Slough Mass Rapid Transport (SMaRT)

Business Case Report

Slough Borough Council

14 July 2014

ATKINS

www.slough.gov.uk
Slough
Borough Council

Plan Design Enable

Notice

This document and its contents have been prepared and are intended solely for Slough Borough Council's information and use in relation to the application for funding from the Berkshire Local Transport Body.

ATKINS assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 74 pages including the cover.

Document history

Job number:			**Document ref:**			
Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Report format	JR, EN, NM, IW,MG	AJC	JR, EN, NM, IW,MG	AJC	01/05/14
Rev 1.1	Report format	DW				22/05/14
Rev 2.0	Draft Report	DW	EN	AJC	AJC	16/06/14
Rev 3.0	Final Report	DW	EN	AJC	AJC	14/07/14

Client signoff

Client	Slough Borough Council
Project	Slough Mass Rapid Transport (SMaRT)
Document title	Business Case Report
Job no.	5130515

Table of contents

Tables

Figures

Appendices

Executive summary

Slough Mass Rapid Transit (SMaRT)

The Slough Mass Rapid Transit (SMaRT) scheme is a continuation of improvements being made by Slough Borough Council to increase the level of accessibility to, from and around the town for residents, employees and visitors. Without the investment required to both improve sustainable transport and to mitigate the existing and forecast levels of congestion in Slough, there is concern that the viability of the ambitious employment and residential development, required to fulfil the sustainable economic growth objectives of the Thames Valley Berkshire (TVB) sub-region, will be hampered.

The A4 forms the spine of a 12 km strategic public transport corridor that links Maidenhead, Slough and Heathrow and plays an important role in providing surface access to the airport. The SMaRT scheme focuses on a 6.7km section of the A4 corridor between the junction of Dover Road to the west of Slough town centre, and the junction with High Street Langley approximately 300m from the M4 Junction 5.

The SMaRT scheme will enhance connectivity and accessibility between a number of key trip attractors and generators, reflecting the criticality of the A4 corridor as a section of route for journeys in the sub-region:

- The Slough Trading Estate is one of the largest business parks in Europe, consisting of 486 acres of commercial property to the west of Slough town centre and immediately north of the A4 Bath Road. There are over 450 businesses on the site employing over 20,000 people. SEGRO, the owners of the trading estate, have planning permission to expand the site with over 150,000m^2 of office, leisure and amenity space which could lead to the creation of over 4,000 additional jobs;

- Slough town centre is recognised as a regional shopping centre, however in recent years it has lost trade to other competing centres. To counter this downturn, a £450 million regeneration project known as the Heart of Slough has been ongoing since 2010. Since then, traffic management on the A4 has been radically changed to resolve issues of severance; in addition to highways works, a new bus station has been built and the rail station access improved. Several developments are planned for the Heart of Slough and the rest of the town centre which will deliver a further 60,700m^2 of office space, and 2,700 new residential units within the next six years; and

- London Heathrow airport is one of the largest international airports in the world; in 2013, 72 million passengers and 1.4 million tonnes of cargo passed through the airport. Following the opening of Terminal 5 (less than 7 miles from Slough town centre) in 2008, annual passenger numbers are expected to increase to 86 million by 2014 and eventually reach 90-95 million.

The SMaRT scheme is a combination of:

- Highway infrastructure measures aimed at delivering journey time and reliability performance improvements of bus services while also improving efficiency of operation of the highway network for general traffic as a whole; and

- Consequential and complementary improvements to bus service provision facilitated by the infrastructure improvements to be implemented

Problems and objectives

The SMaRT scheme will help to alleviate a number of problems, bringing benefits to the local population and businesses and to the wider economy. The major problems in the area are:

- Congestion on the road network
    - Resident and worker dependence on cars adds to the existing traffic congestion. This congestion leads to slow public journey times and results in a lack of reliability of the

services and leads to more people uses their cars creating a vicious circle of congestion leading to further congestion

- The growing traffic congestion problems have the potential to ultimately damage the local economy. Traffic levels outside the peak are rising, affecting the reliability of off-peak journey times, potentially threatening one of Slough's attractions for retail opportunities;
- Air quality in parts of the town is poor and could get worse. Slough compares poorly in comparative studies for natural environment quality, suffering from congestion, noise and poor air quality which are worsened by the proximity of Heathrow and motorways;
- Important places in Slough, like schools and colleges, the university, the industrial estates and major employment sites and the hospital find it harder and harder to cope with car access and traffic difficulties.

- Viability of the town centre and key areas:
  - Despite being recognised as a regional shopping centre, studies indicate that Slough is losing trade to competing centres. There are also around a million square feet of empty offices needing refurbishment;
  - There is a need to ensure that Slough residents can take advantage of the opportunities available at Terminal 5 and any future airport expansions through transport provision and skills development. Following a consultation in 2005, a greater need to consider the needs of those who cannot access mainstream bus services was identified;
  - In order to serve Heathrow, there is a need for more bus services – particularly to Heathrow Terminal 5 and Wexham Park Hospital. Heathrow airport is identified as being difficult to get to, particularly for shift workers at evenings and weekends and for those without a car.

- Social distributional issues in Slough:
  - A high level of socio-economic disadvantage prevails in Slough and includes some of the most deprived areas in the country (Figure 3.1). There is a need to ensure that Slough residents can take advantage of increased opportunities at Heathrow through improved public transport provision;
  - Slough has a higher than average unemployment rate and that there is a requirement to provide a reliable level of accessibility to enable these Slough residents to access employment opportunities;
  - The A4 accounts for a large percentage of road traffic accidents in Slough with 381 separate incidents recorded in the 5 years to March 2014

The scheme objectives have been defined to address directly the problems above. They align closely with the business strategies for the scheme promoters, the Local Economic Partnership and for Central Government – most obviously in terms of the Government's broad goals for transport.

Objectives	Desired Outcomes
(1) Provide a high quality, safe, convenient and reliable alternative to the car and improve public perception of transport in Slough	Increase PT modal split Increase PT capacity Improve PT reliability Improve PT journey times Improve personal security

	Reduce casualty frequency and severity
(2) Alleviate the severe congestion on the A4 by allowing better flow of traffic	Improve (or keep to neutral) car journey times
(3) Minimise the impact of noise and air pollution and greenhouse gases on the A4 corridor	Reduce (or keep to neutral) carbon dioxide emissions and noise levels
(4) Support economic development in Slough and Heathrow and contribute to tackling deprivation	Support employment and housing development planned for Slough. Improve PT journey times between areas of deprivation in Slough and employment opportunities Provide regular PT frequency throughout the day, supporting shift workers Provide affordable transport Reduce unemployment in Slough

Strategic fit

In March 2014, the Thames Valley Berkshire LEP submitted their Strategic Economic Plan (SEP).

Within the six year period covered by the SEP (2015/16 to 2020/21) several considerable employment developments are planned on the Slough Trading Estate, which sits within the Heart of Slough. The development amounts to 108,000m^2 of office space along with ancillary retail, food and accommodation. In addition, 2,920 residential units are programmed over the same time period.

In addition to the infrastructure benefits the SMaRT scheme will provide, it will also aid the delivery of the SEP's business and education programmes across Slough.

Strategic Priority	How will SMaRT contribute?
Unlocking housing development	To combat the issues of congestion in Slough, new housing developments are to be taken forward with restrictive measures on the availability of parking. Ensuring the market viability of some 2,800 new units in the town centre (planned over the 6 years to 2021) therefore requires investment in sustainable transport to provide sufficient levels of accessibility for new residents. To the east of Slough, development at Castleview, Langley will generate a further 220 residential units and will be served directly by public transport along the A4.
Enhancing urban connectivity	The SMaRT scheme is named directly as one of the key priorities for providing an enhanced level of connectivity within the TVB. The scheme also acts as a continuation of the recent delivered and planned works for improving the sustainable transport throughout the town, not least the LSTF and Better Area Bus Fund.
Encouraging vibrant town centres	Where the Heart of Slough town centre scheme has sought to improve public realm and deliver development in the town centre; the SMaRT scheme will help to improve accessibility for those wishing to travel to the town for leisure and shopping. It also provides a better alternative to car travel thereby reducing the volume of traffic and improving the sense of place.
Foundations for future growth	The eastern section of the SMaRT scheme is referenced as being a key building block for ensuring future sustainable growth, enabling modal shift and reducing congestion.
Enhancing the strategic transport	The SMaRT scheme includes a number of improvements at signal junctions, installing MOVA control which deals with variable traffic patterns in a more

network	efficient manner. These improvements will aid business access to the strategic routes of the M3 and M4. With the planned introduction of Crossrail and Western Rail Access to Heathrow (WRAtH) coming to Slough in 2019 and 2021 respectively, the SMaRT scheme will provide a fast link into Slough Station.
Enterprise, innovation and business growth programme	Mitigating for planned employment growth on the Slough Trading Estate and within the Heart of Slough is fundamental to the success of the regeneration projects and the SMaRT scheme will maintain the strategic connectivity advantages to workforce within the UK and internationally via Heathrow.
Skills education and employment	The SMaRT scheme will improve accessibility between the areas of higher unemployment or social deprivation and the areas of job market growth in Slough and at Heathrow Airport.

Value for money – what the scheme will deliver

Scheme value for money has been assessed within a WebTAG-compliant framework.

Economic appraisal

The potential impacts of the SMaRT scheme have been assessed using the SATURN and EMME highway and public transport assignment models which make up the Slough Multi-modal Transport Model.

Economic benefits of the scheme have been quantified using the DfT's Transport User Benefit Appraisal (TUBA v1.9.4) software. Benefits reported included time savings, reductions in vehicle operating costs, savings in charges, such as public transport fares, changes in revenue to private operators and local government and reductions in carbon emissions. These benefits were all monetised so that, based on values of time, the benefits of time savings could be added to the already monetised benefits of reduced operating costs and savings on fares. This allowed all benefit types to be combined to give a Present Value of Benefit (PVB).

Environmental appraisal

An appraisal of the environmental impacts of the SMaRT scheme has been undertaken following the guidance provided in TAG unit A3. For each of these eight environmental aspects, an appraisal of the scheme has been undertaken to identify whether significantly beneficial or adverse environmental effects are likely to arise.

Appraisal scheme costs

A robust approach to the estimation of scheme costs has been developed by the scheme designers and is based on benchmarked construction values from recent schemes in Slough

The total costs, once converted to 2010 prices and values using the default rates included in TUBA, and discounted to 2010, produce a **PVC** of investment of **£9.95 million PV** made up of:.

- The total capital cost of the scheme, including all land, preparation and supervision costs but excluding any future inflation, is £6.871 million at Q2 2014 prices.
- An allowance of £0.775 million for future inflation on construction and land prices has been made;
- Included is a quantified estimate for known risks (including inflation) amounting to £0.570 million;
- The level of optimism bias (OB) included in the scheme cost is £3.36 million;
- The total capital cost used in the economic appraisal therefore amounts to £9.452 million. This value has been input to TUBA to reflect the allocation of expenditure between Local and Central Government; and

- In addition, we have included an allowance of £2.474 million for the increase in future maintenance costs associated with the new infrastructure as well as renewals over the scheme assessment period.

Scheme appraisal

The analysis suggests that the SMaRT scheme will generate a **PVB of £73,430,000 PV** made up of:

- £11,760,000 PV resulting from a reduction in journey time and vehicle operating cost for business users;
- £20,791,000 PV resulting from a reduction in journey time and vehicle operating cost for commuters;
- £34,516,000 PV resulting from a reduction in journey time and vehicle operating cost for other users;
- £7,574,000 PV resulting from reduced accident numbers and severity; and
- £419,000 PV as a result of reduced greenhouse gas emissions.

Further analysis was conducted on noise and air quality however the impact was deemed to be neutral in each case and no monetised benefit was produced.

This PVB compared against the PVC of £9,950,000 PV and will generate a **BCR of 7.66**.

A number of sensitivity tests have been undertaken to determine the SMaRT scheme's BCR in the event of variations to growth, the provision of scheme details, or to the construction cost of the scheme. The *worst case* scenario assumes that there will be no contribution to service improvements on behalf of the public transport operators in addition to there being no transfer of patronage of the shuttle buses to public transport. Even in this worst case, with the resulting reduction in public transport benefits, the remaining benefits (of both public transport and public transport) , the BCR for the SMaRT scheme remains above 4.1 and therefore still represents a high value for money.

Further social and environmental benefits have been derived from qualitative assessment, and whilst these will not provide a monetised benefit for use in this appraisal, the impacts should be accounted for when considering the overall Value for Money presented by the scheme:

- The impact to Noise is considered to be **neutral**;
- The impact to Local air quality is considered to be **neutral**;
- The impact to Landscape is considered to be **neutral**;
- The impact to Townscape is considered to be **neutral**;
- The impact to the Historic Environment is considered to be **neutral**;
- The impact on Biodiversity is considered to be possible **slight** to **moderate adverse**;
- The impact on the Water Environment is considered to be **neutral to slight adverse;**
- The impact on Severance is considered **neutral**;
- The impact on Personal Security is considered **neutral;** and
- The impact on Accessibility is considered to be **slight beneficial.**

Whilst not being benefits for inclusion in the economic appraisal as defined by WebTAG, as they are not net impacts on the UK economy as a whole, the impact of the scheme on the local economy will be substantial:

- The SMaRT scheme is support employment development across Slough creating **4,754 FTE** jobs and generating an annual GVA of over **£229 million**;

- SMaRT will also enable significant residential development along the A4 corridor, helping to deliver **2,920** new residential units.

The evidence provided within this report proves that the monetised benefits which can be deemed to be having an effect on the public accounts can provide a **Very High Value for Money** category based on BCR. This categorisation is confirmed when the reliability benefits and significant local economic and social benefits are added.

Delivering the scheme

Extensive work has already taken place to ensure that the mechanisms for delivering the scheme are in place, from initial conception right through to construction and maintenance. The project is overseen by a steering group known as the Project Board which includes the Lead Cabinet Members responsible for transport, the Senior Responsible Owner (SRO) who is responsible for the delivery of the project and the Section 151 Officer.

The planning of the SMaRT scheme has run in-line with the BLTB Assurance Framework procedures. The following key milestones for SBC and BLTB/LEP signoff are shown below:

- Decision by BLTB/Thames Valley Berkshire LEP Board on commitment of funding: July 2014;

- Contract between BLTB LEP and scheme delivery body produced and signed: September 2014;

- Detailed design approval (SBC): March 2015;

- Planning permission: April 2015

- Construction tender contract awarded (SBC): September 2015;

- Sign-off of construction duties (SBC): August 2016.

These milestones have been built into the project programme and will be monitored by the SBC Project Manager and reported to the Project Board.

Financial and commercial considerations

The total scheme **outturn cost**, on which this business case for funding is based, is **£8.09 million** including inflation and risk but excluding optimism bias. This is based on:

- £0.34 million of preparation costs;

- £1.10 million for land aquaistion;

- £6.62 million for scheme construction, supervision and other works.

The funding package for the scheme is made up of:

- £5.560 million of funding from the Berkshire Local Transport Body; and

- £2.53 million of funding from Slough Borough Council's capital scheme programme.

The preferred procurement strategy for delivery of the scheme is through using a traditional fixed price construction contract awarded through the standard NEC 3 contract model.

1. Introduction

Slough Mass Rapid Transit (SMaRT)

1.1. Slough is one of the six unitary authorities within the Thames Valle Berkshire (TVB) sub-region which forms one of the UK's most important economic sub-regions for both national and international trade. A number of high-end technology, industrial and service companies wish to expand or move into the sub-region. Slough in particular is a key growth area for business and residents owing to its proximity to Heathrow and London.

1.2. The Slough Mass Rapid Transit (SMaRT) scheme is a continuation of improvements being made by Slough Borough Council to increase the level of accessibility to, from and around the town for residents, employees and visitors. Without the investment required to both improve sustainable transport and to mitigate the existing and forecast levels of congestion in Slough, there is concern that the viability of the ambitious employment and residential development, required to fulfil the sustainable economic growth objectives of the TVB sub-region, will be hampered.

1.3. The implementation of the SMaRT scheme will make a significant contribution to enabling the creation of **4,754 new direct full time jobs** for the TVB region within the six years period covered by the TVB Strategic Economic Plan and will provide a sustainable transport environment which makes it easier for businesses and employees to travel to, and for work. Once full occupied these new jobs will generate an annual increase in GVA of over **£229 million.**

1.4. A further **2,092** new indirect full-time jobs will be generated within the local and national supply chain in the same timeframe.

1.5. SMaRT will support the ambitious housing growth identified for Slough across the next six years. Over **2,900** new housing units are planned at the Thames University site, Queensmere, Castleview and at various office conversions in the town centre.

1.6. The SMaRT scheme is predicted to generate significant journey time savings for transport users with a more frequent public transport service, which as a result of associated junction works and bus infrastructure will be more reliable.

1.7. The appraisal of the SMaRT scheme's Value for Money will therefore focus on the following objectives:

Table 1.1 Key objectives of the SMaRT scheme

Key objectives of the SMaRT scheme	
1	Provide a high quality, safe, convenient and reliable alternative to the car and improve public perception of transport in Slough
2	Alleviate the severe congestion on the A4 corridor by allowing better flow of traffic
3	Minimise the impact of noise and air pollution and greenhouse gases on the A4 corridor
4	Support economic development in Slough and Heathrow and contribute to tackling deprivation

1.8. The SMaRT scheme is a combination of:

- Highway infrastructure measures aimed at delivering journey time and reliability performance of bus services while also improving efficiency of operation of the highway network for general traffic as a whole; and
- Consequential and complementary improvements to bus service provision facilitated by the infrastructure improvements to be implemented.

Background to the SMaRT Business Case

1.9. Following the devolution of major transport scheme funding from the DfT, Slough Borough Council (SBC), as part of the Berkshire Local Transport Body (BLTB) along with Bracknell Forest, Reading, West Berkshire, Windsor and Maidenhead and Wokingham Councils and the TVB Local Economic Partnership (LEP), were asked to prepare business cases for proposed schemes which would deliver the transport infrastructure critical for realising growth and developments identified in the Core Strategy.

1.10. In January 2013, the BLTB issued a Founding Document which set out the principles and arrangements for the BLTB to follow when allocating funding amongst the applicants. This was superseded by a revised version in November 2013 and included a five-step process for prioritising the schemes submitted by the BLTB members. This process is outlined in Table 1.2 below.

Table 1.2 BLTB programme management

Founding document process	
1	Unapproved or Long List of schemes. We will invite councils, the LEP (and other bodies in limited circumstances) to submit unapproved schemes for consideration. These will either be; refused, referred back for further development or accepted into the Programme.
2	Programme Entry Stage. Acceptance into the Programme signifies only that we will give a scheme further detailed consideration. The scheme proposer will develop a full Transport Business Case in line with current DfT guidance and this will be subject to independent assessment and public scrutiny before a scheme can be considered for Approval. In addition, in order to demonstrate value for money, all schemes will be developed in accordance with current WebTAG guidance published by DfT, and this assessment will also be independently scrutinised.
3	(optional) In appropriate circumstances, a scheme may be given Conditional Approval (e.g. conditional on securing a financial contribution from s.106 or similar source).
4	Where a scheme can demonstrate high value for money and receive a positive assessment, and have this validated by the independent appraisal, it may become an Approved scheme. In other cases it may be deleted from the Programme, or referred back for further development, but retain its place in the Programme.
5	Approved schemes will be subject to formal agreement about roles, responsibilities, reporting and auditing between the BLTB and the Local Transport Authority promoting the scheme.

1.11. In June 2013, SBC submitted a total of seven schemes to the BLTB to be considered on the long list of schemes. Three of these schemes were constituent phases of the Slough to Heathrow Mass Rapid Transit:

- Slough to Heathrow Mass Rapid Transit Phase 1 - western section: Provision of segregated bus lanes along the A4 corridor to serve Slough Trading Estate and support the development of a mass rapid transit connection between Slough and Heathrow;

- Slough to Heathrow Mass Rapid Transit Phase 2 - central section: Scheme to provide a series of bus priority measures along the A4 corridor in central Slough to support the development of a mass rapid transit connection between Slough and Heathrow; and

- Slough to Heathrow Mass Rapid Transit Phase 3 - eastern section: Provision of a segregated bus lane along the A4 Colnbrook Bypass to support the development of a mass rapid transit connection between Slough and Heathrow.

1.12. The first two phases (western and central sections) were included within the eight schemes selected for the short-list which was to be taken forward into step 2 of the programme management process. The two phases were ranked as the joint fifth priority for investment. The Eastern section was placed lower in the priority list and this scheme was therefore not approved for Programme Entry. Development of further analysis for this scheme has been deferred for the time being. The BLTB application forms submitted for the western and central sections are contained in Appendix A.

1.13. In March 2014, the TVP LEP published their Strategic Economic Plan (SEP) which defined schemes and measures which would help deliver the TVB sub-region's aspiration growth in employment, housing and skills. Phases 1 and 2 of the Slough Mass Rapid Transit scheme were included, as a combined scheme (and now referred to as Phase 1), as one of the identified measures in Package D-iii: Enhancing Urban Connectivity.

1.14. In response to the SEP, Slough Borough Council have chosen to bring forward the western and central sections of the Slough to Heathrow Mass Rapid Transit as a combined scheme for the remainder of the BLTB process with a funding request of **£5.56 million**.

Purpose of this document

1.15. This document is intended as the Full Business Case submission for Step 2 of the BLTB Founding Document process for the combined western and central sections of the SMaRT scheme. The document provides details of the progress made on developing the scheme and how it will be managed through to implementation.

1.16. The aim of this document is to present the five-case model Business Case for the revised SMaRT scheme to the BLTB who is reviewing the applications for funding.

Structure of the document

1.17. This report is structured in accordance with the Department for Transport's guidance on Transport Business Case, which was updated in January 2013. Following this Introduction, the remainder of the document is structured as follows:

- Chapter 2 provides a description of the scheme design;

- Chapter 3 states the *Strategic Case*;

- Chapter 4 presents the *Economic Case* including the Value for Money Statement

- Chapter 5 outlines the *Financial Case*;

- Chapter 6 details the *Commercial Case*; and

- Chapter 7 provides the *Management Case*.

2. Scheme description

The proposed SMaRT scheme

2.1. The A4 forms the spine of a 12 km strategic public transport corridor that links Maidenhead, Slough and Heathrow and plays an important role in providing surface access to the airport.

2.2. The Slough Mass Rapid Transit (SMaRT) project focuses on a 6.7km section of the A4 corridor between the junction of Dover Road to the west of Slough town centre, and the junction with High Street Langley approximately 300m from the M4 Junction 5.

2.3. The SMaRT scheme consists of two sections which broadly align to the Western and Central phases from the original BLTB submission document.

2.4. The SMaRT scheme will enhance connectivity and accessibility between a number of key trip attractors and generators, reflecting the criticality of the A4 corridor as a section of route for journeys in the sub-region:

- The Slough Trading Estate is one of the largest business parks in Europe, consisting of 486 acres of commercial property to the west of Slough town centre and immediately north of the A4 Bath Road. There are over 450 businesses on the site employing over 20,000 people. SEGRO, the owners of the trading estate, have planning permission to expand the site with over 150,000m^2 of office, leisure and amenity space, 48,000m^2 of which is programmed to t be implemented in the six years between 2015/2021. This alone could lead to the creation of over 4,000 additional jobs;

- Slough town centre is recognised as a regional shopping centre, however in recent years it has lost trade to other competing centres. To counter this downturn, a £450 million regeneration project known as the Heart of Slough has been ongoing since 2010. Since then, traffic management on the A4 has been radically changed to resolve issues of severance; in addition to highways works, a new bus station has been built and the rail station access improved. Several developments are planned for the Heart of Slough and the rest of the town centre which will deliver a further 60,700m^2 of office space, and 2,700 new residential units within the next six years;

- London Heathrow airport is one of the largest international airports in the world; in 2013, 72 million passengers and 1.4 million tonnes of cargo passed through the airport. Following the opening of Terminal 5 (less than 7 miles from Slough town centre) in 2008, annual passenger numbers are expected to increase to 86 million by 2014 and eventually reach 90-95 million.

Key bus infrastructure elements of the SMaRT scheme

2.5. Figure 2.1 provides a summary diagram of the proposed improvements to be introduced in the SMaRT scheme.

Phase 1 Central Section

2.6. The Phase 1 Central Section of the scheme (as shown in Dwg SBC/T/IT/00248/000/015 in Appendix B) runs from the A4 Wellington Street junction with the Tesco Store Access to the A4 London Road junction with the High Street Langley.

2.7. In the eastbound direction of the Central Section the SMaRT scheme will:

- Widen the carriageway for 60m on the approach to the Tesco access to allow for a larger stacking capacity;

- Create carriageway build outs to help with realignments at the A4 Wellington Street and Wexham Road crossing;

- Widening the carriageway to increase stacking capacity to turn North and South at the A4/A412 Uxbridge Road junction;

- Widen the carriageway for 300m to accommodate a dedicated bus lane starting from Upton Court Road up until High Street Langley. Westbound, it is proposed to widen the road and extend the existing bus lane from Cedar Way to existing bus lane at Cedar Way.

2.8. In the eastbound direction of the western section the SMaRT scheme will:

- Widen the carriageway for 70m between the junction with High Street Langley Ditton Park Road; and

- Extend the existing bus lane from Cedar Way to Drake Avenue.

Phase 1 Western Section

2.9. The Phase 1 Western Section of the scheme (as shown in Dwg SBC/T/IT/00248/14 in Appendix B) runs from the A4 Bath Road junction with Dover Road to the A4 Bath Road junction with the A355 Farnham Road/ Tuns Lane.

2.10. In the eastbound direction of the Western Section the SMaRT scheme will:

- Realign bus routes to the service road between Dover Road and Galvin Road which runs parallel to the A4 Bath Road thereby avoiding congestion and queues on the A4;

- The service road will be bus only access from the west, with the Dover Road junction amended to include yellow box markings to remove the potential delay for buses;

- Existing parking along the Service Road will be removed (through application of Traffic Orders) and waiting and loading restrictions added along the whole road;

- Bus stops will be relocated onto the service road, providing direct access to the businesses in the Slough Trading Estate. Existing bus stops lay-bys on the A4 will be filled in;

- Widen the A4 Bath Road carriageway for 150m between 172-184 Bath Road to the junction of Salt Hill Avenue to facilitate a westbound bus lane. This requires:

    - the transfer of land to the front of 172-184 Bath Road as part of the S106 agreement for planning application P/01766/022;

    - transferring a piece of land (to the front of 150-160 Bath Road) owned by SBC which will require a planning application for change of use; and

    - purchase of two plots of privately owned land (hardstanding to the front of 142 Bath Road and to the front of Kingsmead House).

- Aside from being able to widen the carriageway, it is proposed that the remaining land (along with council owned land in between) will be developed by SBC as housing development land;

- Within the transferred and purchased land a one-way bus only lane will be created providing access from the service road (east of Galvin Road) back onto the (widened) A4 Bath Road;

- A 110m section of carriageway on the A4 Bath Road between the junctions of Dover Road and Twinches Lane, and 140m between Ipswich Road and Leigh Road is to be widened to allow for longer approach lanes to signalised junctions;

2.11. In the westbound direction of the western section the SMaRT scheme will:

- Widen the carriageway for 100m leading up to Leigh Road junction, and for 60m after the junction to allow for two ahead lanes and one dedicated right-turn lane;

- Create a140m long segregated bus lane which bypasses the Ipswich Road junction.

Associated traffic signal infrastructure elements

2.12. In addition to the highways works, a number of existing signal sites along the A4 corridor will be improved. At this time, a full assessment of existing signal infrastructure condition has not been undertaken. Whilst some junction signals are known to be outdated and a cost for replacement included in the scheme cost, at other sites, a do minimum cost (i.e. no replacement of equipment) has been used and an associated uplift has been included in the risk register:

- Cedar Way pedestrian crossing – signal pole relocations and new/relocated controller;
- Upton Court Road wig wags – new signal controller and pole (or possibly removed);
- Wexham Road – new dual pedestrian crossing;
- Sainsbury's Roundabout junction – Install ducting to facilitate conversion to MOVA control;
- Tesco Roundabout junction – Replacement of controller to facilitate introduction of MOVA/SCOOT control;
- Ledgers Road junction – Conversion to MOVA control;
- Montem Lane - Conversion to MOVA control;
- Thirkleby pedestrian crossing – Relocation of signal pole and cabling;
- Twinches Lane junction – Equipment removal following closure of northern arm, re-cabling and some pole relocations. Conversion to MOVA control;
- Ipswich Road junction – Addition of box junction. Some relocation of poles due to widening;
- Dover Road junction – Kerbline adjustments require relocation of poles, cabling and detection equipment. Conversion to MOVA.

Bus service alteration proposals

2.13. Appendix C contains a technical note examining the proposed bus service alterations in detail. In summary, the MRT bus service is based on revenue generated by:

- An increase in frequency across the route as a whole – in effect, so the impact of increasing the frequency from one bus every 15 minutes (up to every 18 minutes at peak) to one bus every 10 minutes throughout the day. This includes the effect of moving to a 'clockface' timetable – so moving from a position where at peak times passengers need to consult a timetable to one where the times conform to a repeating and therefore memorable pattern; and
- An increase in the number of passengers utilising public bus services to access employment on the Trading Estate. This is as a result of the improved frequency described above, greater awareness of affordable means of bus travel and improved awareness of the bus service product.

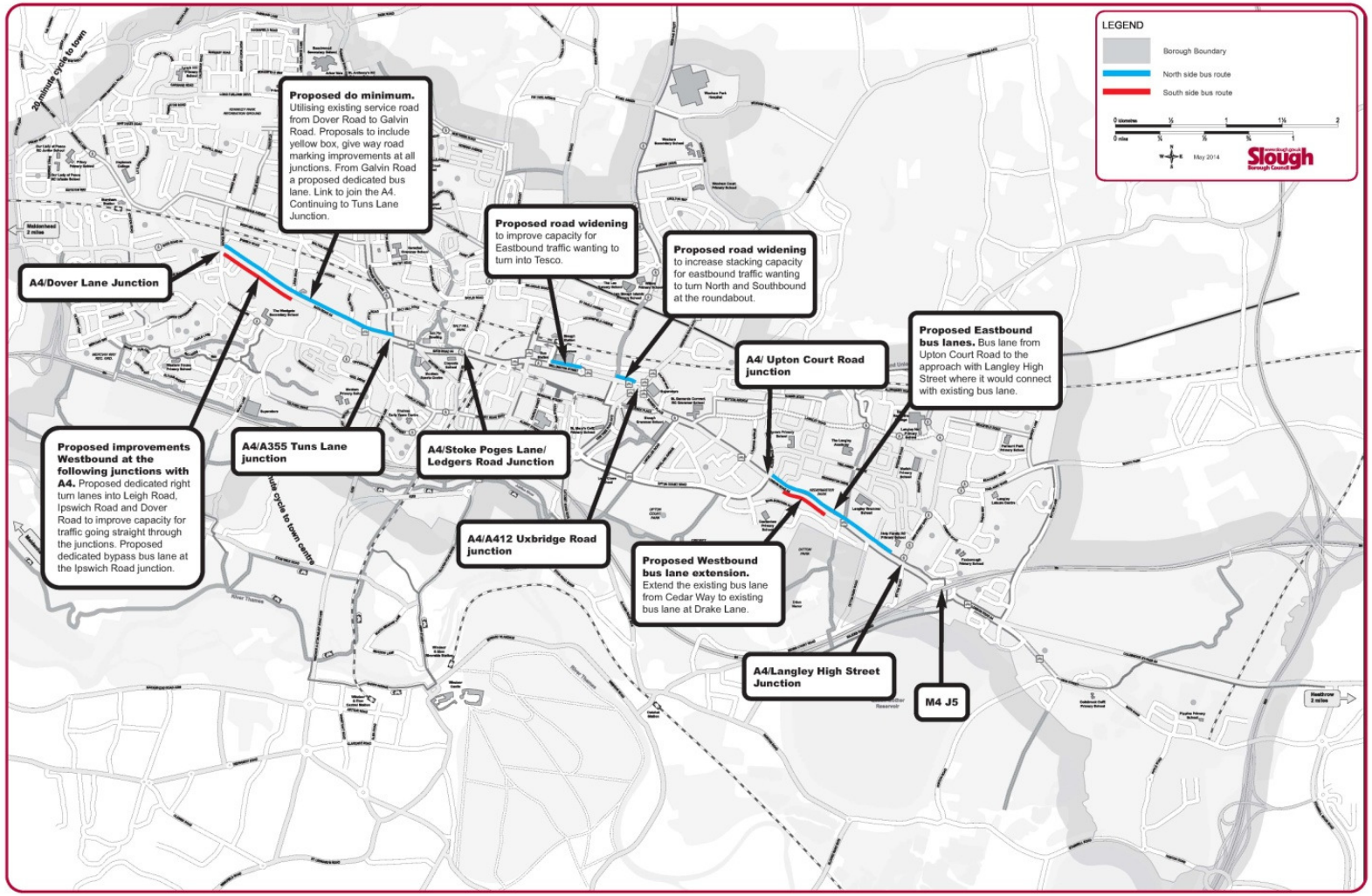
2.14. In the first case, Stagecoach's experience in Perth of doubling frequency, introducing low floor buses and a targeted marketing campaign supported by a simplified fare structure was a 56% increase in ridership recorded over 2 years. This led to a series of 'Kickstart' funding rounds in which the primary focus was the delivery of frequency enhancements. In one such case, aimed at commuting trips into Exeter, growth in trips by bus was around 50%, with 36% previously using car or motorcycle (Devon County Council, 2006).

2.15. In the second case, Slough Borough Council and First in Berkshire have implemented measures to improve the attractiveness of bus services along the Bath Road corridor as part of the Better Area Bus Fund, particularly to those currently unfamiliar with bus services and for whom it therefore needs to be made as easy as possible to try the bus:

- New diesel-electric hybrid buses;
- Real Time Passenger Information screens at Slough Bus Station and at all stops on the Bath Road; and
- New bus stop flags showing the bus stop name, route numbers and direction at all stops on the Bath Road.

2.16. As with the Better Area Bus Fund scheme, First Berkshire Group acknowledge the benefits that the SBC and BLTB funding of the SMaRT scheme will provide, and are keen to match those benefits with investment of their own, feeding back cost and time savings from enhanced reliability and journey times into the bus network. In the case of the SMaRT scheme, First Berkshire Group will invest the necessary funds to pay for enhancement in service frequency along the route. A letter of support is contained within Appendix D.

Figure 2.1 Scheme overview



Complementary measures

2.17. As proof of the commitment of SBC to make Slough a better, more accessible and more sustainable town; the SMaRT scheme is just part of a wide ranging set of schemes which have already been delivered, are under construction or are planned in Slough. All of these schemes have the aim of improving accessibility in Slough through providing a safe and reliable sustainable transport network whilst reducing congestion, and enabling economic growth through development and reducing costs of travel for businesses, workers and residents.

2.18. In 2012, work was completed on the £12.5 million Heart of Slough Infrastructure Improvements scheme which rejuvenated the town centre highway network, reducing severance through providing better pedestrian and cycle routes and improving access to Slough Rail Station.

2.19. The £1 million Farnham Road (A355) Route Scheme is currently under construction, and will provide bus lanes, junction improvements and pedestrian and cycle facilities along the A355 between Buckingham Avenue East and the A4 Bath Road.

2.20. Included within the Package D-iii of the TVB Strategic Economic Plan is a scheme which will see the continuation of the A355 improvements south of the A4 Bath Road junction to the M4 at a cost of £4.7 million. The scheme will include remodelling of the Copthorne Roundabout, signal and junction improvements and bus priority measures to improve accessibility to the town and the Slough Trading Estate.

2.21. Funding has been secured from the DfT's Better Area Bus Fund, and complemented with £500,000 of SBC contributions to improve conditions along the Route 78 bus corridor. The route which runs from Britwell to the north-west of Sough to Heathrow Terminal 5 uses a significant portion of the A4 through Slough. The BABF scheme will provide:

- Upgraded current traffic signals with modern technology based on SCOOT and MOVA incorporating Selective Vehicle Detection to give buses priority; and
- Selected bus lane implementation where these are easy to implement and give clear benefits to buses.

2.22. Slough Borough Council has also filled in two bus stop laybys on the Bath Road to improve bus journey times, and has effected major improvements to traffic flow at the Three Tuns junction. Further works being undertaken under Better Bus Area Fund will improve bus journey times and punctuality between the Trading Estate and Langley.

2.23. Slough Borough Council has found in its engagement with businesses that there is support in principle for fares offers or initiatives to make public buses easier to use. This included telefonica (O2) in a meeting earlier this year. This business case submission puts forward a scenario based on maximising use of current best value fares (PlusBus) and ignores the possibility of further improvements through salary sacrifice schemes, for example. It also ignores the improvements First are making to ticket retailing from this summer, with the introduction of mobile phone-based ticketing. This will make it easier for passengers to buy or renew period-based tickets and will enable First to introduce new products aimed particularly at those travelling to a place of work on a part-time basis, such as carnets. We expect this particularly to benefit employees on the Trading Estate and will aid the transfer of existing shuttle bus users to public transport.

2.24. SBC has recently been awarded further revenue funding in 2015/16 under its LSTF to continue to implement sustainable travel measures. It is planned that this will support the efforts in convincing businesses that the benefits which the SMaRT scheme will provide would be a more cost efficient service than the existing shuttle buses. It has developed a suite of leaflets specific to each business on Bath Road that explain public transport options to employees, including the low-cost fare options available to rail/bus passengers through 'PlusBus'. These will be updated as improvements to bus services are made. The LSTF will also help to develop further measures to make buses easier to use, including 'next stop' audio-visual announcements on bus.

Managing the impact of construction

2.25. Construction of the SMaRT scheme is programmed to start in June 2015 (for stats diversion with construction of the infrastructure beginning in January 2016) and finish by August 2016.

2.26. Included within the planning application which is scheduled January 2015, *A Construction Management Plan* will be developed to protect the interests of local residents, businesses and the general public in the immediate vicinity of the construction works. The code will seek to minimise impacts, such as noise, vibration and traffic, during the period of construction. It is expected that the appointed contractor (and SBC as the promoter) will be required to comply with the Construction Management Plan as an obligation of the planning conditions.

3. The strategic case

Area description

3.1. Slough is a dense urban environment bounded by green belt, situated in the east of Berkshire and in the Thames Valley Berkshire sub-region. Slough is a thriving multicultural town in close proximity to Heathrow airport and London with excellent transport and communication links which account for its importance and success as a commercial centre'. Slough is a major employment centre with around 4,500 businesses providing 82,000 jobs.

3.2. Slough is well connected by road, dominated by the A4 which runs east-west through the centre of Slough, and the M4, which runs east-west to the south of the town.

3.3. The town centre is well served by buses and has approximately 75,000 bus journeys each week. Bus passenger numbers on the A4 between Slough and Langley, for example, are as high as those in the town centre itself. Eight hourly First bus services and five hourly Transport for London (TfL) bus services operate along the A4 corridor with a journey time of between 20 and 38 minutes, depending on whether the bus runs along the A4 throughout, (Route 77), or via Langley village (routes 75, 76 and 78) or via Colnbrook village (Route 81). Appendix E contains the bus map for Slough.

3.4. In terms of rail, the Great Western Mainline service serves the main Slough rail station, Langley, in the east and Burnham, in the west. Services between Slough and London (Paddington) are relatively frequent, (approximately six trains per hour). The fastest journey times to Paddington are approximately 20 minutes.

Socio-Economic Characteristics of Study Area

3.5. The 2011 census indicates that Slough has a population of 144,000. Various socio-economic problems have been identified in the borough, including:

- 20.8% of households show 'overcrowding' compared to just 8.5% across England and Wales;
- Slough's average household size is 2.8 people per household - the second highest across England and Wales;
- Almost 25% of households do not own a car. Of those that do, single car ownership is more common in Slough than across the rest of the nation;
- Of residents aged 16 to 74, 73.4% (73,819 people) are economically active; 26.6% are economically inactive (compared to 30.3% across England and Wales); whilst 2.1% of the workforce is unemployed;
- 20.1% of Slough residents aged 16 and over hold no qualifications. An above average percentage (14.7%) hold Level 1 qualifications, with lower than average possession of higher levels. 13.7% of residents hold 'Other qualifications', reflecting the high level of non-UK immigrants; and
- 9.1% of our residents are aged 0-4 years old. This is the second highest proportion of any of the 348 local authorities;

Importance of the Heathrow Airport - Slough Relationship

3.6. London Heathrow airport is one of the largest international airports in the world; in 2013, 72 million passengers and 1.4 million tonnes of cargo passed through the airport. Following the opening of Terminal 5 (less than 7 miles from Slough town centre) in 2008, annual passenger numbers are expected to increase to 86 million by 2014 and eventually reach 90-95 million.

3.7. Heathrow has two major impacts on the economy of Slough. Primarily this is seen through the airport generating significant employment directly, in the form of on-site workers, and secondly through indirect supply chain linkages. The town's close proximity to the airport makes it a prime location for multinational industry.

3.8. In 2010, a survey was conducted to investigate Heathrow's labour market and found that Slough provided over 4,000 direct on-site employees. Further economic analysis estimated that a further 1,500 jobs off-site indirect jobs associated with the airport were taken by the residents of Slough.

Business strategy

National transport priorities

3.9. The Government has long-term objectives aimed at improving the economy, environment and society. These are the three tenets against which major transport infrastructure projects are assessed, and will continue to be assessed in future.

3.10. In its National Infrastructure Plan 2011, the Government presented its vision for the UK transport system:

- Transport infrastructure can play a vital role in driving economic growth by improving the links that help to move goods and people around and by supporting the balanced, dynamic and low-carbon economy that is essential for future prosperity.
- Local transport systems must enable suburban areas to grow. The transport network must support good value and rapid movement of goods around the country. The transport system must be efficient but also resilient and responsive to infrequent and unexpected pressures.
- Airports and ports are the gateways to international trade and the Government will work to improve the road and rail connectivity to major ports and airports.

3.11. These elements of the vision can be seen as being of direct relevance to the SMaRT scheme, which aims to reduce congestion, improve links to Heathrow Airport and enable to the growth of Slough.

Regional transport priorities

3.12. **Error! Reference source not found.**In March 2014, the Thames Valley Berkshire LEP submitted their Strategic Economic Plan (SEP).

3.13. Within the six year period covered by the SEP (2015/16 to 2020/21) several considerable employment developments are planned on the Slough Trading Estate, which sits within the Heart of Slough. The development amounts to 108,000m^2 of office space along with ancillary retail, food and accommodation. In addition, 2,920 residential units are programmed over the same time period.

3.14. The SEP document outlines the case for the necessary investment to infrastructure, enterprise and employment that is required for the Thames Valley Berkshire region's economy to continue its successful upward trajectory.

3.15. Six *packages* for infrastructure investment have been identified within the SEP. SMaRT is directly referenced in several of the packages; however it is clear that the scheme will also help to deliver benefits related to each of the other infrastructure packages.

3.16. In addition to the infrastructure benefits the SMaRT scheme will provide, it will also aid the delivery of the SEP's business and education programmes across Slough.

3.17. Table 3.1 summarises how the SMaRT is a key element of being enabling the delivery the SEP's programmes and packages.

Table 3.1 TVP LEP Strategic Economic Plan

Strategic Priority	How will SMaRT contribute?
Unlocking housing development	To combat the issues of congestion in Slough, new housing developments are to be taken forward with restrictive measures on the availability of parking. Ensuring the market viability of some 2,800 new units in the town centre (planned over the 6 years to 2021) therefore requires investment in sustainable transport to provide sufficient levels of accessibility for new residents. To the east of Slough, development at Castleview, Langley will generate a further 220 residential units and will be served directly by public transport along the A4.
Enhancing urban connectivity	The SMaRT scheme is named directly as one of the key priorities for providing an enhanced level of connectivity within the TVB. The scheme also acts as a continuation of the recent delivered and planned works for improving the sustainable transport throughout the town, not least the LSTF and Better Area Bus Fund.
Encouraging vibrant town centres	Where the Heart of Slough town centre scheme has sought to improve public realm and deliver development in the town centre; the SMaRT scheme will help to improve accessibility for those wishing to travel to the town for leisure and shopping. It also provides a better alternative to car travel thereby reducing the volume of traffic and improving the sense of place.
Foundations for future growth	The eastern section of SMaRT is referenced as being a key building block for ensuring future sustainable growth, enabling modal shift and reducing congestion.
Enhancing the strategic transport network	The SMaRT scheme includes a number of improvements at signal junctions, installing MOVA control which deals with variable traffic patterns in a more efficient manner. These improvements will aid business access to the strategic routes of the M3 and M4. With the planned introduction of Crossrail and Western Rail Access to Heathrow (WRAtH) coming to Slough in 2019 and 2021 respectively, the SMaRT scheme will provide a fast link into Slough Station.
Enterprise, innovation and business growth programme	Mitigating for planned employment growth on the Slough Trading Estate and within the Heart of Slough is fundamental to the success of the regeneration projects and the SMaRT scheme will maintain the strategic connectivity advantages to workforce within the UK and internationally via Heathrow.
Skills education and employment	The SMaRT scheme will improve accessibility between the areas of higher unemployment or social deprivation and the areas of job market growth in Slough and at Heathrow Airport.

Local transport priorities

Slough Local Development Framework

3.18. There are clear linkages between the SMaRT scheme and several of the policies within Slough's Local Development Framework (Core Strategy 2006 – 2026):

- Core Policy 5 governs the location of employment development within Slough. The A4 provides a strategic route to Slough Trading Estate and the Heart of Slough which have been identified as the primary locations for new employment, and existing congestion is seen as a barrier to growth;

- Core Policy 7 (Transport) seeks to improve road safety and air quality. The combination of a reduction in vehicle speeds, high quality resurfacing and the installation of traffic signals provided by the scheme will provide a higher level of safety at and around the junction. Through relieving congestion and reducing the stop-start nature of vehicles the scheme will have a beneficial impact on air quality; and

- Core Policy 10 states that development will only be allowed where there is sufficient existing, planned or committed (transport) infrastructure. Relieving congestion on the A355 will assist in providing a suitable transport system for which to realise the implementation of the Slough Trading Estate Masterplan.

Slough Local Transport Plan 3

3.19. Table 3.2 details the linkages between the strategic objectives and the transport outcomes identified within Slough's Local Transport Plan 3. Each of the objectives is shown to support the delivery of number of outcomes.

Table 3.2 LTP 3 objectives and outcomes

Transport outcomes / LTP3 objectives	Less unnecessary movement of people and goods	Travel by sustainable modes is more attractive than travel by private car	Stop/start traffic conditions minimised % journey times more reliable for all modes, including freight	Better public transport connectivity to jobs & services within Slough and beyond, especially from deprived areas	Public transport more accessible to disadvantaged people	An integrated, high quality, public transport network	Safer roads, walking cycling and public transport	Reduced impacts of travel on our communities	Reduced impacts of travel on our natural environment & heritage
Reduce transport's CO2 emissions & make the transport network resilient to the effects of climate change	✓	✓	✓	✓	✓	✓			
Mitigate effects of the transport system on the natural environment, heritage and landscape									✓
Reduce traffic accidents involving death or injury	✓						✓		
Minimise the opportunity for crime, anti-social behaviour & terrorism & maximise personal safety							✓		
Protect and improve personal health	✓	✓	✓				✓		
Minimise the effect of high levels of noise								✓	
Achieve better links between neighbourhoods and to the natural environment		✓		✓	✓		✓		
Improve the journey experience of transport users					✓	✓			
Ensure that transport helps Slough maintain its economic competitiveness	✓		✓	✓		✓	✓		
Facilitate the development of new housing	✓	✓	✓	✓				✓	
Make sustainable travel options accessible to all					✓		✓		
Enhance social inclusion & regenerate deprived areas				✓	✓			✓	

Problem identified & drivers for change

3.20. The 'key issues' for Slough, as identified by the Slough LDF (2006 to 2026) are:

- Overcrowding and congestion;
- Viability and vitality of the town centre and other key areas;
- The need to improve the image and environment of Slough; and
- Socio-economic characteristics;
  - Shortage of affordable housing and family housing;
  - Skills mismatch;
  - Pockets of deprivation; and
  - The need to plan for diversity.

Overcrowding and congestion

3.21. Slough's LTP 3 identified a number of challenges for Slough. Key areas of concern are as follows:

- Residents rely heavily on cars for their daily travel and this adds to traffic congestion and emissions of carbon and reduces the viability of bus services and contributes to poor health through lack of exercise;
- Many people living in Slough travel out of the town for work and access by public transport is poor compared to the private car;
- The growing traffic congestion problems have the potential to ultimately damage the local economy. Traffic levels outside the peak are rising, affecting the reliability of off-peak journey times, potentially threatening one of Slough's attractions for retail opportunities;
- Air quality in parts of the town is poor and could get worse. Slough compares poorly in comparative studies for natural environment quality, suffering from congestion, noise and poor air quality which are worsened by the proximity of Heathrow and motorways. Traffic is the main contributor to high levels of pollution in Slough town centre, and along the A4, particularly the London Road Section close to junction 5 of the M4; and
- Important places in Slough, like schools and colleges, the university, the industrial estates and major employment sites and the hospital find it harder and harder to cope with car access and traffic difficulties.

Viability and vitality of the town centre and key areas

3.22. Key areas of concern are as follows:

- Despite being recognised as a regional shopping centre, studies indicate that Slough is losing trade to competing centres. There are also around a million square feet of empty offices needing refurbishment;
- There is a need to ensure that Slough residents can take advantage of the opportunities available at Terminal 5 and any future airport expansions through transport provision and skills development. Following a consultation in 2005, a greater need to consider the needs of those who cannot access mainstream bus services was identified;
- In order to serve Heathrow, there is a need for more bus services – particularly to Heathrow Terminal 5 and Wexham Park Hospital. Heathrow airport is identified as being difficult to get to, particularly for shift workers at evenings and weekends and for those without a car. The LTP identifies the issues that have the best combination of need and the ability to act for the benefit of the largest sector of Slough's population as being access to Wexham Park hospital, and access to employment sites in and around Slough;

- There is also a need to improve access to Slough Trading Estate (SEGRO), including both employment and visitors transferring from transport hubs (Slough rail station and Heathrow Airport).

The need to improve the image and environment of Slough

3.23. Concerns are as follows:

- Consultation[1] demonstrated that in general, a poor perception of 'transport' in Slough prevails, for all modes. Other consultation with council members and stakeholders, found that there was a poor perception of safety and security at bus stops and on buses;

- The dual carriageway and traffic levels on the A4 cause severance and the pedestrian environment is described as poor; the underpass beneath the A4 is described as being an 'unpleasant and potentially threatening environment at any time of day'. The extent of perceived or actual severance varies, however the elderly, disabled and children are particularly vulnerable;

- Slough ranks poorly in comparative studies for natural environment quality, with a recent study[2] ranking the Borough at 350 out of 354. The Borough suffers from congestion, noise and poor air quality which are worsened by the proximity of Heathrow and motorways; and

- Crime levels are high in the Borough and there is a poor perception of personal security within the public realm.

Socio distributional issues in Slough

3.24. The key problems, issues and challenges associated with the study area are:

- A high level of socio-economic disadvantage prevails in Slough and includes some of the most deprived areas in the country (Figure 3.1). There is a need to ensure that Slough residents can take advantage of increased opportunities at Heathrow through improved public transport provision;

- Slough has a higher than average unemployment rate and that there is a requirement to provide a reliable level of accessibility to enable these Slough residents to access employment opportunities;

- The A4 accounts for a large percentage of road traffic accidents in Slough with 381 separate incidents recorded in the 5 years to March 2014; and

- The A4 causes severance and the pedestrian environment is poor in places.

The impact of not changing

3.25. Without the introduction of the measures proposed by the SMaRT scheme, congestion along the A4 in Slough will remain and become exacerbated by future traffic growth serving to further discourage new development and investment in the Slough Trading Estate and the Heart of Slough.

3.26. Specific outcomes of a Do Nothing case will include:

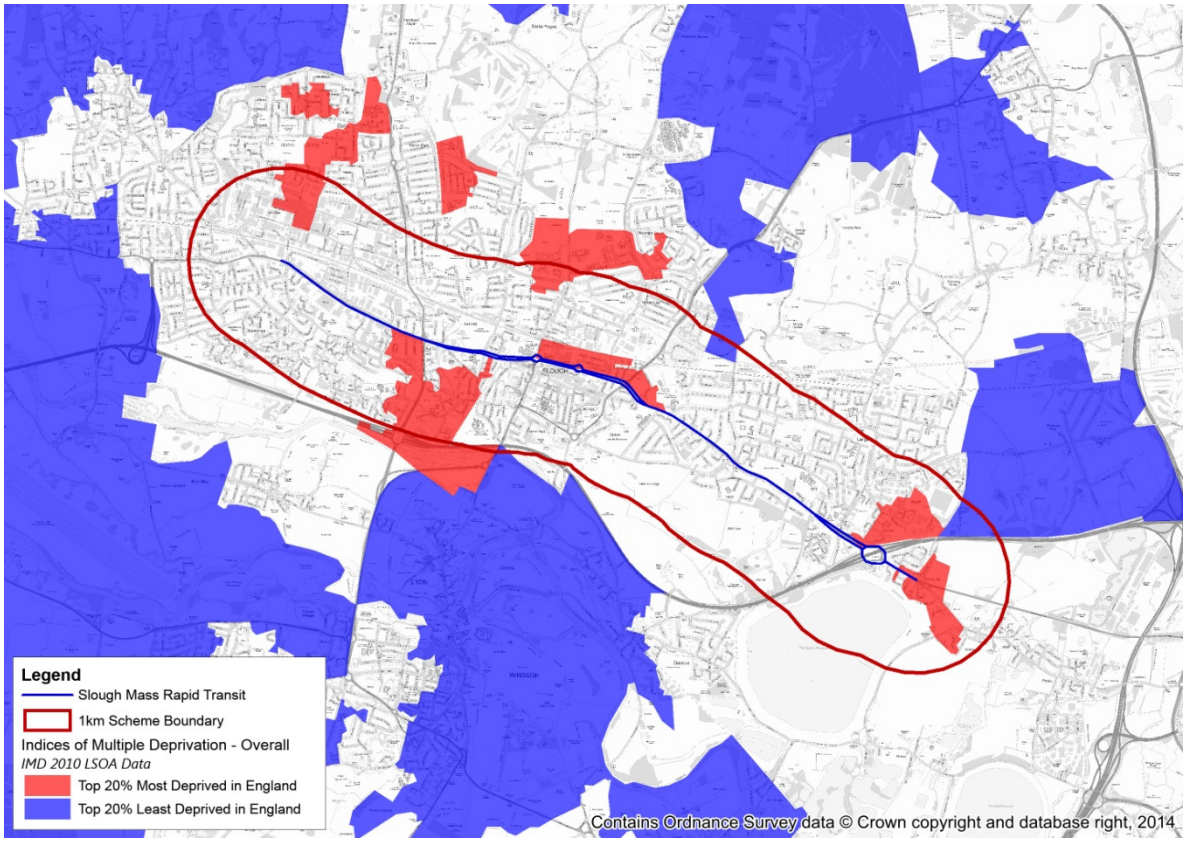
- The constraints of the existing transport conditions will act as an inhibitor to growth with private sector investment attracted to other areas with better accessibility;

- The A4's ongoing Air Quality issues will be exacerbated without the mitigation afforded by the scheme; and

1 LTP 2 (2006 to 2011) http://www.slough.gov.uk/documents/LTP2-ch1-8.pdf
2 Slough LDF (2006 to 2026) http://www.slough.gov.uk/documents/Adopted_Core_Strategy_16-12-08.pdf

- Sections of Slough's resident population will continue to be disadvantaged by restricted accessibility to jobs and services.

Figure 3.1 Deprivation levels by Super Output Area (Indices of Deprivation 2010)



Objectives

3.27. The scheme objectives have been defined to address directly the problems discussed earlier in this chapter. They align closely with the business strategies for the scheme promoters, the Local Economic Partnership and for Central Government – most obviously in terms of the Government's broad goals for transport.

3.28. The desired outcomes from each objective have been considered and are shown in Table 3.3.

Table 3.3 Objectives and desired outcomes

Objectives	Desired Outcomes
(1) Provide a high quality, safe, convenient and reliable alternative to the car and improve public perception of transport in Slough	Increase PT modal split Increase PT capacity Improve PT reliability Improve PT journey times Improve personal security Reduce casualty frequency and severity
(2) Alleviate the severe congestion on the A4 by allowing better flow of traffic	Improve (or keep to neutral) car journey times
(3) Minimise the impact of noise and air pollution and greenhouse gases on the A4 corridor	Reduce (or keep to neutral) carbon dioxide emissions and noise levels

Objectives	Desired Outcomes
(4) Support economic development in Slough and Heathrow and contribute to tackling deprivation	Support employment and housing development planned for Slough. Improve PT journey times between areas of deprivation in Slough and employment opportunities Provide regular PT frequency throughout the day, supporting shift workers Provide affordable transport Reduce unemployment in Slough

3.29. The A4 carries high volumes of traffic and like many busy roads experiences congestion and bottlenecks. This results in some of the worst environmental conditions in terms of air and noise pollutants. The proposal to improve public transport on the A4 corridor will:

- Improve bus service frequency, journey times, reliability and journey ambience;
- Improve accessibility for all, particularly in off peak periods;
- Encourage modal shift and would ultimately reduce congestion and its environmental impacts, aligning particularly; and
- Enhance the viability of the town centre and other key areas.

3.30. Reduced congestion on the A4 corridor will help to consolidate Slough as a commercial centre, complementing the Heart of Slough town centre regeneration scheme. If Slough is to compete with other regional centres then the increase in traffic and congestion on this route needs to be reversed, in order to attract investment and allow local residents an easy route to work in neighbouring boroughs, and vice versa.

3.31. Accessibility between the town and Heathrow Airport, a key employment area with strong links to Slough residents, would be improved, facilitating the airport's role as a regional and national gateway. Potential future expansion of the Airport will in part depend upon improving accessibility and achieving modal shift to public transport for workers / visitors and thereby reducing its carbon footprint. Achieving this, by improving the quality, coverage and frequency of services is an agenda shared by BAA.

3.32. As part of the Heart of Slough town centre development there is a transport vision for Slough to be a regional transport hub, and with this is a planned redevelopment of the area adjacent to the railway station, incorporating a new bus station as a focal element. The proposed bus improvements on the A4 corridor between Slough and Heathrow Airport will be a complimentary measure that will increase the accessibility of a major employment centre to residents of Slough, reducing journey times whilst improving quality and reliability of public transport in the area. The scheme will contribute towards improving the image of transport in Slough, helping to maintain Slough as a commercial centre.

3.33. In the six years covered by the SEP, an estimated 108,000m^2 of office space is planned for Slough generating over 4,700 direct Full Time Employment (FTE) jobs and over 2,000 indirect jobs for the local economy and beyond. The SMaRT scheme will improve accessibility for those workers, providing an alternative to car travel and reducing congestion which could otherwise threaten the investment required for that level of development.

3.34. Slough has been identified as an area with a relatively high level of unemployment, a high proportion of unskilled workforce and a high proportion of those without a car. Therefore improving accessibility for all and providing a step change in public transport provision, particularly in the off peak periods, will enable more Slough residents to benefit from a large existing and potentially expanding place of work at Heathrow Airport.

3.35. Slough has been shown to have a relatively high and mixed proportion of ethnic background people in the community. Some studies have shown that some ethnic minority groups are more likely to be associated with lower income and therefore, as described above, may more directly benefit from improvements to public transport and links to Heathrow airport.

Measures for success

3.36. Successful delivery against the scheme objectives will be monitored as part of the post-construction scheme evaluation, details of which are discussed in Chapter 7 (the Management Case) of this report.

3.37. A programme of monitoring will be put in place prior to construction, then again at one-year and five-year post construction. It is envisaged that monitoring will include before and after conditions in relation to:

- Traffic congestion and journey times;
- Public transport journey time and reliability;
- Public transport patronage;
- Road safety; and
- Accessibility.

3.38. Objectives relating to economic growth through investment in business and housing will be difficult to measure in the short-term, and cannot be directly attributable to this scheme in particular. However, longer term evaluation will seek to monitor economic, employment and housing growth.

Scope

3.39. A detailed scheme description outlining the scope of the SMaRT scheme is provided in Chapter 2.

Constraints

3.40. A number of potential constraints exist for the scheme and these have been dealt with or have planned mitigation throughout scheme development:

- The construction of SMaRT is scheduled to occur during the same period as other proposed works on the network. A Construction Management Plan will be submitted in support of the planning application to mitigate for the potential disruption caused by the combination of works;
- A number of mature trees along A4 Bath Road could be affected by the scheme. The scheme designs have been carried out to minimise the number of trees affected. A plan is in place to relocate or replace trees affected by the scheme;
- The project team have taken every effort to ensure that there are no technical, technological or buildability issues with the scheme design. The design team has recent experience of successfully designing similar schemes in Slough;
- The proposed scheme is essentially a Do Minimum option which will provide the strategic benefits required at the lowest cost.

Inter-dependencies

Interdependencies in project delivery and risk

3.41. A comprehensive list of risks has been prepared as part of the management case (Chapter 7). The delivery of the SMaRT scheme is dependent on these risks either not arising or being sufficiently mitigated so that scheme delivery remains unaffected.

3.42. A total of 67 risks have been identified. The list is exhaustive and in some cases there are certain risks for which the likelihood of their occurring, or their impact, is so low that the scheme cannot be defined as truly dependent upon their negation.

3.43. For the purposes of this section of the business case, therefore, it is sufficient to summarise the key areas of risk / dependency, with more detailed supporting information presented in Chapter 4.

3.44. The key inter-dependencies can be summarised as:

- Strategic issues: for example, changes in Government transport policy, or change of political will at the local level;
- Appraisal: changes in appraisal guidance, or in gaining formal 'sign-off' from BLTB may delay scheme delivery;
- Costs: changes in the costs of raw materials may affect the outturn costs of the scheme, although this should be adequately covered within the allowance for risk and optimism bias;
- Consultation: there is the potential for delays to delivery as a result of issues raised during consultation;
- Design; and
- Construction.

3.45. The development of a detailed risk log, and the time already devoted to mitigating some of these risks (e.g. through detailed modelling, appraisal and design work, early stakeholder and public consultation, and environmental assessment), means the risk to scheme delivery is relatively low. The project team will, however, continue to monitor these risks / inter-dependencies throughout scheme development to ensure the smooth delivery against the programme.

Stakeholders

3.46. The stakeholders being consulted as part of the scheme development are summarised below:

- Heart of Slough Partners;
- First Berkshire Bus Company;
- SEGRO (Trading Estate);
- Transport for London;
- Heathrow Airport;
- Royal Borough of Windsor and Maidenhead;
- Thames Valley Berkshire Local Enterprise Partnership.
- Local residents;
- Land agents / owners / tenants; and
- Local user groups e.g. cyclists, walking and disability groups.

Options

Development of the preferred scheme option

3.47. At the outset of the scheme design a number of strategic options were considered:

- Heavy rail – although the existing rail line runs parallel to the A4, approximately 500m to the north, any branch line extension or new station would not address the issues in the corridor of interest. Heavy rail does not meet the demands of local residents and workers wishing to make the short journeys along the route. The deliverability assessment suggests reasonable potential deliverability but with a high degree of uncertainty over delivery partner buy-in, cost and timescale for delivery. Not recommended for further appraisal;
- Light rail - This mode of transport w not considered for detailed analysis on the grounds of obvious feasibility, property/land-take and cost grounds. It is not a flexible mode of transport as it cannot leave the rail to provide door to door service. The amount of land take required would have serious implications of other modes of transport. Significant road space would be lost to facilitate the infrastructure leading to increased congestion. Option presents poor deliverability - very costly, poor affordability and could not be delivered within reasonable timescale. Not recommended for further appraisal;
- Guided bus - This option, though presenting reasonable deliverability offers little additional benefit over and above Non-Guided Bus Transit but introduces significant additional costs, including maintenance. Although it provides a segregated transport corridor for bus services allowing operation of regular reliable services with reduced influence from traffic congestion, it is unlikely to provided significant benefit over and above Non-guided Bus Transit. Option is less flexible in terms of adaptation post implementation too.
- Traditional bus improvements – This was considered the only preferred option as it would provide the necessary accessibility improvements to the key destinations (Slough Trading Estate, town centre and Heathrow airport) along the A4 corridor. The option recognises that the corridor features significant interaction between buses and general traffic and as such any adverse impact to general traffic needed to be avoided otherwise a business case could not be made (car disbenefits would outweigh PT benefits). The standard engineering measures proposed in the preferred scheme design recognise that land adjacent to the corridor is heavily developed (and will be more so in future) and the costs associated with large amounts of land purchase would put any business case at risk.

3.48. Appendix F contains the Option Assessment Report which assesses the various strategic options.

Refinement of the scheme

3.49. Once the decision on the strategic scheme option was taken, several alternatives for bus service specifications were considered and these are examined within the Network Service Specification Technical Note contained in Appendix C.

3.50. The Option Assessment Report in Appendix F contains detail of the various options for highways works which were compared in refinement of the preferred scheme.

4. The economic case

Outline approach to assessing value for money

4.1. Scheme value for money has been assessed within a WebTAG-compliant framework, comprising the following:

- Transport modelling - Atkins developed a multi mode model framework for Slough Borough Council (SBC) in 2009. The Slough Multi-Modal Transport Model (SMMTM) framework has a 2009 base year and contained the following elements:
  - A highway assignment model in SATURN;
  - A public transport assignment model in EMME;
  - A WebTAG compliant demand model in EMME; and
  - A DIADEM model for assessing the impact of highway interventions.
- Benefits appraisal
  - A detailed assessment of monetised economic benefits using TUBA, in accordance with WebTAG.
- Derivation of scheme costs
  - Scheme costs calculated by SBC using benchmarked values for recent schemes;
  - Incorporation of scheme costs to TUBA, in accordance with WebTAG.
- Scheme assessment and supporting analysis
  - Assessment of monetised and non-monetised impacts in terms of the economy, environment, social and public accounts;
  - Supporting analysis to demonstrate impacts in terms of distribution and equity, affordability and financial sustainability, and practicality and public acceptability.
- Collation of the Appraisal Summary Table (AST), Transport Economic Efficiency (TEE) Table and tables for supporting analysis

4.2. Further details on all aspects of the value for money assessment are provided in the sections below.

Options appraised

4.3. The evolution of the SMaRT scheme – and the wide range of options considered in arriving at the current scheme option – was presented in detail as part of The Strategic Case (see the sections on ‘external drivers for change’ and ‘options’). The option included in this business case is the result of identifying a solution that will deliver substantial benefits at the same time as being affordable and maximising value for money.

4.4. The final schemes included in this business case, therefore, are:

- The ‘Do-Minimum’, which includes committed transport schemes and development proposals across the study area; and
- The ‘Do-Something’ (Scheme Option), which appraises the impact of the SMaRT scheme on top of the ‘Do-Minimum’.

Assumptions

Traffic modelling

4.5. A robust approach to scheme assessment has been undertaken using the SMMTM.

4.6. The potential impacts of the SMaRT are analysed using the existing SATURN and EMME highway and public transport assignment models respectively, currently available at SBC. The appraisal using this proportionate approach is if anything under-stating benefits. The direct benefits received by users changing mode from car to public transport and the indirect impacts of this on reduced congestion is not captured and the benefit total will therefore err on the side of caution.

4.7. Forecasts for two years, 2015/16 (the year of scheme opening) and 2025/26 (ten years thereafter) are carried out. The Do Minimum scenario includes all key committed development and (highway and public transport) schemes in Slough that are forecast to be completed by the end of each forecast year.

4.8. Transport demand growth is accounted for in two ways:

- Demand generated by new key development sites will be added according to information obtained from the relevant Transport Assessments (TA), and in agreement with SBC. The trip ends were checked against databases such as TRICS and applied to the relevant zone(s) affected. The trip distribution of these zones is in line either with the TA or with any existing trip patterns already there;

- Background demand growth will then be applied using TEMPRO v6.2 minus growth already accounted for in the above so that growth is restrained to NTEM.

4.9. The Do Something scenario considers the sole addition of bus lanes, the new SMaRT service and the improvement to signalling through MOVA.

4.10. Appendix G contains the full Modelling Report detailing the methodology undertaken for the scheme, and presents the results and findings.

Economic appraisal

4.11. Economic benefits of the scheme have been quantified using the DfT's Transport User Benefit Appraisal (TUBA v1.9.4) software.

4.12. Outputs from the transport models were provided, giving details of demand, journey times, trip distances and charges or fares applicable to those trips. These were generated as matrices with average figures for each origin-destination pair and were provided for both modelled years, 2016 and 2026, and for three time periods, AM, inter-peak and PM in each year.

4.13. Annualisation factors, calculated using traffic count data commissioned specifically for use in this study, were used to convert hourly/daily benefits to annual benefits, based on the assumption of benefits being evenly accrued for 253 working days a year.

4.14. Using the above methodology, benefits were calculated to show time benefits for highway and public transport users. Benefits were disaggregated by user type, with separate figures for business and non-business users.

4.15. Benefits reported included time savings, reductions in vehicle operating costs, savings in charges, such as public transport fares, changes in revenue to private operators and local government and reductions in carbon emissions.

4.16. These benefits were all monetised so that, based on values of time, the benefits of time savings could be added to the already monetised benefits of reduced operating costs and savings on fares. This allowed all benefit types to be combined to give a Present Value of Benefit (PVB).

Sensitivity and risk profile

4.17. Sensitivity tests have been undertaken to confirm the robustness of the business case and reflect potential risks around scheme costs and benefits. The sensitivity tests, and their impact on the business case, are detailed later in this chapter.

Appraisal summary table

4.18. The quantitative and qualitative assessments of impacts made in the previous three sections have been input to the Appraisal Summary Table (AST) provided in Appendix H.

Value for Money statement

Scheme appraisal

Assessment of environmental impacts

4.19. Appendix I contains a technical note covering the environmental scoping exercise. For each of the eight environmental aspects, an appraisal of the scheme has been undertaken to identify whether significantly beneficial or adverse environmental effects are likely to arise. Where it is considered that there is a reasonable possibility that significant environmental effects could arise, the environmental aspect would be scoped into the business case for further consideration. Environmental aspects that are unlikely to be affected either beneficially or adversely would not be considered further.

4.20. Consideration of whether a particular environmental aspect would experience significant effects has been undertaken using a range of assessment methods. For noise, air quality and greenhouse gasses, calculations based on surveyed and forecasted traffic flows provide an indication of the likely impacts. These are compared to criteria set out in the TAG Unit A3 guidance to determine the likely effects.

Noise

4.21. The noise aspect considers the effects of the SMaRT scheme on the noise climate and, where appropriate, any consequential annoyance within the vicinity of the scheme. At the scoping stage, a noise assessment is undertaken based upon the scoping assessment guidance provided in DMRB 11.3.7, which provides threshold values against which changes in noise due to the project should be compared, and assessed in both the short-term (on scheme opening) and in the long-term (over the design period, typically 15 years after scheme opening).

4.22. The scoping assessment indicates that the impacts arising from changes in road traffic noise on the local road traffic network are not expected to exceed DMRB threshold criteria. Road traffic noise impacts on the local road network may therefore be scoped out from further assessment.

4.23. Distributional analysis has considered the likely population affected and, due to the small change in flows and affected links, it is considered that these areas suffer no benefits or disbenefits as a result of the scheme. The overall noise impacts assessment has therefore been appraised as **neutral**.

Local air quality

4.24. In most urban areas, including Slough, the main source of pollution is road traffic. Emissions from motor vehicle exhausts contain a number of pollutants including oxides of nitrogen, carbon monoxide, hydrocarbons and particulate matter.

4.25. The local air pollutants of most concern are nitrogen dioxide (NO2) and small particles known as PM10 (particulate matter less than 10 micrometres in diameter). It is known from air quality assessments across the UK that these pollutants are the most likely to be present at concentrations close to or above statutory criteria, particularly in urban environments. The relevant local air pollutants requiring consideration are NO2 and PM10.

4.26. Given the expected changes in traffic due to the Scheme and the location of air quality sensitive receptors relative to road widening, local air quality can be scoped out of the next stage of assessment as the proposed SMaRT scheme is not expected to affect air quality.

4.27. The overall air quality impacts assessment has therefore been appraised as **neutral**.

Greenhouse gasses

4.28. The estimated impact of the SMaRT scheme on greenhouse gases has been covered within the Assessment of Economic Impact section of this report.

Landscape

4.29. Landscape in TAG is defined as a result of the physical and cultural characteristics of the land itself. As the Slough MRT scheme is entirely located within an urban townscape, all landscape issues are considered in the Townscape aspect. The landscape aspect has been scoped out of further assessment.

4.30. The overall impact on landscape has therefore been appraised as **neutral**.

Townscape

4.31. The definition of townscape is outlined within the TAG guidance as the physical and social characteristics of the built and non-built urban environment.

4.32. The potential for townscape effects are likely from the following activities:

- Loss of habitat through loss of mature/semi-mature horse chestnut trees along A4 Bath Road;
- Scale of the proposals to remove trees along A4 Bath Road. The 'chestnut avenue' is a well-known feature of the area and the removal of a considerable number of these trees will impact on the distinctive local character;
- Potential adverse effects on remaining trees due to loss of rooting area; and
- Baseline changes in relation to the wider development, including through the introduction of new layouts, associated signage and highways design on visual amenity.

4.33. As the proposals at this stage mainly consist of amendments within the footprint of the existing road/service road, a proportionate study area is localised at close range to the site. Therefore, Townscape is to be scoped in for further assessment.

4.34. The overall impact on townscape has therefore been appraised as **neutral**.

Historic environment

4.35. Due to being heavily bombed during World War II, Slough's heritage and historic resources tend to be scattered on the outskirts of the town; however Slough has 96 listed buildings remaining. Within the scheme corridor historic resources tend to be in the form of mileposts, of which three remain in the central verges of the A4.

4.36. It is also unlikely that any surviving archaeological remains from previous features would be disturbed as these are likely to have been removed previously.

4.37. The potential for affecting the historic environment is therefore low and the historic environment should therefore be scoped out for further assessment.

4.38. The overall impact on historic environment has therefore been appraised as **neutral**.

Biodiversity/ Ecology

4.39. The biodiversity aspect considers the effects of the proposed scheme on biodiversity and earth heritage (geological) features. The majority of the scheme is on existing hard standing areas devoid of any vegetation or biodiversity value. However, the proposals to remove trees along the 'chestnut avenue' would have an effect on biodiversity as this would remove habitat for nesting

birds or bats. The removal of roadside verges would have a small, localised impact on biodiversity.

4.40. There are no geological features within the site or that would be affected by the proposed scheme.

4.41. In light of the unknown potential for protected species/nesting birds to be present in trees proposed for felling and without ecological walkover survey data, it is proposed to undertake a further assessment throughout the design process due to the potential presence of protected species.

4.42. The overall impact on biodiversity has therefore been appraised **as slight to moderate adverse** pending further assessment.

Water environment

4.43. The water environment aspect considers the effects of the proposed scheme on surface and ground water quality, and flood risk.

4.44. The majority of the scheme is not located in an area designated by the Environment Agency as at risk from flooding. Where there is a risk, this is classed as a very low risk This is the lowest possible flood risk and means that each year, this area has a chance of flooding of less than 1 in 1000 (0.1%).

4.45. The proposed drainage is likely to be kerbs and gullies with some retention built in with oversize carrier pipes. Drainage during operation has the potential to impact on water quality due to increased traffic flows and the increased potential this has on pollutant loading from road runoff. By extending hard surface area of the carriageway, increased volumes of water are collected that can exacerbate flooding. However this issue will be considered within the detailed design of the scheme and is expected to be mitigated through the deployment of appropriate drainage systems.

4.46. The overall impact on the water environment has been appraised as **neutral to slight adverse**.

Assessment of economic impacts

4.47. The economic impacts of the SMaRT scheme have been assessed, considering highway, bus and rail transport users, bus operators, employers which operate shuttle buses, indirect taxation, costs to SBC and funding required from the LTB.

4.48. User benefits assessed include journey time savings, vehicle operating costs, accident benefits and reliability improvements. No changes to fares for public transport users have been assumed.

4.49. This assessment has been carried out for the Core Scenario, with a number of sensitivity tests also carried out in order to demonstrate the level of robustness of the economic case to variations in forecast values such as rates of growth in demand and effectiveness of junction improvements in relieving congestion.

Journey Time and Vehicle Operating Costs

4.50. The impacts of the scheme on journey times for highway, bus and rail passengers, as well as vehicle operating cost impacts for car users have been assessed using TUBA, based outputs from the highway and public transport models.

4.51. The assessment has been performed over AM, interpeak and PM peak periods, covering weekdays between the hours of 0700 and 1900, with peak hour benefits factored up based on local traffic flow data for the peak periods. Benefits and costs have been annualised over a 60 year appraisal period.

4.52. The results of this assessment indicate that road users will experience time saving benefits of £26.6m and operating cost benefits of £3.6m, bus users will experience time saving benefits of £35.1m including in-vehicle time, access/egress time and waiting time. Rail user impacts will be negligible.

Operator Revenue

4.53. In order to measure the impacts of the scheme on bus and rail operator revenue, elasticity testing was undertaken to capture the impact of forecast journey time savings on demand for services. This testing in the demand model indicated that the effect on trip numbers is expected to be only a negligible increase, of around 20 trips per hour across all services in the AM peak period and fewer during other time periods.

4.54. As this increase is so small in magnitude an economic assessment of the change to revenue resulting from demand elasticity to journey time changes has not been undertaken. Similarly rail impacts are negligible and have not been included in the economic assessment.

4.55. The one area of revenue changes which can be monetised relates to the removal of shuttle buses and replacement with use of PSVs, with employers who previously funded the shuttle buses providing employees with annual Slough PlusBus passes. The cost of procuring these passes for each of the current shuttle bus users has been calculated to fall in the range £195,000 to £233,000 annually. The operating costs for running all of the current shuttle buses meanwhile is estimated at around £665,000, the cost of which will currently be borne by the employers.

4.56. SBC's ongoing consultation with business's through the LSTF work is promoting the evidence that the result of each employer providing passes for the PSVs, rather than running the shuttle buses individually, will result in a reduced bus revenue (cost to employers) of around £432,000 per year.

4.57. This reduced revenue is based on the assumption that shuttle buses are run on behalf of operators by private operators. In some cases the shuttles may be owned by the employers and run independently. In either case, this has no impact on the economic performance of the scheme, as the cost of fares would be a transfer payment from one private sector company to another, therefore not influencing the benefits or costs overall. The saving which is being made by employers has therefore been captured only within the impact on operating costs. The increase in costs to the PSV operator resulting from the new MRT service has been partially offset by the cost saving achieved by stopping the running of each of the shuttle bus services. The net impact on revenue within the economic appraisal is therefore set at zero.

Shuttle Bus User Benefits

4.58. User time benefits were predominantly captured using a TUBA assessment based upon the highway and PT elements of the transport model. However, as the existing shuttle buses serving the Slough Trading Estate (STE) are privately operated, these are not included in either the demand or the public transport assignment elements of the modelling package. This results in the requirement for a number of additional user benefit calculations, in relation to public transport users, to supplement those carried out using TUBA.

4.59. For OD pairs in the PT model which have non-zero demand for use of the existing shuttle bus services, journey time savings relating to waiting time, walking time and in-vehicle time will be assessed externally to the TUBA assessment.

4.60. This will first involve the removal of the benefits calculated in TUBA for PT movements to and from the specified zones. These values can be extracted directly, using TUBA's detailed outputs.

4.61. These removed benefit values will be replaced by the three separate elements of waiting, walking and in-vehicle time, as discussed below.

Shuttle Bus User Benefits - Waiting Time and Reliability

4.62. In the DM scenario, waiting times for users of the shuttle bus services have been based on the frequency of each user's specific shuttle bus, as it is assumed they will opt to use the free service, rather than paying for whichever bus turns up first. Analysis of journey time reliability (set out below) suggests that passengers timing their arrival to catch a specific bus would be able to significantly reduced waiting times compared to those arriving at random times, but some allowance for variation in bus arrival times would be required.

4.63. Trains from key destinations (Reading, Windsor and London) have headways of approximately 15 minutes during the peak periods. This means that where buses have longer headways, passengers could choose to travel into Slough using a later train, rather than waiting at the station for the full period. However, reliability analysis shows that for services between the station and STE, a standard deviation of arrival time of 10 minutes applies. A maximum wait time of 25 minutes has therefore been assumed for users of either shuttle buses or PSVs.

4.64. Existing users of PSVs have DM waiting times based on the existing service frequency of relevant services (in this case services 75 and 76, as no other service provides a suitable route for the OD pairs under consideration).

4.65. In the Core DS scenario, shuttle buses have been removed so waiting time for all users (those previously using shuttle buses as well as those previously using PSVs) has been based on the frequency of available services, which will now include 75, 76 and the MRT service, i.e. a headway of 10 minutes.

4.66. The impact on waiting time of the change from shuttle buses to PSVs for existing shuttle users is forecast as £735,000 PV. This excludes the impacts of improved reliability which are discussed below.

4.67. Waiting time benefits for OD pairs not affected by the existing shuttle buses has been calculated within TUBA based on the PT model outputs.

Shuttle Bus User Benefits – Walking Time

4.68. Walking times are assumed to be largely unaffected, as the shuttle buses which are being replaced currently serve locations adjacent to the route of the public service vehicles (PSVs). The only consequential change to walking times which will occur will result from the relocating of stops on the eastbound bus lane, which will be positioned for ease of crossing.

4.69. The effect of these relocations for trips to the north side of the A4 will be neutral, with small benefits to some users and small disbenefits to others, depending on their exact points of final destination and disembarking.

4.70. There will however be a tangible reduction to walking time for those passengers travelling eastbound along this stretch and accessing a location on the southern side of the A4. These benefits have been captured externally to the PT model, based on the difference in time taken to reach the crossing point from the bus stops and the number of movements enjoying this time saving.

4.71. This crossing time benefit is forecast as £940,000 PV.

Shuttle Bus User Benefits – In-Vehicle Time

4.72. In-vehicle journey times have been assessed to capture two elements of variation between DM and DS in-vehicle times:

- The negative scheme impact that, whereas the existing shuttle buses provide a direct link between the station and the site of employment, PSVs will serve a broader market. Therefore the number of stops made for passengers to board/alight will increase, resulting in slightly longer journey times. As the shuttle buses are not included in the PT model this effect has been captured outside of modelling.
- Positive time savings will also be achieved as a result of the improved infrastructure, allowing buses to avoid congestion (where bus lanes are in place) and smoothing the flow of general traffic (which will benefit bus users when there are no bus lanes).

4.73. The first of these impacts will affect only existing users of shuttle buses who are being transferred to PSVs in the DS scenario. There are 6 stops between the station and STE. Journeys for some OD pairs will travel past all 6 of these while others will pass a lesser number of stops. For however may stops are passed on each trip, it has been assumed that, on a typical trip, a PSV

will stop at 50% of these, with a 30 second increase in JT per stop. Shuttle buses on the other hand will be assumed to travel directly from the station to the destination without stopping.

4.74. The result of this increase in stops experienced has been valued at -£1,680,000 PV.

4.75. The second impact has been captured using outputs from the PT model for the relevant OD pairs, including only the in-vehicle time element of the journey, rather than the full generalised journey time. These benefits will affect both passengers who use shuttle buses and those who use PSVs in the DM scenario. The benefits for passengers who use PSVs in the DM scenario however have been included in the TUBA assessment. Those for passengers using shuttle buses in the DM scenario have calculated externally, but following the same methodology as used in the TUBA assessment.

4.76. These benefits have been valued at £2,200,000m PV.

Total User Time Benefits

4.77. As the same DM and DS demand matrices are applicable to each OD pair for the calculation of waiting, walking and in-vehicle time benefits, the total user time benefit can be calculated simply as the sum of the three elements set out above.

4.78. This gives an overall user benefit for shuttle bus passengers of £2,190,000 which is in addition to the benefits calculated using TUBA.

Bus Operating Costs

4.79. Operating costs for the changes to bus services have been calculated over the scheme appraisal period. These changes to services include the addition of the MRT service providing 2 buses per hour between Heathrow Airport, Langley and STE (Dover Road) and the removal of all shuttle bus services.

4.80. The new MRT service cost is forecast at £670k p.a. while the cost saving achieved through removal of the shuttle bus services will be £665k p.a. This gives a net operating cost increase of £5k p.a.

Investment and Maintenance Costs

4.81. The costs of implementation of each phase of the scheme have been assessed, inclusive of the costs of:

- Carriageway widening for implementation of bus priority lanes;
- Upgrades to signalised junctions;
- Junction improvements;
- Land acquisition through compulsory purchase order;
- Statutory undertakers costs;
- Preparation and supervision.

4.82. In addition, an allowance has been made for risk (discussed below), an uplift of 44% for optimism bias and ongoing capital renewal and maintenance costs for the upkeep of assets over the appraisal period.

4.83. Costs have been forecast at current prices and amount to £6.8 million excluding inflation, risk and optimism bias. Ongoing costs are forecast to increase by £46,000 p.a. compared to the Do-Minimum scenario.

QRA

4.84. A risk register has been compiled containing all risks of potential overspend which have been identified. This risk register sets out the forecast probability of each risk occurring and defines a range of probable costs which may be incurred for each in that instance. @RISK software has been used to generate a cumulative distribution for forecast risk. From this distribution a mean value has been extracted for addition to the costs to appraisal and the P(80) value has been

passed to the outturn cost calculation for the financial assessment. These risk values have been forecast as:

Mean cost of risk = £563,812

P(80) cost of risk = £773,423

Accidents

4.85. The impact of the scheme on road traffic accidents has been assessed on a combined link and junction basis using the COBALT software package. This has captured the effects of changing link speeds and flows resulting from the scheme. No junction designs are considered to change significantly enough as a result of the scheme to enable accident impacts to be captured.

4.86. Local accident data has been used to measure current levels of road safety and enable a quantified assessment of the accident reductions forecast as a result of the scheme.

4.87. The COBALT assessment has been designed to capture the effect across the modelled area, based on the SATURN network and traffic flow details. This assessment has indicated that the SMaRT scheme will result in a reduction in total accident numbers by 88 over the 60 year appraisal period (approximately 1.5 p.a.). This represents a reduction in casualties of 1 fatality, 9 serious injuries and 116 slight injuries. A further 1,600 damage only accidents will be avoided.

4.88. These accident savings will generate a combined benefit valued at £7,574,000.

4.89. A summary of the methodology, inputs and outputs of this analysis, accompanied by an interpretation of what the results mean in real terms and which areas are most impacted can be found in Appendix M.

CO2 Emissions

4.90. As a result of reduced congestion, greenhouse gas emissions are forecast to be significantly reduced. A benefit from reduced CO2 emissions of £0.4m is forecast representing a saving of 8,850 tonnes of CO2 equivalent emissions.

Transport Economic Efficiency (TEE)

4.91. Economic impacts from the proposed scheme are measured in terms of monetised benefits and costs, based on changes in travel times, vehicle operating costs, user charges and fares. The benefits to users and transport providers are presented in the Transport Economic Efficiency (TEE) table. The TEE table for the SMaRT Scheme is shown in Table 4.1 (all presented in units of £000s at 2010 prices and values).

Table 4.1 Transport Economic Efficiency (£000s)

Consumer - Commuting user benefits	**All Modes**	**Road**		**Bus**		**Rail**	
Travel Time	19,058	9,722		9,251		- 74	
Vehicle operating costs	1,315	1,315		0		-	
User charges	-	0		0		-	
During Construction & Maintenance	-	0		0		-	
NET CONSUMER - COMMUTING BENEFITS	**20,373**	**11,037**		**9,251**		**- 74**	
Consumer - Other user benefits	**All Modes**	**Road**		**Bus**		**Rail**	
Travel Time	32,685	8,627		24,414		- 54	
Vehicle operating costs	1,528	1,528		-		-	
User charges	-	-		-		-	
During Construction & Maintenance	-	-		-		-	
NET CONSUMER - OTHER BENEFITS	**34,213**	**10,155**		**24,414**		**- 54**	
Business	**All Modes**	**Road Personal**	**Road Freight**	**Bus Personal**	**Bus Freight**	**Rail Personal**	**Rail Freight**
Travel Time	10,459	6,354	1,853	3,048	-	- 120	-
Vehicle operating costs	743	348	395	-	-	-	-
User charges	-	-	-	-	-	-	-
During Construction & Maintenance	-	-	-	-	-	-	-
Subtotal	**11,202**	**6,702**	**2,248**	**3,048**	**-**	**- 120**	**-**
Private Sector Provider Impacts	**All Modes**	**Road**		**Bus**		**Rail**	
Revenue	-	-		-		-	
Operating costs	- 118	-		- 118		-	
Investment costs	-	-		-		-	
Grant/subsidy	-	-		-		-	
Subtotal	**- 118**	**-**		**- 118**		**-**	
Other business Impacts							
Developer contributions	-	-		-		-	
NET BUSINESS IMPACT	**11,084**						
TOTAL							
Present Value of Transport Economic							
Efficiency Benefits (TEE)	**65,670**						

Public accounts (PA)

4.92. Table 4.2 presents the Public Accounts for the SMaRT scheme.

Table 4.2 Public Accounts (£000s)

Local Government Funding	ALL MODES	Road	Bus	Rail
Revenue	-	-	-	-
Operating Costs	1,044	1,044	-	-
Investment Costs	2,779	2,779	-	-
Developer Contributions	-	-	-	-
Grant/Subsidy Payments	-	-	-	-
NET IMPACT	**3,822**	**3,822**	**-**	**-**
Central Government Funding: Transport	**ALL MODES**	**Road**	**Bus**	**Rail**
Revenue	-	-	-	-
Operating costs	-	-	-	-
Investment costs	6,127	6,127	-	-
Developer Contributions	-	-	-	-
Grant/Subsidy Payments	-	-	-	-
NET IMPACT	**6,127**	**6,127**	**-**	**-**
Central Government Funding: Non-Transport				
Indirect Tax Revenues	1,175	1,175	-	-
TOTALS				
Broad Transport Budget	**9,950**	**9,950**	**-**	**-**
Wider Public Finances	**1,175**	**1,175**	**-**	**-**

4.93. The total capital cost used in the economic appraisal amounts to £9.5 million. This value has been input to TUBA to reflect the allocation of expenditure between Local and Central Government. In addition, we have included an allowance for an increase in future maintenance costs associated with the scheme as well as renewals. The total costs once converted to 2010 prices and values and discounted to 2010 using the default rates included in TUBA, produce a PVC of investment of £10.0 million.

Analysis of Monetised Costs and Benefits (AMCB)

4.94. Table 4.3 presents the Public Accounts for the SMaRT scheme.

Table 4.3 Analysis of Monetised Costs and Benefits (£000s)

Noise	-	***(12)***
Local Air Quality	-	*(13)*
Greenhouse Gases	419	*(14)*
Journey Quality	-	*(15)*
Physical Activity	-	*(16)*
Accidents	7,574	*(17)*
Economic Efficiency: Consumer Users (Commuting)	20,791	*(1a)*
Economic Efficiency: Consumer Users (Other)	34,516	*(1b)*
Economic Efficiency: Business Users and Providers	11,760	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	1,175	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	76,235	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	9,950	*(10)*
Present Value of Costs (see notes) (PVC)	9,950	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	**66,285**	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	**7.66**	BCR=PVB/PVC

Reliability

4.95. A reliability assessment has been carried out for bus passenger journeys through the core scheme area, to measure the expected impact of the bus priority lanes and junction improvements on journey time reliability. Local data has been used for key services to establish the Do-Minimum level of reliability. Using this as a base, the levels of congestion avoided through use of new priority lanes and reduced delays at junctions have been used to forecast the expected reduction in levels of un-timetabled journey time variability.

4.96. Real time data for routes 75 and 76 over movements along the A4 from STE toward the station and for route 77 along the eastern section from the station has been analysed over available periods in 2013 and 2014.

4.97. Based on this data, a typical variation from timetabled arrivals during the AM peak of around 10 minutes is apparent between the station and STE, dropping to 3-4 minutes during interpeak and PM peak periods. A proportion of this journey time variability can be avoided as a result of the scheme, with bus priority lanes enabling bypassing of congestion on the approach to certain

junctions. The highway model indicates that around 20% of this congestion may be bypassed through use of priority lanes with the Stoke Poges Lane junction generating the majority of remaining delay.

4.98. This improvement to reliability is valued at £134,000 PV to existing PSV users. This value is generated almost entirely between STE and the station. Journey time variability on the Phase 2 section of the scheme to the east of the station is much lower in the Do-Minimum scenario with lateness generally measured at less than 1 minute, while improvements to junction performance are also less significant.

4.99. In addition to this reliability benefit to current PSV users, as set out above £680,000 PV will be generated for passengers of the existing shuttle buses, giving a total reliability benefit of £814,000.

4.100. Including this value in the above AMCB would generate an adjusted BCR of 7.46.

Sensitivity Testing

4.101. A number of assumptions have been used in the preparation of this economic forecast. To demonstrate the level of robustness of the economic case to variations in these assumptions and indicate to which the scheme performance is most sensitive, a range of tests have been carried out in which individual assumptions have been varied from the Core Scenario. These sensitivity tests include:

1. MOVA signal impacts removed (saturation flows revert to Do-Minimum levels)
2. MOVA signal impacts halved
3. Low growth scenario
4. Access to service roads – there are potentially difficulties with buses access and egress to and from service roads due to other traffic using the service roads and flows in the main carriageway. This will need to be examined more closely at the detailed design stage. An assumed delay to buses resulting from this has been added into the PSV performance.
5. Elasticity testing – impacts of bus journey time saving on passenger demand assessed using demand elasticity modelling
6. As employer support for discontinuing shuttle bus services in favour of using public bus services has yet to be confirmed, a test has been performed in which shuttle buses are assumed to continue to run.
7. Employers assumed not to provide funding for employees to use PSVs
8. Capital cost increase (20% added to central forecast and QRA value doubled)
9. Capital cost decrease (20% deducted from central forecast and QRA value halved)
10. Operating cost increase (double Core cost)
11. Operating cost decrease (half Core cost)
12. To isolate the impact of the infrastructure elements of the scheme a test has been carried out in which bus services have been reverted to the Do-Minimum scenario, leaving other elements in line with the Core Scenario.
13. As a worst case scenario, Test 6 and Test 12 have been combined to remove all private sector service changes.

14. As described in paragraph 2.10, several sections of land are required to enable the full length of bus lane included in the core design. Either this land requires purchase through compulsory purchase, or a formal transfer of ownership. The feasibility of obtaining the plots is currently subject to varying levels of uncertainty. Of all the plots, the least certain in the privately owned land of 142 Bath Road which (along with land to be transferred from the property services department of SBC to the Highway Authority) is required to widen the carriageway and provide a bus lane between the A4 and Pitts Lane. If this cannot be obtained the eastern most end of the eastbound bus lane could not be built, effectively reducing the length of road within which bus services will enjoy benefit by 11%. It has therefore been assumed that journey time benefits of the core scenario are reduced by 11%. However, as the section of bus lane lost is at the more congested end and the priority to the Farnham Road junction would be lost, a disbenefit 50% greater than the proportion of the length of the bus lane has been assumed.

15. Of equal importance, is the land to the front of 172-184 Bath Road which is reuqired to enable a bus lane to join the eastern end of the service road back to the A4.This land is currently subject to a planning application (P/01766/022) which would see the landowners tranferring the land free of charge to SBC for use in a highway scheme. Whilst this should be considered straigtfoward, if this transfer can not be completed then not being able to use this land for routing buses from the trading estate would result in a 22% reduction in the total length of road way in which buses will have prioirty or benefit and would make merging with traffic on the A4 more difficult. This would result in slightly greater delays than only removing 22% of the benefit, so again a 50% increase in that level of disbenefit has been assumed. In both cases the level of proportional reduction in benefit to shuttle bus users has been treated as higher than for PSV passengers, as shuttle buses would largely only use the eastern end of the new priority lane.

4.102. Table 4.4 sets out the key economic indicators generated by each of these sensitivity tests.

Table 4.4 Sensitivity Tests

	Description	PVB (£millions)	PVC (£millions)	NPV (£millions)	BCR
	Core Scenario	76.2	10.0	66.3	7.66
1	DM MOVA signals	55.1	9.9	45.1	5.54
2	½ MOVA Signals	64.6	10.0	54.6	6.49
3	Low Growth	60.1	10.0	50.1	6.04
4	Access to service roads	72.1	10.0	62.1	7.24
5	Bus passenger demand elasticity	76.2	10.0	66.3	7.66
6	Shuttle buses included	59.2	10.0	49.3	5.95
7	No employers funding for PSVs	76.2	10.0	66.3	7.66
8	Capital cost increase	76.2	12.2	64.1	6.26
9	Capital cost decrease	76.2	8.0	68.2	9.53
10	Operating cost increase	76.1	11.0	65.1	6.92
11	Operating cost decrease	76.3	9.4	66.9	8.09
12	Infrastructure improvements only	57.0	10.0	47.0	5.72
13	Infrastructure only with shuttles	42.6	10.0	32.7	4.28
14	CPO refused at Pitts Road	71.3	8.7	62.6	8.21
15	CPO refused at Thirkleby Close	68.7	8.6	60.2	8.03

4.103. The testing of reduced effect of MOVA signalisation shows a significant impact on highway benefits, but little effect on public transport performance. Setting the flows enabled by these junctions back to the DM values results in a 55% reduction in highway benefits but less than 10%

reduction in bus and rail benefits. The performance of the scheme overall is reduced by a noticeable margin, but still represents very high value for money.

4.104. The modelled low growth scenario represents a slower rate of growth in trip numbers in both the DM and DS scenarios with approximately 7% fewer trips by 2025 in both cases. This results in lower levels of congestion existing in the DM scenario and so reduced benefits being generated by the scheme despite achieving an improved performance in DS.

4.105. With a detailed design specification the appropriateness of the approach to modelling the access of buses to service roads is somewhat unclear. While service roads have minimal traffic levels, they are, and will continue to be, used by vehicles other than buses. This may cause problems with access if a vehicle is trying to exit the service road at the same time that a bus is trying to turn into it. It is considered that carriageways will be sufficiently wide to enable following traffic to avoid such buses while they wait to access service roads, so no detrimental impact on highway users has been assumed.

4.106. Modelling such low level traffic impacts in SATURN is not possible and would require more detailed junction modelling, so a high level assumption has been applied to replicate the potential impacts of it not being possible to design out such obstructions.

4.107. Making the assumption that, for all bus journeys making use of the service roads between STE and the station, a delay occurs while accessing the service road at some point along the journey and assuming that this delay averages 1 minute results in a £4 million reduction in user benefits. This figure should not be considered as absolute, but is indicative of the potential user cost of delays along this stretch and may be used as a guide as to how much should reasonably be spent on mitigating measures to avoid the problem.

4.108. The testing of bus passenger demand elasticity to reductions in journey times resulting from the SMaRT scheme showed only minimal changes to trip numbers, with 10-20 trips per hour across the network being generating in each time period.

4.109. As agreement has not been finalised with the employers current operating shuttle buses, some variations to the Core assumptions on how employers will react to the SMaRT scheme have been tested.

4.110. The assumption that employers continue to run shuttle buses results in an increased operating cost, as more vehicles will be running, while user benefits reduce as the benefit to shuttle bus users of transferring to PSVs is lost. The BCR still remains above 5 under this scenario though.

4.111. Testing of a scenario in which shuttle buses are removed but employers choose not to provide funding for employees to use PSVs creates an increased cost to users and a resultant reduction in passenger numbers and user benefit. However, these disbenefits are very closely matched by the cost saving to the employers, resulting in no significant change to the BCR compared to the Core Scenario.

4.112. Variations to both capital and operating costs from those forecast indicate that changes would need to be very significant compared to those forecast for the effect on the BCR to be enough to prevent the scheme falling into the very high value for money category.

4.113. The removal of service improvements, including the introduction of the MRT service and improved timetabling of other services, results in an 85% reduction in bus passenger benefits, but highway benefits are retained and operating costs are reduced.

4.114. Retaining shuttle buses in this scenario has a lesser impact than including them in the core scenario, as without other improvements to existing services and adding the MRT the service provided by shuttles is not significantly worse than that provided by PSVs. The extra cost to the private sector of operation of the shuttles however remains the same.

Assessment of social distributional impacts

4.115. Appendix J contains a report covering the Social Distributional impact analysis.

Severance

4.116. The severance assessment has examined the key links within the scheme area that will have a 10% increase or decrease in traffic flow, using the percentage difference between the do minimum and do something (2015) scenarios.

4.117. In terms of severance the scheme area demonstrates a very small number of roads experiencing an increase and decrease in traffic flows as a result of the proposed scheme. The severance assessment has shown that within a 1km boundary of the scheme, there are only six links that are expected to have a decrease in traffic in excess of 10% (a max decrease of 36 vehicles) and five experiencing increases of more than 10% (a max increase of 55 vehicles).

4.118. The assessment has appraised the impact on severance as **neutral** to the vulnerable groups within the scheme area given the likely population affected and the small change in flows on the relevant links.

Personal security

4.119. The area used for the security analysis has focused on an area designated by a 1km buffer of the scheme alignment in order to assess the impact on pedestrians who live and/or work in the area or will use the scheme to access a wider range of destinations.

4.120. There is no information available regarding public transport users in the area but these are likely to be older and younger people and people without access to a car of which there are high concentrations on the eastern extent of the alignment north of Bath Road.

4.121. Police crime maps show that for March 2014 the majority of the criminal incidents along the proposed route were classified as anti-social behaviour, shoplifting, or violence/sexual offences. Geographically there were higher numbers of criminal incidents towards the town centre. Points of particularly high crime were in and around the supermarket on Wellington Street where there were 36 crime counts, 21 of which were shoplifting offences.

4.122. The Scheme does not propose any new high quality facilities such as CCTV, real time passenger information, or high standard of lighting. The vehicles themselves are assumed to be the current fleet, though these do provide good levels of accessibility, security, information and comfort as they are equipped with CCTV such that the driver can see CCTV images of all passenger areas.

4.123. There are some alterations to bus timetables as a result of the scheme with improved frequency and changes to the headway on routes 58, 78, 81 and 77. This should improve the overall reliability of the services and have a positive impact on personal security as people have a reduced wait time between buses.

4.124. Overall the assessment demonstrates a **neutral** impact on security across the impacted area as a result of the Scheme.

Accessibility

4.125. The accessibility appraisal followed a qualitative assessment when considering the likely impacts to bus services and the potential impacts this may have on vulnerable groups.

4.126. There are some alterations to bus timetables as a result of the scheme with improved frequency and changes to the headway on routes 58, 78, 81 and 77. Journey time data from the traffic suggests that there could be savings of up to 4 minutes in the peak.

4.127. Although it is not possible for the qualitative appraisal to show any change in accessibility levels, the scheme demonstrates an improved service frequency and thus was appraised as **slight beneficial**.

Assessment of wider strategic impacts

4.128. The previous sections have detailed how the SMaRT scheme will have a net impact on the efficiency of the transport system as well as environmental and social impacts on the A4 and the surrounding land use. In addition to these impacts, the scheme is of significant importance in a strategic economic context and will create jobs, not just through the construction of the scheme,

but also as it will encourage the anticipated economic and housing growth planned for Slough in the next six years (the period of the TVB Strategic Economic Plan) and beyond.

4.129. To combat issues of congestion in the town, planning applications for new employment and residential developments will be required to propose restrictive parking allocations. Not having allocated parking can reduce the viability of developments, and the SMaRT scheme will provide mitigation for this potential issue through reducing public transport journey times and increasing the reliability of services.

Job creation

4.130. In order to forecast the expected number of jobs created within Slough which will be supported by the SMaRT scheme, typical values of full time employees (FTE) per square metre of area (taken from the HCA's Employment Densities Guide - 2010) have been applied to the scale of development for each land use class where possible. All of these jobs are considered as indirect employment.

4.131. It is assumed, however, that 50% of all jobs created through retail, office and leisure businesses which would occupy the sites would be displaced from elsewhere in the region (rather than be new start-ups or businesses currently based outside the region).

4.132. In addition to permanent job creation, further jobs would be supported locally and regionally through supply linkage and income multiplier effects, i.e. relating to purchases made as a result of the development and further purchases associated with linked firms alongside the supply chain as well as local expenditure as a result of those who derive incomes from the direct and supply linkage impacts of the development. A composite multiplier of 0.44 has been used for estimating supply linkage FTE, and this value has been taken from the English Partnerships Additionality Guidance (2010, Table 4.12).

4.133. Table 4.5 summarises the expected job creation by land use.

Table 4.5 Slough town centre and trading estate developments and job creation

Land use class	Floorspace m^2 /units	Employment densities (m^2 or unit)	FTE (gross)	FTE (net)	Supply linkage FTE
B1 (office)	108,700m^2	12	9,058	4,529	1,993
A1 (Wholesale & retail)			150	75	33
C1 (Accommodation & food services)			150	75	33
D1 (Education)			150	75	33
		Total	**9,508**	**4,754**	**2,092**

GVA

4.134. *Gross Value Added per employee* benchmark data for each employment sector has been extracted from the *2012 Annual Business Survey* and used to estimate the GVA resulting from the Slough developments which will be enabled by the SMaRT scheme. For office uses, there is an assumed 50/50 split between professionals and support staff.

4.135. Table 4.6 details the GVA created through employment at the developments programmed over the next six years in the Slough Trading Estate and the town centre. GVA referred to is for the on-site jobs only. In addition, it is expected that a large proportion of the GVA generated through the supply linkage FTE jobs will also come into the economy of the TVB sub-region. The figures of total GVA shown are those expected in 2021 once all scheduled development has been completed.

Table 4.6 GVA created through the Slough employment developments

Land use class	Jobs created	Per capita GVA	Total GVA
B1 (Professional)	4,529	£60,682	£137,418,567
B1 (Support services)		£38,692	£87,621,096
A1	75	£32,308	£2,423,115
C1	75	£12,871	£965,325
D1	75	£18,985	£1,423,896
		Total	£229,851,999

4.136. Table 4.6 shows that the employment developments which will be supported by the SMaRT scheme are expected to result in a net annual GVA benefit of over £229 million.

Housing

4.137. The SMaRT scheme will support the ambitious housing growth identified for Slough across the next six years. Over 2,900 new housing units are planned at the Thames University site, Queensmere, Castleview and at various office conversions in the town centre.

Table 4.7 Housing developments in Slough 2015/2021

Site	Year of development (units)						Total
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	
Thames Valley University		300	400	400	400		**1600**
Queensmere		100	200	200			**500**
Castelview	170	50				170	**220**
Town Centre conversion	100	100	100	100	100	100	**600**
Total	**270**	**550**	**700**	**700**	**500**	**270**	**2,920**

Value for Money

4.138. The analysis contained within this chapter suggests that the SMaRT scheme will generate a PVB of **£76,235,000** made up of:

- £11,760,000 PV resulting from a reduction in journey time and vehicle operating cost for business users;
- £20,791,000 PV resulting from a reduction in journey time and vehicle operating cost for commuters;
- £34,516,000 PV resulting from a reduction in journey time and vehicle operating cost for other users;
- £7,574,000 PV resulting from reduced accident numbers and severity; and
- £419,000 PV as a result of reduced greenhouse gas emissions.

4.139. Further analysis was conducted on noise and air quality however the impact was deemed to be neutral in each case and no monetised benefit was produced.

4.140. This PVB compared against the PVC of **£9,950,000** and will generate a **BCR of 7.66**.

4.141. Reliability benefits provided by the scheme suggest an **adjusted BCR of 7.74.**

4.142. Further social and environmental benefits have been derived from qualitative assessment, and whilst these will not provide a monetised benefit for use in this appraisal, the impacts are taking considered when deriving the Value for Money presented by the scheme:

- The impact to Noise is considered to be **neutral**;
- The impact to Local air quality is considered to be **neutral**;
- The impact to Landscape is considered to be **neutral**;
- The impact to Townscape is considered to be **neutral**;
- The impact to the Historic Environment is considered to be **neutral**;
- The impact on Biodiversity is considered to be possible **slight** to **moderate adverse**;
- The impact on the Water Environment is considered to be **neutral to slight adverse;**
- The impact on Severance is considered **neutral**;
- The impact on Personal Security is considered **neutral**; and
- The impact on Accessibility is considered to be **slight beneficial.**

4.143. Whilst not being appraised benefits as defined by WebTAG, as they are not direct impacts on public accounts, the impact of the scheme on the local economy will be substantial:

- The SMaRT scheme will support employment development across Slough creating 4,754 FTE jobs and generating an annual GVA of over £229 million;
- SMaRT will also enable significant residential development along the A4 corridor, helping to deliver 2,920 new residential units.

4.144. In Chapter 1, four key objectives for the scheme were identified with the intention of justifying the scheme. In each case, the evidence provided within this report identifies how these objectives have been met thus justifying the scheme's Value for Money on investment.

Key objectives of the SMaRT scheme		
1	**Provide a high quality, safe, convenient and reliable alternative to the car and improve public perception of transport in Slough**	✓
2	**Alleviate the severe congestion on the A4 by allowing better flow of traffic**	✓
3	**Minimise the impact of noise and air pollution and greenhouse gases on the A4 corridor**	✓
4	**Support economic development in Slough and Heathrow and contribute to tackling deprivation**	✓

4.145. The evidence provided within this report proves that the monetised benefits which can be deemed to be having an effect on the public accounts can provide a **Very High VfM** category based on BCR. This categorisation is confirmed when the reliability benefits and significant local economic and social benefits are added.

5. The financial case

Introduction

5.1. This chapter presents The Financial Case for Phase 1 of the SMaRT scheme. It concentrates on the affordability of the proposal, its funding arrangements and technical accounting issues. The total outturn costs and expenditure profile are presented, along with an assessment of the impact of the proposed deal on the Department's budgets and accounts.

Outline approach

5.2. The cost of implementing the scheme and incremental costs of maintaining and operating it have been estimated in accordance with TAG unit 1.2: Scheme Costs. The costs have been subject to value engineering and critical assessment both internally and externally.

Cost estimates

Derivation of base costs

5.3. Detailed cost estimates for the total scheme, including the preparation costs, the design, supervision and construction of the road, and associated complementary and environmental mitigation costs have been prepared using the known costs for the ongoing Farnham Road scheme as a benchmark.

5.4. Table 5.1 provides a summarised breakdown of the un-inflated base cost estimate, which excludes allowances for inflation, risk and optimism bias, for the latest scheme design.

Table 5.1 Breakdown of costs

Cost item	Cost (£, Q2 2014 prices)
Preparation costs	£330,000
Construction costs	£4,039,409
Land costs	£1,100,000
Supervision costs	£202,224
Statutory undertaker's diversions	£1,200,000
Total Base Cost (excluding inflation, risk and optimism bias)	£6,872,633

Inflation assumptions

5.5. Investment, operating and maintenance costs have all been forecast at current prices and inflated up to the point of expenditure.

5.6. For the purposes of appraisal only real inflation (i.e. the rate of inflation of costs above the rate of background inflation) has been considered, for the financial case the full rate of inflation has been included in cost forecasts.

5.7. Latest forecasts suggest that construction related costs will rise by 3% in absolute terms to 2015 and by a further 3.5% to 2016. This covers the period included in the construction profile for SMaRT.

5.8. Beyond 2016, reliable forecasts of construction cost growth are not available so the long term average growth rate has been applied to ongoing capital renewal and maintenance costs.

Allowance for risk

5.9. A risk register specifically for the SMaRT scheme has been prepared and used to obtain a Quantified Risk Assessment (QRA).

5.10. Atkins undertook a review of the individual risks and modelled the data using @Risk to obtain an 80th percentile QRA, the quantified value of risk, of £773,423.

5.11. However, since these risks occur in the future years, inflation has also been added to the value of the risk. Inflation adjusted quantified risk is therefore £825,000.

5.12. The Risk Register and QRA results are contained within Appendix K.

Quantified cost estimate

5.13. Table 5.2 sets out the quantified cost estimate, (outturn cost) which includes risk and inflation and shows the years in which the costs are incurred.

Table 5.2 Quantified Cost Estimate (£m, outturn)

Cost element	Year cost are incurred (£millions)			Total
	2014/15	2015/16	2016/17	
Preparation	£0.045	£0.294		£0.339
Land Acquisition		£1.133		£1.133
Main Works		£0.013	£5.572	£5.585
Supervision		£0.110	£0.102	£0.212
Risk			£0.825	£0.825
Total	**£0.045**	**£1.549**	**£6.498**	**£8.093**

Details of eligible preparatory costs

5.14. The preparation costs include the work required to complete the business case, the planning application and planning, statutory process, the monitoring and evaluation, the funding approval process and procurement of the scheme. The preparation costs are being funded from a variety of SBC sources including local authority capital and revenue programmes.

Ongoing revenue liability

5.15. Operation and maintenance liabilities will fall to the local authority. These costs have not been included in the cost estimate as they will be become part of the maintenance and operations costs for the principal road network authority.

Section 151 officer sign off

5.16. In support of the business case submission SBC's Section 151 officer, will sign off the estimated costs of the scheme.

Budgets/ Funding cover

Funding package

5.17. The funding package proposed for financing the SMaRT scheme is made up of £5.560 million (as scheduled in the TVB SEP) which will be used for all construction cost and an element of land purchase; and £2.532 million of SBC funding which includes the preparatory and supervision costs which are to be funded from the capital and revenue programmes, and land purchase costs.

Phasing of the total funding package

5.18. Table 5.3 shows the total cost estimate and the funding sources by year broken down by funding organisation.

Table 5.3 Funding package (£m, outturn)

Organisation	Year cost are incurred (£millions)			Total
	2014/15	2015/16	2016/17	
BLTB			£5.560	**£5.560**
SBC	£0.045	£1.549	£0.938	**£2.532**
Total	**£0.045**	**£1.549**	**£6.498**	**£8.093**

6. The commercial case

Outline approach

6.1. The DfT's guidance document, 'The Transport Business Case: Commercial Case', outlines the areas that should be covered as part of the Transport Business Case documentation. The necessary elements to achieve compliance are:

- Output based specification;
- Procurement strategy;
- Sourcing options;
- Payment mechanisms;
- Pricing framework and charging mechanisms;
- Risk allocation and transfer;
- Contract length; and
- Contract management.

6.2. The commercial case has been developed following the outline approach below:

- Set the procurement objectives, outcomes and constraints;
- Identify potential procurement / purchasing options;
- Assess the procurement options in terms of pros and cons, as a rationale for selecting the preferred sourcing option;
- Confirm the preferred payment mechanism and pricing framework; and
- Assess how different types of risk might be apportioned / shared, with risks allocated to the party best placed to manage them.

Output based specification

6.3. The commercial case is based on strategic outcomes and outputs, against which alternative procurement options are assessed.

6.4. The outcomes which the preferred procurement strategy must deliver are to:

- Achieve cost certainty, or certainty that the scheme can be delivered within the available funding constraints;
- Minimise further preparation costs with respect to scheme design by ensuring best value, and appropriate quality;
- Obtain contractor experience and input to the construction programme to ensure the implementation programme is robust and achievable; and

- Obtain contractor input to risk management and appraisals, including mitigation measures, to capitalise at an early stage on opportunities to reduce construction risk and improve out-turn certainty thereby reducing risks to a level that is As Low As Reasonably Practicable.

Procurement strategy

6.5. The procurement process will be run in strict accordance with the legislative framework set out within the SBC Council Procurement Strategy (2012). In addition the process will be governed by the Council's own constitutional Contract Procedure Rules (2012) and will be subject to the Council's Procurement Gateway Process.

6.6. Under the Procurement Gateway Process the strategy will be subject to review by the Council's Procurement Manager, senior Legal officer and senior officers from across the Council who are highly experienced in strategic procurement and contract management. Express approval must be gained from the Procurement Gateway Board in two stages, firstly to enable the tender documentation to be released and secondly to enable the procurement to move to the award procedure stage following review of the award recommendation.

Procurement options

6.7. The following procurement routes have been considered:

- Traditional, procurement, construction, separate maintenance;
- Design and Build (D&B) construction, separate maintenance;
- Early Contractor Involvement (ECI), separate maintenance; and
- Private Finance Initiative (PFI) Funding, Design Build Operate and Maintain (DBOM).

6.8. For the first three options described above, the additional work involved in the maintenance and operation of the infrastructure will be undertaken by SBC.

6.9. Table 6.1 summarises the options, presenting the pros and cons of each procurement route.

Preferred route

6.10. The Council’s preferred route is to go out to direct tender as it enables the Invitation to Tender to seek the “Most Economically Advantageous Tender” and, as the Council will not reveal budget or expected spend, this approach will encourage the most competitive tendering.

Sourcing Options

6.11. In accordance with the Council’s Constitution and Financial Procedures, procurement will commence through a formal Invitation to Tender. This is seen as a “Works” contract and it is anticipated that the total value of the contract will be above £4,348,350 at which point EU Procurement Rules apply. For this requirement it is intended to use the Open Tender procedure and Corporate Procurement would advertise the tender and issue documentation through the South East Business Portal:

(https://www.businessportal.southeastiep.gov.uk/SECE/cms.nsf/vLiveDocs/SD-DEVV-6UNGEK?OpenDocument&contentid=1.001)

6.12. A minimum period of 45 days would be allowed for tender submissions to be made and following evaluation and award a 10 day Standstill Period would then be allowed prior to the start of contracts. OJEU notices would be issued as appropriate throughout the procurement process.

Table 6.1 Procurement options

Procurement Type	Description	Risk Transfer	Pros	Cons
Traditional	Client completes a full detailed design followed by tendering for a Contractor, who is passed the design to construct. The form of Contract is usually the ICE or similar	Risk resulting from design is carried by the Client.	• Allows for competitive tender. • Comparable in programme terms with D&B. • High client control over specification and quality.	• Poor record on cost certainty – generally accepted that outturn cost will be 30% higher than tendered price. • Majority of the Risk is carried by the client.
Design & Build with Consultant Contractor commission for advice throughout the design development phase	Client submits for tender the design developed during the statutory processes and passes it to the Contractor to tender the detailed design and construction. By employing a contractor through the design stage, the scheme benefits from continuous appraisal of buildability and value engineering options.	Risk from detailed design is carried by the Contractor. The client develops a detailed knowledge of risk, enabling a more informed negotiation of risk transfer at tender stage.	• Allows for competitive tender. • Comparable in programme terms with traditional. • Target cost contract allows for high degree of cost certainty and potential cost savings. • Design solutions are likely to be directed towards specific Contractor methods aiding buildability and potential for value engineering.	• Requires well developed works information to ensure client control over specification and quality.
Early Contractor Involvement	Contractor appointed prior to preliminary design stage, helping to ensure that the design taken into the statutory processes is as efficient and buildable as possible. Allows for early supplier engagement on a partnering basis. This form allows for the incorporation of the supplier skills and knowledge within the early stages of design.	All design risk carried by the Contractor. Risk register developed in partnership with supplier. Opportunity to share risk to most appropriate party.	• Contractor is better placed to manage risk, having been involved from an early stage in the design process. • ECI benefits projects with complex engineering challenges like this scheme which includes multiple interfaces with Network Rail crossings and Metrolink allowing the Contractor to address key risks earlier. • Contractor involvement pre-planning inquiry would permit robust evidence to be presented regarding concerns of construction impact on the local environment and communities	• Although rates would be market tested, the target cost for the main construction works negotiated rather than competitively tendered. • Requires some certainty of scheme funding prior to the commencement of preliminary design and statutory processes.
PFI DBOM	A Concession contract is awarded with the Concessionaire paid a service fee for delivery of operational and maintenance services for a duration of typically less than 22 years (procurement Regulations). In this instance the fee or unitary charge reflects the cost of the provision of the infrastructure through private finance (or largely private finance) plus the operating, maintenance costs and profit.	All risk is carried by the PFI Operator	• Total cost of the scheme including maintenance and operation is effectively spread over the whole lifecycle of the project. • Long term interest in maintenance helps ensure quality driven approach to the design and construction of the scheme.	• Increased time of procurement process will lead to significantly later start date of construction and therefore potential for increased cost to completion.

Payment/ Charging mechanisms and framework

6.13. A tendered fixed price contract will be awarded based on the NEC 3 contract model, which allows for penalty clauses, specifically relating to over running.

6.14. Payments to the contractor will be made in arrears to the value of 60% of the project subject to an independent clerk of works (appointed by the Council) agreeing with the submission made by the contractor.

6.15. Payments made to the contractor will be subject to a further cross checking against the programme to ensure that the absolute minimum over run occurs, if any and if a penalty is due to be applied work with the contractor to rectify/remedy this.

6.16. The final 40% will be paid in stages upon receiving invoices for completed elements of the work.

Risk allocation and transfer

6.17. A Risk Workshop was held in May 2014 between the SBC Project Management Team, designers, planners and external consultants. The workshop resulted in the formation of a risk register detailing risks associated with:

- Strategic/Political/Policy;
- Economic/ Financial/Management;
- Statutory process/ legal/ land acquisition;
- Design/technical/preparatory works;
- Stakeholder Management/Consultation;
- Procurement;
- Construction; and operation.

Risk management plan

6.18. A Risk Management Plan will be developed throughout the life of the project. Following confirmation of scheme funding, ownership of the risks will be allocated to those parties best able to manage them.

6.19. The Risk Management Plan will set out the full risk management process and responsibilities for undertaking risk management to deliver the SMaRT scheme. Implementation of a structured, forward looking and continuous risk and opportunity management process is intended to increase the certainty of cost-effective scheme delivery and operational success.

6.20. Further risk identification will be carried out in numerous ways such as:

- Workshops;
- Reviews;
- Meetings; and
- Day to day operation.

6.21. When a risk is identified, the data will be added to the Risk Register.

Risk management organisation

6.22. The risk management organisation for this scheme consists of four key parties: the Project Board, the Project Manager, the Risk Manager and the Risk Owner.

6.23. The Project Board has overall responsibility for ensuring sufficient resources are available to manage risks across the scheme. Risks shall be allocated and managed in a cost effective manner by the most appropriate party to do this and at the appropriate level. The Board shall be primarily concerned with managing strategic level risks relating to interfaces between the scheme and the wider project environment.

6.24. The Project Manager has overall responsibility for ensuring that the risk management process is implemented and managed in accordance with strategies.

6.25. The Risk Manager shall ensure that risks are actively managed in a consistent and appropriate manner across all work streams in accordance with this Plan. All severe risks shall be reported by the Risk Manager to the Project Board through the Project Manager. In addition, all risks which relate to the overall direction, organisation and control of the scheme, e.g. loss of key project staff, shall be reported to the Project Board.

6.26. The Risk Manager shall:

- ensure that an appropriate procedural framework is adopted;
- report to the Project Manager in review and management of project performance;
- agree the required level of risk management support to be provided for risk identification, analysis, review and reporting;
- facilitate risk workshops/meetings as appropriate supported by a risk co-ordinator if required;
- be the custodian of the risk register and the contained data.

6.27. The Risk Owner shall be responsible for the day to day management of the risk(s) that they own. The selection and appointment (by the Project Manager) of a risk owner will be on a “best person for the task” approach and, once appointed, the risk owner will monitor and update the risk register informing the risk manager of changes.

Key project risks

6.28. Table 6.2 identifies the key project risks throughout the planning and implementation of the scheme. A full risk register can be found in Appendix K.

Table 6.2 Key project risks

Planning / Approval Risks & Mitigation	
Risk	**Mitigation**
Delays during planning stage (including delays in statutory process orders, determination of public inquiry, advanced archaeological finds etc) leading to increased capital cost.	Ensure robust scheme and orders presented at planning application and publication. Employ experienced team to prepare and complete the statutory process.
Failure to achieve Planning Consent	Prepare robust Planning Application. The scheme will continue to liaise with a scheme specific advisory group made up of planning officers from each of the local authorities.

Cost Risks & Mitigation	
Changes to scheme funding	Continue communication with funding sources.
Statutory Undertaker diversions cost underestimated	Continual liaison with SU's (C3 estimates already received). Consider employment of specialist consultant to value engineer planned diversions at preliminary design stage.
Delivery Risks & Mitigation	
Development sites affecting design criteria	Ensure agreement with planning authorities at early stage and review.
Delays during construction, including statutory undertaker diversions, access restrictions due to environmental constraints etc.	Continually review programme to ensure sufficient time allowance made for such issues. Continue to liaise with consultant contractor to seek advice on buildability issues. Liaison with external bodies to assist in development and acceptance of scheme design.

Contract length

6.29. As specified in the project programme, the contract for construction of the SMaRT scheme will run from the award date in November 2015 to August 2016.

Contract management

6.30. A traditional contract NEC 3 will be used, ensuring that the contractual / commercial arrangement will be well defined. This form of contract is well understood throughout the supply chain and relies on a pre-defined risk register to allocate and manage anticipated risk. During contract negotiations, risk will be allocated to the party best able to manage it the most cost effective way.

7. The management case

Outline approach

7.1. The DfT's guidance document, 'The Transport Business Case: Management Case', outlines the areas that should be covered as part of the Transport Business Case documentation. The necessary elements to achieve compliance are:

- Evidence of similar projects;
- Programme/ project dependencies;
- Governance, organisational structure & roles;
- Programme / Project plan;
- Assurance & approvals plan;
- Communications & stakeholder management;
- Programme / Project reporting;
- Contract management;
- Risk management strategy;
- Benefits realisation plan; and
- Monitoring and evaluation.

7.2. The management approach has been developed following the outline set out below:

- Set the appropriate governance structure to ensure outcomes and objectives are met;
- Identify and plan for the key approval milestones ensuring information is provided in good time so as to not delay the programme;
- Assess how the delivery process will be managed to achieve the optimum financial and impact performance.

Evidence of similar projects

Heart of Slough Infrastructure Improvements scheme

7.3. The management structure and practices outlined in this section are the same as those which delivered the £12.5 million 'Heart of Slough' scheme which was completed in spring 2012.

7.4. The Heart of Slough town centre scheme delivered a complete overhaul of road space, traffic management and public realm within Slough Town Centre, providing a base for the large scale regeneration of office and residential development. The implementation was led by Slough Borough Council and part funded by the Homes and Communities Agency (HCA) and consisted of:

- A new four-way junction controlled by traffic lights to improve the traffic flow. The Brunel roundabout has been removed and new improved road level pedestrian crossings have been installed;

- Closure of the subways under the Brunel roundabout;
- New wide pavements catering for pedestrians and cyclists around the junctions;
- A new tree lined boulevard along the north and south sides of the A4 Bath Road from High Street West to Brunel Way;
- Footways on High Street West were repaved and widened in places;
- New street furniture and street lighting installed throughout the scheme;
- The train station forecourt has been improved including new paving making it a more pedestrian friendly environment, relocation of the taxi pick up point plus the introduction of a new passenger drop-off area

Farnham Road (A355) Bus Lane scheme

7.5. SBC are currently implementing the Farnham Road (A355) Bus Lane Scheme which has been procured and managed through the same process and strategies as those intended for the SMaRT scheme. The scheme is currently under constructing following a successful tender award in mid 2013 and is scheduled to cost £1 million.

7.6. The main features of the scheme are:

- Construction of bus lane sections from the junction of Buckingham Avenue East to the junction with Bath Road;
- Completion of cycle facilities from Number 90 Farnham Road to Bath Road;
- Introduction, improvement or relocation of pedestrian crossing facilities at several junctions; and
- Improvement works at the junctions with Bath Road (Tun's Junction) and Salt Hill Drive.

Programme / Project dependencies

7.7. The scheme programme is dependent on the following:

- Planning Permission granted on behalf of all three local authorities;
- Successful CPO process complete to acquire land required for the scheme;
- Timely procurement of a capable supplier;
- Political backing and funding from each of the identified funding streams and public transport operators; and
- Successful liaison with the local communities ensuring they are included in regular updates throughout the schemes development.

Governance, organisational structure & roles

7.8. SBC will operate the design, construction and monitoring stages of the scheme utilising a governance structure as shown in the organogram in Figure 7.1.

7.9. At the head of the structure is the Lead Cabinet Member with ultimate authority over the implementation of transport schemes with the assistance of the project board. The leadership

team will be responsible for ensuring the scheme follows the identified programme and will maintain the operation of the project delivery team.

7.10. The project will be delivered by SBC. The Senior Responsible Officer for the project delivery is Savio De Cruz – Acting Head of Transport. The Project Manager for the project is Neelesh Mohun.

Programme / Project plan

7.11. Since the last submission of the BLTB application SBC has progressed with the planning and management required in order to be in a position to complete the scheme (when funding is received) by mid-2016.

7.12. A Gantt chart programme detailing the process to completion has been adopted and maintained and is contained in Appendix L.

7.13. The work to date has been undertaken at SBC's own risk. Without funding from the BLTB, the scheme cannot be completed and the prospects of enabling increased transport required to deliver jobs in this key area will be hampered.

Assurance & approval plan

7.14. SBC will follow its Gateway Process as a mechanism for assessing projects at critical stages in their lifecycle prior to commencing the next stage. The use of the Gateway process enables:

- Realistic and achievable targets to ensure successful delivery;
- Deployment of relevant skills and competencies to a project;
- Compliance with best practice;
- Key stakeholder input and understanding;
- Project feedback through lessons learnt; and
- A visible audit trail.

7.15. The planning of the SMaRT scheme has run in-line with the BLTB Assurance Framework procedures. The following key milestones for SBC and BLTB/LEP signoff are shown below:

- Decision by BLTB/Thames Valley Berkshire LEP Board on commitment of funding: July 2014;
- Contract between BLTB LEP and scheme delivery body produced and signed: September 2014;
- Detailed design approval (SBC): March 2015;
- Planning permission: April 2015
- Construction tender contract awarded (SBC): September 2015;
- Sign-off of construction duties (SBC): August 2016.

7.16. These milestones have been built into the project programme and will be monitored by the SBC Project Manager and reported to the Project Board.

Communications & stakeholder management

7.17. The key objectives of the scheme's stakeholder management are to:

- Keep stakeholders aware of the schemes progression and give an opportunity for feedback to help gain scheme approval;
- Give an opportunity for stakeholders to provide views and recommendations for improvements so that the scheme meets stakeholder requirements as far as is practical;
- Meet statutory requirements;
- Increase public and stakeholder awareness of the scheme;
- Provide consistent, clear and regular information to those affected by the scheme, including the nature of any scheme-related impacts and when and how it will affect people of groups both during delivery and once operational; and
- Address perceptions of the scheme where these are inconsistent with the scheme objectives and forecast outcomes.

Stakeholder management

7.18. SBC will ensure adherence to the programme via monthly meetings with the Contractors and Designers to ensure that the project is on target.

Public consultation

7.19. SBC will follow their Community Engagement Policy when consulting the public. The scheme will be publicised in the public domain for public consultation in advance of construction and direct engagement with statutory consultees will occur during the Detailed Design Stage of the project and further during the public consultation stage.

7.20. The Design team along with the project team will undertake these consultation activities in partnership with Slough Borough Council's communication team.

Programme / Project reporting

7.21. Responsibility for accurate, timely and appropriate communications within the project team rests with the SBC Project Manager to ensure that the Project Board is kept up-to-date with programme developments.

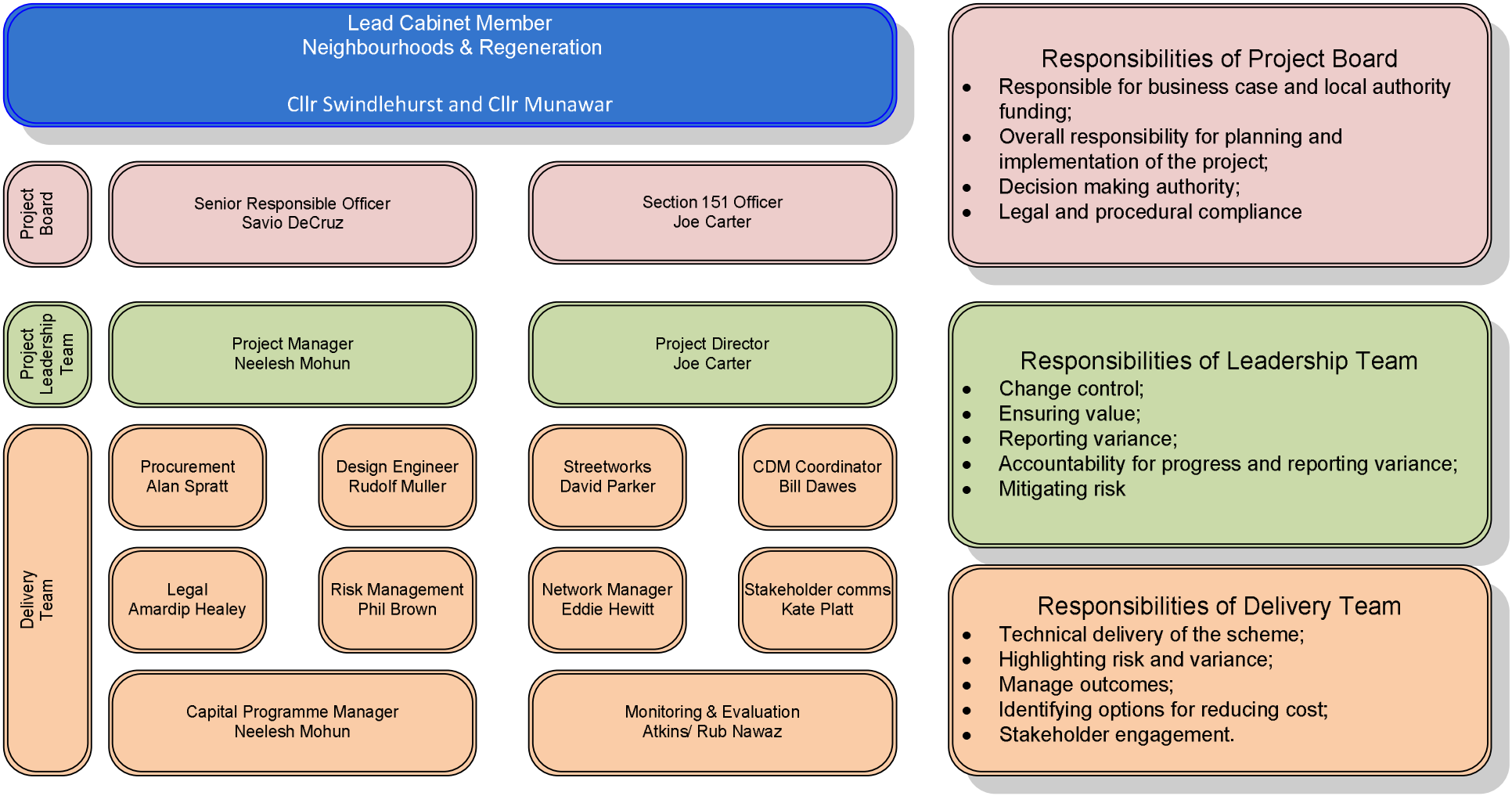
7.22. The Project Manager identified is responsible for ensuring the Project Board is provided with sufficient information and that the Project Board clearly understands that information in order to provide necessary guidance on programme decisions. The Project Manager is responsible for leading both Delivery Team and reporting to the SRO to ensure that all parties are up-to-date with relevant information.

7.23. The SRO is responsible for keeping the Lead Members aware of the development of the scheme towards meeting the project objectives.

7.24. It is the responsibility of the Project Director to ensure that the Project Board has sufficient information and is involved in all decisions that affect performance of the project, achievement of the project objectives or deviation from agreed and delegated responsibilities.

7.25. Project team meetings are held on a monthly basis, with the outcomes escalated to the Project Board.

Figure 7.1 SMaRT project governance structure



Key issues for implementation

7.26. The live risk register contains a full set of identified risk associated with the implementation of the scheme along with planned mitigation.

7.27. Table 7.2 identifies the key project risks throughout the planning and implementation of the scheme.

Table 7.1 Key issues for implementation

Planning / Approval Risks & Mitigation	
Risk	**Mitigation**
Change in SBC Lead Cabinet Member/Leader results in withdrawal of support for scheme.	The current LCM is signed up to the scheme development. Regular briefing notes for all SBC members will update them on scheme development.
Planning permission for change of use refused.	SBC planning team is already preparing the case for the planning application. All land impacted by change of use is within parcel identified as 'Bath Road Widening Line' in policy.
Several trees will required relocation due to the scheme	Locations to be obtained with all TPO areas along the whole route.
Cost Risks & Mitigation	
Local authority contribution is not forthcoming due to pressures on other budgets.	Members are aware that the BLTB/LEP have prioritised the scheme which, subject to statutory consents being obtained and design / procurement, will be affordable and delivered within the approved funding envelope. There would be considerable reputational damage if SBC decided to abandon the scheme because of a change in short term funding priorities.
The capital costs of the scheme increase as a result of factors uncovered at preparatory surveys and design stages.	As the site survey information is obtained, there will be further cost reviews as part of the design process. We are currently in the process of commissioning Site Investigation work (geo-technical, outstanding topo, etc.). A comprehensive QRA process will be undertaken as part of the detailed design work and added to the risk register.
Delivery Risks & Mitigation	
Unknown services struck during construction works incurring delays to programme	Adequate planning, liaison and undertaking of works in advance of main programme. Agreement of any utilities work before start of construction. GPR survey undertaken to establish location of statutory undertakers' equipment and unmarked services. Digging of trial holes and CAT scans for any advance works. Permit to dig process for main works.

Change to design after construction commences.	Design review will consider any potential risks of changes to scheme design. Potential to seek external advice on potential risks areas where design changes could occur.

Contract management

7.28. Monitoring during implementation will be undertaken by the SBC PM/SRO and will ensure that mitigation measures identified in the risk register will be undertaken and adhered to.

7.29. The monitoring of activity during the construction will be embodied in a Construction Management Plan (CMP) to be prepared and operated by the scheme promoter as the planning authority and adhered to by the contractor. Similarly, a Site Waste Management Plan would be prepared to address requirements for waste handling and disposal which would be adhered to during the construction phase.

7.30. Local authority environmental health officers' stipulations in respect of air, noise, operating hours and waste would also be incorporated into the contractor's monitoring procedures and plans as part of a construction code of practice.

Risk management strategy

7.31. The management of risk has been covered in detail in Chapters 5 and 6 of this report.

Benefits realisation plan

7.32. Tracking of the scheme benefits will be a key element in understanding the success of a specific intervention. The realisation of benefits is intrinsically linked to the Monitoring and Evaluation plan (discussed in the following section).

Scheme objectives, outcomes and impacts

7.33. The intervention Logic Map (seen in Figure 7.3) identifies the scheme objectives along with the associated expected outcomes and impacts (benefits).

7.34. The PM/SRO will be the owner, responsible for tracking the benefits being realised and for reporting any exceptions to the project board. This will allow early identification of any particular areas where benefits are not being realised as expected. The Project Board will then appoint someone with sufficient expertise to oversee remedial actions to try to bring benefits back in line with expectations.

Benefit monitoring

7.35. The monitoring of the benefits realised against each objective is controlled within the Monitoring and Evaluation plan. This sets out the necessary data and information requirements to track the performance of objectives.

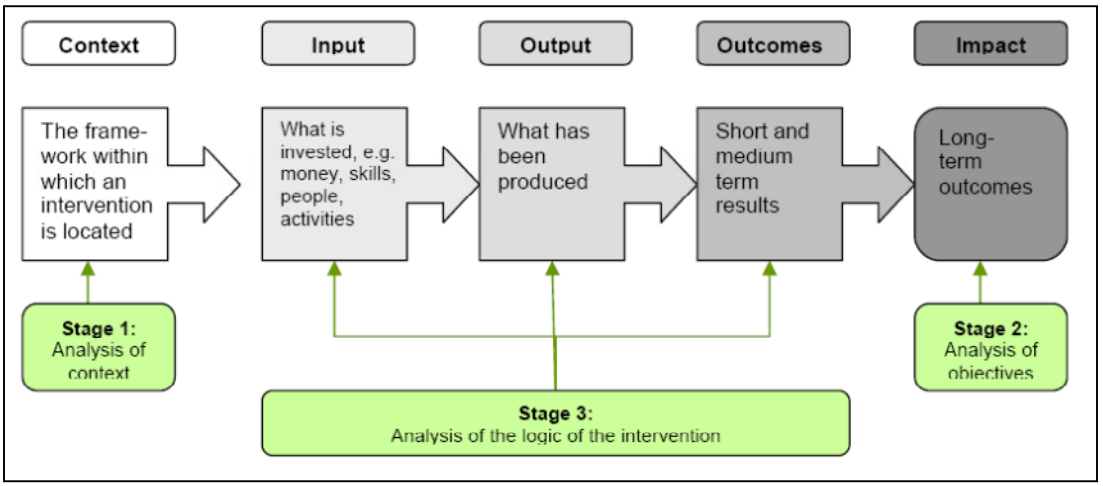
Monitoring & evaluation

7.36. The Department for Transport's latest Monitoring and Evaluation Framework for Local Authority Major Schemes states that the Monitoring & Evaluation Plan should be targeted for the scheme. In the case of the SMaRT scheme evaluation, this will cover standard monitoring of measures common to all schemes covering inputs, outputs, outcomes and impacts.

7.37. A key element of the Monitoring and Evaluation plan is to map the intervention logic. This involves systematically linking key components of an intervention in order to produce a causal pathway (see figure 7.2**Error! Reference source not found.**) across the:

- Inputs (i.e. what is being invested in terms of resources and activities);
- Outputs (e.g. target groups reached, roads built, products developed);
- Outcomes (i.e. short and medium-term results, such as changes in traffic flow levels and modal shifts); and
- Impacts (i.e. long-term results such as better quality of life, improved health, environmental benefits etc).

Figure 7.2 Components of an intervention logic map



7.38. Figure 7.3 sets out the intervention logic map for the scheme and shows the linkages between the key components of the intervention with the scheme objectives. The map shows the process by which the scheme outputs will deliver the primary objectives for intervention (shown as dark green boxes), and describes an outline evaluation approach for monitoring the extent to which these are achieved as part of a pre and post-opening monitoring report.

7.39. The map also shows wider and longer term impacts, which depend on the delivery of the primary objectives.

Evaluation objectives

7.40. The evaluation objectives are as follows: (1) the efficiency of the scheme management and delivery process leads to (2) whether outcomes have been achieved, which in turn provides (3) the ability to demonstrate accountability for the initial investments. Evaluation objectives have been set to show a clear flow reflecting the process, impact and economic elements of the evaluation.

Process evaluation: Efficiency of scheme delivery

7.41. The resources and finances used in delivering the scheme should be understood in order to gain an understanding of existing planning techniques and to provide lessons learned for use in future best practice.

Impact evaluation: Delivery of projected outcomes

7.42. The planning and processes used in defining an intervention from the outset, and their continual evolution throughout design, construction and implementation play a key factor in predicting outcomes. Understanding of how the predicted outcomes match those which are delivered by scheme is essential in providing lessons learned for future proposals.

Economic evaluation: Accountability for investment

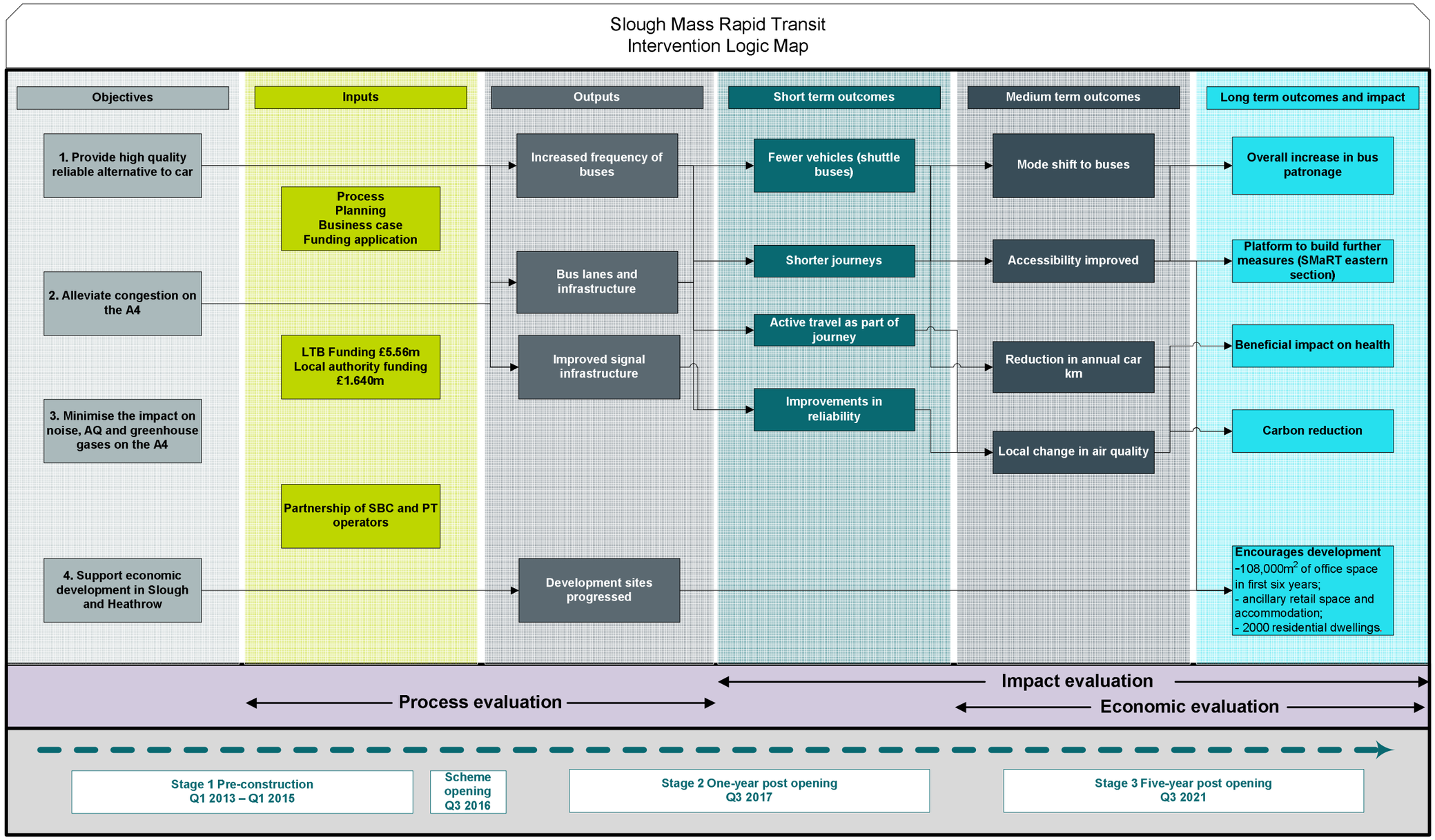
7.43. The outcomes of the scheme will enable SBC to establish a revised assessment of the benefits of the scheme. Whether anticipated or not, do the benefits justify the investment made at the outset? How can the VfM forecasts be considered in the planning of future schemes?

Three-stage approach for Monitoring and Evaluation

7.44. It is important to establish how different scheme-specific objectives are realised over different timescales.

7.45. Some objectives will be realised immediately or shortly after the scheme opens; such short and medium term scheme effects are referred to as outcomes. Other objectives such as supporting economic regeneration are less direct and tangible effects of the scheme and are expected to take effect over a longer period; these longer term effects are called impacts. Impacts can be more difficult to attribute directly to the scheme.

Figure 7.3 Intervention logic map for the SMaRT scheme



7.46. For this reason the Scheme Monitoring & Evaluation Plan will be undertaken in three distinct stages:

- Stage 1 - Pre-Construction Study;
- Stage 2 – One Year Post Opening Process Evaluation, Q3 2017; and
- Stage 2 - Five Year Post Opening Impact Evaluation Study, Q3 2021.

Process evaluation

7.47. The Process Evaluation will be undertaken as the construction nears completion through to the Stage 2 One-year post opening evaluation.

7.48. The aim of the process evaluation is to identify factors influencing the extent to which objectives have been achieved, identify and investigate unintended outcomes, and identify lessons learned.

7.49. The process evaluation will extend beyond a desk-based study and will involve interviews with key project officers and a process review workshop with key parties (e.g. SBC, BLTB) and stakeholders. This will include assessment of:

- Programme management, success factors and key obstacles to delivering the scheme. Provide details of project plan assessment, delivery at key milestones, etc. This will help identify good practice in this area, which can be shared in the future;
- A review of evidence collated through SBC's project management and governance procedures;
- Consultation with key stakeholders to garner a range of views of the operation and success of the scheme;
- The evolution of the risk register and the effectiveness of the risk management strategy e.g. safety during construction, delays to transport users, impacts on local business during construction;
- If and how the context and rationale behind the scheme has changed;
- Identify any changes to the delivered scheme from the planned scheme and the reasons behind any changes. This can be used to identify good practice and feed into the Department's meta-analysis of local authority schemes;
- Assess how well scheme objectives are being realised at this stage; and
- All costs involved in the management, construction and delivery of the scheme compared to the forecast costs including an assessment of risk and optimism bias in pricing.

7.50. The process evaluation will make use of the extensive audit trail provided by the use of the PRINCE 2 project management environment. We expect the following reports to be produced as part of this system:

- Highlight Report;
- Exception Report;
- End Stage/Next Stage Report;
- Project Closedown; and
- Lessons Learned Log.

7.51. These reports will be used to assist in the evaluation of the process from start to finish. As part of the project closedown process a workshop will be held with key members of the client and contractor teams to capture the items that went well and did not go well and if there are additional lessons that need to be learned. This will include a review of the impact of stakeholder engagement based upon the feedback that was received during the project, and also perceptions of the construction phase obtained via the residents' attitudes surveys.

Impact evaluation

7.52. The evaluation of impacts will be undertaken using a standard knowledge-based theory of change approach, and designed so that the unique contribution of the SMaRT scheme can be established, and so that the approaches and methods are commensurate with the scheme's scale. This approach has been adopted as it will allow:

- The evaluation of specific interventions;
- The ability to derive causal based effects of the interventions; and
- An opportunity for continual forecasting of impacts.

7.53. Stage 1 (Pre-construction) involves the collation of baseline information which can be used in the evaluation of impacts in the later stages.

7.54. Collating electronic copies of all reports, documents, data and models relating to the scheme appraisal that will be required to establish baseline conditions and forecast impacts in terms of accidents, traffic volumes and journey times.

7.55. In Stages 2 and 3 the impact evaluation will be updated with the following:

- Request and process personal injury accident data for period beginning five years prior to the start of construction and finishing five years after opening. Compare accident and casualty numbers allowing for a robust assessment of safety impacts;
- Commission ATC surveys to assess the change in traffic flows along the route;
- Collect ticketing data from public transport operators. This information is expected to be commercially sensitive and will only be referred to in broad terms;
- Commission bus user surveys to determine a counterfactual evidence base e.g. would you have travelled without the bus interventions. If so how would you do it?
- Compare Stage 1 baseline data to future data to determine scheme impacts;
- An evaluation of the scheme in terms of the outturn impacts on regeneration and economic growth;
- Business surveys which will include questions which seek responses on the causal relationships between the scheme and new/relocated business and development as well as evidence of the counterfactual i.e. what would business have done without the scheme?;
- Compare information provided in the Air Quality Monitoring Area studies pre and post construction; and
- Obtain and analyse local socio-economic and economic metrics such as employment data and housing volumes to establish any correlation between the delivery of the scheme and improvements in local economic conditions.

Economic evaluation

7.56. After completion of the Stage 3 monitoring and impact evaluation, an economic evaluation will be undertaken to assess the accountability of the investment into the scheme through answering the following questions:

a) How do the realised benefits, and therefore, VfM correspond with those assumptions derived from the scheme appraisal?

b) Have any unexpected benefits occurred or have other predicted benefits not materialised?

c) Are on-going benefits expected to change?

7.57. The actual outturn costs and movement data will be used to generate a new BCR. This will be supplemented with an assessment of the wider economic benefits generated by the scheme to understand the Value for Money provided. This will be compared back to that generated within the original business case.

Dunstan Westbury
Atkins
United Kingdom - Epsom - Gateway

dunstan.westbury@atkinsglobal.com