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South Reading Mass Rapid Transit Phases 3 & 4

Business Case Addendum

On behalf of **Reading Borough Council**

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1 Introduction

1.1 Background

- 1.1.1 South Reading Mass Rapid Transit (SRMRT) is a long-established element of Reading's strategy to manage levels of congestion whilst delivering economic growth and housing and has been included in Reading's three Local Transport Plans and Core Strategy.
- 1.1.2 The aspirations are to provide bus priority along the length of the A33, to connect: the MereOak Park and Ride facility south of M4 junction 11 to existing businesses and business parks, the planned GreenPark railway station, further commercial development, Madjeski stadium, committed international conference centre, new additional residential development; to central Reading, and Reading station.
- 1.1.3 Phase 1 and 2 of the scheme have been completed. Phase 1 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.
- 1.1.4 SRMRT phases 3 & 4 were awarded funding by the Local Enterprise Partnership (LEP) based on the Business Case dated October 2017.
- 1.1.5 The 2017 Business Case included the following improvements:
- Northbound bus lane on the A33, between Longwater Avenue/Bennet Road Gyratory and Island Road.
 - Southbound bus lane on the A33 between Rose Kiln (Reading Link Retail Park) to Rose Kiln Lane (Brunel Retail Park) and southbound bus lane between Rose Kiln Lane (Brunel Retail Park) to Island Road to the south.
 - MOVA on the approach and intermediate junctions between the bus priority lanes.
- 1.1.6 Construction of the southbound bus lane on the A33 between Rose Kiln (Reading Link Retail Park) to Rose Kiln Lane (Brunel Retail Park) will be complete in November 2019 and detailed design for the remaining elements of the scheme is now complete.

1.2 Scheme Amendments

- 1.2.1 Unfortunately RBC is unable to deliver the section of SRMRT through the 'Southside' site (i.e. northbound bus lane on the A33, between Longwater Avenue/Bennet Road Gyratory and Island Road) in the timescales required by the LEP, due to delays to the land transfer and lease agreements.
- 1.2.2 The scheme has therefore been amended to enable the delivery of other sections of the SRMRT, which are deliverable within the timescales. The amendments continue to provide improved connectivity into central Reading, and improve journey times and reliability of bus/MRT services to attract people to travel more sustainably.
- 1.2.3 This report sets out the amendments and shows that the amended scheme is viable, provides high value for money and continues to achieve Reading Borough Councils future aim of the scheme.

1.3 Future South Mass Rapid Transit Phases

- 1.3.1 For information, we are continuing to develop schemes for phases 5 and 6 of the South MRT, which will seek to complete south bound bus priority along the A33 corridor from Rose Kiln Lane to J11. It is hoped that the Southside section can also be completed, but this may form part of phase 7.

2 Scheme Proposals

2.1 Scheme Changes

2.1.1 The amendments to the original scheme are set out in this section.

Schemes Removed From Original Business Case Scheme

- 2.1.2 It has not been possible to progress the Reading Southside scheme northbound on the A33 at this time due to delays to the land transfer and lease agreements.
- 2.1.3 Proposals at the Oracle junction have been omitted due to complexities in providing the traffic signal upgrade and the improvement that the London Street scheme (a LEP Phase 3 scheme) has brought to the area.
- 2.1.4 Following site investigation into the condition of the existing signal equipment at the Bennet Road gyratory, a fuller refurbishment of the junction is necessary in order to implement the traffic signal MOVA scheme. This has resulted in an increased cost to deliver the Bennet Road gyratory traffic signals improvements scheme.

Schemes in Addition to the Original Business Case Scheme

- 2.1.5 Alternative schemes have been identified to substitute the Southside scheme and reallocate funds from the Oracle junction to the Bennet Road gyratory. These additional schemes have been identified with the aim of improving connectivity by delivering a prioritised and accessible bus corridor on the A33.
- 2.1.6 There is a northbound section of bus lane from the M4 junction 11 to Reading International Business Park (RIBP) on the offside lane of a three-lane section of carriageway that currently provides priority to Basingstoke Road and Worton Grange. This bus lane was delivered historically as part of the M4 junction 11 scheme and does not prioritise the majority bus services which travel either northbound along the A33 or through RIBP. Relocating the bus lane to the nearside lane and widening the carriageway at the signal island to introduce a third lane at the stop line would cater for the main movement of buses and provide them with priority.
- 2.1.7 A bus stop outside Worton Grange for southbound bus services has been included to provide further accessibility for the new development and for RIBP.
- 2.1.8 Improvements to the A33 Island road junction will allow southbound buses through the junction bypassing the ahead traffic lanes which are often congested in the evening peak hour. A northbound bus stop is also being installed just north of the junction catering for the new development to the west of the A33 and providing a link to residents of Kennet Island to utilise straight through bus services on the A33.

Scheme Change Summary

2.1.9 The following scheme changes are included within this update.

Scheme elements removed:

- Northbound bus lane between Bennet Road Gyratory and Island Road.
- MOVA signal upgrade to the Oracle Roundabout.

- Northbound bus lane on the Oracle Roundabout under the flyover.

Additional Scheme elements:

- Northbound bus lane on the M4 Junction 11 and the next section up to Basingstoke Road moved from the offside to the nearside (Figure 1).
- Northbound bus stop, north of Island Road.
- Southbound bus stop on the A33 outside Worton Grange (Figure 2).
- Realignment of the Island Road junction to allow the southbound bus lane to continue straight through it (Figure 3).



Figure 1: Northbound bus lanes M4 Junction 11

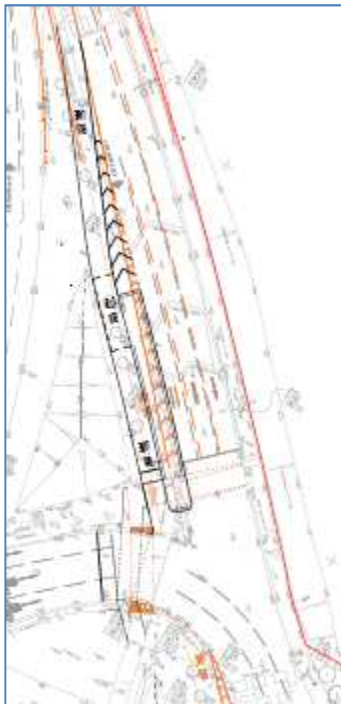


Figure 2: Southbound A33 bus stop outside Worton Grange

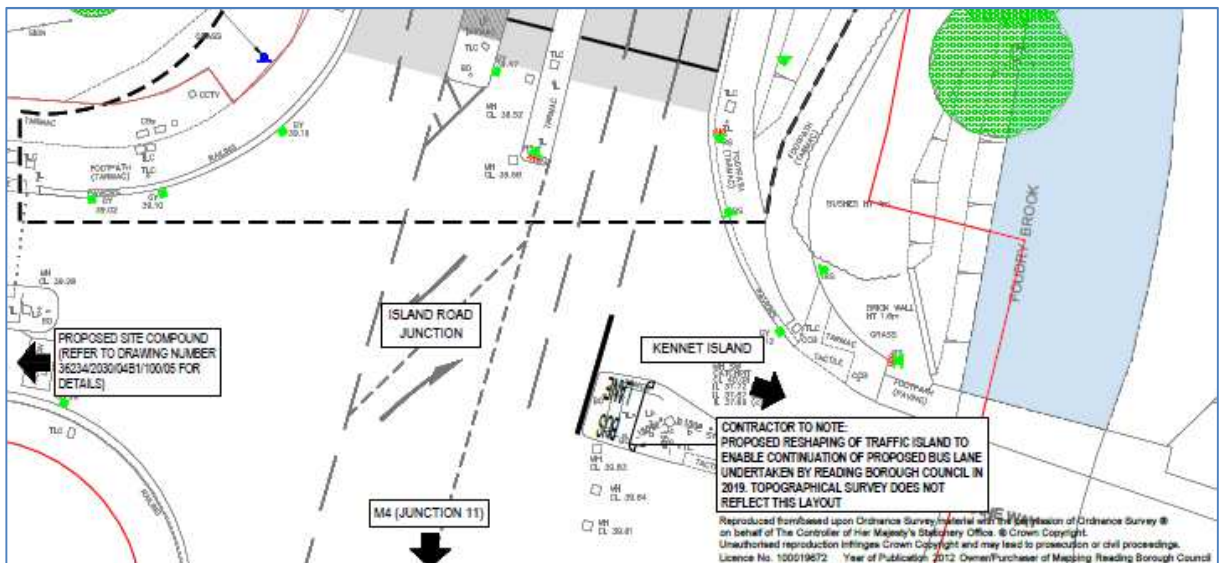


Figure 3: Realignment of the Island Road junction

2.2 Scheme Costs

2.2.1 The above changes do not alter the overall scheme costs. The breakdown of the scheme cost changes is as below:

- Southside bus lane removed -£1.81m
- M4 J11 Scheme included +£920k
- Oracle removed -£50k

- Bennet Road increased +£453k due to complexities in the age of existing signal equipment, including poor condition of ducting etc
- Kennet Island arm adjustments +£50k
- Island Rd northbound bus stop +£437k

2.3 Timescales

2.3.1 The tenders for the remaining phases 3 / 4 schemes are being finalised and it is anticipated tenders will be returned from the contractors in mid Jan 2020, and contract award in Mid February for a mid-March start on site. Overall planned completion will be at the end of November 2020.

2.3.2 The planned individual completion dates are:

- RIBP and Little Lea bus stop completion (revised Phase 3): June 2020
- Bennet Road signals completion: Aug 2020
- All remaining elements completion: Nov 2020

3 Assessment and Appraisal

3.1 Overview

- 3.1.1 The Reading's SATURN Highway model and a spreadsheet-based passenger demand model has been used to assess and appraise the amended scheme, in line with the methodology agreed for the 2017 Business Case.
- 3.1.2 The following scenarios have been considered:
- Core Scenario 1
 - Scenario 2 - low demand public transport sensitivity test assuming 10% less demand than the Core Scenario, and
 - Scenario 3 - a sensitivity test with only 50% private sector Community Infrastructure Levy (CIL) provision (instead of 100% compared to Scenario 1)

3.2 SATURN Model

- 3.2.1 The SATURN model was updated to include the revised scheme in the 2021 and 2031 with Phase 3 & 4 (do-something) models, no changes were made to the without Phases 3 & 4 (do-minimum) models.
- 3.2.2 Vehicle time and distance skims were extracted from the updated models and fed into the demand model.
- 3.2.3 Public transport journey times were also revised based on the updated SATURN models to take account of the changes in delays as a result of the scheme amendments and this again fed into the demand model.

3.3 Demand Model

- 3.3.1 The demand model was updated using the revised with Phase 3 & 4 (do-something) SATURN skims and public transport journey times.
- 3.3.2 **Tables 1 to 4** show the bus and Mereok Park and Ride (P&R) patronage calculated by the demand model for 2021 and 2031 and for the do-minimum and do-something models. They show an increase in patronage in both years and all time periods except for the PM bus in 2021. These outputs are very similar to those in the 2017 business case.

Table 1: Demand Model Outputs – Bus Patronage 2021

Time Period	Commuting	Other	Employers Business	Total
AMDM	415	272	25	712
IPDM	850	982	55	1887
PMDM	261	335	23	618
AMDS	418	274	25	717
IPDS	851	984	55	1890
PMDS	267	326	23	616
AM Change	3	2	0	5
IP Change	1	2	0	3
PM Change	6	-9	1	-2

AM – AM Peak, IP- Inter Peak, PM – PM Peak, DM - Do Minimum (without Phase 3 & 4), DS - Do Something (with Phase 3 & 4)

Table 2: Demand Model Outputs – Bus Patronage 2031

Time Period	Commuting	Other	Employers Business	Total
AMDM	409	271	24	703
IPDM	832	933	53	1817
PMDM	276	339	24	638
AMDS	412	273	24	710
IPDS	833	936	53	1821
PMDS	284	345	25	654
AM Change	4	3	0	7
IP Change	1	3	0	4
PM Change	9	6	1	16

AM – AM Peak, IP- Inter Peak, PM – PM Peak, DM - Do Minimum (without Phase 3 & 4), DS - Do Something (with Phase 3 & 4)

Table 3: Demand Model Outputs - Mereok Park and Ride Patronage 2021

Time Period	Commuting	Other	Employers Business	Total
AMDM	139	52	4	195
IPDM	78	91	3	172
PMDM	24	34	1	59
AMDS	166	62	5	233
IPDS	82	114	4	200
PMDS	32	45	1	78
AM Change	27	10	2	38
IP Change	4	22	1	27
PM Change	7	11	0	19

AM – AM Peak, IP- Inter Peak, PM – PM Peak, DM - Do Minimum (without Phase 3 & 4), DS - Do Something (with Phase 3 & 4)

Table 4: Demand Model Outputs - Mereok Park and Ride Patronage 2031

Time Period	Commuting	Other	Employers Business	Total
AMDM	145	55	4	203
IPDM	80	97	3	179
PMDM	30	41	1	72
AMDS	173	65	6	244
IPDS	84	120	5	208
PMDS	39	53	2	94
AM Change	28	10	2	41
IP Change	4	23	2	29
PM Change	9	13	1	23

3.4 Value for Money Assessment

- 3.4.1 Using the revised SATURN skims and the outputs from the demand model a separate highway and public transport (PT) TUBA have been run to calculate the value for money of the scheme. **Table 5** shows the Benefit Cost Ratio (BCR) is 2.12 for the Core Scenario 1, which demonstrates that the scheme offers high value for money.
- 3.4.2 A low demand PT sensitivity test (Scenario 2) assuming 10% less demand than the Core Scenario, and a sensitivity test (Scenario 3) with only 50% private sector Community Infrastructure Levy (CIL) provision (instead of 100% compared to Scenario 1) were run as before to check the robustness of the value for money case to less favourable outcomes.
- 3.4.3 Scenario 2 tests the sensitivity and robustness of the scheme to low PT patronage, while Scenario 3 tests the robustness of the scheme to a higher level of public sector funding, with less developer contribution.

3.4.4 The results show that at BCR values of 2.06 and 2.01 respectively, the scheme still provides high value for money for these less favourable scenarios.

Table 5: Sensitivity Test Results – 15% Optimism Bias: Costs in £000s

Benefit Type	Scenario 1 (Core)	Scenario 2 (Low Demand)	Scenario 3 (50% CIL)
PVB	24,364	23,739	25,599
PVC	11,503	11,503	12,737
BCR	2.12	2.06	2.01
NPV	12,861	12,236	12,862

3.4.5 A summary of the Transport Economic Efficiency (TEE) results from TUBA is provided in Table 6. This excludes benefits associated with generated fare income, environmental benefits and indirect taxation.

Table 6: TEE Benefits (£000s) 60 Year Appraisal

Sector		Travel Time	Vehicle Operating Costs	Total (£000s)
Non-Business	Commuting	26,940	-632	26,308
	Other	4,151	-1,623	2,528
Business		1,558	-657	901
Total		32,648	-2,912	29,736

3.4.6 The analysis shows that most 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.

3.4.7 **Table 7** 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. **Table 7** shows that the scheme generates significant benefits when considered over all three time periods.

Table 7: TEE Benefits (£000s) by Time Period

Time Period	Travel Time Benefits	Vehicle Operating Costs	Total Benefits
AM Peak	18,112	-312	17,800
PM Peak	13,257	-671	12,586
Inter Peak	1,279	-1,930	-650
Total	32,649	-2,913	29,736

4 Conclusion

- 4.1.1 This report summarises the work undertaken for the value for money assessment of the proposed amended SRMRT Phase 3 and 4 scheme. Details of the scheme amendments in relation to the previous scheme submitted in the Business Case in 2017 have also been set out.
- 4.1.2 TUBA software has been used to estimate the scheme benefits, in line with methodology previously agreed and undertaken for the 2017 Business Case. TUBA warnings were analysed to check that the benefits were authentic and attributable to the scheme and where necessary, remedial measures undertaken. The scheme is considered to generate considerable user benefits and is therefore beneficial and viable.
- 4.1.3 The results show that in all three scenarios, the scheme benefits exceed the scheme costs giving positive Net Present Values (NPV). In all three scenarios, the Benefit to Cost Ratio (BCR) is in the High 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 £2.12 for the main Scenario 1, £2.06 for Scenario 2 and £2.01 for Scenario 3. The proposed amended scheme therefore been demonstrated to be in the High Value for Money category, the 'economic case'.
- 4.1.4 The 'strategic case' (supported by a robust case for change that fits with wider public policy objectives); the 'commercial case' (commercially viable); 'financial case' (financially affordable) and 'management case' (are achievable) remain the same as outlined in the 2017 Business Case as the amended scheme is fully in line with the overall strategic objectives of the full South Reading MRT scheme.