Heathrow Airport: Additional Surface Access Information

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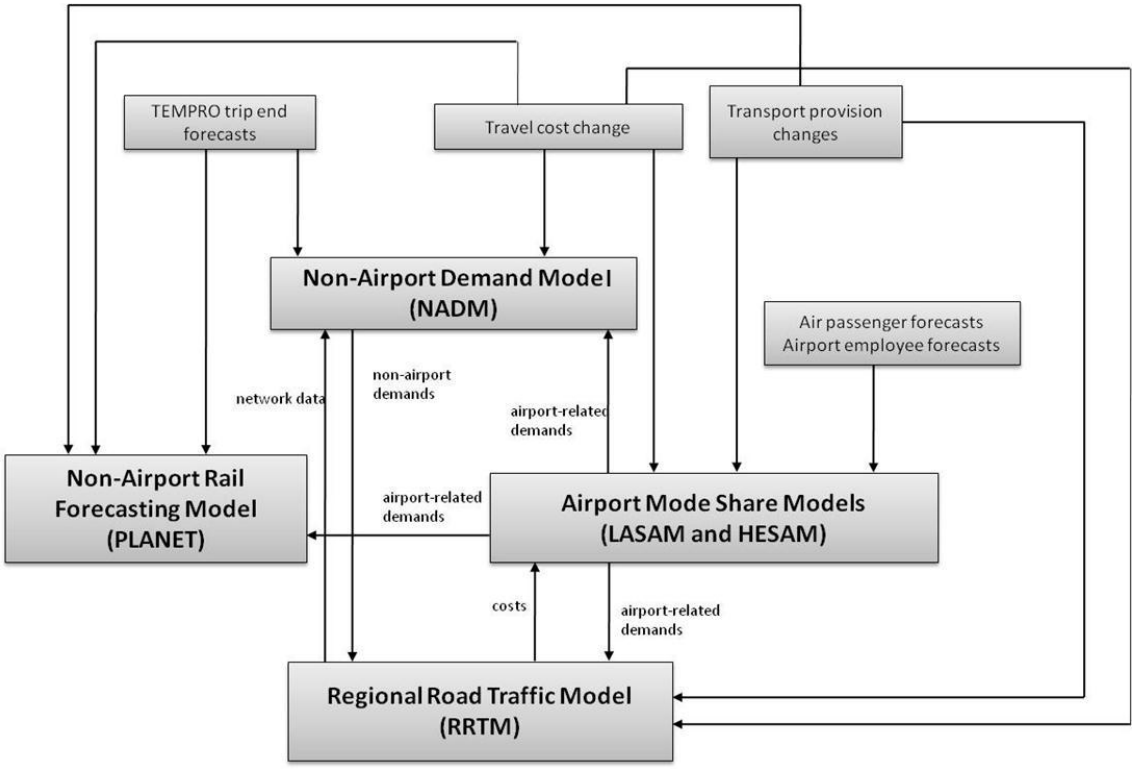
Purpose

1. This note summarises Heathrow's modelling suite and the assumptions used to support its submission to the Airports Commission in May 2014.

Heathrow modelling framework

2. Heathrow has developed its modelling suite over a number of years. It has been used to support the Terminal 5 Inquiry and Stansted G2 Application. At a high level, the structure of the modelling framework, its inputs and interrelations are illustrated in Figure 1

Figure 1 – Heathrow modelling suite



3. The purpose and functionality of each of the models are in summary:

- air passenger demands by mode and hour of the day are forecast using the London Airports Surface Access Model (LASAM) and the associated Time Period Model (TPM);
- airport employee demands by mode and hour of the day are forecast using the Heathrow Employee Surface Access Model (HESAM);
- non-airport travel demands by mode and hour of the day are forecast using the Non-Airport Demand Model (NADM);
- road trips from the previous three models are assigned to the road network using the Regional Road Traffic Model (RRTM); and
- non-airport travel demands by rail are forecasts by a locally calibrated version of PLANET South.

4. NADM is used for forecasting demands over time; these are fed down to RRTM, which in turn produces highway journey times for LASAM and HESAM. NADM is only run occasionally, when warranted by significant changes in infrastructure development assumptions, planning projections or economic growth parameters. The impact of Heathrow Airport development scenarios is not usually significant enough to lead to material changes at the NADM level.

5. This note focuses on the model components identified by the Airports Commission:

   - LASAM
   - HESAM;
   - RRTM.

6. These are the models that have been used to develop the evidence base for Heathrow's Surface Access Strategy for Growth.

Mode choice models: LASAM and HESAM

7. LASAM and HESAM have been used to estimate future mode share of airport passengers and employees. Based on the passenger and employee forecasts which are inputs to the model, we are able to assess the demand on the public transport network by time period. Using assumptions on car occupancy, the models also allow the expected levels of daily car movements to and from the airport to be calculated for each scenario.

Representation of Choices

8. In our current model set-up for the airport-related demand (LASAM and HESAM) we only represent mode choice. Trip frequency and time period choice as well as the geographical distribution of surface access demand (and by implication also airport choice) are taken as fixed inputs to the model, based on exogenous forecasts provided either by the DfT or by HAL.

9. We consider this appropriate given the purpose of the analysis. This is to forecast the effect of changes in surface access accessibility on the choices airport travellers and employees and to assess the demand generated so that the impact on the wider surface access network and other users can be considered.

Segmentation of Modes

10. LASAM currently represents all modes we consider of relevance for air passenger surface access in a hierarchical logit mode choice tree:

    - Bus/Coach
    - Taxi
    - Car: park-and-fly (parked at/near the airport)
    - Car: kiss-and-fly (driven to the airport and dropped off)
    - Heathrow Express
    - Other rail, such as Connect or Airtrack
    - Underground
    - RailAir Coach
    - Charter Coach
    - Airport Transfer Coach
    - Other

11. Of these, Charter Coach, Airport Transfer Coach and Other are currently regarded as fixe. They represent a very small proportion of travellers who are largely captive to those modes. 'Other' would include walking and cycling which have a very minor role for air passengers.

12. We do not explicitly distinguish between local bus and scheduled coach. Local buses are of relatively minor importance for air passengers but are included in our coach coding where relevant.

13. HESAM is set up to consider three main modes in a multinomial logit model:

    - Car sole
    - Car share
    - Public transport

14. Further sub-mode split is provided by an assignment module to give the following total set of modes:

    - Car Sole
    - Car Share
    - Standard Rail (such as Connect or Crossrail)
    - Other Rail (such as Airtrack)
    - Tube
    - Bus
    - Shuttle
    - Other modes

15. Walking and cycling are contained within 'other modes' which are treated as a fixed proportion in the model. These modes are likely to play an important role in the future surface access strategy. However, they have not been modelled explicitly at this stage.

Segmentation of users

16. The segmentation and trip purpose split in LASAM and HESAM is bespoke to the airport population and in many ways more detailed than standard guidance stipulates. However, we do not distinguish by car availability – this is implied in our segmentation rather than being modelled explicitly.

17. The segmentation is generally informed by data availability. For LASAM, this is based on the available segmentation from the CAA passenger survey:

    - UK Business Domestic
    - UK Business International
    - UK Leisure Domestic
    - UK Leisure International
    - Foreign Business
    - Foreign leisure

18. The facility for further segmentation by flight type (charter, low cost or other scheduled) exists in the model but charter and low cost are less relevant at Heathrow. The distinction between foreign and UK is important as it generally determines local car availability. Business and Leisure passengers have different values of time and, in some cases, different mode availability.

19. The distinction between domestic and international is less important but it does influence mode choice behaviour as these two groups tend to have different stay-away durations and different luggage requirements.

20. For HESAM, the model estimation has led to a different type of segmentation. By definition, the model contains commuting journeys only. The trip matrix is split by off-airport home location and on-airport employment location as well as reporting and finishing times.

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Time Periods

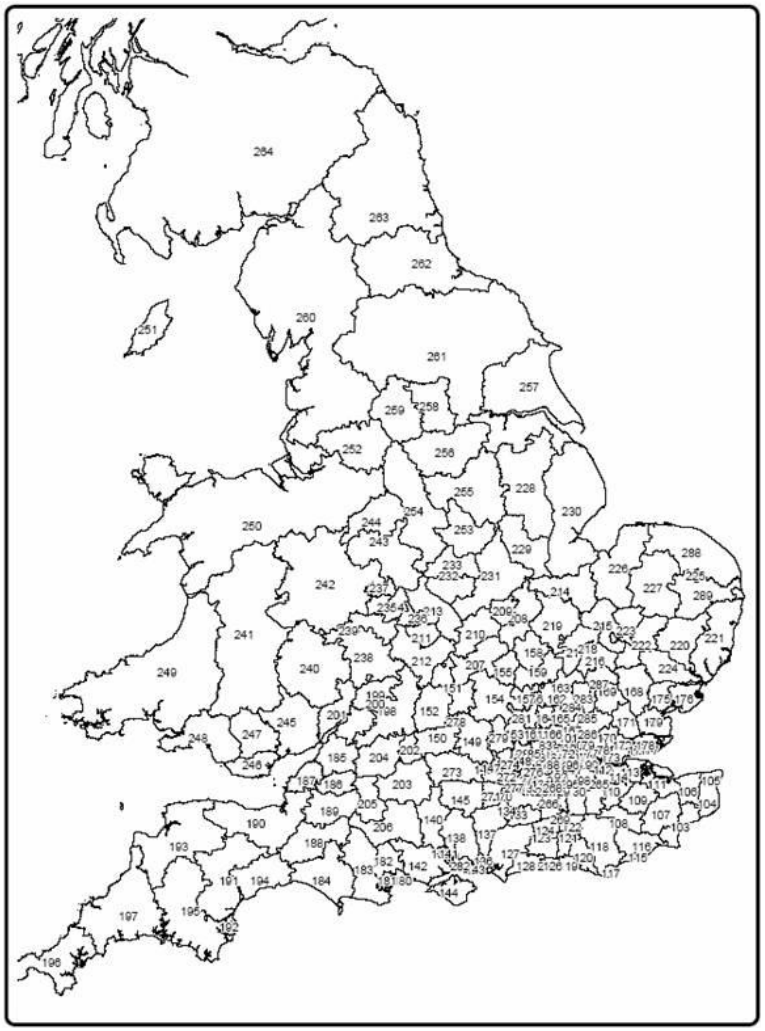
21. LASAM is set up to explicitly represent four separate time periods in the mode choice model: AM peak, PM peak, inter-peak and off-peak (including weekend). The model outputs are then processed further using the air passenger arrival and departure profiles to provide forecasts for individual hours. This process also takes account of the unavailability of most public transport services late at night. Forecasting for individual hours is important as it cannot be taken for granted that air passenger demand peaks will coincide with the standard commuter peak and it is important to ascertain, for each air passenger demand scenarios, when the peaks occur.

22. HESAM also represents these four time periods and the employee demand is defined in terms of “tours”. This takes account of the timing of both the outbound and the return journey. It ensures that any mode unavailability (for example for night workers) or unattractive levels of service are taken into account for both journey legs. Employees would not, in general, wish to rely on a particular mode for one leg of the journey if it is not attractive or available for the return journey. HESAM is also able to output demands by individual hour.

Representation of the network and zoning structure

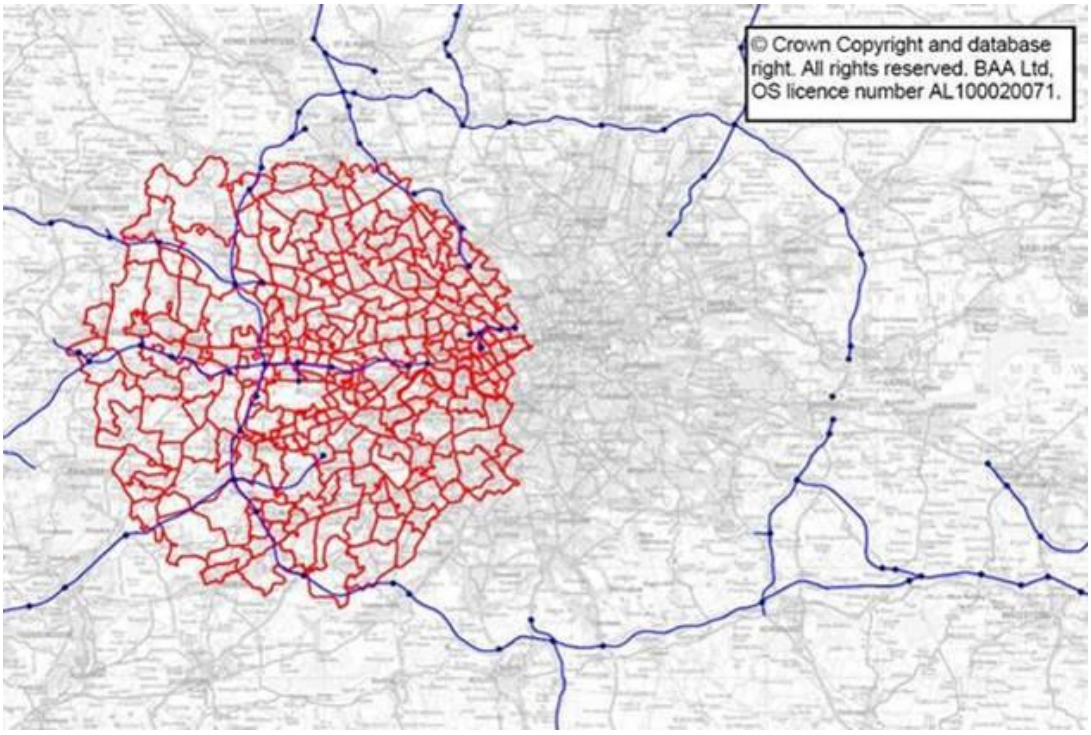
23. LASAM has GB-wide coverage with appropriate level of detail. The zoning is based on CAA districts outside London with some further disaggregation in central London.

Figure 2 - LASAM Zone Structure



24. HESAM covers the detailed area of RRTM only (approximately a radius from Heathrow to Central London and the same distance in all directions). Around 80% of employees fall within that area. Figure 3 2 shows the zoning structure used for HESAM.

Figure 3 Zoning Structure underlying HESAM



Calibration

25. Many of the model inputs for LASAM and HESAM are bespoke due to the nature of airport travel. Some rely on the standard recommended sources are from WebTAG unit M1.2. Where appropriate, they conform to advice in published sources. For example, the LASAM values of time have been calibrated specifically for air passengers using statistical estimation but the growth in value of time uses WebTAG-recommended factors.

26. The estimation of LASAM and HESAM is based on 2004 data. The implementation of both models is for a later base year, 2009. This included a re-calibration of ASCs to reproduce the (new) base year mode shares but not a re-estimation of the underlying behavioural parameters of the logit model.

HESAM and LASAM base year updates

27. The HESAM mode choice parameters are based on 2004 employment survey data and the model has been updated to a 2009 base year by updating Level of Service (LOS) data to a 2009 level, updating the trip matrix based on the 2009 employment data and calibrating Alternative Service Constants (ASC) to reproduce the mode shares from the 2009 employment survey.

28. The CAA survey is a rolling programme, allowing annual (or more frequent) updates to LASAM. It is not cost-effective to update the model every year, and (like HESAM) the current model has a 2009 base year.

Realism and sensitivity testing

29. Realism testing on LASAM and HESAM has been undertaken as part of the original model estimation and has found the models to respond appropriately. Given the specialist nature of airport travel, complete consistency with WebTAG and PDFH-based guideline values is not always appropriate. For example cost elasticities in LASAM are generally towards the lower end of the suggested ranges, reflecting the high values of times of air passengers.

RRTM

30. RRTM is a road traffic assignment model implemented in SATURN software. It is used to assess how changes to the road network and distribution of demand on the airport campus may impact on the operation of the wider road network.

31. It is a strategic tool intended to identify high level changes in traffic rather than to produce a detailed traffic impact assessment at the local level.

Representation of modes

32. Within RRTM seven vehicle classes are modelled:

- Airport Passengers;
- Cars on Employer's Business;
- Cars on 'Other' trip purposes (Low value of time);
- Cars on 'Other' trip purposes (Medium value of time);
- Cars on 'Other' trip purposes (High value of time);
- Heavy Goods Vehicles; and
- Light Goods Vehicles.

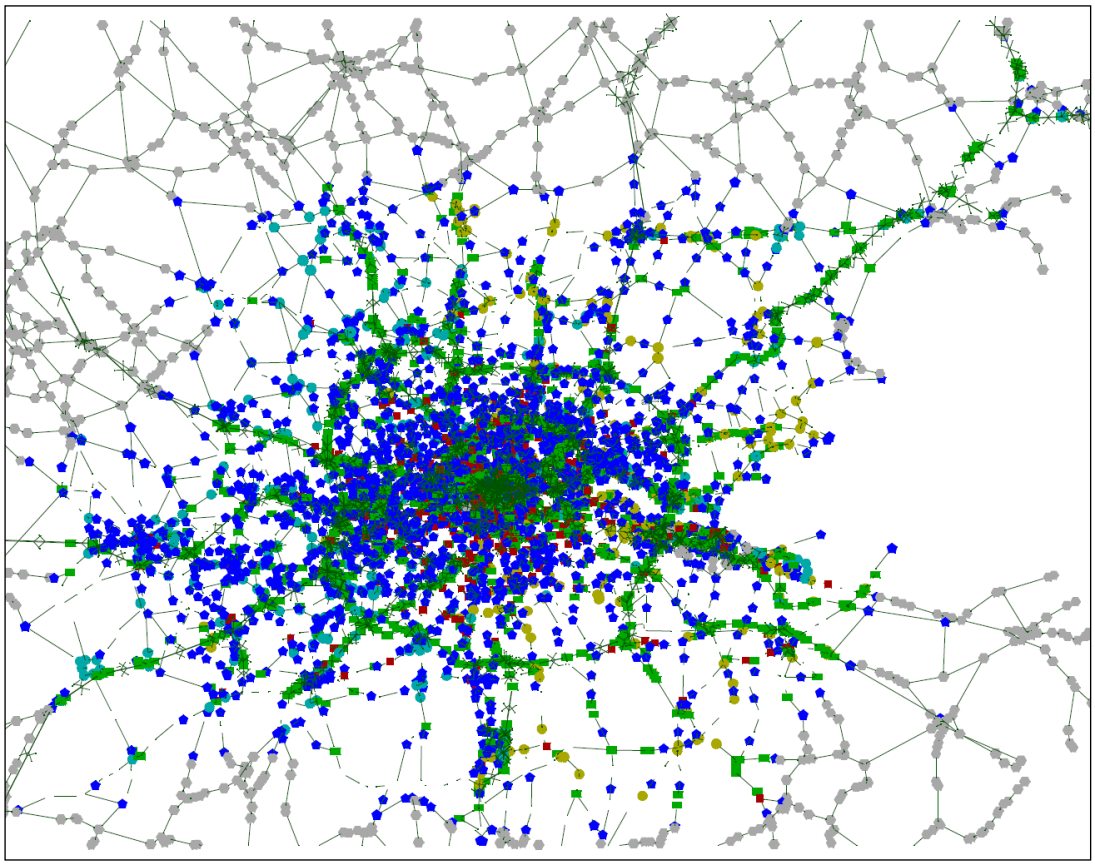
33. Airport employees are not modelled individually and are included within the other car matrices. Further refinement of the representation of airport employees is being undertaken, segmenting employees out of cars on 'Other' trip purposes user classes into a discrete user class and assigning to more specific employee parking destinations.

Representation of the networks

34. Around 80% of employees fall within the detailed modelled area, which forms a concentric 'buffer' around the airport to Central London and the same distance in all directions. This is adequate coverage to capture all salient impacts of prospective future schemes, whilst not being so large as to lead to excessive model run times, with convergence and model noise issues.

35. The strategic network covering the M25 and main routes within the M25 are included in the simulation network. Also included in simulation coding are strategic arterial routes outside the M25, covering a concentric ring around the M25 to Reading in the west, Gatwick in the south, Stansted and the A12 and A120 in the northeast and Luton in the northwest. Beyond this the external area is covered by more skeletal buffer network incorporating strategic routes in the rest of the UK.

Figure 4 - RRTM Fully Modelled Area



Note: coloured nodes = simulation coding, grey nodes = buffer coding

Modelled time periods

36. The time periods modelled in RRTM cover, and are limited to, the morning peak (0800-0900) and evening peak (1700-1800) hours. There is no representation of the interpeak or off-peak period. Note that the network peak period differs from the arrival and departure peaks for passengers and employees. This is accounted for in the factoring of demand between LASAM, HESAM and RRTM.

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Zoning system

37. A zone system was developed specifically to meet the needs of the Heathrow model.

Figure 5 - RRTM Zoning System – Heathrow Area

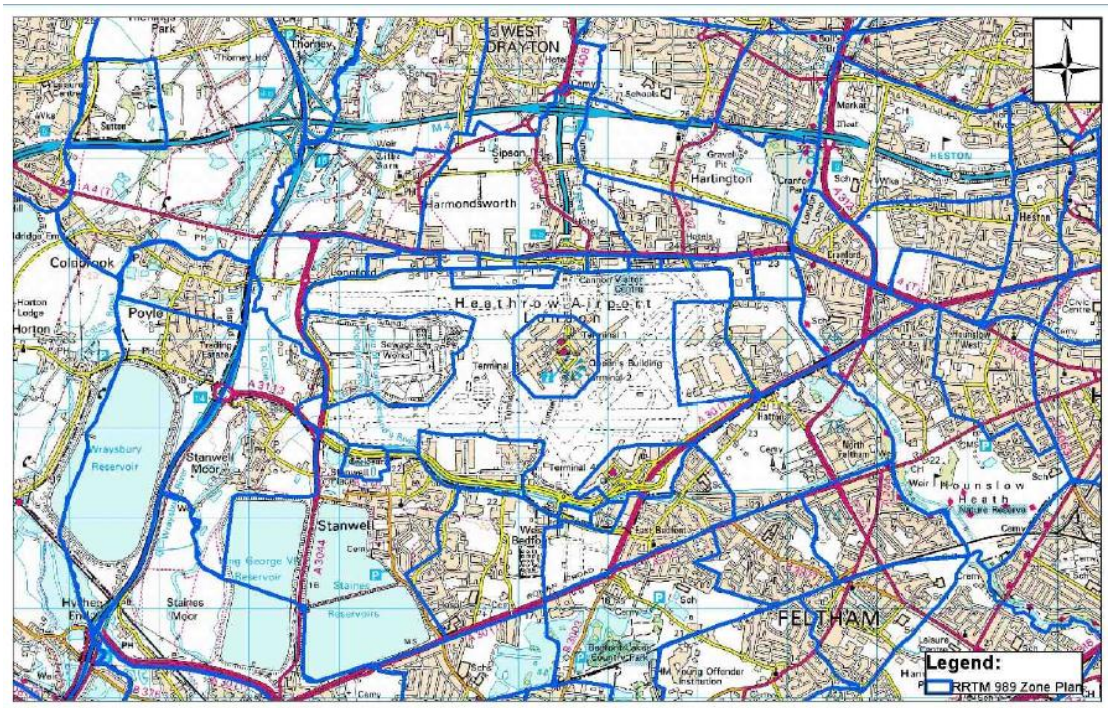


Figure 6 - RRTM Zoning System – Wider Heathrow Area

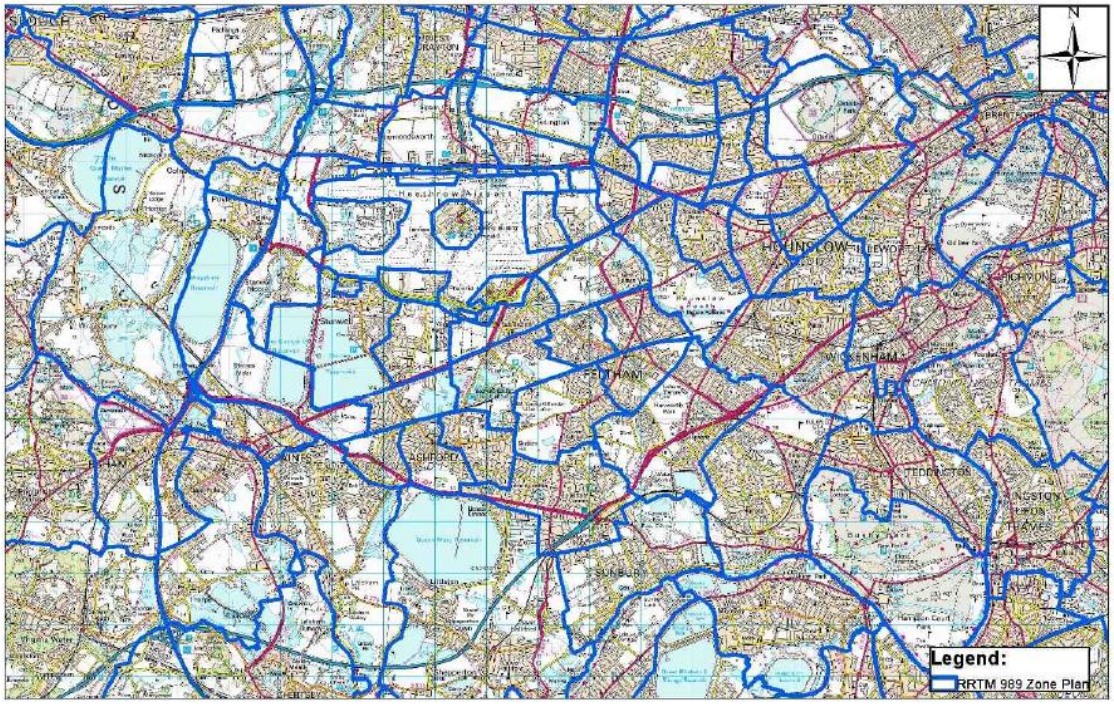
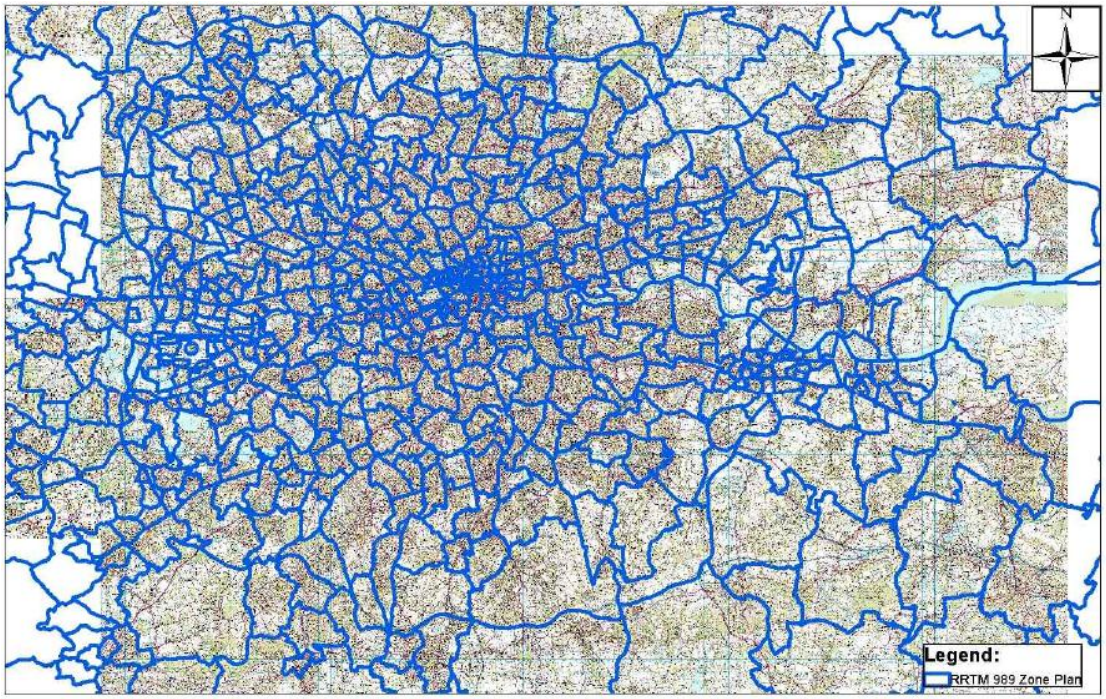


Figure 7 - RRTM Zoning System – M25 Area



Calibration and Validation

38. RRTM matrices were originally calibrated in 2006/2007 through a process of count based matrix estimation, in order to gain a close match between observed and modelled traffic flows within the likely area of influence.

39. RRTM prior matrices for AM and PM periods have gone through 15 iterations of the matrix estimation and assignment process to maximise the correspondence with control counts. Demand related to all of the Heathrow Airport zones was frozen in the matrix estimation process to ensure that air passenger and employee demand was unchanged from that provided by the Airport Models. Matrix estimation was carried out on the three user class Development model and applied separately for light vehicles and heavy vehicles.

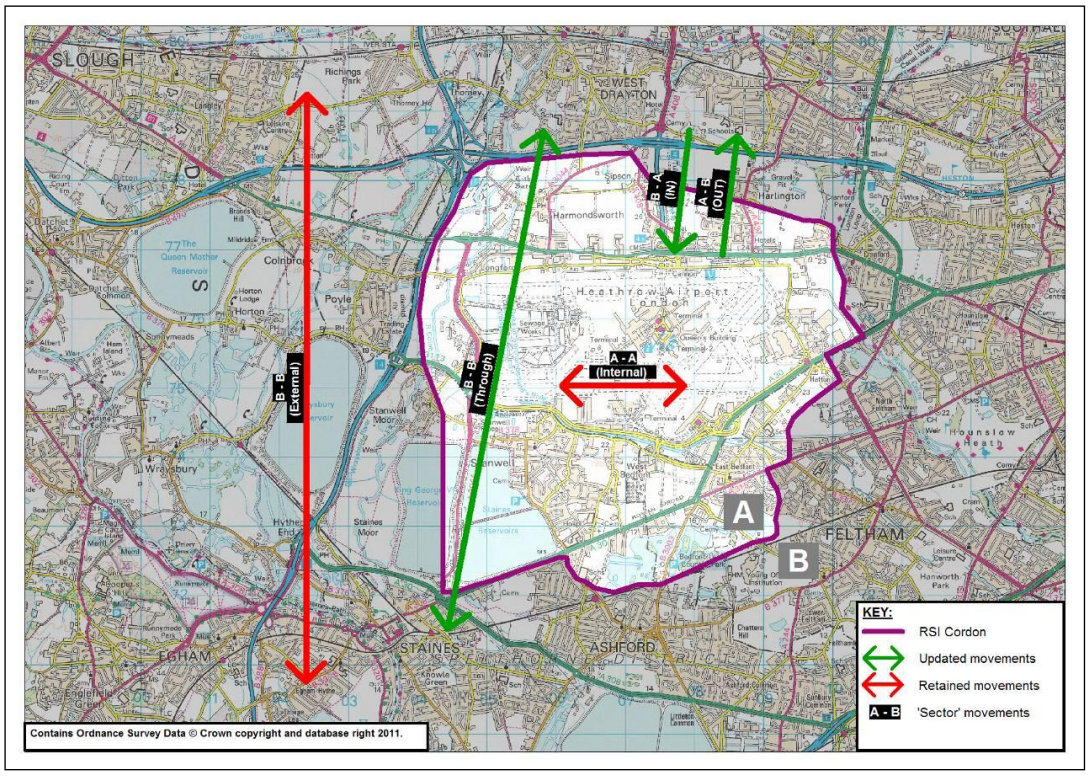
40. Count locations for matrix estimation purposes were spread across the model; this arose from the general approach of making best use of available data rather than embarking on a bespoke data collection programme. They did not form a comprehensive system of ‘watertight’ screenlines and cordons (though a sub-set of counts have been grouped in this way for the purposes of presenting model results). Checks were carried out to ensure there was a reasonable degree of consistency in the estimation of traffic flows implied by adjacent counts. Turning counts from the LRTM surveys were included in the matrix estimation process.

41. During 2009 a large traffic survey programme was conducted across the western area of London and beyond that included about 100 roadside interview (RSI) surveys, manual and automatic traffic counts, journey time surveys and local surveys of operational sites around the airport. A limited local subset of data, corresponding to a cordon around local Heathrow roads was incorporated into a local Heathrow area model update in 2011.

42. As part of this upgrade a sub-set of the data relating to the local Heathrow area was incorporated to locally update the RRTM to a 2009 base. The most significant data utilised was the RSI data which provided updated origin and destination data reflecting improvements to the highway network and airport infrastructure.

43. From the available RSI surveys a cordon was formed around Heathrow that captured the majority of trip movements into and out of the airport area as indicated in Figure 4-5. All trips crossing the cordon, as indicated by green arrowed movements (B-A or A-B), have been updated based on the observed RSI data. In addition, details of trips travelling through the cordon (B-B) trips were updated. This facilitates a good understanding of the key movements in the local study area. Longer distance through movements not crossing the cordon and localised internal area trip patterns indicated by red arrows remain as per original modelling.

Figure 8 - Indication of updated and retained trip patterns in RRTM



44. Whilst the original 2006/2007 RRTM pre-dates WebTAG guidance on assignment model validation at screenlines, link flows, turning movements and journey times, standard processes and checks were performed to ensure a transport model which was representative of prevailing vehicle flows and movements had been developed.

45. During 2011 a local recalibration and validation using September/October 2009 surveys was undertaken. The model was re-based to correspond to an average weekday (Monday to Friday) for a five week period between mid-September and mid-October.

46. Both the morning (0800-0900) and evening (1700-1800) peak models have been locally re-calibrated and validated but the inter-peak model was not part of this scope of work. The calibration process made use of a large number of the manual and automatic traffic counts for both links and junctions which were collected in 2009.These count data were grouped into cordons, screenline and corridors as part of the model calibration and validation process and split by vehicle type, either HGV or Light vehicles.

47. Validation screenlines were defined around Heathrow. A number of journey time routes were also identified within the updated model area. The outcome of the network calibration and assignment validation process indicates that the model performs reasonably well against WebTAG acceptance criteria in the Heathrow area.

Passenger mode share analysis

Travel Costs

48. Mode choice decisions are influenced by assumptions about changes in travel costs relative to the model's base year. The table below sets out the relevant indices for the 2030 scenario for a 2009 base.

Figure 9 - LASAM forecasting assumption indices, 2009 Base

Assumptions	Sources	2009	2030	2040
Value of Time - Business	WebTAG (February 2014 release)	100	139.47	170.25
Value of Time - Leisure	WebTAG (February 2014 release)	100	139.47	170.25
Fuel Costs - Car (Business)	WebTAG (February 2014 release)	100	78.87	80.25
Fuel Costs - Car (Leisure)	WebTAG (February 2014 release)	100	81.31	82.74
Non Fuel VOC	WebTAG (February 2014 release)	100	97.07	97.07
Car Occupancy, Air Passengers	Historic Trend	100	100.00	100.00
Rail Fares - all modes*	Government policy	100	100.99	100.99
Bus and Coach fares*	Government policy	100	100.99	100.99
Airport parking charges	Earnings Trend	100	139.47	170.25

49. Current government policy regarding rail fares is to maintain rail fares at RPI+0% . Rail fare statistics over the last four years show that rail fares have increased by 15 percent in nominal terms between 2013 and 2009, but by only 1.0 percent in real terms

Figure 10 - Heathrow parking parameters, 2009 Base

Component	UK Business Domestic	UK Business International	UK Leisure Domestic	UK Leisure International	Non-UK Business	Non-UK Leisure
Group size (people)	1.13	1.16	1.44	1.81	1.26	1.66
Parking duration (days)	2	5.7	5.3	13	1	1
K&F parking charge (£/trip)	0	0	£0.618	£1.236	0	£1.236
P&F parking or rental charge (£/day)	£21.00	£21.00	£15.70	£15.70	£62.829	£62.829

Note that these charges are grown in line with earnings for 2030 and 2040 forecasts

50. In the current implementation of LASAM, the access time between car parks and the terminals is accounted for in mode constants, which represent an average for all car parks. From 2011, the Personal Rapid Transit (PRT) system enhances the accessibility of the T5 business car park to the terminal. LASAM is not able to forecast demand for individual car park products, whose demand management and relative pricing is a matter for HAL policy. With respect to car park capacity, LASAM assumes that there is currently no capacity constraint for air passengers.

51. In forecasting, it will be assumed that the average accessibility of car parks from the terminals will not change from the base year and that there will continue to be no capacity constraint for air passengers. In practice, parking demand will be managed to the available capacity via price.

52. The 2040 scenario includes an airport access charge of £10 for air passengers using the Taxi, Park & Fly and Kiss & Fly modes. It is noted that a £10 charge is implemented in the model as a £17.03 charge (2009 prices, 2020 value) to reflect the growth of earnings between now (or 2009) and 2040.

Journey time assumptions

53. The journey times for existing services are based on timetable information. New services are based on published plans and previous proposed schemes (e.g. Airtrack) to allow a realistic assessment of future journey times.

Figure 11 – Assumed Crossrail journey times

Station	Time (mins)	Station	Time (mins)
Shenfield	0	Abbey Wood	0
Brentwood	3	Woolwich	3
Harold Wood	8	Custom House	7
Gidea Park	10	Canary Wharf	11
Romford	13	Whitechapel	16
Chadwell Heath	16	London Liverpool St	19
Goodmayes	18	Farringdon	21
Seven Kings	20	Tottenham Court Road	24
Ilford	23	Bond Street	27
Manor Park	25	Paddington	30
Forest Gate	28	Old Oak Common	33
Maryland	30	Acton Main Line	36
Stratford	32	Ealing Broadway	39
Whitechapel	38	West Ealing	42
London Liverpool St	41	Southall	45
Farringdon Xrail	43	Hayes & Harlington	48
Tottenham Court Road	46	CTA	55
Bond Street Xrail	49	T5	60
Paddington	52		
Old Oak Common	55		
Acton Main Line	58		
Ealing Broadway	61		
West Ealing	64		
Southall	67		
Hayes & Harlington	70		
CTA	77		
T5	82		

Figure 12 – Assumed Western Rail Access journey times

Station	Time (mins)
Reading	0
Maidenhead	12
Slough	19
T5	27
CTA	33

Figure 13 – Assumed Southern Rail Access journey times

Station	Time (mins)
London Waterloo	0
Clapham Junction	8
Richmond	18
Twickenham	22
Feltham	28
Staines	34
T5	42
CTA	51

Other infrastructure assumptions

54. A number of potential rail schemes have been identified and the likelihood of these schemes being delivered has been classified according to the definitions in WebTAG Unit 3.15.5. Table summarises the schemes and specifies their inclusion in forecast year scenarios.

Figure 14 - Forecast Year Rail Schemes

Scheme	2009	2030	Likelihood
Complete London Overground Network (as implemented by late 2012)	N	Y	Near certain
Reading Re-modelling (enabling the HLOS service provision)	N	Y	Near certain
Thameslink Programme (24tph through central London)	N	Y	Near certain
Domestic High Speed 1 Services (services from King's Cross International via Stratford International to Kent)	Y	Y	Now implemented
Intercity Express Programme (IEP) on GWML (strengthening of GWML service level)	N	Y	Near certain
GWML Electrification (little impact on service provision)	N	Y	Near certain
European Railway Traffic Management System on GWML (little impact on service provision)	N	Y	Near certain

55. Rail schemes that are identified as 'near certain' or 'more than likely' in the above table are assumed for the scenario. The levels of service on all other rail services and routes are assumed to be unchanged.

Public transport mode shift by intervention

56. Figure 4.22 in 'Taking Britain Further' simply illustrates the impact of each intervention or economic change on air passenger public transport mode share as forecast by LASAM. This is indicative and created by applying each intervention in turn using the model to understand the impact of each change.

Hourly demand by rail service

57. The numbers in Figure 4.26 have been derived using outputs from the LASAM model. This shows the busiest hourly flow (based on airport demand) on each service as well as the average hour. Airport passenger flows from LASAM have been factored up to allow for other users including airport employees.

58. The purpose of the analysis is to identify where significant growth in airport demand will take place and whether there is sufficient capacity on airport to carry predicted demands. Loading beyond the airport has been assessed by Network Rail in their analysis.

Employee mode share analysis

59. The table below presents the employee demand forecast used in the 2030 HESAM forecast.

Figure 15 – 2030 Employee forecast

Demand by work location		Demand Employment groups	
Work location	**Employees**	**Employment group**	**Employees**
Terminal 4	4,314	Pax related	32,286
Cargo Area	2,457	ATM related	30,855
Other Southside	1,709	Cargo related	1,244
Waterside	3,784	Traffic Support	4,732
Westside/T5	37,260	Non-Traffic Support	20,884
Central Terminal Area	35,383	**Total**	**90,000**
Northside A	736		
Northside C	218		
Northside B	1,459		
Haslemere Estate	0		
Maintenance Areas	2,598		
Cranebank	80		
Total	**90,000**		

Figure 16 – 2040 Employee forecast

Demand by work location		Demand Employment groups	
Work location	**Employees**	**Employment group**	**Employees**
Terminal 4	5,273	Pax related	39,460
Cargo Area	3,003	ATM related	37,712
Other Southside	2,089	Cargo related	1,520
Waterside	4,625	Traffic Support	5,783
Westside/T5	45,540	Non-Traffic Support	25,525
Central Terminal Area	43,245	**Total**	**110,000**
Northside A	900		
Northside C	266		
Northside B	1,784		
Haslemere Estate	0		
Maintenance Areas	3,176		
Cranebank	98		
Total	**110,000**		

Parking assumptions

60. The economic assumptions described in for the 2030 LASAM forecast are applied in 2030 HESAM forecast. The key assumptions unique to HESAM are:

- Employee car parking reduced to 20,000 in 2030 and 10,000 in 2040. These spaces distributed across airport in the same proportions as 2009,
- Car share vehicles have been given priority everywhere, and

61. These assumptions are represented by applying a charge to employee car parking to represent the constraint on car parking. This charge is applied at a lower rate for car sharers to represent priority in car parks for these users.

Infrastructure assumptions

62. The infrastructure assumptions described in for the 2030 LASAM forecast are applied in 2030 HESAM forecast.

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Road capacity assessment

Network assumptions

63. The following outlines the highway network assumptions relating to the future base case and the future 3R Heathrow development case for the purposes of the RRTM Saturn modelling.

64. The 2030 Base Case networks include a number of changes to the highway network. These are schemes that have been, or are proposed to be, completed between 2009 and 2030.

65. Schemes that are particularly relevant to Heathrow are the M25 J16-J23 widening and the proposed Hard Shoulder Running (HSR) scheme on the M4 between Junction 3 and Junction 12 at Reading.

- M4 Hard Shoulder Running J3-J12
- M25 Widening J16-J23
- M25 Hard Shoulder Running J23-J27
- M25 Widening J27-J30
- M25 Hard Shoulder Running J5-J7
- M3 Hard Shoulder Running J2-J4a
- A3 Hindhead Improvements
- M1 Hard Shoulder Running J10-13
- A421/M1 J13 Bedford Improvements
- A5/M1 Link (Dunstable Northern Bypass)

Masterplan 3R NW Network coding assumptions

66. The key features of the new 3R NW masterplan in terms of the highway network changes include:

- Re-alignment of the existing A4 and provision of corresponding new junctions along length to generally re-provide existing corridor connections: A4 severed west of Emirates roundabout, with downgraded section remaining to serve local access
- New collector distributors alongside M25 corridor between Junction 14 and Junction 15
- Addition of southern tunnel to Central Terminal Area (CTA)
- Removal of Heathrow Western Perimeter Road
- Changes to T5/T6 access with entrance with Airport Way and Southern perimeter and egress via modified Junction 14A

Forecast Demand Assumptions

67. For modelling around Heathrow, forecasts are formed of two main elements, airport demand and non-airport demand. Airport demand is obtained from LASAM for air passengers, HESAM for airport employees and use of growth assumptions relating to other airport trips such as business and servicing. The derivation of the LASAM and HESAM demand are described above.

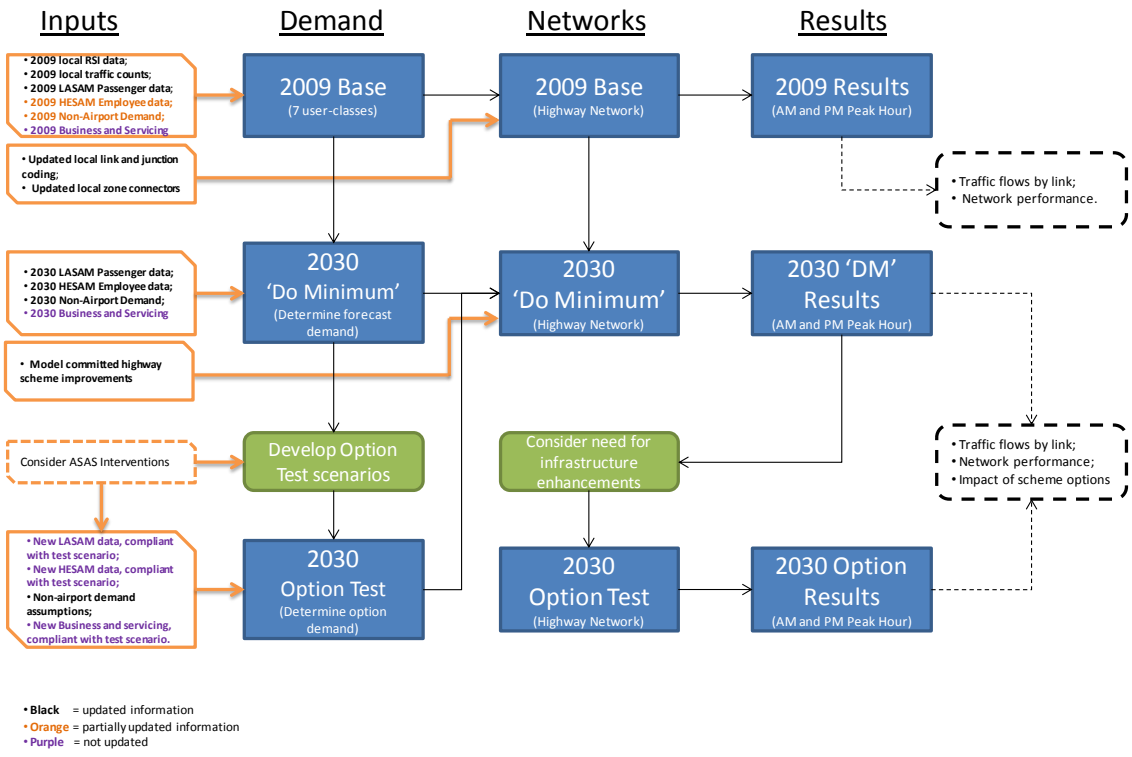
68. Non-airport demand, which forms the majority of demand within RRTM, is taken from NADM. This incorporates growth based on planning data and outputs from the Department for Transport's (DfT) TEMPRO database.

69. NADM also accounts for changes in travel costs over time and incorporates the impact of increased traffic congestion on demand and journey length. NADM has been updated to account for a number of changes to input assumptions since the last forecasting work was undertaken.

70. The first update was the re-basing of the model to a 2009 rather than the previous base year of 2004. The 2011 local model update work included incorporating webTAG guidance from April 2011. Freight growth was also updated in 2011 to match latest National Transport Model forecasts. The highway assignment model was also fully integrated within NADM to improve demand/supply convergence.

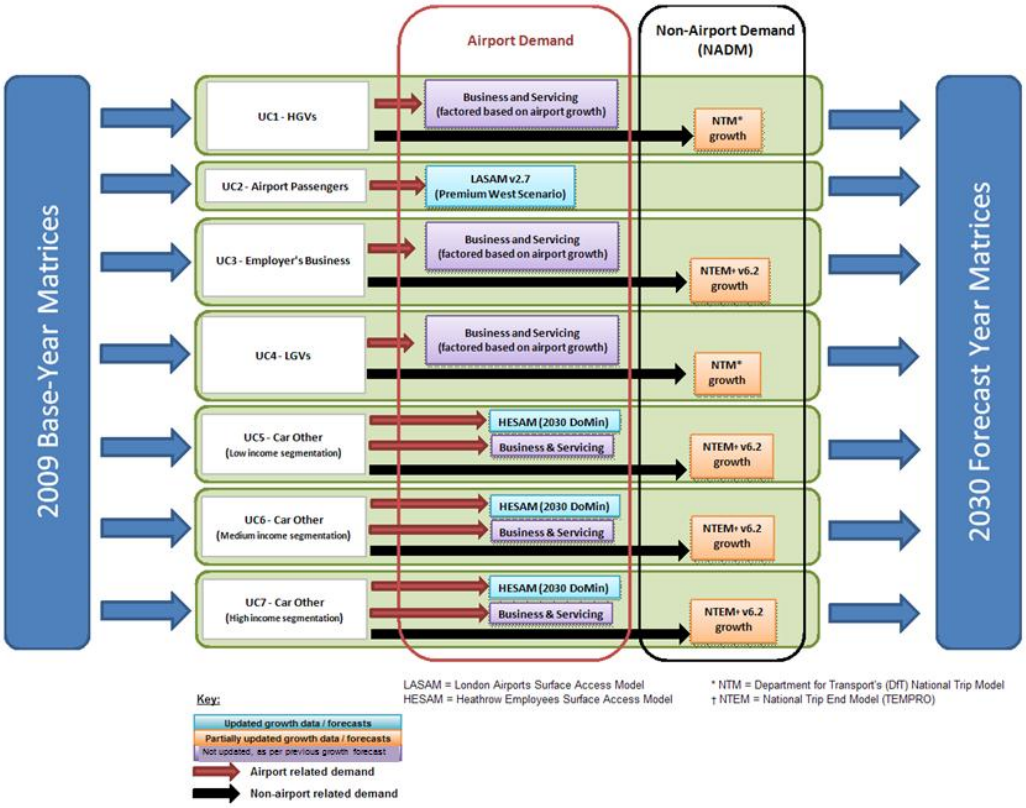
71. Figure 14 represents an overview of the highway forecasting process indicating the relationship between forecasting inputs, demand, networks and traffic flow assignments for the 2009 base year and the 2030 forecast year.

Figure 17 - Overview of the Highway Demand Forecasting Process



72. Figure 15 provides a summary of how the 7 vehicle user classes modelled in RRTM are expanded from the 2009 base year to the 2030 forecast year. The figure highlights via colour coding the elements which were updated in the local model enhancement process undertaken in 2011.

Figure 18 - Summary of Local Forecast Matrix Updates



Analyses

73. The summary analysis presented in the Heathrow submission paragraphs 4.5.2.1 and 4.5.2.2 is based on interrogation of the RRTM model outputs. The Volume to Capacity (V/C) ratios illustrated in Figure 4.28 are based on outputs from the latest 2030 3RNW AM Peak model run including the Collector Distributor upgrades to M25 corridor and compared to the previous 3R Masterplan which retained the M25 corridor between J14 and J15 as existing.

74. The impact on Heathrow traffic plot shown in Figure 4.29 is again taken from secondary analysis using the latest 2030 3RNW AM peak model run. Select link analysis was undertaken for all links accessing airport zones to determine the proportion of Heathrow related traffic on links on the surrounding RRTM highway network. Any trips arriving or departing defined Heathrow airport zones are taken to be airport related.