Bristol/Bath to South Coast Study

Final Report - The City of Bath
Government Office for the South West

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1 INTRODUCTION

Study Background

1.1 In 1997, the "Roads Review - Consultation Document - What Role for Trunk Roads in England?" identified that some 40% of roads in the trunk road network would be potential candidates for detrunking. This included the A36/A46 between the M4 junction 18 and the M27 junction 2. The detrunking proposals for this particular route were strongly opposed by certain highway authorities as well as the then regional planning body. Government Office for the South West commissioned a short study to examine the case for this route's detrunking and to facilitate future decisions on the status of the A36/A46. This report was produced in September 2000.

1.2 The report concluded that a further review would be required of the A36/A46, and the A350, but, in the meantime, the Regional Assembly reconfirmed their objection to the detrunking proposals on the grounds that the report had not adequately led to the conclusion that the route should be detrunked. The Secretary of State meanwhile confirmed the decision to promote the detrunking of the route.

1.3 Subsequently, the Regional Planning Guidance for the South West [RPG10] was published in September 2001. Table 6 of the Guidance specifically identifies the requirement for "improvements to north/south transport links from the Bristol/Wiltshire and Bath and North East Somerset area to Southampton/Bournemouth/Poole, which addresses in particular the World Heritage city status of Bath". The requirement further demands that the functionality of the A36/A46, and the other north/south routes which extend from the south coast towards the M4 motorway, have to be better understood in order to recommend appropriate measures for their management.

1.4 In order to address the concerns of the Regional Assembly and the highway authorities, Government Office for the South West, in consultation with the Highways Agency, commissioned a further study, the Bristol/Bath to South Coast (BB2SC) Study, in order to supplement the previous study undertaken in 2000. The findings are to be reported to the South-West Regional Assembly in order to enable it to consider revisions to the Regional Transport Strategy [RTS], which forms part of the emerging Regional Spatial Strategy [RSS].

1.5 WSP was commissioned by Government Office for the South West on behalf of the South West Regional Assembly to undertake the BB2SC Study.

The Bath Report

1.6 The deliverables for the BB2SC require a "Strategic Report" and a "Bath Report". This report is the outcome of the analysis undertaken relating to the City of Bath, a designated World Heritage Site, and concentrates on addressing one of the study's main aims which was "to develop an integrated transportation strategy, to address the issues relating to through traffic in the corridor on the historic City of Bath". The Strategic Report[1] concentrates on the functionality of the key north-south routes found within the study area. It examines improvement measures both remitted to the study by the Secretary of State for Transport and also those identified by the project team and within the Terms of Reference. Some of the strategic options recommended will naturally have an impact on measures appropriate to addressing through traffic in the City of Bath and, although duplication has been kept to a minimum, it will be evident from this report that there is a degree of overlap.

Study Area Remit

1.7 The study area is shown on Figure 1.1. It includes the A37 to the west in order to take account of issues pertinent to the A350 and A37 from south-east Dorset and the Poole/Bournemouth conurbation to the M4/M5 corridors. To the east the study area is bounded by the A34, which is itself to be the subject of a study to be commissioned by Government Office for the South East. To the north, the M4 bounds the study area and to the south, the coast.

1.8 Within the study area, there are a number of routes of significance including the A36/A46 between junction 18 of the M4 to Warminster, Salisbury and the M27 at junction 2. From junction 17 of the M4, the A350 runs due south through the towns of Melksham and Westbury connecting to the A36 at Warminster, before continuing to Poole, via Shaftesbury and Blandford. The A35/A37 in the west extends from the south east Dorset region and runs due north to the A303 and on to Bristol as well as connecting to the M5 via the A358. In the east, the A34, a trunk road, connects the M3 to the A303 and the M4.

1.9 East/west issues have recently been examined by the South West Area Region Multi-Modal Study, (SWARMMS), and the South Coast Multi-modal Study, (SOCOMMS), studies and are not covered in any detail as part of this work.

[1] Bristol/Bath to South Coast Study - The Final Report - Strategic Corridor, WSP, 2004

1.10 Within this study area there are also important rail routes which offer opportunities for improved freight and passenger flows, most notably the South Coast to Bristol and South Wales line between Bristol and Bath, Westbury and Southampton.

1.11 The historic City of Bath is entirely within the study area, and as can be seen from subsequent sections of this Final Report, traffic issues in the city have been analysed in some detail using the transport model developed.

Issues of Relevance

1.12 The Terms of Reference, comments received from stakeholders and the analysis of data from primary and secondary sources identified particular issues that were relevant to the analysis of traffic related problems in the city of Bath. In particular these included previous assessments of other highway improvement schemes proposed to be constructed to the east of the city, including:

- The A36 Batheaston/Swainswick bypass link to the A36 at Dry Arch that was rejected at public inquiry.
- The East of Bath to Beckington Scheme which was abandoned by the Highways Agency in 1996 following a review of the National Roads Programme.

1.13 Both of these schemes would have provided considerable traffic relief to the A4 London Road, the A36 Cleveland Bridge/Bathwick Street and the A36 Warminster Road. The East of Bath to Beckington Scheme was a much larger project which would have provided a high quality route between the already improved Beckington and Batheaston bypasses as well as providing a bypass for Bradford-on-Avon, also a very historic town. However, as a consequence of its scale there were considerable environmental disbenefits as well as cost implications.

1.14 As a consequence, a solution to the problem of north-south traffic between the A46/A4/A36 has still to be found. The Local Transport Plan of Bath and North East Somerset Council indicates that the council intends to take steps to ensure that the built and natural environment is managed in such a way as to encourage potential growth of the city without compromising the unique status of Bath as a UNESCO World Heritage site. Inherent within these responsibilities is the need to mitigate the impact of highway traffic on the city, and in particular the effects of heavy goods vehicles.

1.15 The council has set a target to reduce the average 1990-1999 observed levels of traffic in the city centre by 10% by the year 2006. Bath and North East Somerset Council have also identified particular problems resulting from car and HGV traffic within the town including:

- environmental deterioration of the unique architectural heritage and townscape;
- poor accessibility by non-car modes,

- deterioration of air quality with a designated air quality management area on the A4 London Road and consequential environmental problems to residential areas;
- cars rat-running and parking in undesirable locations; and,
- the over arching threat to Bath's economic potential.

Study Objectives

1.16 Of particular relevance to this report are the following objectives for this study:

- To develop an integrated transportation strategy to address the issues relating to through traffic in the corridor on the historic City of Bath,
- To undertake effective, timely and focussed consultation with stakeholders,
- Produce an implementation programme which focuses on overcoming particular constraints within Bath with a corresponding implementation plan.

Study Deliverables

1.17 The Terms of Reference for the study, found in Appendix A of the Commissioning Report, define a number of stages and deliverables. These are principally reports, supported with plans, tables and other information and include:

- The Commissioning Report
- The Data Collection Report
- The Stage One Consultation and Participation Report
- The Rail Report
- The Environmental Assets Report
- The Traffic Model Validation Report
- The Identification of Problems and Issues Report
- The Stage Two Consultation and Participation Report
- The Option Development and Appraisal Report
- The Final Report for Bath, and
- The Final Report for the Strategic Corridor

1.18 All of the final reports are available on the Internet site www.bb2scstudy.org.uk.

2 STUDY APPROACH

2.1 The study has required significant data assimilation throughout the corridor. It has collected primary and secondary data from a range of stakeholders covering issues relating to travel demand, infrastructure capacity and environmental assets. The travel demand information and travel infrastructure information has together assisted in defining the problems and issues within the corridor. The environmental information has been used to produce an Environmental Assets and Constraints Report[2] that has assisted in the production of option development, appraisal and constraints analysis.

2.2 There has been extensive consultation with stakeholders. This has included workshops with four selected stakeholder groups, responses via a Citizens Panel, newsletters, and commentary and comments received via the website (detailed above).

The Environmental Assets and Constraints

2.3 The study area for the environmental work broadly comprises a 1km band either side of the main transport corridors within the study area which run north-south.

2.4 The data collection used to collate the environmental assets within Bath covers issues relating to noise, air quality, landscape, townscape, nature conservation, cultural heritage and water environment. Much of the data is available from the relevant statutory bodies, as well as Bath and North East Somerset Council. The environmental assets and constraints information has been brought together and is reported more fully in the Environmental Assets and Constraints Report[2].

Travel Demand Data Collection

2.5 At the centre of this study's analysis is a transport model. The model has been assembled from a number of existing transport models; the Salisbury Transportation Model, the West Wilts Traffic Model, the Bath and North East Somerset multi-modal model and the SWARMMS regional model. Data from these sources has been amalgamated with new primary data collected from six roadside interviews and automatic traffic counts undertaken in September 2002. Rail patronage data has also been collected from the LENNON and CAPRI datasets. A validated transport model has been developed and is fully reported in the Local Model Validation Report[3]. This model is used to test options at the study's forecast year, 2023.

[2] Bristol/Bath to South Coast Study, Environmental Assets and Constraints Report, WSP 2003

2.6 Other data which has proved invaluable to the study's processes includes:

- Automatic Traffic Count data from the councils of Wiltshire, Hampshire, Bath and North East Somerset, Somerset, Dorset and the Highways Agency.
- Manual Classified Count data, also from the same sources, and
- Journey time information from AutoRoute.

2.7 In addition, the opportunity to assess the impacts of the closure of the A36 at Limpley Stoke, between mid-September and early December 2002, were monitored. This required a significant data collection exercise on a number of routes in and around the study area in order to gauge the effect of re-routing arising from this road closure. A separate report detailing the impact of the A36 closure at Limpley Stoke is also provided in the Limpley Stoke Monitoring Study[4]. This work indicates significant localised re-routing around Bath, but little strategic re-routing in response to the closure.

2.8 Towards the end of the study, the LENNON revenue database came on stream and Wessex Trains provided information to the project team for the South Coast to Bristol and South Wales line, on numbers of ticket transactions - a good proxy for passenger numbers.

2.9 Also during the course of the study, the Joint Strategic Planning & Transportation Unit, (JSPTU), and North Somerset Council undertook a series of boarding and alighting surveys for all stations that lie within the former Avon area.

2.10 Discussions with the bus operators provided background to service patterns and aspirations. It was clear from these discussions that the public transport operators are concentrating more on service quality and consolidation rather than on service expansion.

2.11 The summary data collected during the surveys and from previous sources has been brought together to form a robust and comprehensive database which was used for the development of current travel demand by mode and the calibration and validation of a network traffic model for the entire study area, which has been used to analyse a number of options for Bath.

3 PROBLEMS AND ISSUES

3.1 The City of Bath is identified in the Regional Planning Guidance for the South West of England, RPG10, as a Principal Urban Area (PUA). Table 6 of the RTS identifies that "improvements to north-south transport links from the Bristol/Wiltshire and the Bath and North East Somerset district area to Southampton/Bournemouth/Poole which addresses in particular the World Heritage City of Bath" are required in order to play a key role in its sustainable development within the south west of England.

3.2 The City of Bath is also a UNESCO World Heritage Site. This has implications for conservation in order for its universal value to be appreciated in the long term. These special circumstances are of particular importance when considering any possible measures to reduce the impact of existing traffic on Bath. Of specific importance in relation to this report is the issue of addressing "through traffic" on the City of Bath and tackling the impacts that any demand management measures may have on the surrounding urban and rural areas.

3.3 The city plays a pivotal role in the tourist industry of the south-west of England. It is a major employment and retail destination as well as a university town which generates over 1,000,000 overnight and 2,000,000 days trips per year for visitors and tourists. An estimated 4,000,000 regional shoppers visit Bath each year.

3.4 The Council consults the residents of Bath on a regular basis. Some clear messages have emerged from this consultation, namely that the Council should:

- protect the built environment, and
- improve public transport and reduce the perceived significant adverse impacts on HGVs and lorry routings within and around the city.

3.5 Noise pollution, congestion and structural damage are all identified as being largely attributable to the heavy goods movements in and around the city.

3.6 The Local Transport Plan, (LTP), identifies some specific problems which need addressing within the city including:

- The scale of "through traffic" in particular the traffic between the A36 and A46 and between the A36 and the A4,
- The management of parking availability in the city centre, and,
- Congestion on radial routes.

3.7 The LTP also recognises that Bath and North East Somerset is influenced not only by the City of Bath but also by the proximity of Bristol. The journey to work pattern is dominated by these

two major employment centres but the cost of living within the city of Bath has encouraged workers to live in less expensive parts of Bath and North East Somerset Council and rural Wiltshire generating a commuter migration pattern from the West Wiltshire towns into Bath and Bristol. This presents particular difficulties when seeking to provide sustainable transport solutions, given the dispersed pattern of demand for travel into the city.

The A36/A46 Route

3.8 The A36/A46 is identified as being a key transport route in the council's area. The decision to detrunk the A36/A46 has been assessed as part of the strategic brief to this study. Currently Bath and North East Somerset Council have concerns about the decision, and this study has been commissioned partly to address the question of mitigating the impact of through traffic movements between the A46 and the A36.

3.9 The "A36/A46 Batheaston/Swainswick Bypass" Inspector's Report considered an A46/A36 link road, but concluded against the need for it on the grounds of "intolerable impacts on landscape and being devastating to recreational amenity". However, the Inspector also agreed that measures were required to meet the demands of north-south traffic and the impacts on the City and also the greater demands of east-west movements. The Department of Transport (DoT) and local authorities were requested to come forward with a solution and the DoT promoted the Batheaston to Beckington scheme. This much longer route was subsequently removed from the Targeted Programme of Highway Improvements in 1996 and as a consequence no bypass of Bath has been forthcoming. This has left the city with a traffic problem that now requires addressing.

3.10 There are particular topographical constraints presented to the east of Bath, namely the Kennet and Avon canal, the River Avon, the Great Western Railway Mainline and the proximity of the A4 Batheaston Bypass to the railway line. The significant environmental assets which exist within the Avon Valley combine with these topographical constraints to present challenges when considering the development of an appropriate solution to remove or reduce traffic from the Cleveland Bridge and the A4/A36 route through Bath.

3.11 This is reinforced in the Environmental Assets Report which indicates that Bath is a complex mix of archaeological and cultural heritage designations, sensitive landscapes and unique natural assets such as the hot springs. Any major infrastructure solution to the north-south traffic issue needs to be sympathetic to the landscape and the built environment and to be able to accommodate long term travel demand needs. However these impacts must also be weighed against the considerable environmental benefits to the historic built environment of Bath that a link road could achieve.

Consultation with Stakeholders

3.12 The stakeholder workshops, undertaken in November 2002, included a group drawn from representatives of Bath. Detailed commentary can be found within the Problems and Issues Report[3] but the most significant concerns raised by this group related to the impact of traffic and transport on the city. Pragmatic solutions were advanced by this group including an A36/A46 link road, ideas to finance it through tolls on traffic, impact of HGVs and their restriction to motorways and night time deliveries as well as the use of public transport. Park and Ride was identified as a major opportunity to encourage the use of buses and restrict car use within the town centre. More integrated transport systems in particular between buses, trains, walking and cycling with improved through ticketing opportunities were also advanced. A strategy that had considerable support was to ban through HGV movements and cars from the centre of Bath.

3.13 Comments received via the web site were also interesting. Although the submissions made by the general public cannot always be considered to be representative of the overall view of the populous, out of 23 comments received from residents of Bath, 11 were in favour of an A36/A46 link road and only two against. A further six were in favour of rail upgrades and mass transit opportunities within the city and a further three regarding perceptions of the adverse impacts of heavy goods vehicles on the City.

Traffic Situation

3.14 Two-way traffic flows on the A36 Cleveland Bridge are currently of the order of 18,500 vehicles over the 12 hour period of which some 1,200 are heavy goods vehicles. The A4 London Road carries higher flows of the order of 20,600 over a 12 hour period. The flow levels are relatively consistent throughout the day, dropping off dramatically overnight as would be expected.

3.15 Table 4.3 of the Problems and Issues Report provides a summary of the frequencies of specific trip lengths on key links within the study area network. It is reproduced here for convenience.

[3] Bristol/Bath to South Coast Study - "Problems and Issues Report", WSP, 2004

Table 3.1 – Summary of Trip Lengths on Key Links

LIGHT VEHICLES	Number of trips within distance range						Proportion of trips within distance range					
	0-10 km	10-25 km	25-50 km	50-100 km	>100 km	TOTAL	0-10 km	10-25 km	25-50 km	50-100 km	>100 km	TOTAL
A350 Melksham	1,308	6,792	4,428	2,376	216	15,120	9%	45%	29%	16%	1%	100%
A36 Cleveland Bridge	7,140	4,080	3,420	2,268	852	17,760	40%	23%	19%	13%	5%	100%
A36 Limpley Stoke	3,300	9,540	2,280	1,692	984	17,796	19%	54%	13%	10%	6%	100%
A36 Near Warminster	2,136	1,608	3,516	4,236	1,440	12,936	17%	12%	27%	33%	11%	100%
A350 / C13 combined	0	192	3,864	3,312	660	8,028	0%	2%	48%	41%	8%	100%
A37 South of Yeovil	0	984	3,228	876	1,596	6,684	0%	15%	48%	13%	24%	100%
HEAVY GOODS VEHICLES	**Number of trips within distance range**						**Proportion of trips within distance range**					
	0-10 km	10-25 km	25-50 km	50-100 km	>100 km	TOTAL	0-10 km	10-25 km	25-50 km	50-100 km	>100 km	TOTAL
A350 Melksham	0	199	364	312	36	911	0%	22%	40%	34%	4%	100%
A36 Cleveland Bridge	43	145	276	442	366	1,272	3%	11%	22%	35%	29%	100%
A36 Limpley Stoke	24	156	356	446	360	1,343	2%	12%	27%	33%	27%	100%
A36 Near Warminster	0	48	672	1,968	474	3,162	0%	2%	21%	62%	15%	100%
A350 / C13 combined	0	0	171	262	192	625	0%	0%	27%	42%	31%	100%
A37 South of Yeovil	0	180	366	253	336	1,135	0%	16%	32%	22%	30%	100%

3.16 Of interest to Bath is the A36 Cleveland Bridge crossing of the River Avon. The following can be summarised from this table:-

- For cars and vans, 40% undertake trips which are less than 10km in length, 63% are less than 25km in length and only 18% are in excess of 50km.
- For HGVs on the other hand, only 3% of trips are less than 10km, 14% are less than 25km, while 64% are in excess of 50km and 29% are in excess of 100km, the approximate length of the study area.

3.17 The perception by many stakeholders is that of major volumes of traffic routing between locations south of the A36 Warminster Road via Sydney Gardens, Bathwick Street, Cleveland Bridge and A4 London Road to reconnect to the A46 at London Road roundabout. This movement is generally described as being a “through movement” and the study has spent considerable time examining and quantifying this movement.

3.18 Table 4.4 from the Problems and Issues Report, provides a summary of the existing traffic movements on the Bridge. It is reproduced below as Table 3.2. Vehicle trips have been classified to:-

- those which are undertaken **wholly internal** to the Bath urban area;
- those that start outside of the Bath area but finish their trip **within** it;

- those that start within the Bath wider urban area but finish their trip **outside** of it and,
- those trips which **neither start nor finish** within the Bath wider urban area - classified in this study as *through trips*.

Table 3.2: Cleveland Bridge Traffic, 2002 12 Hour Traffic Flows

	Base 2002			
	AM PEAK		**12 HOUR**	
Two-way volume	**LIGHTS**	**HGV's**	**LIGHTS**	**HGV's**
Internal Bath Trips	414	4	6,309	42
Destination within Bath	537	8	4,566	139
Origin within Bath	453	36	5,151	88
Through traffic	129	39	1,500	935
	1,534	**87**	**17,525**	**1,204**
% two-way volume	**LIGHTS**	**HGV's**	**LIGHTS**	**HGV's**
Internal Bath Trips	27%	4%	36%	3%
Destination within Bath	35%	9%	26%	12%
Origin within Bath	30%	42%	29%	7%
Through traffic	8%	45%	9%	78%
	100%	**100%**	**100%**	**100%**

3.19 The tabulation indicates that in the 12-hour period, of the 17,500 trips undertaken by cars and vans on the bridge, 1,500 (or 9%) are through traffic movements. The opposite is observed for heavy goods vehicles where 78% are through traffic movements, which clearly indicates that this is a significant strategic route for such vehicles.

3.20 The study can conclude therefore that, using the Cleveland Bridge as a barometer of through travel movements in the City of Bath, only a very small proportion are cars and vans, HGV trips represent approximately 7% of total vehicle movements, but of these, 78% are through trips.

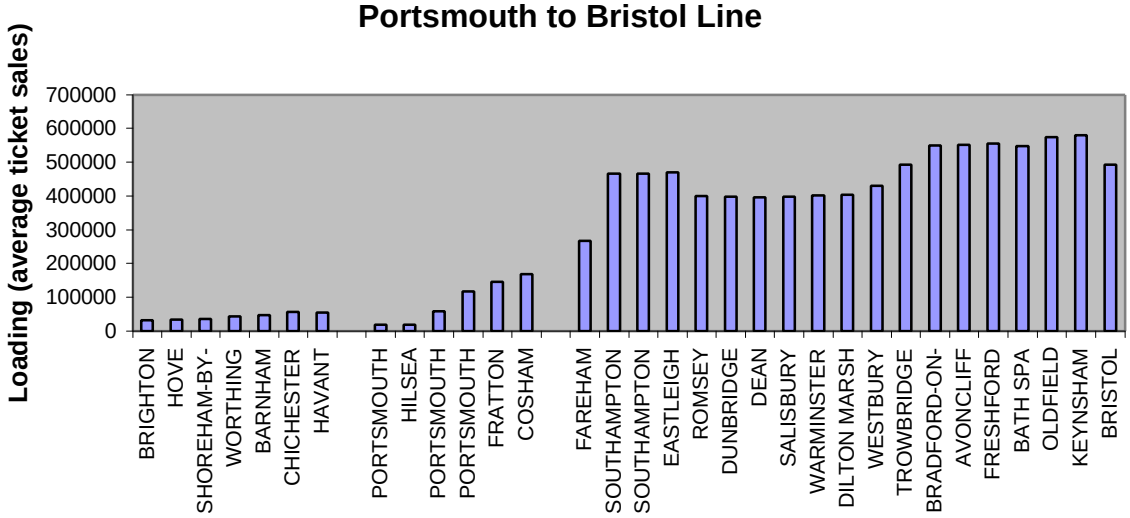
Railway Services

3.21 The majority of the issues relating to the railways require the stringent funding regimes imposed by the Strategic Rail Authority to be relaxed, and for the franchisees to gain sufficient confidence to invest.

3.22 The main rail related issues pertaining to the City of Bath are overcrowding on the section of line between Bristol Temple Meads, Bath Spa and Trowbridge. This is particularly evident in the

morning and evening peak periods but also at weekends. The overcrowding at Bath Spa is particularly acute and Figure 4.4 of the Problems and Issues Report demonstrates how this overcrowding manifests itself against the available seating capacity. Figure 3.1 below details the loadings on the Portsmouth to Bristol railway line and shows the loadings in passengers per annum with particular emphasis on the volume of trips between Bradford on Avon, Bath Spa and Keynsham.

Figure 3.1: "Passenger loadings on station departure" Portsmouth to Bristol Line



Bus Services

3.23 The desirability of Bath as a city for visitors, as well as to live and work, has had significant ramifications on the cost of living. House prices in particular have forced people on lower incomes to live further and further out of the city. In particular the West Wiltshire towns and villages are especially attractive in terms of quality of life, relative affordability and access to these employment centres. This has lead to a dispersed pattern of travel to work between these towns and villages, and Bath and Bristol. As in most of the UK's towns and cities, the most immediate mechanism to cater for this dispersed demand is by concentrating dispersed car trips into a focal point, generally a park and ride site. Bath and North East Somerset Council have introduced park and ride round the city with sites strategically placed:-

- to the north (Lansdown),
- to the west (Newbridge),
- to the south (Oddown), and
- one proposal currently in the planning process at Lambridge to the east.

3.24 These sites are shown on Figure 3.2. The three existing sites operate between Monday and Saturday. An additional fourth site operates on Saturdays from the University of Bath and caters for the influx of shoppers and tourists. Services between Bath and these sites are operated by First Group in partnership with the Council.

4 ENVIRONMENTAL ASSETS

4.1 The City of Bath has a rich diversity of environmental and archaeological assets and cultural heritage. The historic assets include buried archaeological remains, listed buildings in both the road and rail corridors and underground vaults and cellars. The city was placed on the UNESCO list of World Heritage Sites in December 1987. The designation boundary for this World Heritage Site includes most of the defined urban area of Bath including Bathampton, Batheaston, Twerton, Oddown and Coombe Down. The remainder to the east of Bath, as far as and including the A363 at Bathford, is designated as greenbelt. As part of the UNESCO designation, Bath and North East Somerset Council are required to produce a World Heritage Site management plan which will aim to serve and protect the World Heritage Site whilst at the same time improve accessibility to it as an educational resource.

4.2 Examining the A36/A4/A46 road corridor, it is lined with over 1500 listed buildings. Many of these were built during the Georgian expansion of the city and represent buildings of exceptional or particular cultural heritage importance. The A36/A4/A46 route is adjacent to residential and other sensitive receptors of noise and air quality. Indeed, there are specific air quality concerns which relate to the high concentrations of NO_2 on the A4 London Road and the discolouration of the "Bathstone" which is an Oolitic limestone, used in the construction of many of the listed buildings within this corridor.

4.3 Anecdotal evidence from stakeholders indicates that previous intrusive groundworks have impacted upon the hot springs ground water regime across the city. Additionally, residents perceive that heavy goods vehicles are damaging the cultural heritage through noise, vibration, and air pollution. Clearly the degree to which this is factual will have to be assessed as part of further work on the environmental impact of the recommended actions from this study.

4.4 Listed buildings also exist alongside the rail corridor. The survival of so many structural features from the Great Western Railway has combined to make it the most complete railway of its date in the world. Most of the railway structures between the Box Tunnel, Bath's Sydney Gardens, Bath Spa station and Twerton Tunnel are listed.

4.5 Examining landscape, the River Avon Valley to the east of Bath is designated part of the Cotswold Area of Outstanding Natural Beauty as is the whole of Batheaston, Upper Swainswick, Monkton Combe, South Stoke and Lansdown. Ancient woodlands are also dotted throughout the Avon Valley and can be found adjacent to the A36 at Dry Arch and Hangrove Woods and to either side of the A363. The area is recognised as being one rich in cultural heritage, landscape and

biodiversity. Details of the designations can be found in the study's Environmental Assets and Constraints Report.

5 TRANSPORT OPTIONS FOR BATH

Introduction

5.1 The study requires the development of an integrated transportation strategy to address through traffic in Bath, specifically on the A36/A4/A46 corridor. Previous reports have demonstrated that, in common with most urban areas, the majority of traffic on routes in and around Bath is fairly local in terms of trip lengths undertaken. These statistics will have a bearing on the strategic and local response of traffic to new measures.

5.2 During the appraisal of options mention is made of the Bath "urban area" and the extent of this area is shown in Figure 5.1. It covers areas as far south as Coombe Down, Oddown, Twerton, Weston, Lower Swainswick and Bathampton. Other measures which have been used to assess the options include:

- The impact of the particular option on traffic volumes on key road links within Bath.
- The impact of the option on vehicle kilometres, an aggregate measure of vehicle volumes and the distance they travel,
- The impact of the option on volumes and proportions of through traffic on the A36 Cleveland Bridge.

Park and Ride

5.3 There are currently four park and ride sites in Bath. Of these, the University campus is dedicated to Saturday operations only. The three Monday – Saturday park and ride sites may also be supplemented by a fourth Monday to Friday site at Lambridge, located to the east of the city. The existing sites that operate on a Monday to Saturday have a car parking capacity equivalent to 1,939 spaces. There is an opportunity to extend all three existing Monday to Saturday sites, and, with the addition of the Lambridge site, the quantity of spaces available to the commuter could rise to 4,400.

5.4 Presently, the three existing sites are used on average at 76% of their capacity which is near to practical capacity. With the additional spaces available by the extensions, an additional potential 3,000 spaces could become available to the commuter, tourist and shopper. Given that some of these spaces will be used more than once then the analysis has indicated that over 4,000 additional vehicles could be removed from city centre roads and car parks over a typical 12-hour day.

5.5 A potential alternative Park and Ride site to that at Lambridge was also identified about 1km to the east adjacent to the A4 at Bathampton Meadows. The site is currently the subject of a planning application by Bath Rugby Club for training ground facilities, to replace their existing site which needs to relocate to accommodate the new Lambridge park and ride facility. It is unlikely that both Lambridge and Bathampton Meadows would be constructed but the advantage of this more easterly site is that it could accommodate over 1,800 cars as opposed to the 800 spaces predicted for Lambridge. Both sites were examined in the Option Development and Appraisal Report. If the Meadows site is not a practical option, then further consideration of a greater capacity at the proposed site at Lambridge may be required. However, any expansion of the Lambridge Park and Ride site is likely to involve a second level, which would almost certainly have environmental / heritage impacts. These would need further quantification, which would probably result in the need to look at alternative location(s).

Congestion Charging

5.6 Within the timescale of the Study's longer term horizon, congestion charging is likely to become an acceptable traffic management measure appropriate to reducing congestion in the UK's towns and cities. To date, the only scheme that has been successfully implemented on an area-wide basis is in London. The concept has been mooted for many other towns and cities with proposals at various stages of preparation in Bristol, Edinburgh and Leicester.

5.7 Figure 5.2 shows a possible congestion zone for Bath, which has been tested using the traffic model. The cordon allows traffic from the A36 Warminster Road to continue to route across the Cleveland Bridge and the A4 London Road. To have defined the cordon further east would have caused traffic to re-route to alternative corridors, most notably the A363 through Bradford on Avon, and this was felt to be inappropriate. The alternative would be to construct a new river crossing, and given the proximity of the A363, it was felt that this new crossing would almost certainly represent the A36/A4/A46 link road.

5.8 A £5 charge was assumed to be an appropriate deterrent for traffic wishing to enter the city centre.

HGV Ban

5.9 An HGV ban on Cleveland Bridge was also assessed. The A36/A4 route is clearly an important route for HGV especially those undertaking A36/A4/A46 through movements. The ban would cause some, or all of these vehicles to divert to alternative routes - the A34, the A350, the A37 or the A36 Pulteney Road.

A Demand Management Package

5.10 The Demand Management Package comprised the following three management measures:-

- An HGV ban on the A36 Cleveland bridge
- A congestion charge for the city centre.
- An expanded park and ride regime across the city.

5.11 The following statistics are pertinent to the analysis of the demand management package of measures:

- Traffic flows on the A4 London Road and the A36 Cleveland Bridge reduce by between 3,300 and 4,800 vehicles over the 12-hour period. It has no impact on the traffic through Bradford on Avon.
- HGVs are completely removed from A36 Cleveland Bridge and reduced on A4 London Road by 1,100 vehicles over 12 hours.
- The park and ride expansion strategy reduces vehicles travelling into the city centre by 4,000 vehicles over the 12-hour period.
- The congestion charge has dramatic effects on traffic levels inside the cordon which are predicted to reduce by at least 37,000 vehicles over the 12 hour period.
- Further assumptions relating to modal shift, in particular to buses, indicate that this could be reduced yet further such that traffic flows into and out of the cordon would be only 33,800 over the 12 hour period compared to almost 80,000 without the congestion charge.

5.12 However, with the congestion cordon as shown in Figure 5.2, the model demonstrates that traffic is displaced to other even less suitable routes around the periphery of the cordon, especially in the Camden area of the city. These displacement impacts are recognised and a considerable amount of additional work would be required to identify whether or not there is a cordon that would not displace traffic to unsuitable routes. With the current cordon, the benefits enjoyed by traffic reduction in the city centre could be out-weighed by the disbenefits occurring as a result of additional traffic on these alternative routes.

The A36/A46 Link Road Options

5.13 The Strategic Report analyses the A36/A46 link road in significant detail. That analysis indicated that both of the alignments considered between the A36 south of Bathampton over the Avon valley to interconnect with the A4 at Bathampton Meadows had significant impact in terms of reducing traffic on the A36/A4/A46 route through Bath. On the A4 London Road, traffic is reduced by some 6,700 vehicles over the 12 hour period and on the A36 Cleveland Bridge the link road

reduces flows by some 5,600 vehicles over the same period. The changes in flow are detailed in Tables 5.1 to 5.3 below.

5.14 The Strategic Report also analyses the impact of the link road on through traffic using the A36 Cleveland Bridge. Under the do-minimum 2023 scenario, the total quantum of through traffic, (cars, vans and HGVs), was equivalent to some 2,058 vehicles. Under a link road scenario, this reduced to approximately 220 cars, vans and HGVs. Heavy goods through traffic is almost entirely removed from Cleveland Bridge. With the link road, car and van through traffic is reduced from 1,342 in the do-minimum, to a little over 190.

5.15 A link road option was also assessed with the expanded park and ride strategy. This demonstrated that the inclusion of the park and ride sites reduces flows on the London Road and Cleveland Bridge yet further. Traffic flows were reduced by between 6,000 and 7,000 vehicles on London Road, 7,000 on Cleveland Bridge and on Warminster Road, north of the proposed junction with the link road, by between 500 and 2,000 vehicles.

5.16 When the park and ride expansion strategy is added is the link road option, it is observed that there is very little incremental reduction of through traffic flows on the Cleveland Bridge. This is the case for both cars and vans, and for HGVs. It is clear that the link road has the greatest benefit in terms of reducing through traffic movements to the Cleveland Bridge and A4 London Road route.

Demand Management Package and Link Road

5.17 The full DMP was added to the link road. However, little change in traffic flows was observed because most of the benefits have already accrued through the construction of the link road plus the Park and Ride expansion. The analysis indicates that the addition of the DMP has very little incremental impact on reducing traffic on the A4 London Road, A36 Cleveland Bridge or the A36 Warminster Road.

Traffic Flows

5.18 The tabulations below make comparisons of traffic flows on key links in the study area under the different demand management options, the comparison of vehicle kilometres on the A36/A4 route between Dry Arch and the A46 roundabout with the A4 and, the comparison of through traffic flows on A36 Cleveland Bridge.

Table 5.1 – Comparison of Traffic Flows on Key Links in the Study Area Under Bath Management Options

Scheme	Do Minimum + Westbury Bypass	Link Road Option		Demand Management Package	Park & Ride + Link Road		Demand Management Package + Link Road	
Key Link		Link Road Option			Link Road Option		Link Road Option	
		A	B		A	B	A	B
Warminster Road	17,064	16,728	14,995	16,056	16,412	14,838	16,137	14,461
Increase (+) or Reduction (-) in Traffic Flow		-336	-2,069	-1,008	-652	-2,226	-927	-2,603
A36 Cleveland Bridge	22,068	16,421	16,825	18,840	15,060	15,324	15,972	16,500
Increase (+) or Reduction (-) in Traffic Flow		-5,647	-5,243	-3,228	-7,008	-6,744	-6,096	-5,568
London Road	23,580	16,764	17,853	18,864	16,296	17,556	15,924	16,752
Increase (+) or Reduction (-) in Traffic Flow		-6,816	-5,727	-4,716	-7,284	-6,024	-7,656	-6,828
Bradford-On-Avon	13,260	12,015	12,043	13,320	12,384	12,132	11,964	11,736
Increase (+) or Reduction (-) in Traffic Flow		-1,245	-1,217	60	-876	-1,128	-1,296	-1,524

Table 5.2 - Summary of Vehicle-Kilometres –
A36 Dry Arch/A36 Cleveland Bridge/A4 London Road

Refer to Option Appraisal & Development Report for Option Names		*Strategic Corridor Option 3e*		*Bath Option 4*	*Bath Option 5*		*Bath Option 6*	
Scheme	**Do Minimum**	**Link Road Option**		**Demand Management Package**	**Park & Ride + Link Road**		**Demand Management Package + Link Road**	
Key Link		**Link Road Option**			**Link Road Option**		**Link Road Option**	
		A	**B**		**A**	**B**	**A**	**B**
A36 Warminster Rd *(percent reduction)*	17.00	15.74 *(7.4%)*	13.88 *(18.3%)*	15.54 *(8.6%)*	15.36 *(9.6%)*	13.63 *(19.8%)*	15.04 *(11.5%)*	13.23 *(22.2%)*
A36 Cleveland Bridge *(percent reduction)*	5.31	3.91 *(26.3%)*	3.98 *(25.1%)*	4.46 *(15.9%)*	3.66 *(31.1%)*	3.68 *(30.75)*	3.74 *(29.5%)*	3.85 *(27.4%)*
A4 London Road *(percent reduction)*	14.88	10.93 *(26.5%)*	11.58 *(22.2%)*	11.66 *(21.6%)*	10.67 *(28.3%)*	11.38 *(23.6%)*	9.72 *(34.7%)*	10.29 *(30.8%)*
TOTAL *(percent reduction)*	37.19	30.58 *(17.8%)*	29.43 *(20.9%)*	31.67 *(14.9%)*	29.69 *(20.2%)*	28.68 *(22.9%)*	28.51 *(23.4%)*	27.38 *(26.4%)*

Table 5.3 - Summary of Through Traffic Flows on A36 Cleveland Bridge

Refer to Option Appraisal & Development Report for Option Names		*Strategic Corridor Option 3e*		*Bath Option 4*	*Bath Option 5*		*Bath Option 6*	
Scheme	**Do Minimum**	**Link Road Option**		**Demand Management Package**	**Park & Ride + Link Road**		**Demand Management Package + Link Road** *Bath*	
		Link Road Option						
		A	**B**		**A**	**B**	**A**	**B**
Cars & Van	1,342	190	192	681	194	193	93	105
(% of Total)	*6%*	*1%*	*1%*	*4%*	*1%*	*1%*	*1%*	*1%*
HGV's	716	24	36	0	24	36	0	0
(% of Total)	*68%*	*11%*	*14%*	*0.0%*	*12%*	*15%*	*0.0%*	*0.0%*
Total Through Traffic	2,058	214	228	681	218	229	93	105

Environmental Costs and Benefits

5.19 There are three main areas for environmental consideration under the options appraised. These are the benefits and disbenefits of the Demand Management Package (DMP) of measures the environmental impacts which could be expected as result of the Bathampton Meadows Park

and Ride site, and the benefits that could be expected from the A36/A46 Link Road. The following is a summary of the environmental impacts of these measures:-

Demand Management Package

- The DMP, which includes the congestion charge will have beneficial effects in the city centre as a consequence of traffic reduction arising from the congestion charge, with noise and air quality benefits and reduced vibration impacts. Benefits will also arise on the A4 London Road which is a designated air quality management area.
- The impact on the wider urban area, beyond Bath City Centre and the congestion cordon will be adverse. Some routes will experience an increase in flow as traffic seeks to route around the charging zone. For example, the model shows that the Camden area is predicted to experience a large increase in traffic as vehicles travelling from the west on the A4 to the south (the A36) drive around the congestion charge cordon. This may result in the need to designate an AQMA in this vicinity.
- The effect of traffic displacement is expected to be widespread and in places would need to be offset by appropriate traffic management regimes. It is possible that another cordon for the congestion charge will be able to address these impacts, but displacement management measures will be needed in almost all scenarios.
- The reduction of traffic arising from the DMP will bring improvements to the townscape, and the historic heritage resources in the city centre. The dramatic reduction in HGV numbers on Bathwick Street and Cleveland Bridge will create actual and perceived benefits in terms of noise and vibration.

Park and Ride at Bathampton Meadow

- The AST indicates that a large adverse impact on the landscape can be expected. At this location, the site would be very visually prominent and would require extensive mitigation measures that are likely to affect the character of the local area. Mitigation measures could include side screening and grass roofing. The latter measure, due to it's setting in the greenbelt, would be construed as a building and would contravene green belt policy.
- The AST for Bathampton Meadows also indicates adverse impacts on historic resources and on the water environment, particularly the River Avon that would have to accommodate the dust and runoff from the large hard standing area. Careful management would be required to overcome such impacts, but the results for the traffic reductions indicate that this Park and Ride site can be rejected on grounds of impact on the local environment and only marginal incremental benefits for traffic reduction.

Link Road

- The proposed link road would bring significant benefits to a number of properties on the A36/A46 route. These have been conservatively estimated to be equivalent to be 1500 residences on the A36 Warminster Road, A36 Bathwick Street and the A4 London Road.
- Similar benefits are expected from air quality. The London Road is a designated AQMA for NO_2 and PM_{10}, and the reductions in traffic described above can be expected to bring reductions in key pollutants. The traffic reduction can also be expected to bring about some improvements to the townscape and will have benefits to historic heritage resources on the London Road and Bathwick Street.
- The link road proposals will have very large adverse impacts on landscape, along with potentially significant adverse impacts on biodiversity and the water environment. The route would have major intrusive effects on the valley, and would be very intrusive as it crosses the valley bottom, rising to clear the railway and A4 Batheaston Bypass. It is estimated that some 200 properties would be directly affected through disruption to their views, direct impact on properties, or land value.
- Where the route crosses the canal, it can be expected to be disruptive to the many leisure users of the canal and towpath, with consequential losses in the NATA/GOMMMS sub-objectives of physical fitness.
- The longer of the two link roads is designed to follow the valley side slopes and results in a shallower gradient with lower landscape impact. However, the intrusion of this route at its southern end into the pasture and arable lands, and on the Hangrove Ancient Woodlands, potentially combines to have a greater impact on biodiversity than the Dry Arch option.

Public Transport Improvements

5.20 Fundamental to an integrated transportation strategy for Bath is to increase the availability, quality and accessibility of public transport services - essential if the demand management measures are to progress. The assessment of the rail network has demonstrated limited opportunities to play a major role in accommodating the demand for travel by car. There are opportunities to improve travel conditions for existing users and to attract more passengers by some low cost improvements.

5.21 The Problems and Issues Report, and the Option Appraisal Report discuss the potential transfer from car to rail for the whole of the study area arising from service improvements on the Weymouth and South Coast to Bristol and South Wales lines. These improvements relate to train

lengthening in the first instance. This measure will reduce the daily overcrowding that is endured on this line. Because of limited platform length at several stations on the route, these longer trains will have to operate to a selective number of stations as opposed to all. Subsequently it is proposed to run a 2 train per hour "clockface" timetable. This measure is assumed to attract additional passengers. The franchisee also considers that there is a market for a premium fare paying service on the route – a guarantee of a level of comfort.

5.22 Based on these measures, an assessment of the likely additional patronage to the train services has been undertaken, and the analysis shows that rail trips into and out of Bath will be a large proportion of these. Of a total potential car-to-rail catchment of 85,896 car trips, some 46,000 or 54% of trips are to or from the urban area of Bath. The analysis has predicted that over a 12-hour period there will be some 3,684 trips anticipated to transfer from car to rail due to the service improvements.

5.23 The bus services have a more important role as a consequence of the evident local demand for travel around the city, and the commuter movements from the dispersed patterns of settlement, not served by rail, in West Wiltshire and communities to the south of Bath.

5.24 The following benefits arising to public transport from a congestion charge scheme have been determined for London. Whilst the capital and Bath are clearly very different, the statistics indicate the potential for benefits:

- road traffic entering the London congestion zone has fallen by about 20% and traffic within the zone has fallen by 16%
- bus delays inside the zone arising from traffic congestion fell by 50%
- bus speeds within the charging zone have risen
- commuter journey times by car have fallen
- bus patronage in the morning peak hour has increased by some 6,000 passengers

Bath Spa Railway Station

5.25 The Problems and Issues Report indicates that Bath Spa Station accounted for some 500,000 rail passenger movements out of a total of almost 3 million on the South Coast to Bristol and South Wales line. This was in the 2002/3 financial year for routes operated by Wessex Trains. The station is clearly an important hub for rail passengers. The Rail Report identifies a number of improvements and timetabling alterations, which could make the rail service more attractive to current car drivers who live in the study area corridor.

5.26 Of the 3,634 trips predicted to transfer to rail as a consequence of the rail improvements, (see paragraph 5.22 above), some 2,652 (72%) of the trips will have either an origin or destination

within Bath. The transfer of trips from car to rail, where the start or finish of the trip is in Bath, is therefore estimated to be 2,652 of 46,068 trips (5.8%) over a 12-hour period. When annualised, assuming a 300 day annualisation factor (allowing for weekends) then this is equivalent to an additional rail patronage of 800,000, and increase of 15% on existing station usage. Such an increase will provide an added impetus to improving the station for the benefit of rail passengers. Because of the proximity to the Bath bus station, there might be an opportunity for partnership with a transport provider to re-develop the site so as to provide a truly integrated interchange.

Travel Change Initiatives

5.27 A "Hearts and Minds" campaign can go some way toward alleviating many of the pressures endured within urban areas. A variety of mechanisms are available to the local authorities to persuade car drivers to re-time their journeys, make the trips by other more sustainable modes or to even consider whether the journey is necessary. Travel change initiatives are also relevant for employers. Travel Plans are a useful mechanism for encouraging employees to use alternative modes for work and the employer has a great role to play in this regard through the provision of secure facilities for cyclists, the provision of passes for use on Park and Ride, their own mini buses and a range of other incentives and initiatives to encourage walking and cycling.

Passenger Transport Co-ordination

5.28 As part of developing transport strategies that are both integrated and cross boundary it is considered appropriate to consider the establishment of a public passenger transport body similar to the Passenger Transport Executives, (PTE's), in the former Metropolitan areas. The PTEs are a statutory entity and it is not suggested that the legislation apply to this suggestion. However the PTEs are able to take an holistic view on passenger transport planning and operations and can, through agreed formula for revenue reimbursement, enable through ticketing and concessionary fares to be standardised, PTE`s can also operate across boundaries and through economies of scale enable a lower cost base ultimately benefiting the passenger.

5.29 For this study it is more the philosophy of what a PTE can achieve that is worth considering. The interaction between the conurbations of Bristol and Bath and the strong movement between Bath and the West Wiltshire towns indicates that it might be more appropriate for a more holistic view of passenger transport movements to be undertaken by a combined entity.

5.30 The following public transport proposals, appropriate to addressing the north-south A36/A46 traffic movement, are recommended:

- Progress the expansion of the three Monday to Saturday park and ride sites at Odd Down, Lansdown and Newbridge. The latter will be required as part of a planning consent for the Western Riverside development
- Progress the Lambridge Park and Ride Site
- Review requirements for increased public transport services in the city appropriate to meeting displaced demand arising from any introduction of a congestion charge. This could be achieved through the council hypothecating the revenue from the congestion charge and "ring-fencing" it for passenger transport improvements, for traffic management on key radial routes and to manage the displaced demand from the congestion charge
- Establish a public transport partnership/co-ordination body. It will have a remit that extends to rail, bus, demand responsive services, quality improvements to infrastructure, and ticketing. It would comprise all the relevant local authorities in the study area, operators, large employers and the Government Office
- Ensure that major developments are encouraged to instigate travel plan policies
- Consider improvements to Bath Spa Railway station to accommodate increased daily patronage on the South Coast to Bristol and South Wales line, where possible in partnership with a developer and the bus company. This would achieve an objective in the Council's Local Transport Plan for a new interchange at this location.

6 SUMMARY

6.1 The management options for Bath have been developed from the initial premise that any major infrastructure may be avoidable. The measures considered have ranged from a city centre congestion charge for Bath, an expanded park and ride regime, an HGV ban on the A36 Cleveland Bridge, improved bus and train services and some of these measures in association with an A36/A46 link road.

6.2 The assessment of the railway network has demonstrated important but only limited opportunities to play a role in accommodating the demand for travel by car. The main rail based opportunities relate more to the improvements of travel conditions for existing users and to attracting more passengers by low cost improvements, such as train lengthening. A key area to focus investment, in order to retain and encourage further rail patronage, would be to invest in station improvements to Bath Spa interchange, and to run a 2 train per hour regular, or clockface, timetable.

6.3 The bus based park and ride strategy will clearly have benefits in terms of reducing flows into the city centre, while continuing to meet the high demand for travel into Bath. It is recommended that the park and ride expansion strategy progresses as soon as possible and that the Lambridge application, subject to the planning process, proceeds to construction with provision for potential for expansion

6.4 While the Bathampton Meadows P&R site would achieve a significant reduction in traffic on London Road, it will be very environmentally damaging to the green belt and likely to impact on biodiversity and natural water resources through surface run off. By the very nature of the size of such a site, its visual intrusiveness into the natural valley landscape is unlikely to be accepted by the local community. It is therefore recommended that it should not be progressed. In view of this, additional capacity may be required at Lambridge or an alternative site found.

6.5 Buses have a key role to play in the delivery of the park and ride strategy. However, they have a much wider role and the emphasis will be more on improving the quality of services and infrastructure, as opposed to widening service availability. Many of the facets that the operators wish to pursue relate to quality contracts and quality partnerships. Public transport will also have a key role to play under any congestion charging scenario. The nominal charge assumed within the technical work undertaken in this study would be sufficient to encourage up to 20% of car drivers travelling to the city to transfer to buses, or park and ride, in order to complete their journey. This has certainly been observed in London, where bus services are regulated.

6.6 Alternative measures have also been examined in an attempt to suppress the demand for car-based travel into the city centre. A congestion charge zone close in around the city centre area, but excluding the Cleveland Bridge, is shown to have the effect of reducing city centre traffic dramatically but does little to address the issue of reducing the impact of north-south traffic using the A36 and A46. Furthermore, its causes traffic to displace to unsuitable residential roads which will offset the benefits that such a scheme could provide for the city centre. If congestion charging is to be pursued, further extensive work to gauge whether an alternative cordon could redress these negative impacts will be required.

6.7 The HGV ban to the A36 Cleveland Bridge is highly effective at removing lorries from the sensitive approach roads of Bathwick Street and London Road, but again, the choice of routes adopted by the HGVs, will require agreement from adjoining local authorities and possibly measures to manage the impacts on these routes.

6.8 There is no doubt that the construction of the link road would address the study's objective of removing north-south through traffic on the A36/A46 corridor through the east of Bath. It represents the only measure tested that takes through traffic out of Bath, without causing the displaced traffic to use inappropriate routes through the city. Not surprisingly, a link road is forecast to result in additional traffic on the relatively lightly trafficked A36 at Claverton and the A46 Swainswick Bypass by about 3,600 and 2000 vehicles respectively per 12hr day in 2023. However, the link road option must only be considered in parallel with complementary traffic management measures that reallocate the released highway capacity to alternative travel modes, in particular bus services, and / or civic space to enhance the World Heritage Site setting.

6.9 The major issue facing the link road is its impact on the nationally sensitive landscape. This has been raised on more than one occasion and was the principal rationale for the Inspector at the Batheaston inquiry to reject the link road in favour of the much longer East of Bath to Beckington Scheme. The latter proposal was removed from the programme in the 1996 Trunk Roads Review. Since the preceding analysis largely supports the decision to detrunk the road, and highlights the relatively local intra-regional nature of trips using the A36/A46, a local link road rather than a major national scheme is a more appropriate solution to deal with through traffic.

6.10 Balanced against the significant adverse environmental impacts of the link road are the benefits to the World Heritage City of Bath. It is estimated conservatively that some 1,500 properties lie or adjacent to the A36/A4 corridor and will benefit from the link road's construction through reductions in noise, vibration, severance, improved air quality and the reduction in traffic flow and improved environment for pedestrians and cyclists. The route will also be safer, benefiting not just workers and residents but tourists as well. Further analysis will show that additional properties adjacent to and off the direct route will also benefit from these reductions in traffic flow.

With the exception of visual intrusion in particular from Batheaston, very few properties will be adversely affected directly by the link road's construction.

6.11 The link road, when assessed in isolation from the other measures is found to reduce traffic on the A36 Cleveland Bridge and A4 London Road by between 5,600 and 6,800 vehicles over the 12-hour period in the year 2023. It also reduces through traffic on a key route through Bath significantly with almost all HGV through-traffic being re-routed onto the link road and through cars and vans being reduced to a little over 10% of their predicted 2023 do-minimum flow. It is assumed that the benefits accruing from the reduction in traffic attributable to the link road will be captured by traffic management measures designed to discourage induced traffic and enables the benefits accruing within the core of the World Heritage City to be enhanced.

6.12 When assessed in conjunction with demand management measures for Bath, in particular park and ride expansion, traffic flows are reduced yet further on these key links. However, adding the full demand management package of measures, which includes congestion charging, did not reduce flows on these links by a significant incremental volume.

6.13 The timing of measures is critical. London Road is currently designated as an Air Quality Management Area (AQMA) and Bath and North East Somerset Council have to put in place a strategy to reduce pollution levels to below the national recommended maxima. It has been shown that the Link Road results in significant reductions in traffic on London Road, almost certainly sufficient to comply with the air quality requirements, although Bath and North East Somerset Council would have to confirm this. Consequently, if the link road is not to be progressed, Bath and North East Somerset Council will have to consider developing an alternative air quality strategy, although it difficult to see what other measures would be able to reduce traffic to this degree.

6.14 Bearing in mind the need to develop a transport strategy which reduces traffic levels in the city to levels commensurate with its designation as a World Heritage Site, it is imperative that Bath and North East Somerset Council discuss and agree the necessary measures with the relevant Statutory Environmental bodies.

7 RECOMMENDATIONS

7.1 The Study therefore recommends the following measures to address the transport problems in the A36/A46 corridor local to Bath. As with all studies of this relatively strategic nature, it will be for the appropriate Transport Authority, in this case Bath and North East Somerset Council, to develop those schemes / strategies it chooses to the level required for inclusion in their next Local Transport Plan in July 2005.:-

- That Bath and North East Somerset Council should progress a full appraisal, including environmental assessment, of the A36/A46 Link Road, which, of the options tested, has been shown to be the only one capable of satisfactorily removing the majority of north-south through traffic from Bath;
- That Bath and North East Somerset Council should, subject to satisfactory environmental assessments, expand the existing Park & Ride provision at Newbridge, Oddown and Lansdown. The proposed P&R site at Lambridge should, subject to obtaining the necessary planning permission, be built at the earliest opportunity and the potential to expand it be examined to accommodate the additional demand that will arise were the Link Road to be built;
- That Bath and North East Somerset Council should continue to investigate demand management measures, including a possible alternative road user charging cordon. These options should be tested in their own right as well as part of a package of measures to prevent induced traffic taking the place of that removed by the link road.
- That Bath and North East Somerset Council , in conjunction with local bus operators, improve local commuter services through Quality Partnerships, and if need be Quality Contracts;
- That Bath and North East Somerset Council seek a partner to work with to address the need to improve public transport facilities and provide better integration between the bus and rail stations. It may be that the major bus and or train operator would be prepared to work with the Council to produce a Major Scheme for the next LTP. Particular opportunities are presented with the additional demand that could arise through Bath Spa Station as a consequence of the rail capacity improvements highlighted;
- The SRA be requested to increase the frequency of train services on the Bristol-Bath-Salisbury-Southampton line to 2 trains per hour, and lengthen trains to provide further capacity and opportunities for 'quiet' carriages and reduced crowding.

7.2 It will be for Bath and North East Somerset Council to determine the detail of phasing, bearing in mind that the Link Road will have a long lead-in time. However, there will be advantages

in promoting relatively “quick wins” such as Park & Ride, the necessary orders to capture the benefits of traffic reductions, and developing a partnering arrangement for implementation of public transport infrastructure improvements, while progressing the case for the link road.

WSP Group