

South Bristol Link
Major Scheme Business Case

6

The Financial Case

Scheme cost, financial risk and funding sources



6 The Financial Case

6.1 INTRODUCTION

This Chapter sets out how the West of England Authorities (“the Authorities”) propose to finance the South Bristol Link (SBL) Scheme. It includes:

- **Capital Cost Estimate:** – estimation of the capital cost of the Scheme.
- **Treatment of Risk and Inflation:** – treatment of inflation and risk in the calculation of the outturn scheme cost estimate.
- **Preparatory Costs Estimate:** – development costs for the Scheme between Programme Entry and Full Approval stages.
- **Ongoing Financial Sustainability, Maintenance and Operating Costs:** – ongoing cost and revenue implications of the Scheme.
- **Sources of Funding:** – associated payment profile and associated funding requirement for the Scheme.

6.2 CAPITAL COSTS

6.2.1 Capital Cost Estimates

Estimates of works costs have been prepared for the Preferred Scheme and Lower Cost Option based on widespread experience of similar works, using item rates and preliminary estimates of quantities. The capital cost estimate has been calculated using Q3 2009 prices. It is assumed that procurement of the infrastructure works will be by means of a design and build contract and therefore an allowance has been made for the cost of the contractor’s design costs, supervision costs and profit.

A Quantified Risk Assessment (QRA) has been undertaken which has produced an allowance for the risks associated with the Scheme. This is explained in more detail in Section 6.3.

The total capital cost estimate for the Preferred Scheme including risk is £41.156 million at current prices (2009). The detailed breakdown of the capital cost estimate is provided in Appendix 6.1. A summary is provided below in Table 6.1

The capital cost estimate has been independently reviewed. The report from our advisors is provided at Appendix 6.2. A response to this review is included in Appendix 6.3.

The costs of land acquisition have been estimated by North Somerset Council’s Land valuation officers based on their experience in this field. A further allowance has been made for potential compensation costs arising from the project severing agricultural land from the associated farm buildings. Allowance has also been made for environmental enhancements associated with the project.

Almost all the land affected by the scheme within Bristol's boundary is in council ownership. The only exception is the area of land that will be needed to replace land occupied by the Link on Highridge Common. The cost of this is included in the overall assessment of land costs.

Table 6.1 Total Scheme Costs – South Bristol Link: Preferred Scheme

Works Cost: Preferred Scheme Estimate Base: Q3 2009	£ millions
Series 100: Traffic Management (Preliminaries)	5.730
Series 200: Site Clearance	0.043
Series 300: Fencing	0.130
Series 400: Road Restraint Systems	0.011
Series 500: Drainage	0.595
Series 600: Earthworks	3.268
Series 700: Pavements	4.788
Series 1100: Kerbing and Footways	2.461
Series 1200: Traffic Signs and Road Markings	0.927
Series 1300: Street Lighting and Electrical Works	0.561
Series 1700: Structures	5.738
Series 2400: Brickwork, Blockwork and Stone Work	0
Series 2500: Special Structures	0.533
Series 2700: Statutory Undertakers	1.062
Series 3000: Landscape and Ecology	0.004
Rapid Transit Stops	0.480
SUB-TOTAL ENGINEERING WORKS	26.331
Land & Environment	1.600
Design and Build Costs including Profit & Client Supervision	7.932
TOTAL SCHEME WORKS COSTS EXCLUDING RISK and INFLATION	35.863

Table 6.2: Current Prices: Preferred Scheme

Quantified Risk Assessment (Section 6.3)	50% confidence level	5.293
	80% confidence level	6.779
TOTAL SCHEME COSTS (50% RISK EXPOSURE)		41.156
TOTAL SCHEME COSTS (80% RISK EXPOSURE)		42.642

The total capital cost estimate for the Lower Cost Option is £37.602 million at current prices. The detailed breakdown of the capital cost estimate is provided in Appendix 6.1. A summary is provided below in Table 6.3

Table 6.3 Total Scheme Costs – South Bristol Link: Lower Cost Option

Works Cost: Lower Cost Option Estimate Base: Q3 2009	£ millions
Series 100: Traffic Management (Preliminaries)	5.116
Series 200: Site Clearance	0.042
Series 300: Fencing	0.131
Series 400: Road Restraint Systems	0.009
Series 500: Drainage	0.553
Series 600: Earthworks	3.233
Series 700: Pavements	4.522
Series 1100: Kerbing and Footways	1.633
Series 1200: Traffic Signs and Road Markings	0.708
Series 1300: Street Lighting and Electrical Works	0.561
Series 1700: Structures	5.164
Series 2400: Brickwork, Blockwork and Stone Work	0.000
Series 2500: Special Structures	0.472
Series 2700: Statutory Undertakers	1.062
Series 3000: Landscape and Ecology	0.005
Rapid Transit Stops	0.030
SUB-TOTAL ENGINEERING WORKS	23.241

Works Cost: Lower Cost Option Estimate Base: Q3 2009	£ millions
Land & Environment	1.600
Design and Build Costs including Client Supervision	7.088
TOTAL SCHEME WORKS COSTS EXCLUDING RISK	31.929

Table 6.4 Current Prices: Lower Cost Option

Quantified Risk Assessment (Section 6.3)	50% confidence level	5.673
	80% confidence level	7.152
TOTAL SCHEME COSTS (50% RISK EXPOSURE)		37.602
TOTAL SCHEME COSTS (80% RISK EXPOSURE)		39.081

6.3 TREATMENT OF RISK AND INFLATION

6.3.1 Quantified Risk Assessment

A Quantified Risk Assessment (QRA) has been undertaken to support this Programme Entry submission. This assessment has predicted the likely level of confidence that funding will be sufficient to cover the construction of the Scheme with due allowance made for risks. The QRA is confined to the capital cost elements of the scheme and the construction programme from the present day to the Scheme opening. Risks to operational revenues, costs or performance have not been quantified at this stage. The QRA report is provided in Appendix 4.2.

The risk model uses @Risk for probabilistic modelling. Both cost and time risks have been integrated to produce predictions of outturn cost. The model carries out a Monte Carlo analysis over several thousand iterations, potentially with a different result on each occasion. The distribution of these results is then plotted against the frequency of their occurrence. The principal inputs to the risk analysis are estimates of capital cost and the project programme for the works, the tolerance attached to elements within the estimates and discrete risks where appropriate.

Risk modelling has been carried out for both the Preferred Scheme and the Lower Cost Option. The iterative results from the risk model for the capital cost are represented as a curve indicating the possible range of outcomes against confidence levels.

For the Preferred Scheme, the analysis predicts that at confidence levels of 50%, Scheme costs would be £ 41.156million or below and at 80%, Scheme costs would be £42.642million or below (2009 prices).

For the Lower Cost Option, it predicts that at confidence levels of 50%, Scheme costs would be £37.6million or below and at 80%, Scheme costs would be £39.1 million or below (2009 prices).

As set out in Section 4.5 the QRA identified the key risk areas in achieving the project baseline programme. The QRA report (Appendix 4.2) indicates that for the Preferred Scheme, Risk SBL041 (Network Rail Costs) is the key determinant of programme risk. At this stage in Scheme development, negotiations with Network Rail are at an early stage and the detail of the crossing has not been sufficiently developed to determine the implications to the operation of the railway.

The second key risk is securing sufficient funding to progress the scheme to construction, Risk SBL002. This issue will require forward planning and close liaison with Planning Departments and council members.

The third highest risk, Risk SBL063 is encountering greater than anticipated quantities of tip material. The route passes through and close to old waste tips. Previous works in the area have encountered asbestos waste and it is possible appropriate measures will be required to protect the environment and the public during construction. It is planned to carry out site investigations to reduce the uncertainty around this risk prior to works starting.

With identified mitigation measures in place the Authorities believe that the risk to the programme of the works can be significantly reduced. At this stage, the cost risk is included in the P50 estimate to reflect the current level of detail design but the project programme (as set out in Appendix 4.1) reflects delivery of the scheme by 2016/17 which the project will be managed to.

Key risks for the Lower Cost Option have a slightly differing order of priorities. For the Lower Cost Option the key risk is uncertainty about the extent of the waste tips that will be encountered which is then followed closely by risks associated with the railway crossing.

6.3.2 Treatment of Inflation

DfT major scheme guidance states that:

“An allowance for inflation should be included in the Base Cost. Promoters should consider current and forecast inflation from industry sources appropriate to the scheme and present the assumptions and sources of evidence used. Realistic estimates for construction cost inflation will be crucial, and promoters are encouraged to discuss these with the Department at an early stage”.

For some time in the past, construction cost inflation has been above RPI, driven by high demand and global increases in commodity prices, including oil, steel and cement. Current economic conditions are however far less certain. There is relatively little evidence available on potential construction cost inflation given this economic uncertainty. Building materials costs fell sharply in 2009. For example, steel and copper wholesale prices fell by 50% compared with 2008. A general view appears to be that building material prices might pick up slightly in 2010 and longer term demand from China, India and the Middle East could mean commodity inflation will return to relatively high levels at a future date.

Recent DfT guidance states that:

“Promoters should take care to form base cost estimates using realistic assumptions about real cost changes, e.g. cost increases above or below RPI growth. The inflation rates relevant to the delivery of transport schemes were higher than general inflation rates over the period 2006 to 2008. More recently, and related to the world recession, many commodity prices and scheme tenders have been falling, or rising at lower rates. Independent projections suggest immediate change is unlikely, and that significant cost increases may not occur for some time. It is difficult to generalise and suggest inflation rates applicable to all schemes. However, under current circumstances it seems unreasonable to adopt central case projections which include capital costs rising above general inflation. It is therefore suggested that base cost projections should incorporate the most recent relevant actual indexation, and then, as a default, assume no change in real costs up to 2014. This is still consistent with an absolute increase in scheme costs of 14% by 2014, and is, in comparison with industry projections, still relatively high.

In view of the above and following discussions with the DfT an inflation figure of 2.7% has been assumed for construction and all other costs up to and including 2014/15. After that and for 30 years 6% is assumed for construction costs with all other costs at 2.7%. It is not considered that inflation assumptions would differ between the Preferred Scheme and the Lower Cost Option.

These inflation rates have been applied to the current cost estimate assuming start of construction early in 2015 and lasting 2 years. The resulting out-turn costs are set out in the following table.

Table 6.5 Scheme out-turn Costs (£million) Preferred Option

	50% Confidence Level	80% Confidence Level
Total Engineering Works including D&B Costs	41.619	41.619
Client Supervision Costs	0.473	0.473
Land & Environment	1.865	1.865
QRA	6.509	8.241
Total	50.466	52.198

Table 6.6 Scheme out-turn Costs (£million) Lower Cost Option

	50% Confidence Level	80% Confidence Level
Total Engineering Works including D&B Costs	36.841	36.841
Client Supervision Costs	0.473	0.473

	50% Confidence Level	80% Confidence Level
Land & Environment	1.865	1.865
QRA	6.976	8.694
Total	46.155	47.873

6.4 PREPARATORY COSTS

Preparatory costs have been prepared on the basis of known costs for existing arrangements, estimates from the project manager on likely costs and benchmarking with other major schemes to understand the relative level of investment in scheme development. It is not considered that preparation costs would differ significantly between the Preferred Scheme and the Lower Cost Option.

DfT guidance states that:

“Provided that the scheme passes through the necessary approval stages the Department will normally contribute 50% of the eligible preparatory costs incurred between Programme Entry and Full Approval.”

Ineligible costs include:-

- early-stage option appraisal and feasibility;
- publication of draft orders and the submission of and publicity for applications;
- the preparation of cases for, and attendance at, Public Inquiries

The total preparatory costs for the scheme (split in to eligible and ineligible) in current prices and outturn prices are shown in Table 6.7 and Table 6.8 respectively.

Table 6.7 Preparatory Costs (Current Prices)

Task	Preparatory Costs £million	Local Contribution £million	DfT Contribution £million
Preliminary Design	3.466	1.733	1.733
Statutory Processes	0.919	0.919	0.000
Detail Design	1.977	0.988	0.989
<u>TOTAL</u>	6.362	3.640	2.722

Table 6.8 Preparatory Costs (Out-turn Prices)

Task	Preparatory Costs £million	Local Contribution £million	DfT Contribution £million
Preliminary Design	3.670	1.835	1.835
Statutory Processes	1.010	1.010	0.000
Detail Design	2.240	1.120	1.120
TOTAL	6.920	3.965	2.955
Eligible Preparatory Costs	5.910	57%	43%
Non-eligible Preparatory Costs	1.010		

Preparatory costs ineligible from the 50% funding from DfT are the works up to Programme Entry, estimated at £1.51 million and considered to be “sunk”, works for the anticipated Public Inquiry which are included in the Statutory Processes costs and monitoring costs after Full Approval stage which are estimated at £0.26million (in outturn prices) based on 0.5% of scheme costs in accordance with DfT evaluation guidance.

6.5 TOTAL QUANTIFIED COST ESTIMATE

DfT guidance states that:

“Provided that the scheme passes through the necessary approval stages the Department will normally contribute a maximum of 90% of the estimated total cost of the scheme (including preparatory costs), also known as the Quantified Cost Estimate (QCE), as estimated at Programme Entry. The maximum 90% of the QCE is inclusive of the Department’s 50% contribution to Preparatory Costs”.

The breakdown of the Quantified Cost Estimate (total capital cost and preparatory cost estimates) for the Preferred Scheme is provided in Table 6.9

Table 6.9 Total Quantified Cost Estimate (outturn prices, £m) Preferred Option

Costs	Total (All Costs)	Total (Only Eligible Costs)	Local Contribution (non-eligible Costs)	Local Contribution (Eligible Costs)	Local Contribution (All Costs)	DfT Contribution	Total Local Contribution (All Costs)	DfT Contribution
	£m	£m	£m	£m	£m	£m	%	%
Preparatory Costs	6.920	5.910	1.010	2.955	3.965	2.955	57.30%	42.70%

Costs	Total (All Costs)	Total (Only Eligible Costs)	Local Contribution (non-eligible Costs)	Local Contribution (Eligible Costs)	Local Contribution (All Costs)	DfT Contribution	Total Local Contribution (All Costs)	DfT Contribution
Capital Costs	50.466	50.466	0	3.104	3.104	47.362	6.15%	93.85%
Total QCE	57.386	56.376	1.010	6.059	7.069	50.317		
% QCE (Eligible Costs)				10.75%		89.25%		
% QCE (All Costs)					12.32%	87.68%		

The breakdown of the Quantified Cost Estimate (total capital cost and preparatory cost estimates) for the Lower Cost Option is provided in Table 6.10.

Table 6.10 Total Quantified Cost Estimate (outturn prices, £m) Lower Cost Option

Costs	Total (All Costs)	Total (Only Eligible Costs)	Local Contribution (non-eligible Costs)	Local Contribution (Eligible Costs)	Local Contribution (All Costs)	DfT Contribution	Total Local Contribution (All Costs)	DfT Contribution
	£m	£m	£m	£m	£m	£m	%	%
Preparatory Costs	6.920	5.910	1.010	2.955	3.965	2.955	57.30%	42.70%
Capital Costs	43.372	43.372	0.000	2.668	2.668	40.705	6.15%	93.85%
Total QCE	50.292	49.282	1.010	5.623	6.633	43.660		
% QCE (Eligible Costs)				11.41%		88.59%		
% QCE (All Costs)					13.19%	86.81%		

6.6 ONGOING FINANCIAL SUSTAINABILITY, MAINTENANCE AND OPERATING COSTS

Whereas at this stage, a number of options for service procurement remain available to the Authorities for the proposed Rapid Transit Ashton Vale to Temple Meads scheme (RT2), it is assumed that whatever choice is made for that scheme, that choice will apply to the SBL Rapid Transit service as set out in Chapter 5.

Forecast operating costs have been calculated based on modeled service running times and distances, with unit costs such as drivers' time, fuel and engineering costs accounted for. Full details of these cost calculations are provided in Appendix 6.1. The size, composition and cost of extra vehicle fleets required for the provision of the services were also generated using this operating cost model.

The service extension from the Ashton Vale to Temple Meads line, to include the SBL rapid transit line, while providing an improved service for the user, was not anticipated to produce high revenues in proportion to the level of operating cost involved. Therefore analysis was undertaken to determine whether the SBL RT line would require any subsidy payments to be made to the operators in order to make it in their interests to run the service.

In isolation, the Rapid Transit Ashton Vale to Temple Meads line is forecast to generate high levels of revenue for a relatively modest expenditure on operating costs, as shown in Table 6.11.

Table 6.11 - Ashton Value to Temple Meads Rapid Transit Costs and Revenues

Annual Operating Costs and Revenues (£000s, 2009 prices)	
Cost	
Operating	539
Fleet Replacement	122
Total	661
Revenue	
2017	1,889
2031	4,015
Profit	
2017	1,228
2031	3,354

This demonstrates that at the time of opening, the demand for the Ashton Vale to Temple Meads service should generate sufficient revenue to make running the service beneficial to the operator.

With the SBL service in place as an extension to the Rapid Transit Ashton Vale to Temple Meads line, the rapid transit service can be considered as two distinct elements. Together the two services give a RT frequency of one vehicle every six minutes between Temple Meads and Ashton Vale. Of these, two vehicles out of every three only operate up to Long Ashton Park & Ride. The third continues on the SBL line; i.e. Serving the same route as the Rapid Transit Ashton Vale to Temple Meads vehicle, but continuing on to Hengrove Park.

Examining these two elements independently, the profitability of each can be determined, as shown in Table 6.12.

Table 6.12 - Ashton Vale to Temple Meads Rapid Transit (RT2) with SBL Rapid Transit - Costs and Revenues

Annual Operating Costs and Revenues (£000s, 2009 prices)		
Cost		
	RT2	SBL
Operating	359	342
Fleet Replacement	87	70
Total	446	412
Revenue		
	RT2	SBL
2017	1,217	834
2031	2,447	1,781
Profit		
	RT2	SBL
2017	770	422
2031	2,000	1,369

This demonstrates that with the introduction of the SBL line, both Rapid Transit Ashton Vale to Temple Meads and SBL services generate enough revenue to be profitable to the operator, even in the opening year.

However, when considering the SBL line as an addition to the Rapid Transit Ashton Vale to Temple Meads service, the incremental level of profit generated becomes less attractive.

Table 6.13 - Ashton Value to Temple Meads Rapid Transit (RT2) with SBL
Rapid Transit: Profit

	Annual Profit (£000s, 2009 prices)		
	RT2 only	RT2 + SBL	Benefit of SBL
2017	1,228	1,192	-36
2031	3,354	3,369	15

This negative incremental benefit to the operator of running the SBL service on top of the Rapid Transit Ashton Vale to Temple Meads service in 2016 results from the much lower levels of demand occurring on the Ashton Vale – Hengrove leg. While the benefits to the users in time savings that are generated by the SBL service make it good value for money, it may not prove to be a commercially viable option for the operators at the time of opening. However, demand increases forecast up to the forecast year of 2031 suggest that increases in revenue may be sufficient to provide a level of benefit to the operator. These costs and revenues are finely balanced and so the relationship between them will be sensitive to any variation from the levels of demand forecast in the modeling

The Authorities are expected to pay for the infrastructure maintenance costs. Additional maintenance costs are £0.32 million per year (in the opening year, 2009 Q3 prices, without allowance for real inflation or optimism bias). These are related to the upkeep of the track, ITS and RTP1 systems, bus stops and bridges.

The conclusions are:

- Benefit to Cost Ratio (BCR) for the overall scheme is high, and well above the DFT requirement of 2:1.
- Issues raised through the review by either officers or PWC have received satisfactory answers at this stage. A programme of further work has been identified for the next stage of scheme
- development which includes:
 - Financial modelling of the different procurement and delivery models and the effects on any financial return or liability to each of the Authorities.
 - Financial modelling of the effect on the overall budget position of the Authorities (for example potential loss of car parking revenues).
 - Iterative sensitivity modelling and appraisal regularly through scheme development.

6.7 SOURCES OF FUNDING

6.7.1 Regional Funding Allocation

The S W Councils have approved £50.1million – £47.3 million funding contribution to the Scheme plus £2.8 million preparatory costs (outturn prices). Endorsement of the Scheme from the SW Councils is included at Appendix 2.4

6.7.2 Developer Contributions

There are a number of anticipated developments in Bristol and North Somerset where contributions to the project would be appropriate and the Authorities are in discussion with relevant developers regarding potential contributions for infrastructure and /or services. Bristol International Airport have submitted a planning application to extend their operation; although not currently approved, it is anticipated that significant contributions to the project will be made. At this Programme Entry stage there are no confirmed commitments with regard to potential Section 106 Agreement contributions to the Scheme.

6.7.3 Local Contributions

The Scheme is a significant investment for the West of England, not only in terms of the benefits it delivers, but as part of a programme of major schemes contained within the Joint Local Transport Plan (JLTP).

Bristol City Council and North Somerset Council have agreed to underwrite the 11% funding required for the local contribution, a total of £7.07 million. Agreement to underwrite the local contribution was endorsed by Bristol City Council Cabinet on the 25th March 2010 and North Somerset Executive on the 23rd March 2010. As the scheme development work continues, the opportunities for meeting this local contribution will be explored and agreed with possibilities including LTP capital, Council Non Earmarked Capital and / or future Section 106 developer contributions which is the preferred approach.

6.7.4 Payment Profile

Tables 6.14 and 6.15 show the payment profile in outturn prices for the risk-adjusted programme cash flows for the Preferred Scheme and the Lower Cost Option.

Table 6.14 Payment Profile (Outturn prices and Risked Programme at P50) – Preferred Scheme (£ million)

Year	Preparatory Costs	Works Costs	Total	Local Contribution	DfT Contribution
2010/11	0.720	0.000	0.720	0.360	0.360
2011/12	1.700	0.000	1.700	0.860	0.840
2012/13	1.675	0.000	1.675	1.040	0.635
2013/14	1.285	0.000	1.285	0.935	0.350
2014/15	1.540	6.849	8.389	1.191	7.197
2015/16	0.000	24.186	24.186	1.488	22.698
2016/17	0.000	19.431	19.431	1.195	18.236

Year	Preparatory Costs	Works Costs	Total	Local Contribution	DfT Contribution
TOTAL	6.920	50.466	57.386	7.069	50.317

Note: DfT contributions requested at Conditional Approval

Table 6.15 Payment Profile (Outturn prices and Risked Programme at P50) – Lower Cost Option

Year	Preparatory Costs	Works Costs	Total	Local Contribution	DfT Contribution
2010/11	0.720	0	0.720	0.360	0.360
2011/12	1.700	0	1.700	0.860	0.840
2012/13	1.675	0	1.675	1.040	0.635
2013/14	1.285	0	1.285	0.935	0.350
2014/15	1.540	6.341	7.881	1.160	6.721
2015/16	0.000	22.034	22.034	1.355	20.679
2016/17	0.000	17.780	17.780	1.094	16.686
TOTAL	6.920	46.155	53.075	6.804	46.271

Note: DfT contributions requested at Conditional Approval

6.8 SECTION 151 OFFICER INVOLVEMENT

The Chief Finance Officers (s151 officers) of the West of England Authorities meet regularly to discuss and manage issues in relation to the funding, risk and resources of the transport programme. In the case of this Scheme, the Chief Finance Officers from Bristol City and North Somerset Councils are members of the Project Board and have taken an active role in the scheme development, including provision of independent advisors to review the Scheme.

The Project Board has endorsed the submission of the Major Scheme Business Case (MSBC). The s151 officers also provided advice on the recommendations made to Bristol City Council Cabinet and North Somerset Council Executive. Submission of the MSBC was endorsed by both Councils.

6.9 SUMMARY

In Summary:

- The total capital cost estimate is £50.4 million in outturn prices.
- A full Quantified Risk Assessment has been undertaken and has provided for potential variations in cost and programme.

- The total preparatory cost estimate in outturn prices is £6.92 million. This estimate is based on known costs for existing arrangements, estimates from the project manager on likely costs and benchmarking with other major schemes. The eligible cost element of this in outturn prices is £5.91 million.
- The local contribution is £7.1million (£3.1 million capital cost and £4.0 million preparatory costs) in out-turn prices. This has been endorsed by Bristol City Council Cabinet and North Somerset Executive.
- The s151 officers of Bristol City Council and North Somerset Council are members of the Project Team. Their independent advisors have reviewed the modelling work undertaken to date and continue to be involved and provide assurance that the financial modelling is robust.
- The s151 officers of Bristol City Council and North Somerset Council support the submission of this Major Scheme Business Case.

6.10 APPENDICES TO CHAPTER 6

Appendix 6-1 Capital Cost Estimate Details

Appendix 6-2 Independent Check of Costs

Appendix 6-3 Response to Independent Check of Costs

Appendix 6-4 Section 151 Officers Declaration