South Reading MRT Phase 3 and 4

Economic Assessment Report

On behalf of **Reading Borough Council**

Reading Borough Council
Working better with you

Project Ref: 28791/5526 | Rev: AA | Date: October 2017

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1 Introduction

1.1 Background

1.1.1 This document has been produced in support of a bid to the Thames Valley Berkshire Local Enterprise Partnership to secure the funds available to the Local Transport Body and allocated to the South Reading Mass Rapid Transit (SRMRT) Scheme, Phase 3 and 4.

1.1.2 Decisions on transport investment are informed by evidence set out in a business case. The Business case has been developed in line with Treasury's advice on evidence-based decision making as set out in the Green Book and uses its best practice five case model approach.

1.1.3 This document sets out the economic assessment that informs the Economic Case for the Business Case.

1.2 Scheme Description

1.2.1 Reading Borough Council is promoting the South Reading Mass Rapid Transit (SRMRT) scheme, which has been prioritised for funding from the Thames Valley Berkshire Local Enterprise Partnership (TVBLEP), through the devolved LGF3. The SRMRT scheme has been the subject of a number of studies, both looking at wider transport options within Reading and the Thames Valley, as well as specifically looking at the southern (A33) corridor into Reading town centre from M4 junction 11.

1.2.2 The South Reading Mass Rapid Transit (MRT) Phases 3 and 4 will provide a series of bus priority measures on the A33 between Rose Kiln Lane and Bennet Road, for bus services operating between central Reading to existing / proposed residential and employment areas to the south of Reading including Green Park and the new Mereoak Park and Ride facility which was delivered in 2015. The scheme will improve the journey times and reliability of bus/MRT services on the main corridor into Reading, whilst reducing forecast congestion and air quality by attracting people to switch to bus travel. The scheme will thus expand on the existing Bus Priority facilities in the A33 Corridor, through the M4 junction 11, as well as SRMRT Phase 1 which is constructed and Phase 2 which is currently being constructed.

1.2.3 Phase 1 of the scheme runs between M4 junction 11 and A33 junction with Longwater Avenue (GreenPark), whilst Phase 2 runs between the A33 junctions with Longwater Avenue (GreenPark) and Island Road.

1.2.4 Phase 3 comprises a northbound 3.25metre minimum width bus lane on the A33, between Longwater Avenue/Bennet Road Gyratory and Island Road. The existing northbound parallel footway will be retained with a minimum width of 2 metres.

1.2.5 Phase 4 of the scheme, consists of a southbound bus lane of 3.25 metres minimum width on the A33 between Rose Kiln (Reading Link Retail Park) to Rose Kiln Lane (Brunel Retail Park). A further southbound bus lane of similar quality and dimensions, will be provided between Rose Kiln Lane (Brunel Retail Park) to Island Road to the south.

1.2.6 MOVA will also be implemented on the approach and intermediate junctions between the bus priority lanes at; Bennet Road gyratory; A33/Island Road junctions; the Oracle roundabout; London Road/Kendrick Road junction; London Road/London Street junction; and at the junction of the Inner Distributor Road (IDR)/London Street junction to optimise the signal operation to reduce delays for buses and will also benefit general traffic leading to more efficient use of available road space.

1.2.7 The indicative extent of the scheme is shown in Figure 1-1.

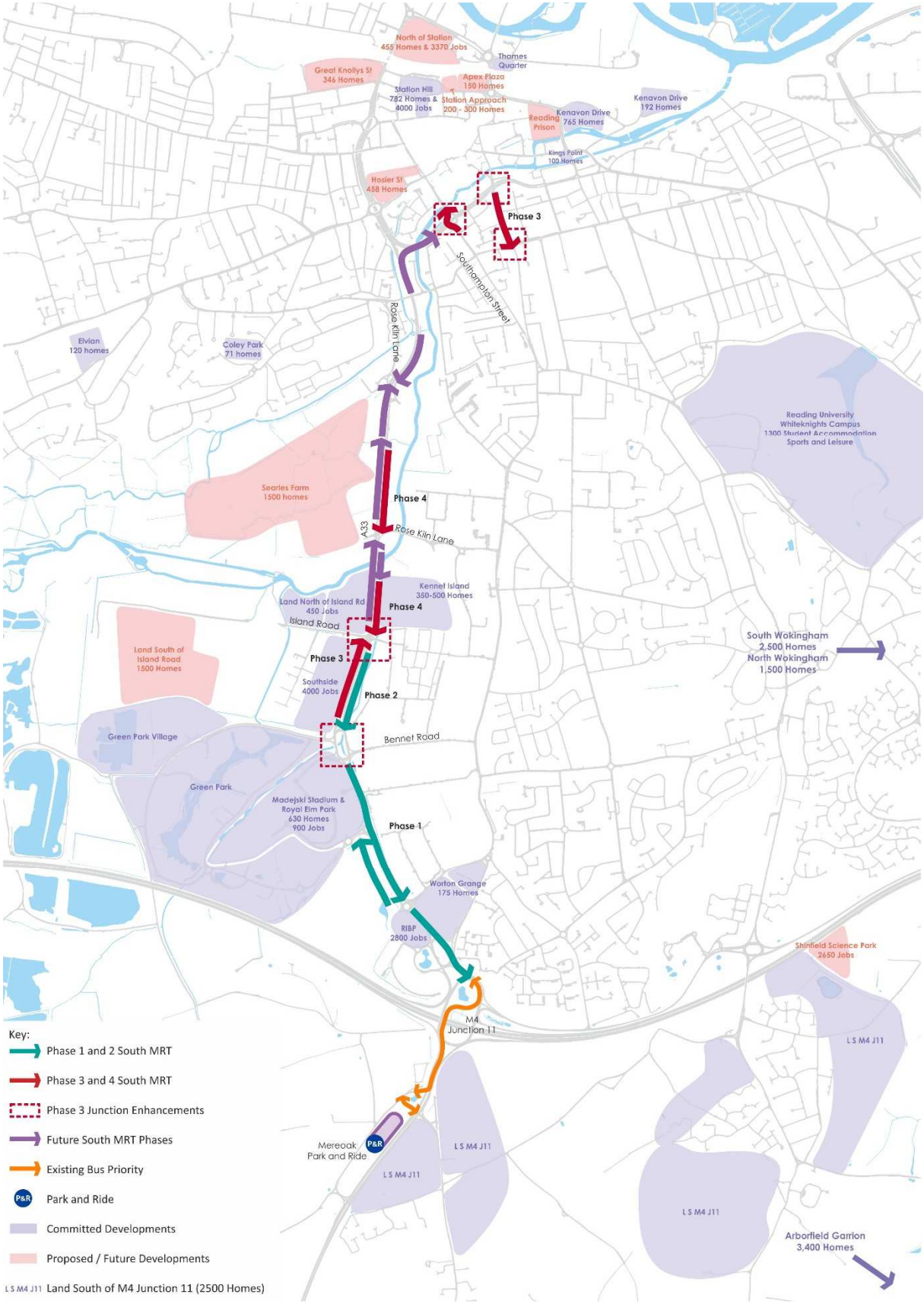

Figure 1-1 – Extent of SRMRT Phases 3 and 4

1.3 Economic Assessment Overview

1.3.1 The modelling work used to inform the economic assessment was undertaken using the Reading Transport Model and a Passenger Transport spreadsheet based demand model. Outputs from the models were used within the economic assessment, which was undertaken using TUBA (Transport User Benefit Appraisal).

1.3.2 The economic assessment informs the Economic Case, as one of the five cases within the Business Case.

1.4 Structure of Report

1.4.1 Following this introduction, the report is set out in the following structure:

- Section 2 – Economic Benefits
- Section 3 – Public Accounts
- Section 4 – Sensitivity Tests
- Section 5 – Summary and Conclusion

2 Economic Benefits

2.1 Overview

2.1.1 The economic assessment methodology has been undertaken in line with the Department for Transport (DfT) guidance set out in WebTAG.

2.1.2 The Economic Case set out in this section looks to show that the proposed SRMRT Phases 3 and 4 will offer good value for money and will help to meet the scheme objectives. Monetised benefits for the SRMRT Phase 3 and 4 scheme are assumed to include:

i. Additional revenue as a result of increased patronage of Mereoak Park and Ride site due to time savings introduced by scheme

ii. User benefits for existing Park and Ride users – equivalent to the journey time saving with scheme introduced

iii. User benefits for new users – assumed to have switched from car and hence have a saving in generalised cost equivalent to the generalised cost of previously travelling by car without the scheme and new generalised cost with the scheme

iv. User benefit for users of other buses using the SRMRT as a result of journey time savings when the scheme is introduced – these include services between the Reading town centre and Green Park.

v. Highway User Benefits or decongestion benefits – i.e. highway users who may experience benefits due to a reduction in traffic as a result of mode shift from car to Park and Ride or dis-benefit if the SRMRT were to reduce highway capacity, TUBA has been used to produce the bus user and revenue benefits and to calculate the overall economic appraisal including highway benefits.

2.1.3 The following benefits have not been quantified and therefore, the assessment is seen as a conservative estimate of the benefits of the SRMRT Phase 3 and 4:

i. Benefits accrued from benefits for public transport users at weekends

ii. Bus journey time reliability – buses are likely to be far more reliable when the scheme is developed. This is due to services avoiding the main pinch points on the A33 corridor

iii. Additional Non-User Benefits or marginal external costs arising from a reduction in highway trips, which are likely to be relatively small in the case of this scheme. These include;

- Accident benefits;
- Noise; and
- Air Quality;

iv. No increase in the use of bus services from rail (boarding and alighting at Reading Station) to GreenPark, as a result of improved reliability and journey times of the buses, as well as growth in rail use. Any increase in demand from Crossrail has not been considered

v. Event days at Madjeski Stadium and/or the committed International Conference Centre.

2.1.4 The economic assessment has predominantly been undertaken using DfT's TUBA (Transport User Benefit Appraisal) software. In this instance items i to iv above are calculated within TUBA.

2.1.5 TUBA is matrix based software that requires inter-zonal matrices of trips, distance, time and charges such as tolls, fares and parking charges. TUBA calculates the financial costs and benefits in respect of time, fuel and non-fuel Vehicle Operating Cost (VOC), charges, investment and operational costs and revenues. TUBA calculates user benefits from the differences in travel times, VOC and user charges between the Do Minimum and the Do Something scenarios.

2.2 Study Area

2.2.1 The modelled study area, shown in Figure 2-1.

Figure 2-1: Modelled Study Area

2.3 Modelled Years

2.3.1 The forecast modelled years are 2021, used to represent opening year and 2031, ten years post opening. Models have been produced for a Do-minimum (DM) and Do-something (DS) scenario. The only difference between these two sets of models is that the DS includes the scheme that is the subject of the Business Case.

2.4 Assumptions

2.4.1 The following assumptions have been made with regard to level of service within the main core case for the SRMRT:

- The Mereoak bus park and ride services frequency has been assumed to be 15 minutes;
- There is significant commuting bus patronage in the AM peak period southbound from Reading town centre to Green Park. This demand then makes the return trip in the PM peak. No commute trips have been assumed in the IP between Reading town centre and Green Park. The demand model limitation implies that trips using trains to commute to Reading before catching a bus to Green Park are not represented and hence a manual calculation has been undertaken outside the demand model. No uplift for an increase in future demand has been assumed, which is a conservative assumption given that reduced journey times for buses between Reading town centre and Green Park in the AM period will make this service more attractive.
- It has been assumed that the park and ride demand trips in the PM peak period are return trips and have been taken to be the transpose of the AM peak period trips. Inbound demand trips in the Inter Peak period are assumed to make the return trips in the Inter Peak period.
- It has been assumed that during the AM and PM peak periods, no lane closures will occur during construction, with lane closures only undertaken during the IP and off peak periods to minimise delays during construction. Therefore, no delays during construction have been assumed.

2.5 TUBA Assessment

2.5.1 TUBA Version 1.9.9 has been used for the economic appraisal of the scheme. This is the current and latest version of TUBA. At its most basic, TUBA requires two input files as follows:

i. A standard economic parameter file which contains data such as values of time, VOC coefficients, tax rates and economic growth. It also contains standard categories for mode, vehicle type, trip purpose etc. The economic file can be modified by users where appropriate. The file has been modified in order to define park and ride in line with TUBA guidance when assessing park and ride in the software.

ii. A scheme specific file which contains data specific to the modelled scheme. This includes data such as scheme costs, trip, distance, time and charge matrices from the transport model that are required by TUBA.

2.6 TUBA Scheme Inputs

2.6.1 The following sections outline the scheme specific TUBA inputs that have been selected in this assessment. This includes key assumptions on the Scheme Parameter data, time slices and annualisation factors, user classes/vehicle sub modes and scheme costs.

Scheme Parameters

2.6.2 The following scheme parameters have been defined in this assessment:

i. The First Year of the appraisal period has been entered as 2021. This is the first year for which user benefits are calculated.

ii. The Horizon Year of the appraisal period has been defined as 2080 (normally First Year + 59 for a 60-year appraisal as has been undertaken here).

iii. The Modelled Years for which model data is available are 2021 and 2031 as noted in paragraph 2.4.1. TUBA requires that if the first and horizon years are not the same, then at least two modelled years be defined and that these should lie between the first and horizon years (inclusive).

iv. The Current Year has been defined as 2016 and is the year in which the TUBA run is being made.

v. The detailed results option has been selected to enable detailed analysis of the TUBA results.

vi. The number of warnings has been set to 'All', the default selection for TUBA. This allows TUBA to write or output all serious warnings and error messages to the output file for further analysis.

Time Slices

2.6.3 The outputs from the models represent a single hour for each of the AM peak, inter Peak and PM peak modelled periods. The model has the following modelled hours (referred to as time slices in TUBA).

i. AM Peak Hour 0800 – 0900

ii. PM Peak Hour 1700 – 1800

iii. Average Inter Peak Hour representing 1000 -1600

2.6.4 Time Periods have standard definitions in TUBA as defined in the TUBA economics file. The standard TUBA time periods are defined below.

i. AM Peak (weekday 0700 -1000) – Time Period 1

ii. PM Peak (weekday 1600 – 1900) – Time Period 2

iii. Inter Peak (weekday 1000 – 1600) –Time Period 3

iv. Off Peak (weekday 1900 – 0700) – Time Period 4

v. Weekend – Time Period 5

2.6.5 For each time slice, TUBA requires the duration of the time slice, the annualisation factor, to convert from benefits/time slice to annual benefits.

Annualisation Factors

2.6.6 As noted in Section 2.6.3, the outputs from the model represent a single hour for each of the AM peak, inter Peak and PM modelled periods. Annualisation factors are used to convert

benefits per time slice to annual benefits. The annualisation factor reflects how many of the particular time slices there are in a whole year. TUBA also requires the time period to which the time slice belongs.

2.6.7 Local ATC data was used to determine the factors required to convert the AM and PM peak hours to TUBA AM and PM time periods respectively. In line with TUBA guidance, factors have been determined from ATC data and these have been used to model the shoulder time slices 0700-0800, 0900-1000 in the AM peak; and 1600-1700 and 1800-1900 in the PM peak within TUBA. This in addition to the peak hours 0800-0900 and 1700-1800 respectively. These factors have been applied as appropriate to the AM and PM peak hour matrices used to inform the TUBA. The peak hour cost skims have been reduced by the same factors used to factor down the matrices hence this relies on the assumption that the relationship between trip numbers and costs is linear. The applied factors range between 0.8 and 1 as noted below.

2.6.8 Given that there are 253 weekdays in a year, this led to the following annualisation factors being adopted.

i. 253 hours of AM peak hour (0800 – 0900) (1*253);

ii. 253 hrs of AM Shoulder (0700 – 0800) (1*253);

iii. 253 hrs of AM Shoulder (0900 – 1000) (1*253);

iv. 253 hours of PM peak hour (1700 – 1800) (1*253);

v. 253 hrs of PM Shoulder (1600 – 1700) (1*253);

vi. 253 hrs of PM Shoulder (1800 – 1900) (1*253)

vii. 1518 hours of Inter Peak (6*253).

2.6.9 As modelling outputs for the off-peak (19:00 – 07:00), weekends and bank holidays are not available; these periods were not included in the TUBA analysis. Therefore, the actual benefits are likely to be greater than those calculated in this analysis.

User Classes

2.6.10 In total thirteen user classes have been defined within the TUBA which covers the modes and journey purposes used within the modelling process. These are detailed in Table 2-1. User classes 1 to 7 pertain to the SATURN highway element of the TUBA while user classes 8 to 16 pertain to the Bus and Mereoak park and ride user classes. The later 9 user classes therefore refer to the Public Transport (PT) element of the TUBA as shown in Table 2-1.

Table 2-1: TUBA User Classes

TUBA User Class	Vehicle Type/Sub mode	Journey Purpose	Proportion of Trips
1	Car	Commute	1.000
2	Car	Other	1.000
3	Car	Business	1.000
5	LGV (personal)	Commute	0.120
5	LGV (freight)	Business	0.880
6	OGV1	All	(0.620/2.3) = 0.2700

7	OGV2	All	(0.380/2.3) =0.1700
8	Bus	Commute	1.0000
9	Bus	Other	1.000
10	Bus	Business	1.0000
11	P&R Mereoak	Commute	1.000
12	P&R Mereoak	Other	1.0000
13	P&R Mereoak	Business	1.000

2.6.11 The SATURN model has a single stack matrix each for LGV and HGV trips respectively. Proportions stated in the COBA manual were used to convert the LGV and HGV vehicle matrices into the TUBA vehicle types of LGV (personal) and LGV (freight) and OGV1 and OGV2. These are 12 % LGV (personal) and 88% LGV (freight) for the LGV stacked matrix. For HGV, the splits were 62% OGV1 and 38% OGV2. For the HGV matrix the SATURN model assumes a PCU factor of 2.3 for each HGV. Therefore, the final factors entered into TUBA for OGV1 and OGV2 were (0.62/2.3) = 0.2700 and (0.38/2.3) = 0.1700 respectively. No further factoring was required for LGV as the SATURN model assumes that an LGV vehicle is equivalent to 1 PCU. Note that the SATURN model operates at hour level.

2.6.12 The PT trips are informed by the demand model which operates at peak period level. The TUBA was run at peak hour level, therefore the peak period PT matrices were divided by the peak period factors of 2.8 for the AM peak, 6 for the Inter Peak and 3 for the PM peak to convert the peak period matrices to peak hour for input to TUBA. This gave the flexibility to run the highway and PT elements of the TUBA within the same scheme file.

Matrix Factoring

2.6.13 Time matrices were factored from seconds into hours for the highway model by multiplying each by 0.00028 (1/3600). Distance matrices were factored from metres into kilometres by multiplying each matrix by 0.00100 (1/1000).

2.7 60-Year Appraisal Results - TUBA

2.7.1 A summary of the Transport Economic Efficiency (TEE) results from TUBA is provided in Table 2-2. This excludes benefits associated with generated fare income, environmental benefits and indirect taxation.

Table 2-2: TEE Benefits (£000s) 60 Year Appraisal

Sector		Travel Time	Vehicle Operating Costs	Total(£000s)
Non Business	Commuting	30,539	-481	30,058
	Other	7,890	-1,451	6,439
Business		2,941	-498	2,443
Total		41,370	-2,430	38,940

2.7.2 The analysis shows that the majority of benefits are attributed to non-business users. These results are considered to be realistic as they reflect the fact that the majority of benefits from the scheme are within the AM and PM peak periods, where higher trip numbers of commuter and other trips occur compared to business trips.

2.7.3 As part of the verification of TUBA outputs, sector analysis of the highway benefits was undertaken to check that benefits were accruing from logical sector to sector movements. Benefits that were deemed to accrue from sectors to sector movements not expected to be impacted by the scheme were not included in the scheme benefits.

2.7.1 Table 2-3 shows the benefits by time period. Significant benefits are seen to accrue predominantly in the AM and PM peak periods where congestion is prevalent. The slight disbenefit in the IP can be explained by the fact that bus priority measures will introduce some delays to general traffic during this less congested period and this is not sufficiently offset by the accrued public transport benefits. It can be seen from Table 2-3 that the scheme generates significant benefits over all three time periods.

Table 2-3: TEE Benefits (£000s) by Time Period

Time Period	Travel Time Benefits	Vehicle Operating Costs	Total Benefits
AM Peak	20,247	-306	19,942
PM Peak	20,157	-28	20,129
Inter Peak	967	-2,098	-1,131
Total	41,371	-2,431	38,940

2.8 Summary

2.8.1 The above section has outlined the source of scheme benefits using TUBA undertaken for this work. TUBA warnings were analysed and where necessary remedial measures undertaken to check that the benefits were authentic and attributable to the scheme. The scheme is considered to generate considerable user benefits and is therefore beneficial and viable.

3 Public Accounts

3.1 Overview

3.1.1 The scheme costs have been included within the TUBA assessment. These are converted within TUBA to 2010 prices and values as is consistent with DfT current guidance.

3.2 Scheme Costs

3.2.1 Capital costs for the implementation of the scheme have been calculated at £13.726m in 2010 values and prices. It is assumed that 2.469m at 2010 prices or about 20% will come from developer funding, giving a PVC of £11.503m at 2010 prices. Developer funding is a cost to the private sector and therefore appears as a disbenefit under other business impacts for the purpose of the economic appraisal.

3.2.2 The scheme costs have been subject to a 15% optimism bias that is appropriate for the business case stage and is also consistent with the understanding of risks as informed by the quantified risk assessment (QRA).

3.3 Expenditure Profile

3.3.1 The profile of expenditure is incorporated into the TUBA model. The profile used is shown in Table 4-2. Default TUBA profiles have been assumed for Preparation and Supervision costs as defined in the standard TUBA economics file. The profile adopted is that assuming a Works Commitment (WC) scheme stage.

Table 4-2: Cost Profile for TUBA

Cost	2017/18	2018/19	2019/20		Total
Construction	4.8%	42.9%	8.0%	14.3%	100%
Preparation	default	default	default	default	default
Supervision	default	default	default	default	default

3.4 Broad Transport Budget

3.4.1 TUBA uses the input costs and expenditure profiles to calculate costs in 2010 prices and in the 2010 base year. This is a two-stage process which involves the following:

i. Convert costs to 2010 prices through the application of a GDP deflator for 2016 (108.83) obtained from the WebTAG data book (July 2017-v1.8); and

ii. Discount costs to 2010 by applying a discount factor of 3.5% per annum.

3.4.2 The resulting costs as calculated by TUBA are the Present Value of Costs (PVC) which in this instance are £11.503m (in 2010 prices discounted to 2010).

3.5 Indirect Taxation

3.5.1 The TUBA output shows that the scheme will result in Indirect Tax Revenues of -£0.597m. The negative value implies that this appears as a disbenefit in the overall scheme's Present Value of Benefits (PVB) and implies a loss of revenue to Central Government.

3.5.2 The Indirect Tax revenue is a negative largely due to a reduction in fuel consumption as a result of those car users who switch to bus and to park and ride.

4 Sensitivity Tests

4.1 Introduction

4.1.1 There will always be uncertainty about future consumer behaviour and circumstances when predicting so far into the future. It is therefore good practice for economic and transport assessments to include a set of sensitivity tests to explore the relationship between the assumptions and the robustness of the value for money of the scheme, in this case the BCR.

4.1.2 The tests that were undertaken for the proposed scheme are described below. The economic case considers the following tests:

- Scenario 1 – This is the main TUBA run which assumes a Mereoak park and ride bus frequency of 15 minutes.
- Scenario 2 – This is a TUBA run which assumes a pessimistic scenario in which PT patronage is assumed to be 10% less than that in Scenario 1. This tests the sensitivity and robustness of the scheme to low PT patronage usage.
- Scenario 3 – As in Scenario 1 above, but the scenario assumes a pessimistic developer contribution of 50% (i.e. a pessimistic Community Infrastructure Levy -CIL contribution of 50%). Therefore, in this scenario, the costs to the public sector are higher than in Scenario 1.

4.2 Sensitivity Test Results

4.2.1 The results of the tests are reported in Table 4-1.

Table 4-1: Sensitivity Test Results – 15% Optimism Bias: Costs in £000s

Benefit Type	Scenario 1 (Core)	Scenario 2 (Low Demand)	Scenario 3 (50% CIL)
PVB	37,912	36,830	39,147
PVC	11,503	11,503	12,737
BCR	3.30	3.20	3.07
NPV	26,409	25,327	26,410

4.2.2 The results show that in all three scenarios, the scheme benefits exceed the scheme costs giving a positive Net Present Values (NPV). In all three scenarios, the Benefit to Cost Ratio (BCR) is in the Value for Money (VfM) range of 2.0 to 4.0. This means that for every £1 invested in the scheme, the return is of the order of £3.30 for the main Scenario 1, £3.20 for Scenario 2 and £3.07 for Scenario 3 where the costs to the public sector are highest.

4.2.3 Economic worksheets have been created for the main Scenario 1. These include the Economic Efficiency of the Transport System (TEE) table (Appendix A), the Public Accounts (PA) table (Appendix B), the Analysis of Monetised Costs and Benefits (AMCB) table (Appendix C) and the Appraisal Summary Table (AST) (Appendix D).

Appendix A TEE Table

Economic Efficiency of the Transport System (TEE)

Scenario 1 Core: Scenario1- 15%OB

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	30,539		15,625	14,914		
Vehicle operating costs	-481		-481			
User charges	0		0	0		
During Construction & Maintenance	0		0	0		
COMMUTING	30,058	*(1a)*	15,144	14,914		

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	7,890		5,726	2,164		
Vehicle operating costs	-1,451		-1,451			
User charges	0		0	0		
During Construction & Maintenance	0		0	0		
NET NON-BUSINESS BENEFITS: OTHER	6,439	*(1b)*	4,275	2,164		

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	2,941			2,488	453			
Vehicle operating costs	-498			-498	0			
User charges	0			0	0			
During Construction & Maintenance	0			0	0			
Subtotal	2,443	*(2)*	0	1,990	453			
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	955				955			
Operating costs	0				0			
Investment costs	0				0			
Grant/subsidy	0				0			
Subtotal	955	*(3)*			955			
Other business impacts								
Developer contributions	-2,469	*(4)*						
NET BUSINESS IMPACT	929	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	37,426	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Appendix B PA Table

Public Accounts (PA) Table **Scenario 1 Core: Scenario1_15%OB**

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	0		0			
Operating Costs	246		246			
Investment Costs	13,726		13,726			
Developer and Other Contributions	-2,469		-2,469			
Grant/Subsidy Payments	0		0			
NET IMPACT	11,503	*(7)*	11,503			
Central Government Funding: Transport						
Revenue	0		0			
Operating costs	0		0			
Investment Costs	0		0			
Developer and Other Contributions	0		0			
Grant/Subsidy Payments	0		0			
NET IMPACT	0	*(8)*	0			
Central Government Funding: Non-Transport						
Indirect Tax Revenues	597	*(9)*	309	288		
TOTALS						
Broad Transport Budget	11,503	*(10) = (7) + (8)*				
Wider Public Finances	597	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Appendix C AMCB Table

Analysis of Monetised Costs and Benefits

Scenario 1 Core: Scenario 1_15%OB

Noise	Not Assessed	*(12)*
Local Air Quality	Not Assessed	*(13)*
Greenhouse Gases	-342	*(14)*
Journey Quality	Not Assessed	*(15)*
Physical Activity	Not Assessed	*(16)*
Accidents	Not Assessed	*(17)*
Economic Efficiency: Consumer Users (Commuting)	29,969	*(1a)*
Economic Efficiency: Consumer Users (Other)	6,439	*(1b)*
Economic Efficiency: Business Users and Providers	2,443	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	597	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	37,912	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	11,503	*(10)*
Present Value of Costs (see notes) (PVC)	11,503	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	26,409	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	3.30	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix D AST

Appraisal Summary Table

Date produced:	24/10/2017

Contact:	
Name	Chris Maddocks/Cris Butler
Organisation	Reading BC
Role	Promoter/Official

Name of scheme:	South Reading Mass Rapid Transit (SRMRT)), Reading
Description of scheme:	The scheme will provide a series of new and improved bus priority measures on the A33. It will link central Reading to existing / proposed residential and employment areas to the south of Reading including Green Park and the Mereoak Park and Ride facility. Phase 1 and 2 of the scheme runs between the A33 junctions with Longwater Avenue (Green Park) and Island Road. Phase 1 is complete and phase 2 is currently under construction. Phases 3 and 4 are a continuation of the Phases 1 and 2 schemes to the north of Longwater Avenue on the A33 towards Reading town centre along with complementary bus priority

Impacts		Summary of key impacts	Assessment: Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	The scheme leads to journey time benefits of £2.941mm to business users as a result of improvements in journey times from the scheme. Improvements in journey time reliability are also experienced by all users. TUBA has been used to calculate scheme benefits but does not include a breakdown by time saving bands.	Value of journey time changes(£): £2.941m Net journey time changes (£): < 2min: Not assessed; 2 to 5min: Not Assessed; > 5min: Not Assessed	Moderate Beneficial	£2.941m	Not Assessed
	Reliability impact on Business users	It is anticipated that the scheme will improve journey time reliability for public transport users as a result of the scheme. Reliability benefits have not been assessed.	Not assessed	Beneficial	Not assessed	
	Regeneration	The improvements will provide increased capacity for mpving people on the A33 corridor and improve journey time reliability - this will assist in development coming forward along the corridor, the surrounding areasand Reading town centre. Improved public transport will also provide a viable alterantive to the car.	Not assessed	Moderate Beneficial	N/A	
	Wider Impacts	The SRMRT will provide additional capacity to allow development to come forward to the south of Reading. This includes commercial and residential development, with the resulting increase in labour supply.	Not assessed	Beneficial	Not assessed	
Environmental	Noise	It is considered that the noise changes of the scheme are likely to be imperceptible once the scheme is operational, given the likely changes in flows, vehicle speeds and distance.	Not assessed	Slight Beneficial	Not assessed	Not Assessed
	Air Quality	The impacts of scheme generated traffic on concentrations of nitrogen dioxide, PM10 and PM2.5 have not been assessed given that changes to road alignment will be minimal as most of the scheme is online and traffic flow changes will be relatively small. The proposed scheme is predicted to result in an imperceptible change in NO2, PM10 and PM2.5 concentrations. Taking into account the conservative nature of the assessment, the overall air quality impact of the development is considered to be insignificant.	Not assessed	Neutral	N/A	Not Assessed
	Greenhouse gases	Greenhouse gases have been assessed using TUBA.	Change in non-traded carbon over 60y (CO2e): 4,052 tonnes Change in traded carbon over 60y (CO2e): 0 tonnes	Slight adverse	"-£0.305m	
	Landscape	The scheme predominantly follows the existing alignment and therefore has no impact on landscape quality.	Not assessed	Neutral	N/A	
	Townscape	The scheme predominantly follows the existing alignment and therefore has no impact on townscape quality.	Not assessed	neutral	N/A	
	Historic Environment	The historic environment assessment found the site could contain historic assets but they would be of low significance.	There are no predicted impacts on the historic environment	Neutral	N/A	
	Biodiversity	The schemes are predominantly within the existing highway boundary and hence there are unlikely to be any significant ecological impacts. Any impacts that may arise will be able to be mitigated.	Not assessed	Neutral	N/A	
	Water Environment	The works are not likely to have a significant impact on the water environment.	Not assessed	Neutral	N/A	
Social	Commuting and Other users	The scheme leads to journey time benefits of £30.539mm to commute users and £7.89m to other users as a result of reduced congestion and improved bus journey times on the A33 corridor Reading. Bus services also experience improvements in journey times as a result of scheme. Improvements in journey time reliability are also experienced by all users. TUBA was used to calculate scheme benefits.	Value of journey time changes(£): £38.429m Net journey time changes (£): < 2min: Not assessed; 2 to 5min: Not Assessed; > 5min: Not Assessed	Large Beneficial	£38.429m	Although SDI analysis has not been assessed, it is expected that most income groups will enjoy slight to moderate benefits from the scheme
	Reliability impact on Commuting and Other users	It is anticipated that the scheme will improve journey time reliability for public transport users as a result of the scheme. Reliability benefits have not been assessed.	Not assessed	Beneficial	Not assessed	
	Physical activity	Pedestrians are largely unaffected by the sheme and will see little change in physical activity.	Not assessed	Beneficial	Not assessed	
	Journey quality	Pedestrians are largely unaffected by the sheme and will see little change in physical activity.	Not assessed	Beneficial	Not assessed	
	Accidents	The accident benefits are likley to be slightly positive as the scheme results in some car traffic switching to Park and Ride and buses with a small but beneficial reduction in traffic flows with consequent accident benefits. Accident benefits have not been quantified.	Not assessed	Slight Beneficial	Not assessed	Not Assessed
	Security	No changes to security along the route are expected, so this has not been analysed.	Not assessed	Neutral	N/A	Not Assessed
	Access to services	The route is a key public transport corridor on the A33 to the south of Reading, improved bus services and bus priority will result in improved access to services. Improved journey times and reliability will result in a better bus services along the corridor and provide improved access to services, not least access to central Reading, existing/proposed commercial and residential development. This will paritularly, although not exclsively, be of benefit to more dio	Not assessed	Beneficial	N/A	Not Assessed
	Affordability	The scheme provides bus lanes which will improve connectivity to other services. The reduced travel times means reduced fuel and non-fuel user operating costs.	Not assessed	Slight Beneficial	N/A	Not Assessed
	Severance	The scheme is largely on line and is therefore not expected to cause severance.	Not assessed	Neutral	N/A	Not Assessed
	Option and non-use values	No assessment of Option Values has been undertaken.	Not assessed	Neutral	N/A	
Public Accounts	Cost to Broad Transport Budget	Investment costs are £13.726m. This has been discounted to 2010. This does not include any developer contributions which are a saving to the government or any maintanance/renewal costs of the scheme which is a cost to the public sector. When developer contributions of £2.469m are taken into account, the investment costs incurred by government are £11.502m.	Discounted investment costs are £13.726m and the Broad Transport Budget is £11.502m	N/A	£10.070mm	
	Indirect Tax Revenues	These have been assessed in TUBA over a 60 year period and have been estimated to fall by £0.597m as a results of reduced congestion and improved efficiency, and removal of cars to bus	Indirect Tax Revenue are estimated at £0.597m	Slight Adverse	-£0.597m	