

High Wycombe Regional Hub Development

Background Note - Comparison between Ultra Light Rail and Coachway options

Introduction

At the High Wycombe Regional Hub Project Board meeting of 7 November 2008, the Project Board requested that further work be done on the Ultra Light Rail option 2a+6.

This work has consisted of three stages :

- 1) Jacobs Light Rail team has undertaken a Costing Study of three different ULR options
 - Original rail alignment with no deviations
 - Original rail alignment as far as possible, with deviation to the south of the line where this is not feasible
 - Original rail alignment, except between Wycombe Marsh and Wooburn Green where there would be street running.
- 2) Halcrow has used the regional model to forecast the patronage for a half-hourly ULR service between High Wycombe and Maidenhead co-ordinated with a half-hourly service between Marlow and Maidenhead.
- 3) Jacobs Project team has extended the above work to
 - provide estimates on potential CPO costs for the three ULR options and
 - compare the model outputs for the ULR and Coachway schemes in terms of trips and passenger-miles either newly generated or transferred from car to public transport.

Jacobs Engineering U.K. Limited

This document has been prepared by a division, subsidiary or affiliate of Jacobs Engineering U.K. Limited ("Jacobs") in its professional capacity as consultants in accordance with the terms and conditions of Jacobs' contract with the commissioning party (the "Client"). Regard should be had to those terms and conditions when considering and/or placing any reliance on this document. No part of this document may be copied or reproduced by any means without prior written permission from Jacobs. If you have received this document in error, please destroy all copies in your possession or control and notify Jacobs.

Any advice, opinions, or recommendations within this document (a) should be read and relied upon only in the context of the document as a whole; (b) do not, in any way, purport to include any manner of legal advice or opinion; (c) are based upon the information made available to Jacobs at the date of this document and on current UK standards, codes, technology and construction practices as at the date of this document. It should be noted and it is expressly stated that no independent verification of any of the documents or information supplied to Jacobs has been made. No liability is accepted by Jacobs for any use of this document, other than for the purposes for which it was originally prepared and provided. Following final delivery of this document to the Client, Jacobs will have no further obligations or duty to advise the Client on any matters, including development affecting the information or advice provided in this document.

This document has been prepared for the exclusive use of the Client and unless otherwise agreed in writing by Jacobs, no other party may use, make use of or rely on the contents of this document. Should the Client wish to release this document to a third party, Jacobs may, at its discretion, agree to such release provided that (a) Jacobs' written agreement is obtained prior to such release; and (b) by release of the document to the third party, that third party does not acquire any rights, contractual or otherwise, whatsoever against Jacobs and Jacobs, accordingly, assume no duties, liabilities or obligations to that third party; and (c) Jacobs accepts no responsibility for any loss or damage incurred by the Client or for any conflict of Jacobs' interests arising out of the Client's release of this document to the third party.

This note summarises the results of the above work and compares the costs and relative benefits of the Coachway and ULR schemes.

Cost Comparison

The costs for the three ULR options are set out in Table 2 opposite. These are at 2008 prices excluding inflation and are shown both with and without Optimism Bias. At this stage of the project, and given the level of unknowns, the 66% figure used for Optimism Bias for the ULR scheme can be regarded as reasonable.

The comparable Cost estimate for the Coachway 'Preferred Scheme' at 2008 prices is £20.72M.

For comparison purposes, Table 1 sets out the capital costs (excluding inflation and optimism bias) for all three ULR options and the Coachway 'Preferred Scheme'.

Scheme	Cost (£M) Excl. Inflation 2008 prices
ULR Option 1 – Original Alignment	£89.27
ULR Option 2 – Deviations to south of line	£60.63
ULR Option 3 – Street running Wycombe Marsh to Wooburn Green	£51.32
Coachway Preferred Scheme	£20.72

Table 1: Comparison of ULR and Coachway capital costs

Element Description		Option 1 Orig. Alignment £ (2008 prices)	Option 2 Deviations to south £ (2008 prices)	Option 3 With street running £ (2008 prices)
<u>Construction Costs</u>				
Option 1 - Re-instatement of Original Alignment		£18,941,820		
Option 2 (rev 1) - Re-instatement of Original Alignment with Southern Diversion			£17,942,815	
Option 3 - Re-instatement of Partial Original Alignment & Street Running				£18,054,921
Total Base Construction Cost	(a)	£18,941,820	£17,942,815	£18,054,921
Preliminaries 20%	(b)	£3,788,364	£3,588,563	£3,610,984
Design Cost 8%	(c)	£1,818,415	£1,722,510	£1,733,272
Design & Construction Costs (excl. Optimism Bias and inflation)	(d)= (a)+(b)+(c)	£24,548,599	£23,253,888	£23,399,177
<u>Other Costs</u>				
Engineering Costs for Conversion of Network Rail Network between Bourne End - Marlow, Bourne End - Maidenhead to ULR running	(e)	£1,500,000	£1,500,000	£1,500,000
Fleet Vehicle Cost	(f)	£7,200,000	£7,200,000	£7,200,000
Depot Costs	(g)	£11,559,000	£11,559,000	£11,559,000
Legal & Other Costs in Setting up Entity to Operate System	(h)	£634,800	£634,800	£634,800
Start Up Costs	(i)	£2,599,620	£2,599,620	£2,599,620
<u>Total Design, Construction, Fleet, Depot and Set-up Costs</u> <u>(excl Optimism Bias and inflation)</u>	(j) = (d) + (e)...+(i)	£48,042,019	£46,747,308	£46,892,591
<u>Compulsory Purchase Costs</u>	(k)	£41,223,058	£13,882,412	£4,427,071
<u>TOTAL COSTS (excl Optimism Bias)</u>	(l) = (j) + (k)	£89,265,077	£60,629,720	£51,319,672
Treasury Optimism Bias - 66% of Design & Construction costs	(m) = 66% * (d)	£16,202,075	£15,347,566	£15,443,451
<u>TOTAL COSTS (INCL Optimism Bias, EXCL Inflation)</u>	(n) = (l) + (m)	£105,467,152	£75,977,286	£66,763,123
Annual Operating Costs		£5,897,000	£5,897,000	£5,897,000

Table 2: ULR Comparative costs - Options 1, 2 and 3

Modelling Outputs

Halcrow have issued a Technical Report on the modelling results for the ULR option for the design year of 2026. This has been supplemented by additional work analysing station-to-station flows and the breakdown of trips by previous mode used – rail, bus, car, etc.

As the ULR scheme will take over the existing Marlow – Maidenhead heavy rail branch, a large proportion of the trips are transfers from rail. As these trips will have similar journey times and costs as previously, they are likely to generate little or no economic benefit for the scheme.

Similarly, for the Coachway scheme, many coach trips will be diverted from rail – and are likely to have longer journey times but lower costs, and also generate little economic benefit.

The bulk of economic benefits for both ULR and Coachway schemes will therefore be derived from trips either transferred from car or newly generated. The outputs from the model have therefore been analysed to extract the number of transferred/generated trips per weekday for both options to provide an indication of the relative benefits of each.

ULR Modelling Results

The matrix of trips for design year 2026 transferred from car or generated is shown in Table 3. The equivalent matrix of passenger-miles is shown in Table 4. Both tables refer to average weekday flows.

	High Wycombe	Loudwater	Wooburn Green	Bourne End	Cookham	Furze Platt	Maidenhead	Total
High Wycombe		0	67	40	0	6	45	158
Loudwater	0		34	0	0	0	0	34
Wooburn Green	134	17		22	0	0	0	173
Bourne End	123	6	22					151
Cookham	12	0	0					12
Furze Platt	22	0	0					22
Maidenhead	50	0	0					50
Total	341	23	123	62	0	6	45	601

Table 3 : Weekday ULR trips transferred from car or newly generated

	High Wycombe	Loudwater	Wooburn Green	Bourne End	Cookham	Furze Platt	Maidenhead	Total
High Wycombe	0.0	0.0	294.8	240.0	0.0	54.6	481.5	1070.8
Loudwater	0.0	0.0	44.2	0.0	0.0	0.0	0.0	44.2
Wooburn Green	589.6	22.1	0.0	41.8	0.0	0.0	0.0	653.5
Bourne End	738.0	19.2	41.8	0.0	0.0	0.0	0.0	799.0
Cookham	91.2	0.0	0.0	0.0	0.0	0.0	0.0	91.2
Furze Platt	200.2	0.0	0.0	0.0	0.0	0.0	0.0	200.2
Maidenhead	535.0	0.0	0.0	0.0	0.0	0.0	0.0	535.0
Total	2154.0	41.3	380.8	281.8	0.0	54.6	481.5	3392.7

Table 4 : Weekday ULR Passenger-miles transferred from car or newly generated

Coachway modelling results

The equivalent information for trips generated by the Coachway scheme is shown in Table 5. All trips are to or from the Coachway.

Destination	Trips	Distance (miles)	Passenger Miles
Oxford	125	40.9	5112.5
Heathrow	98	20.5	2009.0
Hillingdon	49	15.6	764.4
Notting Hill	27	27.9	753.3
London	49	29.9	1465.1
Gatwick	38	58.5	2223.0
	386	31.9	12327.3

Table 5 : Weekday Coach trips and passenger miles transferred from car

Summary of Modelling

The most cost-effective ULR option is Option 3 – which has street running between Wycombe Marsh and Wooburn Green to avoid the majority of the overbuilding which has occurred on the line over this section.

The costs and modal transfer outputs for Option 3 and the Coachway are shown in Table 6.

	ULR Option 3	Coachway
Capital Costs (£M) 2008 prices excl. Optimism Bias	£51.32	£20.72
Weekday trips transferred from car or generated	600	386
Weekday passenger miles transferred from car or generated	3394	12327

Table 6 : Comparison of costs and performance of ULR and Coachway schemes

Recommendation to Project Board

The cheapest ULR option has a capital cost of around 2.5 times that of the Coachway – before Optimism Bias is taken into account. Although the number of trips transferred from car is higher than for the Coachway, these are generally much shorter in length, resulting in the passenger miles transferred or generated by ULR being less than one third of those for the Coachway.

Taking both these factors into account the Benefit Cost Ratio of the Coachway scheme is likely to be at least 7 times that of the cheapest ULR option. Even if ULR trips were underestimated by 50% and coach trips overestimated by the same amount, the Coachway scheme would still show a significant advantage.

It was therefore recommended to the Project Board that the ULR scheme not be considered further in the development of the Major Scheme Business Case and that a summary of these results be presented in the document put forward to DfT. This recommendation was agreed.

Response of Department for Transport

The above results were presented to the Department of Transport at a meeting in early June. The Department's response was that due to the disparity between the schemes they did not feel that it would be appropriate for the ULR option to be considered as 'Next Best' option to the Coachway in the Major Scheme Business Case. A more appropriate 'Next Best' option would be a revised Coachway option with reduced scope.

As a result of this response, all further work on the development of the Major Scheme Business Case for the High Wycombe Regional Hub will be centred on different options for the Coachway; no further work on the ULR option will be undertaken as part of this project.