UNITED BY OUR DIFFERENCE

WSP

WARFIELD LINK ROAD BUSINESS CASE

22/10/2014

Confidentiality: Public

Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks				
Date	10/10/14	22/10/14		
Prepared by	Alex Sexton, Craig Drennan, Stephen Reed	Alex Sexton, Craig Drennan, Stephen Reed		
Signature				
Checked by	Stephen Reed	Stephen Reed		
Signature				
Authorised by	Stephen Reed	Stephen Reed		
Signature				
Project number	70007051-001	70007051-001		
Report number	1	2		
File reference				

Warfield Link Road Business case

22/10/2014

Client

Bracknell Forest Borough Council
Easthampstead House,
Town Square,
Bracknell, Berkshire
RG12 1AQ

Consultant

WSP
Mountbatten House
Basingstoke
RG21 4HJ
UK

Tel: +44 1256 318 887
Fax: +44 1256 318 700

www.wspgroup.co.uk

Registered Address

WSP UK Limited
01383511
WSP House, 70 Chancery Lane, London, WC2A 1AF

WSP Contacts

Alex Sexton, Transport Planner
Stephen Reed, Technical Director
Craig Drennan, Technical Director

Table of Contents

1 Executive Summary

1.1.1 Warfield is a parish on the outskirts of Bracknell in the county of Berkshire. The A3095 (Warfield Street) provides access north to Maidenhead, as well as a link to the A308(M) which connects to the M4 in the north. Harvest Ride lies to the south of the Parish, with Newell Green to the east and the B3017 to the west. Newell Green and the B3017 provide access to the centre of Bracknell.

1.1.2 The proposal from Bracknell Forest Borough Council is to improve the existing highway infrastructure by creating a link road between Forest Road (B3034) and Harvest Ride.

1.1.3 Economic, Distributional, Environmental and Social appraisals have been conducted in conjunction with Department for Transport's WebTag. These appraisals list all the impacts associated with the highway schemes proposed. A Management Case has also been considered in this report.

1.1.4 The economic impacts have concluded that the scheme has a high benefit cost ratio of 7.668 which places this in the Very High value for money in Department for Transport guidelines. In addition it is believed the link road will help unlock 2,200 homes and over 16,500 jobs.

1.1.5 The environmental impacts of the schemes indicate that there will be 'Slightly Beneficial' impacts to the landscape and townscape, particularly with the development of residential housing around the area. There will be some Slightly Adverse impacts through air quality, noise and biodiversity which will need to tackled with management strategies through the construction to ensure limited people and areas are affected.

1.1.6 The schemes will also provide benefits in terms of social impacts through reducing severance of areas such as Warfield Street/Newell Green and by improving the security of areas with enhanced landscaping and lighting columns.

1.1.7 The appraisal summary table (AST) provides a useful breakdown of the final decisions with regards the impacts. This can be found in Appendix A.

2 Introduction

2.1.1 Bracknell Forest Borough Council appointed WSP to undertake an independent, initial appraisal of potential distributional, social and environmental opportunities and constraints relating to strategic highway infrastructure improvements in Warfield. Warfield is a rural parish made up of a small number of houses north west of Bracknell town centre. The work consists of:

- **Warfield Link Road:** A new road linking Quelms Park Roundabout by Harvest Ride and Forest Road (B3034). It will also connect to a new development and consist of a roundabout by Forest Road and further roundabout along the new link road. In addition, there will be junction improvements between Forest Road (B3034) and Warfield Street (A3095) named Three Legged Cross.
- **3m shared use path and a pedestrian island** along the link road from Quelms Park Roundabout to Forest Road.
- **750 homes** located to the west of the Warfield Link Road and Warfield Street and to the east of Binfield Road (B3018). Also on the development will be a village green, bowling green, primary school and an elderly residential development. This is also the beginning of Bracknell Forest Borough Council's plans to deliver 2,200 dwellings across the Warfield area.

2.1.2 Figure 2.1 located in Appendix A illustrates the area where the link road and the development will be located.

2.1.3 The purpose of this report is to understand the site's baseline conditions which should be taken into account for future decision making when improving this area. The report will summarise the impacts of each of the schemes to the surrounding areas and provide useful guidance in terms of the appraisals to understand how to move forward with each of the schemes.

2.1.4 Figure 2.2 found in Appendix A identifies the locations of the works and the super output areas they are identified in. The lower super output data has been used in the analysis since it provides an in depth look at the new link road's demographical area when compared to the general Local Authority data.

2.2 Key Objectives

2.2.1 The SEP (Strategic Economic Plan) has six key strategic priorities which it requires any infrastructure packages to achieve. These are:

- Unlocking housing development;
- Enhancing urban connectivity;
- Encouraging vibrant town centres;
- Positioning TVB for a digital future;
- Foundations for future growth- housing transport and utilities; and
- Enhancing the strategic transport network.

2.2.2 Most of the above strategic priorities can be attributed to the Warfield site. The Bracknell Forest Council (BFC) Local Transport Plan 3 Core Strategy and Implementation Plan (2011-2026) defines the following objectives which were considered in the planning process for the Warfield Link Road:

- Reduce delays associated with traffic congestion and improve reliability of journey times
- Maintain and improve, where feasible, the local transport network
- Secure necessary transport infrastructure and services to support sustainable development
- Encourage and promote accessibility by sustainable modes of transport
- Protect and enhance the quantity and quality of natural resources including water, air quality and the natural environment
- Reduce greenhouse gas emissions from transport
- Reduce casualties and improve safety on the local transport network
- Enhance the street environment

2.2.3 Planning permission has now been granted for the link road and the development of 750 homes. In total the link road should unlock 2,200 dwellings for the Warfield area by 2026. The link road and the homes will help unlock over 16,500 jobs as more businesses are attracted to the area, which will be of significant economic benefit..

2.3 Background to the Business Case

2.3.1 Following the devolution of major transport scheme funding from DfT, Bracknell Forest Borough Council as part of the Berkshire Local Transport Body (BLTB) and the Thames Valley Berkshire Local Economic Partnership (TVB LEP) were asked to prepare business cases for proposed schemes which would deliver the transport infrastructures which are identified in the Core Strategy.

2.3.2 The process of a business case through BLTB is described below.

Founding Document Process	
1	Unapproved or Long List Schemes. BLTB will invite councils and the LEP to submit unapproved schemes for consideration.
2	If approved this means it will be taken into further consideration. A full Transport Business Case in line with current DfT guidance, including WebTAG and this will be subject to independent assessment and public scrutiny before approval.
3	(optional) In appropriate circumstances, a scheme may be given conditional approval (conditional on securing a financial contribution)
4	If a scheme demonstrates high value for money and receives a positive assessment by the independent appraisal it can become an Approved scheme. Otherwise it could be deleted or referred back for development.
5	Approved schemes are subject to formal agreement about roles, responsibilities, reporting and auditing between the BLTB and the Local Transport Authority promoting the scheme.

2.3.3 In March 2014, the TVB LEP published their Strategic Economic Plan (SEP) which defined schemes and measures that would help deliver the TVB sub regions aspirational growth in employment, housing and skills.

2.3.4 As part of the Local Enterprise Partnership funding technical note the benefits of the scheme were outlined through the use of the Bracknell Forest Multi- Modal Transport Model (BMMTM) and the Transport User Benefits Appraisal (TUBA) programme to help produce a Benefit to Cost Ratio (BCR) value. A Gross Added Value (GVA) exercise was also undertaken to understand how much value the goods and services produce in an area, industry or sector of an economy.

2.3.5 The analysis in 2013 looked at the link road and the developments and resulted in a BCR of 15.551 and a Present Value of Benefits (PVB) totalling £54,989,000.

2.3.6 The analysis just for the link road concluded that the scheme has a PVB of £38,576,000 and a BCR of 7.668 which is in the "Very High Value for Money" category set by Department for Transport.

2.4 Background of Support for Warfield Link Road

2.4.1 The proposed Warfield Link Road is part of the wider strategic development of 750 homes, two form entry Primary School, multi-functional community hub, formal and informal open space including Suitable Alternative Natural Greenspace (SANG). This is also Phase 1 of a larger project constructing 2,200 homes around Warfield.

2.5 Structure of the Document

2.5.1 The chapters of this report can be set out as follows

- Chapter 3: Summary of AST
- Chapter 4: Strategic Case
- Chapter 5: Economic Case
- Chapter 6: Financial Case
- Chapter 7: Commercial Case
- Chapter 8: Distributional Impacts
- Chapter 9: Environmental Impacts
- Chapter 10: Social Impacts
- Chapter 11: Management Case
- Chapter 12: Conclusion
- Appendices- including maps and management case information

2.5.2 Other documents which are integrally linked to this report include Annex A which is the Appraisal Summary Table and Appendix B which are all the worksheets which contribute to the report.

3 Summary of Appraisal Summary Table (AST)

3.1.1 All the economical, distributional, environmental and social appraisals have been derived for the proposed development of Warfield Link Road. The assessments have been produced using Lower Level Super Output Area data as well as Local Authority Level data. Lower Level Super Output Area data was considered to be the most appropriate level of data since it provides detailed data within a useful radius of the sites in order to accurately analyse data of different social groups. Furthermore, guidance produced by Department for Transport states that mapping at the Lower Super Output Area is preferable.

3.1.2 The full appraisal of impacts through the worksheets provides an assessment score. These assessment scores range from Highly Beneficial to Highly Adverse on a seven point scale. The overall assessment of these impacts is recorded in the AST along with supporting information. A copy of the final AST can be found in Annex A.

3.1.3 All the worksheets are located in Annex B and are attributed to the final AST in Appendix A.

4 The Strategic Case

4.1 Area Description

4.1.1 Warfield is a parish on the outskirts of Bracknell in the county of Berkshire. The A3095 (Warfield Street) provides access north to Maidenhead, as well as a link to the A308(M) which connects to the M4 in the north. Harvest Ride lies to the south of the Parish, with Newell Green to the east and the B3017 to the west. Newell Green and the B3017 provide access to the centre of Bracknell.

4.1.2 Bracknell is approximately 40km west of London and 15km outside the M25, with good motorway links to Junction 3 of the M3 and Junction 10 of the M4. It can therefore be seen as a desirable place to live due to its proximity to London coupled with lower house values.

4.1.3 Bracknell Forest has seen periods of high growth with significant release of land around the area. However, there have been previous years (e.g. 2006) of outstanding commitments for housing but with lower delivery rates due to delays in implementation. It is proposed that the Warfield development and link road will provide important housing that will bridge the gap in the borough between supply and demand.

4.1.4 Bracknell is a major employment centre within the South East comprising of many household names predominantly from the financial and ICT sectors, but also from the research and pharmaceutical sectors. In Warfield specifically, Syngenta is a large employer that runs a research centre in the north. Bracknell Forest's employed consist of 28,560 inward based employees and 31,159 outward bound. The majority of outbound employment trips are destined to Windsor, Maidenhead, Wokingham and London.

4.1.5 The area south of the proposed development and link road comprises numerous residential housing developments in an area known as Harvest Ride. Bracknell town centre and railway station is approximately 2km's away from Quelms Park Roundabout where the link road will join with Harvest Ride.

4.2 Socio-Economic Characteristics of Study Area

4.2.1 The 2011 Census indicates that Bracknell Forest has a population of 113,205 with the LSOA area totalling 1,825 people. Some socio-economic problems have been highlighted through the Local Development Framework- Core Strategy. These are:

- Previous poor housing delivery and completion rates (e.g. 2006) when compared with the growth of the borough. However in recent years it has been successful.
- In 2010 Bracknell Forest Borough ranked number 291 out of 326 local authorities for deprivation. This places Bracknell Forest in the top 12% of local authorities as one of the least deprived in England, however, it also highlights that the area is becoming deprived dropping 29 places from three years previously.
- Bracknell has 49% of people in fulltime employment and the ward of Binfield with Warfield has 11.4% more people in full time employment compared to the national average (38.6%). This contributes to traffic and congestion issues around the borough during peak periods.

4.3 Business Strategy- National Transport Priorities

4.3.1 The Government has produced the National Infrastructure Plan 2013 which provides the Government's approach to identifying and delivering infrastructure that is needed.

4.3.2 Within the Plan the Government states the *"need for infrastructure investment*." One of the ways suggested is by meeting future demand through "*better and more efficient infrastructure, serving more homes and increasing capacity on existing networks."* This provides a direct relevance to the Warfield Link Road scheme which aims to provide connections to existing houses as well as new homes and increasing capacity along the Bracknell road network.

4.3.3 The DfT's Business Plan 2011-2015 states a transport system should be greener, safer and an engine for economic growth that improves quality of life. It is envisaged that the Warfield Link Road will do this through relieving congestion from Warfield Street, providing sustainable transport infrastructure and providing new homes creating economic growth.

4.4 Business Strategy- Regional Transport Priorities

4.4.1 The Thames Valley Berkshire LEP submitted their Strategic Economic Plan in March 2014.

4.4.2 The Strategic Economic Plan outlines the case for necessary investment to infrastructure, enterprise and employment that is required for the Thames Valley region's economic growth.

4.4.3 The Warfield Development has been identified as a "location for growth" in the Strategic Economic Plan with Bracknell Forest having the second biggest planned housing provision between 2006-2026 in the Thames Valley Berkshire LEP after Wokingham Borough Council. It is noted that in the future it is "*crucial that housing availability and affordability do not become serious constraints on the future growth of our economy*" therefore this development, including the link road, will provide large economic growth for the local area. The development of 750 homes and the link road is only the start of a larger development comprising of up to 2,200 new dwellings in the Warfield area.

4.4.4 The implementation of this scheme can be seen as having useful connections to the strategic priorities of the Thames Valley Berkshire LEP.

Table 4.1*- TVB LEP Strategic Economic Plan and how Warfield will contribute*

Strategic Priority	**How will Warfield Link Road Contribute?**
Unlocking housing development	The Warfield link road will unlock new housing development planned to the west of the proposed link road. It will help tackle congestion along Warfield Street.
Enhancing urban connectivity	Urban connectivity will be enhanced through an alternative route for people either approaching Bracknell or going toward Maidenhead. It will create reliable journey times and less congestion.
Encouraging vibrant town centres	Warfield Street will be less congested and volume of traffic will be reduced therefore this will improve the sense of place through Warfield and Newell Green. Bracknell's town centre will be more prosperous from the new development and the reliable journey times along the link road. The new development will be created to provide large

	landscaped areas including a village green, pond and playing fields.
Positioning TVB for a digital future	The improved journey times on the route will attract new businesses from high technology sectors.
Foundations for future growth-housing transport and utilities	Initially, the link road will unlock 750 homes with associated transport and utilities, with a further 2200 homes planned for the future.
Enhancing the strategic transport network	The link road will enhance the strategic transport network by providing an alternative route and relieving pressure on the existing network, thus improving connectivity with Bracknell, Maidenhead and the M4. Furthermore, the link road will comprise a shared use pedestrian and cycle path to promote and support these modes of travel.

4.5 Business Strategy- Local Transport Priorities

4.5.1 The Warfield development and link road is stated in BFC's Core Strategy Development Plan Document as an initiative for further investigation. It is believed the scheme has been designed to support key principles of sustainable development by limiting the impact of the development through Suitable Alternative Natural Greenspace (SANG), installing the link road to increase accessibility, provide high quality design and to provide connectivity for the wider area.

4.5.2 Challenges have been identified in the Local Transport Plan 3 which will be tackled by the Warfield Link Road. These are displayed in Table 4.2 below.

***Table 4.2**- LTP 3 challenges and Warfield based measures*

Challenge / LTP Objective	**Warfield Link Road**
Reduce delays associated with traffic congestion and improve reliability of journey times	✓
Maintain and improve, where feasible, the local transport network	✓
Reduce greenhouse gas emissions from transport	✓
Encourage and promote accessibility by sustainable modes of transport	✓
Protect and enhance the quality of natural resources including water, air quality and the natural environment	✓
Enhance the street environment	✓
Reduce casualties and improve safety on the local transport network	✓
Secure necessary transport infrastructure and services to support development	✓

4.5.3 As stated, the Warfield Link road scheme is part of a much wider programme of development for the Warfield area. The link road will initially unlock 750 homes, with 2,200 dwellings proposed by 2026. The table below shows the timescales of these homes being created:

Table 4.3- *Timescales of developments around Warfield*

Site	Projected Completions												
	2014/15	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**Total Net**
Land At Manor Farm, Binfield Road, Warfield. (SALP SA9, Area 4) (Application: 13/00831/FUL)	24	3	0	0	0	0	0	0	0	0	0	0	27
Land North Of Harvest Ride and South Of Forest Road and East Of West End Lane, Warfield. (SALP SA9, Part of Area 2) (Application: 13/01007/HYB)	0	60	100	100	100	100	100	100	90	0	0	0	750
Land at Warfield (SA9) Area 1	0	0	50	150	150	150	150	164	0	0	0	0	814
Land at Warfield (SA9) Area 2 (residual area)	0	0	0	0	0	50	50	0	0	0	0	0	100
Land at Warfield (SA9) Area 3	0	0	0	0	0	0	50	100	100	100	104	0	454
Total	24	63	150	250	250	300	350	364	190	100	104	0	2145

4.6 Problem Identification

4.6.1 The proposed Warfield link road scheme supports a key issue for BFC – the delivery of housing and infrastructure, a key driver for the local economy. There is a shortage of housing within Bracknell Forest and other Berkshire Authority areas. Linked to this is previous under investment in new infrastructure to support historic housing growth in the area.

4.6.2 In providing the new 2200 dwellings, including affordable homes and supporting social infrastructure like schools, ensuring this does not impact negatively on the existing transport network and seeking to mitigate the impacts of the associated growth in car traffic, the new Warfield Link Road will provide both access to the estates and alternative routes for existing traffic away from less suitable rural roads.

4.7 Impact of not Changing

4.7.1 The impact of not changing the current road layout in the proposed development area would be to not cater for the development access roads through this “spine road” and that the developments may be served by a number of smaller and more numerous roads, cul-de-sacs and access points on to existing highway of rural and unsuitable character for the traffic loads.

4.7.2 It would also mean that no allowance would have been made for accommodating external growth drivers (from development in adjacent boroughs) which would, over time, add additional traffic to the network thus impacting further on the existing network, creating greater congestion, reducing journey times and reducing economic efficiency. A further side effect would be reduced local amenity, reduced journey ambience on existing roads and the potential for less non-motorised users.

4.8 Specific Scheme Objectives

4.8.1 The proposed Warfield Link Road scheme key objectives are:

- Providing access to 2200 new dwellings;
- Providing access to local employment and supporting the building of the new homes;
- Assisting in tackling local congestion issues for historic and proposed development by providing an improved link road and thus relieving other alternate routes that are rural in nature and not suitable for increased traffic loads;
- Improving journey times between the edges of Bracknell and the Town Centre and key employment areas in the town;
- Improving the environment for non-motorised users on existing routes and also providing the right level of infrastructure for new residents on the development areas served by the new link.

4.9 Measures for Success

4.9.1 BFC will be measuring the following items to see if the scheme has been successful:

- Reduced traffic on existing roads around the area of the new development
- A potential increase in the number so walking and cycle trips from existing areas
- Improvements in journey times in to the town centre from the edges of urban area

- The comprehensive development of the area is brought forward quickly, including the provision of affordable housing and the new school

4.10 Scope of Works

4.10.1 The scope of the works is set out below:

- **Warfield Link Road:** A new road linking Quelms Park Roundabout by Harvest Ride and Forest Road (B3034). It will also connect to a new development and consist of a roundabout by Forest Road and further roundabout along the new link road. In addition, there will be junction improvements between Forest Road (B3034) and Warfield Street (A3095) named Three Legged Cross.
- **3m shared use path and a pedestrian island** along the link road from Quelms Park Roundabout to Forest Road.
- **750 homes** located to the west of the Warfield Link Road and Warfield Street and to the east of Binfield Road (B3018). Also on the development will be a village green, bowling green, primary school and an elderly residential development. This is also the beginning of Bracknell Forest Borough Council's plans to deliver 2,200 dwellings across the Warfield area.

4.11 Constraints

4.11.1 Planning permission for the development area and the new link road has been granted by the Local Planning Authority on this key development area (which is contained in the Borough Councils strategic planning documents). As such, the key constraints are:

- Funding for the scheme in order for it to be brought forward early in the development build-out process (improving traffic conditions for existing residents in the area and supporting journey time improvements on the existing network) and to provide a link to wider development areas to release the whole of the 2200 dwelling development
- Reaching agreement with the Environment Agency on the diversion of the main river section at the Three Legged Cross junction. This is highlighted in the risk register with mitigation proposals
- Reaching agreement on the Section 278 design and adoption areas of the highway. This is highlighted in the risk register with mitigation proposals.
- Unknown or unidentified Statutory Utilities Plant in and along the road alignment. This is highlighted in the risk register with mitigation proposals.

4.12 Inter-Dependencies

4.12.1 Planning permission for the development area and the new link road has been granted by the Local Planning Authority on this key development area (which is contained in the Borough Councils strategic planning documents). As such, the internal dependencies are likely to focus around:

- Reaching agreement with the Environment Agency on the diversion of the main river section at the Three Legged Cross junction. This is highlighted in the risk register with mitigation proposals
- Reaching agreement on the Section 278 design and adoption areas of the highway. This is highlighted in the risk register with mitigation proposals.

- Unknown or unidentified Statutory Utilities Plant in and along the road alignment. This is highlighted in the risk register with mitigation proposals.

4.12.2 Overall, the risks on the project stay with the developer Berkeley Homes including all those listed in the risk sheet plus, construction cost inflation, variable ground conditions, weather impacts on delivery programme and contractor failure as typical examples.

4.13 Stakeholders

4.13.1 These can be summarised as:

- Bracknell Forest Council;
- Thames Valley Berkshire Local Enterprise Partnership; and
- Local Residents (consulted through the strategic planning, development site planning application and permission processes).

4.14 Options Considered

4.14.1 The location of the Warfield link road was such that it was needed to connect two existing junctions together; at the Three Legged Cross and existing roundabout junction on Harvest Ride. This route had been identified during the strategic planning by BFC as a route which could “open up” an area of land for development and at the same time assist in reducing impacts of traffic growth on existing rural routes and communities in the vicinity of the route.

4.14.2 Some option testing at the Three Legged Cross junction was undertaken for roundabout and alternate signal junction alignments, but these either required additional land outside of the developers control, or negatively impacted the existing main river section due to need to the need to provide for culverting the river, which was rejected by the Environment Agency.

4.14.3 These options were examined prior to the submission of the planning application. The scheme presented in this business case has been through the planning process and received approval from the BFC.

4.15 Internal and External Drivers for Change

4.15.1 These items are not required to be assessed in the Transport Business Case, as set out in the DfT Transport Business Case document 2013.

5 The Economic Case

5.1 Introduction

5.1.1 The economic assessment is undertaken to ensure that all the options are assessed and to fulfil the treasury's requirements for appraisal and demonstrating value for money.

5.1.2 To enable the scheme value for money to be calculated, and to inform the scheme design and environmental assessments of the scheme, a traffic model of the Bracknell Forest Council area was created in accordance with the principles set out in WebTAG and the Design Manual for Roads and Bridges (DMRB).

5.1.3 The Bracknell Forest Multi-Modal Model (BFMMM) was built to an observed base year of 2007 with a forecast year of 2025 for AM peak and PM peak hours.

5.2 Options appraised

5.2.1 In developing the economic case, the following option has been tested against a Do Minimum scenario:

- Do Something: Warfield Link Road

5.3 Assumptions

5.3.1 The economic case has been compiled in accordance with the assumptions set out in WebTAG. However, there are some further assumptions that have been made in relation to some specific areas of the assessment, and these are discussed below.

User benefits

5.3.2 Scheme benefits have been assessed using the DfT's TUBA (Transport Users Benefit Appraisal) software. This is an industry-standard tool for undertaking economic appraisal in accordance with guidelines published in WebTAG Unit A1 (January 2014).

5.3.3 TUBA v1.9.4 was used which is the current version and is consistent with parameters published in WebTAG Unit A1 (May 2014).

5.3.4 Scheme appraisal has been undertaken for a 60-year period, from the assumed scheme opening in 2017 to 2076. The Economic Case has been assessed **with** the housing development.

5.3.5 Annualisation factors for the two modelled time periods are given in table 1.

***Table 5.1**: Annualisation factors*

Period	Peak hour to peak period factor	Number per year	Annualisation factor
AM	1.000	253	253
PM	1.000	253	253

5.3.6 The calculated benefits have therefore been derived for an AM peak (08:00-09:00) and PM peak (17:00-18:00) hour only as there is no interpeak model. The weekends and the overnight period

have not been considered, but these are assumed to have sufficiently low flows that the overall assessment of benefits will not be affected.

5.3.7 User classes have been defined as shown in table2 so that the definitions used in model development have been applied to the TUBA assessment.

Table 5.2: *User class definitions*

UC	Model Definition	TUBA Parameter		
		Vehicle Type	Purpose	Person Type
1	Car	Car	All	All
2	HGV	HGV	Business	Driver

5.4 Value for money statement

5.4.1 The value for money assessment has been prepared in accordance with the DfT's "Value for money assessment: advice note for local transport decision makers".

5.4.2 Initial monetised impacts of the scheme have been extracted from the AST and reported in the Analysis of Monetised Costs and Benefits (AMCB) table, included in Appendix B and repeated in table 3. All monetary values are in 2010 prices, discount to 2010.

Table 5.3: *Analysis of Monetised Costs and Benefits (AMCB)*

Item	Value (£000s)
Greenhouse gasses	270
Economic Efficiency: Consumer Users (Commuting)	10,064
Economic Efficiency: Consumer Users (Other)	15,158
Economic Efficiency: Business Users and Providers	13,836
Wider Public Finances (Indirect Tax Revenues)	-752
Present Value of Benefits (PVB)	38,576
Broad Transport Budget	5,283
Present Value of Costs (PVC)	5,283
OVERALL IMPACTS	
Net Present Value (NPV)	**33,545**
Initial Benefit to Cost Ratio (BCR)	**7.668**

5.4.3 This information shows that the Initial BCR of the scheme, based on standard monetised values, is 7.668. This represents the benefits for the core elements of the scheme, and is considered high value for money according to Department for Transport guidance.

5.4.4 No Appraisal Specification Report was completed prior to the business case submission. Bracknell Forest Council and WSP have provided details of the Base Model Validation and Forecasting report links for the assessment team to review. The modelling approach used a Full Demand Model, as set out in those documents.

6 Financial Case

6.1.1 The anticipated costs of the total scheme, as provided by Berkeley Homes, are set out in the table below.

Cost Item	Cost
Preparation Costs	£125,000.00
Construction Costs	£4,950,845.00
Land Costs	n/a
Statutory Undertaker's Diversions	£207,000.00
Total Cost	**£5,282,845.00**

6.1.2 Preparation costs include such items as design fees, Section 278 review and agreement fees (for instance).

6.1.3 Construction costs for all four stages of the link road (as set out in the programme in Appendix C).

6.1.4 Statutory Undertaker Diversion costs are those currently identified through site investigations and discussions with utility companies.

6.1.5 There are no land costs as part of the link road project as all land assembly has been completed by the developer, Berkeley Homes.

6.1.6 The potential risk for the scheme costs to be affected by inflation remain with Berkeley Homes.

6.1.7 A quantified risk assessment and risk register has been undertaken and is included in Chapter 10 and Appendix C.

Anticipated spend profile by year

Cost Element	Year cost are incurred (£millions)			Total
	2014/15	2015/16	2016/17	
Preparation	0.011	0.061	0.053	0.125
Construction	0.420	2.382	2.149	4.951
Stat Diversions	0.100	0.107	0.000	0.207
Total	0.531	2.550	2.202	5.283

6.1.8 The anticipated contribution from the Local Enterprise Partnership was previously set out by BFC as £3.5 million which would support the scheme expenditure as £1.75 million in 2015/16 and £1.75 million in 2016/17.

6.1.9 Berkeley Homes will provide the balance of £1.783m of funding towards the Warfield Link Road and also pay any costs in excess of the total £5.283m scheme budget.

7 Commercial Case

7.1.1 The commercial case provides evidence of the commercial viability of the project and the procurement strategy adopted.

7.1.2 Information is presented below on the following:

- Procurement strategy
- Sourcing options
- Output based specification
- Payment and charging mechanisms
- Risk allocation and transfer
- Contract length
- Contract management

7.2 Procurement strategy

7.2.1 The procurement of the works will be by Berkeley Homes as the site developer. This is set out in paragraph 11,7,1. There will be a competitive tender process from a pre-qualified list of contractors.

7.3 Sourcing options

7.3.1 As outlined in paragraph 7.2.1 the works will be sourced by Berkeley Homes and as the site developer there were no other sourcing options tested.

7.4 Output based specification

7.4.1 The scheme will be delivered by the developer as part of the wider Warfield development area. The delivery of the road will be secured through a S278 agreement with the developer (separate to any legal agreements linked with any planning permission granted for the site). Within this S278 agreement there will be certain elements of the scheme specified – these will include:

- Cost certainty – there is a certain amount of funding available from the LEP contribution with the remainder being contributed by the developer (section 6.1.9) all risks on cost overruns remain with Berkeley Homes;
- Timescales for delivery – the funding is available for a certain period therefore milestones for delivery and the overall completion target are as programmed;
- Work standards - the road will be expected to be delivered in line with construction design standards specified in the S278 agreement for later adoption by BFC;
- Confidence in delivery – the developer will be expected to engage with a contractor with a proven track record of customer engagement, innovation and value engineering solutions on similar projects – hence the Berkerley Homes select list of pre-qualified contractors, and;
- Minimising disruption – the developer should ensure that the elements of the scheme that cause disruption to the network are minimised

7.5 Payment and charging mechanisms

7.5.1 The funding available for the scheme will be set out in a funding agreement between the developer and the Council. This funding agreement will be finalised as soon as reasonably practicable after the confirmation of funding from the Berkshire Local Transport Body (BLTB).

7.5.2 Payment mechanisms to the developer will be set out in the funding agreement and will reflect the agreement that BFC enters into with the BLTB. The developer will be paid in arrears and will be required to submit an annual invoice for each financial year together with a certificate of work completed. The Council, once satisfied, will pay the developer and invoice the BLTB providing the evidence of expenditure on valid scheme delivery works.

7.6 Risk allocation and transfer

7.6.1 The developer will prepare their own risk register and risk management strategy in association with the delivery of the wider development area and their selected contractor. The developer will prepare appropriate mechanisms for reporting back regarding risk and programme issues through the Governance structure and S278 agreement.

7.7 Contract length

7.7.1 The contract strategy determines the level of integration of design, construction and cost certainty for a given project and should support the main project objectives in terms of risk allocation, delivery, incentivisation etc.

7.7.2 The contract length for the delivery of the road is for the developer to determine and has been set out in the delivery programme in Appendix C. The expectations for the delivery of the road will be included within the funding agreement and the main funding is allocated for 2015/16 and 2016/17.

7.8 Human resource issues

7.8.1 The DfT guidance for Transport Business Case, January 2013, does not require this aspect to be assessed as part of this submission.

7.9 Contract management

7.9.1 The developer will enter into a construction contract which will specify costs and the key milestones for delivery of the scheme as well as clauses relating to delay. It will be the responsibility of the developer to manage the contract and to report anything significant to the Council.

8 Distributional Impacts

8.1.1 Distributional impacts relate to the extent to which there are differences in the way impacts affect different groups in society. The groups are classified as vulnerable and are children, young people, older people, people with a disability / long term health issues, black minority ethnicity, no car households and households with dependent children. Some of these will only be relevant for certain distributional impacts.

8.1.2 The distributional impacts which needed consideration within the appraisal process included:

- Accidents;
- Air quality;
- Noise;
- Security;
- Severance;
- Accessibility; and
- User Benefits.

8.1.3 It was not seen beneficial to consider Affordability as it was irrelevant to works which are completely highway and traffic based, with no real focus on cost of public transport. Therefore it need not proceed to Step 2 identified in **Table 7.2**.

8.1.4 Department for Transport has listed a process to conduct the appraisal which was followed throughout this AST.

Table 7.1 *The AST Process*

Step	Description	Output
1	Screening Process: Identification of likely impacts for each indicator	DfT Screening Proforma
2	Assessment: (a) Confirmation of the area impacted by the transport intervention (impact area) (b) Identification of social groups in the impact area (c) Identification of amenities in the impact area	GIS maps indicating social groups and places affected within impact areas
3	Appraisal of Impacts: (a) Core analysis of the impacts (b) Full appraisal of Dis and input into AST	Appraisal worksheets and AST

8.1.5 The Distributional Impact Screening Proforma was completed first to gather a brief outline of the issues and whether to proceed the assessment with each indicator. This can be found in Appendix B.

8.1.6 Most of the distributional impacts have been displayed using GIS and the DfT TAG (Transport Analysis Guidance) Worksheets. All the worksheets can be found in Annex B.

8.2 Initial Screening

8.2.1 The findings in the initial screening can be seen in Annex B and are summarised below.

Table 7.2 *Summary of initial screening of the sites*

Indicator	**Likely DI Impact**	**Recommendations**
Accidents	Yes	Proceed to Step 2
Air Quality	Yes	Proceed to Step 2
Noise	Yes	Proceed to Step 2
Security	Yes	Proceed to Step 2
Severance	Yes	Proceed to Step 2
Accessibility	Yes	Proceed to Step 2
Affordability	No	No further assessment
User Benefits	Yes	Proceed to Step 2

8.3 Assessment (Step 2)

8.3.1 The initial screening provides a brief understanding of areas which could be impacted from the scheme. The assessment stage requires a more in depth look into the spatial side of the impacts. WSP has displayed this through GIS.

8.3.2 The GIS maps detail the impact area, social groups data if relevant and amenities which could be applicable for the vulnerable social groups.

8.3.3 There are different vulnerable social groups which will need to be investigated for different impacts. **Table 7.3** (next page) displays the socio-demographic analysis for distributional impacts and is below with ticked boxes indicating the need to investigate these social groups.

Table 7.3 *Socio-demographic analysis needed for each distributional impact*

Social Group	Accidents	Air Quality	Noise	Security	Severance	Accessibility	Affordability	User Benefits
Income Distribution		✓	✓				✓	✓
Children proportion <16	✓	✓	✓	✓	✓	✓		
Young adults: proportion 16-25	✓	✓	✓			✓		
Older people: proportion aged 70+	✓			✓	✓	✓		
Proportion of population with a disability	✓			✓	✓	✓		
Proportion of population of BME origin						✓		
Proportion of households without access to a car					✓	✓		
Carers: Proportion of households with dependent children						✓		

8.3.4 Most of this data has been accessed through 2011 Census data. WSP have looked specifically at Lower Super Output Areas due to many of the areas having impacts affecting people locally. Figures used have also referenced the inclusion of the development. The homes being built can be integrally linked to this proposed link road therefore it is important to take account of this.

8.3.5 Each of the social groups and amenity indicators should be evidenced for each site first. These are displayed in the Distributional Output Summary Table located in Annex B and facilities are displayed on **Figures 1.2** and **1.3** in Appendix A.

8.4 Appraisal of Impacts (Step 3)

8.4.1 After the assessment the use of GIS and the Distributional Worksheet for each of the areas can be completed. This will research specifically the impacts and at the end of the worksheet an assessment score will be given. This is a seven point scoring system provided by Department for Transport listed as:

- Highly Beneficial
- Moderately Beneficial
- Slightly Beneficial
- Neutral
- Slightly Adverse
- Moderately Adverse
- Highly Adverse

8.4.2 The Bracknell Multi Modal Transport Model (BBMTM) has provided data using a VISUM model. This predicts travel use and then the routes taken by motorists depending on highway constraints as entered into the model. This model has been used to help with some parts of the appraisal process.

8.4.3 Key locations have been identified to help with the assessments and these are Harvest Ride (West of Newell Green), B3034 Warfield Street and Forest Road (East of proposed link road). These areas have been chosen due to how close they are to the proposed link road and the impacts that could occur.

8.4.4 The projection of future traffic flows along Warfield Street are predicted to decrease by 40% while Forest Road and Harvest Ride will have increases of 45% and 28% when the entire development is created (including housing). This indicates how the link road can affect other roads therefore this will be taken into account through the appraisal process.

8.5 Accidents

8.5.1 Accidents can be categorised as Slight, Serious or Fatal. Slight injuries are defined as people who do not require hospital treatment, or if they do, the effects of the injuries quickly subside. Serious injuries are defined as casualties who require hospital treatment and have lasting injuries, but do not die within the recording period for a fatality. A fatality is any death that occurs within 30 days from causes arising from the accident.

8.5.2 In total across the roads of Forest Road and Harvest Ride (including Binfield Road) and Warfield Street there have been 24 incidents within 5 years between 2008-2013. None of the accidents were identified as fatal, but 4 were identified as serious with 2 along B3034 Warfield Street and 2 along Forest Road.

8.5.3 Below shows the typical accident rate of each of the surrounding roads.

***Table 7.4**- Accident rates of routes*

	Typical Accident Rate	**Actual Accident Rate (average over 5 yrs)**	**2026 Typical Accident Rate**
B3034 Warfield Street/Newell Green	0.7	1.6	0.9
Harvest Ride (West of Newell Green) (also include Binfield Road and start of Forest Road)	1	0.2	1.6
B3034 Forest Road (East of Link Road) (also include Binfield and Newell Green)	0.2	0.2	0.3

8.5.4 Along the B3034 Warfield Street and Newell Green, five out of the eight accidents occurred at the junctions of Jigs Lane North and Warfield Street. It has been concluded that most of the accidents were due to driver error.

8.5.5 Along Harvest Ride (West of Newell Green) all the accidents occurred either at Temple Way Roundabout or crossroads of Binfield Road and Forest Road. Therefore all the accidents are irrelevant for the construction of the link road, except that some of the traffic flow might be reduced along Binfield Road due to link road.

8.5.6 Along B3034 Forest Road (East of Link Road) all the accidents can be attributed to driver error.

8.5.7 The data has shown that the installation of a link road between Harvest Ride and Forest Road will reduce accident rates along the B3034 Warfield Street, however the expected increase in traffic will then mean accident rates will remain similar.

8.5.8 The overall assessment for the AST resulted in Neutral for accidents. This was mainly due to the development of 750 homes nearby which will add increased traffic onto Harvest Ride and Forest Road as well as the new link road providing this as well. It is predicted that the increases will be small due to speed limits being unchanged on surrounding roads and the link road being signed 30mph. In addition there will be reduced traffic along Warfield Street as most will be displaced via Warfield Link Road.

8.6 Air Quality and Noise

8.6.1 Air quality and noise are considered to be important issues, particularly in projects which look to increase the traffic flows. Through the identification of social groups and amenities, useful GIS maps have been created to illustrate the impact of the improvements based upon a nominal percentage figure (10%) per 20m distance from the site reducing over the course of 200m. This will not be fully accurate and further studies may be needed regarding air quality and noise impacts. The distributional worksheets for air quality and noise can be found in Annex B labelled Distributional Noise and Air Quality Worksheet.

8.6.2 There are GIS maps created of the sites in relation to the projected air quality and noise impact against the indices of deprivation which are detailed in Appendix A, labelled Figure 1.3. The maps have not identified Children (<16) and Young People (16-25). This is due to the 2011 Census data showing no clear visual link of large or small concentrations of children and young people. Instead the populations of those demographics are similar throughout the study areas.

***Table 7.5**- Air Quality and Noise affected users and summary of assessment*

Scheme	**Number of Users affected within 200m boundary before development**	**Number of Users affected within 200m boundary after development**	**Overall Assessment**
Warfield Link Road	241	520 (16 people will have improved air quality)	Slightly Adverse

8.6.3 It is concluded that without the development approximately 241 people will be affected by air quality. Out of these people 51 are between 0-16 and 48 people are between 16-25 years old. These are the vulnerable groups which need to be identified through the appraisal.

8.6.4 With the development approximately 514 people will be affected by reduced air quality (including some of the new development). Out of these people 108 are 0-16 and 103 people are between 16-25 years old.

8.6.5 The overall qualitative assessment of air quality and noise for the AST resulted in Slightly Adverse due to reduced air quality affecting Harvest Ride residents, the new development during operation and construction, and Warfield Street area just during construction.

8.7 Security

8.7.1 Perceived or real security risks can affect the transport choices of different groups of people. This impact assessment involves understanding all the different factors which could be influential in harming the perception or real risk of security. Indicators have been determined by Department for Transport in the worksheets which are found in Annex B labelled Distributional Security Worksheet.

8.7.2 **Table 7.6** below indicates the number of users affected by each of the projects and the overall assessment of the sites. The number of users affected is an estimation based upon the predicted daily traffic flows of those areas.

Table 7.6- *Summary Assessment of Sites for Security*

	Scheme	**Total No of Traffic users affected with improvements (AADT)**	**Total Security Improvement Score**	**Overall Assessment**
All Users	New Link Road	~11,427	24	Highly Beneficial
Older People	New Link Road	621	30	Moderately Beneficial
Women	New Link Road	1901	19	Moderately Beneficial
Young people	New Link Road	776	17	Moderately Beneficial

8.7.3 The total number of traffic users affected by the new link road has been determined by the total difference between baseline and scheme based AADT for relevant roads as it is considered they will use Warfield Link Road.

8.7.4 The overall distributional assessment for the AST resulted in Highly Beneficial for security, due to the new link road providing an enhanced environment improving personal security as there is none in the location currently due to it being predominantly agricultural land. There will also be improvements to lighting which will provide better personal security on Forest Road and along the new link road.

8.8 Severance

8.8.1 Severance issues can usually be identified at an early stage and many designs for transport are trying to reduce the severance within communities. The scheme has been split into all the different communities which are disconnected from one another by the highway and then assessed in terms of access to them by walking and cycling.

8.8.2 ***Figure 6.1**- Map showing severance sites*

8.8.3 The sites have also been assessed using the concentration of vulnerable users (in particular no car households, young people 16-25, older people and people with disabilities). Site maps (Figure 2.4 map detailing 400m buffer and 1km buffer to surrounding facilities which are relevant for vulnerable users) can be seen in Appendix A. The map displays a 400m distance ring around the sites as this indicates the average distance people are likely to walk to a bus stop. There is also a distance ring of 1km which is a predicted distance people could walk to educational establishments (evidence suggests 2km however 1km is believed to be a more realistic distance). This data is gathered from evidence provided by Guide lines for Providing Journeys on Foot (IHT, 2000), Planning for Public Transport (IHT, 1999) and DfT's Creating Growth and cutting Carbon. The facilities map indicated include any amenities which are involved in education or healthcare services like schools, care homes and GP's. Unfortunately young people, older people and disabled people data was not deemed relevant to display on the maps as their demographic is evenly distributed around the borough.

8.8.4 **Table 7.7** below indicates the schemes overall effect (which is calculated through change in severance multiplied by the number of people affected) and the overall assessment. The Method of Travel to Work data (2011) was used in this analysis to create an average amount of people who walk around the area, however this data only provides data for employed adults and not young or older populations. For a detailed look at severance look at Annex B, Distributional Severance Worksheet.

***Table 7.7**- Overall Impact and Summary Assessment of Severance*

Scheme	Impacted Population	Overall Assessment
New Link Road (When 750 complete)	LSOA and New Development impacted are: 3880 No car Households- 228 Young People- 776 Older People- 621 People with disabilities- 477	Highly Beneficial
	Population impacted within 400m, with development (walking distance to bus stops): 3642	
A3095 Forest Road/ Warfield Street (Used B3034 Warfield Steet data) Harvest Ride (West of Newell Green) B3034 Forest Road (East of Link Road)	LSOA impacted are: 1825 No car Households- 102 Young People- 365 Older People- 292 People with disabilities- 224	Slightly Beneficial- The figures would potentially increase further with displacement of traffic from Warfield Street to the new link road. The figures highlighted are estimates for each road

8.8.5 Most of the people affected by the link road will be affected in a positive way. Many areas will be new developments with useful walking and cycling connections to the shared use path along the link road. Also the traffic flow being reduced in Warfield Street will have an impact. The traffic flow along the other roads surrounding the site will be increased therefore the benefits will not be as large.

8.8.6 The overall assessment for the AST can therefore result in being Slightly Beneficial.

8.9 Accessibility

8.9.1 Accessibility links closely with severance however the appraisal focuses mainly on the public transport accessibility aspect of reaching employment areas, healthcare facilities, education establishments and main town centres. A table of the nearest bus services are indicated below within approximately 400m of the site. This is due to the average distance people walk to bus stops being 400m as indicated by Department for Transport and IHT guidance.

Table 7.8- *Bus Service Summary (within 400m of the link road)*

Route No	Bus Stop	Operator	Route Description	Weekday Frequency		Saturday Frequency	Sunday Frequency
				AM	**PM**		
53	Newell Green, Forest Road Hail and Ride	First Group	Wrexham Hospital to Binfield	1 per hour	1 per hour	1 per 2 hours	None
152	Quelms Park, Piggy Wood	Courtney Buses	Winkfield Church to Bracknell Bus Station	1 every 2 hours	1 every 2 hours	1 every 2 hours	None
162	Many bus stops within 400m: includes Bracknell, Braybrooke Recreation Ground	Courtney Buses	Bracknell-Ascot	1 per hour	1 per hour	1 per hour	None

8.9.2 Due to the changes to the road network, it is predicted that there will also be alterations to the bus services and additional bus stops erected close to the new developments.

8.9.3 None of the bus stops and services identified above have been decided to be upgraded yet with the new link road. However the potential for new bus stops is required to help with the expanding development. There are currently no public transport plans in place for the new link road. It is therefore proposed that no improvements will be made to current stops, however there is a benefit when homes are starting to be built to implement and place bus stops around the area. The assessment score can be considered Slightly Beneficial due to an increase in patronage on services creating a better environment and in turn will provide more public transport services, enhancing accessibility.

8.10 Affordability

8.10.1 Affordability was not considered relevant for further analysis due to the programme consisting of a traffic based highway scheme, and not public transport.

8.11 User Benefits

8.11.1 User benefits have been calculated in the Economic Case. Please refer to Chapter 5 for further information.

9 Environmental Impacts

9.1.1 There are eight environmental aspects which should be considered in the environmental appraisal following guidance provided in Department for Transport TAG Unit A3:

- Air Quality;
- Noise;
- Greenhouse Gases;
- Landscape;
- Townscape;
- Historic Environment;
- Biodiversity; and
- Water Environment.

9.1.2 For each of these an appraisal needs to be completed to discover whether significantly beneficial or adverse effects are likely to arise.

9.1.3 These assessments are completed through Department for Transport TAG (Transport Analysis Guidance) worksheets and some are an extension of the work completed in the distributional impacts stage (Air Quality and Noise for example). These worksheets can be found in Annex B.

9.1.4 **Table 8.1** below describes each of the aspects and the assessment which has been achieved.

Table 8.1- *Environmental aspects and type of assessment chosen*

Aspect	**Type of Assessment**
Air Quality	GIS Maps from Distributional impacts
Noise	GIS Maps from Distributional impacts
Greenhouse Gases	TUBA
Landscape	Environmental Impact Worksheet
Townscape	Environmental Impact Worksheet
Historic Environment	Environmental Impact Worksheet
Biodiversity	Environmental Impact Worksheet
Water Environment	Environmental Impact Worksheet

9.1.5 Through the completion of the worksheets an overall assessment score will be given and this will then be included into the AST with a brief description. The Environmental Statements have been used as well as other sources.

9.2 Air Quality

9.2.1 The proposal for a new link road between Harvest Ride and Forest Road will mean a potential increase in traffic flow along Harvest Ride and Forest Road. However it would also create a reduction in traffic flow along B3034 Warfield Street.

9.2.2 **Table 8.2** below lists the sites with the constraints and the overall assessment score for each area.

Table 8.2- *Air Quality Impact and Assessment of the Sites*

Scheme	**AADT Do Minimum 2026**	**AADT With Development 2026**	**Potential constraints/ impacts**	**Overall Assessment**
A3095 Forest Road/ Warfield Street (Used B3034 Warfield Steet data)	5394	3233	The new link road construction will affect a small number of households along Warfield Street due to some being within the 200m boundary. This will be minor affecting small numbers of individuals (less than 10 homes) When in operation the air quality will be vastly improved around the area due to reduced traffic by up to 40%.	Moderately Beneficial
Harvest Ride (West of Newell Green)	13112	16767	The new link road construction will affect people south of Harvest Ride. It will affect mostly flats with adverse air quality conditions (approximately 88 homes). When in operation the link road will slightly affect the air quality all along Harvest Ride as its indicated that traffic volumes will increase by 28%.	Slightly Adverse
B3034 Forest	6503	9423	Air quality will	Slightly Adverse

Road (East of Link Road)			reduce due to construction and excess traffic along Forest Road. However there are few sensitive receptors (e.g. homes/people) for it to affect once the development is complete.	

9.2.3 Through construction there might be short term changes in air quality around Warfield. This is due to the works reducing speed levels around the Three Legged Cross junction and Quelms Park Roundabout. It is envisaged the air quality of the areas will be negative during construction. However when the works are complete the level of air quality will improve around Warfield Street but reduce around Harvest Ride and Forest Road. This is due to a proposed increase in traffic along Harvest Ride and Forest Road because of the development and the new link road moving traffic away from Warfield Street. The new link road will however provide reduced air quality affecting approximately 135 homes of the development (within a 200m zone).

9.2.4 The overall assessment for the AST therefore resulted in Slightly Adverse for Air Quality due to the increase in pollution from construction and from increased traffic volumes. However some areas like Warfield Village and Newell Green should benefit, and have improvements in air quality from the new link when in full operation.

9.3 Noise

9.3.1 Noise can be considered a nuisance to people. It is caused by road and rail traffic related sounds and vibrations. The potential noise effects are likely to arise as a result of construction and operation. For highways schemes disruption due to construction tends to be more localised than the noise effects arising once the scheme is operational. **Table 8.3** below lists the sites and potential constraints with the overall assessment score.

***Table 8.3**- Noise impacts and assessment of the sites*

Scheme	**Potential constraints / impacts**	**Overall Assessment**
A3095 Forest Road/ Warfield Street (Used B3034 Warfield Steet data)	During construction roadworks will only occur by Three Legged Cross Junction. Noise impacts for Warfield Street should be fairly minimal. When link road is completed there will be reduced traffic flows by 40%.	Moderately Beneficial
Harvest Ride (West of Newell Green)	In construction there will be roadworks planned producing some higher noise levels. It is predicted to have a higher	Slightly Adverse

	proportion of traffic flows however the urbanisation of this area already should mean the noise is not much more. It will affect 88 homes.	
B3034 Forest Road (East of Link Road)	In construction there will be roadworks planned producing some higher noise levels. It is predicted to have a higher proportion of traffic flows however the urbanisation of this area already should mean the noise is not much more. There are few homes around this area to be affected.	Slightly Adverse

9.3.2 The new link road will provide enhanced noise when in operation to approximately 135 homes, however due to traffic speeds being slow (30mph) it should be minimal.

9.3.3 The overall assessment for the AST resulted in Slightly Adverse for Noise due to constructional noise causing disruption and operational noise through excess vehicles along Harvest Ride and Forest Road. The new link road will provide a key connection for the new development and most of the land adjacent to the road will be allotments, school and playing fields with some homes located by the road as well but these will be faced away from the road and protected by trees and landscaping.

9.4 Greenhouse Gases

9.4.1 WSP have calculated the Greenhouse Gas emissions associated with the scheme through TUBA analysis. The results have shown a cost benefit of £270,000 from the new link road. Speed limits will be low on the new link road, however traffic congestion will ease.

9.5 Landscape

9.5.1 Landscape is both the physical and cultural characteristics of the land itself. The landscape and visual resources of the sites are discussed in this section, along with the potential constraints and opportunities the proposed works will have. It discusses the scale of the infrastructure in relation to the landscape as well as the importance of the landscape. **Table 8.4** below explains the site and the brief description of the landscape as well as the assessment score. For a more in depth appraisal please look at Annex B, labelled Environmental: Landscape Worksheet.

Table 8.4- *Landscape overview and summarised assessment*

Scheme	Brief Description	Potential Constraints	Overall Assessment
Warfield Link Road	The area where the proposed link road will be constructed can be considered rural, tranquil agricultural land and grassland.	Loss of hedgerows and mature trees The culverting of the	Slightly Adverse

	There is a footpath which the road will link to and a byway that is open up to all traffic (Watersplash Lane). There are several other footpaths in the vicinity of the site. The fields themselves illustrate they are only helping locally as they are on a very small scale. The surrounding area comprises of a small village to east consisting of red brick farm style buildings, Warfield Hall Estate and a hamlet of properties to the west. Trees and hedgerows all around the area and The Cut river flowing through the site from south west to north east (passing underneath proposed road). The road system around the area consists of A and B roads with the A3095 north of the proposed site linking directly to Maidenhead.	river underneath the proposed road. The character of the area becoming more urbanised, however already new developments are also being created around the area.	

9.5.2 The overall assessment for the AST resulted in Slightly Beneficial for Landscape as the link road will change the current outlook of the area of farmland. However, with the location being at the edge of Bracknell it has been noted in the Berkshire County Council Unitary Authority Landscape Character Assessment of 2008 that "*The Bracknell Settled Farmlands is almost entirely settled and the remaining undeveloped land is strongly affected by the influences of the urban area*". In addition, the development of up to 2,200 homes around the area will suggest that the link road will fit into the landscape over time.

9.6 Townscape

9.6.1 Townscape can be defined as the physical and social characteristics of the built and non-built urban environment and the way we perceive those characteristics. It is closely related to Landscape. It also uses the same features as Landscape to discuss whether there will be positive or negative effects on the Townscape. These are Scale, Rarity, Importance and Substitutability but it also looks at the baseline changes. The table below details the sites, with a brief description of the area and the assessment score. For further details on the overall assessment score visit Annex B, labelled Environment: Townscape Worksheet.

Table 8.5- *Townscape Summary Assessment*

Scheme	Current Site Description	Work Description	Overall Assessment
Warfield Link Road	Agricultural with proposed link going through approximately 7 fields. It is considered to be rural except there is a large modern development to the south at Harvest Ride. Also there are properties to the east and west of the proposed link road that are characterised as 19th to early 20th century red brick farmhouse buildings.	Development of 2,200 dwellings over the next 12 years around the area will change the townscape drastically to become a desirable, suburban residential area.	Slightly Beneficial

9.6.2 The overall assessment for the AST resulted in Slightly Beneficial for Townscape. This is because the scheme will fit in well with the overall layout, scale and appearance once the development is underway. It will also enable some sense of place and scale to be restored from an area that was seen as a place you drive through to get to destinations e.g. Bracknell and Maidenhead.

9.7 Historic Environment

9.7.1 The historic environment can consist of buildings of historical significance, areas such as parks and gardens and sites such as ancient monuments, battlefields and archaeological sites etc. The historic environment can also include the sense of identity and place which a combination of these features provides. The assessment of the historic environment covers the survival, condition and complexity surrounding the historical areas. **Table 8.6** below details the sites and the features of potential historical impact with the overall assessment score.

Table 8.6- *Historic Environment Summary Assessment*

Scheme	Features of historical importance	Overall Assessment
Warfield Link Road	4 Grade II Listed Buildings within 400m of the site. Only one is considered significant for the link road which is South Lodge to Warfield Hall. South Lodge to Warfield Hall is close to the Three Legged Cross junction improvements but the site should be unaffected by the widening of the highway. An archaeological study has shown there are no artefacts of archaeological interest by The Cut where the link road will be located.	Negligible/ Neutral

9.7.2 The overall assessment for the AST resulted in Neutral. This is due to no historic environments being affected by the proposed new link road during construction or operation. A suggestion could be made to extend the archaeological survey if the Council wanted to look at further areas for historical artefacts. The area is known to have produced archaeological finds from a range of periods (including Mesolithic, Bronze Age, Roman and Medieval).

9.8 Biodiversity

9.8.1 The biodiversity of each of the sites has been analysed and appraised through aerial photo interpretation and using MAGIC data as well as the Environmental Statement, Chapter 9 by WSP from 2013. This appraisal looks at species of flora and fauna which might benefit or be at risk from the proposed improvements. The assessment is done by looking at key indicators such as the scale, importance, trend, substitution possibilities, and biodiversity and earth heritage value. **Table 8.7** below indicates the sites with a description of the key features and the final assessment score. For further details on the assessment score and reasoning visit Annex B, Environment: Biodiversity Worksheet.

Table 8.7- *Biodiversity key features and assessment summary*

Scheme	Key Features	Overall Assessment
Warfield Link Road	Dense scrub, woodland, hedgerow and some individual trees. Some mature trees and hedgerows will need to be removed for the link road. These areas may support EU protected dormice populations. Potential presence of dormice. Bats, Great Crested Newts and Nesting birds can also not be ruled out. The River Cut will be diverted for the link road to be connected to Forest Road.	Slightly Adverse

9.8.2 The Development will change The Cut in the following ways:

- Diversion of a section at the northern part of the Site;
- Two road bridges and one footbridge will replace one existing footbridge;
- Addition of reed beds and biodiversity enhancements; and
- Changes to the Sites overall drainage regime.

This will allow the quality of the river to be improved by the development.

9.8.3 The overall assessment for the AST resulted in being Slightly Adverse. This was due to the evidence provided of dormice and potential other species near the sites which could be affected as well as the minor disruption of some vegetation. Further fauna surveys could be conducted to understand the true extent of biodiversity around these areas.

9.9 Water Environment

9.9.1 The water environment has been researched using Environment Agency resources including the Flood Risk Map and the Environmental Statement Flood Drainage and Water Quality from 2013. The appraisal details the key environmental resources relating to the water environment and the features and quality of these. These are then measured against different indicators including scale, rarity, substitutability, importance and then finally magnitude and significance. In addition the potential impacts are listed. For further details on the assessment score and reasoning visit Annex B labelled Environment: Water Environment Worksheet. **Table 7.8** illustrates the sites with a brief description of the resource (including the feature and quality of them) and the final assessment score for the site.

Table 8.8- *Water Environment Summary Assessment*

Scheme	Brief Description	Overall Assessment
Warfield Link Road	Transport and dilution of waste products: During construction surface water sewers from housing by Harvest Ride flow into River Cut. Potential increase in potable water may increase sewer water. During operation surface water sewers will flow into River Cut. Drainage improvements will be made in development to cope with potential increases in potable water.	Low Negative
	Contamination of Water Courses: Through construction the contamination of surface water may affect chemical quality of water. During operation little contamination will be made and water quality is hoped to improve from EA's poor classification.	Slight Negative

	Biodiversity: Conservation of river corridor. Enhancement will be created through reed beds and other biodiversity enhancements.	Slight Positive
	Aesthetics: Contribution to landscape character and quality. River will be integrated within the development.	Neutral
	Flood Risk: The Cut River is categorised as Flood Zone 3 and 2 by the Environment Agency due to the largely impermeable London Clay. Excess water from drainage could enhance flood risk however the new surface water drainage systems should cater for 1:100 years plus climate change.	Neutral

9.9.2 The overall assessment for the water environment AST is Neutral. The positives are the drainage being altered around the area in line with flooding risks and climate change and the rerouting of the River Cut causing potential enhancements to the biodiversity and the chemical water of the river. However there are concerns over the contamination of the river, particularly during construction and the amount of surface water that could be produced.

9.10 Overall Environmental Constraints and Recommendations

9.10.1 The environmental constraints are useful to understand as they outline the key aspects which need further consideration outside of the Department for Transport TAG Appraisal. The environmental constraints associated with each of the sites can be summarised below.

Table 8.9 *- Environmental constraints and recommendations of new Warfield Link Road*

Scheme	**Constraints**	**Recommendations**
Warfield Link Road	Increase in noise among Harvest Ride and Forest Road	Resurfacing of roads at Harvest Ride. Speed limits to be low along link road and to be kept low along Harvest Ride
	Reduced air quality in Warfield Area	Warfield Street will have improved air quality. The other areas are predicted to have more pollution. Landscaping and trees planted to capture some of the pollution

	Disruption to homes. Particularly historic buildings such as South Lodge to Warfield Hall	Continual conversations with residents regarding the work is key. Creation of diversions and necessary routes for people to access their homes.
	Diversion of River Cut	Enhance the biodiversity and chemical quality of the river to improve from the poor quality classification. CEMP (Construction Environmental Management Plan) to put together a programme of drainage works that will enhance river quality and biodiversity but also to make sure it doesn't create a detrimental effect on the flood risk.
	Mature trees and hedgerows removed	Any removed foliage will be replaced. Development to create landscaped areas with numerous plants
	Potential of fauna such as dormice, bats, great crested newts etc.	More in depth surveys could be conducted, particularly for dormice.

9.10.2 The rest of the impacts or issues associated with the works that are not included in the table above are considered irrelevant due to the distance away from the sites therefore no works will harm these areas.

10 Social Impacts

10.1.1 There are five social aspects which should be considered in the social impact appraisal:

- Accidents;
- Journey Quality;
- Physical Activity;
- Security; and
- Severance.

10.1.2 For each of these aspects an appraisal needs to be completed to discover whether significantly beneficial or adverse effects are likely to arise. However, an appraisal should only be completed if it is considered relevant for the business case.

10.2 Accidents

10.2.1 Accidents around each of the surrounding roads (B3034 Warfield Street, Harvest Ride- West of Newell Green and B3034 Forest Road-East of Link Road) have been analysed in the distributional impacts stage qualitatively. To look at the comparison of the accidents over periods of time with intensity of injury for each site please see **Table 9.1**. This details accidents between 01/07/2008 to 30/06/2013.

Table 9.1- *Traffic accidents over time along the Forest Road, Warfield Street, Newell Green and Harvest Ride*

	B3034 Warfield St/Newell Green	Harvest Ride/ Binfield Rd/ Forest Rd	Binfield Rd/ Forest Rd/ Newell Green	Total
Fatal	0	0	0	0
Serious	2	0	2	4
Slight	6	9	5	20
Total	8	9	7	24

10.2.2 None of the areas have fatal accidents, however there are a couple serious accidents and several slight accidents. Nearly all of the accidents have been concluded as driver error.

10.3 Journey Quality

10.3.1 Journey Quality is a measure of the real and perceived physical and social environment experienced while travelling. Journey quality factors are important to understand the travel choices made by individuals. Poor quality may dissuade individuals from certain modes and interventions. There are factors of Traveller Care, Travellers' Views and Traveller Stress which all have sub-factors to measure against. Traveller Care has aspects such as cleanliness, level of facilities, information and the general transport environment. Travellers' views indicate the view and pleasantness of the external surroundings in the duration of the journeys and traveller stress specifies frustration, fear of accidents and route uncertainty. These are reviewed as being Better, Neutral or Worse when the new proposed improvements have been delivered. However the overall assessment scores still follow the same seven stage guidelines used previously. If the assessment is considered beneficial or adverse then the amount of users of the site needs to be

taken into account. If there are more than 10,000 users a day then it is considered Highly Beneficial / Adverse, if there is between 500 to 10,000 then it is Moderately Beneficial / Adverse and if it is under 500 a day then it is considered Slightly Beneficial / Adverse.

10.3.2 **Table 9.2** below indicates each of the sites and summary scores with a brief description of the sites reasoning for the assessment score. For a more in depth reasoning for the assessment score visit Annex B labelled Social: Journey Quality Worksheet.

***Table 9.2**- Journey Quality Summary Assessment*

Scheme	Overall Assessment	Reasoning
Warfield Link Road- Overall	Highly Beneficial	Warfield Link Road will help reduce congestion along Warfield Street in the short term as well as provide excellent traveller care for road users and for pedestrians.
A3095 Forest Road/ Warfield Street (Used B3034 Warfield Street data)	Slightly Beneficial	Currently the driver stress along this route is High with level of fear and intimidation being classified as Moderate. With the development by 2026 it is predicted that the area will have High Driver Stress and High levels of fear and intimidation. The average hourly peak flow will only increase from 328 to 403 therefore it is very marginal over such a long period of time as is reduced with the implementation of the link road. The traveller views will improve as people will be signed away from Newell Green and through the new link road and the traveller care will improve through the new link road. In the short term the area will improve noticeably with journey quality with driver stress and fear and intimidation being reduced.
Harvest Ride (West of Newell Green)	Neutral	Currently the driver stress along this route is Moderate and the level of fear and intimidation is classified as Moderate. With the development by 2026 it is predicted that the area will have High driver stress and Moderate levels of fear and intimidation. The average peak hourly flow will increase from 1163 to 1904 by 2026. The AADT for 2015 baseline is 10,372 and with the development in 2015 it is 10,655 which is an increase in traffic of 2.7%. The traveller care will improve with the new link road providing facilities, and the potential for new facilities such as bus stops to be included along Harvest

		Ride.
B3034 Forest Road (East of Link Road)	Neutral	Currently the driver stress along this route is Low and the level of fear and intimidation is Moderate. With the development by 2026 it is predicted that the area will have High Driver Stress and High levels of fear and intimidation. The average peak hourly flow will increase from 638 to 1173 by 2026. The AADT for 2015 baseline is 5195 and with the development in 2015 it is 5195 which is an increase in traffic of 0%. The traveller care will improve with the new link road providing facilities and the speed of vehicles should be reduced with developments around the area.

10.3.3 The overall assessment for the journey quality would be seen as Slightly Beneficial. However due to the average total vehicles being over 9,000 vehicles per day at full build out along the researched corridors it is suggested it will be Moderately Beneficial in accordance with Department for Transports guidance.

10.4 Physical Activity

10.4.1 Physical inactivity is a primary contributor to a broad range of chronic diseases, and physical activity can play an important role in preventing obesity and improving mental health. This impact is calculated by estimating the benefit to the population using active modes along the new link road and subsidiary roads.

10.4.2 Unfortunately the Physical Activity appraisal worksheet has not been completed. This is due to insufficient data on the current pedestrians and cyclists and the journey times related to them.

10.4.3 The local areas Method of Travel to Work data from 2011 Census Data has been used to calculate the percentage and numbers of people who walk and cycle around the area. This data only looks at people commuting to and from work therefore it does not capture other journeys. The figures can therefore be seen as minimal figures and they have included the prospect of the creation of 750 homes.

10.4.4 The number of cyclists affected currently by the scheme by looking at the LSOA (Lower Super Output Area) data is approximately 1.3% of commuters which equals 11 and the number of pedestrians affected by the scheme is approximately 6.8% of commuters which equals 57 people. Using the same trajectory it would detail that with the development of 750 homes there would be 50 cyclists and 264 pedestrians (with an average of 2.74 people per household). It is predicted that numerous people, particularly children and the elderly population (which are not captured in Method of Travel to Work Data) in the senior living development will be affected positively with shared use paths and pedestrian crossing islands.

10.4.5 Using the same percentages as above, 1.3% for cycling and 6.8% for pedestrian commuters, put against the population living within 400m (including the development) which is 3642, the number

of cyclists and pedestrians equals 47 and 248 respectfully with most being benefited from the scheme.

10.4.6 The overall assessment score for physical activity can therefore be detailed as Slightly Beneficial due to improvements to small numbers of pedestrians and cyclists.

10.5 Security

10.5.1 Transport interventions may affect the level of security for transport users. Within the Department for Transport guidance there are no formal instructions on how to measure security for road users. The security indicators provided in the worksheets include formal surveillance, informal surveillance, landscaping, lighting and visibility and emergency call. Most of these are either not applicable or need to be adapted for scenarios presented.

10.5.2 These security indicators are measured through their relative importance and with/without scheme analysis. The approximate number of users affected by the scheme also alters the assessment score as if the number is over 10,000 users it is described as being Highly Beneficial/Adverse, between 500-10,000 Moderately Beneficial/Adverse and less than 500 Slightly Beneficial/Adverse. The analysis completed has looked at pedestrians mainly as these users will be the most relevant in terms of personal security issues. Below is a summary table for the collaboration of all the sites analysed. All the worksheets these can be found in Annex B labelled Social: Security Worksheet.

***Table 9.3**- Security Summary Assessment of the Warfield Link Road*

Security Indicator	**Relative importance**	**Without scheme**	**With scheme**
	(High/Medium/Low)	**(Poor/Moderate/High)**	**(Poor/Moderate/High)**
Site perimeters, entrance and exits	High	Moderate	High
Formal surveillance	Low- N/A	Poor- N/A	Poor- N/A
Informal surveillance	Medium	Poor	Medium
Landscaping	Medium	Poor	High
Lighting and visibility	High	Poor	High
Emergency call	Low- All N/A	Poor- All N/A	Poor- All N/A

10.5.3 The overall assessment of the security section of the AST is Highly Beneficial. This is due to large improvements affecting the landscape, entrances and exits as well as the lighting. This should help deter criminals and intruders and reduce crime.

10.6 Severance

10.6.1 Community severance is defined as the separation of residents from facilities and services within their community caused by substantial changes in transport infrastructure or by changes in the traffic flows. Severance is only important when it can significantly impede pedestrian movements. Each of the sites has been split into different sections where the road creates a severance. They are then assessed on whether the improvements will have positive or negative impacts in terms of severance. **Table 9.4** describes the overall change in severance against each of the main sites.

10.6.2 The numbers of people affected could be the number of people located in a 400m boundary which totals 2820 people or 3642 (if include part of development) as 400m is considered the appropriate distance for main pedestrian movements, particularly to access bus stops.

10.6.3 However to understand specifically the number of pedestrians associated with the scheme Travel to Work Data from Neighbourhood Statistics has been used capture the percentage of people who walk as this could give a further detailed analysis of the daily pedestrian movements. This does not give a perfectly accurate impression of the population as the data shows only the population who are in employment. This data has shown that there are approximately 108 people who will walk to work once the link road and the 750 homes are built.

10.6.4 Annex B labelled Social: Severance Worksheet details the worksheets and in depth assessments of each of the sites. **Figure 2.4** in Appendix A illustrates the facilities (e.g. schools, GP practices, care homes) around the 400m boundaries which can show the populations routes and distances to those facilities and the social groups it would affect.

Table 9.4- *Population against change in severance with the scheme (using Travel to Work Data only, 2011)*

Change in Severance (Assessment Score)	**Population Affected**			
	North	**East**	**South**	**West**
Large negative				
Moderate negative				
Slight negative	15 (400m) 0 (Walk to Work)			
Neutral			2505 (400m) 170 (Walk to Work)	
Slight positive				822 (400m) 58 (Walk to Work)
Moderate positive				
Large positive		300 (400m) 20 (Walk to Work)		

10.6.5 However socially if you take into account all the vulnerable users (children <16, older people, people with a disability, and no car households) and appraise this against improvements in infrastructure and services aside from car, you will notice improvements to the active travel based modes.

10.6.6 A 3m shared use path along the new Warfield Link Road will provide access to many homes, a school and a care home. It will also provide a link through a pedestrian island near the school which could be upgraded to a toucan crossing in the future. This should help children and the elderly in particular to access the school and the senior living development.

10.6.7 The overall assessment for the AST is Slightly Beneficial. This is because of the installation of 3m wide shared use paths and pedestrian islands which are located in specific areas to protect vulnerable users such as children (for school) and the elderly (for senior living development). In addition, the reduced traffic on Warfield Street will help with severance along there.

10.7 Accessibility

10.7.1 One in four households do not have access to a car for reasons including cost, disability and choice. These people rely heavily on public transport, walking, cycling or lifts from friends, family or community organisations. Accessibility can relate to physical access onto a mode of transport or into a given place as well as the accessibility of information regarding a service.

10.7.2 The appraisal of accessibility was covered in Distributional Impacts, Chapter 6 and has been given a Neutral assessment score due to currently there being no improvements to the public transport system but there is the potential for the provision of bus stops and services when the link road is completed.

10.8 Overall Social Constraints and Recommendations

10.8.1 The social constraints are useful to understand as they outline the key aspects which need further consideration outside of the Department for Transport TAG Appraisal. The social constraints associated with each of the sites can be summarised below.

***Table 9.5**- Social constraints and recommendations for the Warfield Link Road Scheme*

Scheme	Constraints	Recommendations
10.8.2 Warfield Link Road	■ Need to understand the public transport usage around the area to install bus stops	■ Public transport strategy and study to occur to understand the potential usage.
	■ Driver stress, route uncertainty and Fear of potential accidents seems to increase in areas.	■ Provide adequate signage along route. ■ Three Legged Cross improvements should rectify any congestion predicted from Forest Road

11 Management Case

11.1 Outline Approach

11.1.1 The DfT's guidance document, 'The Transport Business Case: Management Case', outlines the areas that should be covered as part of the Transport Business Case documentation. The necessary elements to achieve compliance are:

- Programme and project dependencies;
- Governance;
- Communications and stakeholder management;
- Risk management strategy;
- Contract management, and;
- Monitoring and evaluation.

11.1.2 The management approach has been developed following the outline set out below:

- Set the appropriate governance structure to ensure outcomes and objectives are met;
- Identify and plan for the key approval milestones ensuring information is provided in good time so as to not delay the programme, and;
- Assess how the delivery process will be managed to achieve optimum financial and impact performance.

11.2 Evidence of Similar Projects

11.2.1 Berkeley Homes is one of the UK's biggest house builders that has demonstrated key delivery of projects over the last 5 years. In general Berkeley Homes has:

- Built a total of 15,750 homes over the last 5 years. This includes approximately 10% of all the new homes built in London over the same period;
- supported 21,000 jobs in the UK in 2014, sustaining a total of 5.6 jobs for each home built;
- been ranked Britain's most sustainable major housebuilder for the last 8 years in a row; and
- contributed £416 million to local communities via Section 106 payments in the last five years. This pays for new schools, parks, shops, transport and other public amenities.

11.2.2 In terms of similar schemes delivered the following list sets out Berkeley Homes recent achievements:

- North Bersted, Bognor – 1,800m of relief Road with 2 roundabouts connecting to existing highway. Works including embankments and two river crossings with a contract value of £8.5m
- Cirencester – approximately 750m of link road through the site including major reprofiling works to existing roundabout with a contract value of £1.5m
- Horsham – works included forming a new grade separated junction over the A24 a main spine road linking two parcels of land with 2 river crossing (one being the River Arun) approximate contract value £4m

11.3 Programme and Project Dependencies

11.3.1 The scheme programme has been presented in Appendix C and this outlines the key delivery stages for the link road project.

11.3.2 Outline planning permission and detailed planning permission have been awarded by the planning authority which significantly reduces the delivery risk for this project.

11.3.3 In advance of construction works which are expected to start in January 2015, Section 278 and Section 38 link road agreements are required between Berkeley Homes and the authority. In order to mitigate delay in construction the authority has agreed a staged approach to Section 278 approvals so that the first stage and second stage engineering plans can be achieved whilst ongoing discussions with the Environment Agency and the authority on the fourth stage (Forest Road roundabout to Three Legged Cross) continue.

11.3.4 Key aspect will be ensuring funding for the link road is secured so that the link road can be brought forward early in the development delivery and thus assist in relieving traffic congestion on adjacent routes, improve journey times to the town centre and major employment areas and provide access to the wider development area so that key deliverables, such as the school and affordable housing come forward early in the development, thus supporting the local economy.

11.4 Governance

11.4.1 The Council's Highway Team, in conjunction with Berkeley Homes, will oversee the detailed design (through the Section 278 process), construction and monitoring stages of the scheme. Day to day delivery of the scheme on the ground will be managed by Peter Pellet (Commercial Director) for Berkeley Homes and their contractors when selected.

11.4.2 An organogram detailing the organisational structure of the link road development is currently being finalised and will be provided separately.

11.4.3 The Senior Responsible Officer for the Council will be Neil Mathews (Transport Development Manager) supported by Stuart Jefferies (Principal Engineer).

11.5 Communications and Stakeholder Management

11.5.1 The key objectives of the schemes stakeholder management are to:

- Keep stakeholders aware of schemes development and progress.
- Meet statutory requirements (such as Section 278/38 and Environment Agency consents)
- Increase public and stakeholder awareness of the scheme through local publicity
- Provide information and support to those affected by the scheme during construction and operation.

11.6 Risk Management Strategy

11.6.1 A quantified risk assessment and Monte Carlo simulation have been undertaken for key risks identified at this time. A risk register is contained in Appendix C.

11.6.2 The risk register has been compiled containing all risks of potential overspend which have been identified. This risk register sets out the forecast probability of each risk occurring and defines a

range of probable costs which may be incurred for each in that instance. A cumulative distribution for forecast risk has been prepared.

11.6.3 From this distribution a mean value has been extracted for addition to the costs to appraisal and the P(80) value has been assessed to the outturn cost calculation for the financial assessment. These risk values have been forecast as:

	Pre Mitigation	Post Mitigation
P(50)	£215,724	£82,351
P(80)	£342,264	£172,428

11.6.4 The risk owner for the project will be Berkeley Homes as the developer and they will be working in conjunction with the Council to mitigate the risks identified on the risk register as outlined in the risk response and through dialogue with the Council and the Environment Agency. More information regarding the Risk Register can be found in Appendix C.

11.6.5 Berkeley Homes will meet all cost overruns on the link road project as scheme developer, beyond the £5,282,845 predicted scheme cost.

11.7 Contract Management

11.7.1 Berkeley Homes will be appointing the contractors for the construction of the link road. Berkeley's have an approved database of contractors who have passed through various Financial and Health and Safety processes to enable the contractor to work for any of the Berkeley regions. The approval process also ties the contractor to a Standard Form of Contract which has been developed by Berkeley Homes based on the JCT form of contract.

11.7.2 The link road will be tendered on the basis of drawings and specifications, but at this stage, Berkeley Homes have not decided if the link road will be a separate project or included within a bigger package of one of their development parcels. There are commercial benefits to the project if the link road is included within a larger development package such that coordination and access issues between contractors would be avoided with one construction project. Overall project programming and delivery would also benefit from one overall construction project.

11.8 Assurance and Approvals Plan

11.8.1 The Warfield Link Road has received planning permission and the remaining approvals are:

- Commitment from TV LEP to fund the Warfield Link Road included within Annexes to Implementation Plan
- Funding decision from TV LEP November 2014
- Tender competition during winter 2014/2015
- Receiving technical approval from the Environment Agency for river diversion works at the Three Legged Cross
- Receiving S278 agreement, in stages, from the Council

11.8.2A project programme is contained in Appendix C which will be monitored by the Council in conjunction with Berkeley Homes. The key contacts are set out in section 10.4 Governance.

11.9 Implementation of Work Streams

11.9.1 A delivery programme has been set out in Appendix C which shows the key work streams to be delivered. A works will be delivered by Berkeley Homes or their contractors and the Council will oversee delivery on the ground through the Section 278 and highway adoption processes.

11.10Key Issues for Implementation and Contingency Planning

11.10.1 Key issues for implementation have been set out in 10.8 in terms of remaining approvals and key risks as set out in 10.6 and the QRA.

11.10.2 Berkeley Homes will track progress against the project programme and discuss with the Council key aspects of the risks (namely submitting and receiving approvals from the EA and S278), and work in conjunction with the Council, to identify contingency plans; such as staged S278 approvals for different sections and actively managing EA approvals with the Council.

11.10.3 Berkeley Homes are responsible for cost risk on the project and can accelerate delivery works if required or where approvals have been late in being received.

11.11Benefits Realisation Plan

11.11.1 It is anticipated that benefits will be realised in stages as the link is progressed. Early stage (1) delivery will give access to the construction area for the new school and the next stage (2) will provide access to the affordable housing. Completion of the whole link by April 2017 will allow traffic using existing roads to be diverted on to the new route.

11.12Monitoring and Evaluation

11.12.1 Post scheme opening traffic surveys will be undertaken on the link road and existing surrounding roads to establish the change in traffic movement patterns and improvements to journey times have occurred as anticipated in the modelling. In addition, wider transport surveys of walking and cycling will be undertaken on existing roads to identify if the anticipated improvement in physical activity, journey quality and reduction in severance have led to an increase in non-motorised uses. These will be reported to the Council to inform future projects.

12 Conclusions

12.1.1 The overall AST has been compiled after all the worksheets have been completed using thorough analysis. The AST is a collection of all the impacts of the sites to produce a finalised review. It details the social and environmental impacts as well as economic (monetary) impacts of the scheme. This can be found in Appendix A.

12.1.2 The environmental impacts are seen to be a mix of Slightly Beneficial (Townscape and Landscape), Neutral (Historic Environment and Water) and Slightly Adverse (Biodiversity, Air quality and Noise). There are some recommendations to reduce the negative impact on the scheme through additional vegetation and potentially further surveys and management strategies could be required to enhance the benefits environmentally.

12.1.3 The social impacts are seen to be Beneficial. Areas which will receive benefits from the schemes are the severance and security of pedestrians and cyclists which can be improved by the provision of a 3m wide shared use path and pedestrian islands for crossings. In addition, the journey quality should be improved along Warfield Street through reduced traffic meaning residents of Warfield and Newell Green have access to all areas of the village.

12.1.4 The economic impacts have resulted in a benefit to cost ratio of 7.668 which classifies this scheme as a Very High Value For Money scheme.

12.1.5 The overall scheme cost is £5.283 million and the Council will be requesting from the Local Enterprise Partnership £3.5 million to support the delivery of the Warfield link road scheme.

Sources/References

- Thames Valley Berkshire LEP, Delivering National Growth, Locally, Strategic Economic Plan (2014)
- Office for National Statistics (2011), Flows of Commuters between Local Authorities
- Bracknell Forest Local Transport Plan 3: Core Strategy and Implementation Plan 2011-2026 (2011)
- HM Treasury, National Infrastructure Plan (2013)
- Glanville, Transport Assessment: Warfield, Bracknell (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 3, The Proposed Development (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 5, Socio-Economics (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 6, Transport (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 7, Noise and Vibration (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 8, Air Quality (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 9, Nature Conservation and Ecology (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 10, LVIA (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 12, Archaeology (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 13, Built Heritage (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 14, Ground Conditions (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 15, Flood Drainage and Water (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 16, Agriculture Soils (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 17, Cumulative Effects (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 18, Summary of Mitigation (2013)
- Berkeley Homes (Oxford and Chiltern) Ltd, Environmental Statement, Chapter 19, Summary of Residual Effects (2013)
- Neighbourhood Statistics, Census Data (2011)
- Department for Transport, TAG UNIT A4.2, Distributional Impact Appraisal (2014)
- Department for Transport, TAG UNIT A3, Environmental Impact Appraisal (2014)
- Department for Transport, A4.1, Social Impact Appraisal (2014)

Appendices

12.2 Appendix A- GIS Maps

***Figure 2.1**: Map detailing the location of the development and link road*

***Figure 2.2**: Map detailing LSOA's (Lower Super Output Areas) and the junctions for improvement*

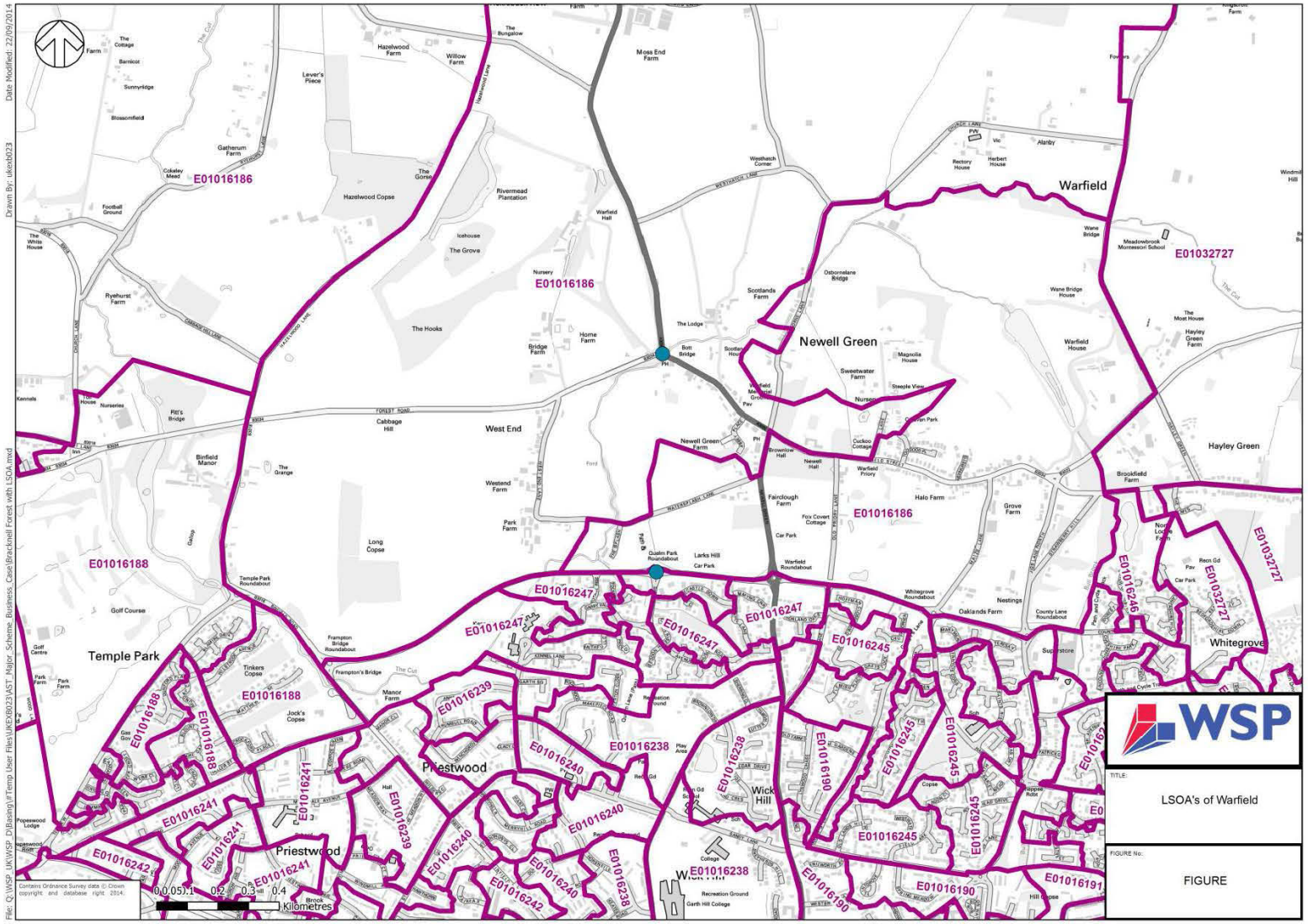


Figure 2.3: *Map detailing Air Quality and Noise along the new link road.*

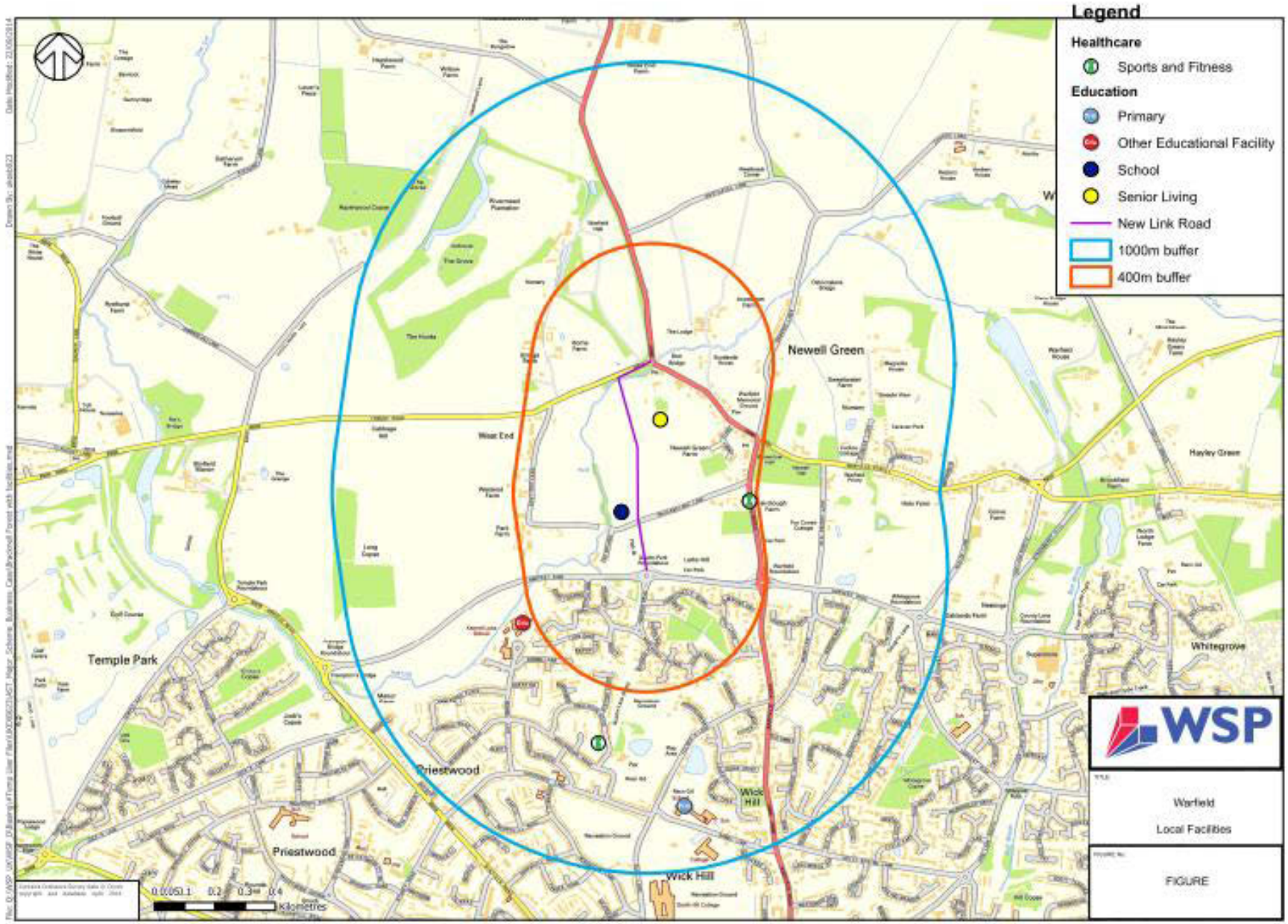


***Figure 2.4**: Map detailing 400m buffer and 1km buffer to surrounding facilities (which are relevant for vulnerable users)*

12.3 Appendix B- Designs

Figure 3.1- *Warfield Link Road Scheme Design*

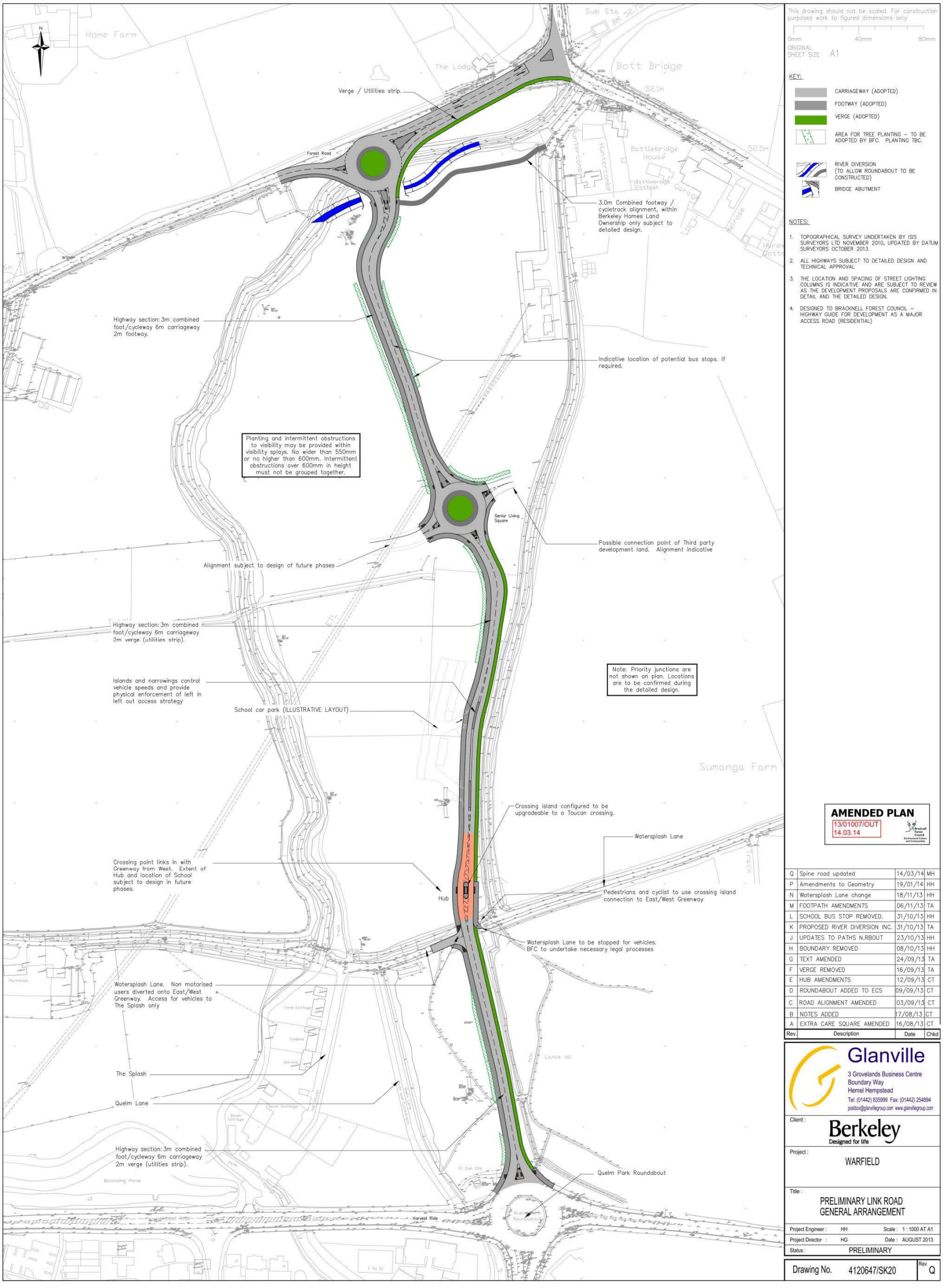
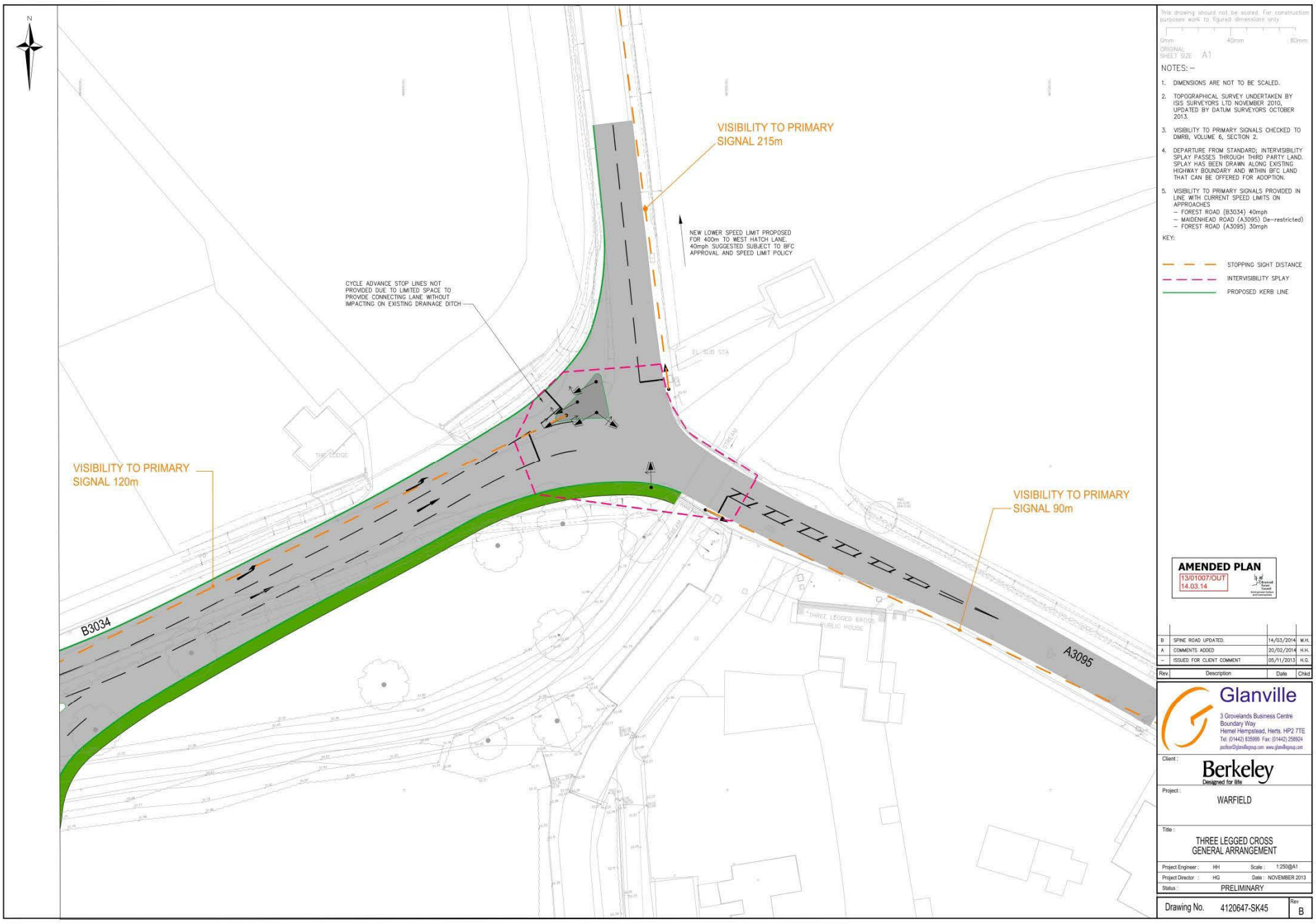


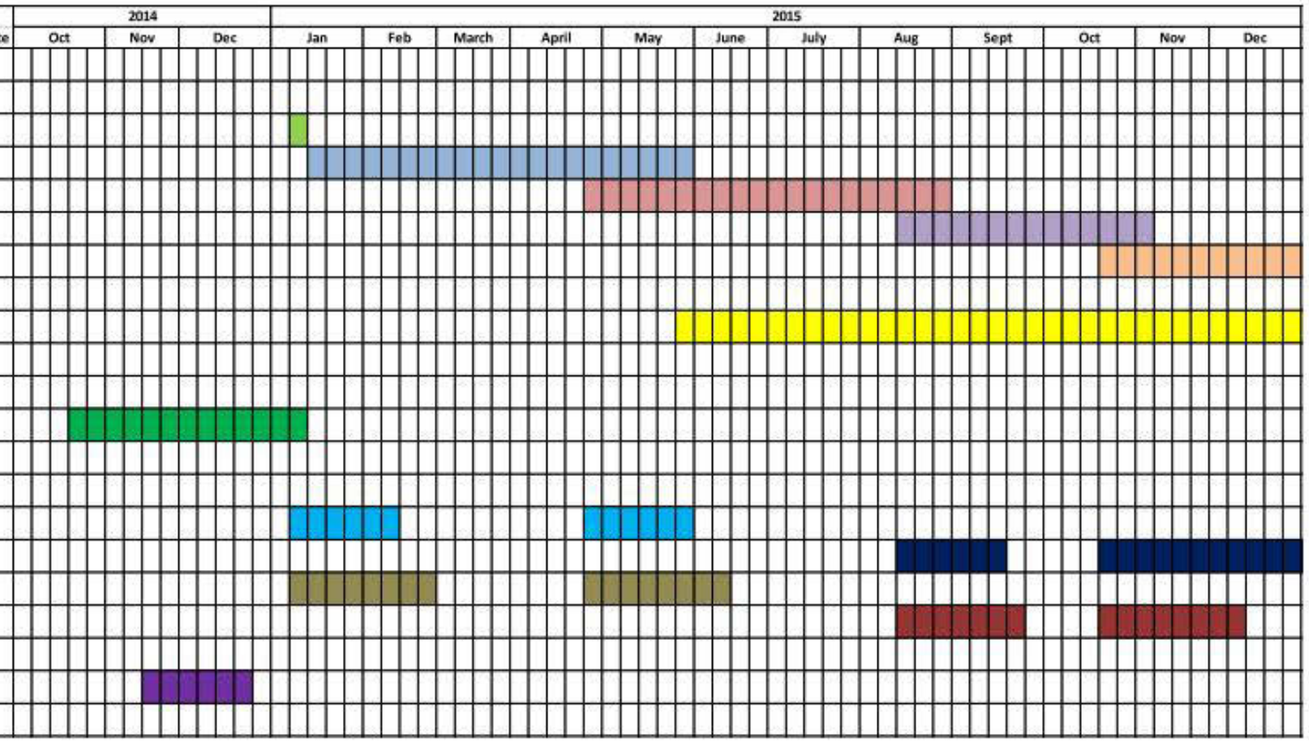
Figure 3.2- Three Legged Cross Design



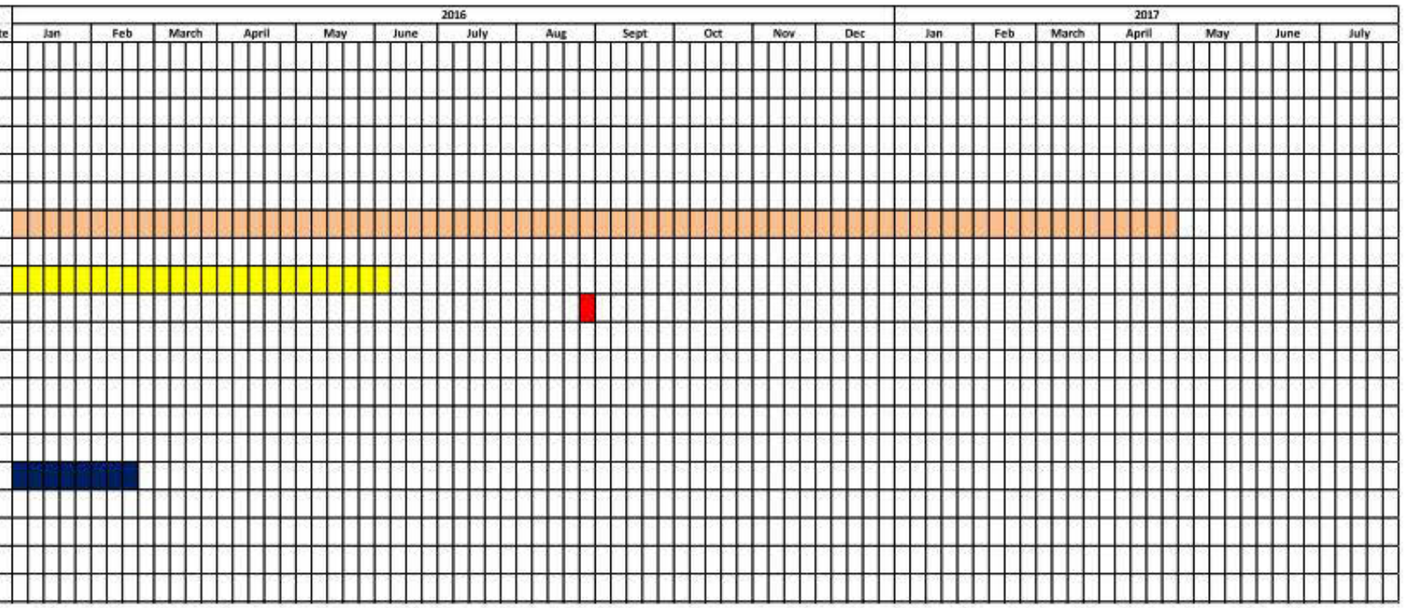
12.4 Appendix C - Management Case Information

Warfield Link Road Programme

Work Stage	Start Date	Complete Date
Outline Planning Permission		27.03.14
Detailed Planning Permission		27.03.14
Site set up	05.01.15	12.01.15
1st Stage - Quelm Park Roundabout to Water Splash Lane	12.01.15	29.05.15
2nd Stage - Water Splash to Senior Living Roundabout	20.04.15	31.08.15
3rd Stage - Senior Living Roundabout to Forest Road	10.08.15	31.10.15
4th Stage - Forest Road Roundabout to 3 Legged Cross	12.10.15	30.04.17
School	25.05.15	01.06.16
School Open	01.09.16	01.09.16
Section 278/38 Link Road Agreement	20.10.14	05.01.15
Services		
Diversions - 1st to 2nd stage		
Diversions - 3rd to 4th stage		
New Supplies - 1st to 2nd stage		
New Supplies - 3rd to 4th stage		
EA Approval to River Cut Flood Model		



Work Stage	Start Date	Complete Date
Outline Planning Permission		27.03.14
Detailed Planning Permission		27.03.14
Site set up	05.01.15	12.01.15
1st Stage - Quelm Park Roundabout to Water Splash Lane	12.01.15	29.05.15
2nd Stage - Water Splash to Senior Living Roundabout	20.04.15	31.08.15
3rd Stage - Senior Living Roundabout to Forest Road	10.08.15	31.10.15
4th Stage - Forest Road Roundabout to 3 Legged Cross	12.10.15	30.04.17
School	25.05.15	01.06.16
School Open	01.09.16	01.09.16
Section 278/38 Link Road Agreement	20.10.14	05.01.15
Services		
Diversions - 1st to 2nd stage		
Diversions - 3rd to 4th stage		
New Supplies - 1st to 2nd stage		
New Supplies - 3rd to 4th stage		
EA Approval to River Cut Flood Model		



Risk Register Information

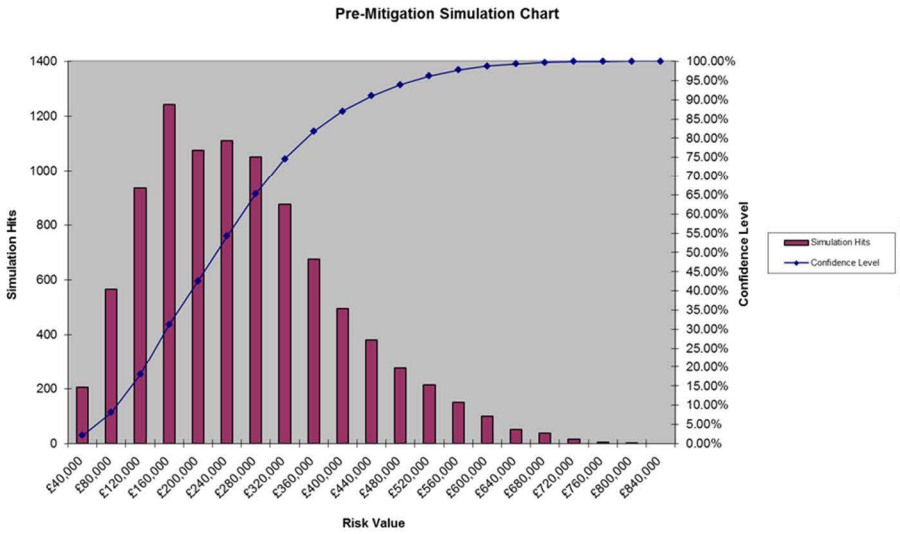
Probability	Min	Max	Score
Very Likely	60%	100%	5
Likely	30%	60%	4
Fairly Likely	10%	30%	3
Unlikely	5%	10%	2
Very Unlikely	0%	5%	1
Cost Impact	**Min**	**Max**	**Score**
VH	£150,000	£300,000	5
H	£75,000	£150,000	4
M	£25,000	£75,000	3
L	£5,000	£25,000	2
VL	£1	£5,000	1

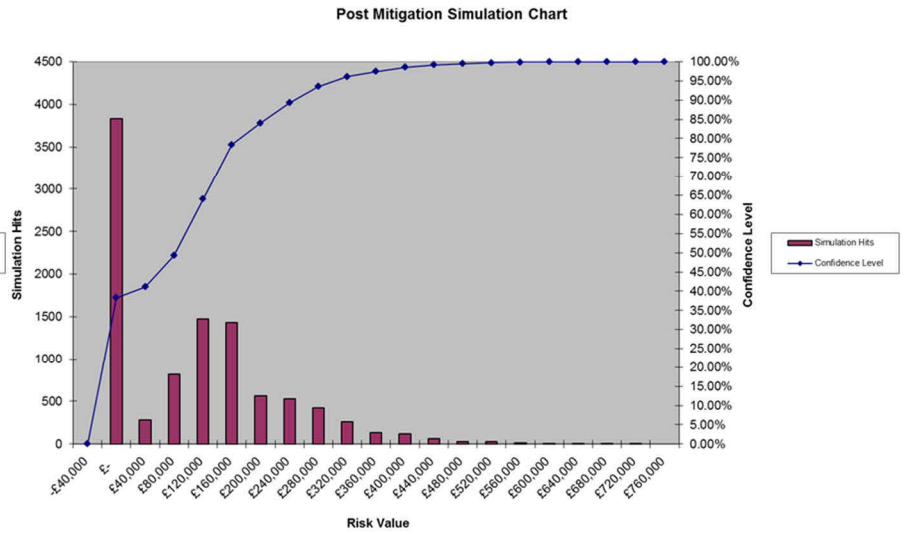
	WARFIELD , LINK ROAD		PRE - MITIGATION								RESIDUAL RISK POST MITIGATION			
Risk ID	Risk Description	Threat / Opportunity	Probability of Occurrence	Cost Impact if Occurs	Overall Risk Score	Exp. Risk Impact	Risk Response	Risk Org	Cost of Risk Intervention	Cost Estimate Notes	Probability of Occurrence	Cost Impact if Occurs	Overall Risk Score	Exp. Risk Impact
	PROJECT RISKS													
1.1	Environment Agency Approval	Threat	Fairly Likely	M	9	£ 10,290	Continued dialogue with the the EA throughout design process		£5,000	provision for additional consultant fees	Unlikely	H	8	£ 8,625
1.2	Modelling does not support highways case	Threat	Fairly Likely	VH	15	£ 43,404	Design progressed in line with agreed transport modelling			Included within Consultant fee appraisal	Unlikely	H	8	£ 8,713
1.3	Existing Statutory Utilities	Threat	Likely	H	16	£ 50,548	Slip trenches being undertaken along line of link road		£15,000	Attendance works	Unlikely	VH	10	£ 17,821
1.4	Ground Conditions	Threat	Likely	H	16	£ 49,383	Geotechnical investigations undertaken			Cost accounted for in original appraisal	Fairly Likely	H	12	£ 21,103
1.5	Failure to agree on technical design issues (alignments, cross sections, highways width, cycleways / footway provision etc)	Threat	Unlikely	M	6	£ 3,537	ongoing dialogue with Highway Authority			Included within Consultant fee appraisal	Unlikely	H	8	£ 8,186
1.6	Impact of temporary TM restrictions greater than expected leading to extension of time and additional TM costs	Threat	Likely	H	16	£ 50,814	Early involvement with Key Stakeholders		£5,000	provision for additional consultant fees	Fairly Likely	M	9	£ 9,869
1.7	Abnormal weather conditions	Threat	Likely	M	12	£ 22,186	Programming of earthworks and construction works monitored, potential for additional resources or parallel working if necessary		0	Delay implications due to potential flooding	Fairly Likely	H	12	£ 21,879
									£ 25,000					

The results of the Monte Carlo simulation are recorded below. Please note the following:
1. Risks can be either threats or opportunities. The convention used here is that threats are expected to add cost to the project and therefore they are numerically positive in value and opportunities are expected to remove cost from the project and therefore they are numerically negative.
2. Confidence levels are derived from the simulation. For example the P80 risk value represents the risk value that 80% of the simulation results were equal to or below. Therefore, in theory, if the contingency value were set at the P80 value you could be 80% certain that it would be sufficient.
3. The simulation was run with 10,000 iterations

	Pre-Mitigation	Post-Mitigation
P_0	£0	£0
P_{50}	£215,724	£82,351
P_{80}	£342,264	£172,428
P_{100}	£798,201	£699,520

Pre-Mitigation Mean Risk	£	**230,162**
Post Mitigation Mean Risk	£	96,196
Estimated Cost of Mitigation	£	25,000
	£	**121,196**





Results Summary			Percentile Distribution			Histogram Data			Interval Probability Data		
Mean	**£ 230,162**		Percentile	Value		Bin	Frequency		Value	Probability	Cum Prob
Number of Trials	10000		0%	£ -		£ 40,000	204		£ 40,000	2.16%	2.16%
Standard error	£ 1,402		5%	£ -		£ 80,000	565		£ 80,000	5.97%	8.13%
			10%	£ 59,874		£ 120,000	936		£ 120,000	9.89%	18.02%
Minimum	£ -		15%	£ 89,670		£ 160,000	1242		£ 160,000	13.13%	31.15%
Maximum	£ 798,201		20%	£ 110,974		£ 200,000	1075		£ 200,000	11.36%	42.52%
Median	£ 215,724		25%	£ 128,899		£ 240,000	1110		£ 240,000	11.73%	54.25%
Range	£ 798,201		30%	£ 143,668		£ 280,000	1051		£ 280,000	11.11%	65.36%
			35%	£ 160,339		£ 320,000	875		£ 320,000	9.25%	74.61%
Standard Deviation	**£ 140,171**		40%	£ 178,397		£ 360,000	675		£ 360,000	7.14%	81.74%
Variance	£ 19,647,896,988		45%	£ 197,568		£ 400,000	495		£ 400,000	5.23%	86.98%
			50%	£ 215,724		£ 440,000	381		£ 440,000	4.03%	91.00%
Skewness	0.59		55%	£ 233,035		£ 480,000	276		£ 480,000	2.92%	93.92%
Kurtosis	3.11		60%	£ 252,029		£ 520,000	213		£ 520,000	2.25%	96.17%
			65%	£ 270,354		£ 560,000	150		£ 560,000	1.59%	97.76%
			70%	£ 290,927		£ 600,000	100		£ 600,000	1.06%	98.82%
			75%	£ 315,303		£ 640,000	51		£ 640,000	0.54%	99.36%
			80%	£ 342,264		£ 680,000	38		£ 680,000	0.40%	99.76%
			85%	£ 378,524		£ 720,000	17		£ 720,000	0.18%	99.94%
			90%	£ 421,986		£ 760,000	4		£ 760,000	0.04%	99.98%
			95%	£ 493,114		£ 800,000	2		£ 800,000	0.02%	100.00%
			100%	£ 798,201		£ 840,000	0		£ 840,000	0.00%	100.00%

WSP UK Limited
Mountbatten House
Basingstoke
RG21 4HJ
UK
Tel: +44 1256 318 887
Fax: +44 1256 318 700
www.wspgroup.co.uk