

TfL Planning: **Technical note**

Heathrow third runway: Surface access analysis

January 2018

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1. Introduction

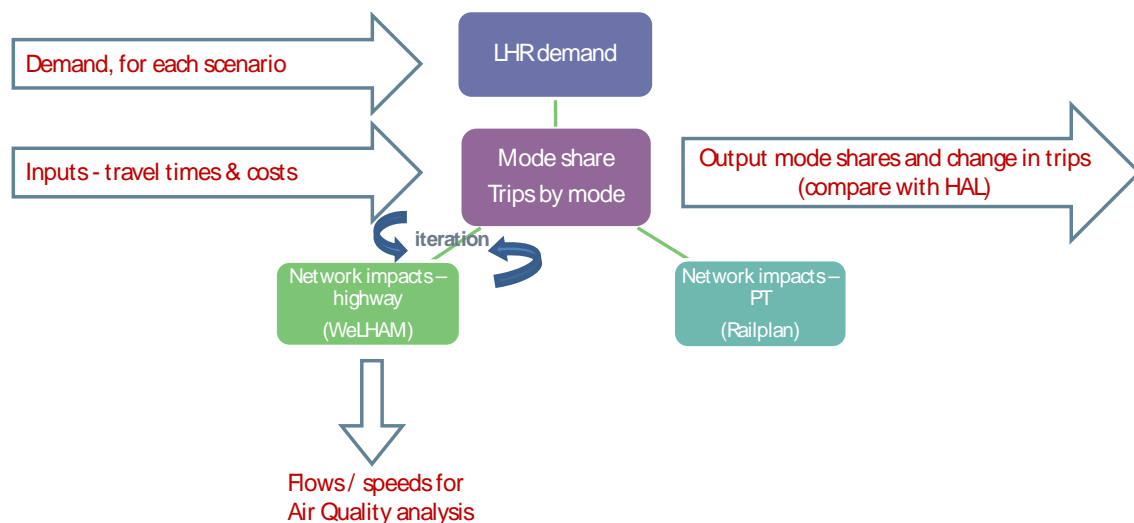
- 1.1 In 2017, the Government published its Draft National Policy Statement on airport capacity in the South East (NPS) which took forward a third runway at Heathrow airport. The Government held two consultations on the NPS, to which the Mayor responded, with the assistance of TfL.
- 1.2 As part of this, TfL undertook analysis of the surface access implications of Heathrow expansion. This technical note summarises TfL's analysis, which draws upon what has been published by Heathrow Airport Limited (HAL), the Department for Transport (DfT), the Airports Commission (AC), and the Civil Aviation Authority (CAA). This paper sets out the methodology adopted by TfL and its findings.
- 1.3 The report is structured as follows:
- Approach and methodology of the analysis;
 - Development of airport current and forecast year scenarios;
 - Assessment of airport surface access mode share;
 - Highway impact assessment of Heathrow expansion;
 - Public transport impact assessment of Heathrow expansion;
 - Assessment of traffic demand management options.
- 1.4 The key findings of TfL's analysis of the surface access impacts of a three-runway Heathrow, as detailed in this note, are:
- Heathrow currently has 140,000 daily highway (person) trips and 90,000 public transport trips, resulting in a public transport mode share of 39%.
 - An expanded Heathrow will result in 170,000 additional daily passenger and staff trips compared to today. There are also forecast to be an additional 18,000 freight trips.
 - To achieve no increase in (passenger, staff and freight) highway trips would require a public transport mode share of around 65-70%. This could be expected to result in up to 200,000 additional airport trips by public transport every day, an increase of 210% on today, which for the most part will need to be accommodated by the rail links serving an expanded Heathrow.
 - The requirements for mode shift set out in the NPS would result in a public transport mode share of around 55%, which equates to around 40,000-60,000 additional vehicles on the roads every day as a result of Heathrow expansion.

- Based on the schemes currently committed as well as those assumed (but not committed or funded) by the NPS, a three-runway Heathrow could be expected to generate around 90,000 additional (passenger, staff and freight) vehicles trip sas well as 100,000 extra public transport trips every day.
- In the AM peak hour, this results in a 3-5% increase in average highway journey times for non-airport users across west London as far in as Westminster. For rail users, this contributes to significant levels of crowding on the Elizabeth line, Piccadilly line and Windsor lines.
- Heathrow-related traffic is estimated to constitute as much as 9% and 16% of all traffic in the London Boroughs of Hounslow and Hillingdon respectively – and these shares increase following expansion (based on the NPS committed and assumed schemes).
- New public transport infrastructure alone is insufficient to secure no increase in highway trips. To achieve this additionally requires the airport to introduce a significant road user access charge or local congestion charging scheme.

2. Approach and Methodology

2.1 The analysis and modelling approach has been to develop bespoke airport travel mode choice models, for passengers and staff, that builds upon TfL's established network-wide highway and public transport models. The mode choice models employ an approach commonly adopted to understand how changes in transport provision and costs can influence travel behaviour. A summary of the modelling approach is provided in Figure 2-1.

Figure 2-1: Overview of Forecasting Approach



2.2 For the assessment of any given airport scenario the multi-step approach adopted has been to forecast the overall Heathrow Airport demand and mode shares based on:

- Airport passenger and staff demand – Base year, 2031 Do Minimum (future no expansion) or Expansion;
- Highway and public transport travel times and costs, which reflect the demand and network scenario under consideration.

2.3 The predicted resulting airport-related trips have then been modelled using the established TfL Railplan (public transport) and WeLHAM (highway) models to assess the impact of expansion on surface access.

2.4 The mode choice model thus forecasts the mode choice between public transport and highway modes. For the purposes of forecasting the overall number of trips and mode shares, TfL has assumed that the mode share of 'other' trips such as hotel shuttles, cycling and walking remains constant between each of the forecast scenarios (i.e. the absolute volume of 'other' trips varies in proportion to overall Heathrow demand, but its mode share remains the same).

3. Airport Forecast Scenarios

- 3.1 To undertake a transport assessment of Heathrow expansion a set of future airport demand forecasts and surface access infrastructure assumptions need to be established. TfL's methodology is detailed below.

Airport demand assumptions

- 3.2 TfL has reviewed the publically available data (NPS, AC, CAA, HAL) in order to source assumptions and develop Heathrow forecast scenarios on which to estimate future airport surface access demand.

- 3.3 The key assumptions required to estimate airport surface access demand are:

- total air passenger demand;
- proportion of transfer passengers (who do not use surface access);

with the total air passenger demand, in turn, largely determining:

- airport staff numbers;
- freight traffic demand; and
- additional travel demand from indirect, induced and catalytic employment.

- 3.4 As such, the airport surface access demand is, to a substantial extent, driven by the assumptions made for the total air passenger demand and transfer.

- 3.5 The AC forecast that the proposed expansion would more than double the passenger movements, growing from 75 million passengers per annum (mppa) in 2015 to 148 mppa, once the three-runway airport is fully utilised. This growth underpinned the AC's economic evaluation and recommendation for Heathrow expansion.

- 3.6 There were no passenger demand forecast assumptions published in the first NPS, therefore TfL drew on the AC forecast to undertake its analysis for its response to the first NPS consultation. Given the AC forecast that all three runways would be full in 2030 – and with a reasonable prospect of full passenger capacity between 2030 and 2040 – TfL tested full utilisation in 2030 (though without the growth in non-airport demand which would be expected between 2030 and 2040).

- 3.7 The AC forecasts assumed a transfer percentage of 32.6% and 114,000 staff in 2030. These were both used for the TfL analysis, notwithstanding the inherent uncertainty in each. As the airport nears capacity, the transfer proportion is likely to decrease – and lead to increased surface access numbers. At the same time, it is possible that faster adoption of technology over time could reduce staff demand. Nonetheless, adopting these forecasts, together with freight and induced economic activity, results

in a total daily airport trip demand of 409,000.

- 3.8 TfL has subsequently tested a sensitivity with 10% fewer passenger and staff, namely 133 mppa and 103,000 staff (though with the same transfer proportion). This was to capture various uncertainties, in particular around how quickly the airport would reach full passenger capacity. This results in a total daily airport trip demand of 368,000.
- 3.9 The revised NPS provided detailed forecasts which had not been undertaken for the original NPS, including a central case estimate of passenger throughout for a three-runway Heathrow of 132 mppa in 2030 and full passenger capacity of at least 142 mppa. Its upper estimate for staff numbers in 2030 was similar to the AC, at 114,000, though it used a slightly higher transfer proportion of 35%. Taken together, this results in a total daily airport trip demand of 370,000 – broadly in line with the 10% sensitivity tested in TfL’s analysis.
- 3.10 These demand forecast assumption scenarios are detailed in Table 3-1, with average daily surface access demand estimates (person trips).

Table 3-1: Summary of demand assumption scenarios considered by TfL

Demand	2015 Base year	2031 Do Minimum	Expansion (AC, Full Utilisation)	Expansion -10% Sensitivity	Expansion (Revised NPS, 2030)	Primary source
Passenger Demand (mppa)	75	87.5	148	133	132	AC and NPS
% Transfer Passengers	30%	22%	32.6%	32.6%	35%	AC and NPS
Staff ('000s)	77	77	114	103	114	AC, HAL and NPS
Total daily demand (person trips)	234,000	277,000	409,000	368,000	370,000	

[TfL’s assessment focused on Expansion (AC, Full Utilisation) and Expansion -10% Sensitivity]

- 3.11 The TfL assessment includes trips relating to freight and induced economic activity. The NPS does not explicitly include assumptions relating to freight traffic demand, therefore TfL has adopted the assumptions and methodology used by the AC, namely that freight traffic demand grows in proportion to passenger demand.
- 3.12 As part of the economic case that underpins the decision for Heathrow expansion, a substantial number of jobs relating to economic activity induced by expansion is forecast, much of which would be created in London. This would lead to further pressures on the transport network but neither the AC nor the NPS have attempted to quantify this. For the purpose of this analysis, TfL has forecast high-level estimates of potential travel demand associated with the new jobs predicted in west London and applied them to the transport modelling analysis.

- 3.13 A base year of 2015 has been adopted for understanding current demands utilising published CAA data on Heathrow passenger travel patterns. The most recent available employee data has also been used.
- 3.14 For the 2031 no-expansion scenario, the AC forecast Heathrow would be operating at 87.5 mppa by 2031 and this was adopted for TfL's analysis. The revised NPS was broadly aligned with this, predicting 86.2 mppa. The revised NPS followed the AC assumption for the proportion of transfer passengers in its no-expansion 2030 forecast, namely 22%. For staff, TfL adopts the HAL 2030 no-expansion estimate of 77,000. It is unclear what the NPS assumes for future direct employment at Heathrow under the no-expansion scenario.
- 3.15 Other demand assumptions which are required to estimate total daily airport demand include the proportion of staff reporting each day, vehicle occupancy and the factor to convert annual passenger demand to an average daily demand figure. These assumptions have not been published in the NPS, and so TfL has followed the published AC assumptions.

Network scenarios

- 3.16 For this study, TfL has considered a range of potential transport infrastructure scenarios, to apply to its established model year for non-airport demand of 2031. The forecast scenarios are:
- **2031 Do Minimum (no expansion)** - committed infrastructure (without expansion)
 - **2031 Expansion Committed** - committed infrastructure (with expansion) i.e. including the highway changes to enable expansion
 - **2031 Expansion Committed+Assumed** - includes infrastructure assumed by the NPS (but not committed) plus committed infrastructure
 - **2031 Expansion Committed+TfL** - includes an indicative TfL package of enhancements plus committed infrastructure
- 3.17 Further details are provided in Table 3-2 below.

Table 3-2: TfL Forecast Network Scenarios

Scenario	Demand description	Network description
2015 Base Year	<ul style="list-style-type: none"> • Latest model year • Calibrated and validated to 'fit-for-purpose' level 	<ul style="list-style-type: none"> • Current (base year) network
2031 Do Minimum (no expansion)	<ul style="list-style-type: none"> • Heathrow Do Minimum forecast demand • Background travel growth from GLA London Plan and DfT TEMPRO forecasts 	<ul style="list-style-type: none"> • No Heathrow expansion • All currently committed schemes including Elizabeth Line, Piccadilly line upgrade, HS2 with stop at Old Oak Common
2031 Expansion Committed	<ul style="list-style-type: none"> • LHR Expansion related demand • Background travel growth from GLA London Plan and DfT TEMPRO forecasts 	<ul style="list-style-type: none"> • Heathrow 3rd runway expansion • Includes all schemes in 2031 Do Minimum • Includes schemes committed as part of expansion – i.e. highway diversions to accommodate the larger airport footprint (as per HAL proposals)
2031 Expansion Committed+Assumed	<ul style="list-style-type: none"> • As per 2031 Expansion Committed 	<ul style="list-style-type: none"> • Heathrow 3rd runway expansion • Includes all schemes in 2031 Expansion Committed • Includes rail schemes assumed by the NPS (though not committed or funded) namely Network Rail (NR) schemes for Western Rail Access & Southern Rail Access
2031 Expansion Committed+TfL	<ul style="list-style-type: none"> • As per 2031 Expansion Committed 	<ul style="list-style-type: none"> • Heathrow 3rd runway expansion • Includes all schemes in 2031 Expansion Committed • Includes indicative TfL package, notably, NR Western Rail Access, an alternative version of Southern Rail Access and bus and cycle access enhancements such as priority measures on key corridors (with some reallocation of highway capacity)

[Note that the modelling assumed an Elizabeth line service of four trains per hour to Heathrow; it has subsequently been announced that this will increase to six.]

4. Airport Mode Share

Calculated policy scenarios

- 4.1 The NPS cites the HAL aspiration of no increase in highway traffic. However, the criteria specified by the NPS for 2030 are a 50% mode share for passengers and a 25% decrease in staff highway trips.
- 4.2 Table 4-1 sets out what these policy scenarios would mean when applied to the forecast surface access demand for an expanded Heathrow in 2031. They have also been tested with the -10% demand sensitivity. 'No extra traffic' scenarios are tested with both no increase in passenger and staff highway trips and no increase in passenger, staff and freight highway trips.

Table 4-1: Forecast mode share for policy scenarios

Scenario	Person trips (passenger and staff)			Vehicle trips		
	Highway	Public transport	Public transport mode share	Highway passenger and staff	Highway incl. freight	Additional vehicles
2015 Base Year	143,700	90,600	38.7%	141,700	160,300	-
2031 Do Minimum (no expansion)	151,900	125,400	45.2%	150,400	172,000	11,700
2030 No extra traffic (including freight)	125,200	284,000	69.4%	123,600	160,300	-
2030 No extra traffic (including freight) -10% sensitivity	125,200	243,200	66.0%	123,600	160,300	-
2030 No extra traffic (without freight)	143,600	265,700	64.9%	141,700	178,400	18,100
2030 No extra traffic (without freight) -10% sensitivity	143,600	224,800	61.0%	141,700	178,400	18,100
2030 NPS conditions	181,300	228,000	55.7%	180,800	217,500	57,200
2030 NPS conditions -10% sensitivity	167,100	201,300	54.6%	166,400	203,100	42,800

[Public transport includes 'Other' modes such as hotel shuttles, cycling and walking]

- 4.3 This shows the significant increase in mode share required, from 39% without expansion to 65-70% with expansion, if the aspiration for no increase in highway trips (including freight) is to be secured. This also results in 150,000-200,000 additional public transport trips, a very considerable increase which for the most part will need to be accommodated by the rail links serving an expanded Heathrow.
- 4.4 This table also shows that the conditions set out in the NPS fall considerably short of no increase in highway trips, even applying the -10% demand sensitivity, and would result in 40,000-60,000 additional vehicle trips every day.
- 4.5 The aspiration for no increase in highway traffic has occasionally been interpreted as excluding freight (the scenarios on the fifth and sixth lines of Table 4-1). In these scenarios, there is an increase in highway trips of almost 20,000, reflecting the growth in freight demand.

Modelled infrastructure scenarios

- 4.6 Table 4-2 sets out the forecast demand growth and mode share under different infrastructure interventions and compares them against the aspiration for no increase in highway trips.

Table 4-2: Forecast mode share for infrastructure scenarios

Scenario	Person trips (passenger and staff)			Vehicle trips		
	Highway	Public transport	Public transport mode share	Highway passenger and staff	Highway incl. freight	Additional vehicles
2015 Base Year	143,700	90,600	38.7%	141,700	160,300	-
2031 Do Minimum (no expansion)	151,900	125,400	45.2%	150,400	172,000	11,700
2031 Expansion Committed	216,800	190,900	46.8%	214,900	251,600	91,300
2031 Expansion Committed +Assumed	215,300	192,400	47.2%	213,400	250,100	89,800
2031 Expansion Committed+TfL	203,600	204,100	50.1%	202,200	238,900	78,600

[Public transport includes 'Other' modes such as hotel shuttles, cycling and walking]

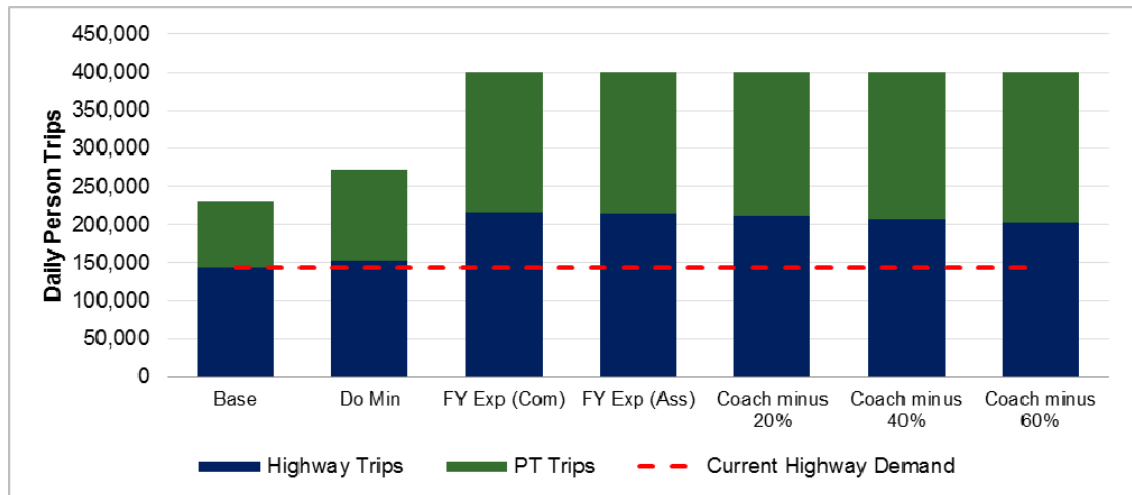
- 4.7 The results of the modelling show that, based on what is currently assumed in the NPS, Heathrow expansion could be expected to generate around 90,000 additional vehicle trips a day and over 100,000 extra public transport trips every day, compared to current levels.
- 4.8 The modelling shows that the overall (passenger and staff) public transport mode share rises from 39% in the 2015 Base Year to 45% in the Do Minimum (no expansion) scenario. This mode shift to public transport is primarily due to increasing road congestion as well as the opening of the Elizabeth line and the upgrade of the Piccadilly line. Expansion results in a further increase in public transport mode share up to 47%, largely because of the increased congestion associated with additional expansion-related highway demand.
- 4.9 Above and beyond what is committed for Heathrow expansion, the Committed+ Assumed scenario delivers less than one percentage point increase in public transport mode shift while the Committed+TfL scenario delivers an increase of around three percentage points to 50%.
- 4.10 However, while the schemes may be important in providing connectivity and capacity, this modelling suggests that, of themselves, they will be unable to attract sufficient numbers of passengers and staff from highway to public transport to meet the aspiration for no increase in highway trips.
- 4.11 To achieve such a sizeable shift to public transport to secure no increase in highway traffic, a third runway at Heathrow is likely to additionally require traffic demand management measures such as road user access charging. This is investigated further in Chapter 7, below.

Coach and bus sensitivity

- 4.12 It has been suggested that improvements to bus and coach have a key role to play in supporting mode shift. TfL has conducted analysis on the sensitivity of Heathrow airport mode share to coach improvements as well as coach and bus. This high-level test, on the Expansion Committed+Assumed scenario, involved decreasing coach and bus modelled travel time to/from the airport by increments of 10%, running TfL's airport demand and assignment models, and examining the change in mode share.
- 4.13 The results are shown in Figure 4-1 and Figure 4-2 below; in summary:
- An improvement to coach travel time of 50% would be required to achieve a 2.6% increase in public transport mode share;
 - A 10% reduction in both bus and coach travel time could achieve a 2.3% shift to public transport, while a 20% reduction would create a 4.9% shift;
 - To achieve 'no extra traffic', both coach and bus travel time would have to be reduced by at least 60%.

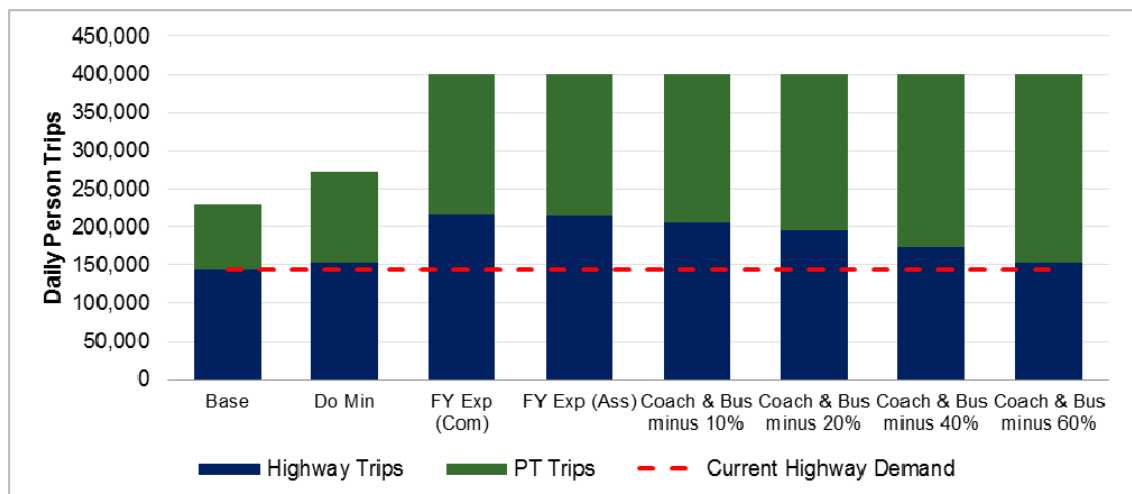
4.14 Overall, this analysis shows that it is extraordinarily difficult to achieve a significant airport mode share shift away from car/taxi by improving coach access to Heathrow alone. The results show that a greater mode shift to public transport can be achieved if both coach and bus access is very significantly enhanced. However, delivering this scale of improvement in travel times would in itself be highly challenging, faced with already constrained road corridors, many of which do not lend themselves to easy implementation of bus and coach priority.

Figure 4-1: Daily Heathrow trips under different coach scenarios



[Note: current highway demand on this graph excludes freight]

Figure 4-2: Daily Heathrow trips under different coach and bus scenarios

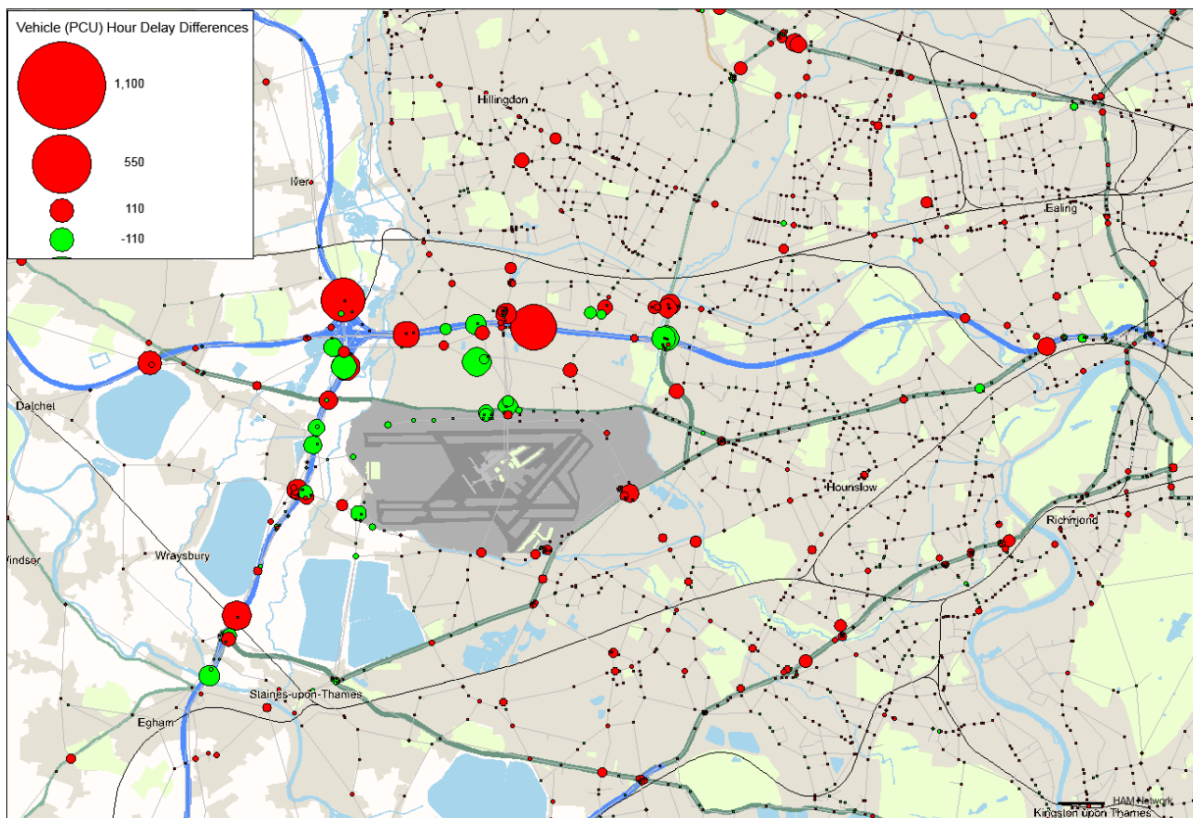


[Note: current highway demand on this graph excludes freight]

5. Highway Demand Impact

- 5.1 This section sets out the impacts of expansion on the highway network, focused in particular on the Expansion Committed+Assumed scenario i.e. the basis of the NPS. Needless to say, there would be no highway impact if the aspiration for no increase in highway traffic was achieved.
- 5.2 While the combined impact of public transport interventions and highway congestion serves to reduce Heathrow's highway mode share, the uplift in highway demand associated with expansion will nevertheless result in a significant increase overall under the Committed+Assumed scenario. Trips would increase from 140,000 per day now, to 150,000 in the Do Minimum and over 210,000 with a third runway (which is 50% above the Base Year, and 40% above the Do Minimum).
- 5.3 The impact of this additional demand is to worsen congestion and delay on an already constrained highway network, as shown in Figure 5-1, Figure 5-2 and Figure 5-3.

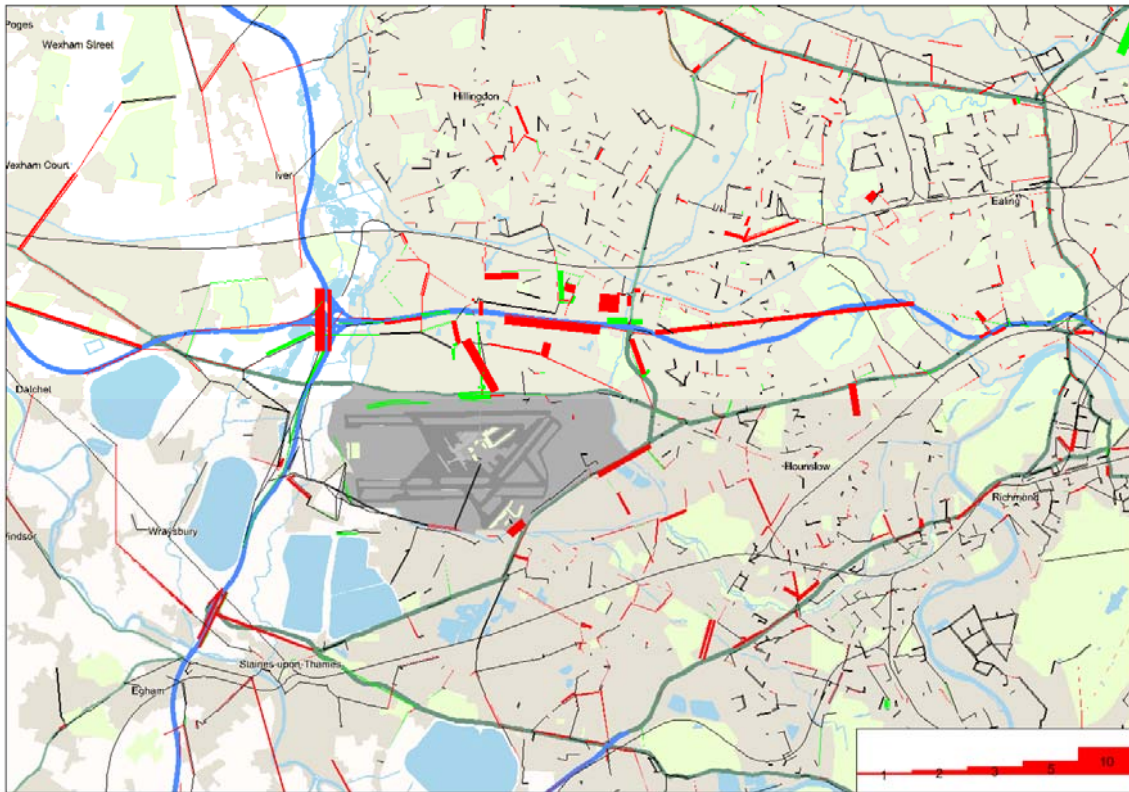
Figure 5-1: Junction delay change - 2031 Expansion Committed+Assumed scenario vs. 2031 Do Minimum (no expansion) scenario (AM peak hour 08:00-09:00), vehicle-weighted hourly delay



- 5.4 Figure 5-1 shows the increase in delay time at junctions in the surrounding areas in the AM peak hour (08:00-09:00) as a result of expansion, while Figure 5-2 shows the increase in delay time on links (per direction). Some of the impacts are muted where roads are already heavily congested and expansion-related traffic is diverted to other

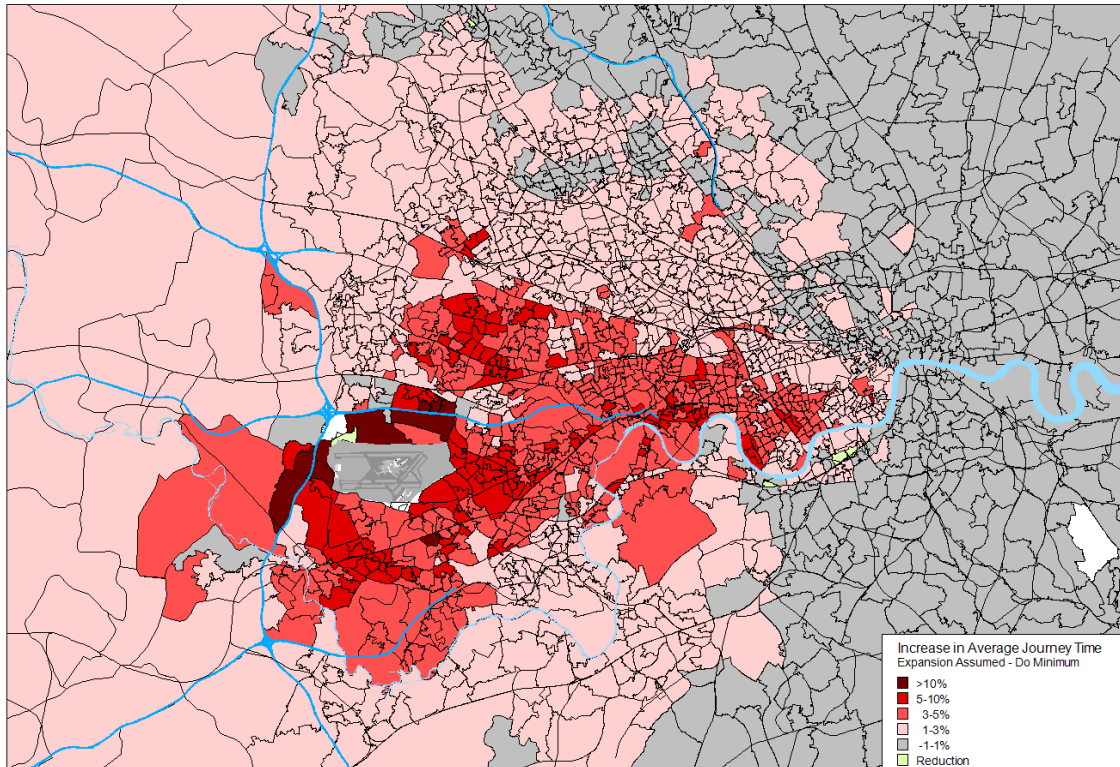
routes.

Figure 5-2: Link delay change - 2031 Expansion Committed+Assumed scenario vs. 2031 Do Minimum (no expansion) scenario (AM peak hour 08:00-09:00), average delay in seconds



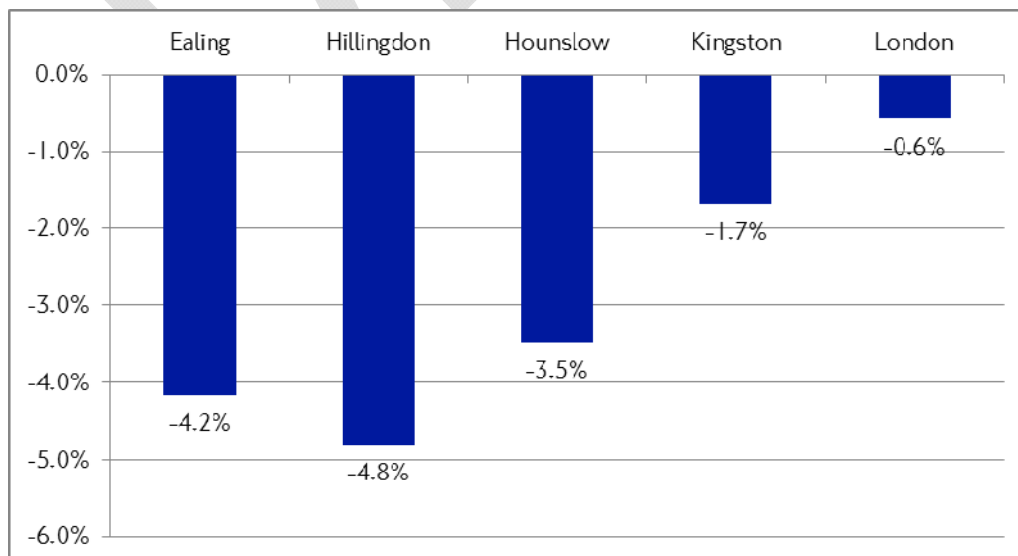
5.5 Figure 5-3 shows, for the different model zones, the average delay to non-airport journeys in the AM peak hour (08:00-09:00) as a result of expansion, for all non-airport journeys starting in that zone. It shows the impacts over a wide area, with locations as far away as Westminster experiencing a 3-5% increase in journey time for non-airport journeys as a result of a third runway.

Figure 5-3: Change in average journey times for non-Heathrow demand - 2031 Expansion Committed+Assumed scenario vs. 2031 Do Minimum (no expansion) scenario (AM peak hour 08:00-09:00)



5.6 Another measure of the network performance is an aggregate comparison across all links in an area. Figure 5-4 shows the change in average speed from the Do Minimum to the Expansion Committed+Assumed scenario, for some of the boroughs close to Heathrow as well as London as a whole. Analysis shows that average speeds drop significantly as a result of Heathrow expansion.

Figure 5-4: Change in average speeds across London boroughs - 2031 Expansion Committed+Assumed Scenario vs. 2031 Do Minimum (no expansion) Scenario (AM peak hour 08:00-09:00)



Heathrow-related traffic on the roads

- 5.7 This analysis assessed the contribution of Heathrow-related traffic to the overall levels of traffic on the road network.
- 5.8 A breakdown of the total distance travelled overall by Heathrow-related vehicles as a proportion of all traffic is shown in Table 5-1. This is measured in Passenger Car Unit kilometres (PCU-km) and is compared to the WeLHAM model 2012 base year. Data is included for the four London boroughs on the key road corridor between Heathrow and central London.

Table 5-1: Proportion of Heathrow traffic (PCU-km) by borough

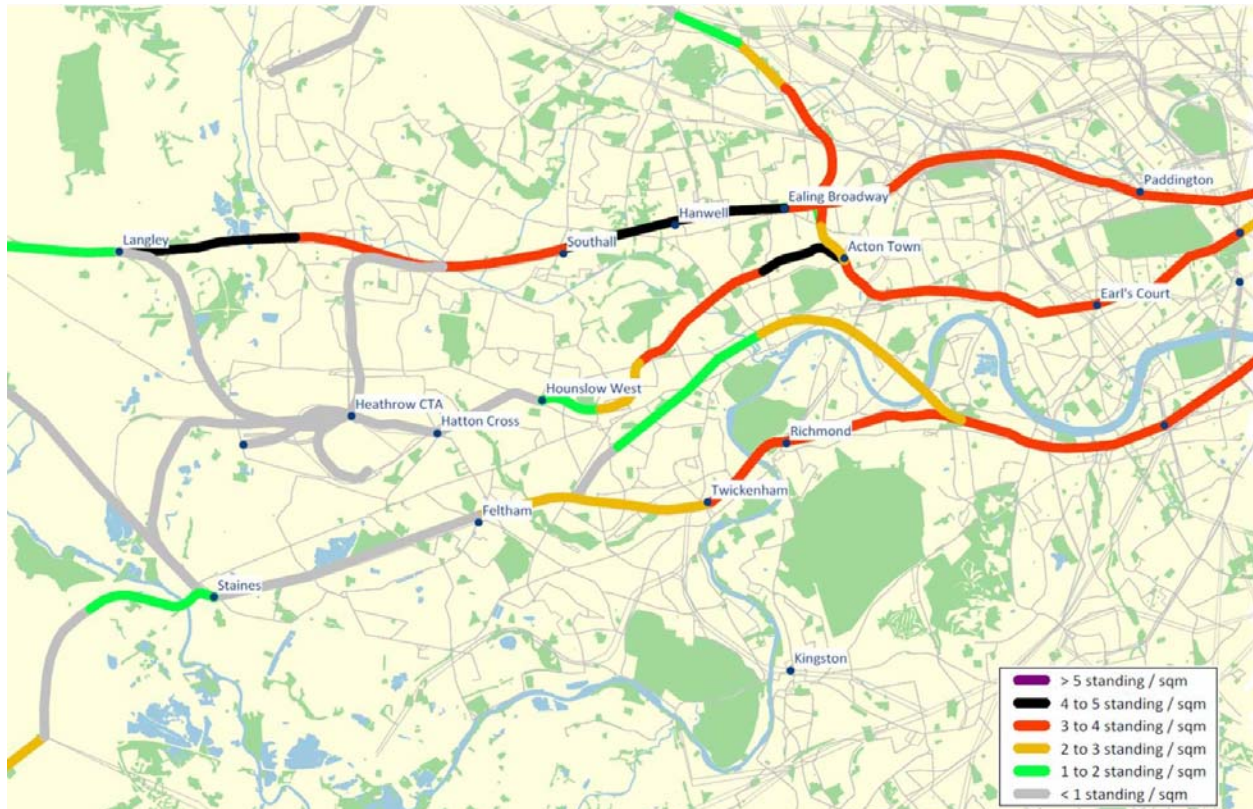
Borough	Proportion of Traffic (PCU-km) to/from Heathrow Airport		
	2012 base	2031 Do Minimum	2031 Expansion Committed +Assumed
Hillingdon	16%	15%	17%
Hounslow	9%	10%	13%
Hammersmith & Fulham	6%	7%	9%
Kensington & Chelsea	4%	5%	7%

- 5.9 The proportions remain broadly stable between the base year and the 2031 Do Minimum, indicating that, without expansion, Heathrow traffic grows at a similar rate to overall traffic in west London. However, the proportion of Heathrow-related traffic increases by up to three percentage points in the expansion scenario, providing further evidence of the extra strain put on the road network by Heathrow expansion.

6. Public Transport Impacts

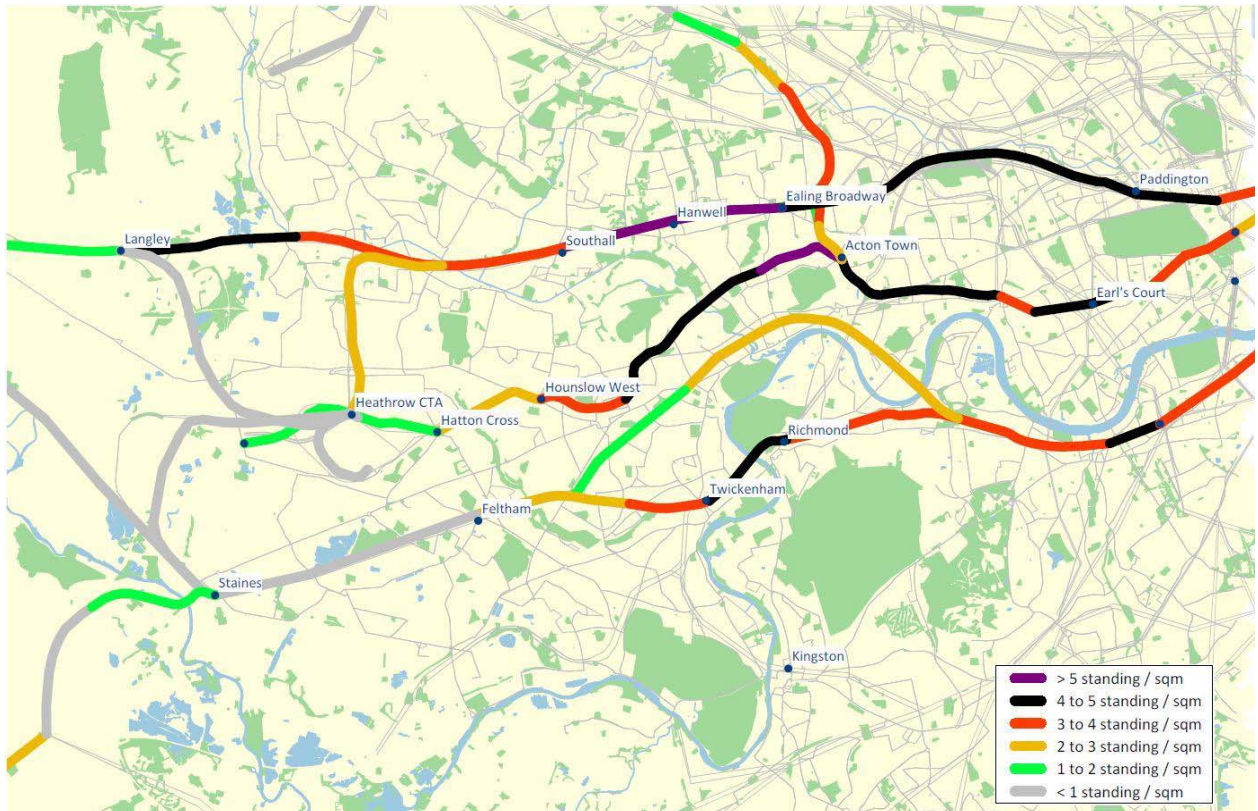
- 6.1 This section sets out the impacts of expansion on the public transport network, again focused in particular on the Expansion Committed+Assumed scenario i.e. the basis of the NPS.
- 6.2 The additional demand associated with expansion would result in a significant increase in overall public transport demand from around 90,000 trips per day currently, to around 120,000 in the 2031 Do Minimum (no expansion) scenario, and up to 280,000 trips every day if the aspiration for no increase in highway traffic were achieved.
- 6.3 For the Expansion Committed+Assumed scenario, 190,000 daily public transport trips are forecast to be generated (which is 110% above the Base Year and over 50% above the Do Minimum scenario).
- 6.4 TfL's airport demand mode share model allocates demand to Heathrow's rail links and estimation of peak hour demand can be made, with new rail demand assigned through TfL's Railplan public transport model. Results show Heathrow expansion places significant additional demand on the public transport network.
- 6.5 The implications for the performance of the rail network in terms of crowding, are shown in Figure 6-1 for the Expansion Committed+Assumed scenario. Crowding of 3-4 passengers per square metre (denoted by red) indicates a very crowded section of line while greater than 4 passengers per square metre (denoted by black or purple sections) represents a extremely high level of crowding at which absolute maximum capacity has been reached.

Figure 6-1: Crowding on key lines from Heathrow, Committed+Assumed – Eastbound, AM peak hour (0800-0900)



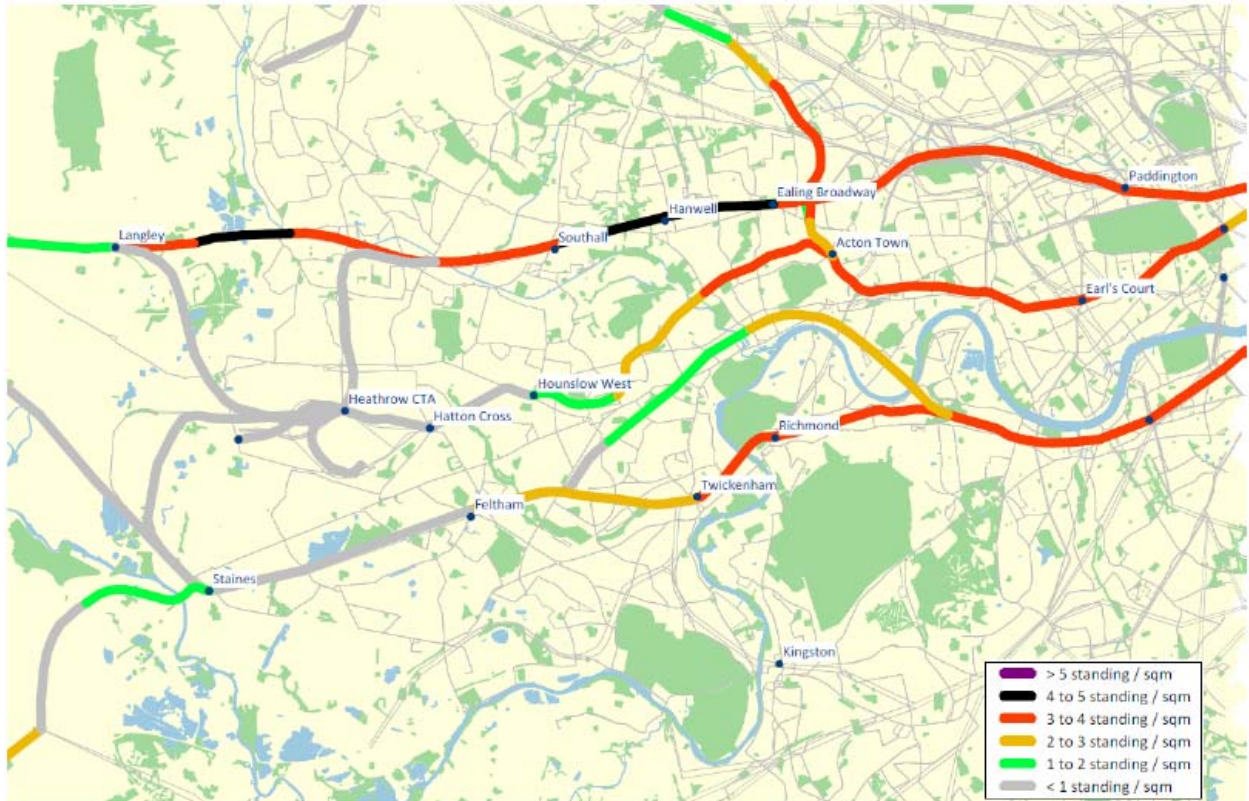
- 6.6 The analysis shows that Heathrow passengers travelling to London, can board relatively easily at the airport and almost all get a seat. However, the impact of the additional Heathrow airport demand will be felt along the line as commuters try to board services on the Elizabeth line, Piccadilly line and Windsor lines that quickly become full.
- 6.7 It should also be noted that a similar crowding challenge will be faced westbound in the PM peak, departing from central London towards Heathrow. However, in that direction, Heathrow passengers will be equally disadvantaged, struggling to board increasingly crowded trains at central London stations, alongside commuters.
- 6.8 The above modelling excludes consideration for luggage. If luggage is taken into account in the crowding (assuming a luggage factor of 0.5 per Heathrow passenger), the impact of Heathrow passengers on non-airport rail users is shown to increase considerably. Figure 6-2 shows the severity of the crowding levels for those boarding Heathrow services after the airport, including the 'assumed' (Network Rail version of) Southern Rail Access.

Figure 6-2: Crowding on key lines from Heathrow, Committed+Assumed – Eastbound, AM peak hour (0800-0900) plus luggage factor



6.9 Figure 6-3 below shows the crowding on the key links to the airport for the Expansion Committed+Assumed scenario under the -10% demand sensitivity (and without luggage factor). The difference in forecast crowding levels compared to the main demand scenario in Figure 6-1 is marginal, with substantial crowding evident on the Elizabeth line, Piccadilly line and Windsor lines.

Figure 6-3: Crowding on key lines from Heathrow, Committed+Assumed – Eastbound, AM peak hour (0800-0900), -10% demand sensitivity



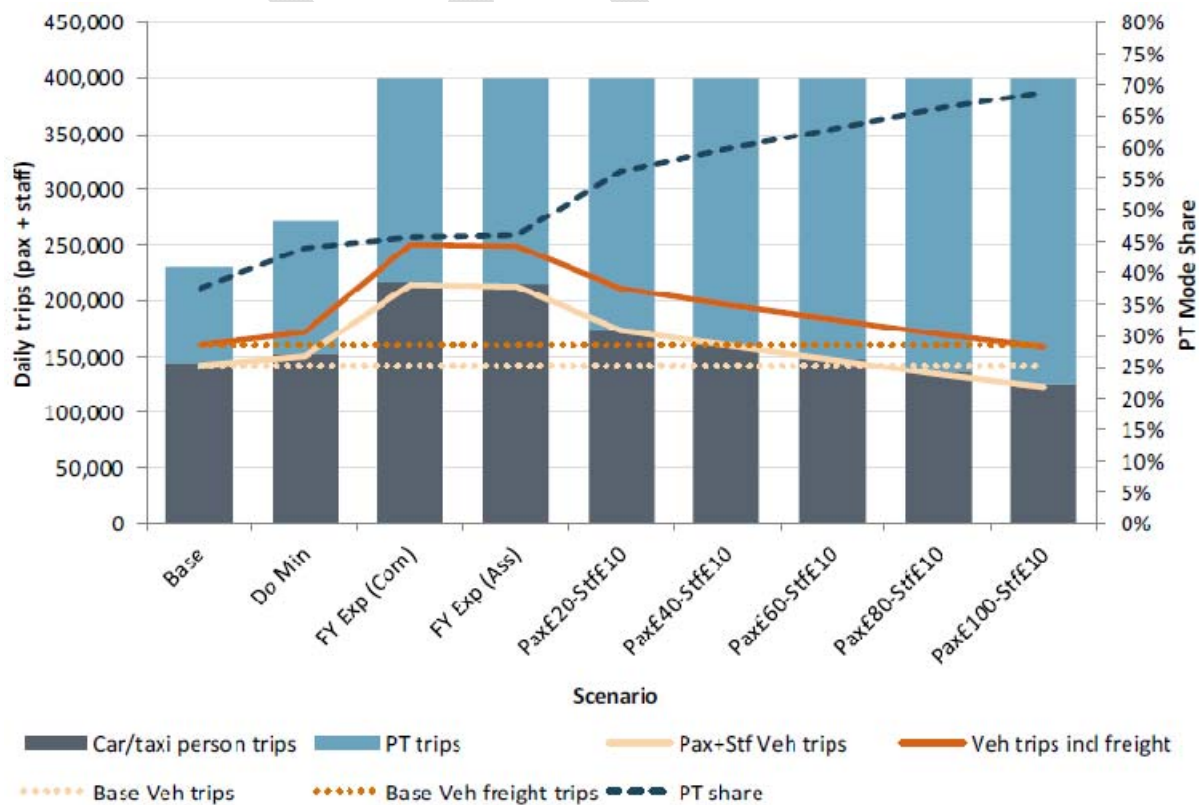
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7. Airport Traffic Demand Management Measures

Road User Access Charge

- 7.1 The mode choice modelling found the various public transport infrastructure interventions alone to be inadequate to attract sufficient numbers of trips to public transport to secure the aspiration for no increase in highway traffic.
- 7.2 Therefore TfL conducted an indicative range of sensitivity tests involving airport road user access charges for passengers and staff to determine the level of charging that would drive sufficient mode share. This was applied to the Expansion Committed+Assumed scenario, i.e. the basis of the NPS.
- 7.3 A range of passenger highway access charges for cars, minicabs and taxis were examined alongside limited staff highway access charges to assess the pricing level at which the overall Heathrow-related highway demand would be brought back down to current levels i.e. 'no extra traffic'.
- 7.4 The modelling indicates that in order to secure no increase in highway traffic, a passenger access charge in excess of £50 would be required, alongside a staff access charge of £10 per day.
- 7.5 The impact on mode share of varying the passenger access charge with a staff access charge of £10 per day is shown in Figure 7-1 below.

Figure 7-1: Daily person trips under different passenger access charges



- 7.6 This analysis should be treated as very approximate as a number of factors will determine how exactly users will respond to a very high charge - though the willingness of many passengers to pay for the convenience of a car journey to the airport should not be underestimated. There are also different ways in the airport could implement such a scheme.
- 7.7 Nevertheless, it does suggest a very significant road user access charge will be required to shift passengers and staff to public transport if no increase in highway traffic is to be achieved.

Car Parking Demand Analysis

- 7.8 As an alternative to road user access charging, the question has been raised as to the extent to which demand could be managed by increasing the car parking charge. TfL has undertaken analysis of parking demand for Heathrow Airport, to investigate this.
- 7.9 It should be noted that this analysis did not seek to consider the potential leakage to unofficial off-site parking facilities, which could be substantial, depending on the scale of the on-airport parking charges and road user access charges and how they are implemented.
- 7.10 TfL's analysis found that raising parking charges alone – even to over £100 – has very little effect on the airport's overall highway mode share. This is because many of those choosing to park at Heathrow have a high willingness to pay and those who do shift will shift to taxi or kiss and fly modes as well as to public transport. A shift from parking to taxi or kiss and fly actually leads to additional highway trips as kiss and fly trips and a large proportion of taxi trips are without a passenger in one direction – i.e. entailing an additional 'empty' one-way airport journey.
- 7.11 TfL's analysis also considered a combination of parking and road access charging, but again this was not successful in achieving no extra highway traffic as too many trips switch from parking to kiss and fly and taxi.