

Croxley Rail Link

Alternatives Review

Report

July 2011

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1 Introduction

Background

- 1.1 The Croxley Rail Link has been developed to achieve three core objectives:
- To enhance Watford’s sustainable transport links;
 - To promote economic and housing development in Watford, and
 - To provide a credible alternative to the car for trips to, from and within Watford.
- 1.2 In the process of developing the scheme a number of alternative options have been considered to meet the scheme objectives. These have included using different modes and variations in the scope and design of the preferred option.
- 1.3 These options have been proposed from a variety of sources including; early feasibility studies, campaign groups and members of the public. This report provides a summary assessment of these alternative options.

Objectives

- 1.4 The objectives of the report are to:
- Describe the alternative options that have been considered throughout the history of the project and explain their relative strengths and weaknesses against the Do Minimum;
 - Provide a summary assessment of each option against the scheme objectives and the preferred option; and
 - Explain why the preferred option has been chosen over these options.

Structure of the Report

- 1.5 The rest of this report is structured as follows:
- **Section 2 - Alternatives Review** describes the 13 alternative options that have been considered. The section presents a Pro-Forma summary of each describing its origins, relative strengths and weaknesses.
 - **Section 3 - Summary** provides a summary assessment of the performance of each option against the stated objectives of the scheme and explains why the preferred option has been chosen.

2 Alternative Review

2.1 The Croxley Rail Link has a strong business case and will contribute to the objectives of the Department for Transport, Hertfordshire County Council, Watford Borough Council, Transport for London and Network Rail. The preferred option has evolved over many years, during which time several variations and alternative options have been considered. The options proposed have included:

0. The Do Minimum;
1. Croxley Rail Link Extension - including the closure of Watford Metropolitan (The Preferred Scheme);
2. Croxley Rail Link extension - including the retention of Watford Metropolitan;
3. Providing a Shuttle Service from Croxley to Watford Metropolitan;
4. Using the Croxley Moor Alignment;
5. The Central Herts Rapid Transit scheme;
6. A Shuttle Service from Ascot Road to Watford Junction;
7. Direct Services from Watford Junction towards Aylesbury;
8. A Tunnel between Watford Metropolitan and Watford Junction;
9. A Guided Busway on Croxley Green;
10. A Segregated Busway on Croxley Green;
11. Bus Priority and Quality Measures allowing service enhancements (on existing routes);
12. A Cycleway between Ascot Road and WatfordTown Centre, and
13. Ascot Road to South Watford / Bushey Road Link.

2.2 This section of the report provides a summary of alternative options to demonstrate that all viable solutions to achieve the scheme objectives have been considered, and only the most suitable have been taken forward for development and full appraisal. The following Pro-Forma sheets consider the alternative options in summary, describing their origins, benefits, costs, and environmental impact, providing an overall summary assessment.

<p>Option 0: Do Minimum</p>	
<p>Option Description and Alignment:</p> <p>The Metropolitan Line will remain to continue to serve Watford Metropolitan Station. No new link will be made to Watford Junction and no additional services provided.</p>	
<p>Origins:</p> <p>The current situation with planned changes to stock and service patterns.</p>	
<p>Option Details:</p> <p>Maintain the existing Metropolitan Line services to Watford Metropolitan Station. National Rail Services will continue to run through Watford Junction and Watford High Street Stations.</p>	<p>Feasibility and Cost:</p> <p>No cost, but misses an important opportunity to utilise the rail link to improve services and access to & from Watford.</p> <p>The option does not support the delivery of new homes and economic growth in development areas including the Watford Health Campus, the Harlequin Shopping Centre and CroxleyBusinessPark.</p>
<p>Demand and Benefits:</p> <p>Potential to use the Croxley Rail link land for other purposes including housing development.</p> <p>Maintains current access patterns for Watford Metropolitan users.</p>	<p>Environmental Impact:</p> <p>Potential impact is dependent on the alternative use of Croxley Green - for housing development for example.</p> <p>There would be no need to construct the viaduct and no visual impact on the local area.</p>
<p>Summary & Conclusions:</p> <p>The population of Watford is expected to increase by 15% between 2006 and 2030. This growth is expected to generate travel demand growth of around 20% over the period and increase pressure on the local transport network. There are also several large development sites in the town which will require good public transport links to be delivered successfully.</p> <p>Watford borough is relatively self contained with 50% of work trips originating and terminating in the district area, however it also has a very high level of commuting trips to London, which account for around 20% of all work trips. The town (Watford Junction station in particular) also serves as an important transport hub for the wider area. London is a key destination, and good access links to the capital are critical.</p> <p>The position of Watford Metropolitan station in a suburban area over one mile from the high street is a barrier to the accessibility of the town centre as an employment, business, retail and leisure destination. The Do Minimum Option will therefore lead to a relative decline in the quality of the transport network as population and employment growth increase transport demand and crowding. There is limited scope for expansion of services on the Watford to London DC line. The need to commute to and from London in particular will grow and without intervention, crowding on existing national rail services will increase. Poor transport interchange between London Underground and National Rail Services reduces the accessibility of each service and is a barrier to economic growth.</p>	

Summary & Conclusions:

This option provides a step change in the accessibility and interchange quality of Watford's public transport network. Linking national rail and underground services at Watford Junction and High Street stations will provide interchange benefits for the transport network, both for Watford and the wider area. The provision of new stations will also deliver improvements in accessibility for key areas of development in the centre of Watford including the Watford Health Campus, Watford Business Park and Watford Junction Interchange. Each of these developments are crucial to the economic aspirations of the town and the wider county.

The option is viable, and can be easily implemented subject to securing funding. It will have a net positive economic impact, represents value for money, and has a positive financial case. The option also contributes to wider objectives and will assist economic growth by improving access to Watford town centre and key centres of employment growth in Hertfordshire.

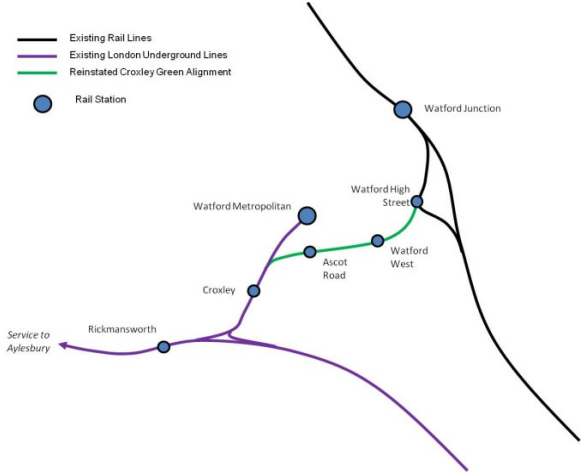
The option will provide some crowding relief to national rail services, encourage mode shift to rail and underground and help to strengthen the transport links between Watford and London. It will strengthen Watford's ability to attract workers, employees, businesses, and both retail and leisure visitors, particularly from the towns connected to the Metropolitan line.

There would however be some adverse distributional impacts for some individuals as a result of the closure of Watford Metropolitan station. A large majority of current users would see an improvement in service quality and a reduction in station access time / distance.

This is the preferred option for which DfT funding is being sought. Quantitative analysis of this option has been undertaken in support of the BAFFB.

Summary:

- Links Watford town centre and multiple development sites to the Metropolitan line with frequent services to London;
- Provides an high profile improvement in access and interchange between underground and rail services at Watford Junction and High Street Stations;
- Requires the closure of Watford Metropolitan station;
- Sufficiently advanced construction timescale;
- Positive economic and financial case, and
- Strongly supports wider economic development objectives for Watford and Hertfordshire.

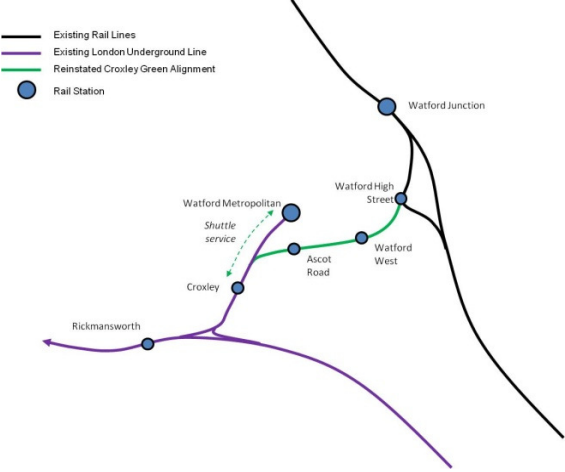
<h3>Option 2: Croxley Rail Link extension - including the retention of Watford Metropolitan</h3>	
<p>Option Description and Alignment:</p> <p>The Metropolitan Line will be extended from Croxley to Watford Junction via a new viaduct, the disused Croxley Green alignment and Watford High Street. This option is the same as Option 1, but Watford Metropolitan station is kept open, with the train service split between Watford Metropolitan and Watford Junction.</p>	 <p>The map illustrates the proposed rail extension. It shows existing rail lines (black) and London Underground lines (purple). The reinstated Croxley Green alignment is shown in green, connecting Croxley to Watford Metropolitan, Ascot Road, and Watford High Street. Watford Junction is shown as a major station on the existing rail line. A legend identifies the symbols for Existing Rail Lines, Existing London Underground Lines, Reinstated Croxley Green Alignment, and Rail Stations. Other stations shown include Rickmansworth, Watford Metropolitan, Ascot Road, and Watford West. A service to Aylesbury is also indicated.</p>
<p>Origins:</p> <p>Identified as an option by London Underground in 1989, but ruled out in later work.</p>	<p>Feasibility and Cost:</p> <p>Operating costs for this option are higher than Option 1 due to the retention of Watford Metropolitan.</p> <p>In addition to the costs in Option 1, this option would require a junction to the north of Croxley station between the current Metropolitan Line to Watford Metropolitan and the proposed Croxley Rail Link.</p>
<p>Option Details:</p> <p>The option includes the reinstatement of double track over the former Croxley Green Branch, and a double track viaduct linking this to the Metropolitan Line north of Croxley station.</p> <p>Watford Metropolitan station would remain open. Services would be provided to both Watford Metropolitan, and Watford Junction. There would be 3 trains per hour to each station in the peak.</p>	<p>Environmental Impact:</p> <p>The option would have similar environmental impacts as Option 1, the lower operating frequency to Watford Junction would mean slightly less train mileage, noise, and carbon emissions.</p>
<p>Demand and Benefits</p> <p>The benefits are similar to option 1. However the accessibility of the area around Watford Metropolitan station would be maintained, although with a lower frequency service than in the do minimum.</p> <p>This Metropolitan service would be split between Watford Metropolitan and Watford Junction stations. Because Watford Junction is a larger travel origin / destination, the option would generate lower demand and benefits.</p>	

Summary & Conclusions:

This option is a variation of the preferred scheme. The main differences are that Watford Metropolitan station is retained, but the Metropolitan service is split between Watford Metropolitan and Watford Junction providing a lower frequency service relative to the preferred option. The reduction in service frequency relative to Option 1 means that it will provide fewer benefits, there will also be a slight increase in operating costs due to the maintenance of an additional station. The retention of Watford Metropolitan station comes at the expense of a reduction in service frequency to Ascot Road, Watford Hospital and Watford Junction. Overall the option is less attractive than Option 1 because of this reduction in service frequency, and the increase in the complexity of operations. Quantitative analysis of this option has been undertaken in support of the BAFB.

Summary:

- Increased operational complexity relative to the preferred scheme;
- Maintains services at Watford Metropolitan;
- Service frequency to Ascot Road, Watford Hospital and Watford Junction stations is reduced relative to the preferred scheme;
- Increased operating costs relative to the preferred scheme due to the retention of Watford Metropolitan.

<h3>Option 3: Shuttle Service from Croxley to Watford Metropolitan</h3>	
<p>Option Description and Alignment:</p> <p>This option is a variation of Option 1 and involves retaining a self-contained rail shuttle service on the existing alignment between Watford Metropolitan and Croxley.</p>	 <p>The map illustrates the rail network around Watford Junction. It shows existing rail lines in black, the London Underground line in purple, and the reinstated Croxley Green Alignment in green. A shuttle service is indicated by a dashed green line between Croxley and Watford Metropolitan. Other stations shown include Rickmansworth, Ascot Road, Watford West, and Watford High Street.</p>
<p>Origins:</p> <p>Referenced in LUL Croxley Link Study, 1989.</p>	
<p>Option Details:</p> <p>Compared to the preferred scheme (which is an integral part of this option) Option 3 would see the retention of the existing alignment between Croxley and Watford Metropolitan, including the current station at Watford Met.</p> <p>The option will also require new infrastructure at Croxley to allow services from Watford Metropolitan to terminate and turn back.</p>	<p>Feasibility and Cost:</p> <p>As in Option 2, there are no anticipated engineering barriers to delivering a junction between the proposed Watford Junction alignment and the existing Watford Metropolitan alignment.</p> <p>Given the high service frequency on the route, a bay platform would be required at Croxley to allow the shuttle service to terminate and turn back without impeding the main Watford Junction to London Metropolitan Line service. It is likely that these would need to be separate from the current through platform to minimise the impact on the proposed Watford Junction to London Met line services. The level of demand for the shuttle service is likely to be low and the financial case is uncertain. The availability of land at the station may also make this option challenging.</p> <p>The operation of a shuttle service would require an additional rolling stock unit and supporting train crew.</p>
<p>Demand and Benefits:</p> <p>The shuttle service would benefit current users at Watford Metropolitan for whom a quicker journey opportunity was not available via new stations on the Watford Junction alignment in the preferred scheme.</p> <p>The option would require an interchange at Croxley in order to reach London, this would significantly reduce the attractiveness of the service.</p>	<p>Environmental Impact:</p> <p>Similar to the preferred scheme.</p> <p>There would be construction, operational and environmental impacts associated with the new railway, as well as infrastructure required at Croxley to allow the service from Watford Metropolitan to terminate and turn back.</p> <p>Carbon emissions and noise would be slightly higher than Option 1 due to the increased level of service from the shuttle.</p>

Summary & Conclusions:

This option is a variation of Option 1 and allows the project to be delivered with higher frequency to Watford Junction (than Option 2) whilst retaining access at Watford Metropolitan station via the shuttle service.

The option therefore does offer some additional benefits over Option 1. However the availability of direct services at Ascot Road and Watford Hospital would mean that relatively few people are likely to use the shuttle service between Watford Metropolitan and Croxley. The need to interchange at Croxley will reduce the attractiveness of services at Watford Met and many who currently use the station would be likely to be abstracted to Ascot Road. As a result the demand for the shuttle service is unlikely to provide adequate finance and the financial case for the project is likely to be weak.

The need to provide termination and turnaround facilities for the shuttle service at Croxley will add complexity and cost to the scheme.

Summary:

- More complexity in rail operations because of the provision of the shuttle service;
- Additional engineering and design requirements increase capital costs and lower the economic case;
- Maintains a level of service to Watford Metropolitan;
- Forces Watford Metropolitan users to interchange at Croxley;
- Low demand for the shuttle service and a poor financial case are likely.

<h2>Option 4: Croxley Moor Alignment</h2>	
<p>Option Description and Alignment:</p> <p>This option uses a more southerly route along the former Watford - Rickmansworth alignment to link Watford Junction and Watford High Street to the main Metropolitan line.</p>	
<p>Origins:</p> <p>Referenced as a sensitivity test in a 1993 brief, the resulting analysis has not been sourced.</p>	
<p>Option Details:</p> <p>The option would see the reinstatement of the former Watford - Rickmansworth railway between Watford High Street and the Metropolitan main line south of Croxley.</p> <p>This would require approximately 6km of double track route (opposed to 3kms for the preferred scheme) and possible stations at Croxley Moor, Holywell Industrial Estate, East Holywell and Cardiff Road.</p> <p>The option would require a number of additional bridges, as the original structures have since been removed. A new structure will be required to allow the alignment to join the Metropolitan main line, which is at a different grade.</p> <p>The option could facilitate the closure of the current Watford Metropolitan branch. This could remove approximately 4km of track (including the triangular junction at Croxley) which could represent a maintenance saving. Additionally the stations at Croxley and Watford Metropolitan could be closed.</p>	<p>Feasibility and Cost:</p> <p>Part of the route is a Sustrans cycleway (and public right of way) which means that obtaining powers to build will be more complicated and therefore significantly more expensive.</p> <p>A number of rail bridges on the alignment have been replaced by pedestrian/cycle bridges. Therefore there would be significant costs involved in reinstating rail bridges.</p> <p>There was no connection between the former alignment and the Met Line, and an industrial estate prevents this alignment being used to provide a London facing junction at the point where the lines cross. Therefore approximately 2km of completely new alignment on green land is needed to provide the London facing connection. Additionally a bespoke structure will be required to allow the alignment to meet the Met main line at grade.</p> <p>Services would be provided by diverting the existing Watford Met Line. This would require an increase in rolling stock and train crews due to the additional time taken to reach Watford Junction. This would increase costs.</p>
<p>Demand and Benefits:</p> <p>The option will provide improved access to Met line services for residents of Watford town centre and Holywell. However the alignment skirts the southern edge of Watford meaning that the potential catchment is severely limited relative to option 1.</p> <p>Current users of Watford Met and Croxley would have their services removed and given the distance to the new alignment would not have a realistic alternative journey opportunity.</p>	<p>Environmental Impact:</p> <p>There would be construction, operational and environmental impacts associated with the railway, new rail bridges and infrastructure. There would be 2km of construction causing significant noise and vibration.</p> <p>There may be some visual impacts from new stations and the new structure that would be required to link the alignment with the Metropolitan Line. The Sustrans cycleway would be lost to the new alignment.</p>

Summary & Conclusions:

The option would have significant additional costs associated with obtaining TWAO powers due to the closure of the cycle way. Construction will be much more expensive given the alignment is currently being used as a cycleway and some of the original bridge structures will need to be replaced. The cost of joining the alignment to the Metropolitan main line at grade is also likely to be high.

The benefits generated by the scheme are likely to be limited as the alignment skirts round rather than dissecting the residential areas of Holywell and West Watford. The closure of Watford Met and Croxley, with no viable alternative stations provided for these users. This would result in significant disbenefits for existing users, and a loss of revenue.

The option can be ruled out as the costs will be greater than the Preferred Scheme, whilst delivering fewer benefits.

Summary:

- The alignment is significantly longer than Option 1 with much higher construction costs.
- There are more physical barriers to construction, including existing buildings.
- The option may require the removal of existing services at Watford Metropolitan alternatively services would have to be split.
- The proposed stations on the alignment at Cardiff Road and Holywell Industrial Estate have a smaller population catchment area than the stations proposed in Option 1.
- The alignment will displace an existing cycle way, and will be significantly more difficult to deliver than Options 1, 2 and 3, whilst providing fewer benefits.

<h2>Option 5: Central Herts Rapid Transit</h2>	
<p>Option Description and Alignment:</p> <p>This option involves the creation of a rapid transit line from St Albans to Chesham. This assessment focuses on the costs and benefits of delivering services on the Croxley Green alignment.</p>	
<p>Origins:</p> <p>Referenced in Transport Today article 23 August 1989.</p> <p>Proposals to convert the Abbey Line to light rail may add interest in extending the service beyond Watford via the Croxley Green alignment.</p>	
<p>Option Details:</p> <p>Provide a cross Watford Metropolitan service by linking the current St Albans Abbey Line with services over the disused Croxley Green alignment. The service would run from St Albans to Chesham via Watford Junction and the Croxley rail link.</p> <p>To make the link between the two lines it would be necessary to cross the West Coast Main Line. It is assumed that this crossing would be made on street through Watford town centre.</p> <p>Such an option would require reopening of the 4km disused Croxley Green line and approximately 2km of on street alignment through Watford town centre. The number of additional stops is unknown.</p>	<p>Feasibility and Cost:</p> <p>To make the link between the two lines infrastructure would be needed to cross the West Coast Main Line. A bridge at Watford Junction would be highly complex and expensive.</p> <p>Should the option be extended beyond the Croxley Green alignment to shared running with LUL services, then tram-train technology would also be required which would increase the complexity and cost of the scheme. Shared service running would also create reliability impacts for LUL services.</p> <p>The option would be operated as an additional service in isolation to the existing heavy rail or LUL operations in the area. Therefore there will be significant additional costs in financing a new fleet of vehicles and crew to support the full service.</p> <p>This option is part of a much wider project to develop a rapid transit system, therefore the project would be significantly more challenging to deliver than the preferred scheme.</p>
<p>Demand and Benefits:</p> <p>The option will provide improved public transport services for those travelling from West Watford to Watford town centre, St Albans, Chesham and further afield via Watford Junction.</p> <p>The option would involve more stops and provide greater accessibility gains to a wider area than Option 1 although at lower speeds.</p> <p>However the option does not deliver any direct journey opportunities towards London via the Metropolitan line corridor, or to Watford in the other direction.</p>	<p>Environmental Impact:</p> <p>The option would promote mode shift from car use to public transport throughout the corridor with wider coverage than the rail options.</p> <p>There would be construction, operational and environmental impacts associated with the system. The new rail bridge at Watford junction and town centre tram route will require additional infrastructure, new stations and overhead cabling if tram train technology is adopted.</p>

Summary & Conclusions:

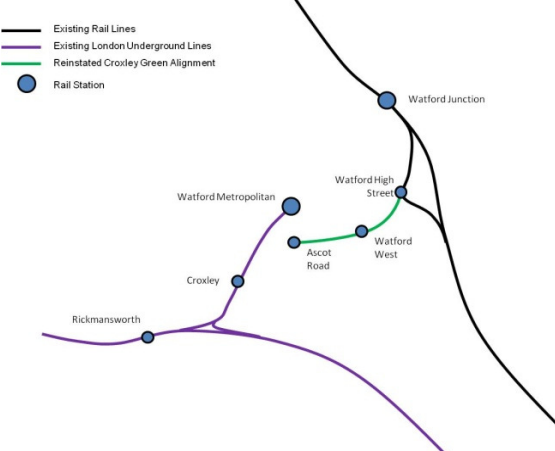
This is a wide ranging scheme which would deliver a significant improvement in accessibility for the local area, including Watford, St Albans and Chesham. However the provision of an additional mode of transport operating on LUL lines, with numerous new stations is likely to be very challenging in terms of implementation.

The cost of providing an on street link through Watford Town centre and a standalone fleet of train-tram vehicles to deliver the service will make this much more expensive compared to earlier options.

The benefits of the scheme will be focused on those travelling from West Watford and accessing Watford town centre. However the option does not generate new opportunities by linking West Watford with London and the various employment opportunities in the Metropolitan line corridor.

Summary:

- The scheme would deliver significant benefits, particularly for east west linkages and the connectivity of Hertfordshire.
- Maintains existing services.
- The rapid transit system is a wide ranging scheme which is likely to have a very long design, construction and implementation phase significantly longer than Option 1.
- The cost of the scheme is likely to be very high. The cost of a bridge or tunnel at Watford Junction in particular is likely to be prohibitive.

<h3>Option 6: Shuttle Service Ascot Road to Watford Junction</h3>	
<p>Option Description and Alignment:</p> <p>This option involves the reinstatement of the Croxley line between Watford High-Street and Ascot Road - but not to Croxley station. There is no direct connection to the Metropolitan line, but a shuttle service would be provided between Watford Junction and Ascot Road. This would avoid the need to construct a viaduct</p>	
<p>Origins:</p> <p>Referenced in NATA Appraisal 1999.</p>	
<p>Option Details:</p> <p>The option would see two trains per hour providing a shuttle service between Ascot Road and Watford Junction.</p> <p>The option would require the reinstatement of the disused Croxley Green branch involving approximately 4km new double track. New stations were proposed at Ascot Rd and Watford West with potential stops at Watford Stadium and Cardiff Road.</p>	<p>Feasibility and Cost:</p> <p>There would be no notable engineering feasibility constraints in delivering this option as a heavy rail option.</p> <p>Alternative rail technologies (e.g. ultra light rail) could be considered but interoperability with heavy rail services would need considering and would likely add to costs.</p> <p>The option could be delivered with a single additional rolling stock diagram and supporting train crew.</p> <p>The previous shuttle service on the Croxley Rail Link was withdrawn because it was lightly used and the revenue generated did not justify the service. There has not been sufficient change in the potential rail market for this position to have changed.</p>
<p>Demand and Benefits:</p> <p>The option would only benefit those travelling from West Watford towards Watford town centre or beyond via Watford Junction.</p> <p>For journeys to Watford town centre the option is likely to be unattractive as the competing bus routes will offer improved frequency and access to the town centre.</p> <p>The option does not provide direct links from West Watford to London and the various opportunities in the Metropolitan line corridor.</p>	<p>Environmental Impact:</p> <p>The construction and operational environmental impacts would be similar to the preferred scheme. But there would be no construction or visual impacts from the construction of the viaduct.</p> <p>The level of service would be lower and carbon, noise and vibration impacts would be slightly less also.</p> <p>The option would not require a viaduct and so visual impacts would be reduced.</p>

Summary & Conclusions:

The low service frequency and lack of connection to the Metropolitan line and central London limits the attractiveness of the shuttle service. The option provides no interchange benefits and crucially does not produce an actual link between the Met line and direct rail services in Watford town centre. While the option will be relatively easy to deliver, it is unlikely that significant benefits will be generated to justify the scheme, and the financial case for the shuttle is likely to be poor.

Summary:

- Low cost and technically feasible;
- Maintains existing services to Watford Metropolitan;
- Does not provide a direct link to the Metropolitan Line;
- Limited demand from Ascot Road and Watford West and a poor financial case.

<h3>Option 7: Direct Services from Watford Junction towards Aylesbury</h3>	
<p>Option Description and Alignment:</p> <p>Heavy rail service provided from Watford Junction towards Aylesbury. Delivered independently or in addition to Option 1.</p>	<p>The map illustrates the proposed rail route from Watford Junction to Aylesbury. Key stations marked include Watford Junction, Watford High Street, Watford West, Ascot Road, Watford Metropolitan, Croyley, Rickmansworth, and Aylesbury. The route involves existing rail lines, closed underground lines, and a reinstated Croyley Green alignment. A viaduct is shown linking the Croyley Green alignment to the Metropolitan line at Croyley. A legend identifies: Existing Rail Lines (black), Existing London Underground Lines (purple), Closed Existing Underground Lines (dashed purple), Reinstated Croyley Green Alignment (green), and Rail Station (blue circle).</p>
<p>Origins:</p> <p>Referenced in NATA Appraisal 1999.</p>	
<p>Option Details:</p> <p>This option could be delivered alongside or independently from the preferred scheme. The option would require the same infrastructure, namely the reinstatement of 4km of double track over the disused Croyley Green alignment, a viaduct linking to the Metropolitan line at Croyley and new stations at Ascot Road and Watford West. The viaduct could be single track if delivered independently of the preferred scheme.</p> <p>Watford Met station would be closed.</p>	<p>Feasibility and Cost:</p> <p>The most complex element of engineering in this option is the viaduct linking the Croyley Green alignment to the Metropolitan line at Croyley. This has been designed as part of preferred scheme development work, is feasible and the appraisal indicates good value for money.</p> <p>The Aylesbury to Watford services would be provided additionally to the current rail service. Therefore additional rolling stock would be required to deliver this option which will add to the scheme capital and operating cost. Shared running could cause reliability issues.</p> <p>If delivered alongside Option 1, enhancements to the signalling between Watford High Street and Watford Junction will be required to ensure that the proposed new services can be accommodated with the existing LOROL and proposed Metropolitan line services.</p> <p>A detailed timetabling study will be required to confirm that the option can be accommodated within the existing Met line and Chiltern services.</p>
<p>Demand and Benefits:</p> <p>The option could deliver additional benefits beyond the preferred scheme by providing a direct heavy rail link between Watford, Rickmansworth and Aylesbury.</p> <p>Delivered independently of the preferred scheme the option does not deliver direct journey opportunities from West Watford to London and the employment opportunities in the Met line corridor. However it would provide improved connectivity through interchange at Croyley.</p>	<p>Environmental Impact:</p> <p>The extended services would promote a shift from car use to rail and reduce traffic impacts. The construction, operational, and environmental impacts would be similar to the preferred scheme if delivered alongside this scheme as the same infrastructure would be required.</p> <p>Increased train services would increase noise, vibration and carbon emissions, although this could be partially offset by a reduction in car use.</p>

Summary & Conclusions:

The option could be delivered alongside the preferred scheme. It requires the same level of infrastructure investment as Option 1, but extends heavy rail services to link with the Metropolitan line at Croxley and beyond to Aylesbury. There is therefore some overlap in the provision of services which would increase the complexity of operations.

It is unlikely that the provision of heavy rail services at Ascot Road, Watford West and Croxley will provide significantly more benefits relative to the underground services delivered in Option 1. The main merits of the scheme come from linking Watford town centre and Aylesbury.

Summary:

- Provides a direct heavy rail link between Aylesbury and Watford Junction.
- Increase the operational complexity of the scheme and requires a significant amount of input and development from the rail industry.
- Unlikely to provide significant benefits for Watford centre.

<h3>Option 8: Watford Metropolitan Tunnel to Watford Junction</h3>	
<p>Option Description and Alignment:</p> <p>This option was the original plan for the Met Line whereby a tunnel from Watford Met Station would link through to Watford Junction under Cassiobury Park and Watford Town Centre.</p>	
<p>Origins:</p> <p>Original aspiration for the Met Line Extension.</p>	
<p>Option Details:</p> <p>The original proposals consisted of driving a tunnel from Watford Metropolitan Station under Cassiobury Park and Watford town centre to Watford Junction. This would involve about 2km of new tunnels. The original proposal also included plans for an underground station in Watford town centre.</p>	<p>Feasibility and Cost:</p> <p>The engineering feasibility and practicality of tunnelling under Watford town centre is likely to be complex and prohibitively expensive relative to using the Croxley Green alignment.</p> <p>The option could be delivered by extending the existing Metropolitan line services beyond Watford Metropolitan station. This will minimise the additional operating cost of delivering the services, although it is likely that an additional rolling stock diagram and associated train crew would be required.</p>
<p>Demand and Benefits:</p> <p>The option would provide improved access to Watford town centre and, as the route is the most direct, the quickest journey time to Watford Junction.</p> <p>However the option would not provide improved connectivity from the areas of Ascot Park, Holywell and West Watford to London.</p>	<p>Environmental Impact:</p> <p>There are likely to be substantial construction impacts and environmental issues at Cassiobury Park, which outweigh the environmental issues of other options considered.</p> <p>The use of a tunnel would reduce noise, although tunnelling activities and a longer construction period would mean that environmental impacts would be worse in the short term.</p> <p>There would be a reduced visual impact as no viaduct would be required.</p>

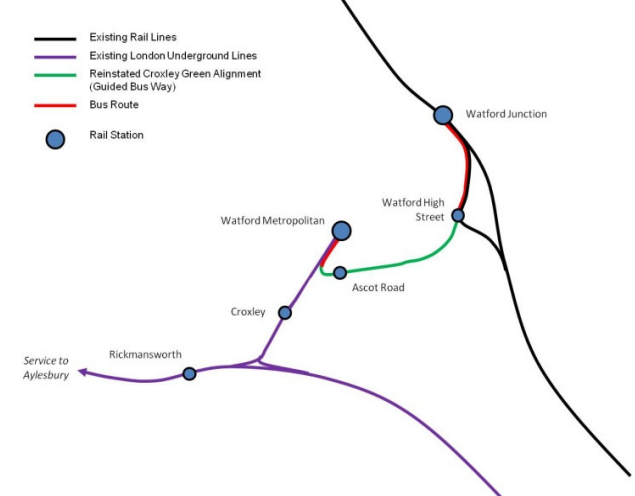
Summary & Conclusions:

The scheme bypasses a large part of Watford town centre and does not provide access to new developments near Ascot Park and West Watford. This means that key developments at Watford Health Campus and the business park will not be served.

The option does not improve access from residential areas in the south of Watford to London. Although there would be some benefits from providing a direct link to Watford town centre and Watford Junction. The environmental constraints, engineering feasibility and cost of a new tunnel, infrastructure and land take pose significant barriers to the delivery of this option. The length of construction is likely to be significantly longer than the preferred option and the economic case is also likely to be weak given the significant costs involved.

Summary:

- The scheme costs are significantly more than for Option 1.
- The scheme requires more complex engineering and will take much longer to deliver than Option
- The scheme provides less accessibility for the town centre and key developments in the area.

<h2>Option 9: Guided Busway</h2>	
<p>Option Description and Alignment:</p> <p>A high quality bus service linking Croxley Metropolitan Line and Watford Junction stations using the Croxley Green Branch converted to Guided Busway. Services would leave the Busway at Cardiff Road and would continue via Watford Town Centre to Watford Junction.</p>	 <p>The map illustrates the proposed Guided Busway route. It starts at Watford Junction (marked with a blue dot) and follows a red line (Bus Route) through Watford High Street and Ascot Road. A green line (Reinstated Croxley Green Alignment / Guided Bus VWay) then runs from Ascot Road to Watford Metropolitan (blue dot) and Croxley (blue dot). From Croxley, a purple line (Existing London Underground Lines) branches off to Rickmansworth and Aylesbury. A black line (Existing Rail Lines) is also shown for context. A legend in the top left identifies the line types and station markers.</p>
<p>Origins:</p> <p>Referenced in NATA Appraisal 1999, Croxley MSBC 2009</p>	
<p>Option Details:</p> <p>The options include the conversion of the existing Croxley Rail alignment to guided busway with buses accessing the busway at Ascot Road and Watford High Street.</p> <p>Stops would be provided at Ascot Road (with park and ride spaces for 200 cars), Watford West, Watford Stadium, Cardiff Road and Watford High Street.</p>	<p>Feasibility and Cost:</p> <p>This option utilises the disused Croxley Green branch and involves the construction of a guided busway. This would be more expensive than the option of providing a non-guided segregated busway.</p> <p>The busway would use kerb guided bus technology and offer a high frequency service similar to the rail link.</p> <p>The capital cost is less than the preferred scheme. However obtaining the necessary TWA powers would be challenging given the likely objections from rail groups.</p>
<p>Demand and Benefits:</p> <p>The option would offer high frequency services, but is a less attractive mode than rail. Interchange at Watford Junction and Croxley will be less integrated.</p> <p>The option would provide improved access to health, leisure and employment opportunities from local services going north (Hemel Hempstead) and south (Harrow, Queens Park, Euston). However the option would not provide direct rail access to central London as in the preferred option.</p> <p>Overall journey time reliability is greater than conventional bus due to fixed infrastructure. However, on-street journey times will be less reliable.</p>	<p>Environmental Impact:</p> <p>There would be impacts on local air quality and from noise along the Busway and the link roads to Watford Junction (eg. Cardiff Road). There would be further environmental impacts associated with the construction and operation of the busway and associated infrastructure, although the impact would be less than for the rail options.</p> <p>The environmental impacts would be less severe than with rail options.</p> <p>There would be no need to construct a viaduct and therefore the visual impact of this option would be much less than the preferred scheme.</p>

Summary & Conclusions:

The capital and operating costs of this option are lower than the preferred scheme, and the implementation of the guided Busway is feasible. However the provision of a bus rather than a rail mode will make the service significantly less attractive. The portions of on-road bus way will make the service slower, and less reliable than the rail service. Demand will be lower as a result and the financial case for the scheme is weak.

Additionally the connection between bus and rail will be less integrated and this reduces the attraction of the wider public transport network. Essentially the link between Watford town centre and the Metropolitan line services will be weak, relative to Option 1, and it will not provide improved access to London.

Summary:

- Lower overall impacts relative to rail options.
- Poor financial case.
- Lower capital and operating costs than Option 1.
- Lower level of service than a rail line. Reliability and journey times are worse.
- Station interchange will be less integrated.
- The link between Watford Town Centre and Metropolitan Line services will be relatively poor compared with Option 1 and it will not provide improved access to London.

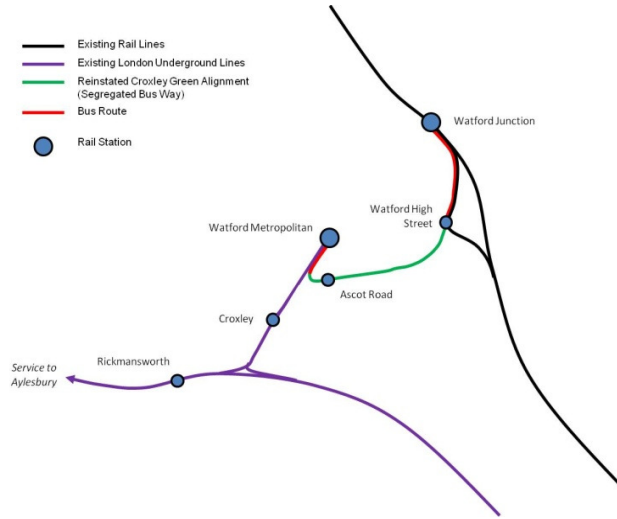
Option 10: Segregated Busway (Low Cost Alternative)

Option Description and Alignment:

This is a variation of Option 9 - a high quality bus service linking Croxley Station and Watford Junction station on a segregated alignment, re-joining the existing road network at Wigenhall Road to access the town centre. An additional service would operate from Watford Junction to Croxley Business Park, also utilising the segregated busway.

Origins:

Referenced in NATA Appraisal 1999, Croxley MSBC 2009



Option Details:

The option includes the conversion of the existing Croxley Rail alignment to segregated busway with buses accessing the busway at Ascot Road and Watford High Street.

Stops would be provided at Ascot Road (with park and ride spaces for 200 cars), Watford West, Watford Stadium, Cardiff Road and Watford High Street.

Engineering Feasibility and Cost:

The option includes 5.3km of bus route of which 3.2km is on the segregated Busway on Croxley Green. The cost is estimated at £23.4m (2007 prices) including construction and management costs. The segregated Busway is cheaper than the kerb guided alternative.

Powers to build the busway would need to be sought through the Highways Act.

A high frequency of 6bph for the core route including 2bph from Watford Junction to Croxley Business Park would be achieved.

Demand and Benefits:

As with Option 9, this option would offer high frequency services, but is unlikely to encourage significant transfer from car as it is perceived as a less attractive mode than rail, and the interchange at Watford Junction and Croxley will also be less integrated.

The option would provide improved access to health, leisure and employment opportunities from services going north (Hemel Hempstead) and south (Harrow, Queens Park, Euston). However the option would not provide direct rail access to central London as in the preferred option.

Overall journey time reliability is greater than conventional bus due to fixed infrastructure. However, on-street journey times will be unreliable.

Environmental Impact:

There would be impacts on local air quality and increased noise along the busway and the link roads to Watford Junction (eg. Cardiff Road). There would be further environmental impacts associated with the construction and operation of the busway and infrastructure. However the impacts would be less than Option 1.

The environmental impacts would be less severe than with rail options.

There would be no need to construct a viaduct and therefore the visual impact would be significantly less than options one and two.

Summary & Conclusions:

Despite the lower costs, the value for money of this option is likely to be less than for Options 1 and 2 due to the lower level of demand, slower journey times, smaller network and lower trip frequency provided by the service. Critically, this option will not deliver the service and interchange benefits of the preferred scheme. There are no significant engineering challenges in terms of feasibility, but the deliverability of the project may be affected by a lack of stakeholder support.

The demand and revenue of the option is likely to be lower than the preferred scheme, and the financial case is also likely to be weak.

Summary:

- Lower overall impacts relative to the preferred option.
- Lower capital and operating costs than the preferred option.
- Lower level of service than rail options. Reliability and journey times are likely to be worse for most trips.
- The link between Watford Town Centre and Metropolitan Line services will be relatively poor compared with Option 1 and station interchange will not be improved.

Alternatives Review

Option 11: Bus Priority/Quality Measures allowing service enhancements (on existing routes)	
<p>Option Description and Alignment: Enhanced bus service on existing bus routes, with bus lanes, junction priority, stop improvements, enhanced information provision, higher specification vehicles and increased service frequency.</p>	
<p>Origins: Referenced in NATA Appraisal 1999</p>	
<p>Option Details: This option would provide service enhancements on existing bus routes including; bus lanes, junction priorities, stop improvements and enhanced information provision. The option would also provide improved vehicles for the service and increase bus frequency increased from 7bph to 10bph on key routes. The option would also provide a 200 space P&R site at Ascot Rd.</p>	<p>Feasibility and Cost: There would be significant infrastructure costs related to bus lanes, junction priorities, stop improvements and enhanced information provision. The P&R site at Ascot Rd would also require significant funding. The option would require new buses and drivers to increase frequency of services. The financial case for the increase in frequency is uncertain. There would be a slight negative impact on highway capacity.</p>
<p>Demand and Benefits: The option will deliver an improvement in service and frequency for existing bus services. Depending upon the extent of measures provided, some highway capacity may be lost, which could increase congestion for existing car users if mode transfer is not significant. Increased service frequency to access health, leisure and employment opportunities, but limited accessibility to other new developments. Overall journey time reliability is greater than with existing bus services due to priority measures. However, journey times will not be as reliable as a fixed track system and interchange between stations will remain poor.</p>	<p>Environmental Impact: May promote some shift from car use to bus. This would be partially offset by impacts on local air quality and noise along the bus priority route due to a higher frequency of buses. Some further, more limited environmental impacts due to infrastructure in bus lanes, junction priorities, etc. May result in increased congestion if highway capacity is lost. Increased service frequency would improve the service to some facilities but would not provide a direct link to the Metropolitan Line corridor and Central London.</p>

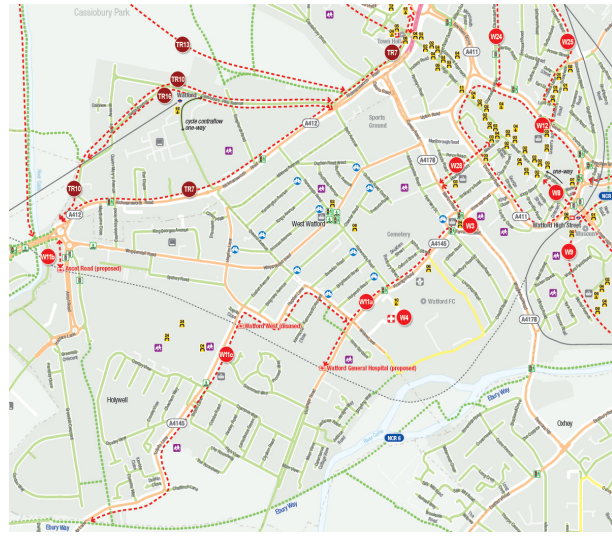
Summary & Conclusions:

Existing services will be enhanced by this option and there would be benefits across the city, but there is no introduction of new infrastructure and the improvement in services is unlikely to attract enough additional patronage to warrant the cost. The financial case for the increase in frequency is uncertain and costs could exceed revenues.

There is also a lack of political will and support for this option when compared to the rail link as it is more complex, requires more extensive planning, and will not deliver the same direct and visible improvements in transport network interchange and connectivity. Critically the option does not provide a direct link between National Rail and London over ground services, and therefore lacks the same impact as the preferred scheme.

Summary:

- Will improve public transport throughout Watford;
- Does not provide a direct link between National Rail and London underground services;
- Requires extensive planning;
- Does not provide any new infrastructure;
- Uncertain financial case.

<p>Option 12: Cycleway between Ascot Road and Watford Town Centre</p>	
<p>Option Description and Alignment:</p> <p>An on-road cycleway between Ascot Road and Watford town centre.</p>	
<p>Origins:</p> <p>South West Herts Cycle Strategy 2011.</p>	
<p>Option Details:</p> <p>The scheme would involve the creation of a cycle lane or system of cycle lanes to improve the cycling accessibility of the local network, particularly between local stations.</p> <p>The emerging strategy identifies alternative routes to the town centre from the Ascot Road area, Holywell and Vicarage Road.</p>	<p>Feasibility and Cost:</p> <p>The option is likely to be highly feasible and relatively low cost. There are already a number of cycle routes in the area, and the disused Croxley Line provides the potential option for a largely off-road route.</p>
<p>Demand and Benefits:</p> <p>Improving transport provision for cyclists fits very well with local and national policy objectives to encourage sustainable transport.</p> <p>A cycleway on the rail link would not provide a direct route to the town centre and so is likely to be lightly used for station access trips (although this could provide a scenic leisure route).</p> <p>On-road cycle routes would provide a useful access improvement, but demand is not likely to be high and it will not generate a significant improvement in the connection between stations and key development areas. Cycling is not feasible for many groups and the accessibility impacts would therefore not be as widespread as the other options.</p>	<p>Environmental Impact:</p> <p>The option would encourage sustainable transport and provide health and environmental benefits through encouraging people to cycle.</p> <p>The option would therefore have a positive impact on noise, pollution, accidents and other externalities although the impact is likely to be modest relative to other options.</p> <p>Construction impacts would be very limited and short term and there would be limited visual impact.</p>

Summary & Conclusions:

The option is feasible, low cost and would provide a useful route to encourage sustainable travel in Watford and in between the LUL and National Rail stations. However it is unlikely to generate significant use and would not provide the same increases in accessibility for the local transport network as a rail or bus link.

The option would not provide the same improvement in access to key sites of development, and would have no impact on service interchange.

Summary:

- The scheme is low cost and feasible;
- Does not support wider regeneration objectives;
- Positive environmental, health and congestion impacts, and
- Low impact on transport objectives.

Option 13: Ascot Road to South Watford / Bushey Road Link	
<p>Option Description and Alignment:</p> <p>A new road linking Ascot Road with south Watford Bushey.</p>	
<p>Origins:</p> <p>The option has not previously been considered.</p>	
<p>Option Details:</p> <p>A new road using the former Croxley Rail Link and linking Ascot Road with South Watford Wiggshall Road, Tolpits Lane and Watford Road.</p>	<p>Feasibility and Cost:</p> <p>Current transport policy makes justifying road schemes challenging and it is likely there would be significant objections to a new road.</p> <p>The current rail alignment and structures are not wide enough to accommodate the width of a modern general highway.</p> <p>The narrow width may make a public highway challenging to deliver when consideration is given to maintenance and safety considerations.</p>
<p>Demand and Benefits:</p> <p>The new road may improve highway journey times and reliability to and through Watford but it does not provide the same significant new journey opportunities afforded by the Rail Link.</p> <p>There could be significant access benefits for some local developments.</p>	<p>Environmental Impact:</p> <p>Significant negative impact from the building of the road and the additional induced traffic. Increased noise, pollution, traffic and accidents.</p> <p>There would be increased surface run off from the asphalt surface.</p> <p>No viaduct requirement.</p>

Summary & Conclusions:

Building a road on the rail link would be a highly unsuitable option which would lead to increased traffic, noise and pollution without delivering a significant improvement in access and transport network interchange and quality. The option is likely to be costly and there would be significant protest and complaint about using the alignment as a road rather than as a public transport link.

Summary:

- Major negative environmental impacts;
- Low impact on the transport network;
- Poor fit with national and local policy, and
- Difficult to implement and likely to draw protest and criticism.

3 Summary

3.1 The 2009 MSBC documents identify the policy objectives that the Croxley Rail Link is intended to achieve. These objectives are shown in Table 3.1, and have been summarised into three core objectives described below:

- | **To enhance sustainable links to and between residents and employment, business, education, health and leisure opportunities** within Watford and across Hertfordshire, and to key external attractors, notably north-west & central London and the national rail network, thus reinforcing Watford’s role as a key transport hub north of London;
- | **To promote economic and housing development** by improving public transport linkages between current and potential employees, Watford town centre and the key development areas of Watford Junction, Watford Business Park / Ascot Road and the Watford Health Campus; and
- | **To provide a credible alternative to car travel**, with inherently lower environmental impacts per trip including noise and greenhouse gas emissions.

TABLE 3.1 2009 MSBC OBJECTIVES

Objective	#	Description
Accessibility	A1	Further enhance Watford Junction as a regional transport hub.
	A2	Provide improved and direct access to jobs in the north-west and centre of London.
	A3	Enhance east-west passenger transport links across Hertfordshire and make more journeys seamless.
	A4	Provide more sustainable links between Watford and other local areas in north-west London.
	A5	Address pressures for orbital movement around London in a sustainable manner.
Equality	Eq1	Improve access to local health, education, employment and leisure services, including the Watford General Hospital and Health Campus.
Environment	En1	Improve quality of life and environment by providing alternatives to private car for trips made within and to/from the area, reducing the adverse effect of road congestion such as noise, pollution and safety.
Economy	Ec1	Assist economic development by improving transport access by sustainable means to existing centres of economic activity such as Watford town centre, new business parks near Ascot Road and Watford Junction redevelopment.
Value for Money	V1	Meet transport requirements efficiently and in a sustainable manner by making best use of existing rail, bus and highway networks and infrastructure which offers good value for money and long term commercial sustainability.
Deliverability	D1	Promote a scheme which has the support of all key stakeholders, and a clear funding solution available for the capital investment required.

Alternatives Review

- 3.2 Figure 3.1 on the following page provides a summary assessment of the different options against the objectives for the scheme based on the evidence summarised in each Pro-Forma. Each option has been scored against the original scheme objectives in comparison to the Do Minimum case. A single tick indicates that the option contributes to the objective, two ticks indicates where it makes a strong contribution.

FIGURE 3.1 OPTION ASSESSMENT AGAINST OBJECTIVES

#	Scheme / Objective	A1	A2	A3	A4	A5	Eq1	En1	Ec1	V1	D1
1	Croxley Rail Link Extension - including closure of Watford Met	✓✓	✓✓	✓	✓✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓
2	Croxley Rail Link extension - including the retention of Watford Met	✓✓	✓✓	✓	✓✓	✓	✓✓	✓✓	✓✓	✓	✓
3	Shuttle Service from Croxley to Watford Met	✓✓	✓✓	✓	✓✓	✓	✓✓	✓✓	✓✓		
4	Croxley Moor Alignment	✓	✓		✓		✓	✓	✓		
5	Central Herts Rapid Transit	✓✓		✓✓	✓	✓✓	✓✓	✓✓	✓✓		
6	Shuttle Service Ascot Road to Watford Junction	✓					✓	✓	✓		
7	Direct Services from Watford Junction towards Aylesbury	✓✓		✓✓		✓✓	✓✓	✓✓	✓✓	✓	
8	Watford Met Tunnel to Watford Junction	✓✓	✓	✓	✓✓	✓	✓	✓	✓		
9	Guided Busway	✓		✓			✓✓	✓✓	✓✓		
10	Segregated Busway	✓		✓			✓✓	✓✓	✓✓		
11	Bus Priority/Quality Measures allowing service enhancements (on existing routes)	✓		✓			✓	✓	✓		
12	Cycleway between Ascot Road and Watford Town Centre						✓	✓	✓		
13	Ascot Road to South Watford / Bushey Road Link						✓		✓		

Alternatives Review

- 3.3 The table shows that options 1, 2 and 3, which are all variations of the preferred scheme, make a strong contribution towards the overall project objectives. Option 1, the preferred scheme, is selected because it returns the best value for money and is cheaper to deliver than Option 2.
- 3.4 Although option 3 scores strongly against the objectives it is likely to be significantly more expensive to deliver while only providing marginal additional benefits compared to the preferred scheme.
- 3.5 While the other options considered do contribute to some of the scheme objectives, none make the overall contribution to all objectives while offering a feasible scheme that is likely to attract government funding.
- 3.6 Central Herts Rapid Transit system (option 5) scores well against most objectives, but does poorly in terms of financial and deliverability objectives. It also does little to improve access to London. Direct services from Watford Junction towards Aylesbury (option 7) score well against most objectives, but the option has a poor financial and deliverability case and provides limited access to London. The Ascot Road to South Watford road link option scores very poorly against most objectives and is the worst performing scheme overall. The other options score poorly in comparison to the preferred scheme. The source and evidence used to develop the Pro-Forma options in this report are shown in the following table.

TABLE 3.2 OPTION SOURCES

	Double Rail Link - Preferred Scheme	Combined Rail	Heavy Rail	Bus Priority	Single Rail Link	Guided Bus	Segregated Busway	Croxley Green shuttle service	Watford Met remains open. Croxley Green sold	Split service to Watford Met and Watford Junction	Station Identification and Provision of Scheme	Link across Croxley Moor	Rickmansworth-Watford Junction via Croxley Rail Link
Major Scheme Business Case (2009)	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Major Scheme Business Case (2008)	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Expected Impact on LUL Revenue (2004)	✓												
LTP Annex E Major Scheme Appraisal Update (2003)		✓	✓	✓	✓	✓	✓						
LTP Annex E Major Scheme Appraisal Update (2002)	✓	✓	✓	✓	✓	✓	✓	✓					

	Double Rail Link - Preferred Scheme	Combined Rail	Heavy Rail	Bus Priority	Single Rail Link	Guided Bus	Segregated Busway	Croxley Green shuttle service	Watford Met remains open. Croxley Green sold	Split service to Watford Met and Watford Junction	Station Identification and Provision of Scheme	Link across Croxley Moor	Rickmansworth-Watford Junction via Croxley Rail Link
Central Case Modelling Corrections and Appraisal Implications Correction to July 2002 Annex E appraisal which was affected by model coding errors affecting revenue, patronage and bens. Positive impact on case.	✓												
Crossrail Scenario Initial Predictions (2002) Analysis of the likely impacts Crossrail will have on the LUL business case for the Croxley Rail Link (old Crossrail option).	✓												
Croxley Rail Link Brochure (2002) Consultation leaflet.	✓												
CRL Model Devt Report (2002) No option explicitly stated. Describes the updating of the South West Hertfordshire Model (SWHM).													
CRL Survey Report (2002) Bus and Rail Station O/D surveys.	✓												
Croxley Rail Link Delivery Option Assessment (2001) Delivery Options Presentation - no specific route mentioned													
Examination of Delivery Options (2001) Summarises status of project, position of involved/interested parties and potential ways forward	✓												
Croxley Rail Link Cost Estimate Reconciliation (2001) Cost estimate comparisons between Railtrack/Hyder and Skanska.	✓												
CRL and LTP Annex E Appraisal (2000)	✓	✓	✓	✓	✓	✓	✓	✓					✓
CRL Study - Business Model Devt - Mar 2000 - Programme.pdf Work programme. No option specified.													
Croxley Corridor Transport Scheme Options: Outline NATA Appraisal (1999)	✓	✓	✓	✓	✓	✓	✓						

Alternatives Review

	Double Rail Link - Preferred Scheme	Combined Rail	Heavy Rail	Bus Priority	Single Rail Link	Guided Bus	Segregated Busway	Croxley Green shuttle service	Watford Met remains open. Croxley Green sold	Split service to Watford Met and Watford Junction	Station Identification and Provision of Scheme	Link across Croxley Moor	Rickmansworth-Watford Junction via Croxley Rail Link
<p>South West Hertfordshire Transportation Study Stated Preference Research (1995)</p> <p>No option explicitly stated. Stated preference survey of travel in South West Herts area.</p>													
<p>Map of proposed Croxley Moor Alignment (1994)</p> <p>Map produced by Aspinalls (1994) showing Croxley Moor Link</p>											✓	✓	
<p>CRL Study (1992)</p> <p>Looked at number of station options - 1. Ascot Rd, Wat West, Wat High St, Wat junc. 2. Wat West, Wat High St, WatJunc, 3. Ascot Rd, Wat High St, Wat Junc. Model update to 1989 LUL CRL Study.</p>	✓									✓			
<p>Croxley Rail Link Brief for Demand Study (Date unknown but post 1991)</p>											✓	✓	✓
<p>Final Report (Passenger Forecasts) (1989)</p>									✓				
<p>Transport Today (1989)</p> <p>References local campaign group (Colne Valley Transit) who want to use new linked line to form part of Watford Light Rail system, taking in BR line to St Albans and LU Chesham branch.</p>	✓												
<p>London Underground CRL (for LUL) (1989)</p> <p>Surveys, car park demand, demand forecasts, revenue and non-revenue bens. Options of keeping Watford met open and closed.</p>	✓								✓				

