

TfL Planning

TfL response to questions from Zac Goldsmith MP, Chair of the All Party Parliamentary Group on Heathrow and the Wider Economy

Heathrow airport expansion proposal - surface access

February 2015

1. Question 1

Although the Airports Commission has produced a figure - in the region of £5bn - for improvements to surface access, I recall that last May TfL produced a range of performance based estimates ranging from £2.1bn to £17.6bn for Heathrow's surface access. We have examined the service levels contained in the Commission's consultation and query whether the levels for Heathrow's passengers are adequate. In particular we note that demand for seating capacity on segments of the Piccadilly line and Crossrail far exceed the available seating capacity. While this might be a lesser problem for non-airport users, Heathrow's passengers may have luggage, whole families in tow, and long flights ahead or behind them.

We would be interested to learn whether TfL regard the service levels projected for Heathrow passengers on public transport in terms of comfort, journey times and frequency, interchanges, ease of use, and reliability etc. are appropriate, and if not, what might be realistic target service levels? We would be interested to learn of TfL's views on similar issues relating to access by road?

TfL Response

Surface Access 'Level of Service'

- 1.1. For airport passengers, our view is that any new major airport upgrade should be properly planned with a level of public transport access commensurate to the expectations of the future world traveller. This includes business travellers, passengers with luggage, families and staff.
- 1.2. For non-airport users of London's transport network, TfL's view is that they should not incur a significantly lower level of service or dis-benefit from airport expansion in terms of additional congestion/crowding or journey time delay.

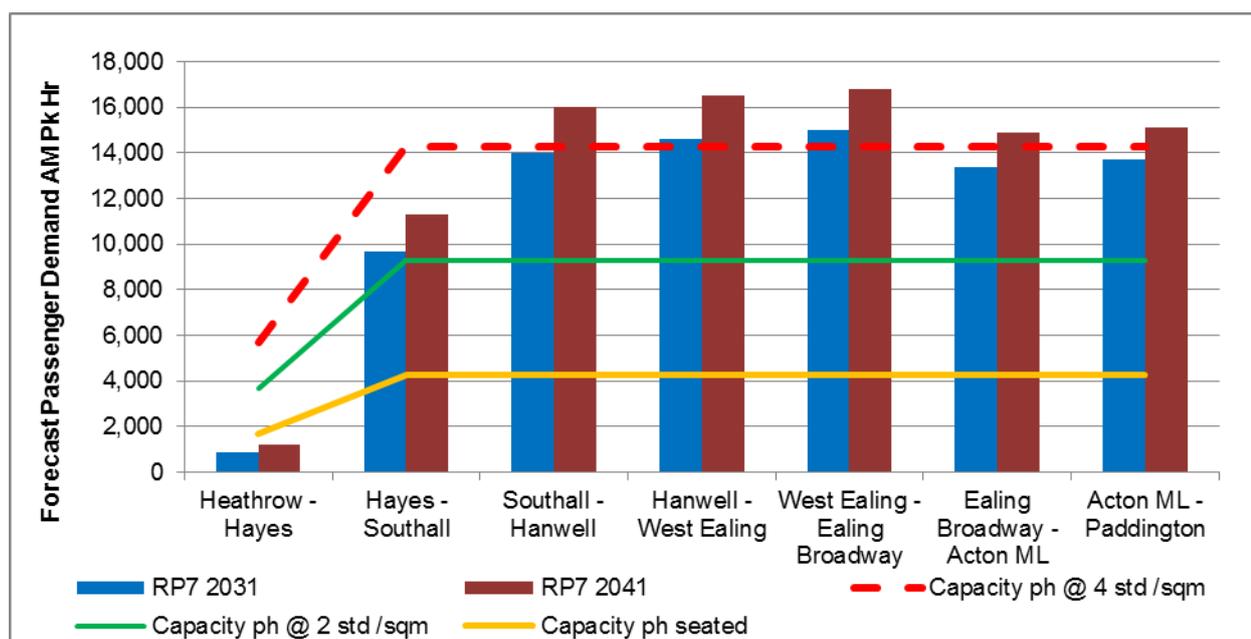
- 1.3. The below summary reviews the level of service that London's future transport network can potentially offer airport and non-airport users. It shows that overall, there is unlikely to be sufficient spare capacity on airport road and rail links to accommodate airport expansion by 2030. Beyond 2030, with London's population forecast to continue to grow, the 'level of service' of the transport network in West London is expected to be further constrained, without Heathrow expansion.
- 1.4. **Heathrow – Rail Impact**
- 1.5. Although the Commission's proposal includes two new rail links, Western Rail Access to Heathrow (WRAtH) and the Southern Rail Access (SRA), most rail journeys to/from Central London are likely to be made using Crossrail and the upgraded Piccadilly Line¹. These two lines are being implemented or upgraded to relieve forecast crowding and facilitate growth on the network for non-airport users. However, at peak times and direction on key sections, both lines are forecast to be reaching capacity between 2030 and 2040, without airport expansion-related growth. Heathrow's surface access proposition depends on some of these key sections.
- 1.6. To illustrate this, the graph below shows forecast Crossrail eastbound AM peak hour demand from Heathrow to Paddington. It shows that in 2030, Heathrow passengers boarding Crossrail to London in the AM peak are likely to get a seat or stand with space. However, it is the level of service for both these passengers and non-airport users of Crossrail further down the line that is of concern – both are forecast to receive a low level of service (all seats full and 4 people standing per square metre) by 2030 - 2040. This is not in line with the Commission's surface access objectives (listed below). The Heathrow demand in the graph represents the Commission's forecast AM peak hour Crossrail demand estimate of 949 passengers for a 103.6 million passengers per annum (mppa) airport in 2030 (page 25, Airports Commission, Surface Access: Heathrow Airport NW Runway report). The 2040 figure is an extrapolation of this demand for a 149mppa airport. The analysis does not take into account the extra luggage space Heathrow passengers will require.
- 1.7. In the PM peak, Heathrow passengers and non-airport users are also likely to

¹ Trips with origins and destinations in Central London currently account for around a quarter of Heathrow passenger demand. Many more trips will pass through Central London - for example, a trip from Heathrow to Cambridge, by rail

receive a low level of service boarding westbound trains on these lines, as they seek to travel away from Central London, in the busy PM peak.

- 1.8. The Commission also note this concern stating “airport passengers should be able to board (Crossrail) trains but some will experience very crowded conditions during peak times” (page 7, Airports Commission, Surface Access: Heathrow Airport NW Runway report)
- 1.9. The Commission also acknowledge the same issue is forecast for the Piccadilly Line (page 7, Airports Commission, Surface Access: Heathrow Airport NW Runway report) which concurs with our analysis, particularly for the Central London Piccadilly Line sections.

Graph: Crossrail Demand and Capacity Forecast: 2030-2040
 (person trips – AC demand forecasts used for Heathrow boarders)

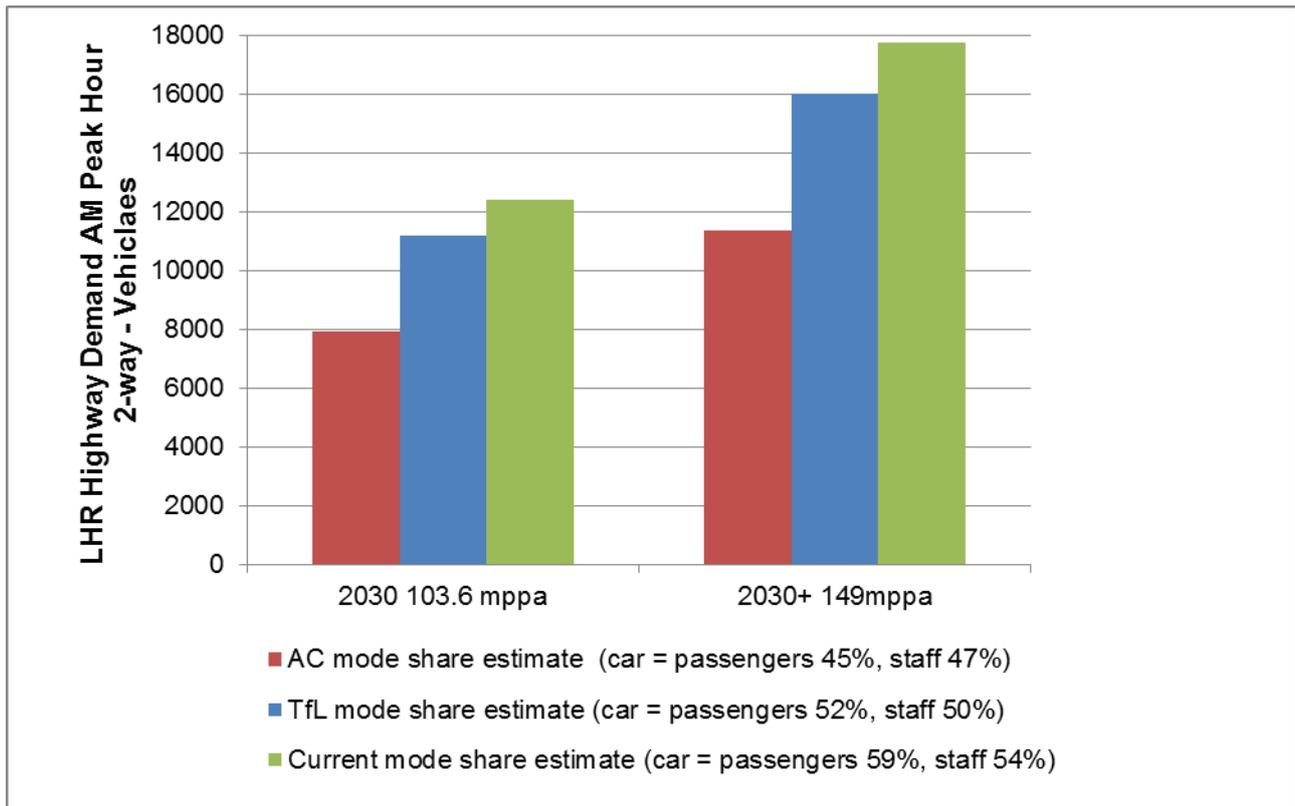


- 1.10. In conclusion, there is not sufficient spare capacity on Crossrail and the Piccadilly Line to accommodate airport expansion and achieve an adequate level of service in the long-term.

Heathrow – Road Impact

- 1.11. The motorway connections that serve Heathrow are forecast to be reaching capacity in peak directions by 2030 (the Commission's published data in their Surface Access report for Heathrow, both options).
- 1.12. The Commission's analysis predicts that in spite of committed enhancements (M4 SMART motorway scheme) the sections of M4 and the M25 that serve Heathrow will reach capacity by 2030 in the AM peak hour. Given that the Highways Agency has no further enhancement schemes in the pipeline, Heathrow expansion will have a significant impact on all major and minor roads in the area as traffic attempts to find routes which avoid congestion.
- 1.13. The Commission adopt optimistic assumptions that underestimate potential highway demand generated by Heathrow expansion. The graph below compares AM peak hour 2-way highway demand forecasts by the Commission, TfL and one which maintains the current highway mode share proportion. It shows the Commission's forecasts are potentially underestimating highway demand by up to 50% or 3-5,000 vehicles in the peak hour for both forecast scenarios (104mppa 2030 and 149mppa beyond 2030 - mppa = million passengers per annum – PCUs = Passengers Car Units - TfL figures exclude additional kiss and fly trips drop off trips)

Graph: Heathrow - Total AM Peak Hour 2-way Highway Demand Estimates (PCUs)



1.14. In conclusion, the Commission underestimate the potential surface access demand that could be generated by Heathrow expansion, leading them to underestimate the transport impact and cost. They also only look short term, to 2030, not beyond.

Surface access cost estimates

1.15. The evidence the Commission publish is insufficient in proving that the £5.7bn* of surface access investment will be enough to provide a sufficient level of service for both airport and non-airport users of the transport network. (*NW option, from the Commission's Cost and Commercial report that includes Southern Road Tunnel cost, maintenance and OPEX estimates. Their surface access report estimates £4bn)

1.16. TfL did conduct a conceptual assessment of the potential cost of delivering a high level of surface in the long-term for a fully expanded Heathrow (Presented at the Runways UK event, summer 2014). To measure level of service, we took the Commission's three surface access objectives:

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.

- 1.17. Our assessment estimated that in order for a fully developed Heathrow (149mppa) to achieve all of the above surface access objectives in the long term (2040-50), costs would be around £15-20bn*. This represents delivering a long-term surface access proposition with an 'optimal' level of service, maximum sustainable mode share and little impact on future non-airport users of the transport network. It included a number of new rail connections to key airport trip generators in SE England, including southwest and central London, as well as some highway access enhancement (*cost estimates 2014 prices, did not include maintenance and OPEX).

2. Question 2

We note that the Commission's study period for surface access ends in 2030 but elsewhere in the Consultation, Heathrow demand is forecast to grow subsequently by another 50%.

We would be interested to learn what might be TfL's estimate of surface access demand for both Heathrow and relevant non-airport users up to 2030 and beyond to the point when Heathrow reaches capacity, say in 2040, assuming an appropriate level of service?

TfL Response

Potential size of expanded Heathrow

- 2.1. The Commission report that in 2030, an expanded Heathrow airport will be operating at 103.6mppa. Beyond this, they estimate that the airport could

operate at 149mppa in the long term. If this level of demand is achieved it will result in significantly higher surface access impacts than those which are currently being assessed by the Commission. As a result the Commission have not presented a long-term plan, with costs, for the new surface access infrastructure and additional maintenance required.

Estimation of Total Heathrow Surface Access Demand

- 2.2. The Commission have not published an assessment of the full, long-term surface access impact of a 149mppa Heathrow in 2040-50. They have only published the impact of partial, shorter-term development, 103.6mppa in 2030. We extrapolated the Commission’s published 103.6mppa demand estimates to an equivalent 149mppa estimate. We have also produced our own estimates that use more conservative assumptions for staff efficiencies and a less optimistic mode share shift from road to rail.
- 2.3. The table and graph below show a comparison between the Commission’s and our demand forecasts for the two expansion scenarios. Figures represent AM peak hour 2-way trip generation rates. The figures show that the Commission’s overall forecasts for Heathrow surface access demand in the AM peak hour are up to 25% lower than ours, for both airport sizes. The main reasons for this are different flight profiles for peak hour arrivals/departures and optimistic staff efficiencies/travel behavioural change. (TfL figures represent passenger and staff demand and exclude additional kiss and fly trips drop off trips)

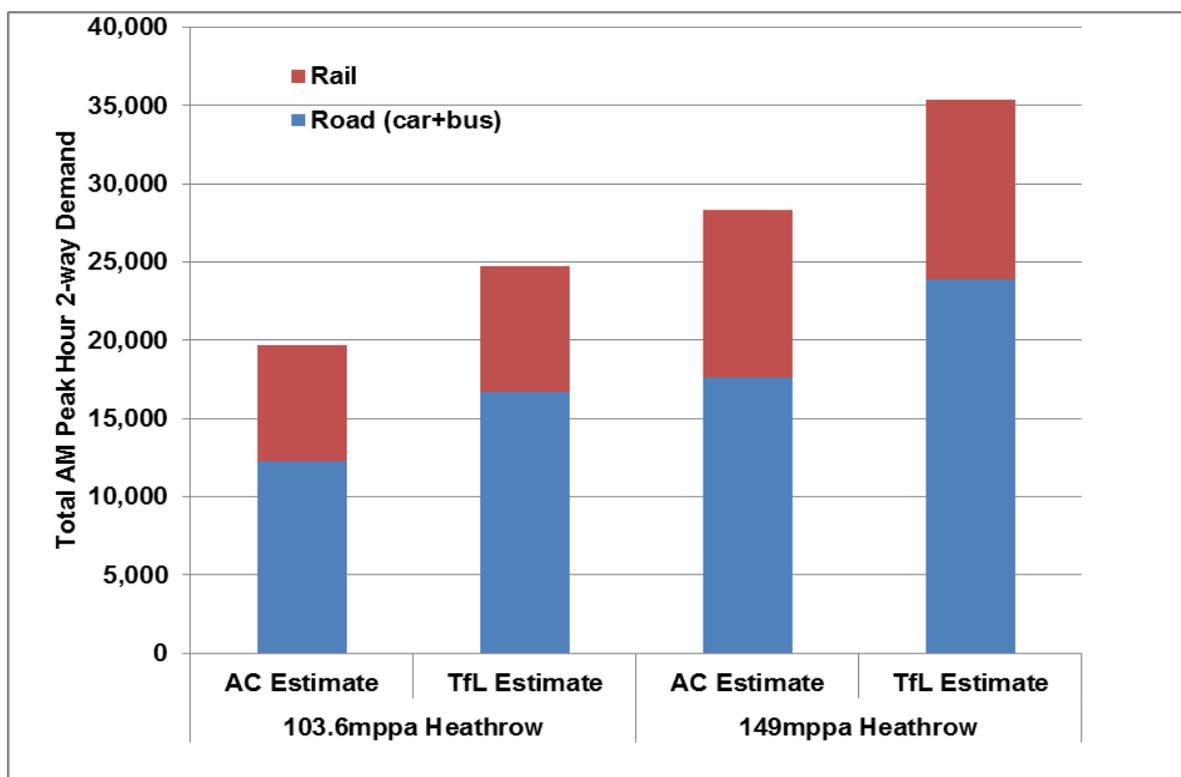
Table: Heathrow - Total AM Peak Hour 2-way Demand Estimates (nearest '00, person trips)

	103.6mppa Heathrow		149mppa Heathrow	
	AC Estimate	TfL Estimate	AC Estimate	TfL Estimate
Road (car + bus)	12,300	16,700	17,600	23,900
Rail	7,400	8,000	10,700	11,500
Total	20,000	25,000	28,000	35,000
Difference		5,000		7,000
% Difference		125%		125%

Staffing Efficiencies

- 2.4. For staffing levels, the Commission have adopted what we consider to be unprecedented staffing efficiencies and changes in attendance from current levels. These assumptions significantly reduce staff travel demand estimates. In the absence of conclusive evidence, our estimates for future Heathrow staff travel demand and attendance represent similar employment levels and trends as today.

Graph: Heathrow - Total AM Peak Hour 2-way Demand Estimates



3. Question 3

We have not been able to draw firm conclusions on the changing shares of Heathrow access demand for car, bus and rail in the Consultation because we have not found detailed comment on behavioural change of existing users and the choice made by new users who contribute to the growth from Heathrow's enlarged catchment area.

We would be interested to learn what TfL might regard as realistic shares going forward for each mode of transport and indeed the sub-categories

such as various individual rail services, e.g. underground, Crossrail etc.?

TfL Response

- 3.1. It will take significant time and resources to accurately attempt to forecast the mode share and sub-mode share (Rail - Crossrail, Pic Line, WRAtH, SRA etc.) of an expanded Heathrow in 2030 and 2040. Furthermore, as you mention, uncertainties such as future behavioural change must also be taken into account. TfL have not attempted to undertake this assessment and test future mode share at this stage.
- 3.2. The Commission have attempted to build a mode share model and they estimate a significant mode shift from road to rail. The Commission have also attempted to predict rail sub-mode demand. From the evidence provided, the Commission's mode-choice modelling tool seems to calibrate [with what / how?] adequately. However, the shift from road to rail seems implausibly large and further evidence justifying such a shift should have been provided by the Commission. [can we draw any parallels with what we would require from more typical developers claiming such a mode shift??] A more thorough modelling exercise is required before conclusions can be drawn which will involve validating highway and PT assignment models for cost inputs and more evidence of future behavioural change. Sensitivity tests of various mode and sub-mode scenarios will also have to be conducted.

4. Question 4

We are concerned that taking into account the points on demand in paragraphs 1 to 3 above, the result might be that there will be insufficient appropriate capacity for Heathrow passengers even after the planned capacity for both Heathrow and non-airport demand detailed in the Consultation.

We would be interested to learn whether TfL consider there to be a gap in the provision of capacity in aggregate and in respect of any particular access channel up to the time when Heathrow reaches full capacity?

TfL Response

- 4.1. As detailed above, we predict that there will be a significant gap in Crossrail capacity if Heathrow expands. While there may be additional train paths on Crossrail that could run to Heathrow, these will come at a cost. At the moment, such costs are not reflected in the Commission's work. Heathrow are for example assuming 8 trains per hour (tph), per direction, between Central London and Heathrow. At the moment, the funded Crossrail scheme will facilitate only 4 tph. Assigning extra services to Heathrow will mean that future opportunities to run Crossrail services elsewhere – for example to destinations on the West Coast mainline in the event of HS2 – will be compromised.
- 4.2. Our analysis also shows that even with the Piccadilly Line upgrade, Heathrow expansion will adversely impact non-airport users of this line in the future [explain how]
- 4.3. For WRAtH and SRA, the significant challenge for Heathrow and Network Rail will be to ensure these planned new services do not impact future non-airport Mainline services, which are already running at capacity (trains serving Waterloo and Paddington for example). It has not yet been proven that the spare train paths or station capacity is available for WRAtH (Reading) and the SRA (Staines – CJ – Waterloo).

5. Question 5

We are concerned that remedying a capacity shortfall, particularly after 2030, has not been adequately addressed – both as to how this might be achieved and at what cost. Also, it is not clear what might be the costs associated with a shortfall in capacity – for example, road congestion, longer journey times, wasted time etc. if the target service level were not achieved.

We would welcome TfL's views on mitigation of insufficient capacity as

currently forecast and the consequences and costs of not satisfying passenger and employee access needs?

TfL Response

- 5.1. TfL agrees with your concerns given that the scale and scope of Heathrow's surface access capacity shortfall beyond 2030 has not yet been considered by the Commission. The analysis above illustrates there will be a lack of road and rail surface access capacity serving Heathrow by 2030 - even with the Commission's proposed £5.7bn of investment. Indeed, the consequences and cost of this lack of investment will be congestion, crowding, delay and wasted time for both airport and non-airport users.
- 5.2. We believe that in order to fully mitigate against this shortfall and offer a surface access level of service commensurate of an international airport, a significantly larger and more expensive package of infrastructure improvements will be required. As explained in para. 1.18, we estimate the required mitigation to cost in the region of £20-25bn. In order to achieve a sustainable mode-share and minimise adverse quality of life and health impacts, we suggest that a much greater level of funding than that currently proposed is targeted towards public transport. Achieving a more sustainable surface access mode share, and rivalling those seen at other major world airports such as Hong Kong, Oslo and Singapore would involve a long-term comprehensive overhaul of Heathrow rail and bus connections.

6. Question 6

Finally, and I don't propose to go into the many detailed issues we have with the surface access proposals, we have noted a number of gaps in the Consultation so far – specifically the absence of a freight analysis, minor road analysis, a dynamic transport analysis, downtime at level crossings in the southern rail access proposal and a cost-benefit analysis. We gather the Commission regard this missing information to be at a level of detail that will not impact the choice between the airport options. However, we

are concerned that, although the incremental evaluation is important, the viability and value for money of each scheme depends on the absolute values apparently missing at this stage.

TfL Response

- 6.1. We agree. The Commission have said that they will conduct their assessment so as to facilitate the speedy preparation of a National Aviation Policy Statement. At the moment, there are so many gaps, and the gaps are of such importance, that we do not think it will be easy for the next Government to readily prepare such a policy – if they so wished².
- 6.2. Given the pressures that we expect to occur on the surface access networks around both airports without any airport expansion – we believe that it is simply not possible for the Commission to conclude that the expansion of Heathrow and/or Gatwick are credible and workable options without such analysis.

² It must be remembered that the next Government is under no obligation to accept and act on the findings of the Airports Commission. They may for example, wish to progress an alternative option, which the Commission has previously ruled out.