**Doc. No. SSE/15.1/d**
**Case Ref. 2032278**

Appeal by BAA Ltd and Stansted Airport Ltd following the refusal by Uttlesford District Council of planning application UTT/0717/06/FUL

# Appendices to Revised Proof of Evidence on behalf of Stop Stansted Expansion

# Relevant correspondence between SSE and BAA on the Transport Addendum Update

26 September 2007

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**Email from Ken McDonald (SSE) to Julia Gregory (BAA) 19 August 2007 and BAA response of 4 September 2007 (in blue).**

Dear Julia,

A number of points following our meeting with you and Ian Forshew on 9th August. . . .

15% sensitivity test

I have considered Ian's simplistic claim that the "15% sensitivity test" is an adequate substitute for SSE's request for a rerun of the forecasting models based on the latest known level of transfer passengers and mix of origins/destinations (O/Ds).

Whilst I accept that there is some correlation, the 15% test does not go far enough. I list some of the reasons below:

(a) Any test should be applied to a sound base, not to achieve that base. We have consistently argued that the forecast base for O/Ds and Transfers is unsound and that it particularly results in an understatement of the increased loading on the Stansted – London transport corridor. The arguments put by Stan Maiden at the Inquiry in support of his forecasts in this area were unconvincing. Further weight has been added to our argument by the 2005 CAA passenger survey, released since his forecasts were prepared - this shows a further increase in the London share of passenger O/Ds, not a decrease.

*(b) Evidence submitted at the Inquiry by York Aviation on behalf of the Stansted ACC projected a continuing decline in the number of transfer passengers at Stansted, both in numerical and percentage terms, from the 2.5m (10.8%) seen in 2006 [Ref ACC/22, para 5.63]. On this basis, the number of non-transferring passengers (i.e. requiring surface access) would be at least 32.4m under the 35mppa scenario and not 29.1m as projected by BAA. This in itself would utilise more than 11% of the 15% sensitivity – and that is before more realistic O/D assumptions are modelled.*

(c) The 15% test fails to examine the effects if what we regard as a sound base actually turns out to be an understatement.

(d) The 15% test is applied somewhat selectively – only to passengers, not employees; and only to the "enhanced" 35mppa case.

(e) A selective test is no substitute for modelling.

We therefore repeat the request contained in my email of 25 July – to run the model based on 10% transfer passengers and an O/D split based on the latest known position.

**BAA Response**

We have previously considered this request and decided that at the present time it is not appropriate to use resources to test what in our opinion is a test comprised of two inappropriate assumptions.

We are confident that the explanation provided by Ian at our last meeting is a good approximation, which demonstrates that your assumptions would result in an outcome not

dissimilar to our 35 mppa enhanced test increased by 15%; a test that demonstrates that there is no material difference in terms of impact on the rail network and certainly would not affect the proposals for rail which we have discussed with the DfT.

**[Note Added 4th September 2007: There is no change in this position but agreement has now been reached on the provision of a model test]**

Other items for follow-up

You or Ian kindly agreed to let us have the following information:

Model specification

The full specification of the current model suite, including changes from that used in the TA.

**BAA Response**

The versions of the models used for various aspects of the surface access work are shown in Table 1 below. Technical Note 45 was prepared specifically to respond to an HCC request and it also included additional runs using the TA modelling suite.

**Table 1: Surface Access Modelling Suite**

| Document | Date | Model Version | | | | |
|---|---|---|---|---|---|---|
| | | RDM/RHRM | LASAM | SESAM | SRTM | PLANET |
| G1 TA | April 2006 | 2 | 1 | 1 | 1 | 3.2 |
| G2 Consultation | Feb 2007 | 2 | 1 | 1 | 1 | 3.2 |
| Technical Note 45 | March 2007 | 2 | 1 | 1 | 2 | - |
| G1 TA Addendum | April 2007 | 3 | 2 | 1 | 2 | 3.2 |

The above table shows that models have been progressively refined and the most up-to-date versions of BAA's models have been used at the time of undertaking the tests.

The differences between the current modelling suite and the earlier versions of the models used for the TA are set out in Chapter 2 of the Addendum Update issued to all Rule 6 parties on 31st July 2007.

Vehicle occupancy

A clear explanation of the vehicle occupancy assumptions in Table 2.5 of the Addendum, including the basis of the change from the TA rates to those in the Addendum and Update. Further, could you please clarify if the occupancy ratios in Table 2.5 have been applied to all scenarios.

**BAA Response**

The revised vehicle occupancy assumptions shown in Table 2.5 are based on an analysis of relevant CAA data for Stansted over a three year period from 2002 to 2004 rather than just a

single year. The analysis was undertaken by group size, by mode and by market segment. These vehicle occupancy assumptions have been adopted for all future scenario tests.

London rail peak 3-hour loadings

Full explanation of the basis of the actual v. forecast figures quoted in Table 4.7 [Great Anglia RUS 3.6], i.e. did they both include passengers for the same stations or was the RUS set different from the Update?

**BAA Response**

As set out in paragraphs 6.3.6 to 6.3.9 of the Response to the Joint Position Statement of Essex and Hertfordshire County Councils, there were additional stops at Stansted Mountfitchet, Broxbourne, Cheshunt, Waltham Cross, Brimsdown and Ponders End in the AM peak period, and at Stansted Mountfitchet in the PM peak period that were introduced in the 2006 timetable. These were not included in the TA or TA Addendum forecasts, which assumed the December 2005 timetable.

Therefore, with the additional stops in the 2006 peak timetable, it is not possible to make a direct comparison of the counts and 2014 forecasts. However, despite the above caveat it is acknowledged that the non-airport regional rail demand on STEX services may have been underestimated and that is why the additional sensitivity test described in section 4.7 of the Addendum Update was undertaken.

RUS forecasts of up peak travel

Full explanation of the basis of the two sets of am up peak forecasts in RUS Table 5.9, defined as BAA and DfT.

**BAA Response**

BAA's G2 team provided preliminary forecasts of airport related passengers arriving in London on STEX services between 0700-1000 hrs to Atkins in June 2006 as an input to the RUS study.

The forecasts provided assumed airport throughputs of 40.5 and 62 mppa in 2015 and 2020 and included a 15% allowance for meeters and greeters, airport employees and other miscellaneous trips.

The origin of the DfT forecasts referred to in Table 5.9 of the RUS are unknown.

Rolling stock availability

Are you able to confirm that new stock capable of being in service by 2009 could operate without infrastructure modifications. If not, what modifications would be necessary and at what cost?

**BAA Response**

We are not in a position to provide a precise answer and without meaning to sound flippant, we anticipate that new rolling stock purchased for use on the WAML will be capable of being employed on the WAML. We understand that longer cars are generally narrower, and designed to fit within the existing gauge. New stock would have to be route cleared by the relevant authority, and although there may be a need for some minor modification work there is nothing insurmountable and this would be an issue for DfT/Network Rail as part of 'business as usual' (Rail White Paper / Control Period 4 2009 - 2014 project delivery).

The future operation of the longer trains will require platform lengthening at some intermediate stations where longer trains will stop (only a handful of stations are currently 12-car: Tottenham Hale, Harlow Town, Bishop's Stortford). Again, this will also be an issue for DfT/Network Rail as part of 'business as usual'.

BAA is proceeding with Scheme development for additional platform capacity at the Airport.

I look forward to hearing from you as soon as possible.

Ken McDonald

Teskey@BTinternet.com

**Email from John Rhodes (SSE) to Ian Forshew (for BAA) 6 September 2007 and BAA response of 14 September 2007 (in blue).**

Dear Ian

Thank you for your responses to SSE's questions. I am replying in Ken McDonald's absence on holiday.

- **Sensitivity test**

We are pleased that you are now running the test that we have requested. Could I confirm that the assumptions we wish you to use are: for origins and destinations, the current distribution from data for the most recently available 12 month period; and for transfer passengers an allowance of 10%.

**BAA Response**

The assumptions and results of the sensitivity test are set out in the attached Technical Note and confirm our previous advice that the highway and rail demands to and from London using the above assumptions are not materially different to the 35 mppa (enhanced) +15% sensitivity test included in the Transport Assessment Addendum Update (TAAU) report.

- **Model confidence limits**

On the calibration of the model your response at the meeting on 3 September was to the effect that since the input data was largely from government sources and was the same for the whole suite of models, errors would not be compounded. We did not have a chance to respond at that meeting but our point was not related to the input data as such. Models of this kind are constructed from algorithms, which seek to replicate mathematically, observed relationships in human behaviour, such as journey time, cost and modal choice. These algorithms would not claim 100% accuracy and indeed different ones are likely to have different margins of error. Since different algorithms will have been used in the suite of models and may have been combined together in different ways we think it reasonable to believe that when those models are used sequentially the margin of error inherent in each of them may have been compounded. In the light of this explanation could you please let us have the average ±% confidence limit applicable to each model in the suite?

**BAA Response**

Confidence intervals for each of the models in BAA's suite of transport models have not been estimated, this is because it is not it is not possible to estimate them for complex models or modelling systems of the kind used by BAA. It is also not normal practice to do so.

The specifications of the models are necessarily simplifications of complex human behaviour. The extent to which the model specifications accurately capture real life choices will govern the confidence that can be placed in the model outputs. In the case of LASAM and SESAM, statistical methods have been used to identify the model specification which 'best' explains the data and minimizes the variation in the data that cannot be explained by the model. This unexplained variation could be due to the limitations of the specifications but could also be due to errors in the data being used for estimation arising from sampling and data recording and processing errors. The statistical estimation methods employed in the development of these models did provide, as normal, indicators of the unexplained variation. However, it is not possible to accumulate errors associated with each of the individual model parameters to form a single overall confidence interval for the models. One of the safeguards against an

accumulation of errors, or a systematic bias, in the model estimation of LASAM is the validation of the estimated models against observed data which has been segmented in a large range of different ways: by segment; sub-segment; geographical sector; airport; time of day; distance; duration; and group size.

In the case of EERDM the model specification has been based on the guidance provided by the Department for Transport (in WebTAG, www.webtag.org.uk). Model parameters have been drawn from that guidance and adjusted to ensure that the model yields appropriate fuel and public transport fare elasticities, as required by WebTAG. In the case of EERDM, therefore, confidence limits are not available for the individual model parameters as they were not estimated using statistical methods. EERHAM and SRTM are assignment models and are calibrated by heuristic processes rather than by statistical estimation; it is therefore not possible to calculate confidence limits for this kind of model. In addition, the same issues of interpreting complex interactions between potential sources of specification error preclude a derivation of overall confidence intervals.

It is often the case that specification errors are compensatory by the nature of the calibration processes. Also, it does not follow that the statistical imprecision in any one transport model would necessarily be compounded by the statistical imprecision in the subsequent model; again, the effects could be compensatory.

- **Vehicle occupancy.**

The difference between the assumption you have used and our own calculations appears to be far more than could be explained simply by your use of an average of three years' data compared with our (more recent) single year. May we therefore please see your actual calculations so that we can understand the methodology you have followed?

## BAA Response

BAA would be pleased to understand the source of data and basis of the calculations undertaken by SSE. In the work undertaken for BAA, vehicle occupancies have been derived for 9 passenger segments used in the air passenger mode share model (LASAM) using CAA data for Stansted for the three year period from 2002 to 2004, adjusted to take account of larger group sizes travelling in more than one vehicle. The results of the analysis of the 19,000 records are provided in the table below.

**STN Group Size by Segment and Mode**

| Segment | Kiss&Fly | Park&Fly | Taxi/Minicab |
|---|---|---|---|
| FB | 1.36 | 1.22 | 1.49 |
| FLLC | 1.55 | 2.04 | 1.99 |
| FLO | | | |
| UKBD | 1.17 | | |
| UKBI | 1.19 | | |
| UKLD | 1.63 | 1.93 | 1.89 |
| UKLIC | 2.32 | 2.51 | 2.80 |
| UKLILC | 1.77 | 2.15 | 2.14 |
| UKLIO | 1.83 | 2.09 | |
| **Overall** | **1.73** | **1.92** | **2.07** |

Passenger Segments: FB = Foreign Business, FLLC = Foreign Leisure Low Cost, FLO = Foreign Leisure Other, UKBD = UK Business Domestic, UKBI = UK Business International, UKLD = UK Leisure Domestic, UKLIC = K Leisure International Charter, UKLILC = UK Leisure International Low Cost, UKLIO = UK Leisure International Other

- **Train loading data and forecasts.**

I am still considering your responses on these questions and will contact you as soon as possible if we have any further comments.

**Response not required**

- **Rolling stock availability.**

I think you may wish to review your response to this question. My reasons are as follows:

1. I would agree that modern designs of DMU which have an on board power plant are designed to achieve maximum route availability. Accordingly they have relatively narrow body shells capable of providing only 2 + 2 seating in standard class with a central aisle. However, EMUs are designed almost exclusively for the main conurbations which have electric power supplies, rather than for network wide availability. High capacity is a more important consideration and modern designs (such as the one recently supplied for Heathrow Connect services) have bodies which typically can accommodate 3 + 2 seating in standard class with an off centre aisle. So their body shell needs to be about a metre wider with a correspondingly larger kinetic envelope. The West Anglia route is characterised by particularly sharp curves and tight clearances between Liverpool Street and Tottenham Hale especially at Hackney Downs and the tunnel immediately North of it. So far as I am aware it has not been cleared for use even by narrow bodied 23m coach DMUs.

2. A train of 12 23m coaches will by definition need an additional 36m of platform length within which to stop compared with the 20m coaches currently in use. So far as I am aware, only Cambridge and Liverpool Street on the West Anglia route have platforms long enough for such trains and so every station on the route would need to have platforms lengthened if 12 coach modern trains are to be run. The issue is not academic for BAA since it is proposing to undertake the lengthening of platforms at the airport and we would like to know what type of train they are planning for.

3. The same consideration applies to stabling facilities (such as the sidings at Bishop's Stortford) and to train maintenance depots. If depots and inspection pits have to be extended or replaced the cost would be substantial (though it may of course be factored into a higher rental cost for the trains).

4. The existing fleet either has no toilets or toilets which flush directly on to the tracks. Modern trains have toilet retention tanks and new pump out facilities will therefore be part of the infrastructure requirement needed to support them.

5. Modern EMU traction control equipment has 3 phase drives which generate stray electric currents. These can interfere with signalling systems, giving false readings in signal boxes and false signal aspects to drivers. Track circuits north of Elsenham are therefore likely to have to be immunised or replaced eg by axle counters before modern trains can safely operate on the route. I do not know whether the recently completed resignalling project dealt with the problem south of there.

6. Power supplies may need to be enhance to allow 12 coach trains of any kind to operate on a frequent basis and to take advantage of regenerative braking available on new types of stock.

These reasons may explain why class 365 Networkers (a relatively old BR design) which operate from Kings Cross to Cambridge and Kings Lynn have never been permitted on the

West Anglia route even when the same franchisee operated both services. Some of the problems might be overcome by running 10 coach rather than 12 coach modern trains. But there might be a capacity penalty for doing so and the trains themselves which have equipment distributed through all the vehicles may need redesign if they are not to be operated in a standard four coach combination. In the circumstances, you may prefer to agree with us that if new trains are acquired and used to enhance rather than replace part of the existing fleet the most likely outcome is that any extra capacity on the West Anglia route is likely to be provided by cascaded 20 year old class 321 trains (which are cleared to operate on the route) rather than by modern units. Alternatively, you may like to provide us with an estimate of the costs of adapting the infrastructure and the likely timescales needed before new trains can be introduced.

**BAA Response**
One Railway has recently published an OJEU for new rolling stock for their services and routes (which include the West Anglia Main Line) to be available within about 2 years. The rolling stock market will offer vehicles that are compatible with the routes without change to the Network Rail infrastructure or systems unless these changes are agreed with Network Rail and can be delivered before the introduction of the new vehicles.

With regard to the specific point about lengthening of platforms at the Airport and the type of train that should be planned for (ref. last sentence of 2), we are pleased to advise that the safeguarding proposals are capable of accommodating the longer 12 x 23m car trains.

Finally, in para 4.8.7 of the TA update you have said that One have published an OJEU notice for the purchase of between 80 and 120 electric multiple units. My understanding is that the enquiry relates to between 80 and 120 vehicles ie between 20 and 30 four coach trains. I am sure you will wish to clarify this ambiguity.

**BAA Response**
Point noted and agreed.

I look forward to hearing from you. Since it will be difficult to finalise our proofs of evidence until we have seen the results of the sensitivity test I hope you will share that with us as soon as possible.

Yours sincerely

John Rhodes

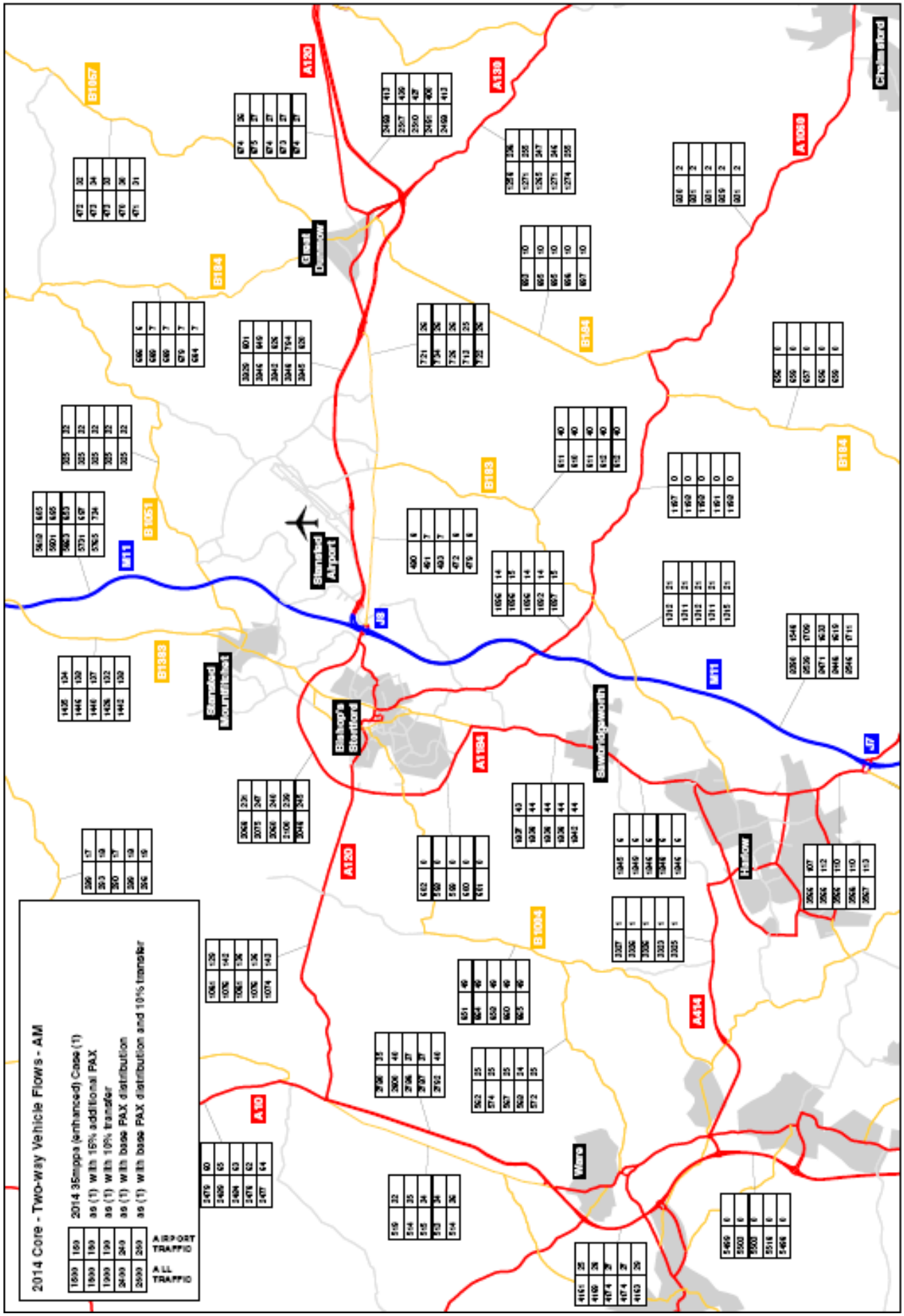


Figure 1: 2014 Core Scenario - Two-Way Vehicle Flows - AM

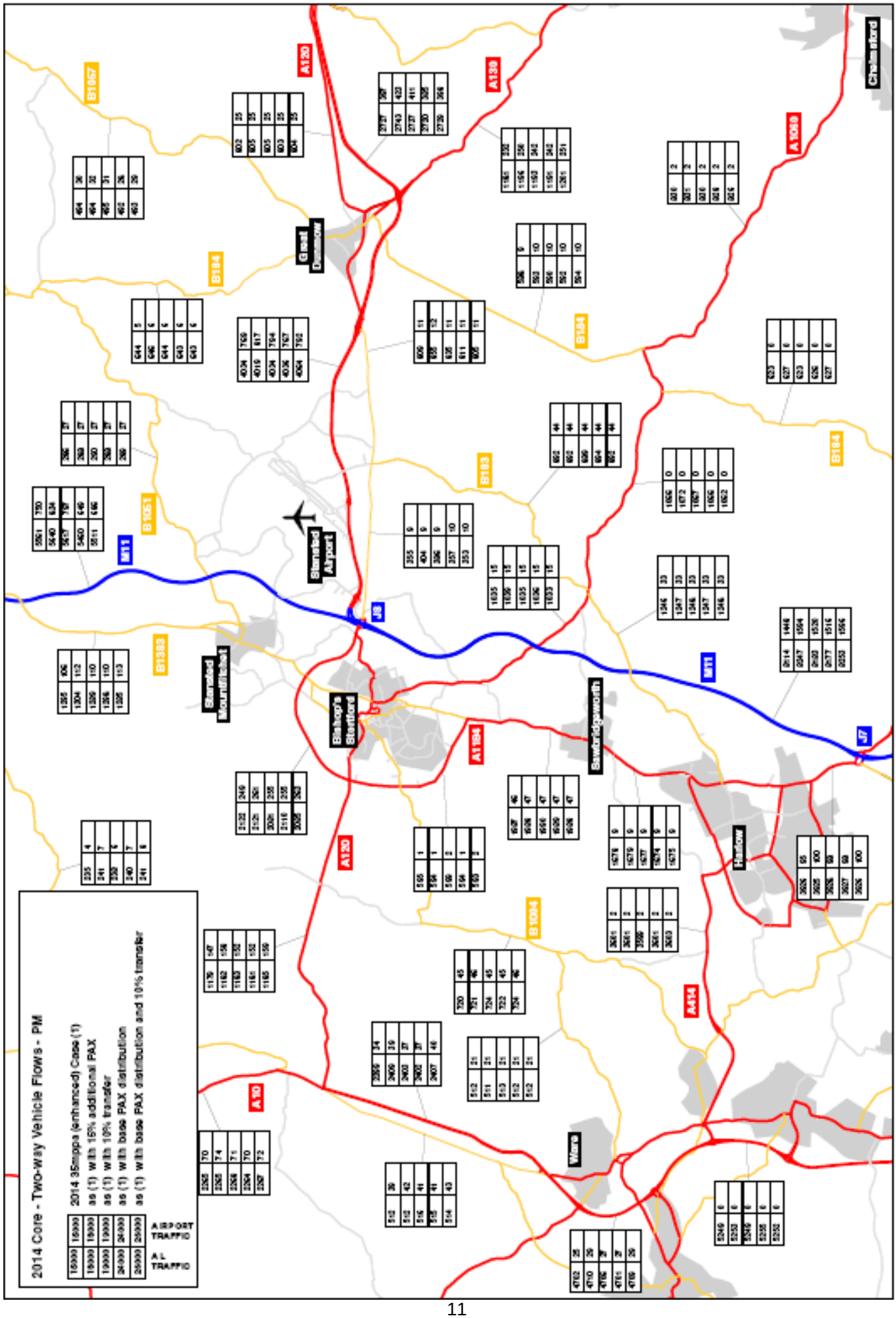


Figure 2: 2014 Core Scenario - Two-Way Vehicle Flows - PM

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# Technical note

| | | | |
|---|---|---|---|
| **Project** | Stansted G1 | **Date** | 14 September 2007 |
| **Note** | SSE Sensitivity Test | **Ref** | FL1148 |
| **Author** | Tony Sharpe | | |

## *1 Introduction*

*1.1* At the meeting held on 3 September 2007, BAA agreed to undertake a 35 mppa sensitivity test in response to a specific request from Stop Stansted Expansion (SSE). The purpose of the test is to assess the transport implications of a lower proportion of transfer passengers, and an alternative distribution of air passenger ground origins and destinations.

*1.2* The assumptions that SSE requested to be used were as follows:

- For air passenger ground origins and destinations use the current distribution from the data available for the most recently available 12 month period; and
- For transfer passengers assume an allowance of 10%.

*1.3* The note describes the results of this 35 mppa 'SSE sensitivity test' that has been based on the TA 25 mppa case air passenger ground origins and destinations but assuming 10% transfer passengers.

## *2 Air Passenger Ground Origins*

*2.1* Table 1 below compares the 35 mppa case ground origins used in the Transport Assessment (TA) and Transport Assessment Addendum Update (TAAU) with comparable 35 mppa demands by region derived by factoring up the observed ground origin distribution in 2004 and the distribution of ground origins assumed in the 25 mppa case.

*2.2* Table 1 shows that 35 mppa demands to London, the Rest of South-East and the Rest of the Country based on the 25 mppa case distribution are similar to the demands based on the observed 2004 distribution. The main difference is that the demands to Central London are about 0.4 mppa lower using the 25 mppa case distribution than the 2004 distribution, and demands to the Rest of London some 0.33 mppa higher.

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**Table 1: Forecasts of Air Passenger Growth by Area**

| Area | Annual Non-Transfer Pax (mppa) | | | | |
|---|---|---|---|---|---|
| | 2004 | 25 mppa case | 35 mppa case | 35 mppa based on 2004 | 35 mppa based on 25 mppa |
| Central London | 2.63 | 2.92 | 3.49 | 4.19 | 3.79 |
| London NE | 2.21 | 2.89 | 3.58 | 3.52 | 3.75 |
| London SE | 0.76 | 0.94 | 1.12 | 1.21 | 1.22 |
| London SW | 1.11 | 1.41 | 1.69 | 1.77 | 1.83 |
| London NW | 1.08 | 1.34 | 1.61 | 1.72 | 1.74 |
| **London Sub-Total** | **7.79** | **9.51** | **11.5** | **12.42** | **12.35** |
| Other SE - NE Sector[1] | 3.22 | 4.01 | 4.81 | 5.13 | 5.21 |
| Other SE - NW Sector[2] | 0.98 | 1.33 | 1.46 | 1.56 | 1.73 |
| Other SE - SW Sector[3] | 0.67 | 0.82 | 0.92 | 1.07 | 1.06 |
| Other SE - SE Sector[4] | 0.86 | 1.05 | 1.2 | 1.37 | 1.36 |
| **Rest of South-East** | **5.73** | **7.21** | **8.39** | **9.13** | **9.36** |
| East Anglia | 2.28 | 2.86 | 4.64 | 3.63 | 3.71 |
| West Midlands | 0.4 | 0.49 | 0.77 | 0.64 | 0.64 |
| East Midlands | 0.84 | 1.03 | 1.66 | 1.34 | 1.34 |
| South West & Wales | 0.62 | 0.74 | 1.13 | 0.99 | 0.96 |
| Rest of UK | 0.62 | 0.67 | 1.06 | 0.99 | 0.87 |
| **Sub-Total Rest of Country** | **4.76** | **5.78** | **9.27** | **7.59** | **7.51** |
| **Total non-Transfers** | **18.3** | **22.46** | **29.17** | **29.17** | **29.17** |

*Notes: 1 NE Sector includes Essex and Hertfordshire*

*2 NW Sector includes Beds, Berkshire, Buckinghamshire and Oxfordshire*

*3 SW Sector includes Hants, Surrey and West Sussex*

*4 SE Sector includes Kent and East Sussex*

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## *3 Model Specification*

*3.1* The modelling suite used in the TA and TAAU is shown below in Table 2.

**Table 2: Components of the Model Suite**

| Model | | | Purpose |
|---|---|---|---|
| LASAM | London Airports Surface Access Model | | Forecast air passenger mode choice to the Airport, to identify how the access strategy influences behaviour. Is supported by a Peak Profile Model and an Hourly Matrix Model to generate outputs by time period. |
| SESAM | Stansted Employee Surface Access Model | | Forecast Airport employee mode choice to the Airport, to identify how the access strategy influences behaviour. |
| EERM | RDM | Regional Demand Model | Based on the pattern of development across the East of England, forecast the future patterns of the region's travel demand by mode, time and source of growth, reflecting the performance and capacity of the transport infrastructure. This will also reflect the impacts that the Airport is expected to generate. The RDM is also the means of estimating demand responses of non-Airport travellers to changes in the transport system, including those that would be brought about by the Airport surface access strategy. |
| | RHRM | Regional Highway Routeing Model | Forecast route choice for longer distance movements using the principal travel corridors through the region. Hence produces loadings for the strategic highway network. Also produces basis for the highway supply model in RDM. The RHRM is the means by which changes in demand, over time and as a result of changes to the transport system or conditions, and changes in the routeing of longer-distance trips are fed down to the SRTM. |
| SRTM | Stansted Road Traffic Model | | Undertake detailed operational assessment, over a wide area, of the performance of the highway transport infrastructure where more than a negligible proportion of the travel relates to surface access travel to and from Stansted. |
| PLANET | Strategic Rail Model | | Applies forecasts of the pattern and level of rail demand to the rail network to derive costs to assess the economic and operational performance of alternate rail schemes for London and the South East of England. |

*3.2* In undertaking the SSE sensitivity test, it was not necessary to re-run the entire modelling suite. For example, EERM comprising the regional demand model and regional highway routing model provides the non-airport demands and as the regional assumptions regarding UK population, households and employment do not change, the EERM was not re-run.

*3.3* SESAM is used to forecast airport employee mode shares and transport demands, and as there were no changes in terms of employee numbers or place of residence in the SSE sensitivity test, this model was not re-run.

*3.4* LASAM is used to forecast air passenger mode shares and transport demands and thus has been re-run using the following assumptions:

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a) The SSE sensitivity test was run for the year 2014, using the Enhanced Case assumptions described in the TA and TAAU and using the latest version of the model described in the TAAU.

b) The 25mppa case trip ends were factored up to a 35mppa level of demand, thus retaining the 25mppa geographical distribution, while assuming the 35mppa air passenger arrival and departure time profiles.

c) The 35mppa trip ends by ground origin/destination were factored up by 7.95% to reflect the lower transfer proportion. [Global factor calculated as: 90/83.372 = 1.0795]

*3.5* SRTM is used to determine the local highway impacts of the proposed airport expansion. Therefore the model was re-run using the revised air passenger highway trip matrix output from LASAM. All other model inputs (i.e. network assumptions and road traffic demand elements, i.e. airport employee and miscellaneous traffic, and non-airport related traffic, were the same as the 2014 35mppa (enhanced) case reported in the TAAU.

*3.6* Revised rail assignments using PLANET were not undertaken (see section 4 for details).

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## *4 Forecast Travel Demands*

*4.1* The impact on travel demands as predicted from LASAM are presented below, keeping where possible a similar series of tables as presented in the TAAU chapter 3 of the TAAU.

*4.2* Table 4.1 presents the predicted passenger mode share forecasts. These show for the SSE Sensitivity Test an increase in Stansted Express mode share of some 1.7 percentage points and an overall increase in PT mode share of about 0.8 percentage points compared to the 35 mppa (enhanced) case.

**Table 4.1: Air Passenger Mode Share Forecasts (Annual)**

| Case | Status | Mode | 2014 |
|---|---|---|---|
| **35 mppa (enhanced)** | **TAA Update** | Car and Taxi | 58.3% |
| | | Stansted Express | 20.2% |
| | | Other Public Transport | 21.5% |
| | | **Public Transport** | **41.7%** |
| **35 mppa (enhanced)** | **SSE Sensitivity Test** | Car and Taxi | 57.5% |
| | | Stansted Express | 21.9% |
| | | Other Public Transport | 20.7% |
| | | **Public Transport** | **42.5%** |

*4.3* Table 4.2 presents the comparative peak period and average weekday air passenger demands on Stansted Express.

**Table 4.2: 2014 Stansted Express Air Passenger Forecasts**

| Case | Status | AM Peak (0700 - 1000)[1] | | PM Peak (1600 - 1900)[2] | | Average Weekday | |
|---|---|---|---|---|---|---|---|
| | | Arrive STN 0800 - 1100 | Depart STN 0600 - 0900 | Arrive STN 1700 - 2000 | Depart STN 1500 - 1800 | Arrive STN | Depart STN |
| **35 mppa (enhanced)** | **TAA Update** | 1,653 | 1,587 | 2,040 | 1,107 | 8,298 | 8,675 |
| **35 mppa (enhanced)** | **TAA Update +15%** | 1,901 | 1,825 | 2,346 | 1,273 | 9,543 | 9,976 |
| **35 mppa (enhanced)** | **SSE Sen. Test** | 1,937 | 1,806 | 2,314 | 1,326 | 9,692 | 10,196 |

*1. Refers to trains arriving at or leaving London between 0700 and 0959*
*2. Refers to trains arriving at or leaving London between 1600 and 1859*

*4.4* It is recognised that if the 2004 trip distribution had been adopted, it is likely that SSE Sensitivity Test would have forecast marginally more rail trips than is shown in the test results shown in table 4.2. For example, by comparison of the air passenger numbers in table 1, it can been seen that

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# Technical note

there some 10% additional passengers from Central London which would presumably generate about 10% more rail trips from Central London.

*4.5* Applying the difference in total air-passengers (between the data derived from 2004 and 25 mppa figures in table 1) to the 25 mppa rail demands shown in Table C.1 of the TAAU, it is estimated that STEX demands would be about 2.3% higher with the 2004 distribution. The likely changes in demand by region are shown in Table 4.3 below.

**Table 4.3: Potential Changes in STEX Demand with 2004 Distribution**

| | |
|---|---|
| Central London | 10.5% |
| London NE | -6.1% |
| London SE | -0.8% |
| London SW | -3.4% |
| London NW | -1.1% |
| **London Sub-Total** | 2.8% |
| Other SE - NE Sector | -1.4% |
| Other SE - NW Sector | -9.6% |
| Other SE - SW Sector | 0.3% |
| Other SE - SE Sector | 0.5% |
| **All Areas** | **2.3%** |

*4.6* Therefore, if the 2004 distribution had been adopted, the peak demand from Stansted to London in the morning peak would potentially be about 1,850 trips rather than 1,806 trips, and the peak demand from Liverpool Street to London in the evening peak period would be about 2,370 rather than 2,314 trips.

*4.7* The conclusion from this exercise is that air passenger demands from the SSE sensitivity test are very similar, i.e. about 30 trips or 3 to 4 passengers per train higher in a 3 hour period, to the 35 mppa (enhanced) + 15% case forecasts discussed in the TAAU (1,825 STEX trips from the airport in the AM peak period and 2,346 STEX trips to the Airport in the PM peak period).

*4.8* Since the SSE test and the 35 mppa (enhanced)+15% test provide similar levels of demand, new PLANET forecasts have not been undertaken. The conclusion however must be that at this level of demand in 2014, the PIXC

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levels are likely to be exceeded (this is essentially the same conclusion drawn from the TAAU test of 35 mppa (enhanced) plus 15%).

*4.9* Table 4.4 presents peak hour and daily air passenger related road traffic demands. This table shows that overall demand levels would be around 8% lower than those for the +15% sensitivity test.

**Table 4.4: 2014 Peak Hour Air Passenger Related Road Traffic Forecasts (vehicles)**

| Case | Status | AM Peak (0800 - 0900) | | PM Peak (1700 - 1800) | | Daily - 2014 | |
|---|---|---|---|---|---|---|---|
| | | Arrive | Depart | Arrive | Depart | Arrive | Depart |
| **35 mppa (enhanced)** | **Update** | 1,208 | 1,064 | 1,034 | 1,073 | 22,023 | 22,023 |
| **35 mppa (enhanced)** | **Update +15%** | 1,389 | 1,224 | 1,189 | 1,234 | 25,326 | 25,326 |
| **35 mppa (enhanced)** | **SSE Sen. Test** | 1,287 | 1,127 | 1,100 | 1,146 | 23,369 | 23,369 |

*4.10* Figures 1 and 2 show the results of the SSE sensitivity test and compare the results with the 35 mppa (enhanced) case forecasts. The figures show 2014 two-way vehicle flows for the AM and PM peak hours for the following cases:

- Box 1 - 35 mppa (enhanced) case
- Box 2 - 35 mppa (enhanced) case + 15%
- Box 3- 35 mppa (enhanced) case with 10% transfer passengers
- Box 4 - 35 mppa (enhanced) case with 25 mppa distribution; and
- Box 5 -35 mppa (enhanced) case with 25 mppa distribution and 10% transfer passengers.' SSE Sensitivity test'

*4.11* A comparison of the assignments shown in these figures shown that the assignments based on the SSE Sensitivity Test assumptions (Box 5) are not significantly different to the 35 (mppa) enhanced case + 15% assignments on the M11 south of the airport and on the A120 west of the Airport, and lower on the M11 north and A120 east of the airport.

## *5 Conclusions*

*5.1* The SSE sensitivity test identifies a set of Stansted Express and highway demands to and from London that are not materially different to those

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considered in the 35 mppa (enhanced) case +15% sensitivity test considered in the TAAU.

*5.2* As such, there are no changes to the conclusions reached in the TAAU as a result of undertaking this sensitivity test.