

# STOP BRISTOL AIRPORT EXPANSION BRISTOL INTERNATIONAL AIRPORT OBJECTION

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## APPRAISAL OF MASTER PLAN AND ASSOCIATED TRANSPORT ASSESSMENT

### 1.0 INTRODUCTION

#### 1.1 Aim of Note

1.1.1 Bristol International Airport (BIA) is pursuing ambitions to expand existing facilities at BIA. This is to cater for predicted increases in demand for air travel at BIA. Details of the proposals are indicated in several documents that are available for inspection.

1.1.2 Stop Bristol Airport Expansion has appointed Peter Evans Partnership to provide an independent review of documents that accompany the planning application.

1.1.3 This note summarises the findings of the independent appraisal.

#### 1.2 Scope of Assessment

1.2.1 This assessment reviews the transport assumptions of and appraises the following documents:

- Bristol International Airport Master Plan
- Bristol International Airport Surface Access Study – Highway Capacity Study
- Bristol International Airport Expansion Transport Assessment
- Greater Bristol Strategic Transport Study - Model Forecasting Report  
Appendix A
- Civil Aviation Authority 2003 Passenger Survey Report

1.2.2 This review continues in Section 2 and concentrates on the following specific issues:

- Passenger Car Occupancy
- Assessment of Traffic Growth
- Traffic Forecast Assessment Validation
- Forecast BIA Trip Generation
- North Somerset Traffic Model (NSTM) Link Flow Forecasts
- Forecast Taxi Trip Generation
- Public Transport
- Junction Capacity Testing

1.2.3 Conclusions are presented in Section 3.

1.2.4 Stop Bristol Airport Expansion should note that the Transport Assessment could be considered to supersede the Surface Access Strategy Highway Capacity Study, but this is unclear from the documents available.

### 1.3 Executive Summary

1.3.1 Peter Evans Partnership has reviewed various documents associated with Bristol International Airport and Bristol International Airport's proposed expansion. Several issues have been identified and are summarised below.

- The airport morning peak hour trip generation is not consistent with the Transport Assessment morning peak hour. There is reason to believe the morning peak may have been underestimated.
- Vehicle occupancy assumptions in the Transport Assessment are valid.
- Taxi movement forecasts in the Transport Assessment are under estimated.
- In respect of targets, the definition of 'Public Transport' is not consistent between the Master Plan and the Transport Assessment.
- Bus and coach movements are not included within the Transport Assessment airport traffic for testing, although this may not make a material difference to capacity test results.
- Junction capacity test assumptions may result in over optimistic capacity assessments.

## **2.0 REVIEW OF ISSUES IDENTIFIED BY STOP BRISTOL AIRPORT EXPANSION**

### **2.1 Passenger Car Occupancy**

- 2.1.1 A review of passenger car occupancy rates has been undertaken to address inconsistencies between the documents.
- 2.1.2 The BIA Highway capacity Study assumed average car occupancy of 2.2 persons per vehicle (paragraph 5.2.5). The BIA Transport Assessment assumed average car occupancy of 1.65 passengers per vehicle (Section 8.3, p.42). The Greater Bristol Strategic Transport Study Model Forecasting Report assumed average car occupancy of 1.94 passengers per vehicle (Appendix A, para. A20). All three of these documents reference CAA passenger surveys as the source for the respective statistic.
- 2.1.3 Peter Evans Partnership acquired a copy of the Civil Aviation Authority 2003 Passenger Survey Report. Tables 13.2 relates to passenger group size at Bristol airport. This table is included as Attachment 1.1.
- 2.1.4 If it is assumed that each passenger group arrives in one vehicle, the Bristol Airport statistics indicate 2 343 000 vehicles for 3 874 000 passengers. This would be equivalent to vehicle occupancy of 1.65 passengers per vehicle.
- 2.1.5 Table 10.2 of the CAA report gives statistics relating to mode split of passengers departing from BIA. This Table is included at Attachment 1.2. This table indicates that nearly 80% of passengers arrive by car. In view of this, Peter Evans Partnership considers average car occupancy of 1.65 for passengers at BIA is a reasonable assumption.

### **2.2 Assessment of Traffic Growth**

- 2.2.1 A manual methodology for forecasting traffic flows is outlined in section 3 of the Highway Capacity Study. Paragraph 3.7.1 states that background growth was established using the TEMPRO database, version 4.2.3.
- 2.2.2 TEMPRO version 4.2 guidance note states: "*Where a traffic growth factor is required in the absence of a traffic model, the Department's published forecast (currently NRTF 97) should be used as a basis*". An explanation is then given that TEMPRO 4.2 should be used to tailor the published [NRTF 97] forecast to local circumstances.
- 2.2.3 Peter Evans Partnership considers that the growth factor was incorrectly calculated.

### **2.3 Traffic Forecast Assessment Validation**

- 2.3.1 The BIA Surface Access Strategy Highway Capacity Study was based on manual forecasting methods and not a formal traffic model. Section 9 of the Highway Capacity Study states NSTM forecasts were compared with manually forecast traffic flows as a validation exercise.

2.3.2 Comparison with NSTM forecasts would be a valid method of validating manually calculated traffic forecasts. Paragraph 9.2.2 of the Highway Capacity Study however states: *“in the morning peak hour the modelled flows [NSTM] are generally greater than those derived in this report, but in the evening peak hour they are less. It is not clear why this should be the case...”*. Peter Evans Partnership suggests incorrect application of Tempro 4.2 growth could be a material factor.

## **2.4 Forecast BIA Trip Generation**

2.4.1 Peter Evans Partnership has reviewed whether the documents have assessed appropriate peak periods.

2.4.2 Greater Bristol Strategic Transport Study (GBSTS) Model Forecasting report morning peak hour trip generation assumptions for BIA are shown in Figures A8 and A10 respectively. In the year 2021, these tables indicate approximate 2-way trips of 1 700 passenger vehicles and 325 employee vehicles.

2.4.2 BIA expansion Transport Assessment is based on NSTM forecasts. The NSTM would appear to be calibrated to a morning and evening peak hours of 0800 to 0900 and 1700 to 1800 respectively. Stated peak hour passenger trip generation forecasts are consistent with these time periods.

2.4.3 Peak hour vehicle movement forecasts are given in Appendix B of the Transport Assessment. The morning peak hour passenger movements are quoted as 518 and 595 passengers entering and exiting BIA respectively. With existing public transport mode split, this would be equivalent to 870 2-way car movements. This is in the order of half the morning peak trip generation assumption given in the GBSTS report.

2.4.4 Peter Evans Partnership has replicated the calculation for peak hour vehicle movements. Forecast morning peak hour movements for passengers flying from BIA would occur between 0545 and 0645 hours. Forecast movements for passengers who have flown to BIA are not given for this time period. With existing public transport mode split, this would be equivalent to 1 725 2-way car movements. Peter Evans Partnership calculations are included as Attachments 2.1 and 2.2.

2.4.5 Peter Evans Partnership considers there is reason for doubt as to whether the worst-case morning peak hour has been assessed in the Transport Assessment.

## **2.5 NSTM Link Flow Forecasts**

2.5.1 NSTM forecasts in Figure 10.2 of the Transport Assessment indicate increases in traffic flow on the A38, which are less than the stated increase in trips to/from the airport.

2.5.2 An explanation of this is that addition of traffic to the SATURN network would cause the SATURN model to re-assign background traffic on to parallel routes. This would be in an attempt to reach equilibrium across the whole network. Also, SATURN suppresses trips as a result of network congestion. The net effect is that forecast link flows can be lower than would be expected if free-flow conditions were assumed. Peter Evans Partnership suspects this may be the case on the A38.

2.5.3 A qualitative assessment of how background traffic has been re-assigned is not possible on the basis of information presented. This exercise would require liaison with North Somerset Council and Atkins.

## 2.6 Forecast Taxi Trip Generation

- 2.6.1 Trip generation calculations for taxis are shown in the Transport Assessment at Appendix B and Figures 8.11 to 8.12. Calculated vehicle movement forecasts are on the basis that all movements contain passengers.
- 2.6.2 The Transport Assessment states that the taxi firm 'AirportCarz' have sole rights to ply for trade at the airport. The Transport Assessment does not indicate the proportion of trips that AirportCarz' taxis return to the airport with passengers. Peter Evans Partnership therefore suggest that after a passenger is collected from the airport taxi rank, some taxis would return to the airport empty.
- 2.6.3 The Transport Assessment also makes no allowance for passengers dropped off or collected by a pre-booked taxi other than AirportCarz. Owing to the policy of prohibiting these taxis from plying for trade at the airport, these taxis would have no passengers for either the arrival or departure journey.
- 2.6.4 For reasons outlined above, Peter Evans Partnership considers taxi movements are under-estimated.

## 2.7 Public Transport

### Targets

- 2.7.1 Information and data on public transport use is inconsistent and confused. Definitions are not clear.
- 2.7.1 The BIA Master Plan document states: "The draft Master Plan proposed that the proportion of passengers using public transport should rise by 10% per annum with a proposed target of 13% of passengers using public transport at 9 million passengers per annum".
- 2.7.2 This statement could mislead on the basis that the document should state: "the *number* of passengers using public transport should rise by 10% per annum". This is unlikely to be a significant issue.
- 2.7.3 Peter Evans Partnership note an inconsistency in the public transport assumptions used for the Transport Assessment. The Transport Assessment states that trip generation is calculated on the basis of either 5% or 13% public transport mode share. The passenger mode share by bus/coach given Appendix B is given as 7% and 14% respectively. No explanation is given for this difference. Peter Evans Partnership speculates the 5% and 13% statistics may include staff public transport mode split. This could underestimate private car use.

### Definitions

- 2.7.4 BIA Master Plan, Appendix A-19, Section 9 states: "*if it is assumed that the number of passengers using taxis remains at 12% of air passengers then the total number of air passengers using public transport would be 21% at 2011*". This statement adds to the confusion regarding public transport targets.
- 2.7.5 If taxi journeys were included within the public transport statistic, the 2005 public transport mode share presented in the Transport Assessment would be 19% and the 9mppa target would be 26%. Peter Evans Partnership notes that 19% is greater than the 13% target with 9mppa.

## Public Transport in Traffic Flows

- 2.7.6 Peter Evans Partnership can find no indication that bus/coach movements are included in the trip generation figures. As a proportion of total airport traffic, bus and coach trips may be sufficiently low as to have no material effect on capacity test results. This would however contribute to underestimation of vehicle movements.

### **2.8 Junction Analysis**

- 2.8.1 Peter Evans Partnership has identified a number of shortcomings with the ARCADY analysis of the two airport access roundabouts.
- 2.8.2 The north roundabout for the Terminal is a four-arm roundabout. The fourth arm gives vehicular access to a school playing field. Only three arms of the roundabout are modelled. No attempt is made to justify zero trips to and from the fourth arm.
- 2.8.3 Peter Evans Partnership suspects that geometric measurements may be incorrect (effective flare length, entry radii and entry angle).
- 2.8.4 The algorithm within ARCADY assumes the full entry width is available to queuing traffic. In situations with high turning movements, ARCADY can produce optimistic results. In 1997, Barbara Chard published a paper with a suggested method to account for unequal lane usage, *ARCADY Health Warning: Account for unequal lane usage or risk damaging the Public Purse!*, Traffic Engineering and Control, Volume 38, Number 3, March 1997. During the evening peak particularly, turning movements are biased towards the airport. No attempt has been made to account for unequal turning movements at either roundabout.
- 2.8.5 ARCADY models have been run with uniform traffic arrival profiles over a 90-minute peak period. This is not typical practice and no attempt is made to justify a flat arrival profile.
- 2.8.6 Peter Evans Partnership suggests that an independent junction capacity test should be undertaken to confirm these views.

## **3.0 CONCLUSIONS**

### **Background Traffic Growth**

- 3.1 Traffic growth assumptions in the Bristol International Airport Surface Access Study – Highway Capacity Study were incorrectly calculated.
- 3.2 Bristol International Airport Surface Access Study – Highway Capacity Study forecasts show a degree of inconsistency with the NSTM forecasts. These differences were not addressed with sensitivity testing.

### **Trip Generation**

- 3.3 The Bristol International Airport Expansion – Transport Assessment assumed a morning peak hour of 08:00 to 09:00. The Airport morning peak hour is forecast to occur from 05:45 to 06:45. There is reason for doubt as to whether the combined morning peak hour and therefore the highest flows have been assessed.
- 3.4 Bristol International Airport Expansion – Transport Assessment assumed passenger car occupancy of 1.65 people per vehicle. On the basis of available data, Peter Evans Partnership considers this is reasonable. The Highway Capacity Study assumption of 2.2 people per vehicle would be too high for BIA.
- 3.5 The Bristol International Airport Expansion – Transport Assessment assumes all taxi movements contain passengers. Forecast vehicle movements for taxis are therefore under estimated.
- 3.6 Public Transport targets are unclear. The term ‘Public Transport’ needs definition. Within the Master Plan, taxi trips are considered public transport. The Transport Assessment gives the impression that Public Transport refers to bus and coach trips.
- 3.7 Bus and coach movements have not been included in traffic flows for testing in the Bristol International Airport Expansion – Transport Assessment.

### **Junction Capacity Testing**

- 3.8 Initial review of capacity test input data for airport junctions with A38 has identified a number of factors that may affect the results. An independent check of junction capacity tests would be beneficial.

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