

Greater Bristol Bus Network

Appendix 3D – Update to Forecasting Report

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1. Introduction

BACKGROUND

- 1.1 This supporting document provides background information on forecasting the impacts of the Greater Bristol Bus Network (GBBN).
- 1.2 It updates the information provided to the Department for Transport (DfT) in July 2005 in support of the Programme Entry submission and provides the basis for the submission of the GBBN scheme for Full Approval under the DfT's Major Scheme approval process.
- 1.3 As described in the main Full Approval submission document, the Full Approval submission recognises that certain contexts and issues related to scheme design have moved on since the Programme Entry bid in 2005. The scheme has been refined as part of an ongoing process of minimising risks to delivery and maximising the achievement of the scheme's benefits.
- 1.4 Minor refinements to the scheme cost and specification have been made to maximise value for money and deliverability. These refinements have been made as part of a rigorous review of the schemes elements and costs and comprise:
 - A value management exercise that has scrutinised each of the scheme's infrastructure components to ensure that they add to the overall benefits of the scheme;
 - A detailed cost review of all scheme elements including not just the physical bus priority infrastructure but also bus stops, RTP1 and marketing;
 - A further re-review in conjunction with First of all service and frequency enhancement assumptions;
 - An updated Quantified Risk Assessment (QRA) taking on board changes to scheme specification and risk; and
 - Overlaying the whole review process an ongoing risk identification and management process that ensured that where additional risks were identified actions were taken to refine elements such that design, cost and delivery risks have been mitigated.
- 1.5 Although the scheme specification changes are very minor we have, as required by the DfT's Major Scheme process, updated the forecasts of the scheme's impacts. These forecasts have fed into an updated business case.
- 1.6 This Appendix provides updated information on the forecast scheme impacts

Modelling tools and approach

- 1.7 The same detailed and comprehensive modelling framework has been employed in developing the Full Approval business case as was used for Programme Entry. The main modelling tool employed is the BATS2¹ model of the Greater Bristol area. This model is a fully specified, spatially disaggregate multi-modal model originally

¹ BATS - Bristol Area Transport Studies

developed by BCC (as BATS1) to support the assessment of a potential congestion charging scheme for central Bristol and the proposed Bristol Supertram Scheme. A full description of the model and its various component parts is provided in Annex 2A (Model Development and Validation Report) of the July 2005 Programme Entry submission.

- 1.8 Identical forecasting approaches have also been used to estimate scheme impacts.

DOCUMENT ROLE AND STRUCTURE

- 1.9 This document does not repeat the detailed information on forecasting approach provided at Programme Entry stage. It focuses on providing an update of any changes in forecasting assumptions and on the forecast scheme impacts. To aid understanding of the revised impacts comparisons against the Programme Entry stage assumptions and forecasts are provided where appropriate.
- 1.10 The Appendix is structured in two parts.
- ◆ Chapter 1 presents a summary of key forecasting assumptions identifying any that have changed since Programme Entry;
 - ◆ Secondly, in Chapters 5 and 6, the forecasts for the GBBN scheme impacts are presented.

2. Summary of Key Forecasting Assumptions

SCENARIOS AND FORECAST YEARS

- 2.1 The appraisal of the major scheme – defined as the do-something case - has been undertaken relative to an appropriate do-minimum case. As per Department guidance two forecast years have been employed.
- 2.2 The modelling framework has been developed to represent the following:
- ◆ A 2004 Base Year to which the model has been calibrated and validated;
 - ◆ 2011 forecast year - assumed to be the first year of full scheme (i.e. all corridors) opening;
 - ◆ 2021 forecast year - assumed to be 10 years after the full scheme opening. It is noted that given the nature of the scheme (i.e. effectively being delivered from 2006 onwards) a +10 year horizon was considered more appropriate as a means of providing a further point for the appraisal process².

FORECAST YEAR SUPPLY ASSUMPTIONS

- 2.3 The BATS2 model comprises detailed representation of highway and public transport networks. Do-Minimum and Do-Something networks have been developed to represent 2011 and 2021 scenarios.

Do-Minimum Assumptions

- 2.4 The Do-Minimum assumptions for highway and public transport networks have not been changed and remain as described in the Programme Entry submission.

Do-Something Preferred Scheme Assumptions

Highway network

- 2.5 No changes to the highway network have been made other than as part of schemes related to changed bus priority schemes.

Bus Network Changes

- 2.6 Changes have been made to bus priority measures in the following locations:
- ◆ Portbury Hundred HOV Lane (3007) - further detailed assessment has highlighted the limited public transport benefits that the scheme will deliver relative to its costs. The frequency of bus services is low on this section and First have confirmed that they do not consider the scheme as significant in terms of benefits to their operations. Treatment in the model consisted of removing the eastbound A369 HOV lane between Portbury Common (B3124) and Station Road.

² As discussed and agreed at a meeting with DfT Major Projects and representatives of the Unitary Authorities, January 26th 2005

- ◆ Orpheus Avenue (4012) - this scheme is for a short length of bus lane but the cost is high because of widening requirements to accommodate the bus lane. On site surveys have observed marginal journey time and reliability benefits. On closer inspection this scheme is not considered to have significant operational benefits for First. Treatment in the model consisted of removing the southbound bus lane, north of Gypsy Patch Lane .
- ◆ A37 New Fosseway Rd to Airport Rd (2022) - detailed analysis has identified limited impacts in terms of predicted journey time savings and reliability impacts. With relatively few bus services using this section First have confirmed that the scheme is marginal in terms of anticipated benefits for their operations. Treatment in the model consisted of removing the southbound bus lane, north of Gypsy Patch Lane.
- ◆ B3340 Locking Rd / New Bristol Rd (3003) - detailed analysis identified that the proposed bus lane would deliver few benefits and that the inclusion of Selective Vehicle Detection (SVD) unit at the traffic signals would be the most cost effective form of priority at the traffic signals. The proposed changes to the scheme reduce scheme costs by 20%. The location is outside the simulation network in the model, so no changes were made;
- ◆ A4174/M32 J1 Sliproad Works (7002) - there is already a bus lane on the approach to junction 1 slip road. This scheme is anticipated to provide limited additional benefits relative to the cost Treatment in the model consisted of removing of extension of bus lane onto the roundabout from east to south;
- ◆ A432 Downend Bus Lane (4018) detailed site survey have identified that this schemes delivers very little in the way of journey time or reliability benefits. The scheme is also relatively high costs due to highway widening requirements. Treatment in the model consisted of removing the southbound bus lane between Cleeve Lodge Road and Cleeve Road;
- ◆ Coldharbour Lane Westbound Approach (4023) - detailed analysis of the journey time and reliability benefits conclude that this short left hand turn scheme into the proposed bus lanes on Coldharbour Lane is providing no significant additional benefits to the wider bus lane scheme on Coldharbour Lane. Treatment in the model consisted of removing the left-turn bus lane on Coldharbour Lane, westbound approach.
- ◆ A370 Main Road, Cleeve (3006) - detailed reassessment of this scheme concluded that whilst the costs are modest the scheme is not providing any tangible benefits to bus operations. The location is outside the simulation network in the model, so no changes were made.
- ◆ A4174 Signal Priority (4019 - two sites) – SVD can be provided via the Real Time Passenger Information system. SVD can be provided using ‘virtual’ loops and no roadside infrastructure is required. No changes are necessary to reflect this in the model;
- ◆ Parkway Bus Link (4013) - this scheme was included in the 2005 Programme Entry bid in anticipation that First would seek to make use this bus only link as a means of servicing Little Stoke and Bradley Stoke. First have confirmed that they have no medium term plans to use this link if provided and the element has been removed. Treatment in the model consisted of removing the bus-only link and reverting to the do minimum situation;

- ◆ A432 Signal Priority (4017 - three sites) - SVD is now to be provided via the Real Time Passenger Information system. SVD can be provided using 'virtual' loops and no roadside infrastructure is required. No changes are necessary to reflect this in the model;

2.7 The location of these scheme changes is shown in Figure 2.1.

2.8 No changes have been made to bus service assumptions – these remain identical to those in the Programme Entry submission.

Other Public Transport Supply Assumptions

2.9 All other public transport supply assumptions covering rail, park-and-ride and fares remain as in the modelling for the Programme Entry submission.

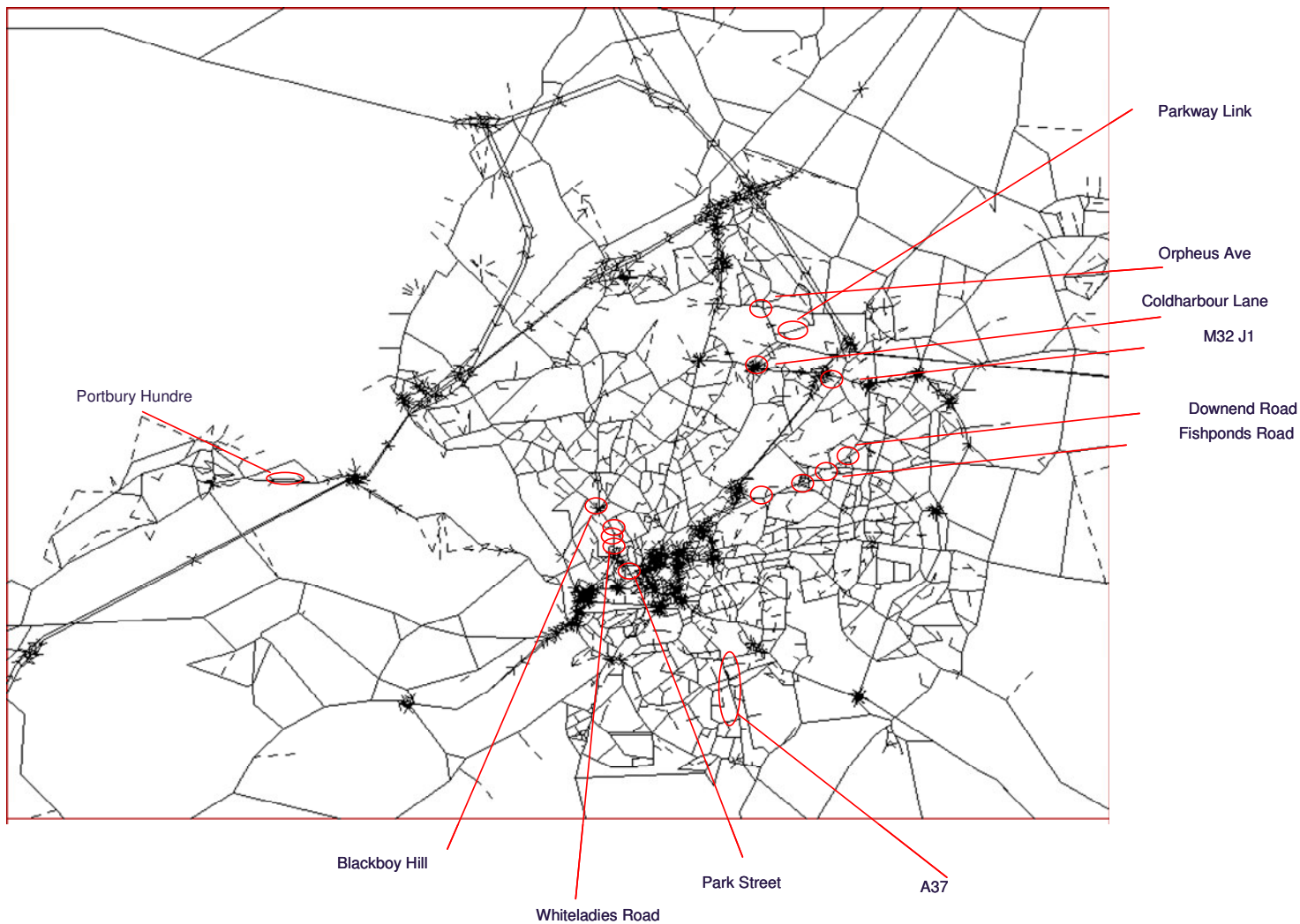
Parking Charges

2.10 Parking charge assumptions remain as in modelling for the Programme Entry submission – i.e. no increase of parking charges in real terms or changes in parking supply.

FUTURE YEAR TRIP MATRICES

2.11 Initial future year demand matrices derived from TEMPRO used as input to the multi-modal model remain identical to those used in the modelling for the Programme Entry submission.

Figure 2.1 – Location of Bus Priority Scheme Changes



3. Model Forecasts – Refined Scheme

INTRODUCTION

- 3.1 This chapter presents the results of the forecasts for the Central Case Do-Minimum and Refined GBBN Do-Something “Preferred Scheme”. As appropriate comparisons between the model forecasts for the Refined GBBN at Full Approval stage and those used at Programme Entry stage are presented.

BUS PATRONAGE : HEADLINE IMPACTS

- 3.2 Table 3.1 presents a summary of the overall estimated impact of the GBBN scheme in 2011, comparing the Do-Something (for Programme Entry and Full Approval stages) with the Do-Minimum.

Table 3.1 – Preferred Scheme Headline Projected Bus Patronage Impacts

	AM Peak	Inter Peak	Daily
Base 2004	16,859	8,875	137,542
Do-Minimum 2011	16,033	7,672	126,198
Programme Entry GBBN Do-Something 2011	16,924	8,047	132,905
<i>% change relative to Do-Minimum 2011</i>	6%	5%	5%
Full Approval Refined GBBN Do-Something 2011	16,916	8,035	132,786
<i>% change relative to Do-Minimum 2011</i>	6%	5%	5%
<i>% change relative to Programme Entry Do Something 2011</i>	0%	0%	0%

DETAILED IMPACT – TRIPS BY MODE

- 3.3 Figure 3.1 and Figure 3.2 present the estimated 2011 demand impact of the measures comparing Base, DM and DS for .AM Peak and Inter-Peak respectively. The figures are also shown in Table 3.2 and Table 3.3.
- 3.4 These figures relate to the entire BATS2 area and include areas where no improvements are proposed. The figures do not include the estimated demand impacts on the A367 Corridor 10 calculated outside the BATS2 model. It is noted that no changes to the scheme specification have been made between Programme Entry and Full Approval in areas not covered by the BATS2 model.

Figure 3.1 – Preferred Scheme, Estimated AM Peak Hour Trips by Mode

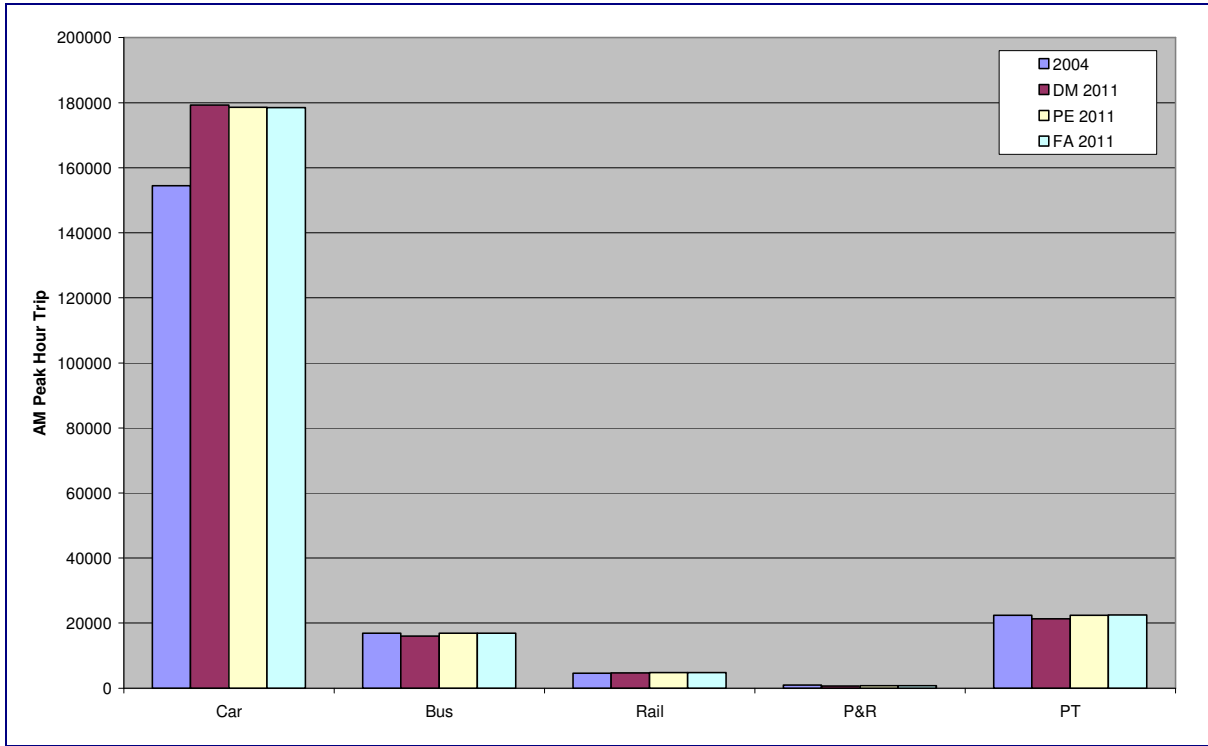


Figure 3.2 – Preferred Scheme, Estimated Inter Peak Hour Trips by Mode

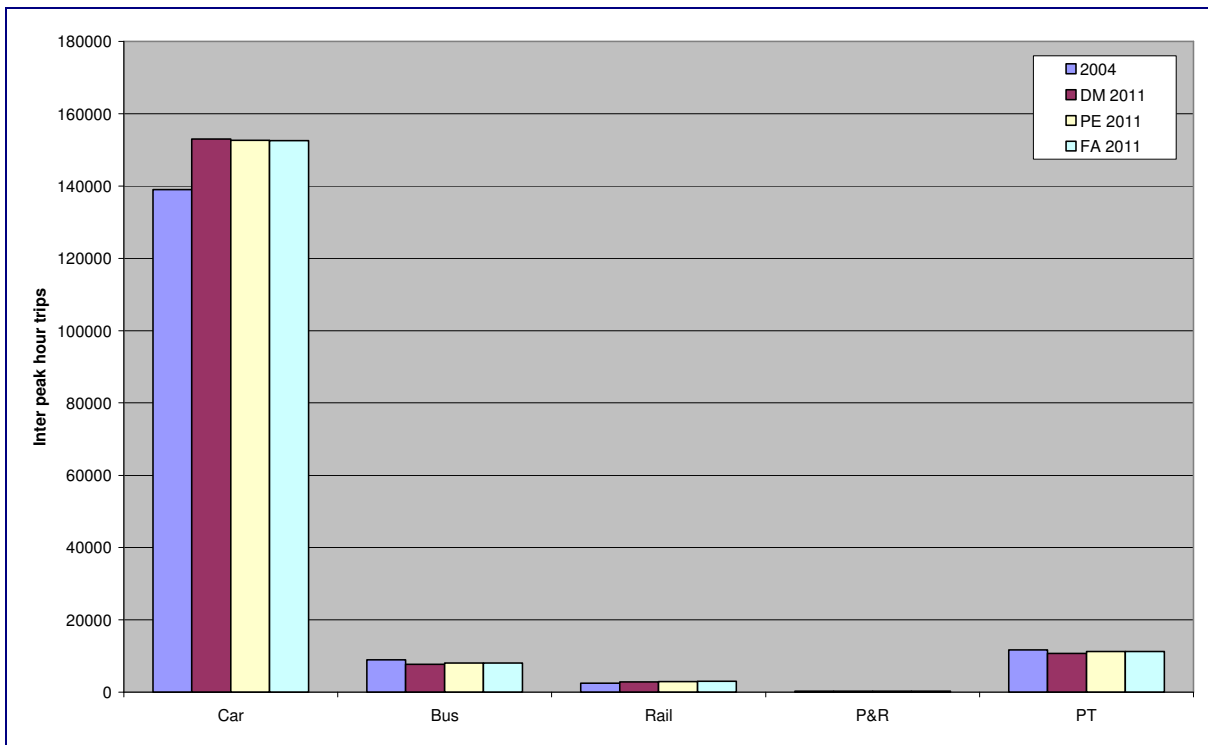


Table 3.2 - Preferred Scheme, Estimated Impacts by Mode – 2011 AM Peak Hour Forecasts

	Base	DM 2011	Programme Entry DS 2011	Full Approval DS 2011
Car	154,485	179,327	178,583	178,516
Bus	16,859	16,033	16,924	16,916
Rail	4,626	4,650	4,775	4,799
Park-and-Ride	900	687	711	768
PT total	22,384	21,369	22,411	22,483
Car Mode Share	87.3%	89.4%	88.8%	88.8%
<i>% change from Base 2004</i>				
Car		16.1%	15.6%	15.6%
Bus		-4.9%	0.4%	0.3%
Rail		0.5%	3.2%	3.7%
Park-and-Ride		-23.7%	-21.0%	-14.7%
PT total		-4.5%	0.1%	0.4%
<i>Absolute change from DM 2011</i>				
Car			-744	-810
Bus			892	883
Rail			126	150
Park-and-Ride			25	81
PT total			1042	1114
<i>% Change from DM 2011</i>				
Car			-0.4%	-0.5%
Bus			5.6%	5.5%
Rail			2.7%	3.2%
Park-and-Ride			3.6%	11.8%
PT total			4.9%	5.2%

Table 3.3 - Preferred Scheme, Estimated Impacts by Mode – 2011 Inter-Peak Hour Forecasts

	Base	DM 2011	Programme Entry DS 2011	Full Approval DS 2011
Car	139,006	153,062	152,665	152,609
Bus	8,875	7,672	8,047	8,035
Rail	2,437	2,820	2,916	2,943
Park-and-Ride	300	225	248	289
PT total	11,612	10,718	11,211	11,266
Car Mode Share	92.3%	93.5%	93.2%	93.1%
<i>% change from Base 2004</i>				
Car		10.1%	9.8%	9.8%
Bus		-13.5%	-9.3%	-9.5%
Rail		15.7%	19.7%	20.7%
Park-and-Ride		-25.0%	-17.4%	-3.7%
PT total		-7.7%	-3.5%	-3.0%
<i>Absolute change from DM 2011</i>				
Car			-397	-453
Bus			375	362
Rail			96	123
Park-and-Ride			23	64
PT total			493	548
<i>% Change from DM 2011</i>				
Car			-0.3%	-0.3%
Bus			4.9%	4.7%
Rail			3.4%	4.3%
Park-and-Ride			10.1%	28.3%
PT total			4.6%	5.1%

ESTIMATED ANNUAL DEMAND IMPACT

- 3.5 Combining the am and inter peak forecasts gives an estimated annual increase in bus trips for the Preferred Scheme of:
- ◆ An extra 1.1 million bus trips per annum in 2011 relative to the Do-Minimum;
 - ◆ An increase of 5% on total modelled bus trips (though noting that the BATS2 model does not represent all bus trips in the Greater Bristol area).

ESTIMATED BOARDINGS AND PASSENGER KILOMETRES

- 3.6 Network performance statistics for 2011 are presented in Table 3.4 for AM Peak and Table 3.5 for Inter Peak. The tables distinguish between Core services, other services in the Showcase corridors and other services in the Greater Bristol area.

Table 3.4 – Preferred Scheme, Summary of AM Peak Bus Network Demand Statistics

				Change from Base				DS Change from DM	
	Base 2004	2011 DM	2011 DS	Abs	Abs	%	%	Abs	%
				DM	DS	DM	DS	DS	DS
Boardings									
All bus services	23,864	24,379	26,365	515	2,501	2.2%	10.5%	1,986	8.1%
Core Bus Showcase Services	10170	10,881	13,348	711	3,178	7.0%	31.2%	2,467	22.7%
Other bus services in Showcase corridors	3650	3,735	3,842	85	192	2.3%	5.3%	107	2.9%
Showcase corridors total	13820	14,616	17,190	796	3,370	5.8%	24.4%	2,574	17.6%
All none Showcase corridors	10,044	9,763	9,175	281	869	-2.8%	-8.7%	588	-6.0%
Passenger kilometres									
All bus services	99,335	102,574	111,913	3239.2	12,578	3.3%	12.7%	9,339	9.1%
Core Bus Showcase Services	46958	50,003	62,821	3044.9	15,863	6.5%	33.8%	12,818	25.6%
Other bus services in Showcase corridors	12357	13,329	13,180	972.9	823	7.9%	6.7%	150	-1.1%
Showcase corridors total	59315	63,332	76,001	4017.8	16,686	6.8%	28.1%	12,668	20.0%
All none Showcase corridors	40,020	39,242	35,912	778.6	4,108	-1.9%	-10.3%	3,329	-8.5%

Table 3.5 – Preferred Scheme, Summary of Inter-Peak Bus Network Demand Statistics

				Change from Base				DS Change from DM	
	Base 2004	2011 DM	2011 DS	Abs	Abs	%	%	Abs	%
				DM	DS	DM	DS	DS	DS
Boardings									
All bus services	13,637	12,961	13,952	676	315	-5.0%	2.3%	991	7.6%
Core Bus Showcase Services	5915	6,093	7,027	178	1,112	3.0%	18.8%	934	15.3%
Other bus services in Showcase corridors	2269	1,978	2,120	291	149	-12.8%	-6.6%	142	7.2%
Showcase corridors total	8184	8,071	9,147	113	963	-1.4%	11.8%	1,076	13.3%
All none Showcase corridors	5,453	4,890	4,805	563	648	-10.3%	-11.9%	85	-1.7%
Passenger kilometres									
All bus services	59,098	57,639	62,699	1458.5	3,601	-2.5%	6.1%	5,059	8.8%
Core Bus Showcase Services	29851	30,042	35,823	190.5	5,972	0.6%	20.0%	5,782	19.2%
Other bus services in Showcase corridors	8644	7,941	8,137	703	507	-8.1%	-5.9%	196	2.5%
Showcase corridors total	38495	37,983	43,960	512.5	5,465	-1.3%	14.2%	5,978	15.7%
All none Showcase corridors	20,603	19,657	18,739	946	1,864	-4.6%	-9.0%	918	-4.7%