

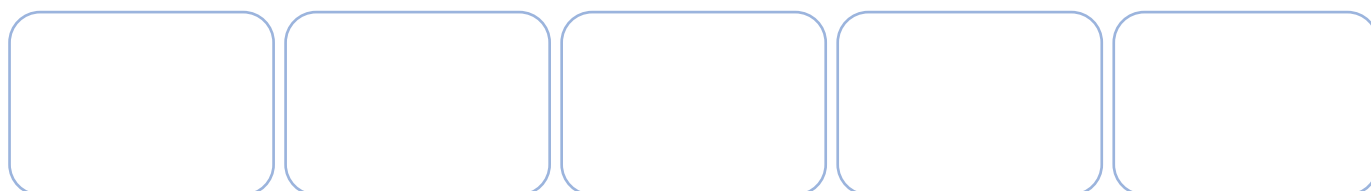


SCOTT WILSON

High Wycombe / Bourne End Light Rail Link

Outline Engineering Feasibility Report

Ref: D120699/R01 v0.2



June 2008

High Wycombe / Bourne End Light Rail Link Outline Engineering Feasibility Report



REVISION SCHEDULE

Outline Engineering Feasibility Report

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Scott Wilson
Scott House
Alençon Link
Basingstoke
RG21 7PP

Tel 01256 310 200
Fax 01256 310 201

www.scottwilson.com

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1 INTRODUCTION

1.1 Introduction

Scott Wilson (SW) was appointed by Summerleaze Ltd. to investigate the engineering feasibility of using the disused heavy rail corridor between High Wycombe and Bourne End as a corridor for a Light Rail (or Ultra Light Rail) Scheme.

This report presents an outline engineering feasibility assessment of the use of the disused railway as a corridor for a Light Rail (or Ultra Light Rail) Scheme. This study is based on a desktop study and site visit to strategic locations along the disused railway. We have not been in consultation with anyone that may have an interest in the scheme, nor have we considered the land ownership of the indicative route alignment shown on the drawing in Appendix A. This report only concerns itself with the engineering feasibility of using the disused rail corridor and does not consider the following details which would be required in order to progress the scheme further:

- Tram Depot (stabling and workshops) location.
- Tram stop locations.
- Loading and access requirements.
- Utilities plant and apparatus.
- Land ownership.
- Structural integrity of any structures, embankments and rail formation.
- Potential tram patronage.
- Construction and operating costs.
- Environmental and ecology assessments.

1.2 Site Location

Figure 1 below shows the alignment of the disused line in relation to High Wycombe and Bourne End.

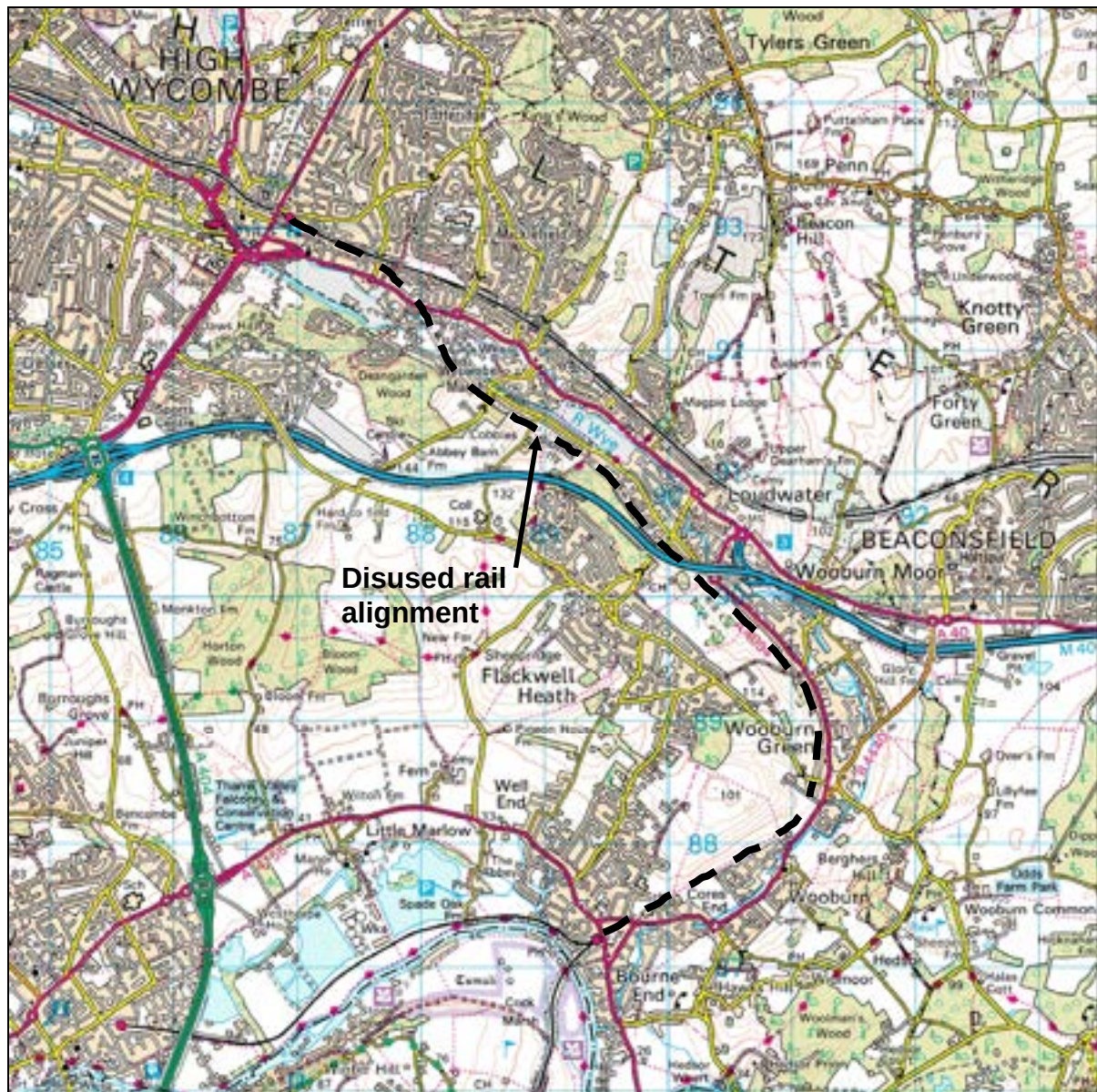


Figure 1: Site Location¹

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2 BACKGROUND INFORMATION

2.1 Site Visit

A site visit was undertaken on Tuesday 27th May 2008 at 13:00 with two members of the High Wycombe Society (Elsa Woodward and Nigel Phillips). During the visit, the following sites were visited as nominated by the two members of the High Wycombe Society:

- High Wycombe Rail Station.
- Gordon Road and housing development on the old G Plan Site (Princes Gate).
- Embankment adjacent to Homebase between London Road and Bassetsbury Lane.
- Bassetsbury Lane adjacent to former Sewage Treatment Works.
- Kingsmead Road / Abbey Barn Lane.
- Tunnel under M40 and Treadaway Hill (Treadaway Tech Centre).
- Juniper Lane.
- Rear of 105 Wycombe Lane.
- Whitepit Lane.
- Wooburn Industrial Estate.
- Boston Drive business area.
- Bourne End Rail Station.

2.2 Background Literature

As part of the study, we have received and read the following reports produced by the High Wycombe Society to obtain background information:

- Clogged Commuter Corridors or a Light Rail Lubricant, Elsa Woodward, May 2001.
- Light Rail to Light the Way to Popular Public Transport in and around High Wycombe, July 2003.
- A Lost Opportunity Looms, Nigel Phillips, High Wycombe Society Newsletter Spring 2008.

3 ROUTE ALIGNMENT

3.1 Introduction

This section of the report discusses an indicative route and identifies the key engineering issues that would need to be detailed during subsequent studies. Note that at this time, no detailed level information is available, and as such, any indicative alignment solution is based on site observations and aerial mapping. We have not considered land ownership details in the identification of an indicative tram alignment.

3.2 Typical Light Rail Corridor Width

The typical width for a Light Rail corridor would be of the order of 9m plus any side slopes (embankment or cutting) to allow for twin track, rail infrastructure (e.g. signals, signs, overhead line equipment, etc.) and a footway for maintenance workers. Drawing number D120699/001 in Appendix 1 shows a potential tram corridor from High Wycombe to Bourne End.

3.3 High Wycombe Rail Station

High Wycombe Rail Station (Location 1 on Drawing Number D120699/001) has three platforms and three tracks. Chiltern Railways provide services to London, Birmingham, Aylesbury, Bicester and Banbury.



Figure 1: High Wycombe Rail Station



Figure 2: View south-east from station

It is proposed to use part of the Network Rail (NR) owned land (and possibly infrastructure) for the tram terminus at High Wycombe. It may be technically possible to use part of the NR track, but this will require detailed discussions with NR. At this time, it is not known what the tram headway would be, and hence whether twin track would be required at the terminus.

As light rail has a lower threshold level than heavy rail, a new platform(s) would be required for the tram. This would typically have a width between 3-5m depending on patronage figures and whether it was a side or island platform.

In order to minimise the impact on heavy rail services, we would recommend that the light rail alignment is kept separate from the mainline. This would require more land, but could offer a simpler solution and avoids heavy and light rail sharing infrastructure, thus reducing the risk of conflict.

The alignment would depart the station and head southeast for a few hundred metres before turning out onto the disused line towards Bourne End.

3.4 Gordon Road and housing on the old G Plan Site (Princes Gate)

Princes Gate is a cul-de-sac and now provides vehicular access to the new residential estate and runs on the old rail alignment. A new bridge over Gordon Road into Princes Gate is required (Location 2 on Drawing Number D120699/001).

The tram could travel off the bridge and down an embankment to join Princes Gate via a new signal controlled junction. The tram could then share the carriageway with general traffic over the remaining length of Princes Gate with the existing junctions remaining under priority control as the traffic flows are expected to be low as Princes Gate is a cul-de-sac.



Figure 3: Princes Gate looking toward Gordon Road



Figure 4: Princes Gate looking south-east

There is a moderately steep slope on Princes Gate down to Gordon Road and also sloping down to the former bridge crossing over London Road. The gradients are not known at this time, but will need to be assessed at a later stage.

3.5 Embankment adjacent to Homebase between London Road and Bassetsbury Lane

The tram would continue along the former track and over London Road via a new skewed bridge crossing (Location 3 on Drawing Number D120699/001). From our site visit, there were no significant engineering issues evident with this part of the route. Adequate headroom over London Road would be required (minimum 5.3m).

The tram would then continue along the former track on the embankment towards the former sewage treatment plant on Bassetsbury Lane. As with other sections, the formation would require further investigation into its structural integrity.



Figure 5: New bridge crossing London Road looking toward Princes Gate



Figure 6: Existing rail formation

3.6 Bassetsbury Lane adjacent to former Sewage Treatment Works

A residential development has been built on the former alignment between Bassetsbury Lane and Abbey Barn Lane (Location 4 on Drawing Number D120699/001). This necessitates a route diversion. Three potential routes have been identified below:

1. Maintain the original alignment with a new bridge over Bassetsbury Lane. This option would require some property acquisition and demolition².
2. Divert the tram through the former sewage treatment works. This is a significant issue as Detailed Planning Permission has been granted for the Wycombe Marsh Phase 2 Housing Development by St. James Group Ltd. Their masterplan layout does not provide an area for a light rail system, and as such, any proposed alignment would require part of their development. New earthworks would be required to bring the tram down from the existing embankment to the proposed levels within the development site. The alignment would then pass to the north of the factory and cottage.
3. Divert the tram around the back of Deangarden Rise. This would require a new bridge over Bassetsbury Lane and some property acquisition and demolition. A new bridge over the tramway at Abbey Barn Lane may also be required, depending on the design of the alignment and whether the existing bridge could be used.

Drawing number D120699/001 in Appendix 1 shows the development site and the alternative tram alignments.

² The Transport and Works Act Order (TWAO) process would identify third party land requirements and if a TWAO application were successful, the land would be acquired through the Compulsory Purchase Order process.

3.7 Kingsmead Road / Abbey Barn Lane

Upon exiting the former sewage treatment site, the tram would pass through the allotments and cross over the western end of Kingsmead Road (Location 5 on Drawing Number D120699/001). Further investigation would be required to identify if a priority junction rather than a signal-controlled junction could be used as the traffic flows are likely to be low. The alignment would then pass underneath Abbey Barn Lane and continue along the disused railway at the rear of the residential properties to Treadaway Hill.

3.8 Treadaway Hill and Tunnel under M40

The tram will need to cross Treadaway Hill and through the Treadaway Tech Centre in order to reach the tunnel under the M40 (Locations 6 & 7 on Drawing Number D120699/001). Only one option is considered to be feasible.

The preferred option would be to build an embankment on the west side of Treadaway Hill so that the tram could climb up and pass over the carriageway on a new bridge and then pass behind the industrial units. Demolition of some of the easternmost units would be required so that the tram can tie into the alignment through the tunnel.



Figure 7: Treadaway Hill looking southwest



Figure 8: Treadaway Hill looking northeast



Figure 9: Tunnel Under M40



Figure 10: Land behind units



Figure 11 & 12: End units blocking tramway

Due to the steep gradient of Treadaway Hill, it is not possible to provide a signalised junction on Treadaway Hill.

Upon passing through the tunnel, the tram alignment follows the course of the former railway along the edge of the golf course (between Locations 7 & 8 on Drawing Number D120699/001).

3.9 Juniper Lane

Juniper Lane acts as an access road to Tudor Drive and to several other properties off it (Location 8 on Drawing Number D120699/001). It is not a major through route and is generally only used by residents to access their properties.

Tudor Drive and several properties have been constructed on the alignment of the former railway. As such, it is suggested that the tram could run to the southwest side of Tudor Drive. This would require the demolition of several buildings and the use of third party land. It may be necessary to provide a signalised junction where Juniper Lane crosses the proposed route if a priority junction arrangement is not considered appropriate in due course.



Figure 13: Tudor Drive looking east

3.10 Rear of 105 Wycombe Lane

The track passes to the rear of the properties on Wycombe Lane in a cutting (between Locations 8 & 9 on Drawing Number D120699/001). There are no engineering issues anticipated through this part of the route.

3.11 Whitepit Lane

The tram crossing of Whitepit Lane (Location 9 on Drawing Number D120699/001) could be via a tunnel or bridge. The tram would need to divert away from the original alignment in order to avoid the houses built on it at Red Lion Way and the two houses on Whitepit Lane (adjacent to Old Station Way). Upon crossing Whitepit Lane, the tram alignment would tie back into the original alignment and continue on towards the Wooburn Industrial Estate.

3.12 Wooburn Industrial Estate

The track passes to the rear of the buildings. There are no engineering issues anticipated through this part of the route.

3.13 Boston Drive offices

The alignment will pass over Cores End Road via a new signal-controlled junction (Location 10 on Drawing Number D120699/001). There is a level difference between the office car park and Cores End Road. It is considered possible to provide an acceptable gradient slope into the car park area. There could be a loss of parking facilities that could be replaced using the area of vegetation at the eastern end of the car park.

The on-street parking along Boston Drive would have to be removed in order to provide adequate space for the tram and traffic.



Figure 14 & 15: Cores End Road

3.14 Bourne End Rail Station

Two options are considered at Bourne End Station:

1. Provide a through route to Maidenhead using NR track and infrastructure. The tram would cross Station Road via a signalised junction and continue into Bourne End Station. Modifications to the NR platform and infrastructure would be required. The tram would then continue on the NR track and infrastructure to Maidenhead (a strategic link between Chiltern Railways, First Great Western and Crossrail). It must be noted that this study has not looked into the feasibility and issues associated with the use of NR infrastructure.
2. Alternatively, Bourne End Station could be the terminus of the proposed light rail scheme (Location 11 on Drawing Number D120699/001). This would provide a more cost effective design solution and does not prohibit future extension across Station Road to tie into the NR mainline to Maidenhead. Improved pedestrian crossing facilities across Station Road would improve the transport interchange facilities. There would be a loss of parking facilities on Boston Road. Depending upon the platform configuration, there may be a need to reduce the carriageway width around the tram stop and provide priority in one direction to control the traffic.



Figure 16: Boston Drive (looking east from Bourne End Railway Station)

4 CONCLUSION

4.1 Summary

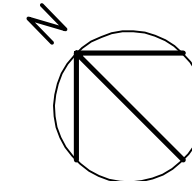
This brief engineering feasibility overview study has considered the route of the disused railway between High Wycombe and Bourne End to act as a light rail corridor. The report has identified key engineering issues that could be resolved at a subsequent design stage with additional survey data. Despite the development of residential areas on certain parts of the alignment, alternative alignments from an engineering perspective appear feasible.

The tram alignment in the area of the Sewage Treatment Plant is the most difficult part of the route from a political viewpoint. As the original alignment has been developed on, and with planning approval for the development of the former Sewage Treatment Plant at Bassetsbury Lane into a large residential estate by the St. James Group Ltd., some property acquisition and demolition would be required for the tram corridor. At this stage, three options have been identified and at the next design stage, more work would be required to develop these options in more detail.

Elsewhere along the route, minor tram alignment diversions from the original alignment would be required and as such, privately owned land and property could be required. There are no anticipated engineering issues that could not be resolved at subsequent design stages.

This report has not considered the environmental or land ownership aspects of reintroducing a rail link between High Wycombe and Bourne End. In addition, it has not considered the implications of using NR track and infrastructure from Bourne End Station to Maidenhead. Should further studies be commissioned, these and the other issues identified in Section 1 will need to be considered.

5 APPENDIX A – INDICATIVE ALIGNMENT DRAWING



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Revision Details		By	Date	Suffix
		Check		
Drawing Status				
PRELIMINARY				

KEY:	
	WYCOMBE MARSH PHASE 2 DEVELOPMENT
	SECTION OF ORIGINAL ALIGNMENT DEVELOPED OVER
	INDICATIVE LIGHT RAIL ROUTE
	HIGH WYCOMBE RAIL STATION
	PRINCES GATE/ GORDON ROAD
	LONDON ROAD
	SEWAGE TREATMENT WORKS
	ABBAY BARN LANE
	TREADAWAY HILL
	TUNNEL UNDER M40
	TUDOR DRIVE AND JUNIPER WAY
	WHITEPIT LANE
	BOSTON DRIVE/ CORES END ROAD
	BOURNE END RAIL STATION

Job Title

HIGH WYCOMBE TO BOURNE END
LIGHT RAIL

Drawing Title

INDICATIVE LIGHT RAIL CORRIDOR

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Scott Wilson Scott House Alençon Link, Basingstoke Hampshire, RG21 7PP Telephone (01256) 310200 Fax (01256) 310201 www.scottwilson.com		
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