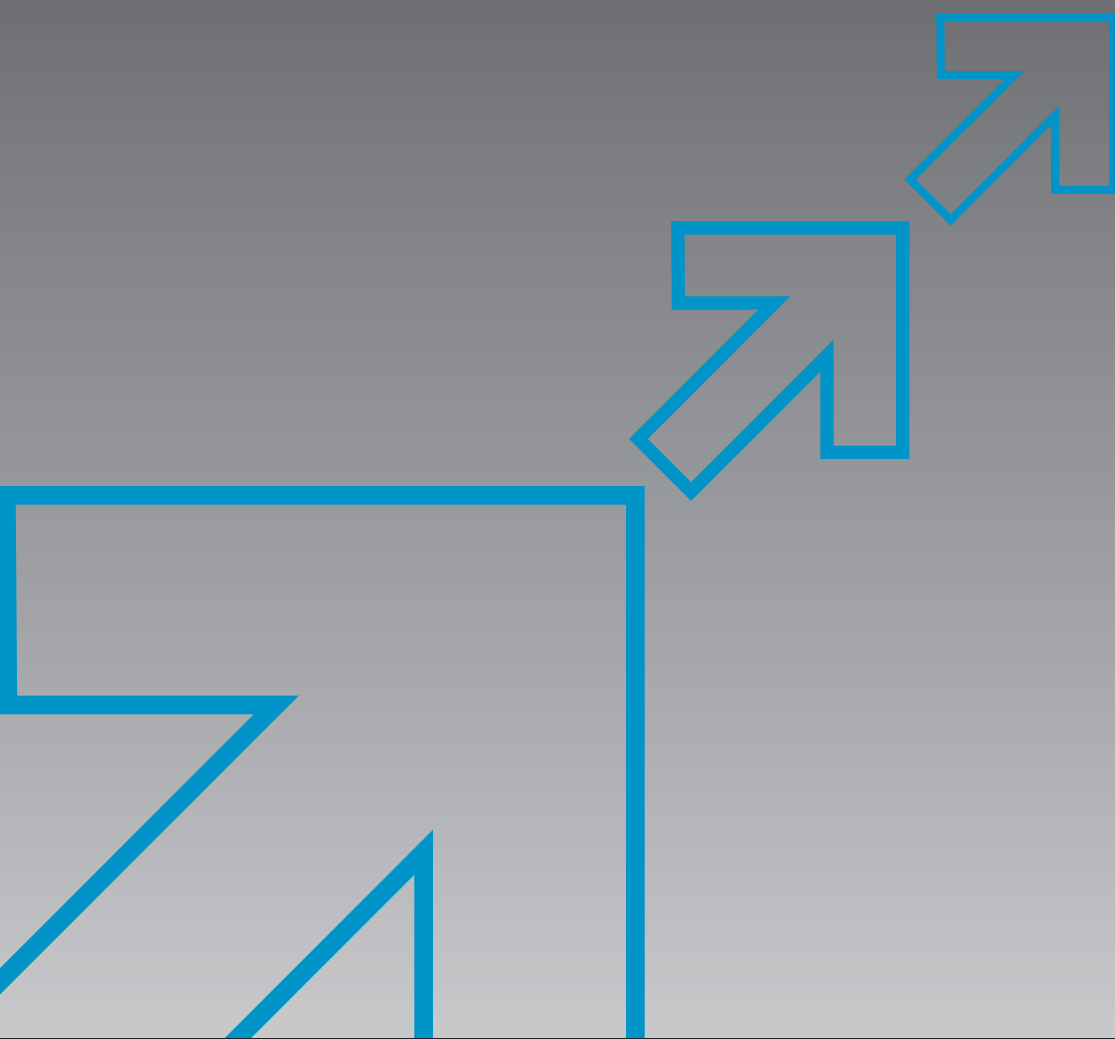


# A SUSTAINABLE JOURNEY TO WORK IN SOUTH YORKSHIRE

## ANNEX 11: RISK AND BIAS ASSESSMENT



SHEFFIELD  
**City Region**



SOUTH YORKSHIRE  
INTEGRATED TRANSPORT  
AUTHORITY

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# 1 INTRODUCTION

## 1.1 THE ANNEX DOCUMENTS

This document forms part of the series of Annex documents, which are presented here as an Annex to our Local Sustainable Transport Fund (LSTF) Business Case. This series of documents presents a substantial body of evidence we have compiled while developing the Business Case, which is the final submission to the Department for Transport, following our successful “key component” bid.

## 1.2 THIS DOCUMENT

This document focuses on the calculation of Risk and Optimism Bias. It presents the risks calculated for each activity in our LSTF programme, the optimism bias and sensitivity tests undertaken for each scheme.

Chapter Two outlines provides details of the risk assessments and calculations, Chapter Three presents the optimism bias that has been applied to each scheme. Chapter Four provides some conclusions.

## 2 RISK ASSESSMENT

### 2.1 OVERVIEW

The process for the assessment of each risk is to identify the effects of its occurrence together with the likelihood of the occurrence being realised. The financial impact of each risk can be analysed by estimating the most likely cost outcome associated with the risk, together with an estimate of the range of possible costs, to carry out a quantitative analysis of the risks.

In the LSTF programme context, not all risks identified have a financial impact. We have defined some strategic risks that may impact on the delivery or feasibility of the programme or parts of it. Although these risks do not contribute to the Quantified Risk Allowance, there is still a need to identify and manage appropriate measures to mitigate their effect. Similarly, some risks impact on the operational phase of the programme and are not included in the Quantified Risk Allowance, but will still be managed by the programme team.

The risk values presented in this annex are based upon the costs post inflation, as presented in the Financial Case. The risk register provided in Folder H on the attached CD is calculated using base scheme costs and does not include allowance for inflation since this has been used in the development of appraisal scheme costs for the economic appraisal of the LSTF programme.

As discussed in the Management Case, the probability of occurrence, as identified for each risk, has been converted into a percentage based on the key provided in **Figure 2.1**. The financial impact of each risk has been estimated as a percentage of the total programme cost, based on the structure presented in **Figure 2.2**.

**Figure 2.1: Assessment of Risk Probability**

| Assessment     | Probability |
|----------------|-------------|
| Almost Certain | 80%         |
| Likely         | 60%         |
| Possible       | 40%         |
| Unlikely       | 20%         |
| Rare           | 10%         |

**Figure 1.2: Assessment of Risk Impact**

| Assessment    | Probability |
|---------------|-------------|
| Catastrophic  | 100%        |
| Major         | 25%         |
| Moderate      | 15%         |
| Minor         | 10%         |
| Insignificant | 5%          |

Nearly 100 risks are currently identified in the Risk Register. Applying these factors to attach a cost to each risk, and adding up the risk costs across the entire programme, has resulted in a risk allowance of £12,709,380. This equates to 34% of the programme cost.

The following three chapters present the risk values for different. Where there are a number of risks that are the same for each scheme, these have been presented as 'generic risks'. To ensure the risk value of the 'generic risks' is proportionate, the schemes have been split by infrastructure, service and BEST. This makes certain that the risk value assigned to the 'generic risks' that are categorised as infrastructure is higher than for the revenue schemes. Schemes that are predominantly capital have a greater number of unknowns and these can come with a higher cost impact.

## 2.2 RISK VALUES BY SCHEME

### Capital Investment

The main overriding risk for the capital investment activities is the potential that the cost estimates are inaccurate and inflation rates change from those assumed. The cost estimates provided for each scheme are based upon experience of delivering similar investment and current operating costs. Of the total LSTF Programme risk value, £4,110,640 is from inaccurate cost estimates and changes to inflation rates impacting upon the infrastructure activities. This is 32% of the risk value for capital investment schemes. **Figure 2.3** lists the infrastructure activity risks.

**Figure 2.3: Risk Value by Capital Scheme**

| Risk                                                            | Likelihood | Cost Impact | Risk Value       | Mitigation                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------|------------|-------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Generic Infrastructure Activity Risks</b>                    |            |             |                  |                                                                                                                                                                                                                                                                  |
| Risk of inflation differing from assumed inflation rate         | Likely     | Moderate    | 1,947,145        | Monitor inflation and adjust cost plan and risk assessment. Discuss issue with DfT and/or other projects to seek guidance on treatment of inflation.                                                                                                             |
| Accuracy of cost estimates - capital and revenue (operating)    | possible   | Major       | 2,163,495        | Independent audit of capital costs. Benchmark operating costs.                                                                                                                                                                                                   |
| Unforeseen obstacles at design stages                           | possible   | Moderate    | 1,298,097        | Undertake full consultation with all appropriate parties to develop designs that take account of all likely requirements.                                                                                                                                        |
| Other contributions not realised                                | Possible   | Moderate    | 1,298,097        | A significant contribution to our match funding sources is from in-kind contributions, such as officer time. The security of our match funding is a significant part of our appraisal process and unsecure match funding will not be included in the assessment. |
| Delay in delivery                                               | unlikely   | minor       | 432,699          | Strong project management and programme governance processes are in place to support on-time delivery.                                                                                                                                                           |
| Conflict between delivery partners                              | unlikely   | minor       | 432,699          | To ensure a strong Governance structure is in place to deal with such conflicts.                                                                                                                                                                                 |
| Insufficient political public support for schemes               | unlikely   | minor       | 432,699          | Undertake full consultation with all appropriate parties to develop and tailor schemes to fulfil all partner requirements                                                                                                                                        |
| <b>TOTAL</b>                                                    |            |             | <b>8,004,931</b> |                                                                                                                                                                                                                                                                  |
| <b>Woodhouse to Sheffield and Parkgate Key Bus Routes DONV2</b> |            |             |                  |                                                                                                                                                                                                                                                                  |

| Risk                                                                                    | Likelihood     | Cost Impact    | Risk Value     | Mitigation                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------|----------------|----------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Failure to secure TROs                                                                  | Unlikely       | Major          | 156,914        | Early involvement of public and other stakeholders                                                                                                                                                                                                                                                                                                                              |
| Statutory Undertakers taking longer                                                     | Unlikely       | Moderate       | 94,149         | Regular meetings and exchange/co-ordination of programmes                                                                                                                                                                                                                                                                                                                       |
| Unsatisfactory ground conditions                                                        | Rare           | Major          | 78,457         | Detailed ground investigations will be undertaken and modifications made to scheme design to overcome any issues                                                                                                                                                                                                                                                                |
| <b>TOTAL</b>                                                                            |                |                | <b>329,520</b> |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Targeted Corridor Enhancements BARN1, DEAR1, DONV1, DONC1</b>                        |                |                |                |                                                                                                                                                                                                                                                                                                                                                                                 |
| Failure to secure TROs                                                                  | Unlikely       | Major          | 176,870        | Early involvement of public and other stakeholders                                                                                                                                                                                                                                                                                                                              |
| Unsatisfactory ground conditions                                                        | Rare           | Major          | 79,054         | Detailed ground investigations will be undertaken and modifications made to scheme design to overcome any issues                                                                                                                                                                                                                                                                |
| There are insufficient experienced staff available to SY partners to carry out the work | rare           | Insignificant  | 19,561         | Experienced staff are currently available, if there is any shortfall in resource it would be filled by use of consultant staff from existing framework arrangements and Yorconsult                                                                                                                                                                                              |
| Difficulty finding interested commercial partners                                       | unlikely       | minor          | 59,491         | A UK company already working in the area has expressed interest, as has a well known European motor manufacturer who is wanting to work with city regions in the UK and Europe. If no commercial partner can be secured a demonstration project for private vehicles can be set up at little cost, and the emphasis switched to working solely with public transport operators. |
| <b>TOTAL</b>                                                                            |                |                | <b>334,976</b> |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Elsecar Park and Ride DEAR3</b>                                                      |                |                |                |                                                                                                                                                                                                                                                                                                                                                                                 |
| Approvals not obtained from NR for pedestrian access to platform                        | unlikely       | Moderate       | 15,147         | The responsibility for obtaining these approvals in a timely manner will be transferred the designer once appointed and when funding is confirmed. Detailed consultation with Network Rail and Northern Rail has already been undertaken as part of the preparation of cost estimate and scheme development. This consultation indicates strong support for the scheme.         |
| Unavailability of land                                                                  | not applicable | Not applicable | -              | The land transfer issues are close to completion with respect to a small area of the former school site (BMBC owned) being transferred to SYPTE in exchange for land on which the access road and some proposed housing land (SYPTE) to BMBC. Land extents and valuations have been agreed and the sales documents are being processed by the relevant legal departments.       |

| Risk                                                                         | Likelihood     | Cost Impact    | Risk Value     | Mitigation                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------|----------------|----------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Planning permission not obtained                                             | not applicable | Not applicable | -              | Full planning permission exists (with conditions) for the park and ride site and access ramp. Outline planning exists for the associated housing development. The risk associated with delivering the housing element of the scheme and meeting the aspirations of the residents will lie with the developer when BMBC sell the land. |
| Unsatisfactory ground conditions                                             | unlikely       | Moderate       | 15,147         | A detailed ground investigation of the whole site has already been undertaken and indicated no significant risk of ground issues impacting on the delivery of the park and ride site.                                                                                                                                                 |
| <b>TOTAL</b>                                                                 |                |                | <b>30,293</b>  |                                                                                                                                                                                                                                                                                                                                       |
| <b>Cycle Boost (infrastructure only) BEST4</b>                               |                |                |                |                                                                                                                                                                                                                                                                                                                                       |
| Lack of Take up by SMEs                                                      | Unlikely       | Moderate       | 6,401          | Would require further promotion, potential to include other businesses and organisations                                                                                                                                                                                                                                              |
| Failure to install by recipient/ SMEs                                        | unlikely       | insignificant  | 2,134          | This is dealt with by the provider who would take the stands back and reallocate                                                                                                                                                                                                                                                      |
| <b>TOTAL</b>                                                                 |                |                | <b>8,535</b>   |                                                                                                                                                                                                                                                                                                                                       |
| <b>Cycle Routes BARN2, DEAR3, DEAR4, DONV5, DONV6</b>                        |                |                |                |                                                                                                                                                                                                                                                                                                                                       |
| Land not in council ownership and consent required                           | likely         | Moderate       | 647,140        | There is one section of a cycle route not currently in council ownership. Permission will need to be sought, this should be ok. However, if there is a problem, an alternative route can be proposed                                                                                                                                  |
| <b>TOTAL</b>                                                                 |                |                | <b>647,140</b> |                                                                                                                                                                                                                                                                                                                                       |
| <b>Adwick Sustainable Access DONC3</b>                                       |                |                |                |                                                                                                                                                                                                                                                                                                                                       |
| Breakdown of plant in possession and delays in the process                   | Unlikely       | major          | 120,498        | Spares and on-call arrangements to be put in place.                                                                                                                                                                                                                                                                                   |
| Increased Noise pollution e.g. night working                                 | likely         | minor          | 144,598        | Inform local residents in advance of works to be undertaken and duration                                                                                                                                                                                                                                                              |
| Presence and damage of unrecorded services during removal of Permanent Way   | rare           | Moderate       | 36,149         | Services to be located prior to works using a NR approved CAT scanning device.                                                                                                                                                                                                                                                        |
| Existing structures and surrounding areas provide nesting areas for wildlife | unlikely       | minor          | 48,199         | A habitat survey has been carried out. No evidence of wildlife identified.                                                                                                                                                                                                                                                            |

| Risk                                                                                                                           | Likelihood | Cost Impact   | Risk Value     | Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------|------------|---------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lack of availability of road closures                                                                                          | unlikely   | Moderate      | 72,299         | Book road closures for works well in advance.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Land Ownership issues in surrounding area                                                                                      | likely     | minor         | 144,598        | Network Rail to liaise with DMBC to determine most appropriate approval of the adjacent landowners.                                                                                                                                                                                                                                                                                                                                                            |
| Cover requirements for services                                                                                                | Possible   | minor         | 96,399         | Principal contractor and Form B designer to liaise with the utility suppliers regarding the required cover for services.                                                                                                                                                                                                                                                                                                                                       |
| Existing waterproofing found to be in poor condition and requires replacing                                                    | Possible   | Moderate      | 144,598        | Existing waterproofing to be examined upon removal of the existing surfacing.                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>TOTAL</b>                                                                                                                   |            |               | <b>807,339</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Waterfront Regeneration DONC2</b>                                                                                           |            |               |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| National Grid will not allow access to their land.                                                                             | unlikely   | Moderate      | 96,458         | Continued dialogue with National Grid to formalise agreement to allow DMBC to undertake works. Work in close partnership with National Grid to ensure the scheme constructed is in accordance with National Grid's agreed scheme. Extensive negotiations have been undertaken to date and National Grid has designed their development scheme currently being considered by DMBC Planning Authority in accordance with the Holmes Market scheme design layout. |
| Loss of key DMBC project staff due to Change Programme                                                                         | Possible   | minor         | 128,611        | Re-allocation of staff in relevant DMBC teams and identifies additional resource to procure external staff assistance if deemed necessary.                                                                                                                                                                                                                                                                                                                     |
| Construction will cause environmental contamination of the local areas such as site run-off contaminating local water courses. | Unlikely   | insignificant | 32,153         | Transfer risk to contractor. Contractor to implement a Construction Impact Management Plan.                                                                                                                                                                                                                                                                                                                                                                    |
| Unforeseen increased costs in disposal of site waste.                                                                          | Unlikely   | insignificant | 32,153         | Transfer risk to contractor. Contractor to implement a Site Waste Management Plan.                                                                                                                                                                                                                                                                                                                                                                             |
| Unforeseen ground conditions encountered within the site.                                                                      | unlikely   | Moderate      | 96,458         | Take account of ground investigation reports on adjacent sites. Provide all Site Information available. Further ground investigations to be undertaken prior to commencement of works. Preliminaries cost element includes for mitigation of potential unforeseen ground issues.                                                                                                                                                                               |

| Risk                                                                                                                | Likelihood | Cost Impact | Risk Value     | Mitigation                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------|------------|-------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The completed scheme does not provide sufficient traffic capacity to enable full development of the Waterfront site | Unlikely   | Major       | 160,764        | Detailed Strategic Modelling work undertaken in respect of the junction and its capacity to support development at Waterfront. Conclusion of the work was that 100% of the 15ha target development site could be supported by the proposed junction improvement scheme.                                                                  |
| Changes to temporary traffic management arrangements during construction imposed on the Contractor.                 | Possible   | minor       | 128,611        | Ensure through liaison with DMBC Network Manager's Team and work in partnership with contractor to develop clear traffic management plan for the construction phase.                                                                                                                                                                     |
| Significant archaeological finds within the construction site                                                       | rare       | Major       | 80,382         | Timely consultation with Planning and South Yorkshire Architectural Services and inclusion in the programme of works of time period to undertake any necessary investigations.                                                                                                                                                           |
| <b>TOTAL</b>                                                                                                        |            |             | <b>755,590</b> |                                                                                                                                                                                                                                                                                                                                          |
| <b>Plugged in South Yorkshire BARN3, DEAR6, DONV6, DONC4</b>                                                        |            |             |                |                                                                                                                                                                                                                                                                                                                                          |
| There are not enough high quality responses to out PQQ and ITT                                                      | Unlikely   | Major       | 52,503         | We are aware of a vast number of charging point suppliers and have had substantial contact with a number of them. We are aware of a number of dealers of electric vehicles that have expressed an interest in being on a panel. We are also aware of several green leasing companies who see electric vehicles as a key market to enter. |
| There isn't sufficient demand from SMEs                                                                             | Unlikely   | Moderate    | 31,502         | Developing a pipeline of interested SMEs before the scheme starts. CO2Sense has already secured interest from three companies, one of which is very high-profile and has indicated their desire to help attract other SMEs to the project.                                                                                               |
| The co-ordination of vehicle and charging point supply is not sufficient and efficient                              | Unlikely   | minor       | 21,001         | The web portal will provide detailed advice to SMEs on compatibility but we will also provide SMEs with a fully managed service if needed. CO2Sense has deliberately designed the projects delivery model to minimise this likelihood of this risk occurring.                                                                            |
| The returned tenders are more costly than the budget we have earmarked                                              | Possible   | Moderate    | 63,004         | Undertaking commercial research to understand the costs involved in supplying electric vehicles and charging points. CO2Sense has undertaken detailed research on the costs suppliers will incur in delivering the scheme.                                                                                                               |

| Risk                                                                                                      | Likelihood | Cost Impact | Risk Value     | Mitigation                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------|------------|-------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dissatisfaction with quality of service offered by suppliers results in negative press and MP involvement | Possible   | Moderate    | 63,004         | CO2Sense will carefully manage suppliers using a Prince2 methodology. We will also perform a quality control role by contacting SMEs during the trials o pick up any concerns about service quality before they become major concerns. |
| <b>TOTAL</b>                                                                                              |            |             | <b>231,015</b> |                                                                                                                                                                                                                                        |

Figure 2.3 lists the risks identified for the capital schemes in our programme and their mitigations. The main risks relate to the cost estimates being inaccurate and there being unforeseen obstacles at design stage. Cost estimates may change if rates of inflation are not as proposed in the Financial Case. Detailed work has been undertaken to ensure the cost estimates are as accurate as possible at the time of writing this Business Case. To reduce the impact of inaccurate cost estimates upon the delivery of the capital schemes in our programme, the rates of inflation will be monitored constantly to understand likely changes at the earliest possible opportunity.

Furthermore, unforeseen obstacles at design stage can have implications upon the cost of a scheme. Where it has not taken place already, full consultation with scheme designers and stakeholders will take place to ensure all likely requirements of each scheme are taken into account. This will work to ensure that the cost of the scheme takes into account all likely obstacles that may be incurred during the implementation of the scheme.

## Public Transport

The greatest risk for the public transport activities is that patronage does not fulfil aspirations causing the service to not run commercially and dis-continue. This risk accounts for £135,996 of the total risk value for Public Transport schemes. **Figure 2.4** below lists the risks, their likelihood and risk value identified for each of the service activities.

**Figure 2.4: Risk Value by Public Transport Activity**

| Risk                                                         | Likelihood | Impact        | Risk Value     | Mitigation                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------|------------|---------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Generic Service Activity Risks</b>                        |            |               |                |                                                                                                                                                                                                                                                                  |
| Risk of inflation differing from assumed inflation rate      | possible   | Moderate      | 34,157         | Monitor inflation and adjust cost plan and risk assessment. Discuss issue with DfT and/or other projects to seek guidance on treatment of inflation.                                                                                                             |
| Accuracy of cost estimates - capital and revenue (operating) | unlikely   | Moderate      | 17,078         | Independent audit of capital costs. Benchmark operating costs.                                                                                                                                                                                                   |
| Unforeseen obstacles at design stages                        | possible   | minor         | 22,771         | Undertake full consultation with all appropriate parties to develop designs that take account of all likely requirements.                                                                                                                                        |
| Other contributions not realised                             | rare       | insignificant | 2,846          | A significant contribution to our match funding sources is from in-kind contributions, such as officer time. The security of our match funding is a significant part of our appraisal process and unsecure match funding will not be included in the assessment. |
| Delay in delivery                                            | unlikely   | minor         | 11,386         | Strong project management and programme governance processes are in place to support on-time delivery.                                                                                                                                                           |
| Conflict between delivery partners                           | unlikely   | minor         | 11,386         | To ensure a strong Governance structure is in place to deal with such conflicts.                                                                                                                                                                                 |
| Insufficient public support for schemes                      | unlikely   | minor         | 11,386         | Undertake full consultation with all appropriate parties to develop and tailor schemes to fulfil all partner requirements                                                                                                                                        |
| <b>TOTAL</b>                                                 |            |               | <b>111,010</b> |                                                                                                                                                                                                                                                                  |
| <b>Jobconnector: Wentworth to Shortwood DEAR5</b>            |            |               |                |                                                                                                                                                                                                                                                                  |
| Staff changes within SYPTE or the partner organisations.     | Possible   | minor         | 10,376         | SYPTE and its partners are accustomed to dealing with grant funded projects, with flexible and reactive working practices.                                                                                                                                       |
| Current economic influences impact on delivery.              | Possible   | minor         | 10,376         | The project has been developed mindful of the challenging financial situation. The bid has been designed to minimise external factors as much as possible and services would be reactive to market fluctuations and designed to keep within overall budget.      |

| Risk                                                                                     | Likelihood | Impact        | Risk Value     | Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------|------------|---------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Failure to achieve anticipated project outputs and outcomes.                             | Unlikely   | moderate      | 7,782          | Effective programme management and monitoring and robust contract arrangements should ensure delays or slippage are avoided in terms of delivering outputs and key milestones. Should passenger loadings not develop as anticipated, the design of the project ensures that there is minimal liability. Services would be reactive to market fluctuations and, if necessary, vehicles will be re-integrated into the Community Transport Vehicle Replacement Programme. |
| <b>TOTAL</b>                                                                             |            |               | <b>28,535</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Jobconnector: X19 BARN4</b>                                                           |            |               |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Projected passenger numbers not materialised                                             | Unlikely   | major         | 62,295         | Consider adjusting the timetable service times and stops                                                                                                                                                                                                                                                                                                                                                                                                                |
| Change in Commercial Market - through increased competition                              | Unlikely   | major         | 62,295         | Consider adjusting the timetable service times and stops                                                                                                                                                                                                                                                                                                                                                                                                                |
| Operators withdraw commercial core                                                       | Unlikely   | major         | 62,295         | Consider alternative funding sources                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>TOTAL</b>                                                                             |            |               | <b>186,885</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Jobconnector: Malin Bridge DONV4</b>                                                  |            |               |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| The bus service is dis-continued commercially                                            | Possible   | moderate      | 73,701         | Guarantee from operator to be sought                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Unable to obtain Highways authority approval                                             | Unlikely   | insignificant | 12,283         | Close working with Highway Authority (for example, commissioning design from them)                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>TOTAL</b>                                                                             |            |               | <b>85,984</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Don Valley Tram Stop Upgrades DONV3</b>                                               |            |               |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Unable to agree on Maintenance Responsibility with supplier                              | Unlikely   | major         | 74,411         | Start early negotiation. Do not progress until agreement is in placed.                                                                                                                                                                                                                                                                                                                                                                                                  |
| Specification for equipment not clear enough                                             | Unlikely   | moderate      | 44,646         | Clear brief and programme sufficient time to discuss with designer and stakeholder                                                                                                                                                                                                                                                                                                                                                                                      |
| Poor Co-ordinations of various contractor on site to implement different "bits of works" | Unlikely   | moderate      | 44,646         | Early involvement with contractors. Careful consideration to be given to procurement process.                                                                                                                                                                                                                                                                                                                                                                           |
| Poor Interface with the public during implementation                                     | Unlikely   | insignificant | 14,882         | Transfer to Contractor                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Change of spec due to Additional                                                         | Possible   | moderate      | 89,293         | To be monitored. Initial discussion with PM for Additional Tram                                                                                                                                                                                                                                                                                                                                                                                                         |

| Risk                                                                                           | Likelihood | Impact | Risk Value     | Mitigation                                                                                            |
|------------------------------------------------------------------------------------------------|------------|--------|----------------|-------------------------------------------------------------------------------------------------------|
| Tram Vehicles/Tram Train require the removal of the 2 "inner" boarding points of each platform |            |        |                | Vehicle identifies no major issue for the trial scheme. (Continue liaison with PM for both projects). |
| <b>TOTAL</b>                                                                                   |            |        | <b>267,878</b> |                                                                                                       |

Figure 2.4 lists the risks identified and their mitigations for the Public Transport Schemes. The main risk is that patronage does not fulfil expectations and the service does not become commercially viable. Detailed work has been undertaken with the Operators to ensure that all Jobconnector services fulfil a requirement and can therefore become commercially viable by the end of the LSTF period. Service timetables and stopping locations can be changed to ensure they meet the needs of the passengers if this is the cause of the reduced patronage figures.

## Business and Employer Sustainability Toolbox (BEST)

The biggest risk overall to the BEST interventions is the potential that elements require more promotion and marketing than originally anticipated to reach their target. The risk value for limited awareness of the scheme is £130,838. **Figure 2.5** summarises the risk value of each BEST scheme.

**Figure 2.5 Risk Value by BEST Activity**

| Risk                                                                                                                                                                                                                           | Likelihood | Impact        | Risk Value     | Mitigation                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Generic BEST Activity risks</b>                                                                                                                                                                                             |            |               |                |                                                                                                                                                                                                                                                                  |
| Risk of inflation differing from assumed inflation rate                                                                                                                                                                        | rare       | minor         | 44,927         | Monitor inflation and adjust cost plan and risk assessment. Discuss issue with DfT and/or other projects to seek guidance on treatment of inflation.                                                                                                             |
| Unforeseen obstacles at design stages                                                                                                                                                                                          | rare       | minor         | 22,464         | Undertake full consultation with all appropriate parties to develop designs that take account of all likely requirements.                                                                                                                                        |
| Other contributions not realised                                                                                                                                                                                               | rare       | minor         | 29,951         | Significant contributions of our match funding sources are from in-kind contributions, such as officer time. The security of our match funding is a significant part of our appraisal process and unsecure match funding will not be included in the assessment. |
| Delay in delivery                                                                                                                                                                                                              | rare       | insignificant | 22,464         | Strong project management and programme governance processes are in place to support on-time delivery.                                                                                                                                                           |
| Conflict between delivery partners                                                                                                                                                                                             | rare       | minor         | 14,967         | To ensure a strong Governance structure is in place to deal with such conflicts.                                                                                                                                                                                 |
| <b>TOTAL</b>                                                                                                                                                                                                                   |            |               | <b>134,773</b> |                                                                                                                                                                                                                                                                  |
| <b>ECO Academy BEST1</b>                                                                                                                                                                                                       |            |               |                |                                                                                                                                                                                                                                                                  |
| Failure to implement measures to meet Government standards regarding Air Quality and carbon reduction.                                                                                                                         | unlikely   | minor         | 35,634         | Resource allocation and funding shifted to meet short term priorities. Management Resource and funding allocated to complete identified actions.                                                                                                                 |
| Failure to achieve required marketing levels– maintaining the Scheme profile is essential to maintain scheme growth and maximise contribution towards Improving air quality and supporting economic growth in South Yorkshire. | unlikely   | moderate      | 61,934         | A Communications and Marketing plan is developed and agreed by the ECO Stars Steering group to maintain Scheme profile.                                                                                                                                          |
| fund all of the training of ADIs and they then do not deliver the training to their learner drivers.                                                                                                                           | rare       | moderate      | 22,483         | This is very unlikely as this programme fits with the Modernisation of Driver Training agenda of the Driving Standards Agency. The ADI training would not be compulsory and the ADIs would have to invest                                                        |

| Risk                                                                                                                                                                                                                                                                    | Likelihood | Impact   | Risk Value     | Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                         |            |          |                | their own time free of charge in it. It would therefore be unlikely that they would not use it.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Lack of buy-in by bus companies                                                                                                                                                                                                                                         | unlikely   | moderate | 61,934         | Early and extensive engagement with businesses to ensure they fully understand the benefits of the initiative. First are already well engaged and have been running the scheme for some time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>TOTAL</b>                                                                                                                                                                                                                                                            |            |          | <b>181,985</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Bus Boost BEST2</b>                                                                                                                                                                                                                                                  |            |          |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Demand is lower than supply so we underspend                                                                                                                                                                                                                            | unlikely   | moderate | 44,133         | Increased effort would be put into promoting the benefits of taking up scheme                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| The scheme requires more promotion than expected                                                                                                                                                                                                                        | unlikely   | moderate | 44,133         | Ensure effective promotion throughout the process                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>TOTAL</b>                                                                                                                                                                                                                                                            |            |          | <b>88,267</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Walk Boost BEST3</b>                                                                                                                                                                                                                                                 |            |          |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| The scheme requires more promotion than expected                                                                                                                                                                                                                        | unlikely   | minor    | 42,720         | This issue of awareness can be mitigated by linking the promotion of walk boost with other incentive schemes, such as Cycle Boost and Bus Boost to strengthen the offer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| The results of the pedestrian audits and identified improvement works cannot be predicted. If complex improvement works are identified as being needed to improve the pedestrian environment these may not be affordable or deliverable within the LSTF period/funding. | possible   | Moderate | 124,352        | Experience indicates that pedestrian audits identify minor improvements. Where more complex improvement works are identified additional funding will be sought to carry these out as soon as is practical.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>TOTAL</b>                                                                                                                                                                                                                                                            |            |          | <b>167,072</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Cycleboost BEST4</b>                                                                                                                                                                                                                                                 |            |          |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Take-up doesn't match available resources                                                                                                                                                                                                                               | unlikely   | moderate | 36,207         | Setting appropriate selection criteria in the procurement process and proper vetting of tenderers, to ensure they are able to successfully recruit participants. Regular (monthly) progress meetings with service provider. Set review points within the contract so that underperformance can be identified and addressed (if necessary by changing service provider). If demand is too high, it will be managed by levying a small user charge, thus raising revenue to expand provision. If demand is too low, SCC will activate networks of contacts within local organisations (e.g. Healthy Cross, contacts in 'Travel Plan' organisations etc) to publicise the service more widely |

| Risk                                                                                                                                                                                                         | Likelihood | Impact   | Risk Value     | Mitigation                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TOTAL</b>                                                                                                                                                                                                 |            |          | <b>36,207</b>  |                                                                                                                                              |
| <b>Travel Training BEST5</b>                                                                                                                                                                                 |            |          |                |                                                                                                                                              |
| Lack of buy-in from partners/colleges                                                                                                                                                                        | possible   | moderate | 76,275         | Ensure effective consultation and promotion of scheme                                                                                        |
| Changes to student pass qualification (Foundation Learning) transfer burden of financial support to concessions pot, leading to lack of interest in the scheme amongst a key user group (16 to 18 year olds) | unlikely   | moderate | 32,130         | Ensure effective consultation and forward planning to ensure all known plans to change student pass qualifications are known well in advance |
| <b>TOTAL</b>                                                                                                                                                                                                 |            |          | <b>108,405</b> |                                                                                                                                              |
| <b>Marketing and Communications BEST6</b>                                                                                                                                                                    |            |          |                |                                                                                                                                              |
| Poor mechanisms in which to sell the product                                                                                                                                                                 | unlikely   | minor    | 48,397         | A flexible and effective marketing plan needs to be developed to allow for unsuccessful delivery. Alternative plans may be most effective    |
| Limited awareness raised through scheme                                                                                                                                                                      | unlikely   | minor    | 49,397         | Monitoring of the effectiveness of the communications programme is on-going to ensure effective delivery                                     |
| Resources not being used how programme managers had envisaged                                                                                                                                                | unlikely   | moderate | 65,259         | Strong engagement between programme managers and marketing team is in place early to ensure marketing is effective                           |
| <b>TOTAL</b>                                                                                                                                                                                                 |            |          | <b>163,053</b> |                                                                                                                                              |

Figure 2.5 lists the risk that have been identified and their mitigations for the BEST schemes. The main risk is that more promotion and marketing of certain elements of BEST is required to ensure the scheme meets its anticipated target. This could impact upon the cost of the project. The mitigation in place to prevent this being a risk to the deliverability of our LSTF programme has two elements. The take-up of all BEST activities will be monitored at strategic times to ensure they are reaching the required number of people in the respective locations. Secondly, the marketing strategy for BEST activities can be adjusted to ensure that schemes that are struggling to achieve their targets are marketed more closely with those that are achieving their requirements. Together, this should ensure that any impact of this risk is minimised.

## 3 OPTIMISM BIAS

### 3.1 INTRODUCTION

This section summarises the steps undertaken to determine a suitable level of optimism bias to apply to the different elements of the scheme costs. The approach adopted is based upon the guidance within WebTAG Unit 3.5.9 for the capital scheme elements. As no guidance is available for applying optimism bias to revenue schemes we have determined this using local evidence from similar schemes.

This section is based upon the note “Approach to Optimism Bias, Risk, Inflation, Annualisation and Calculation of Interim Year Benefits” we sent to the Department for Transport for comment on the 28<sup>th</sup> October 2011.

### 3.2 CAPITAL SCHEMES

The following steps have been used to determine the level of optimism bias for capital schemes:

#### **Step 1: Determine the Nature of the Project**

In accordance with WebTAG Unit 3.5.9, the nature of the capital scheme elements has been determined using the project categories listed in Table 7 of this WebTAG Unit, acknowledging the risk of cost overruns within these categories can be treated as statistically similar. This process has established that other than the Don Valley Tram Stop Upgrades, which fall under the rail category, all other capital schemes have been categorised as road projects. However, as Plugged in South Yorkshire will provide charging equipment and vehicles, it is a non-standard form of transport infrastructure so has been considered separately. Therefore, it is felt this scheme would be better assessed using the Supplementary Green Book Guidance – Optimism Bias.

#### **Step 2: Identify the Stage of Scheme Development**

Following on from Step 1, the stage of scheme development for each of the capital schemes has been established. The stages of development set out in Table 8 of Unit 3.5.9, the quality of the risk assessment and cost estimates for each scheme element have been used to determine where a scheme sits in the development process. The extent to which optimism bias may or may not have been mitigated has also been considered.

Most capital schemes are assumed to fall into the Stage 1 category acknowledging the stage of the development of these elements, the quality of risk assessment conducted thus far and the quality of the cost estimate. However, it has been assumed two capital schemes fall into the Stage 2 category due to their more advanced stage of scheme development, the robustness of the cost estimate and the mitigation of scheme risks that have already occurred. These schemes are Elsecar Park and Ride and the infrastructure element of Cycleboost.

Elsecar Park and Ride is assumed to be a Stage 2 scheme as it is ready for implementation as soon as funding becomes available. The land for the scheme has been secured following completion of the transfer of land between SYPTe and Barnsley Metropolitan Borough Council. The site also has full planning permission and a detailed ground investigation of the whole site, indicating that there are no significant delivery risks. Cost estimates have been independently established by SYPTe Quantity Surveyors and cross checked with estimates made by the Network Rail delivery team. It only remains for the scheme to be procured in accordance with SYPTe Standing Orders and the restricted tender process.

The infrastructure element of Cycleboost has also been assumed to be a Stage 2 scheme. The scheme will provide up to 1,000 cycle stands during the LSTF period. However, the provision of the stands will be undertaken by a third party service provider and installation will be undertaken by the recipients of the stands. Consequently, no statutory permissions or consents are required by SYPTe and District Partners. The risk of providing the stands and managing the scheme is transferred to the third party service provider through contractual arrangements. If the stands are not installed within a set timeframe the third party service provider will reclaim the delivered stands to be used elsewhere. Furthermore, the costs for the scheme are robust being based on similar costs used by one of the providers of this service in another area of the country.

Two other schemes are thought to lie between Stage 1 and Stage 2. These are Adwick Sustainable Access and Waterfront Regeneration. It would be unsuitable for these schemes to be placed in the Stage 2 category as District Partners have not yet been granted the powers required to implement them e.g TROs etc. The procurement strategy is also yet to be formally agreed. However, their design is sufficiently detailed, the cost estimates are robust and externally verified, site survey work has been completed and detailed risk registers established and regularly updated. It is therefore felt these projects lie between Stage 1 and Stage 2 and adjustments to the recommended uplift factors have been calculated.

### **Step 3: Apply Recommended Uplift Factors**

The uplift factors have been determined using those presented in Table 9 of WebTAG Unit 3.5.9 using the scheme stages identified above. Where it was determined in Step 2 that a project falls between stages it has been necessary to establish alternative optimism bias uplifts to those presented in Table 9. The guidance indicates that appraisers should use suitable judgement in deciding applicable uplifts. To assist in this process the Supplementary Green Book Guidance – Optimism Bias has been referred to in order to understand how evidence on contributory factors can be used to reduce the uplift for selected schemes. A similar process that draws on this supplementary guidance has also been used to estimate an optimism bias uplift for Plugged in South Yorkshire as noted above.

Waterfront Regeneration is a standard civil engineering scheme according to the classification presented in paragraph 3.10 of the Supplementary Green Book Guidance – Optimism Bias. Table 3 of this document has therefore been utilised to establish the extent to which the contributory factors have been managed in order to calculate a new optimism bias uplift value.

Adwick Sustainable Access is also a standard civil engineering scheme according to the classification presented in paragraph 3.10 of the Supplementary Green Book Guidance – Optimism Bias. Table 3 of this document has then been utilised to establish the extent to which the contributory factors have been managed in order to calculate a new optimism bias uplift value.

As noted above, Plugged in South Yorkshire can be considered a separate scheme as it does not provide traditional transport infrastructure. It is felt this should be dealt with as an outsourcing project according to the classification presented in paragraph 3.10 of the Supplementary Green Book Guidance – Optimism Bias. This is because CO2Sense will source the charging points from a supplier who will supply and install on a service basis. Table 4 of the document has therefore been utilised to establish the extent to which the contributory factors have been managed in order to calculate a new optimism bias uplift value. The calculations and supplementary evidence were provided in the note we submitted to DfT on 28<sup>th</sup> October 2011 and supplied if necessary.

### **Step 4: Perform Sensitivity Analysis**

In order to satisfy the requirement for sensitivity analysis around the uplift used we have also identified a range around the core level of optimism bias determined using the procedures outlined above. The process for calculating an optimism bias and sensitivity tests for the capital schemes is summarised by **Figure 4.1**.

**Figure 4.1: Optimism Bias and Sensitivity Tests by Capital Scheme**

| Scheme                                                    | Type                                | Nature of Capital Project | Scheme Development Stage     | Proposed Core Level of Optimism Bias | Sensitivity Tests |     |     |
|-----------------------------------------------------------|-------------------------------------|---------------------------|------------------------------|--------------------------------------|-------------------|-----|-----|
|                                                           |                                     |                           |                              |                                      | High              | Mid | Low |
| Woodhouse to Sheffield and Parkgate Key Bus Routes DONV2  |                                     | Road                      | Stage 1                      | 44%                                  | 66%               | 30% | 15% |
| Targeted Corridor Enhancements BARN1, DEAR1, DONV1, DONC1 | Bus                                 | Road                      | Stage 1                      | 44%                                  | 66%               | 30% | 15% |
|                                                           | Road                                | Road                      | Stage 1                      | 44%                                  | 44%               | 10% | 3%  |
| Elsecar Park and Ride DEAR3                               |                                     | Road                      | Stage 2                      | 15%                                  | 66%               | 30% | 15% |
| Cycle Routes BARN2, DEAR2, DEAR4, DONV5, DONV6            | Development of Cycle Routes         | Road                      | Stage 1                      | 44%                                  | 44%               | 10% | 3%  |
|                                                           | Cycle boost infrastructure elements | Road                      | Stage 2                      | 15%                                  | 66%               | 30% | 15% |
| Jobconnector - Malin Bridge Feeder DONV4                  |                                     | Road                      | Stage 1                      | 44%                                  | 66%               | 30% | 15% |
| Don Valley Tram Stop Upgrade DONV3                        |                                     | Rail/Road                 | Stage 1                      | 44%                                  | 66%               | 30% | 15% |
| Adwick Sustainable Access DONC3                           |                                     | Road                      | Between Stage 1 and Stage 2. | 30%                                  | 44%               | 22% | 15% |
| Waterfront Regeneration DONC2                             |                                     | Road                      | Between Stage 1 and Stage 2. | 30%                                  | 44%               | 22% | 15% |
| Plugged In South Yorkshire BARN3, DEAR6, DONV6, DONC4     |                                     | Outsourcing               | n/a                          | 17%                                  | 41%               | 10% | 3%  |

### 3.3 REVENUE SCHEMES

As noted in paragraph 3.7.3 of WebTAG Unit 3.5.9 there is currently insufficient evidence available for the Department of Transport to recommend any specific optimism bias uplifts for operating costs. However, as DfT expects scheme promoters to consider the sensitivity of their scheme's business case to changes in operating costs from those forecast, local data on previous revenue project costs has been collated. This information is summarised in **Figure 4.2** below and relates to previous revenue schemes similar to those included in the LSTF programme. It has been assembled by project partners and provides a summary of all available information obtained during the short allotted timescales.

**Figure 4.2: Comparison of Estimated and Actual Costs for Previous Revenue Projects**

| Project                  | Estimated Costs (£) | Actual Costs (£) | % Difference |
|--------------------------|---------------------|------------------|--------------|
| Give it a Go             | 12,000              | 8,100            | -32.5        |
| Hillsborough TravelSmart | 100,000             | 91,000           | -9.0         |
| Bus Boost                | 4,500               | 3,300            | -26.7        |
| Lower Don Valley Website | 7,000               | 6,200            | -11.43       |
| Bike Boost               | 100,000             | 100,000          | 0            |
| SIMP Website             | 90,000              | 90,000           | 0            |
| Carbon Quids Campaign    | 65,000              | 80,000           | +23.08       |
| <b>Average</b>           |                     |                  | <b>91.93</b> |

**Figure 4.2** indicates that on the whole revenue projects tend to over estimate costs or meet budget estimates. This is to be expected given the flexibility of revenue schemes to deliver efficiencies that bring about cost savings, but do not reduce the scope or impact of the scheme. Consequently, it is proposed that no uplift factor is applied to the revenue projects within the LSTF programme. This is thought particularly appropriate as the LSTF revenue projects are initiatives that have been specifically tailored to local conditions based on the success of previous revenue projects some of which are included in **Figure 4.2** (and there is therefore a high level of confidence in the cost estimates).

## 4 CONCLUSIONS

This annex document has been presented to show the risk and optimism bias applied to each element of our LSTF programme. The information presented in this document has been used in both the Management and Financial Cases of our main submission document.

The total risk value or quantified risk value (QRA) for our LSTF programme is £12,709,380 (including inflation). **Figure 5.1** summarises how this is apportioned across the infrastructure, service and BEST activities:

**Table 5.1: Summary of Risk Value by Activity**

| Activity                                 | Risk Value (£)    |
|------------------------------------------|-------------------|
| Capital Investment                       | 11,149,336        |
| Public Transport                         | 680,292           |
| BEST                                     | 879,752           |
| <b>Total Risk value (with inflation)</b> | <b>12,709,380</b> |

The risk assessment has shown that the capital investment activities carry the highest risk and as such have been apportioned the greatest risk values. The greatest risk in the delivery of our LSTF programme is the potential for the cost estimates to be inaccurate and that inflation rates will change from those assumed. The cost estimates provided for each scheme are based upon previous experience of designing and delivering similar schemes and current operating costs used for existing procurement activities. On the basis of the work that has been undertaken to define the cost we are confident that the specifications are as robust as possible at this stage of scheme development.

The application of optimism bias to each scheme has been undertaken in accordance with WebTAG Unit 3.5.9. For capital schemes, 4 percentage uplifts have been provided to cover a range of scenarios. For revenue schemes, no uplift factor is provided as local evidence suggests that revenue schemes generally tend to over-estimate their costs or meet their budgets.

