case that this would present a significant barrier to delivery, it does potentially complicate the political considerations and increases the possibility that such a decision would be viewed in a national rather than local/regional context. It is worth considering that previous national road pricing proposals have attracted strong political and public opposition<sup>12</sup>.
- 2.3.40 A TfL-led scheme could of course be introduced without covering the motorway accesses, which could reduce demand on congested sections of the TLRN but this would likely lead to increasing demand on sections of motorway that are already forecast to be heavily congested in future regardless of any expansion at Heathrow.

### **Wider area charging**

- 2.3.41 This issue would also need to be tackled if a wider-area public sector-led scheme was implemented covering major traffic routes around the airport, and the potential obstacles to delivery in the form of opposition from local residents and businesses would appear to be more difficult to overcome unless significant discounts/exemptions are granted. A wider area zone would also be more costly to implement and is likely to create more strategic re-routing of traffic, potentially increasing the scope and costs of ancillary traffic management measures – for example, the potential impact on the M25/M4 would need to be carefully assessed if these routes were not included within a wider area zone, as would the impact on strategic routes into London such as the M3/A316 and the M40/A40 and more local distributors such as the A3063 around Hounslow town centre.
- 2.3.42 The Transport Act 2000 does grant powers for “a joint local-London charging scheme” to be implemented “by one or more non-metropolitan local traffic authorities and one or more London traffic authorities”, and the provisions for introducing such a scheme only make reference to a requirement

<sup>8</sup> <http://news.bbc.co.uk/1/hi/england/london/2931901.stm>

<sup>9</sup> Section 295 of the Greater London Authority Act 1999 gives Transport for London, any London borough council, or the Common Council the power “to establish and operate schemes for imposing charges in respect of the keeping or use of motor vehicles on roads in its area” (<http://www.legislation.gov.uk/ukpga/1999/29/section/295>)

<sup>10</sup> <https://www.westminster.gov.uk/sites/default/files/uploads/workspace/assets/publications/Briefing-note-which-sets-out-the-1253706168.pdf>

<sup>11</sup> Section 167 of the Transport Act 2000 states that “a trunk road charging scheme may only be made (a) by the Secretary of State in respect of roads for which he is the traffic authority, or (b) by the National Assembly for Wales in respect of roads for which it is the traffic authority”. It goes on to state that “a trunk road charging scheme may only be made in respect of a road if (a) the road is carried by a bridge, or passes through a tunnel, of at least 600 metres in length, or (b) a local traffic authority or Transport for London has requested the charging authority to make the trunk road charging scheme in connection with a charging scheme under this Part, or a scheme under Schedule 23 to the Greater London Authority Act 1999, made or proposed by them” (<http://www.legislation.gov.uk/ukpga/2000/38/part/III/chapter/I>).

<sup>12</sup> [http://news.bbc.co.uk/1/hi/uk\\_politics/6381153.stm](http://news.bbc.co.uk/1/hi/uk_politics/6381153.stm)

that it is “*desirable for the purpose of directly or indirectly facilitating the achievement of policies in the charging authorities’ local transport plans (including the Mayor of London’s Transport Strategy)*”<sup>13</sup>. However, the inclusion of key routes outside the GLA boundary would obviously complicate the delivery process due to the requirement for co-ordination between multiple traffic authorities.

- 2.3.43 However, the benefits of such a scheme in terms of the traffic reduction and congestion relief potential appear to be significantly greater than those associated with a scheme that only covers the airport road network. Depending on the positioning of the boundary and the discounts/exemptions offered, airport-related trips to remote parking facilities and nearby public transport interchanges/employment areas could be more effectively discouraged (increasing the potential for a mode shift among passengers and staff), and the scheme could also significantly reduce background traffic demand in the wider Heathrow area. A wider area scheme would also allow toll-ring and cordon options to be considered alongside area-based proposals like the Central London CCZ.

### **Motorway tolling**

- 2.3.44 The final proposition considered in this study is the introduction of tolls exclusively on the motorway network around the airport, either on the spurs (thus only effecting airport-related traffic) or on the main carriageway, which would capture significant volumes of background non-airport trips. Such a proposal would effectively provide an equivalent to the express-route tolls in place at other airports described above, and would be significantly cheaper to implement than a wider area charging scheme as only a very limited number of locations would need to be tolled.
- 2.3.45 However, when compared to the alternatives considered above, one issue that would present more of a challenge with such proposals relates to the regulatory framework. As described earlier, charging on trunk roads can only presently be implemented with the permission of the Secretary of State provided that a bridge or tunnel of at least 600m is involved or the proposal is made as part of a wider scheme proposed by a local traffic authority. Charging exclusively on the motorway network would therefore suggest that an amendment would need to be made to the Transport Act 2000 or that a new act would be required, further complicating the political context and increasing the likelihood of national opposition described in the previous section.
- 2.3.46 In practice, even if this regulatory hurdle was overcome, it seems unlikely that a scheme involving only the airport motorway spurs would be delivered as a stand-alone measure due to the potential knock-on impact of airport traffic re-routing from the motorway network onto already congested sections of the TLRN to avoid paying the toll, which would need to be addressed by TfL and local authorities. One of the most cost-effective tools to mitigate the impact would of course be to levy a toll at other entry points to the airport as well, effectively creating an access cordon. The variety of road accesses at the airport at present suggests that re-routing would be the primary response of many drivers if a motorway-only airport access toll was imposed, although the inconvenience may encourage a number to transfer to alternative modes.

The introduction of a general toll for all traffic on the M4 and M25 approaching the airport could have a significantly greater impact in terms of reducing background traffic through one of the most congested sections of motorway network in the UK (junction 15 with the M4 on the M25), but could create significant issues in terms of both local rat-running and strategic re-routing of traffic that may negatively impact on other sections of the motorway network. Such a proposal would definitely provoke a national debate and is far more likely to be seen as a precursor to nationwide road pricing than a scheme designed specifically to tackle congestion around Heathrow.

<sup>13</sup> <http://www.legislation.gov.uk/ukpga/2000/38/part/III/chapter/>



## 2.4 Efficiency measures to reduce traffic impacts

- 2.4.1 As referenced in Appendix C, the only demand management measure currently in place at the airport that focusses on reducing traffic impacts by improving the efficiency of operations is the car-sharing scheme targeted at airport staff. In their 2014 submission to the AC, HAL proposed to add to this by investigating the potential for taxi-sharing/taxi-matching schemes for passengers to increase overall vehicle occupancy and reduce the proportion of empty taxi trips made to and from the airport. At present, 78% of taxis at the airport make a one-way trip empty, constituting a significant proportion of total airport-related traffic on the road network. The submission did not include any details of how either scheme would work.
- 2.4.2 In terms of current operations, all taxis including London Licensed 'Black Cabs' and Private Hire Vehicles (PHVs) can use the terminal forecourts to drop-off passengers. The forecourts are currently free of charge but are restricted for drop-off activity only, with pick-up prohibited.
- 2.4.3 Waiting is heavily restricted on the road network within the airport boundary generally. Black Cabs picking up passengers at Heathrow must be registered with HAL and generally must wait at the Taxi Feeder Park located on the Northern Perimeter Road before being dispatched to terminal taxi stands as passengers arrive. The airport operator levies a charge of £5.22 for each entry to the Feeder Park, with the exception that re-entry is free within an hour to compensate drivers for low fares received for short local trips from the terminal stands. This levy is defined as an ORC and is therefore subject to the same protocol agreed with the AOC governing staff parking charges. The cost is partially recouped by drivers through the £2.80 'Heathrow Extra' charge levied on passengers boarding Black Cabs at the airport<sup>14</sup>.
- 2.4.4 In contrast, Heathrow's byelaws indicate the following provisions with regard to PHVs picking up passengers at the airport:
- *"No person shall cause or permit a Private Hire Vehicle to enter the Airport for the purpose of loading passengers unless that Private Hire Vehicle has been pre-booked or is to be parked in an official car park in anticipation of such a booking;*
  - *No person shall cause or permit a Private Hire Vehicle to load passengers at the Airport other than in an official car park;*
  - *No person shall in the Terminal Building or other public building, car park or any other public place on the Airport offer his or any other Vehicle (unless that Vehicle is a Taxi or Public Service Vehicle) for hire"<sup>15</sup>.*
- 2.4.5 The difference between the pick-up arrangements for Black Cabs and PHVs is related to wider regulation of the taxi industry in London, which identifies Black Cabs as the only hire vehicles that can pick-up passengers on the street without pre-booking – as a result, Black Cabs are the only vehicles allowed on to 'walk-up' terminal stands at the airport. However, PHVs at Heathrow can to some extent be considered an on-demand service as a result of the waiting allowance in airport car parks; the increasing accessibility of online booking options; and the location of PHV booking offices in the airport terminals. There is anecdotal evidence to suggest that some PHVs do rank within the airport boundary in car parks.
- 2.4.6 The 2012 CAA passenger survey data indicates that if Olympic-related trips are excluded, some 12.05m trips were made to the airport by taxi in that year, and that 96% of those trips were made by minicabs i.e. PHVs, with virtually all of the remainder made by Black Cabs.

<sup>14</sup> <https://www.tfl.gov.uk/cdn/static/cms/documents/stp-20140709-part-1-item06-taxi-fares-update.pdf>

<sup>15</sup> [http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/HAL\\_Byelaws\\_2014.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/HAL_Byelaws_2014.pdf)

- 2.4.7 Although it is noted that the CAA survey is generally undertaken in airport departure lounges and therefore does not cover passenger trips made from the airport, it does suggest that any measure to reduce empty taxi trips would need to be targeted at PHVs to have a significant impact.
- 2.4.8 The increasing accessibility of online booking applications and in-terminal PHV facilities is likely to increase the potential for PHVs dropping off at the terminal to collect passengers on the outbound leg of their journey, and this potential would be enhanced further if legal waiting facilities were improved for PHVs, both in terms of cost and capacity.
- 2.4.9 However, there are a number of key issues that may limit the potential for significantly reducing the proportion of PHVs making empty one-way trips to the airport, as follows:
- The PHV industry is heavily fragmented in general, and is made up to a significant extent of large numbers of small operators that focus on a local catchment – this is likely to be particularly the case at Heathrow, which has a wide catchment covering a large geographic area;
  - many small operators must out of necessity be highly demand-responsive, maximising ‘on-call’ driving hours and minimising dead time with a relatively small number of drivers on-call at any one time – this suggests there may be limits to the length of time that many drivers could afford to spend ranking at the airport waiting to collect a fare, particularly where the majority of an operators’ business is generated in a specific geographic area;
  - the market is also fiercely competitive among larger operators such as Uber and Addison Lee – many of these operators already use GPS technology to minimise dead mileage but there may be limited potential for co-operation over a Heathrow-wide matching service covering multiple operators, which is likely to deliver the biggest impact;
  - any move to improve waiting facilities or reduce the cost for PHVs ranking at the airport would be fiercely opposed by the Black Cab lobby, which has already made representations about the legality of PHVs ranking at the airport<sup>16</sup>.
- 2.4.10 As a result of these issues, further work is required on the potential for improving taxi-matching among PHVs at the airport before any reliable claims can be made in terms of significantly reducing empty taxi trips.

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<sup>16</sup> [http://lawcommission.justice.gov.uk/docs/Responses\\_1201-1212.pdf](http://lawcommission.justice.gov.uk/docs/Responses_1201-1212.pdf)

### **3. Sensitivity testing road user charges on airport passenger traffic demand**

#### **3.1 Overview**

- 3.1.1 The previous chapter highlights the demand management measures that could be implemented at Heathrow to reduce traffic impacts, and focusses in particular on the potential impact of various road-user charging scenarios.
- 3.1.2 In this chapter, the impact of applying a general charge to all airport passenger car trips is tested using the spreadsheet-based trip distribution/mode-share models developed during Phase 2 and refined during the Phase 2 consultation window. Sensitivity tests were undertaken to this effect on the core 2030 model for the Heathrow North West Runway expansion option developed for the dynamic modelling work-stream – the Carbon-Traded Global Growth passenger forecast combined with a mid-range staff productivity ratio. All other assumptions in the model were retained as described in the dynamic modelling Appraisal Report, including the use of the relevant distribution forecast from the DfT's National Air Passenger Allocation Model (NAPAM).
- 3.1.3 Two groups of tests were conducted, one group involving the application of charges to all airport passengers travelling by car to the airport including in taxis, and the second with taxis excluded from paying the charge. For each group of tests, four different levels of charge (£10, £20, £30 and £40) were applied to relevant car trips.

#### **3.2 Key assumptions and modelling limitations**

- 3.2.1 In each test the only change made to the core scenario model was to increase the Generalised Cost (GC) of car travel according to the level of charge being applied – the GC of bus/coach and rail trips was retained from the core scenario. It should also be noted that all charges were applied in the model as present values. As detailed in the main surface access option assessment reports published for consultation in November 2014, all GCs were calculated using present values due to uncertainties about future changes in the real value of rail fares.
- 3.2.2 In each case, the charge was assumed to be an access charge rather than a daily charge i.e. on the test day, each car movement to and from the airport incurred a GC penalty, with appropriate calculations undertaken to account for vehicle occupancy. In both test groups therefore, parking trips were charged at half the tariff on the basis that a free egress trip would be a factor in the mode choice while all 'kiss and fly' and, where relevant, taxi trips were charged the full tariff. It was therefore assumed that for the group of tests where taxis were charged, that charge would be passed on to the passengers in full.
- 3.2.3 A number of limitations with the modelling approach should be considered when assessing the impact of congestion charging on travel behaviour at Heathrow, as follows:
- Neither the Phase 2 spreadsheet models nor the enhanced versions developed to provide inputs to the dynamic modelling work-stream produced forecasts for car sub-mode – as a result it was not possible to ascertain the shift from other car-based modes to taxi as a result of the charge in any test – assumed 2030 car sub-mode from each district was therefore retained as a constant from the 2012 CAA survey data, as it was in previous stages of work;
  - The models do not include a component for forecasting employee mode share, and therefore the potential impact of a charge on employee car demand could not be assessed as part of this process – in effect, the test results demonstrate the impact of a charge for passengers, with employees treated as exempt;

- The spreadsheet models forecast the impact of travel behaviour at Heathrow in isolation of other airports – the potential for an increasing level of access charge for car users resulting in an increase in domestic interlining from another airport for example cannot be assessed;
- The mode share forecasts produced by the models are not time sensitive and therefore the tests implicitly assume that all car users are charged regardless of the time they travel to the airport;
- The models also cannot assess the impact of a charge on remote parking and local rail heading activity – the tests therefore assume that the charging system in place captures all car users travelling to the airport – as indicated in the previous chapter, some of the charging proposals considered may result in an increase in such activity outside the charging boundary.

3.2.4 The remainder of this chapter summarises the results of the aforementioned tests, and further discussion is provided in Appendix D.

### 3.3 Results

#### *Mode share and traffic impact*

- 3.3.1 Figure 3-1 summarises the impact of each test on the 2030 core scenario CT GG passenger mode share forecast for Heathrow with the North West Runway in place, as derived from the enhanced Phase 2 spreadsheet model. The GC of a trip in the model does not change by time period and so the mode share forecast is the same in all time periods.
- 3.3.2 The graph indicates that in the core 2030 scenario with no access charge, overall airport passenger car mode share is forecast at 47.1%. This reduces to 38.7% with a £10 charge covering all car users including taxis, and 43.4% if taxis are exempt. As expected, the impact of a charge on mode share increases with the level of the charge, resulting in comparable forecasts of 25% and 32.1% with a £40 charge.
- 3.3.3 The change in mode share is more noticeable when only leisure trips are considered, as business users have a higher VoT and a fixed charge therefore has less impact on the GC of a business journey.
- 3.3.4 Figure 3-2 illustrates the corresponding change in AM and PM peak hour car demand to the airport as a result of the mode share changes described above. In each graph the number of employee trips remains constant under each charge scenario as the model does not include a component forecasting headline employee mode share. In contrast, empty vehicle trips are directly related to passenger demand and therefore reduce in line with this demand as the charge increases.
- 3.3.5 As is to be expected based on the mode share forecasts, in both the AM and PM peak hour scenarios a greater reduction in car demand is forecast when taxi trips are included in the congestion charge. In the AM peak hour the combined passenger and empty vehicle forecast to the airport reduces from 4,000 vehicle trips in the core scenario to 3,299 with the £10 charge in place and 2,056 with the £40 charge in place. A similar trend is evident in the PM period.
- 3.3.6 If taxis are excluded from the charge, the core scenario forecast of 4,000 AM peak hour vehicle trips to the airport reduces to 3,699 with the £10 charge and 2,758 with the £40 charge.

Figure 3-1: Impact of access charge on passenger mode share (core CT GG scenario)

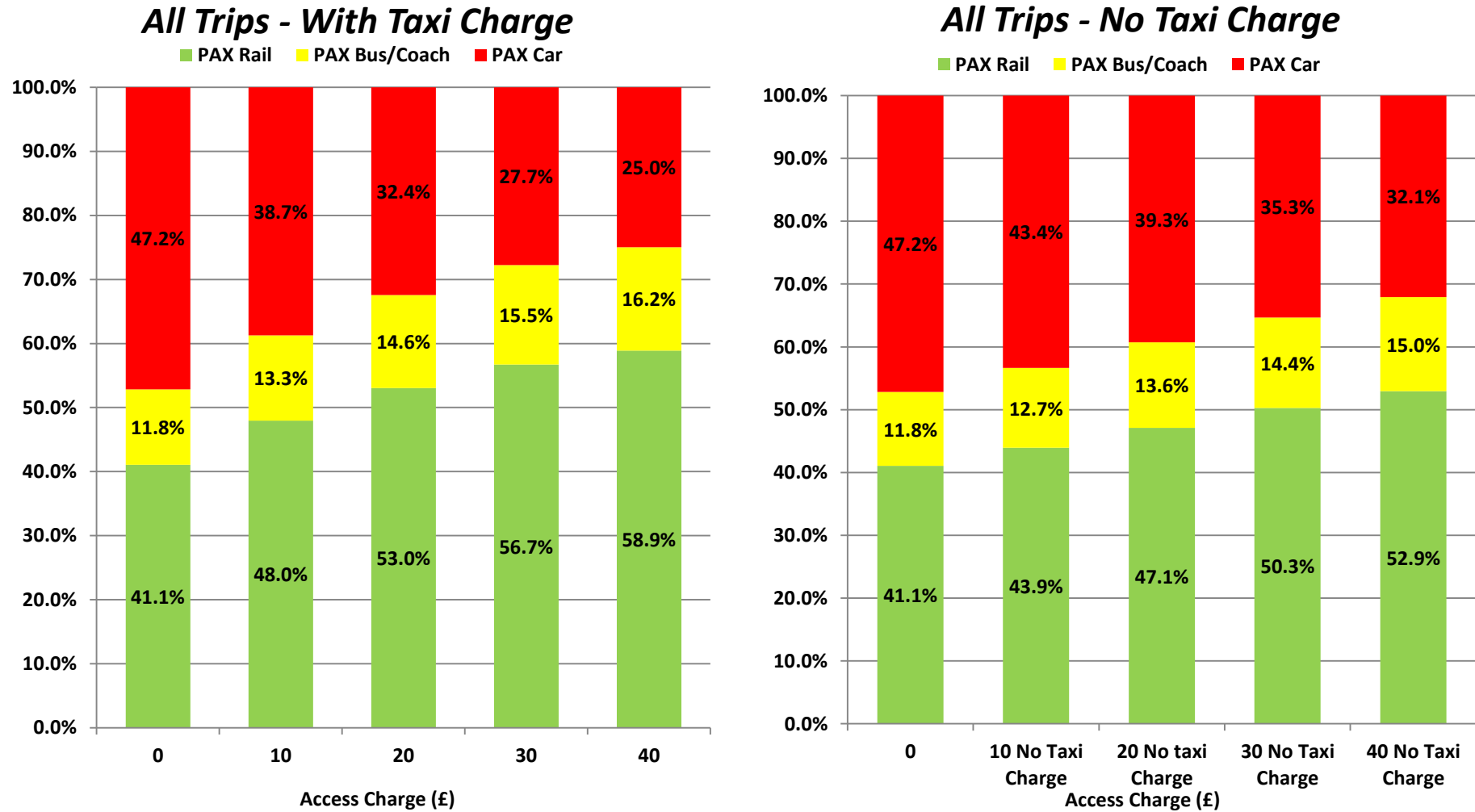
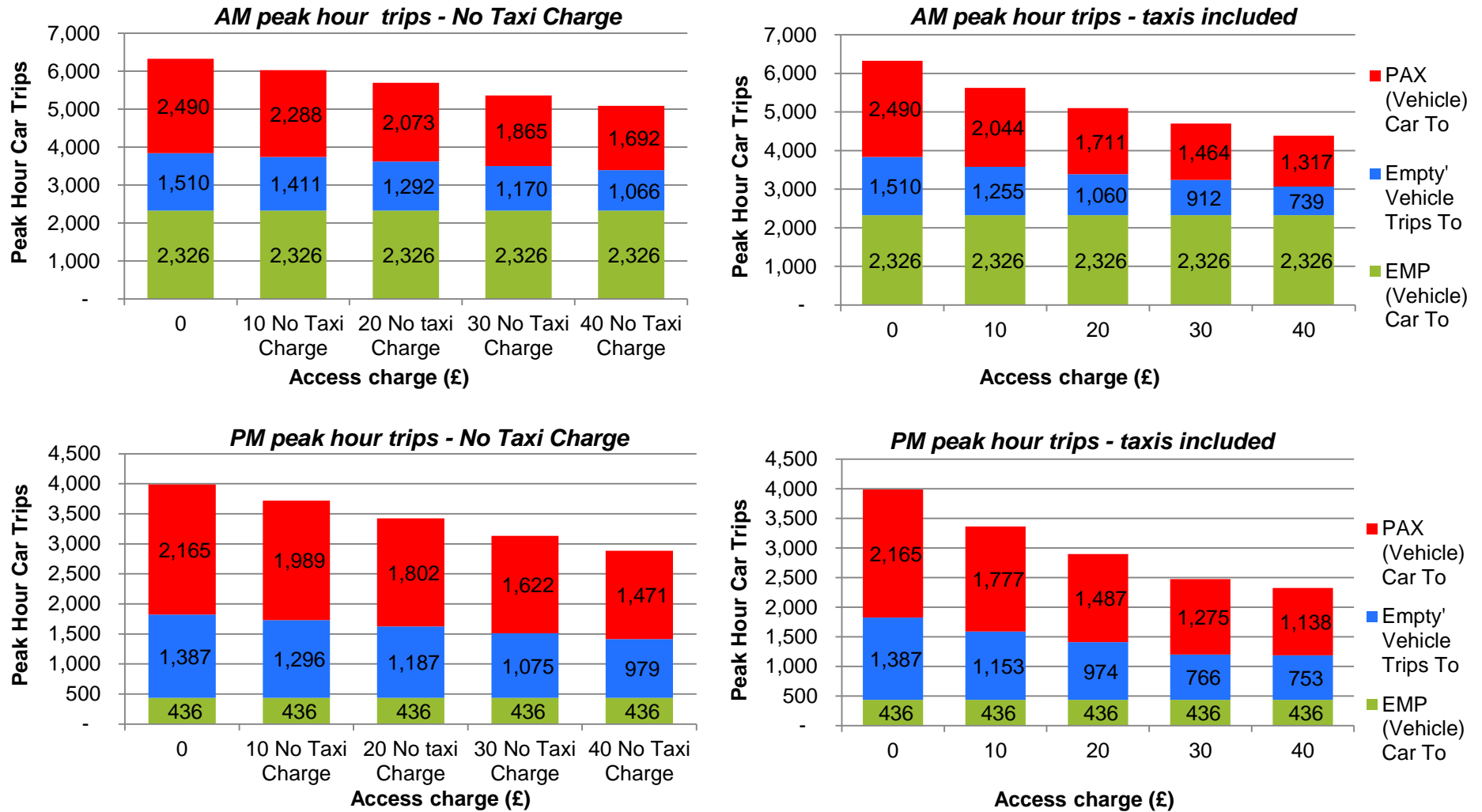


Figure 3-2: Impact of access charge on car demand TO Heathrow Airport



### ***Geographic variation***

- 3.3.7 The plans in Figure 3-3 to Figure 3-6 illustrate the forecast reduction in car demand by geographic location for the different scenarios tested when all car users are charged including taxis. The increasing transfer away from car generally as the overall level of the charge increases is evident.
- 3.3.8 The variability in the impact of a charge by geographic region is dependent on a wide range of factors but can be broadly explained by the following key characteristics:
- the total cost of the initial car trip to the airport - a fixed charge is more significant in proportional terms on the GC of shorter car trips than it is for longer-distance trips;
  - the car sub-mode share – as explained earlier, the access charge is applied to car sub-modes in different ways, with parking activity assumed to benefit from a free egress trip on a different day, while all taxi/kiss & fly trips are subject to the full charge (effectively assuming that all involve an empty vehicle trip) – car sub-mode varies by district in the model, which therefore influences the change in composite GC of car trips as a result of a charge depending on the district;
  - the proportion of business and leisure passengers – due to a lower VoT, a fixed charge is more likely to impact leisure travellers, so the impact of a charge will be lower in districts that generate a higher proportion of business travellers;
  - the competitiveness of alternative modes – since the potential for trip suppression (including a transfer from surface access to domestic interlining via another UK airport) cannot be assessed by the model, total demand from any location is fixed, and thus the charge has less impact on car demand from districts where PT and Car are not competitive in the core 2030 scenario.
- 3.3.9 The plans appear to provide some evidence of the mode competition factor in the relatively large reductions in car demand forecast from some London Boroughs with the charge in place. In these locations, PT is a viable alternative to Car but a significant proportion of passengers are forecast to travel to the airport by Car in the core scenario, and the charge therefore has a relatively larger impact on Car demand from these areas.
- 3.3.10 In contrast, there appears to be less impact in places where Car is either already uncompetitive and has a low mode share (i.e. parts of Central London) or where the opposite is true and PT is uncompetitive, meaning that many passengers continue to drive despite the charge (i.e. parts of Outer London, Essex and Kent). However, as indicated above, the interplay of a wide range of factors makes it difficult to pinpoint the significant characteristic influencing the impact of a charge in any particular location. For example, the low level of reduction in car use evident in Central London is also likely to be partly related to the higher proportion of passengers travelling from this area for business purposes.
- 3.3.11 Further analysis of the geographic variability of charging impacts on car demand is provided in Appendix D of this report.

Figure 3-3: % reduction in car mode share, £10 charge

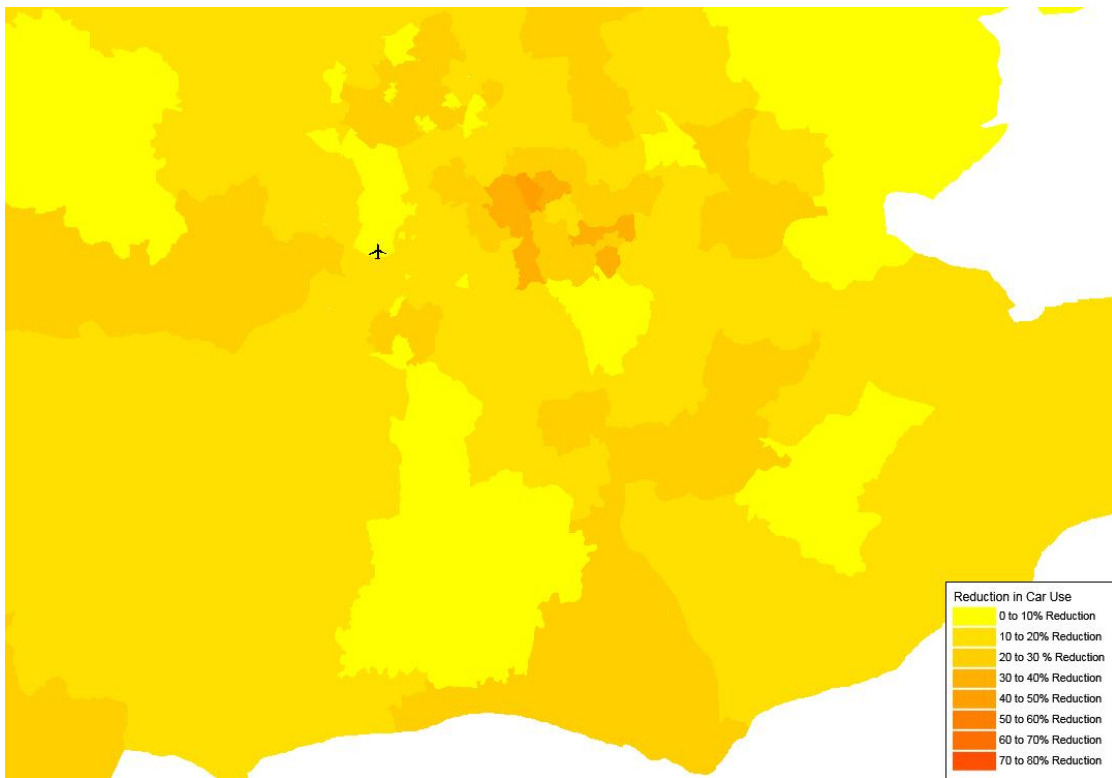


Figure 3-4: % reduction in car mode share, £20 charge

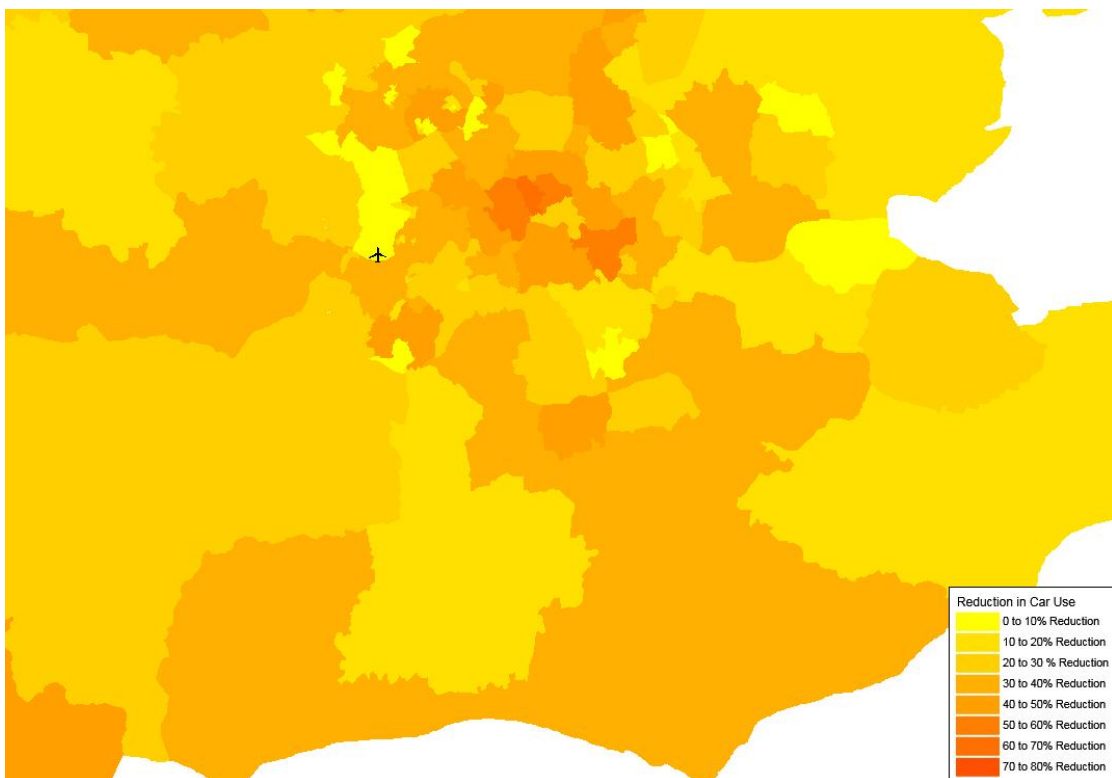




Figure 3-5: % reduction in car mode share, £30 charge

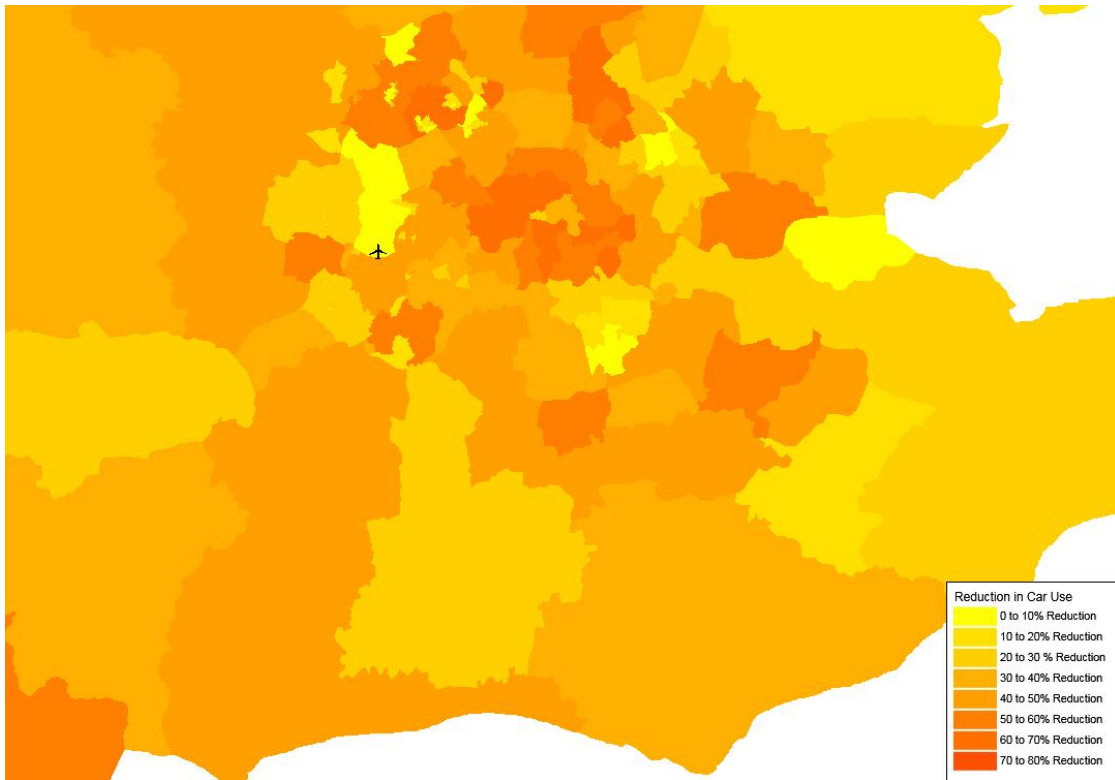


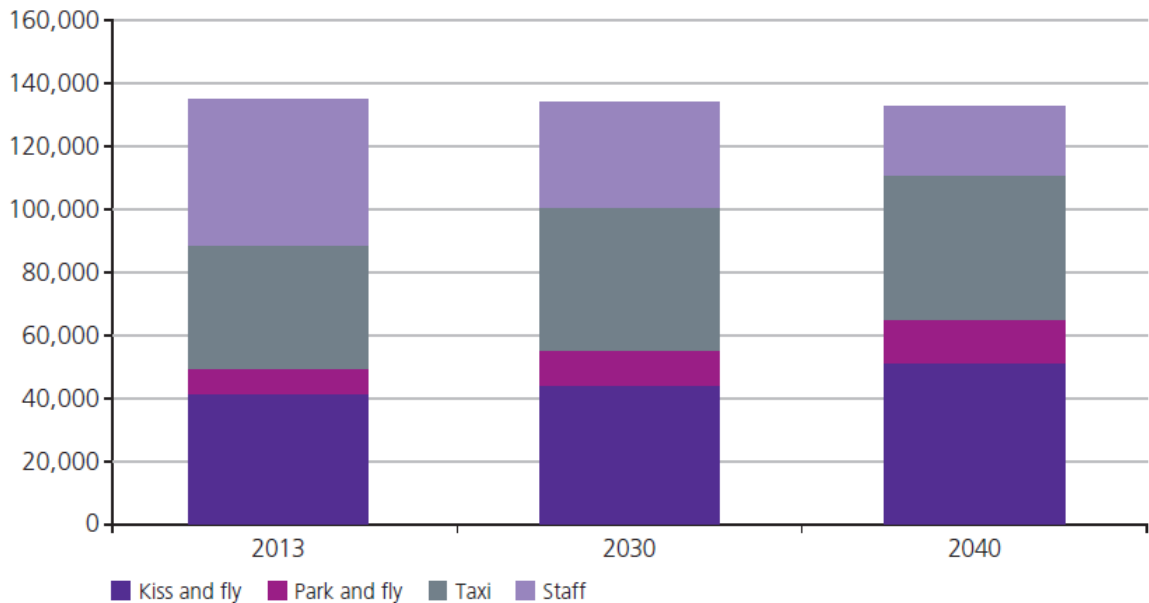
Figure 3-6: % reduction in car mode share, £40 charge



**Comparison with current traffic generation at Heathrow**

3.3.12 A key target identified in HAL’s submission is that in absolute terms, road traffic generated by passengers and staff at the airport will not increase from 2013 levels if their proposed transport strategy is implemented alongside the delivery of a new North West Runway. The graph in Figure 3-7, which is sourced directly from the submission, illustrates this target for daily airport traffic generation.

**Figure 3-7: HAL daily road traffic forecast in 2013, 2030 and 2040<sup>17</sup>**



3.3.13 The submission indicates that this target assumes that “passenger numbers increase from 70 million passengers per annum (mppa) today, to 100mppa in 2030 and 130mppa in 2040. There will be associated growth in the airport workforce, consistent with forecasts in Part 1, from 75,000 today to 90,000 in 2030 and 110,000 in 2040”.<sup>18</sup>

3.3.14 To test the viability of this target, Jacobs used the enhanced trip distribution/mode share model to generate a base year AM peak hour traffic forecast for the airport, based on 72.7mppa and 75,000 staff at the airport. These 2013 headline inputs were sourced from the HAL submission<sup>19</sup> along with other assumptions on vehicle occupancy, empty drive-back rates and employee mode share/trip distribution. Passenger mode share and trip distribution was sourced from the 2012 CAA passenger survey data, as this was originally used to calibrate the Heathrow base year GC assumptions underpinning the 2030 forecasts.

3.3.15 Figure 3-8 indicates that if no employee car demand reduction is assumed from the 2030 core scenario, an access charge of approximately £40 would need to be applied to all passenger car trips, including taxis, to reduce overall AM peak hour demand to a level similar to the base year, forecast as described above. Figure 3-9 in contrast indicates that if the 2030 core scenario employee car demand forecast can be reduced by 20% (either through the inclusion of employees within the charge or through other measures described earlier in this report if employees are exempt) then a £20 charge on passenger vehicles (including taxis) would be sufficient to prevent an increase in absolute AM peak-hour traffic from the base year estimate.

<sup>17</sup> HAL (May 2014), ‘Taking Britain further - Heathrow’s plan for connecting the UK to growth (Volume 1)’ – page 207

<sup>18</sup> HAL (May 2014), ‘Taking Britain further - Heathrow’s plan for connecting the UK to growth (Volume 1)’ – page 206

<sup>19</sup> HAL (May 2014), ‘Taking Britain further - Heathrow’s plan for connecting the UK to growth (Volume 1)’ – page 232

Figure 3-8: AM peak hour car trips TO Heathrow assuming no employee car demand reduction from 2030 core scenario – comparison with base year traffic level

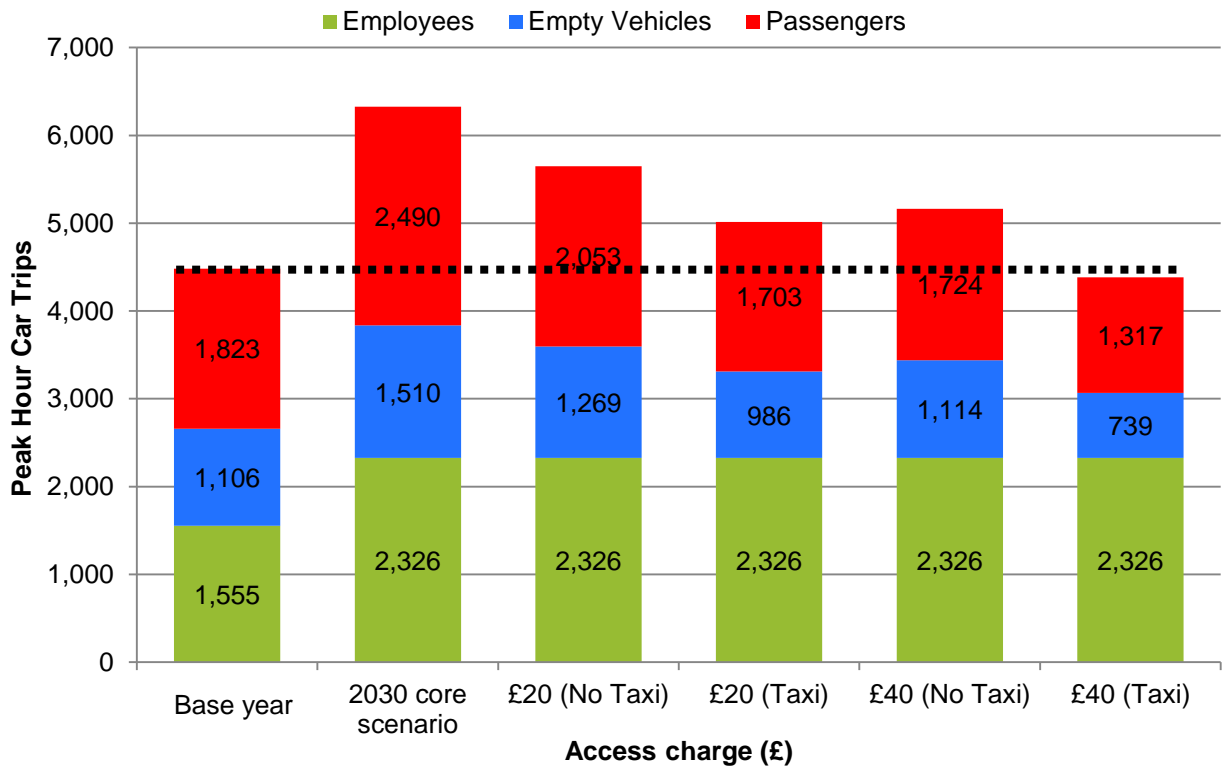
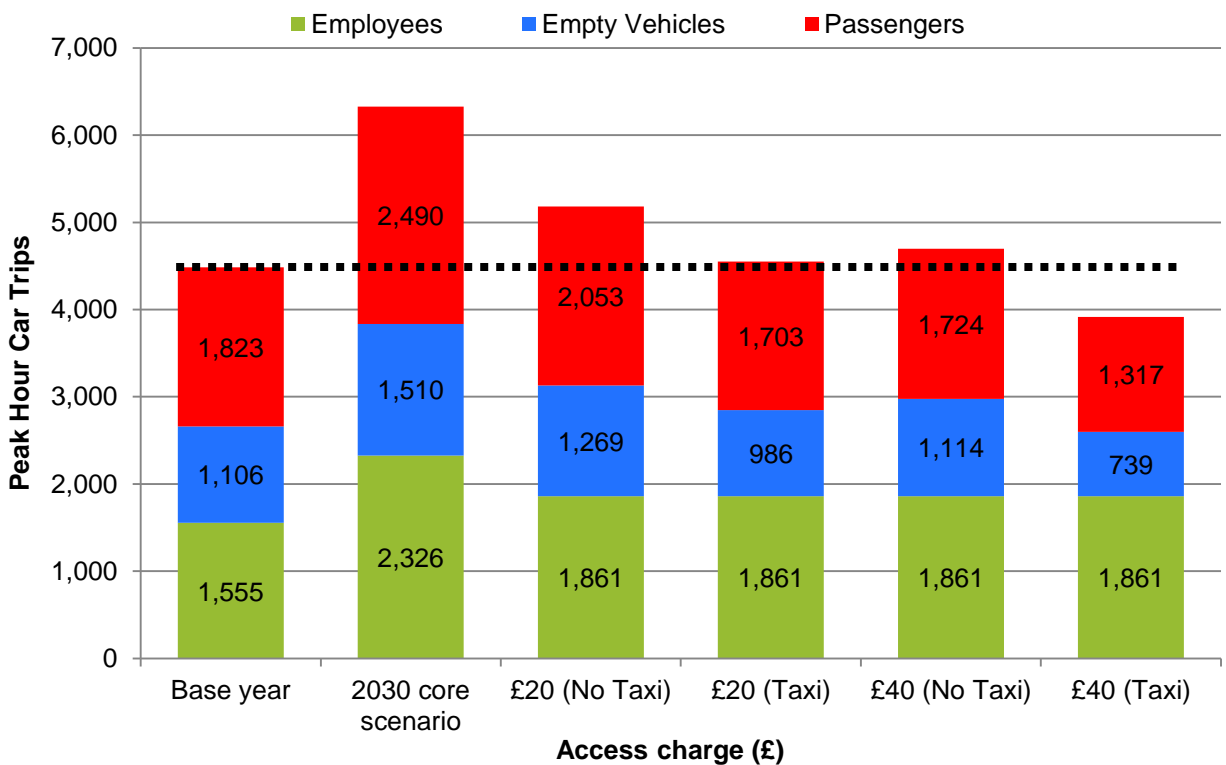


Figure 3-9: AM peak hour car trips TO Heathrow assuming 20% employee car demand reduction from 2030 core scenario – comparison with base year traffic level



- 3.3.16 The following needs to be considered when interpreting the results described above:
- The Jacobs 2030 core scenario is based on headline inputs of 125.2mppa and 114,999 staff at the airport, sourced from the AC – these figures are significantly higher than the estimates included in the HAL submission, on which the target of no additional road traffic is based;
  - The HAL target is also based on daily traffic volumes while Jacobs modelling is based on peak periods – the former approach provides the airport operator with more leeway to meet such a target by reducing off-peak car travel (for example by promoting 24-hour bus services for staff working night shifts);
  - As mentioned previously, the modelling assumes that all passenger car users are captured by the charge – in reality a proportion would likely switch to using remote parking areas or rail-heading at nearby PT interchanges, depending on the geographic extent of the charging regime imposed;
  - Also as mentioned previously, total demand between Heathrow and each district in the model is fixed, so the impact of charging on trip suppression (including switching to interlining) cannot be modelled – this is considered in more detail in the remainder of this chapter.

#### ***Airport passenger amenity***

- 3.3.17 The analysis described above illustrates that introducing a congestion charge for car users at Heathrow could have a significant impact on airport passenger-related car demand at the airport, depending on the extent of the charge levied and the road users that are targeted. Although the mode share model does not include an employee component, it would also seem reasonable to assume that employee car mode share could be significantly impacted as well if staff at the airport are not exempted from paying, particularly since commuters typically have a lower VoT than airport passengers and will therefore be more sensitive to increasing costs when making travel choices.
- 3.3.18 However, as already mentioned, the trip suppression-related impacts of a charge (including the propensity for longer-distance car trips to switch to domestic interlining) cannot be assessed by the model, and therefore it is not possible to quantify the potential impact on the airport's passenger market as the cost of road travel increases.
- 3.3.19 Nevertheless, the model can provide an indication of the impact of a charge on airport passenger amenity, and consequently the perception of the airport's overall accessibility, through the calculation of the average demand-weighted GC of a trip to the airport with and without a charge in place. Average GC is calculated by dividing the sum product of GC and forecast demand from every district by the total demand forecast.
- 3.3.20 Table 3-1 and Table 3-2 provide the average demand-weighted GCs of business and leisure trips, and an overall average, for each sensitivity test carried out. The tables indicate that the overall average GC of a trip to Heathrow does increase with the level of the charge, as while some passengers do transfer to viable alternative PT modes as a result, others (particularly those from areas where PT is not a viable alternative) continue to drive with the charge in place. As expected, the impact is more pronounced in the tests where taxis are included in the charge.
- 3.3.21 The tables also indicate that the overall increase in average GC hides some variation when different modes and journey purposes are considered separately. For example, the average GC of leisure bus/coach users actually decreases as the charge increases, suggesting that leisure passengers initially travelling by car from areas in close proximity to the airport tend to switch to bus as a result of the charge, increasing the proportion of bus/coach trips that are made over short distances.

**Table 3-1: Average demand-weighted Generalised Cost in minutes (taxis excluded from charge)**

Charging scenario	Business			Leisure			Overall average
	Car	Bus	Rail	Car	Bus	Rail	
Core	101.5	109.8	120.8	159.5	199.8	125.6	136.2
£10	105.4	109.6	120.2	170.3	193.5	129.1	138.0
£20	109.4	109.5	119.9	181.3	189.2	132.1	140.2
£30	113.2	109.7	120.1	192.6	185.7	134.7	142.7
£40	117.1	110.0	120.4	201.7	183.7	136.9	145.0

**Table 3-2: Average demand-weighted Generalised Cost in minutes (taxis included within charge)**

Charging scenario	Business			Leisure			Overall average
	Car	Bus	Rail	Car	Bus	Rail	
Core	101.5	109.8	120.8	159.5	199.8	125.6	136.2
£10	109.2	111.6	124.0	172.5	192.5	133.6	140.5
£20	116.1	113.2	126.5	186.1	187.5	137.5	144.5
£30	121.8	114.8	128.9	199.6	183.7	140.0	148.1
£40	128.7	116.0	129.9	212.6	182.1	141.4	151.8

## 4. Summary and conclusions

### 4.1 Impact of charging on mode share and traffic generation

4.1.1 The analysis summarised in this report indicates that the imposition of additional charges on car users at Heathrow could have a significant impact on car mode share and overall traffic demand at the airport. The trip distribution/mode share model indicates that the application of a flat £10 access charge (at present value) for all passenger vehicles at the airport resulted in the following impacts when compared with the core 2030 scenario:

- The reduction of car mode share among airport passengers from 47.1% to 38.7%;
- An overall reduction of 17.5% in passenger vehicle trips to/from the airport in the AM peak-hour (including taxi and 'kiss & fly' empty return trips).

4.1.2 If taxis are excluded from paying a £10 access charge, car mode share reduces to 43.4% and an overall reduction of 7.5% in passenger vehicle trips is forecast, although it should be noted that the model does not forecast car sub-mode. As a result it was not possible to ascertain the shift from car-based modes to taxi as a result of the charge in this test. If a flat £40 charge is levied, the impact is even more pronounced. Car mode share reduces to 25% with a general charge and 32.1% if taxis are excluded, and the corresponding reductions in passenger vehicle trips were 48.6% and 31.5%.

4.1.3 The model also indicates that if employees are exempt from paying a charge and no reduction in employee car demand is achieved from the core 2030 scenario, a £40 charge covering all passenger vehicles including taxis would need to be applied to reduce 2030 AM peak hour traffic generation with a North West Runway in place to 2013 levels. If a 20% reduction in employee car demand can be achieved from the core scenario, a £20 charge covering all vehicle trips would be required. However, this scenario assumes that all passenger cars are captured by a charge. In reality, remote parking and rail-heading at nearby PT interchanges will reduce the impact of the charge on overall passenger car mode share to some extent depending on how charging is implemented at the airport.

4.1.4 The impact on overall passenger amenity should be considered when assessing the validity of the charge, particularly with regard to the propensity for passengers to use alternative airports and switch to domestic interlining instead of making long-distance car journeys – the spreadsheet models were developed to assess travel to Heathrow in isolation and therefore could not assess this impact. The overall demand-weighted GC of a trip to Heathrow in the 2030 core scenario was calculated as 136 mins based on the modelling assumptions described in previous appraisal reports. This overall demand-weighted average increased as follows in each of the tests summarised above:

- £10 flat fee = 141 mins (3.2% increase);
- £10 fee excluding taxis = 138 mins (1.3% increase);
- £40 flat fee = 152 mins (11.5% increase);
- £40 fee excluding taxis = 145 mins (6.5% increase).

4.1.5 The model did not include a mode share component for employees but anecdotal evidence suggests that the imposition of a charge levied on employees would also be significant, potentially more so than for passengers as a result of the lower VoT associated with commuter travel when compared with airport passengers.

### 4.2 Feasibility of reducing traffic generation through demand management

4.2.1 The review of different options for introducing a congestion charge at the airport indicated that such a proposal is likely to be technically feasible and, based on exemplars in city centres, could be deliver a

significant operating profit although the commercial viability is highly dependent on the characteristics of the scheme and needs to be assessed in detail during a feasibility study.

- 4.2.2 The most straight-forward approach would appear to involve the airport operator charging for use of its own road network. The capital costs would be relatively low and assuming the airport operator funds, implements and manages the scheme, the impact on public finances would also be limited. In addition, there appear to be few regulatory issues to consider in implementing such a scheme.
- 4.2.3 However, the geographic extent means that there would be no impact in terms of encouraging a reduction in background non-airport traffic around Heathrow, nor would airport users who park remotely from the site be affected. In addition, a privately-controlled scheme would mean that the public sector would have limited control over the rates and exemptions applied, and evidence from the protocols on charging for other facilities on the airport site suggests that the airport's tenants, led by the airlines, could strongly resist the introduction of a charge.
- 4.2.4 A public sector scheme on the other hand would have benefits in that the rates and exemptions, and the geographic scope, could be defined to achieve wider traffic reduction objectives – as indicated in previous appraisal reports, many sections of the road network around Heathrow are forecast to be over capacity in 2030 as a result of background traffic, before the impact of additional runway capacity is considered. A wider-area scheme could therefore have significant benefits in terms of reducing background traffic when compared to a proposal that only targets airport users. However, significant issues in terms of local opposition from residents and businesses, wider political opposition, and the adequacy of the regulatory framework currently in place need to be considered when assessing the viability of these proposals.
- 4.2.5 Aside from congestion charging, other demand management measures are likely to reduce car demand at the airport to some extent. These measures will be particularly important in targeting employees as the existing approach to staff parking charges at Heathrow for example suggests that there is a possibility that employees would be exempt from paying a congestion charge if it were levied by the airport operator.
- 4.2.6 The 2030 core scenario assumes an overall reduction in employee car mode share to 47% as a result of new rail links to the airport, but no allowance was made for the potential impact of demand management measures. A number of opportunities to reduce employee car mode share further in future are evident, as follows:
- The comprehensive introduction of PTP may encourage a reduction in staff car demand of around 5-10% based on evidence from case studies;
  - Cycling improvements and car-sharing are likely to continue to reduce staff car demand in small increments, although there are likely to be limits in terms of the overall potential cycle market among staff at the airport and the extent to which car-sharing is feasible for shift workers;
  - The extension of the Free Travel Zone could have a significant impact on mode share along specific corridors, particularly in Hounslow and Hillingdon – over 40% of staff in these boroughs currently continue to drive to work;
  - The introduction of forecourt charging could reduce kiss-and-fly trips, although evidence from elsewhere in the UK suggests that it would be premature to assume a significant shift away from car as a result, since free short-stay parking is often provided elsewhere on airport sites, as is currently the case in the long-stay facilities at Heathrow.
- 4.2.7 However, there are issues with some of the proposals included in the HAL submission, which may limit their impact on staff and passenger car mode share. These issues can be summarised as follows:
- The extension of staff public transport discounts to include London services is subject to agreement with TfL, and there is currently no precedent for TfL granting travel discounts to major employers;

- Staff parking charges at the airport are implicitly tied to maintenance costs by the airport's economic regulation license issued by the CAA, and protocols on these charges agreed by HAL with the AOC are even more restrictive, effectively precluding the use of charging as a demand management policy lever with the exception of a small contribution to the airport's Public Transport Levy (PTL);
- Public parking revenues are subject to a price control cap imposed by the economic regulation license, although the cap is calculated using a single till methodology covering multiple revenue streams and some charges at Heathrow are currently lower than at Stansted and Gatwick – this suggests there may be some scope to increase charges to discourage car use at the airport in future;
- Reducing empty taxi trips at the airport will be challenging considering that 96% of the taxi market at Heathrow is covered by PHVs, with Black Cabs only accounting for 4% of trips according to the 2012 CAA passenger survey data – the PHV market is heavily fragmented and consists to a significant degree of many small operators with relatively few drivers and local geographic catchments, and competition between major operators is fierce – these factors cast some doubt on the effectiveness of a taxi-matching scheme in significantly reducing empty taxi trips at the airport – in addition, any proposal to improve PHV waiting facilities at the airport, which would facilitate a reduction in empty trips, would be strongly opposed by the Black Cab lobby.

- 4.2.8 The analysis summarised in the previous section suggests that a £20 access charge on all passenger vehicles (including taxis) combined with a 20% reduction in employee car demand from Jacobs' 2030 core scenario forecast may be enough to reduce overall 2030 airport-related traffic (with runway capacity expansion) to 2013 levels during peak periods.
- 4.2.9 The aforementioned core scenario 2030 employee forecast is based on professional judgement regarding the potential impact of new public transport services on employee mode share, and has not been modelled (by Jacobs or the scheme promoters). There is consequently a higher degree of uncertainty with regard to this forecast when compared with the equivalent for passengers, which has been modelled by Jacobs in some detail. Added to this, the complex range of factors affecting mode share make it difficult to assess definitively whether a 20% reduction in employee car demand can feasibly be delivered via implementation of the demand management measures described in this report.
- 4.2.10 The review undertaken by Jacobs for this report suggests that positive measures alone may not be enough to deliver the necessary shift, particularly when the issues with implementing a congestion charge that is effective in capturing all passenger vehicle trips are considered (as mentioned in the final bullet point of paragraph 3.2.3). A comprehensive PTP programme is likely to deliver some benefits, but there are doubts about the effectiveness of other measures in delivering significant further reductions in car demand (for example, the expansion of Cycle Hub facilities and car-sharing), and there may be significant obstacles involved with other measures that are outside the airport operator's control (for example the negotiation of staff travel discounts on TfL services).
- 4.2.11 However, if effective negative measures penalising staff car use at the airport were brought in alongside positive measures (through the application of an access/congestion charge, a significant increase in staff parking charges, or a significant reduction in the availability of staff parking permits for example), then such a target becomes much more attainable and may even be exceeded.
- 4.2.12 A final issue that also needs to be considered when assessing the impact of demand management measures on car use at Heathrow is the knock-on impact on the public transport network. Previous appraisals undertaken by Jacobs for the AC have for example highlighted background capacity issues on rail routes serving the airport in 2030, including Crossrail, the Piccadilly Line, and (assuming the introduction of Southern Rail Access) the Windsor Lines to Clapham Junction and Waterloo.



- 4.2.13 Any significant transfer from car to rail as a result of demand management measures including congestion charging would increase demand on sections of the rail network that are already forecast to be congested in 2030.

## Appendix A. Consultation feedback related to demand management

Comment Ref	Source	Document Ref	Page #	Paragraph #	Comment
80	ITC	12	1	4	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?
86	ITC	12	6	5	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.
91	ITC	12	50	1	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
92	ITC	12	50	2	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
147	Gatwick Airport Limited	13	101	6	Assessment of Congestion Charge proposals – The Commission should make clear how the congestion charge would be implemented, how it would work, the inherent risks and traffic impacts, and how essential it is for Heathrow’s economic case and for meeting air quality targets;

Comment Ref	Source	Document Ref	Page #	Paragraph #	Comment
164	Gatwick Airport Limited	17	8	6	<b>Issue:</b> The Commission does not refer to the proposals for significant demand management measures needed to support some options, including congestion charging. Whilst both Heathrow schemes identify the need for demand management or congestion charging, which Gatwick's proposals do not require, the Commission has chosen not to analyse or model this issue. <b>Impact:</b> The impact of this is a lack of clarity in relation to the Commission's findings on the two Heathrow runway schemes in terms of congestion charging, its wider impacts (including on other modules such as Air Quality, Local Economy, Place, Community and Quality of Life) and how this would be delivered. <b>Recommendation:</b> It is recommended that the Commission examine and model the two Heathrow schemes' demand management and congestion charge proposals. This should include the charge assumed, the operational details of how the charge would be applied and administered, the impact on mode share, the wider impacts on traffic on local roads (and other modules) and the capital and operational costs. It should also examine proposals for implementation. Otherwise the benefits and costs of the Heathrow schemes' demand management proposals and their impacts on local traffic and access for communities will not be fairly and objectively compared to Gatwick where no such demand management is proposed.
231	Slough Borough Council	35	5	12.1	Both Heathrow expansion proposals rely on a substantial increase in public transport use and constraints on vehicular access to the airport in order that the M4, M25 and local roads do not get overloaded. Significant measures would be needed if this 'no growth' in airport-related road traffic objective is not met.
237	Slough Borough Council	35	7	3.3	Congestion charging should be implemented if the minimum 50% modal shift to public transport is not met at year of operation. The modal shift should go further with higher target levels up to 65% public transport being met by 2040 so there is continuous sustainable reduction in total emissions achieved for all direct and indirect airport operations. All public transport shall be Ultra Low Emission Vehicle compliant by 2025.
246	Slough Borough Council	35	8	4.8	To encourage those accessing Heathrow from the west to use public transport, the existing free travel zone should be expanded to Slough for residents and Heathrow employees, and should be expanded to include the Transport for London 81 service.

Comment Ref	Source	Document Ref	Page #	Paragraph #	Comment
301	Hounslow Council	32	7	10	A suite of transport measures that would reduce congestion and ensure that air quality limit values are achieved and maintained should be introduced including: Instigation of an airport drop off charge for passengers travelling by road. (Hounslow Council retains serious concerns as to how an alternative congestion charging zone could work without simply increasing congestion on the road network serving the Authority).
308	Hounslow Council	32	10	4	The Commission should monetise the cost of congestion on local road networks. This would reveal the true cost of an expanded Heathrow on local roads. Additionally, an appropriate passenger drop off charge (with local residents and business exempted) might provide an additional source of revenue to contribute to a quality of life fund akin to that operated at Schiphol.
322	Hounslow Council	32	13	3	The role of travel demand management in managing the impact of surface access and encouraging modal shift is not mentioned and could play an important role. For example, there is no note of the complex role that the parking stock at Gatwick and Heathrow plays in modal split and trip generation, but also in encouraging 'park and fly' rather than 'kiss and ride' (the latter generates two additional vehicle movements for every journey compared to the former). Techniques to manage trip generation and influence modal choice (e.g. increasing car occupancy through car sharing / passenger drop off charge etc.) should also be assessed in relation to the two sites.
327	Royal Borough of Windsor and Maidenhead	34	6	14	It is important to acknowledge that the scheme promoters have not provided in sufficient detail the range of surface access demand management mechanisms by which users are said to be incentivised to car pool or switch transportation modes for example.
341	Royal Borough of Windsor and Maidenhead	34	21	14	Delivery of the above improvements to rail access to Heathrow is broadly welcomed as it will deliver significant opportunities for mode switch from car to train for local journeys from Maidenhead, Windsor and Ascot, as well as for longer-distance trips. It would be reasonable to expect a significant increase in rail use for travel to and from the airport and given the current capacity constraints on the rail network, however the mechanisms to encourage and deliver this modal shift need to be clearly defined by the proposers before conclusions can be made. Furthermore, the above measures should be delivered as quickly as possible, regardless of whether another runway is delivered at the airport or not.

Comment Ref	Source	Document Ref	Page #	Paragraph #	Comment
440	West Sussex County Council	42	19	46	GAL proposes support for its surface access strategy by reducing the ratio of car parking spaces to passenger numbers to try to divert passengers to public transport.
492	West Sussex County Council	42	49	ix	development and implementation of a car parking strategy to:- <ul style="list-style-type: none"> <li>· reduce the extent of inappropriate car parking in, for example Crawley, Three Bridges and Horsham;</li> <li>· manage car parking for those wishing to access Gatwick Airport; and</li> <li>· provide additional car parking at the rail stations that service Gatwick Airport.</li> </ul>

## Appendix B. Core and Extended Baselines

### B.1 Core Baseline

#### B.1.1 Rail infrastructure (excluding high speed)

In addition to the existing network and services, the rail Core Baseline will include all of the schemes identified in the Network Rail (NR) Control Period 5 (2014-19) Enhancement Delivery Plan, with the exception of Western Rail Access to Heathrow, which does not yet have a fully secured funding package. This is available online at <http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/cp5-delivery-plan/>.

Elements of relevance to proposals may include (but not be limited to):

- Crossrail;
- Reading Area Station redevelopment;
- Thameslink programme;
- ERTMS in-cab signalling roll-out;
- East Coast Main Line capacity enhancements;
- West Anglia Main Line enhancements;
- Great Eastern Main Line capacity enhancement (Bow Junction);
- East Kent re-signalling;
- Redhill Station additional platform;
- London Victoria Station capacity improvements;
- London Waterloo Station capacity improvements;
- Great Western Main Line electrification;
- Intercity Express Programme roll-out;
- Thames Valley branch line enhancements;
- Oxford Corridor capacity improvements;
- Swindon to Kemble redoubling; and
- Birmingham Gateway development.

Scheme promoters are encouraged to consult the Enhancement Delivery Plan for the full details and delivery timescales for schemes.

#### B.1.2 Rail services (excluding high speed)

The Department for Transport (DfT) is responsible for the design and procurement of new and replacement rail franchises on the national rail network for which it is the franchising authority. The DfT is in the process of tendering a number of rail franchises, details of the rail franchise schedule can be found at [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/301976/rail-franchise-schedule.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/301976/rail-franchise-schedule.pdf). This includes information on the timing and scope of competitions for future franchises. Each individual franchise has its own specific requirements and addresses a particular set of challenges and so the requirements set out in each franchise competition are tailored to meet the needs of the areas they serve. The DfT has moved towards more output-based specifications to give greater flexibility to bidders while recognising the need for Government to protect essential service

levels for all passengers. Details of the Department's activities during each of the stages of a franchise competition can be found at <https://www.gov.uk/government/publications/franchise-competition-process-guide>.

In developing the baseline the Commission will assume that service levels will be broadly similar as they are today unless an infrastructure scheme or introduction of new rolling stock triggers a change. Details of the investment programme for 2014-19 can be found at <http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/cp5-delivery-plan/>.

The Commission will monitor the results of current franchise competitions and, when the outcomes of these competitions become known, will discuss the implications of the franchise with scheme promoters. The Commission recognises that dialogue on this issue will need to continue after the receipt of revised scheme proposals.

The outcome of the competition for the Thameslink, Southern and Great Northern franchise is clearly of particular relevance to scheme promoters and understanding and discussing the components of this will be a priority for the Commission.

### **B.1.3 Rail – High Speed**

In respect of the High Speed 1 link and the Channel Tunnel, the Commission will assume for its baseline no fundamental changes to infrastructure or services, though it will use existing demand forecasts for both passenger and freight traffic to inform its baseline for capacity utilisation.

In respect of the High Speed 2 link, the Commission has noted that the "phase 1" route between London Euston and Birmingham and the "phase 2" route from Birmingham to Manchester and Leeds represents stated Government policy and has cross-party support. The Commission has, therefore, decided to include these elements of the scheme in its Core Baseline. The Commission has also noted, however, the Secretary of State for Transport's statement that he will delay a decision on whether to proceed with a spur from HS2 to Heathrow Airport until after the Airports Commission's Final Report. This spur will not, therefore, form part of the Core Baseline.

For an overview of the HS2 programme, scheme promoters are encouraged to consult the following documents:

- <https://www.gov.uk/government/publications/hs2-strategic-case>
- <https://www.gov.uk/government/publications/high-speed-rail-investing-in-britains-future-phase-two-the-route-to-leeds-manchester-and-beyond>

The Commission has also noted that the recent review by Sir David Higgins made a number of recommendations regarding the delivery of HS2. On the basis of this, the Government has already taken the decision not to proceed with a link between HS2 and HS1. This link will not, therefore, form part of either baseline. It is possible that the Government may suggest further changes to the timing and phasing of the HS2 delivery programme on the basis of Sir David's report; the Commission will monitor developments and incorporate any material changes into the baseline. Sir David's report is available at: <http://assets.hs2.org.uk/sites/default/files/inserts/Higgins%20Report%20-%20HS2%20Plus.pdf>.

### **B.1.4 London Underground, London Overground and Docklands Light Railway**

The Commission has taken advice from TfL on the status of various forthcoming enhancements to the London Underground, Overground and DLR networks. On the basis of information provided, the Commission will include the following schemes in the Core Baseline:

- London Underground Subsurface upgrade – Signalling and rolling stock replacement, complete by 2018;

- Croxley link – Metropolitan line link to Watford Junction, planned to complete by 2021;
- Northern line upgrade – planned to complete by 2020;
- Victoria line upgrade – planned increase in service frequency to 36tph;
- Piccadilly line upgrade – planned for completion by 2026;
- Bakerloo line upgrade – planned for completion by 2031;
- Central line upgrade – planned for completion by 2031;
- London Underground station redevelopments – e.g. Bank and Victoria;
- Waterloo & City Line Upgrade – Planned for completion by 2031;
- London Overground extension of class 378s to 5 car – deployed by end 2015;
- Gospel Oak to Barking electrification – complete by 2019;
- DLR 3-car upgrade Poplar to Stratford – complete by 2026; and
- DLR Inter-peak service enhancements (base service plan A) – due September 2014.

### **B.1.5 Strategic roads network**

Following discussions with the Highways Agency (HA), the Commission's view is that the following schemes should be included in the Core Baseline:

- M23 Junction 8 to 10 "smart motorway" (all lanes running) – subject to value for money and deliverability assessment;
- M25 Junction 23 to 27 "smart motorway" (all lanes running) – complete by 2015;
- M25 Junction 5 to 6/7 "smart motorway" (all lanes running) – complete by 2014; and
- M3 Junction 2 to 4a "smart motorway" (all lanes running) – complete by 2016.

## **B.2 Extended Baseline**

### **B.2.1 Rail infrastructure (excluding high speed)**

The Commission has held discussions with NR, the DfT and other parties with an interest in the process regarding rail schemes which are likely – but not certain – to be funded in the coming years to meet growth in background demand regardless of decisions on airport expansion. These include:

- Western Rail Access to Heathrow: which forms part of the Control Period 5 settlement (meaning it is highly likely to progress) but does not yet have a fully agreed funding package. Should the funding package be secured, this scheme would become part of the Core Baseline.
- Gatwick Airport Station redevelopment: recommended as part of the Commission's interim report. Discussions are ongoing between Government, NR and the airport regarding the nature and scale of the redevelopment.
- Proposed capacity enhancements to the Brighton Main Line: Currently under development and may potentially be identified for funding as part of the CP6 (2019-2024) programme. Components include:
  - Windmill Bridge Junction area re-modelling (new flyover for Up London Bridge Fast line, new flyover carrying the Down London Bridge Fast over the Wallington and Victoria Slow lines, reusing the current dive under for realigned Up London Bridge Slow services removes path conflicts of current flat junction, new 6th track between East Croydon and Windmill Bridge);
  - East Croydon Station remodelling and additional platforms



- Selhurst Spurs lengthened to provide 12-car signal standing – removes current conflicts
- Stoats Nest Junction grade separated junction for Up Redhill trains to join the Up Fast line
- London Victoria re-designation of platform 8 and new access from platform 9 approach
- Clapham Junction area alterations to allow for additional train paths (no feasibility work yet undertaken)
- Keymer Junction – third track to enable Up Lewes train to join main line whilst an Up train is passing and enables the Brighton Main Line to remain open when the junction is unusable.
- Potential outcomes of the Wessex, Sussex and East Sussex route studies: which will inform the future development of infrastructure and services on those routes.
- London Victoria: further redevelopment beyond 2019, subject to business case.
- Clapham Junction: further redevelopment beyond 2019, subject to business case.
- Crossrail 2 – subject to significant further specification and assessment.

### **B.2.2 Rail Services (excluding high speed)**

As with the development of the Core Baseline, the Commission will monitor progress on the DfT's refranchising programme. Where the outcomes of franchise competitions are not known, but the Invitation to Tender gives clear indications regarding the probable contents of the franchise, these will be incorporated into the Extended Baseline.

### **B.2.3 High Speed Rail**

The Government has deferred a decision regarding a spur from HS2 to Heathrow Airport until after the Airports Commission publishes its final report. This spur will, therefore, be placed within the Extended Baseline. The Commission notes, however, that the need to progress the HS2 hybrid bill through Parliament may result in changes in Government policy in this area and will keep any such developments under review, in respect of the relationship of the spur to the baselines.

### **B.2.4 London Underground, London Overground and Docklands Light Railway**

The Commission has taken advice from TfL on the status of various forthcoming enhancements to the London Underground, Overground and DLR networks. On the basis of information provided, the Commission will include the following schemes in the Extended Baseline:

- Jubilee line upgrade: increase to 34tph, requires additional stock;
- Northern line extension to Battersea: subject to TWA approval, potentially open in 2020;
- Northern line full separation: potentially by 2026;
- Bakerloo line southern extension: aspirational only at present;
- London Overground additional 2 tph all day between Clapham Junction and Stratford via West / North London Lines – planned for 2019, but dependant on additional rolling stock;
- London Overground additional 2tph on East London Line – dependant on additional rolling stock;
- London Overground Gospel Oak to Barking extended to Barking Riverside – possible by 2021;
- London Overground 6- and 8-car operation on East, North and West London Lines – possible in 2020s / 2030s;
- DLR new franchise service plan – by 2016/17;
- North route double tracking phase 2 – requires additional rolling stock;
- DLR Royal Rocks initial capacity enhancements – requires additional rolling stock;

- DLR full 3-car operation – requires additional rolling stock;
- DLR extension to Catford – aspirational only at present; and
- DLR extension to Bromley – aspirational only at present.

### **B.2.5 Strategic Roads**

Following discussions with the HA, the Commission's view is that the following schemes should be included in the Extended Baseline:

- M4 Junction 3 to 12 "smart motorway" (all lanes running) – subject to value for money and deliverability assessment;
- Lower Thames Crossing – work progressing, but no decision yet as to nature of any option that might proceed.

## Appendix C. Current demand management at Heathrow

### C.1 Overview

This appendix summarises the demand management currently in place at Heathrow Airport, providing context for the discussion of future options, which are explored in Chapter 2. For the purposes of this study, demand management measures were grouped into the following three broad categories:

- **Positive measures** i.e. those involving a 'carrot' to attract use of non-car modes – the Free Travel Zone currently in place around the airport is an example of such a measure;
- **Negative measures** i.e. those involving a 'stick' to discourage car use – the implementation of parking charges is an example of such a measure;
- **Efficiency measures** i.e. those that do not necessarily encourage a shift to more sustainable modes but reduce the impact of road-based modes through more efficient operation – a car-sharing or taxi-matching initiative would be an example of such a measure.

Current measures in place at Heathrow are discussed in more detail below with reference to the three categories described above.

### C.2 Positive measures to encourage sustainable travel

Positive demand management measures already in place at the airport are primarily targeted at staff travel. The airport's website includes a section on commuting to Heathrow with details of a range of measures that are summarised in the remainder of this section as well as an online journey planner and live travel updates to keep staff informed about their commuting options.

Very little positive demand management is currently targeted at airport passengers beyond advertising and marketing the current Public Transport links to the airport, notably Heathrow Express.

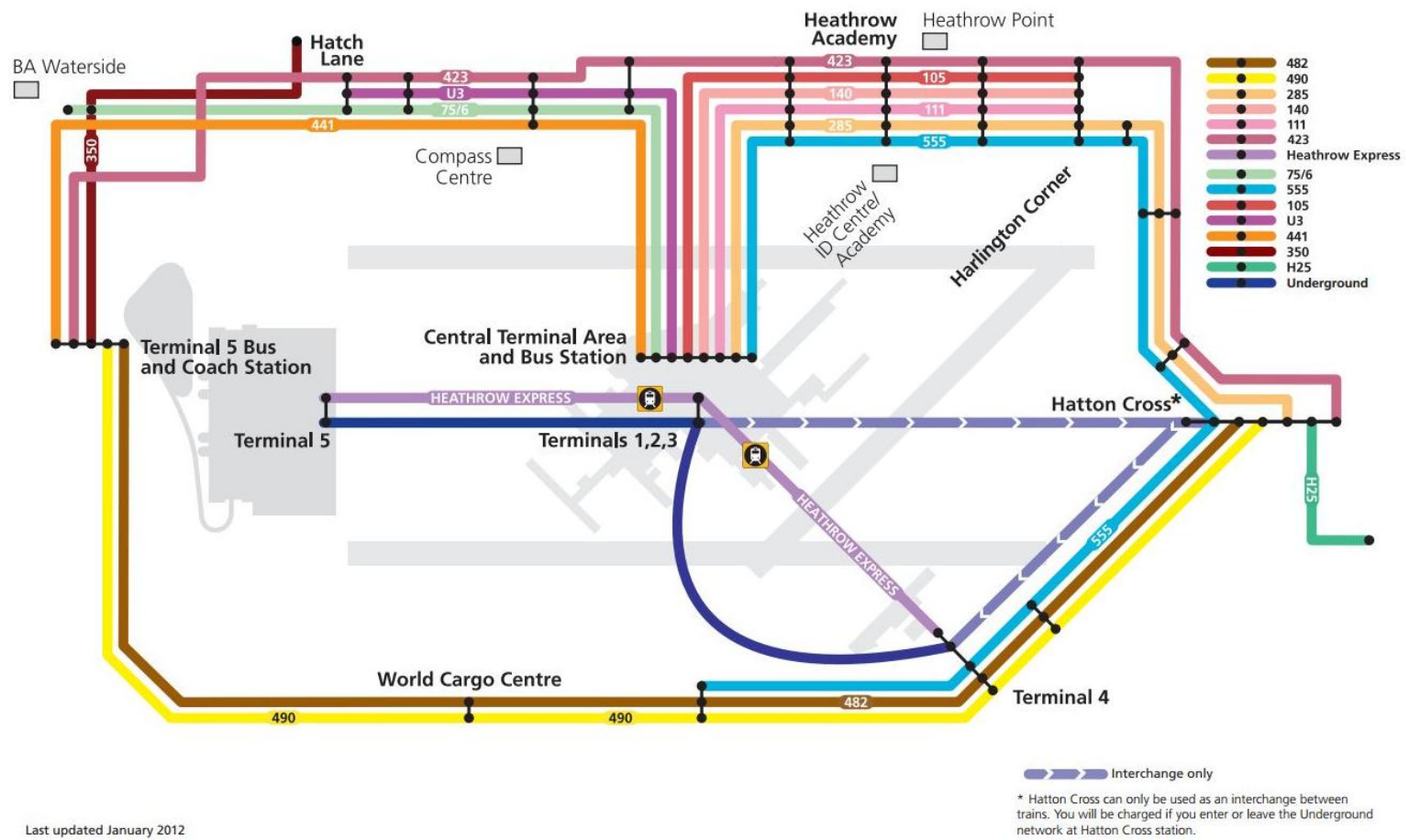
#### *Incentivising Public Transport*

The Heathrow Free Travel Zone (illustrated in Figure C-1) allows free travel at all times of day on 13 bus routes around the airport as well as on Heathrow Express and Piccadilly Line services within the airport boundary. It is primarily targeted at moving airport staff around the site but there are no restrictions on its use and anecdotal evidence suggests that airport passengers do use the free services to transfer between terminals and move around the airport site generally.

The HAL submission to the AC in May 2014 indicates that the Free Travel Zone has recently been extended along the 557 bus route, allowing residents in Stanwell Moor to access the airport free of charge<sup>20</sup>.

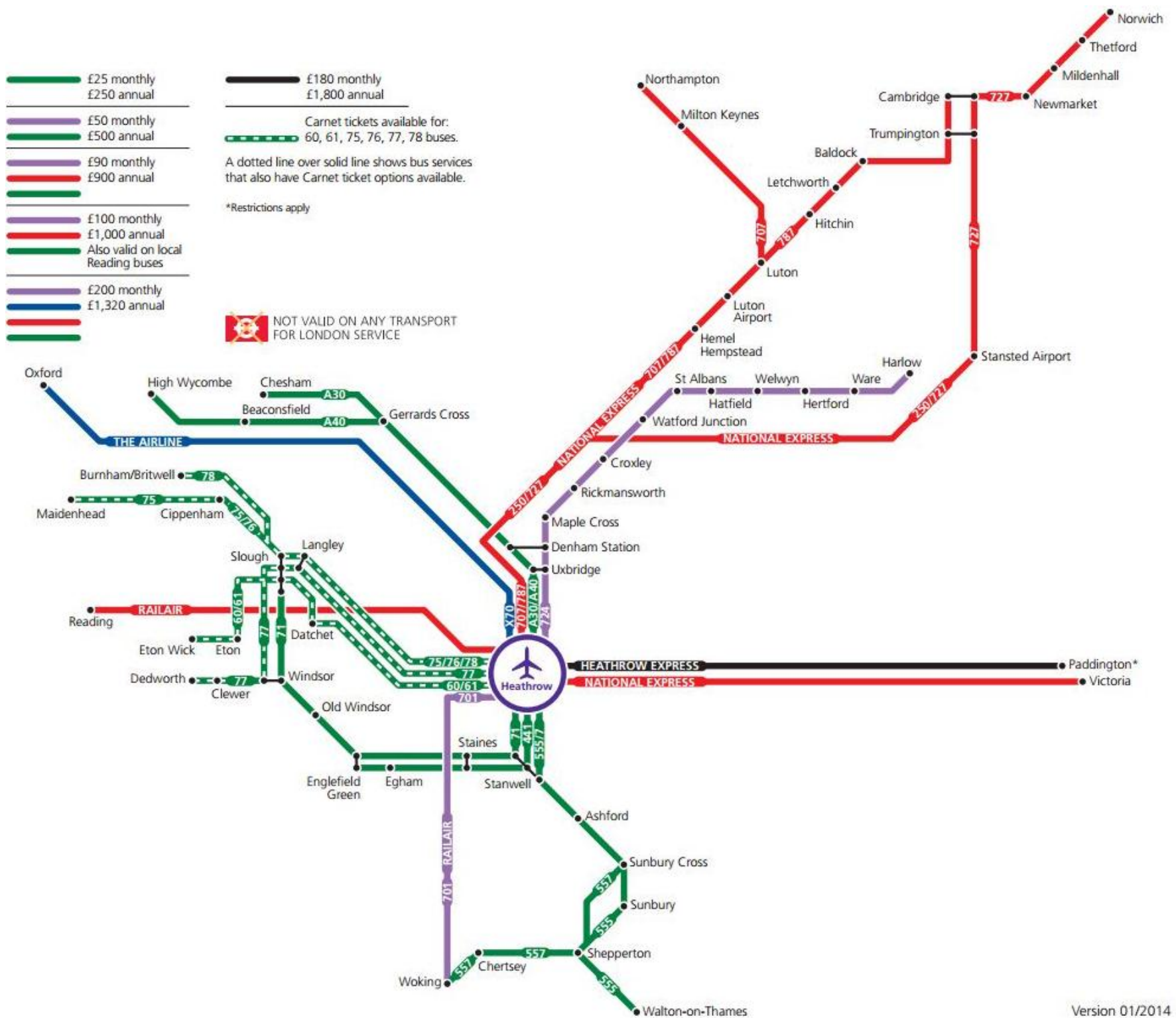
<sup>20</sup> HAL (May 2014), 'Taking Britain further – Heathrow's plan for connecting the UK to growth (Volume 1)' – page 215

Figure C-1: Heathrow Free Travel Zone<sup>21</sup>



Last updated January 2012

Figure C-2: Heathrow Travelcard plan<sup>22</sup>



Version 01/2014

<sup>21</sup> [http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/travel\\_around\\_Heathrow.pdf](http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/travel_around_Heathrow.pdf)

<sup>22</sup> [http://www.heathrowairport.com/static/Heathrow/Commuter/Downloads/HTC\\_Map\\_Jan14.pdf](http://www.heathrowairport.com/static/Heathrow/Commuter/Downloads/HTC_Map_Jan14.pdf)

Airport staff can also use their airport ID cards to apply for a Heathrow Travelcard, which allows discounts of a third off selected bus, coach and rail services to and from the airport. A plan of the services where the discount applies is shown in Figure C-2, with the following bus/coach season ticket fares applicable:

- £25 monthly/£250 annually – bus connections to the west and south (shown in green);
- £50/£500 – all of the above plus coach connections to Woking and Harlow (shown in purple);
- £90/£900 – all of the above plus Railair/National Express coach connections to Reading, Northampton, Norwich, Cambridge and Victoria (shown in red);
- £100/£1,000 – all of the above plus local bus connections in Reading (not illustrated);
- £200/£1,320 – all of the above plus The Airline coach connection to Oxford (shown in blue).

The plan also indicates that staff can purchase Heathrow Express season tickets for £180 per month or £1,800 annually. This purchase is independent and does not include travel on the bus/coach routes described above.

It has also recently been announced that airport staff can now obtain a 75% discount on Heathrow Connect season tickets. The resulting fares available to airport staff are summarised in Table C-1 and the discount can be claimed once staff have obtained a rail photo ID card from a First Great Western ticket office – an airport ID card and a passport-sized photo are the requirements for claiming the rail ID card.

**Table C-1: Heathrow Connect season ticket fares for airport staff<sup>23</sup>**

Station	Weekly	Monthly	Annual
Paddington	£14.80	£56.80	£592.00
Acton / Ealing Broadway / West Ealing	£10.90	£41.90	£436.00
Hanwell / Southall	£9.50	£36.50	£380.00
Hayes & Harlington	£5.70	£21.90	£228.00

The 2013 employment survey by Ipsos Mori indicated that 32% of staff at the airport travelled to work by local bus, with 11% using Piccadilly Line services, 1% using HEX and 1% using Heathrow Connect. It is currently too early to determine whether Heathrow Connect discounts will have a significant impact on rail mode share but the low base figure suggests a significant increase in absolute demand may be unlikely. In addition, the HEX connection to Paddington bypasses the areas around the airport where many staff live, and even with the discount a minimum annual cost of £1,800 is likely to be too expensive for many employees.

The survey also indicated that 36% of Heathrow employees living in Slough commuted to work by local bus in 2013, with 25% of staff living in Spelthorne commuting the same way. Although no data is available on take-up rates, the extent of discounted services between the airport and these districts suggests that many of these commuters are likely to be taking advantage of the Heathrow Travelcard offers. However, around 52% of all employees who use local bus services to commute to the airport come from the three boroughs of Hillingdon, Hounslow and Ealing – services between these boroughs and the airport are predominantly provided by TfL and discounted tickets are not available to staff on TfL routes. The 11% of staff commuting to work on Piccadilly Line services also do not benefit from any discounts.

<sup>23</sup> <http://www.heathrowairport.com/commuter/commuting-to-heathrow/by-train/heathrow-connect>

### ***Encouraging cycling***

Figure C-3 highlights the cycling facilities in place around the airport at present. The focal point of cycling activity is the Heathrow Cycling Hub, located in the Heathrow Academy building on Newall Road near the northern perimeter of the site. The May 2014 HAL submission to the AC indicates that the Hub currently has over 2,300 members and provides a range of services for staff who cycle to work, including a shop selling bicycles and accessories; a maintenance/repair centre; a secure cycle parking facility; and information including cycle route maps. Discounts on new bicycles, equipment and parts are offered to staff as incentives along with free labour on maintenance and repairs to encourage more cycling to work<sup>24</sup>. The submission also states that cycle parking is provided at all key locations and workplaces on the airport site, and the plan in Figure C-3 highlights these locations indicating a total of 654 cycle parking spaces at the airport, of which around 26% are located at the Hub.

Despite these incentives, cycling activity among staff at the airport is currently at a very low level. The 2013 employment survey undertaken by Ipsos Mori indicates that only 1% of staff cycle to work at the airport, some 739 employees out of a total identified workforce of 75,780. Of these, around 40% live in Hounslow to the east and 22% live in Spelthorne to the south of the airport, meaning that the Hub is not conveniently located for many residents in the two districts generating the majority of current cycling trips.

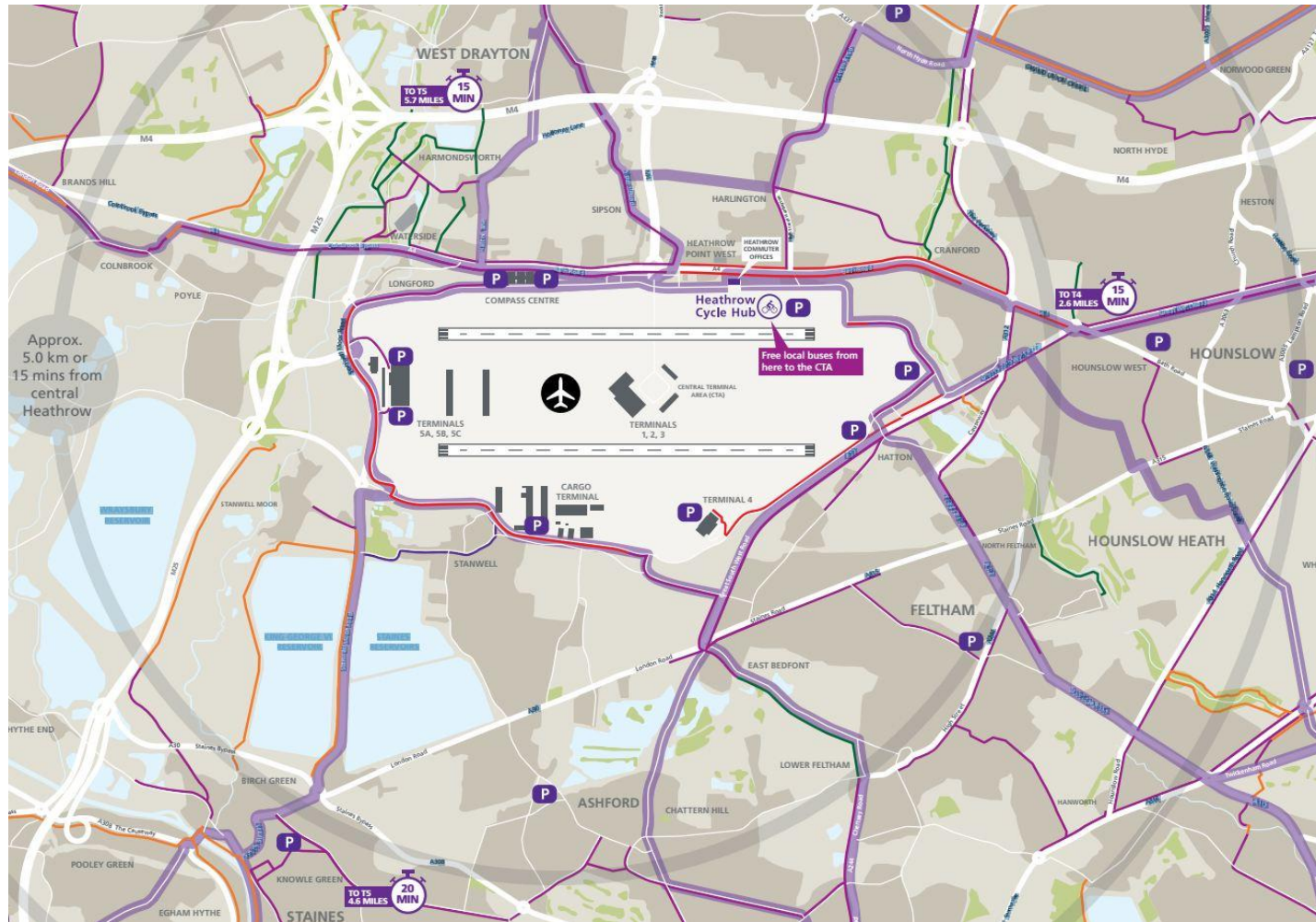
In addition, although more of a transport infrastructure issue rather than a demand management one, the plan below indicates that the provision of segregated cycleways is fragmented in the area around the airport. Dedicated cycleways are provided along sections of some key routes such as the Great South West Road and the Great West Road but where facilities do exist they are often not continuous and in many cases are simply standard footpaths that have been classified for shared cyclist/pedestrian usage (i.e. sections of the A4 Bath Road to the north of the airport), meaning that cyclists using them do not have priority over general traffic and are forced to cross with pedestrians at busy junctions.

There is also a complete lack of dedicated facilities on any of the three main roads connecting the airport with residential areas to the north (Hatch Lane, Sipson Road and High Street Harlington), which partly helps to explain the very low cycling mode share from Hillingdon – the 2013 employment survey indicates that only 42 of the 8,268 staff resident in the borough cycle to work, despite the fact that large residential areas in the borough are within a 30-minute cycle ride of the airport.

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<sup>24</sup> HAL (May 2014), 'Taking Britain further - Heathrow's plan for connecting the UK to growth (Volume 1)' – page 220

Figure C-3: Heathrow Cycle Hub and cycle routes around Heathrow<sup>25</sup>



## Heathrow Cycle Hub local cycling guide

- Heathrow Cycle Hub
- Heathrow Cycle Hub customer commutes
- Traffic free
- On road
- On pavement
- Through parks
- Cycle parking

Contains Ordnance Survey data © Crown copyright and database right 2011. Version 1.0 November 2011.

## Cycle parking spaces

No. of spaces available at each site:

Compass Centre East .....	32
Compass Centre West .....	16
N4 Cycle Park T .....	20
E2 Cycle Park S .....	36
P4 Cycle Park R .....	60
T4 Cycle Park P .....	96
T5 Cycle Park Y (West) .....	110
T5 Cycle Park X (East).....	110
HCH .....	174

The Heathrow Cycle Hub (HCH) cycle parking facilities include 20 secure lockers, a secure restricted access facility for 120 bikes, and toast racks for 34 bikes.

Cycling is no longer permitted through the tunnels to the Central Terminal Area. Instead, cyclists can park at the Heathrow Cycle Hub and catch a free local bus to complete their journey to the CTA.

<sup>25</sup> <http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/cycle-paths.pdf>

### C.3 Negative measures to discourage car use

#### *Parking management – airport passengers and visitors*

The Heathrow Sustainable Transport Plan for 2014-19 indicates that the airport currently controls around 38,000 on-airport parking spaces, with 21,500 allocated for passenger use, 15,500 for staff and 800 for construction uses<sup>26</sup>. Passenger car park locations are indicated on the plan in Figure C-4 – four are classified as short-stay, three as business, two as long-stay and one as business & long-stay. The T5 business car park is unique in that it is connected to the terminal building via a high-frequency PRT system of driverless pod cars.

Figure C-4: Car parks at Heathrow Airport<sup>27</sup>



The current drive-up tariff system in place for each category of car park is summarised in Table C-2 to Table C-4 – discounts on these prices can be obtained by pre-booking parking space on the airport’s website.

<sup>26</sup> [http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Sustainability/Heathrow\\_STP\\_inter.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Sustainability/Heathrow_STP_inter.pdf)  
<sup>27</sup> [http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/Maps/LHR\\_car\\_park\\_map.pdf](http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/Maps/LHR_car_park_map.pdf)



**Table C-2: Short-stay parking charges**

Duration	Car park location and time period		
	Standard tariff (T1, T2, T3 and T5 at all times; T4 off-peak only)	T4 (between 6am and 8am)	T4 (between 6.30pm and 8.30pm)
Up to 30 minutes	£3.50	£4.00	£4.50
30 minutes - 1 hour	£6.50	£7.00	£7.50
1 hour - 2 hours	£10.50	£11.00	£12.00
2 - 3 hours	£13.00	Standard tariff	Standard tariff
3 - 4 hours	£17.00		
4 - 5 hours	£21.00		
5 - 6 hours	£26.00		
6 - 9 hours	£38.00		
9 - 12 hours	£49.00		
12 - 24 hours	£56.00		
Each additional 24-hour period, or part thereof	£56.00		

**Table C-3: Long-stay parking charges**

Time period	Standard tariff	Peak tariff (Easter: 27 Mar- 12 Apr 2015 Summer: 17 Jul - 16 Aug 2015 Christmas: 19 Dec - 3 Jan 2016)
First day	£26.00	£29.90
Each additional 24-hour period, or part thereof	£20.50	£23.60

**Table C-4: Business parking charges**

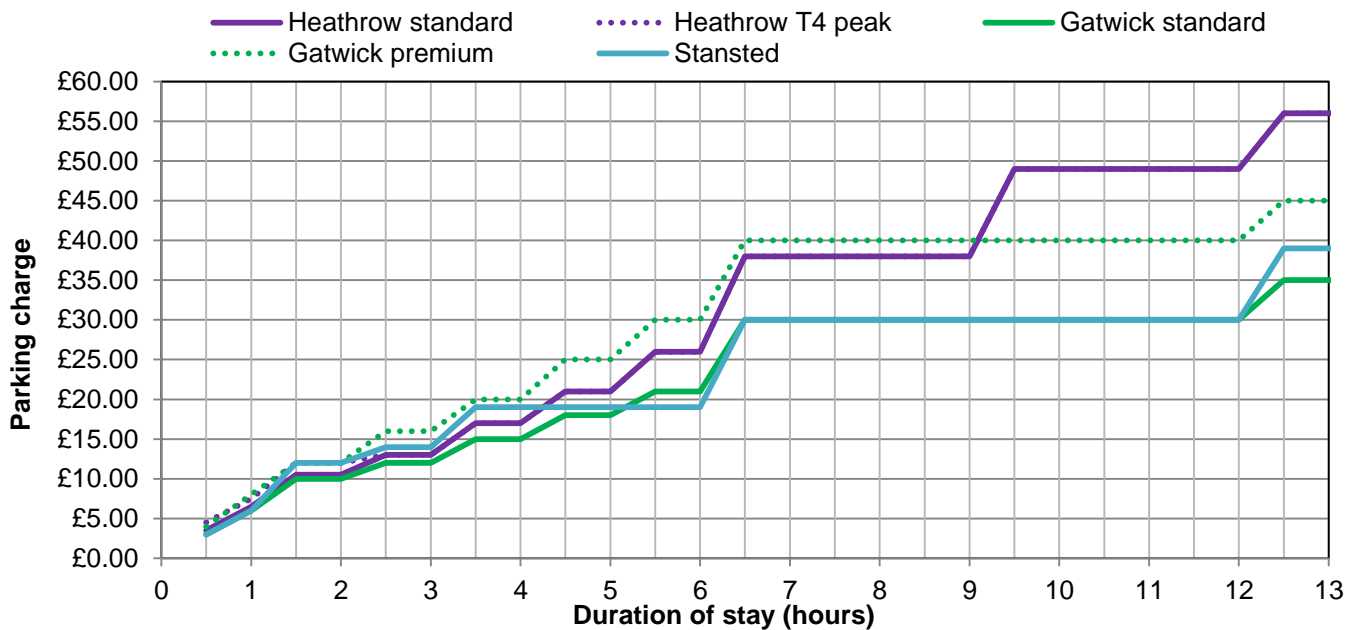
Day	Standard daily rate	T5 pod parking daily rate
Monday, Friday, Saturday, Sunday	£26.00	£32.00
Tuesday, Wednesday, Thursday	£28.00	£34.00

Figure C-5 compares current drive-up charges (March 2015) in short-stay car parks at Heathrow with those at Gatwick and Stansted. The graph indicates that when standard prices are compared, Heathrow is more expensive than Gatwick for all stays of 24 hours or less. However, Gatwick charges a higher rate for stays between 2 and 9 hours in its premium short-stay facilities located close to the terminal buildings. The graph also indicates that Stansted only has one set rate for short-stay parking, which is higher than that charged at Heathrow for stays of between 1 and 4 hours.

At Heathrow, the long-stay car parks can also be used free-of-charge for up to 2 hours for pick-up/drop-off at the airport, while at Stansted stays of up to 1 hour in 'mid-range' facilities are free and stays of 1 to 2 hours cost £1. This combined with the impact of pre-booking discounts available on all 3 airport websites means that the average price paid for short-stay parking is likely to be lower than that indicated on the graph, particularly so for stays of up to 2 hours at Heathrow and Stansted

Stays in long-stay facilities at Gatwick currently cost £20 for the first day and £15 for subsequent days, while at Stansted, 'mid-range' facilities are charged at £21 per day and long-stay at £19 per day. Table C-3 and Table C-4 indicate that long-stay and business parking rates at Heathrow are currently higher than comparable rates at either Gatwick or Stansted, although as with short-stay parking, pre-booking discounts mean that the average rate paid will be lower at all the airports.

Figure C-5: Comparison of drive-up short-stay parking charges (half-hour increments)



NB. Prices sourced from official airport websites on 4<sup>th</sup> March 2015. Short-stay tariff is a fixed rate at all airports for stays between 12 and 24 hours.

Passenger parking charges are covered by HAL’s economic regulation licence, which is issued by the CAA under powers granted by the Civil Aviation Act 2012 – the latest licence<sup>28</sup> dates from April 2014 and runs until December 2018. Only the operators of airports in the UK that pass a market power test (which in January 2014 included just Heathrow and Gatwick Airports) are subject to such a licence, which includes price controls for a range of charges levied by the airport operator. In broad terms, the principle underpinning the licence is the imposition on the airport operator of an annual net revenue cap per passenger, accounting for capital and operational expenditure.

Revenue from passenger parking charges is classified as ‘commercial revenue’ under the terms of the licence, and this along with other non-aeronautical revenue is subject to a ‘single till’ control when calculating the revenue cap. This means that there are no specific conditions in the licence governing the level of passenger parking charges that the airport operator can levy, but that an increase in parking revenue would need to be balanced elsewhere to ensure that HAL meets the conditions of the licence.

**Parking management – staff**

Staff parking locations at Heathrow are illustrated on the plan in Figure C-6. The 2013 employment survey indicated that 45% of staff who park at the airport do so in the cluster of five facilities located on the Northern Perimeter Road to the north-west of the CTA (N1, N2, N4, N5 and the Compass Centre, which is located between N4 and N5), while a further 14% use the PEx facility to the east of the CTA.

Unlike passenger parking charges, staff parking charges are listed in HAL’s economic regulation licence as an ‘Other Regulated Charge’ (ORC). These charges are not subject to the price control condition described above but the licence identifies a number of separate requirements for HAL with respect to these charges, as follows:

<sup>28</sup> <http://www.caa.co.uk/docs/33/CAP1151.pdf>

- The CAA must be informed annually of the system used to allocate costs to each ORC, and any amendments requested by the CAA must be made prior to implementation;
- The CAA must be provided with annual statements of actual costs and revenues for each ORC;
- The CAA and relevant users must be provided with a statement of the pricing principles for each ORC prior to implementing any price changes, including assumptions and relevant cost information to verify that the charges derive from the application of the principles;
- Where charges are not established in relation to cost, the CAA and relevant users must be provided with a statement of the principles for setting the charges, with full background information if the calculation including statements of any comparators used;
- For any relevant regulatory time period, the CAA and relevant users must be provided with detailed reasons for any differences between actual and forecast revenue for the purposes of the price control review.

These conditions imply that revenues derived from ORCs should be tied to costs, although the fourth condition does provide the airport operator with some leeway. For example, HAL at present does raise revenue for its Public Transport Levy from staff parking based on this condition. The latest General Notice on ORCs on the Heathrow website indicates that from the 1<sup>st</sup> January 2015, the price for an annual staff perimeter pass, which covers the majority of staff parking activity at the airport, is set as £635.41. The Notice indicates that “*staff car parking costs consist of annuities, allocated costs and direct costs, which include bussing, car park management and business rates. A £14 levy is also included in the perimeter pass price to help fund public transport initiatives*”<sup>29</sup>.

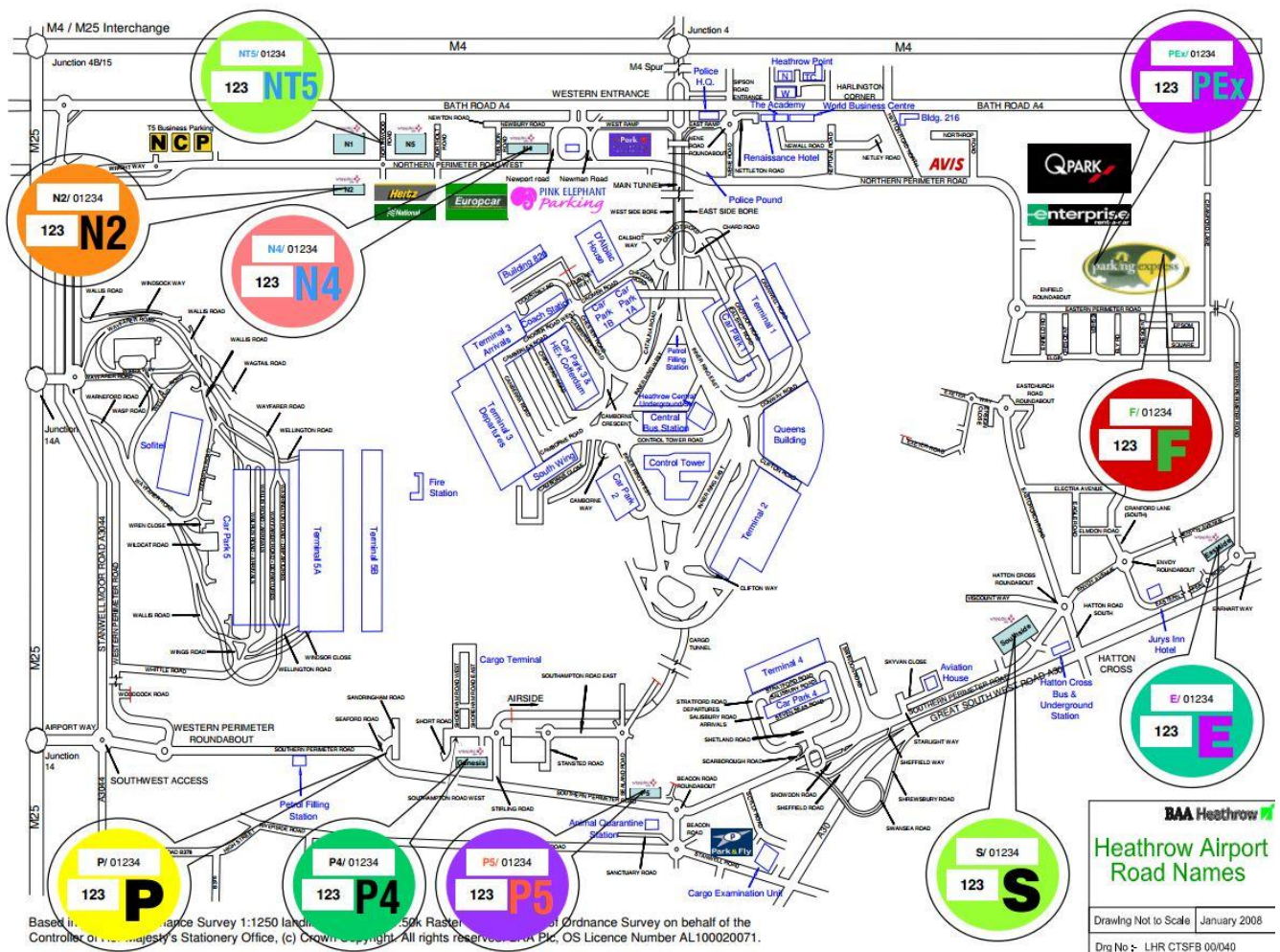
The protocol agreed between HAL and the Heathrow Airline Operators' Committee (AOC) on the articulating principles for ORCs makes the link between revenue and cost more explicit than the conditions set out in the CAA's economic regulation licence described above. These articulating principles are summarised in the aforementioned General Notice as follows:

- “*Prices are set to enable only the recovery of costs (no profit margin is included);*
- *Costs consist of allocated costs, annuities and direct costs;*
- *Annuities reflect the cost of infrastructure investment;*
- *No cross-subsidisation of income between categories;*
- *Where income is greater than the costs in the previous year, this ‘over recovery’ will be returned by a reduction in the prices in the following year, the opposite is true where an ‘under recovery’ has been generated;*
- *Pricing must be supported by transparency on costs and revenues and externally audited Trading Statements”.*

With the exception of the agreed contribution to the Public Transport Levy, the protocol therefore effectively prevents the use of staff parking charges as a policy lever for influencing staff travel behaviour at the airport.

<sup>29</sup> <http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/GeneralNotice0314-Tariffs-with%20effect-from-1%20Jan2015.pdf>

Figure C-6: Heathrow staff parking locations<sup>30</sup>



Staff at the airport also have the option of purchasing CTA and S4 car park passes (the latter being a temporary facility located adjacent to T4). A General Notice issued in February 2014<sup>31</sup> indicated that passes for these car parks were previously defined as ORCs but have now been reclassified as commercial charges, and updated prices are expected to be issued in March 2015. The most up-to-date quoted tariff for a staff terminal MSCP pass is significantly more expensive than the perimeter pass at £3,700 per annum as of the 1<sup>st</sup> April 2013<sup>32</sup>.

It is worth noting that while the cost of staff terminal parking has increased significantly since 2008/9, when an annual charge of £1,111.23 was applied, the implementation of the aforementioned ORC protocol means that the price of the annual perimeter pass has actually decreased over the same period, from £698.80 – at the time, the Public Transport Levy contribution was £12<sup>33</sup>.

No information appeared to be available on the Stansted Airport website about staff parking costs. However, the current annual perimeter staff pass at Heathrow is more expensive than a staff parking

<sup>30</sup> [http://www.heathrowairport.com/static/Heathrow\\_Commuter/Downloads/carparklocations.pdf](http://www.heathrowairport.com/static/Heathrow_Commuter/Downloads/carparklocations.pdf)

<sup>31</sup> [http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/General\\_Note\\_0114\\_Tariffs\\_with\\_effect\\_from\\_1June2014\\_to\\_31\\_December%202014.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/General_Note_0114_Tariffs_with_effect_from_1June2014_to_31_December%202014.pdf)

<sup>32</sup> [http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/LHR\\_NRC-General\\_Note-02\\_12-Tariffs.pdf](http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/LHR_NRC-General_Note-02_12-Tariffs.pdf)

<sup>33</sup> [http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/GN\\_Specified\\_Pricing.pdf](http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/GN_Specified_Pricing.pdf)

permit at Gatwick, which costs £557.43 at present (including a £10 levy for Public Transport enhancements)<sup>34</sup>.

At Heathrow, Gatwick and Stansted, staff parking passes are sold by the airport operator to airport businesses rather than to staff directly. It is then up to each individual business to decide whether to pass this cost to their staff, and if so, how to pass it on. In some cases, businesses may simply absorb the cost of permits as an overhead and offer a free pass as a benefit to all staff, regardless of how they choose to travel to work.

As a result, it is not therefore clear how many staff at Heathrow actually perceive parking as a cost added to their journey to work. The distinction is significant as mode choice to the airport is essentially based on the perceived cost of the trip accounting for visible costs related to parking. If permits are typically offered free of charge as a staff benefit, the cost will not be perceived as part of the overall cost of travel to work, meaning that staff are more likely to drive than use alternative modes.

## **C.4 Efficiency measures to reduce traffic impacts**

The only significant demand management measure related to efficiency (as categorised in the introduction of this chapter) currently in place at Heathrow is the Heathrow Carshare scheme for staff. This scheme is an online tool provided by the airport operator to allow airport staff to register any journey they make by car. The website then matches staff by home location and time of travel and provides an introduction to create car-sharing opportunities, primarily for commuting purposes although the website indicates that the service can be used by staff for any purpose.

Regular, occasional and one-off journeys can be inputted and a range of incentives are offered to encourage take-up, including the provision of priority parking spaces at the airport; a 24-hour emergency ride home facility; and monthly prize draws and discounts. The website also provides information on safety and security as well as a cost-saving calculator.

According to the airport website, the scheme currently has over 7,900 members<sup>35</sup>. The 2013 employment survey indicates a total of 75,780 staff at Heathrow, of whom 53% are car users, suggesting that around 10% of all staff and just under 20% of staff who travel to work by car are members of the car-sharing scheme. The employment survey also indicated that some 13% of car drivers indicated that they had used the scheme already, with drivers in Spelthorne the most likely to use it (22%). No information was provided on the frequency with which the scheme is used by staff at the airport.

<sup>34</sup> [http://www.gatwickairport.com/globalassets/publicationfiles/business\\_and\\_community/all\\_public\\_publications/2015/2015-16-conditions-of-use---clean-30jan15.pdf](http://www.gatwickairport.com/globalassets/publicationfiles/business_and_community/all_public_publications/2015/2015-16-conditions-of-use---clean-30jan15.pdf)

<sup>35</sup> <http://www.heathrowairport.com/commuter/commuting-to-heathrow/by-car>

## Appendix D. Additional modelling analysis

### D.1 Assessment of geographic impacts of congestion charging

The main report includes details of the geographic variability of car demand reduction as a result of an access charge at Heathrow. This variability is related to a range of factors, as follows:

- the total cost of the initial car trip to the airport - a fixed charge is more significant in proportional terms on the GC of shorter car trips than it is for longer-distance trips;
- the car sub-mode share - as explained earlier, the access charge is applied to car sub-modes in different ways, with parking activity assumed to benefit from a free egress trip on a different day, while all taxi/kiss & fly trips are subject to the full charge (effectively assuming that all involve an empty vehicle trip) - car sub-mode varies by district in the model, which therefore influences the change in composite GC of car trips as a result of a charge depending on the district;
- the proportion of business and leisure passengers - due to a lower VoT, a fixed charge is more likely to impact leisure travellers, so the impact of a charge will be lower in districts that generate a higher proportion of business travellers;
- the competitiveness of alternative modes - since the potential for trip suppression (including a transfer from surface access to domestic interlining via another UK airport) cannot be assessed by the model, total demand from any location is fixed, and thus the charge has less impact on car demand from districts where PT and Car are not competitive in the base model.

As well as the variation in experienced generalised cost increase, the relative competitiveness of car and public transport affects the change in mode share. In a location where one mode of transport currently dominates even a large change in the generalised cost of one of the modes may only have a small impact on mode share. Conversely in an area with competitive modes a small change in generalised cost could lead to a big swing in mode share. The broad level of change in mode share we expect to see is outlined in Table D-5.

**Table D-5: Expected change in mode share**

	<b>Mainly Kiss and Fly</b>	<b>Mainly Parking</b>
<b>Competitive Modes</b>	Significant change in mode share	Moderate change in mode share
<b>Un-Competitive Modes</b>	Moderate change in mode share	Little change in mode share

The graphs in Figure D-7 give more detail about the relationship between competitiveness and mode share change and experienced increase in generalised cost and mode share change.

In the first two graphs we see that outcome of the model broadly reflects the expected changes in mode share. In these graphs the x-axis shows the value of generalised cost of car minus the generalised cost of the cheapest public transport mode. The graphs do not take into account the variability in the experienced increase in generalised cost for car users, which weakens the expected correlation.

The second two graphs show change in mode share against experienced generalised cost increase. They show a clear link between an increase in the experienced generalised cost, and a reduction in car use. The graphs do not take into account the relative competitiveness of the modes of transport, leading to the spread of points seen.

Figure D-7: Mode Share Change Scatter Plots

