PARSONS BRINCKERHOFF

Balfour Beatty Living Places

November 2014

SOUTH WYE TRANSPORT PACKAGE PREFERRED OPTION REPORT

Herefordshire Council

3512983A-HHR

Final

South Wye Transport Package
Preferred Option Report

3512983A-HHR

Prepared for
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1 INTRODUCTION

1.1 Background

1.1.1 Parsons Brinckerhoff (PB) has been commissioned by Balfour Beatty Living Places (BBLP) on behalf of Herefordshire Council (HC) to develop options for improving the transport conditions in the South Wye area of Hereford. Figure 1 at the rear of this report illustrates the study area. Various improvements, considered as a package of measures, have been analysed in the process. These improvements are described as the South Wye Transport Package (SWTP).

1.1.2 The SWTP builds upon the initial work undertaken by Amey regarding highway improvements to the Belmont Area. Option development for a new Southern Link Road (SLR) is one measure in the package of measures. Other measures included the following:

Traffic max – This approach aimed to generate maximum capacity for vehicles within the South Wye area by improving existing junctions or roads.

Sustainable transport max – This approach aimed to reduce the use of the private car through improvements to public transport, cycle routes and lanes, pedestrian crossings, traffic management, behavioural change activities, and small localised improvements.

1.1.3 The development of these measures is outlined in the SWTP – Package Assembly Report.

1.1.4 The aim of this report is to consider the route options for the new SLR, and identify a preferred route to be included as part of the SWTP.

1.2 Scheme History and Development

1.2.1 The 'Hereford Relief Road' is considered to be a key strategic transport proposal to relieve the city of its current congestion levels and enable delivery of the council's Core Strategy. Potential corridors orbiting Hereford have been identified across a number of studies, one of these being the 'Southern Corridor'.

1.2.2 The Hereford Relief Road Study of Options Report in 2010 considered two routes options for a link between the A49 and the A465. These two routes differed to consider the impacts upon the special wildlife site and were designed to exploit the optimum crossing locations of both the railway line and minor roads.

1.2.3 The Hereford Relief Road Southern Core Corridor Assessment Report, which was undertaken by Amey in May 2012, included six variations for a Southern Link Road. This was further refined in the Belmont Transport Package to eight different options in December 2012. These eight route options are illustrated in Figure 2 at the rear of this report.

1.2.4 PB undertook further assessment and refinement of these options in 2013, in preparation for a 2014 planning application. The results of this appraisal illustrated that four of these options do not represent practical solutions to the transportation problems due to environmental considerations, as they were identified as affecting the ancient woodland of Newton Coppice and Hayleasow Wood.

1.2.5 Both woodlands are mapped by Natural England as Ancient Woodland. Ancient woodland is land that has had a continuous woodland cover since at least 1600 AD and may be ancient semi-natural woodland, which retains a native tree and shrub cover that has not been planted, although it may have been managed by coppicing or felling and allowed to regenerate naturally, or ancient replanted woodland where the original tree cover has been felled and replaced by planting, often with conifers, and usually over the last century. The removal of conifers is often one of the key principles to the restoration of ancient woodland.

1.2.6 Hayleasow Wood and Newton Coppice have been mapped with elements of both types of ancient woodland (semi-natural and re-planted). At a local level, the woodlands are protected by Council Policy as they are designated as Special Wildlife Site SO43/18: "Hayleasow Wood, Newton Coppice and Spring Grove SWS - an area of ancient woodland, with a small number of introduced species. Oak is dominant, with hazel coppice".

1.2.7 During initial survey works undertaken by Parsons Brinckerhoff to date, several plant species were noted in both woodlands which can be indicators of ancient woodland, because they are often not effective colonisers of plantations or secondary woodland. Species identified included Herb-Paris (Paris quadrifolia), bluebell (Hyacinthoides non-scripta), wood anemone (Anemone nemorosa), yellow archangel (Lamiastrum galeobdolen) and dog's mercury (Mercurialis perennis).

1.2.8 The National Planning Policy Framework now identifies ancient woodland as an irreplaceable habitat that is unlikely to be fully mitigated, and the cost to mitigate the options in this area would be significant. There are also clear alternatives to avoid this significant environmental constraint.

1.2.9 These options would also affect additional properties in the vicinity of the B4349 / A465 junction, as the proposed connection to the A465 would enlarge the current junction.

1.2.10 The remaining four route options for the SLR were presented at a public consultation exhibition during July 2014. These options were:

- SC2: a route located at the southern end of the previously identified SLR route corridor. The road crosses over the railway line and underneath Haywood Lane.
- SC2A: a variation on SC2 whereby the road crosses underneath the railway line.
- SC5: a route located further north of SC2/SC2A within the SLR Route Corridor and south of Merryhill Lane. The road crosses underneath the railway line and Haywood Lane.
- SC7: roughly similar to SC5 but more twisted in nature thereby avoiding a number of existing environmental constraints.

1.2.11 During the consultation process, the public and third parties suggested a number of alternative alignments. The suggestions were considered in advance of this report being finalised.

1.3 Purpose of the Preferred Option Report

1.3.1 This Preferred Option Report describes the results of the appraisal of the various SLR route options as part of the SWTP. The report follows the principles of the guidance outlined in WebTAG, with a review against stakeholder acceptability and deliverability, with the objective of providing a recommendation for a preferred route.

2 POLICY, OBJECTIVES AND APPRAISAL METHODOLOGY

2.1 Introduction

2.1.1 This Preferred Option Report describes how the preferred route for the Southern Link Road (SLR) has been identified using the WebTAG appraisal process as a framework tool. The results of this assessment will then be presented as part of the planning application within the 'alternatives' section of the Environmental Statement (ES). The ES will describe which alternative routes were considered, and why one route was selected and the others were discounted. This will take into account not only the environmental, social and economic constraints identified in this report, but also the results of the public consultation carried out in July and August 2014.

2.2 Transport Policy

2.2.1 As stated in paragraph 1.2.1, a 'Hereford Relief Road' has been identified as a key strategic transport proposal to relieve the city of its current congestion levels and to ensure proposed growth can be accommodated. A 'Southern Corridor' has been identified as a potential route that is part of a network providing relief to Hereford.

2.2.2 The Marches Local Enterprise Partnership (LEP) Strategic Economic Plan sets out how the LEP aims to unlock growth and prosperity across the area. It sets out priorities in addressing areas of business need, including transport, education and investment need, whilst unlocking land for housing and employment growth.

2.2.3 The Marches LEP has identified Hereford as an Urban Powerhouse, which will play a vital part in the accelerated growth for the LEP area. Part of Rotherwas Estate was awarded Enterprise Zone status in 2011, creating a focal point for the creation of new businesses and jobs.

2.2.4 Improvements to existing infrastructure are fundamental to the delivery of the Hereford Enterprise Zone (HEZ) as development is currently being constrained by the high levels of congestion across the city. Unlocking land for both housing and employment growth, including land at the HEZ, will enable development to go forward.

2.2.5 Herefordshire Council's Core Strategy has set objectives to promote:

- 'social progress (supporting strong communities by meeting housing, education and health, transport and infrastructure needs) including the development of 1,000 homes at Bullingham;
- economic prosperity (supporting new jobs, area regeneration, business, tourism and retail); and
- environmental quality (addressing climate change, protecting and enhancing the environmental assets of the county).'

2.2.6 Herefordshire Council's Local Transport Plan (LTP) identifies that an efficient transport network is essential and important for the county's economy, the ability to access services and maintain independence. The LTP therefore sets objectives to:

- reduce short distance car based trips and the impact of car access;
- support regeneration and the successful investment in jobs at the Hereford Enterprise Zone;

- ensure that the county's highway network remains fit for purpose and is safe; and
- provide alternatives so that longer distance commuters could reduce their car use and adopt healthier lifestyles.

2.3 Package Objectives

2.3.1 Specific problems identified within the South Wye area are caused by low network capacity as a result of a limited number of crossings of the River Wye, resulting in significant levels of congestion along the A465 and A49. This has resulted in poor levels of air quality, noise, and public transport usage, which has resulted in large numbers of short distance trips being made by car. This in turn has led to less physical activity, which is a contributing factor to increased levels of obesity and other associated health problems. These problems are expected to increase if no action is taken.

2.3.2 The aim of the South Wye Transport Package (SWTP) and the SLR is to promote the council's aspirations for Hereford and the wider region while tackling the specific problems identified within the South Wye area. Specific objectives have been identified for the study to provide key aims against which the different elements can be assessed. These are:

- **Economic:**
  - Reduce congestion and delay
  - Enable access, particularly to developments such as the HEZ
- **Environmental:**
  - Reduce the growth in emissions such as CO2, NOx and PM10s
  - Reduce traffic noise
- **Health:**
  - Encourage physical activity
  - Reduce accidents

2.4 Appraisal Methodology

2.4.1 The appraisal of the different elements of the package and the SLR options used the principles of a Stage 1 level of appraisal outlined in the Department for Transport guidance WebTAG to identify a preferred route for the SLR.

2.4.2 The remaining chapters of this report appraise the four route options for the SLR to identify a preferred route.

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3 EXISTING CONDITIONS – TRANSPORT

3.1 Description of the Locality

3.1.1 The cathedral city of Hereford is the main service centre and largest urban area in Herefordshire. The city lies on the River Wye, and is approximately 16 miles east of the English border with Wales, 24 miles southwest of Worcester, and 23 miles northwest of Gloucester.

3.1.2 Herefordshire's Economic Development Strategy outlines four key aims that are essential for creating a strong economy. This is achieved by sustaining business survival and growth, increasing wage levels, having a skilled population to meet future work needs and developing the county's built infrastructure so enterprise can flourish

3.1.3 Hereford has an unemployment rate of 6%, which is slightly higher than the unemployment rate for Herefordshire (4%). However, this is still lower in comparison with the average for England (6%). Of those whom are economically active, 56% are in full time employment and 23% are in part-time employment[1].

3.1.4 Herefordshire had the lowest median earnings of all 14 West Midlands authorities, as has been the case for the past five years. It was also lower than Monmouthshire, Powys and Gloucestershire and is the lowest out of the nearest neighbour grouping of local authorities. In fact, Herefordshire had the second lowest median earnings out of all upper tier authorities in Great Britain, after Blaenau Gwent.

3.1.5 The dominant choice of mode for the purpose of travelling to work in Hereford is the car, accounting for 55% of modal share. The contribution of sustainable modes is dominated by journeys by foot, with 22%. The bicycle accounts for 8% of modal share, and bus, minibus or coach 2%. The average distance for trips to work in Hereford is 11.8 km, with the majority being less than 2km.

3.1.6 Journey times and reliability in Hereford are currently limited by congestion along the network. As such, the associated problems with shipping and receiving goods around Hereford have been raised by businesses. This issue further jeopardises the competitiveness of the businesses operating in and through Hereford and ultimately affects the performance of local firms.

3.1.7 The economic development strategy for Herefordshire recommends that there needs to be greater connectivity between businesses as well as improving transport infrastructure.

3.2 Land Use

3.2.1 The city of Hereford is Herefordshire's main centre for employment, administration, health, education, and shopping. Most of these land uses are north of the river Wye; with neighbourhood centres in the South Wye area at Putson, Hinton, Hunderton, and Redhill. Figure 3 identifies the key trip generators in the study area.

3.2.2 The majority of the land in the South Wye area is residential, industrial and agricultural.

[11] 2011 Census data

Residential

3.2.4 Hereford has a population of approximately 60,000, with two thirds of these residents living south of the river. Residential areas in the study area include Redhill, Hunderton, and Hinton.

3.2.5 A strategic location to the south of the city at Lower Bullingham has been identified as an expansion area for urban growth. This Southern Urban Expansion will be a mixed use development, with around 1,000 new homes.

Industrial

3.2.6 The Hereford Enterprise Zone (HEZ) is located to the south-east of the city, on the Rotherwas Industrial Estate. The Enterprise Zone has a focus on the defence and security sector, and has been named Skylon Park. It is a 71 ha site, and is made up of three development areas; South Magazine, North Magazine, and Chapel Road.

3.2.7 The HEZ is located on the B4399, and benefits from the Rotherwas Access Road, which was completed in June 2008. This access road provides the estate with access to the A49, which connects with the M50 to the south, providing access to the M5.

Agriculture

3.2.8 A significant portion of the land within the South Wye study area is rural in nature, with farms located in Grafton, Merryhill, and along Haywood Lane.

3.3 Highway Network

3.3.1 The main roads located south of Hereford are the A49 Ross Road, the A465 Abergavenny Road, the B4399 Rotherwas Access Road, and the B4349 Clehonger Road. These are illustrated on Figure 4, which can be found at the rear of this report. All these single carriageway roads, of varying standard, are County Roads with the exception of the A49, which is a Trunk Road falling under the responsibility of the Highways Agency (Area 9).

3.3.2 There are traffic related issues currently in the Belmont area to the south of Hereford town centre. This is particularly evident on the approach to the junction of the A49(T) and the A465, near what is locally referred to as the Asda Roundabout.

3.3.3 There are also two minor roads located in the countryside. These are known as Grafton Lane and Haywood Lane. Grafton Lane is accessed from the A49(T) and Haywood Lane is accessed from the A465. Both are linked to the south near the hamlet of Callow, and a previous cross-link further north along Merryhill Lane has been altered allowing access to residents only. At peak times during weekdays there is a tendency for Grafton Lane and, in particular, Haywood Lane to be used as cross-country ‘rat runs’.

3.4 Pedestrian and Cycling

3.4.1 The South Wye area is relatively well served with walking and cycling facilities as shown in Figure 5 (rear of report). This includes the Great Western Way shared use path, linking south-west Hereford to the city centre and beyond, and the recently opened Connect 2 link between the Hereford Enterprise Zone and the city centre.

3.4.2 The walking facilities in the area are generally good, with footpaths, drop kerbs, lighting, and crossings in appropriate places. However, the large volume of traffic on the A465 and A49 causes severance within the community and wide junction mouths at several locations further detract from walking.

3.4.3 As shown in Figure 5, the area is well served by cycling routes, and more than 10% of people cycle to work in several parts of the South Wye area (2011 Census). However, there are gaps in the cycling network, including adjacent to the A465 and A49, and limited east to west links.

3.4.4 There are currently no footpath or cycle paths on the A49 and A465 at either end of the proposed Southern Link Road.

3.5 Public Transport

3.5.1 The existing bus routes in the area are shown in Figure 6, at the rear of this report. There are frequent Monday to Saturday daytime services calling at Belmont, Hunderton, Newton Farm, Redhill, and Putson. However, Rotherwas and Lower Bullingham are less well served and many bus routes have long journey times and an unreliable service due to traffic congestion.

3.5.2 Bus occupancy surveys were conducted during 2012 across the city centre at 11 cordon sites. The survey showed the busiest route during the AM (08:00-09:00) and IP (11:00-12:00) periods was Belmont Road north of Belmont Avenue (Inbound), with a total of 105 passengers in the AM peak and 91 passengers between 11:00 and 12:00.

3.5.3 In May 2014, Herefordshire Council reported on a consultation on Herefordshire bus services, stating the need to save one million pounds from the transport budget over the next two years. Over two thirds of respondents were currently able to access their bus stop within 10 minutes. If their main bus service was no longer available 37% would travel by car and 10% by taxi, which would lead to further traffic congestion in the area.

3.5.4 Hereford railway station, managed by Arriva Trains Wales, is located north of the city centre, providing direct services to Worcester, Birmingham and Cardiff. The railway station has a car park with 175 spaces and 50 cycle storage spaces, and the bus services that serve south of the Wye also serve the city centre, within walking distance to the railway station.

3.6 Traffic Flows

3.6.1 Base year (2012) traffic flows on key roads, extracted from the validated Herefordshire Council SATURN model, developed based on actual traffic counts in 2012, are shown in Table 1 below. The AM and PM peak demand flows are also illustrated on Figure 7 at the rear of this report.

Link	Dir	AM (08:00-09:00)	IP (Avg 10:00-16:00)	PM (17:00-18:00)	24hr AADT
A465 west of SLR	NE	207	234	317	3,140
A465 west of SLR	SW	281	220	318	3,273
A465 Belmont Rd west of Tescos Roundabout	NE	416	370	548	5,377
A465 Belmont Rd west of Tescos Roundabout	SW	522	351	663	5,907
A465 Belmont Rd west of Walnut Tree Ave	NE	622	700	775	8,907
A465 Belmont Rd west of Walnut Tree Ave	SW	681	675	1,192	10,139
A465 Belmont Rd west of Belmont Roundabout	NE	1,036	749	722	10,341
A465 Belmont Rd west of Belmont Roundabout	SW	648	757	1,156	10,484
Walnut Tree Avenue	EB	285	249	353	3,591
Walnut Tree Avenue	WB	404	249	380	4,024
A49 north of Belmont Roundabout	NB	2,308	1,685	1,844	23,833
A49 north of Belmont Roundabout	SB	1,735	1,733	2,522	24,405
A49 north of Walnut Tree Ave	NB	1,320	784	1,025	12,329
A49 north of Walnut Tree Ave	SB	772	710	891	9,769
A49 Ross Road south of Walnut Tree Ave	NB	1,039	564	728	9,111
A49 Ross Road south of Walnut Tree Ave	SB	633	629	990	9,086
Holme Lacy Road east of A49	EB	552	419	375	5,615
Holme Lacy Road east of A49	WB	738	519	884	8,344
The Straight Mile	EB	287	133	279	2,587
The Straight Mile	WB	241	139	296	2,543
B3499 Rotherwas Access Road	NB	223	71	71	1,363
B3499 Rotherwas Access Road	SB	93	68	198	1,323

Table 1: 2012 Traffic Flows

3.6.2 The results show the highest flows occur on the A49 north of Belmont Roundabout, A49 north of Walnut Tree Ave, and A465 Belmont Road west of Belmont Roundabout.

3.6.3 An assessment of link capacity according to DMRB guidance TA79/99 reveals that all links were operating within capacity in 2012.

3.6.4 A high proportion of short distance trips within Hereford are made by car, leading to congestion, less physical activity and obesity. In addition, there is a low level of resilience in the network, and blockages on the River Wye crossing can cause severe congestion.

3.6.5 If nothing is done, traffic flows on the A49 and A465 are forecast to increase over time as a result of economic growth. We can therefore expect increased congestion along the A49 and A465, causing increased severance, lower accessibility to public transport, and further social deprivation as a result of constrained economic and housing development.

3.7 Accidents

3.7.1 An accident plot showing accidents within the South Wye area can be found in Figure 8 at the rear of this report, and a summary is shown in Table 2.

3.7.2 During the 5 year period from January 2009 to December 2013, there were a total of 281 road casualties in the study area. There were 3 fatal casualties, 22 serious, and 256 slight. In addition, 38 of the casualties involved pedestrians and 51 involved cyclists.

Year	All Casualties	Slight	Serious	Fatal	Pedestrian	Cyclist
2009	96	87	8	1	11	15
2010	53	51	2	0	5	10
2011	54	50	2	2	15	6
2012	41	35	6	0	2	11
2013	37	33	4	0	5	9
TOTAL	281	256	22	3	38	51

Table 2: Casualties in South Wye Area

3.7.3 The overall trend in accidents and casualties the South Wye area is downward. As could be expected, there are clusters of accidents around major junctions, and in particular the Belmont Roundabout.

3.7.4 There is a notable cluster of pedestrian casualties on the A465 adjacent to Our Lady's Church, and a cluster of cycle casualties at the junction of Hoarwithy Road and Holme Lacy Road, which has recently been the subject of a road safety scheme. There are also a string of cycle casualties on the A465 to the west of the Tesco's roundabout.

3.8 Statutory Undertakers

3.8.1 The following Statutory Undertakers currently have apparatus within the area identified for the SLR routes:

- British Telecom (BT) has underground and overhead cables in the area, which generally run north to south along the existing road/lane network.
- National Grid (gas) have a medium pressure gas main on the B4349 Clehonger Road.
- Western Power Distribution (WPD) have underground and overhead cables ranging from Low Voltage to High Voltage (up to 66kV). These cables generally cross east to west between the A49(T) and the A465. Route Options SC2 and SC2A are affected less than SC5 and SC7.
- Dwr Cymru Welsh Water have water supply mains in the area, which generally run north to south along the existing road/lane network.

4 EXISTING CONDITIONS – ENVIRONMENTAL

4.1 Air Quality

4.1.1 Air quality in the area immediately surrounding the SLR routes is generally good. Road transport is the dominant local source of pollutants.

4.1.2 Herefordshire Council has declared two Air Quality Management Areas (AQMAs) and is in the process of assessing the determination of a third. These are areas in which one or more of the objectives for ambient air quality set out in the UK's Air Quality Strategy are not being met. In Hereford, all AQMAs are in built up areas, and have been declared as a result of the exceedance of the objective for annual mean nitrogen dioxide concentrations.

4.1.3 The closest AQMA to the proposed scheme is Hereford City AQMA, in which monitored roadside concentrations of nitrogen dioxide exceed the objective (40µg/m^3) by some margin and show no strong trend over time. This lies 2.6km to the north of the scheme and is connected to the scheme via the A49 and the A465.

4.1.4 Baseline air quality monitoring has been undertaken at 11 locations across the study area in order to determine existing baseline nitrogen dioxide concentrations in ambient air. These locations are illustrated in Figure 9.

Figure 9: Location of Diffusion Tube Monitoring Sites

4.1.5 The results from the air quality monitoring are shown in Table 3. The standard for NO_2 as defined in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 (Defra in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland) is 40

Sample Site	NO_2 Concentration / $\mu g/m^3$
Belmont Road	15.23
Jct. A465, B4349	25.19
B4349	30.82
Belmont Road Roundabout	19.63
Merryfield Farm	12.42
A49, B4399 Roundabout	23.40
A49 Railway bridge	38.66
Grafton Village	8.68
Grafton Lane	7.56
Victoria Street, Air Quality Monitoring Station	47.68
Wye River Monitoring Station	6.20

Table 3: Baseline Nitrogen Dioxide Concentrations, monitored across study area 4th February to 6th May 2014

4.1.6 It can be seen that at certain roadside locations, concentrations of nitrogen dioxide can be elevated. Air quality monitoring has indicated that air quality along the proposed scheme options is generally good, though poor in selected areas of Hereford town centre.

4.2 Noise

4.2.1 The study corridor for the SLR is primarily rural, agricultural land with some residential properties and farm buildings. The Hereford to Cardiff railway line bisects the study corridor. The existing noise climate is dominated by local sources (e.g. agricultural activities), road traffic noise from the A49 and A465, and frequent but transient railway noise. Towards the western and eastern extents of the scheme, the relative contribution from existing road traffic noise becomes more significant.

4.2.2 The final extents of the wider study corridor used in the assessment will depend on the roads, which are predicted to experience a significant change in traffic flows (as defined in DMRB guidance). However, it is likely that roads within the urban area of Hereford, namely the A465 and A49, to the northeast of the new road will form part of the study area. This area is predominately residential with some commercial activity, which is likely to influence the existing baseline noise environment.

4.2.3 A number of noise sensitive receptors (NSRs) including residential properties, schools, public footpaths and churches have been identified within the study corridor.

4.2.4 The Noise Action Plan for Major Roads (outside agglomerations) published by DEFRA (March, 2010) shows there are Important Areas (IAs) within the likely wider study corridor. These are located at:

- A465 Tesco Roundabout
- A465 adjacent to Monkscroft Drive
- A465 to the east of the Great Western Way
- A465 between Walnut Tree Avenue and Asda Roundabout

4.2.5 There is also a First Priority Location (FPL) on the A49 between the River Wye Crossing and the Newmarket Street Roundabout. The presence of IAs and FPLs indicate that noise from road traffic is high along the main roads in Hereford.

4.2.6 No existing issues with regard to complaints from existing noise sources in the area have been identified at this stage.

4.3 Greenhouse Gases

4.3.1 The release of greenhouse gases (GHGs) into the atmosphere, as a result of human activity, is responsible, at least in part, for global warming. Carbon Dioxide (CO_2), whilst not the most potent GHG, accounts for around 80% of GHGs produced nationally.

4.3.2 The Climate Change Act commits the UK to achieve an 80% carbon emission reduction by 2050 against its 1990 emission baseline.

4.3.3 Emissions from road transport forms an important component of this carbon emissions reduction target, particularly as new technologies allow road transport to be less reliant on fossil fuels.

Existing and Baseline Knowledge

4.3.4 Herefordshire's carbon footprint in 2010 was 1.61 million tonnes (MtCO2). This is equal to 9.0 tonnes per head of population (per capita) in the county. For comparison the UK as a whole emits 7.6 tonnes of CO2 per capita and the West Midlands 7.4 tonnes per capita.

4.3.5 Figure 10 shows the distribution of these emissions across the major emission categories in Herefordshire.

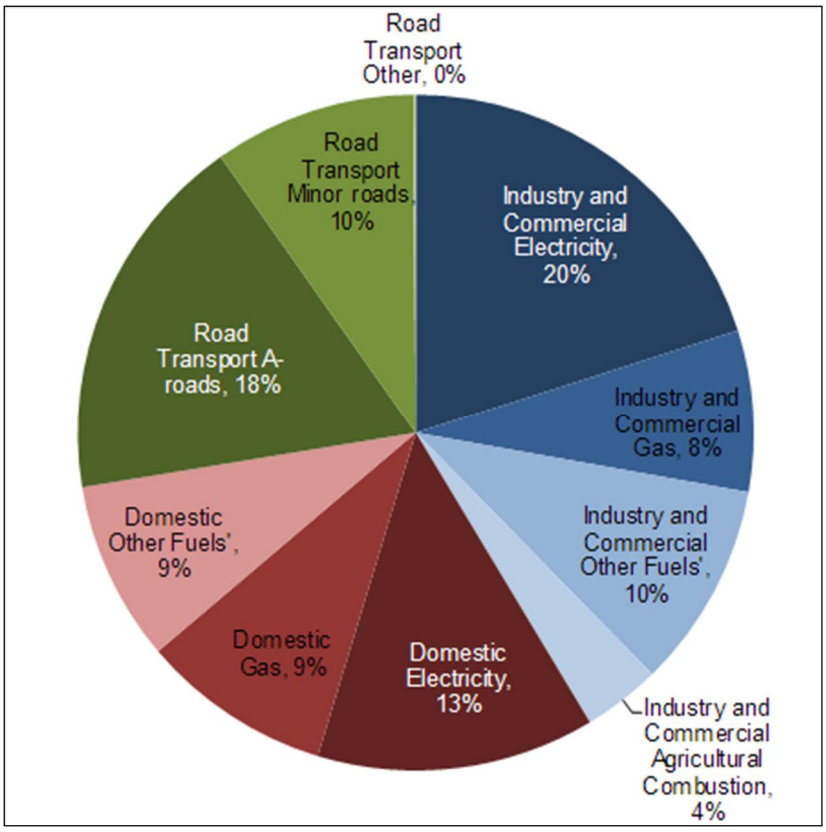


Figure 10: Proportion of CO_2 emissions in Herefordshire by source (2005 to 2010)

4.3.6 Herefordshire County's total carbon emissions reduced by 7% between 2005 and 2010. This is compared to a carbon emission reduction of 8% across the UK in the same period.

4.3.7 A detail breakdown of Herefordshire's CO2 emissions show that between 2009 and 2010:

- Industry and commercial recorded 6% CO2 emission increase.
- Domestic recorded an 8% CO2 emission increase.
- Road transport saw no change in CO2 emissions.

4.4 Landscape/Townscape

Study Area

4.4.1 The study area for landscape effects will include the route corridor and the wider landscape context within which the project may influence landscape character and visual amenity.

Baseline

Landscape Character

4.4.2 Landscape character is what makes an area unique. It is defined as 'a distinct, recognisable and consistent pattern of elements, be it natural (soil, landform) and/or

human (for example settlement and development) in the landscape that makes one landscape different from another, rather than better or worse.

4.4.3 The essential components of landscape character are:

- Landscape elements are the dominant features which characterise, contribute to or detract from the overall landscape impression, i.e. the built form, the landform, land use, vegetation, water, field patterns, walls etc. They are quantifiable and can be described.
- Landscape types are identifiable at the broader scale and are understood in terms of areas with a homogeneous character based on geology, topography, geomorphology, vegetation and / or land use or dominant elements, e.g. moorland, rolling upland, historic parkland, urban. These are elements or groups of elements which can be classified as a landscape type of a particular quality and value. Sensory experiences, e.g. tranquillity and wildness, are also considered as part of the overall makeup of the character type.

4.4.4 The study area lies within Natural England's National Character Area (NCA) 100: South Herefordshire Lowlands and adjacent to NCA 104: South Herefordshire and Over Severn.

4.4.5 The key landscape characteristics of South Herefordshire Lowlands [NCA 100] are considered to be:

- Wide river valleys
- Intensive arable farming with low hedges
- Undulating valley sides
- Steep wooded hills
- Frequent orchards and hop yards
- Historic parks
- Old Red Sandstone and timber framed buildings
- Large farmsteads and frequent hamlets

4.4.6 The key landscape characteristics of South Herefordshire and Over Severn [NCA 104] are considered to be:

- Fertile, undulating farmland with extensive arable farming
- Substantial red sandstone farmsteads
- Large to medium fields with variable, commonly low hedges
- Ageing hedgerow trees
- Numerous churches and manor houses in small hamlets
- Clusters of parkland trees
- Narrow, meandering floodplain with low hedges, ditches, scattered mature trees and willow pollards
- Contrasting steep wooded slopes and gentle riverside slip-off slopes

4.4.7 Potentially significant landscape issues are likely to arise for all routes as the scheme involves construction and operation of new highway infrastructure in a rural setting. The rolling open character of the topography, with numerous small woodland copses, hedgerow trees and low hedges, will need to be carefully considered in terms of alignment and reinstatement.

Visual Amenity

4.4.8 Visual receptors include residential and commercial properties, and users of public amenity areas, rights of way, roads and the railway. Although the route options do not pass through or near large centres of population, there are a number of residential properties (either individual or as part of a hamlet) that are likely to be affected by the routes. Visibility maybe increased through the removal of trees and hedgerows and the contouring of the land.

4.4.9 Visual receptors, such as users of buildings, recreational spaces, footpaths and transport routes, have differing sensitivities to their visual environment. Generally, this is dependent upon their interest in the visual environment, their viewing opportunity and duration, and the context of the views.

4.4.10 The residential visual receptors have been grouped into seven clusters, based on their proximity to one another.

- Group A includes Grafton Inn; Grafton Villa; Lavender Cottage and other nearby buildings.
- Group B includes The Green; Newhouse Farm; Veddoes Farm and other nearby buildings.
- Group C includes Ashley Cottage; Garlands Cottage; Merry Cottage; Graftonbury Cottage; Cedar Folly and other nearby buildings.
- Group D includes Glendale; Vine Cottage; Merryhill Cottage; Merryhill Park; Merryhill Farm and other nearby buildings.
- Group E includes Haywood Lodge; Haywood Lodge Farm House; Haywood Lodge Cottages; the Granary and other nearby buildings.
- Group F includes Abbey Cottages; Highfield; Whiteholme; and other nearby buildings.
- Group G includes Broadmeadow Farm; Golden Post; Golden Post House; Copper Beeches and other nearby buildings.

4.4.11 Other receptors to be considered under effects on visual amenity will include users of the railway, A49; A465; B4349; local lanes [Haywood Lane; Grafton Lane] and public rights of way [National Cycle Network Route 46; Byway on the eastern section of HA3; Bridleway from Haywood Farm to Golden Post via Broadmeadow Farm; Footpaths HA3 (western section), HA5, HA7, and GF3].

4.5 Historic Environment

Scheduled Monuments

4.5.1 There are two Scheduled Ancient Monuments within 2km of the proposed routes, the medieval churchyard cross at Bullinghope Old Church, to the north of Rotherwas Access Road; and the Iron Age hillfort of Dinedor Camp, to the south of Rotherwas Access Road.

Listed Structures

4.5.2 Options SC2/2A is located approximately 150m from a Grade II milestone on the A465 and approximately 220m from the agricultural structures at Clehonger Court, which are Grade II Listed Buildings. The options are also located approximately 300m from the Listed Building complex at Haywood Hall Lodge, containing one Grade II* and three Grade II structures and approximately 350m from the Grade II Listed Buildings at Merryhill.

4.5.3 Option SC5 is located approximately 220m from the Grade II Listed Buildings at Merryhill and approximately 400m of the Listed building complex at Haywood Lodge, containing one Grade II* and three Grade II structures.

4.5.4 Option SC7 is located approximately 200m of the Grade II Listed Buildings at Merryhill and approximately 520m of the Listed building complex at Haywood Lodge, containing one Grade II* and three Grade II structures.

Archaeology

4.5.5 Options SC2/2A would traverse four fields from which archaeological artefacts have been recovered.

4.5.6 Option SC5 would traverse the Medieval site in Field 15 and two cropmarks in Fields 10 and 34, as well as four fields from which significant archaeological artefacts have been recovered.

4.5.7 Option SC7 would traverse a cropmark in Field 10, as well as four fields from which significant archaeological artefacts have been recovered.

4.6 Biodiversity

4.6.1 Environmental constraints within the study area are illustrated in Figure 11, at the rear of this report.

4.6.2 Due to the lead-in time required for ecological survey, a majority of the ecological surveys and studies have commenced at the time of writing (September 2014) and a summary of the information gathered to date is provided below.

Statutory designated sites

4.6.3 Table 4 lists Special Areas of Conservation (SACs) within 2km of the proposed routes and SACs within 30km of the proposed routes where bats are the qualifying interest.

Name and Designation	Area (ha)	Distance and direction from scheme	Description
River Wye (SAC)	2234.89	1.3 km North	**Annex I habitats that are a primary reason for selection of this site** 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation **Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site** 7140 Transition mires and quaking bogs **Annex II species that are a primary reason for selection of this site** 1092 White-clawed (or Atlantic stream) crayfish (*Austropotamobius pallipes*) 1095 Sea lamprey (*Petromyzon marinus*) 1096 Brook lamprey (*Lampetra planeri*) 1099 River lamprey (*Lampetra fluviatilis*) 1103 Twaite shad (*Alosa fallax*) 1106 Atlantic salmon (*Salmo salar*) 1163 Bullhead (*Cottus gobio*) 1355 Otter (*Lutra lutra*) **Annex II species present as a qualifying feature, but not a primary reason for site selection** 1102 Allis shad (*Alosa alosa*)
Wye Valley Woodlands (SAC)	528.7	21 km South	**Annex I habitats that are a primary reason for selection of this site** 9130 *Asperulo-Fagetum* beech forests 9180 *Tilio-Acerion* forests of slopes, screes and ravines * Priority feature 91J0 *Taxus baccata* woods of the British Isles * Priority feature **Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site** Not applicable. **Annex II species that are a primary reason for selection of this site** Not applicable. **Annex II species present as a qualifying feature, but not a primary reason for site selection** 1303 Lesser horseshoe bat
Wye Valley & Forest Of	144.02	22 km South East	**Annex I habitats that are a primary reason for selection of this site**

Name and Designation	Area (ha)	Distance and direction from scheme	Description
Dean Bat Sites (SAC)			Not applicable **Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site** Not applicable. **Annex II species that are a primary reason for selection of this site** 1303 Lesser horseshoe bat *Rhinolophus hipposideros* 1304 Greater horseshoe bat *Rhinolophus ferrumequinum* **Annex II species present as a qualifying feature, but not a primary reason for site selection** Not applicable.

Table 4: SACs within 2km of the proposed routes and within 30km of the proposed routes where bats are the qualifying interest

4.6.4 Other statutory designated sites that are present within 2 km of the scheme are listed in Table 5.

Name	Map code	Designation	Area (ha)	Distance and direction from scheme	Description
Belmont meadows	B	LNR	5.82	400 m North	Described as 'grassland habitats' in Natural England citation
River Wye	A	SSSI	1404.8	1.3 km North	The River Wye (Lower Wye) is a rare example of a near natural, large western eutrophic river which, unlike many rivers of a similar type, has not been subject to significant modification from human activities. The river is of special interest for three main aquatic plant community types - rivers on sandstone, mudstone and hard limestone, clay rivers and lowland rivers with minimal gradient, as well as for certain flowering plants and bryophytes. Key species: Allis shad (*Alosa alosa*) Twaite shad (*Alosa fallax*) Sea lamprey (*Petromyzon marinus*) Brook lamprey (*Lampetra planeri*) River lamprey (*Lampetra fluviatilis*) Atlantic salmon (*Salmo salar*) Bullhead (*Cottus gobio*) Grayling (*Thymallus thymallus*) Common otter (*Lutra lutra*) Atlantic stream crayfish (*Austropotamobius pallipes*) Freshwater pearl mussel (*Margaritifera margaritifera*)

Table 5: Statutory Designated Sites within 2km of the scheme

Non-statutory designated sites

4.6.5 Several non-statutory designated sites are present within 2 km of the scheme. These include Roadside Verge Nature Reserves, Sites of Importance for Nature Conservation (SINCs), and Special Wildlife Sites (SWSs). These are presented in Table 6 in map code order. The information presented below has been obtained from Herefordshire Biological Records Centre's designated sites registers.

Name	Map code	Designation	Approximate distance and direction from scheme	Description (extracts from HBRC designated sites register)
Roadside Verge Nature Reserve 16	C	Roadside Verge Nature Reserve	1.6 km South East	Designated in 1975 for green hellebore (*Helleborus viridis*). Annual Report 2000 (Herefordshire Nature Trust)
Meadow south of St Johns Cottage	SINC_39	SINC	500 m North	Small herb-rich meadow
Belmont Pool & Environs	SINC_40	SINC	800 m North	Area of standing water fed by Newton Brook. The western end is surrounded by Newton Coppice; the eastern end which is used for fishing has an edging of mature trees and has an island in the middle.
Newton Brook	SINC_41	SINC	900 m North	The Register states "Newton Brook forms part of the eastern boundary of the city. It flows in and out of Belmont pool, then continues towards the city bounded by alder until it reaches the built-up area where it becomes canalised and edged with hawthorn. The brook then passes through a small wet area with willow just before flowing into the River Wye opposite the water intake at Broomy Hill."
Newton Farm Wet Woodland	SINC_43	SINC	400 m North	The Register states "A small damp woodland dominated by ash standards with hazel coppice in places. Bramble, ferns, bluebells, wood anemones and marsh marigold were seen. Holly was growing at the south-west end of the wood by a shallow pond. The pond seems to be the source of the stream that flows through the wood. Because of its small size, the wood was not included in the NCC ancient woodland survey, but the variety of plants would suggest this site has been woodland for a considerable length of time."
Newton Farm Open Space	SINC_44	SINC	400 m North	The Register states "A planting by the City Council of standards of various trees species on the Open Space at Newton Farm..."

Name	Map code	Designation	Approximate distance and direction from scheme	Description (extracts from HBRC designated sites register)
Pond north of Newton Farm Open Space	SINC_45	SINC	900 m North	The Register states "A shallow pond on the edge of the built up area. Because the water levels have been reduced it is floristically uninteresting…"
Newton Farm Wet Woodland Stream	SINC_46	SINC	900 m North	The Register states "A small stream originating in Newton Farm Wet Woodland. It joins the Newton brook at the edge of the built up area..."
Woodland to South of Newton Farm	SINC_47	SINC	200 m North	The Register states "A narrow woodland with oak standards with bramble and bluebells underneath…"
Great Western Way	SINC_48	SINC	900 m North	The Register states "500383 - Great Western Way above Frome Avenue and between Stanberrow Road and Charlton Avenue. Linear woodland developing trees and scrub with good cover from canopy to ground. 501385 - Great Western Way below Belmont Road has fairly good scrub with blackberry, privet, blackthorn, rose, birch and hazel with a few trees (oak, ash and pine). 501387 - Mature trees lining Belmont Road on both sides of Great Western Way Bridge on the town side with sycamore, elm, ash and hawthorn and ivy on ground. 501390 - Good scrub cover on both sides of the path. Sallow, goat willow, rose, hawthorn, sycamore, elder and field maple. Some is planted, some (mostly ash and sycamore) has self-grown. 501392 - Stone arch over Wye path has rustyback and hart's tongue ferns and creeping cinquefoil with low scrub of dogwood, hawthorn, sallow and rose. West embankment of Great Western Way below Wye Bridge with elm, hawthorn and blackberry. Grassland along this stretch mostly rye-grass. Further on, on both sides there is introduced scrub with some native scrub species."
Grafton House Orchard	SINC_50	SINC	600 m North	The Register states "About 53 trees thought to be approx. 120 years old. Some are collapsing but most appear to be fine, if unproductive. The grassland, which is occasionally grazed, is semi-improved over most of the orchard but at the back becomes unimproved…"

Name	Map code	Designation	Approximate distance and direction from scheme	Description (extracts from HBRC designated sites register)
Land west of Great Western Way South of Wye	SINC_51	SINC	600 m North	The Register states "Plantation alongside the railway is a mix of native and exotic tree species with crack, white and goat willow, horse and sweet chestnut, ash, birch, alder, lime, field maple, sycamore, beech and grey poplar. The grass under these trees is species-rich…"
Land east of Great Western Way South of Wye	SINC_52	SINC	800 m North	The Register states "Edge of very sheltered grassland between housing at Beaufort Avenue and bottom of playing fields of Haywood School, the last part of the Great Western Way dismantled railway and the current British Rail line. Lesser knapweed, with abundant cat's ear and hogweed, also meadowsweet, meadow buttercup, sorrel, Yorkshire fog, red fescue, cock's-foot and meadow foxtail. The outgrown hedge on two sides of this triangle (on railway embankments) is species-rich with frequent spindle, also dogwood, hawthorn, blackthorn, rose, blackberry, elder, oak, crack willow and sallow and some snowberry, honeysuckle, black and white bryony. The southern embankment of railway that boundaries the wedge site abuts a 15m strip of unimproved grassland in otherwise semi-improved pasture…"
Active Railway South of Wye	SINC_54	SINC	400 m North	The Register states "Part of the Newport-Shrewsbury railway line which passes through the city. It has several areas of scrub which are of importance to wildlife."
Withy Brook	SINC_55	SINC	200 m North	The Register states "It forms a major part of the south-eastern boundary of the city. Parts of the stream near the river have quite dense shrub on the banks."
Land to north of Withy Brook	SINC_56	SINC	800 m North	The Register states "An area of grazed land with patches of bramble adjoining the Withy Brook near Bullinghope Court. Trees were still standing on the banks of the brook…"
Cage Brook Valley and Woodlands	SO43/12	SWS	1.9 km West	The register states: "Lady's and Broomy rise Coppices. Ruckhall and Tuck Woods. An area of semi-natural woodland and unimproved grassland in the valley of the Cage Brook. Oak and ash are the dominant trees with cherry, and the understorey is hazel. The ground flora includes greater tussock-sedge and monk's-hood, which are both uncommon in Herefordshire."

Name	Map code	Designation	Approximate distance and direction from scheme	Description (extracts from HBRC designated sites register)
Clehonger Village Pond	SO43/15	SWS	700 m West	The register states: "An open pond, with a good flow of water. 13 plant species occur and leech, newt, mallard, coot and swan have been recorded."
Breinton Wood	SO43/17	SWS	1.5 km North	The register states: "A mixed woodland with oak predominate and other species such as cherry and coppiced field maple. The ground flora includes stinking iris with abundant wild daffodils and bluebells. The site forms a good habitat for butterflies: the white letter hairstreak is amongst those species recorded."
Hayleaseow Wood, Newton Coppice and Spring Grove	SO43/18	SWS	Immediately adjacent to the scheme	The register states: "An area of ancient woodland, with a small number of introduced species. Oak is dominant, with hazel coppice."
Belmont wood and Hunderton Rough SWS	SO43/19	SWS	1.1 km North	The register states: "A mixed woodland with a dense understorey. Species present include oak, ash, yew and other conifers"
Knockerhill Wood and Adjoining Woodland	SO43/20	SWS	1.0 km South	The register states: "Remnants of ancient woodland which have been interplanted with conifer and sweet chestnut in parts. There is a good mixture of species. Oak, ash and birch are dominant with cherry, field maple and wild service-tree also present."
Hopleys Wood	SO53/01	SWS	1.8 km South East	The register states: "An ancient semi-natural woodland, mostly ash standards with some oak and coppiced wych elm and hazel. The ground flora includes wood spurge, bluebell and wood anemone."
Reeces Wood	SO53/03	SWS	1.3 km South East	The register states: "An ancient semi-natural woodland, mainly ash and oak standards with coppiced ash. The ground flora includes dog's mercury and bluebell."
Roadside bank near Twyford	SO53/04	SWS	1.8 km South East	The register states: "Roadside banks on both sides of the road with a rich flora, including primrose and green helleborine."
River Wye	SO53/06	SWS	1.3 km North	See SSSI and SAC descriptions

Table 6: Non-statutory designated sites present within 2 km of the scheme

Notable Habitats

4.6.6 The survey area is rural in nature and is largely comprised of arable land and improved pasture, with fields separated by both species-rich and species-poor hedgerows. Both Grafton Lane and Haywood Lane bisect the survey area north-

south, and the Hereford to Newport railway line runs north-east to south-west through the site. Two minor tributaries of the River Wye are present within the survey area (Newton Brook and Withy Brook), both of which are designated as SINCs further downstream. Several ponds are present both within the survey area and in the wider study area.

4.6.7 Fragmented areas of woodland are present within the survey area, the largest of which is Hayleasow Wood/Newton Coppice (designated SWS). This woodland is mapped by Natural England as Ancient Woodland (ancient semi-natural woodland in some areas and ancient replanted woodland in others). It is also mapped by Natural England as deciduous woodland BAP priority habitat. Grafton Wood is the second most substantial woodland within the survey area, also mapped as deciduous woodland BAP priority habitat. Three smaller pockets of unnamed woodland present within the survey area are also mapped as deciduous woodland BAP priority habitat. Aside from Hayleasow Wood/Newton Coppice, none of these other woodlands are currently mapped by Natural England as Ancient Woodland.

4.6.8 An updated Ancient Woodland Inventory for Herefordshire has recently been made available to Herefordshire Biological Records Centre (July 2014). This updated inventory revises the current inventory by analysing the continuity of woodland cover of land parcels in Herefordshire as indicated by a time sequence of several geo-rectified digitised maps and aerial photography. Woodlands in whole or part which are missing from the current inventory but are depicted as woodland on the maps and aerial photographs were considered by this updated work to have sufficient historical continuity to be put forward as 'candidate ancient woodlands'. Two such 'candidate ancient woodlands' are present within the survey area, including Grafton Wood. One further unnamed woodland is mapped as possible ancient woodland, with map evidence being equivocal and further evidence being required before it is put forward as a candidate addition to the inventory. Several other 'candidate ancient woodlands' are present within the wider 2 km study area. Further assessment is proposed to evaluate the ecological attributes of the 'candidate ancient woodlands' within the survey area.

4.6.9 Woodpasture and parkland BAP priority habitat is mapped in the wider 2 km study area but is not mapped within the survey area. However, the field layer vegetation within Grafton Wood is of an open grassland nature, rather than a woodland ground flora. This is consistent with it having been used as a wood pasture in the past.

4.6.10 Several orchards are present within the survey area, which are of various ages and subject to different management regimes. All of the orchards within the survey area are mapped by Natural England as traditional orchard BAP priority habitat.

Protected/notable species

Badgers

4.6.11 HBRC returned records of road-kill badgers (*Meles meles*) to the east and west of the 2 km study area. The woodlands, hedgerows and railway embankments provide suitable sett-building habitats.

4.6.12 Badger surveys were undertaken in July 2014, with the survey area encompassing 500 m to either side of the scheme where accessible. Badger activity was considered to be low, with five outlying setts identified approximately 500 m from the scheme and a single outlying sett identified adjacent to the scheme, near to the A465.

Dormice

4.6.13 HBRC returned several records of dormice (*Muscardinus avellanarius*) from 2008 within the 2 km study area. All were field signs and presumably from the same survey, as all records were located between approximately 200 m and 400 m north of scheme, adjacent to railway. The woodlands and hedgerows provide suitable dormouse habitat.

4.6.14 A total of 300 dormouse tubes were deployed in May 2014 and will be checked a total of four times with the final check undertaken in November 2014. Three of the checks have so far been undertaken at the time of writing and no evidence of dormouse found, however absence cannot be confirmed until the surveys have been completed.

Otters

4.6.15 HBRC returned several records of otters (*Lutra lutra*) within the 2 km study area. East of the A49, signs were recorded on Withy Brook approximately 1.4 km north east of the scheme and also on Red Brook further east. Records of otter road-kill were returned from the A465 near to Belmont Pools and approximately 1.1 km south of the scheme on the A49. Although small brooks, both Newton Brook and Withy Brook have the potential to form part of the territory of otters in the local area; and the desk study records indicate that otters are using all of these tributaries of the river Wye.

4.6.16 Otter surveys were deemed necessary on Newton Brook and Withy Brook. Otter surveys were undertaken in September 2014 and encompassed 300 m upstream and 300 m downstream of the scheme where accessible. Otter spraint was recorded on Withy Brook. Water voles

4.6.17 HBRC returned no records of water voles (*Arvicola amphibius*) within the 2 km study area. Newton Brook and Withy Brook contain both shaded and more densely vegetated sections and on-line ponds which are more suitable for the species. The brooks are however fairly isolated, flowing through urban areas downstream before reaching the river Wye, and reaching their source either on or adjacent to the survey area.

4.6.18 Water vole surveys were deemed necessary on Newton Brook and Withy Brook. Water vole surveys were undertaken in September 2014 and encompassed 300 m upstream and 300 m downstream of the scheme where accessible. No definitive evidence of water vole was recorded.

Bats

4.6.19 The scheme falls within habitats that are considered to be of medium quality for bat species, consisting largely of arable and pasture farmland, separated by hedgerows and pockets of woodland.

4.6.20 HBRC returned recent (2004-present) records for 13 of the 17 bat species resident within the UK. These data are summarised in Table 7 . The importance to the county bat population of areas of semi-natural habitat in the wider landscape (such as the Wye valley and larger areas of woodland to the south west) is reflected in these records.

Species	Present within 10 km	Present roosting within 10 km	Comments
Common pipistrelle (*Pipistrellus pipistrellus*)	Yes	Yes	Major roost present approximately 1.9 km west of the scheme, adjacent to the river Wye within Cage Brook valley.
Soprano pipistrelle (*Pipistrellus pygmaeus*)	Yes	Yes	Major roosts present adjacent to the river Wye; in Cage Brook valley, Fownhope and Credenhill.
Nathusius pipistrelle (*Pipistrellus nathusii*)	Yes	No	Two records returned only
Brown long-eared bat (*Plecotus auritus*)	Yes	Yes	
Grey long-eared bat (*Plecotus austriacus*)	No	No	
Natterer's bat (*Myotis nattereri*)	Yes	Yes	
Whiskered bat (*Myotis mystacinus*)	Yes	Yes	
Brandt's bat (*Myotis brandtii*)	Yes	No	
Alcathoe bat (*Myotis alcathoe*)	No	No	
Daubenton's bat (*Myotis daubentonii*)	Yes	Yes	
Bechstein's bat (*Myotis bechsteinii*)	No	No	
Noctule (*Nyctalus noctula*)	Yes	Yes	
Leisler's bat (*Nyctalus leisleri*)	Yes	No	
Serotine (*Eptesicus serotinus*)	Yes	No	
Barbastelle (*Barbastella barbastellus*)	Yes	No	Two records returned only
Greater horseshoe bat (*Rhinolophus ferrumequinum*)	No	No	No recent records were returned; one record from 2002 detailed the presence of 5 droppings at a site near the river Wye east of the A49.
Lesser horseshoe bat (*Rhinolophus hipposideros*)	Yes	Yes	Several major roosts recorded near to Holme Lacy (adjacent to the river Wye) approximately 5 km east of the scheme; and near large areas of woodland at Whitfield, approximately 7 km to the south west of the scheme.

Table 7: HBRC Bat Records

4.6.21 Some of the HBRC records are located less than 500 m from the scheme. Lesser horseshoe bat, barbastelle, serotine, Leisler's, noctule, long-eared spp., Natterer's, soprano pipistrelle and common pipistrelle were all recorded as present in 2008 approximately 300 m north of scheme, adjacent to the railway. A minor common pipistrelle and long-eared spp. roost has been recorded near to Grafton Lane approximately 200 m south of the scheme.

4.6.22 Surveys are on-going for this species group however to date it has been determined that the site is, in general, 'bat rich' with at least 10 species recorded to date. This includes two Annex 2 species: barbastelle and lesser horseshoe bat. For both species, the records are spread throughout the site, with no 'hotspots' identified.

4.6.23 Foraging and commuting activity levels are considered to be relatively high, with continuous foraging activity recorded at several locations, on several occasions and for several different species. The level of roosting activity recorded to date is limited to two minor soprano pipistrelle roosts in two adjacent orchard trees near to Grafton Lane.

Birds

4.6.24 HBRC returned recent (2004-present) records of the following birds which are protected, priority species, or species of conservation concern. These are presented in Table 8.

Species common name	Species latin name	Designation *
Barn Owl	*Tyto alba*	BAmb, Bern2, CITESA, HBAPCC, HBAPPS, WCA1i
Black-Headed Gull	*Larus ridibundus*	BAmb, HBAPCC
Bullfinch	*Pyrrhula pyrrhula*	BAmb, HBAPCC, HBAPPS, HBAPSR
Common Buzzard	*Buteo buteo*	CITESA, CMS_A2, HBAPCC
Common Cuckoo	*Cuculus canorus*	BRed, Sect.41, UKBAP
Common Kestrel	*Falco tinnunculus*	BAmb, Bern2, CITESA, CMS_A2, HBAPCC, HBAPPS
Common Kingfisher	*Alcedo atthis*	BAmb, BD1, Bern2, HBAPCC, HBAPSR, WCA1i
Common Linnet	*Carduelis cannabina*	Bern2, BRed, HBAPCC, HBAPPS
Common Starling	*Sturnus vulgaris*	BRed
Eurasian Curlew	*Numenius arquata*	BAmb, CMS_A2, HBAPCC, Sect.41, UKBAP
Eurasian Hobby	*Falco subbuteo*	Bern2, CITESA, CMS_A2, HBAPCC, WCA1i
Eurasian Teal	*Anas crecca*	BAmb, CITESC, CMS_A2, HBAPCC, HBAPSR
European Golden Plover	*Pluvialis apricaria*	BAmb, BD1, CMS_A2, HBAPCC, HBAPSR
Fieldfare	*Turdus pilaris*	BRed, HBAPCC, WCA1i
Garden Warbler	*Sylvia borin*	HBAPCC

Species common name	Species latin name	Designation *
Goosander	*Mergus merganser*	CMS_A2, HBAPCC, HBAPSR
Green Woodpecker	*Picus viridis*	BAmb, Bern2, HBAPCC
Grey Partridge	*Perdix perdix*	BRed, HBAPCC, HBAPPS, Sect.41, UKBAP
House Sparrow	*Passer domesticus*	BRed, HBAPCC, HBAPSR, Sect.41, UKBAP
Lesser Redpoll	*Carduelis cabaret*	BRed, Sect.41, UKBAP
Lesser Spotted Woodpecker	*Dendrocopos minor*	Bern2, BRed, HBAPCC, HBAPSR
Marsh Tit	*Poecile palustris*	Bern2, BRed, HBAPCC
Northern Lapwing	*Vanellus vanellus*	BRed, CMS_A2, HBAPCC, HBAPPS, Sect.41, UKBAP
Northern Wheatear	*Oenanthe oenanthe*	BAmb, Bern2, HBAPCC
Peregrine Falcon	*Falco peregrinus*	BD1, Bern2, CITESA, CMS_A2, HBAPCC, HBAPPS, WCA1i
Pied Flycatcher	*Ficedula hypoleuca*	BAmb, CMS_A2, HBAPCC
Raven	*Corvus corax*	HBAPCC
Red Kite	*Milvus milvus*	BAmb, BD1, CITESA, CMS_A2, WCA1i
Redwing	*Turdus iliacus*	BRed, HBAPCC, WCA1i
Reed Bunting	*Emberiza schoeniclus*	BAmb, Bern2, HBAPCC, HBAPPS, Sect.41, UKBAP
Sand Martin	*Riparia riparia*	BAmb, Bern2, HBAPCC
Sedge Warbler	*Acrocephalus schoenobaenus*	HBAPCC, HBAPSR
Sky Lark	*Alauda arvensis*	BRed, HBAPCC, HBAPPS, Sect.41
Song Thrush	*Turdus philomelos*	BRed, HBAPCC, HBAPPS
Spotted Flycatcher	*Muscicapa striata*	Bern2, BRed, CMS_A2, HBAPCC, HBAPPS, Sect.41, UKBAP
Stonechat	*Saxicola torquata*	Bern2, HBAPCC, HBAPSR
Whitethroat	*Sylvia communis*	BAmb, HBAPCC
Yellowhammer	*Emberiza citrinella*	Bern2, BRed, HBAPCC, Sect.41, UKBAP

*BD1= Birds Directive Annex 1; WCA1= Wildlife and Countryside Act Sch 1; UKBAP= UKBAP priority species; Bred= IUCN Bird Population Status- red; Sect.41= Species of Principal Importance under S41 of the NERC ACT; HBAPPS= Herefordshire BAP Priority Species; HBAPCC= Herefordshire LBAP: Conservation Concern Species

Table 8: HBRC Bird Records

4.6.25 The scheme falls within habitats that are considered to be suitable for a common assemblage of farmland birds.

4.6.26 A breeding bird survey was undertaken in order to record the breeding bird assemblage throughout the scheme corridor and to note any protected, priority or species of conservation concern. Six visits were undertaken between 29th April 2014

and 9th July 2014 following Common Bird Census methodologies. Each visit comprised three transect surveys undertaken generally on a consecutive dawn-pre dusk-dawn basis. Barn owls have been recorded flying and likely foraging. A likely barn owl roost has been recorded near to Haywood Lane.

Reptiles

4.6.27 HBRC returned recent (2004-present) records of slow-worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*) within the 2 km study area. The hedgerows, woodlands, grassland and railway embankments are suitable to support common reptile species. Surveys are on-going for this species group. Slow-worms, common lizards and grass snakes (*Natrix natrix*) have been recorded in low numbers. All seven visits have been completed.

Amphibians

4.6.28 HBRC returned a record of great crested newts (*Triturus cristatus*) approximately 2 km east of the scheme. Several ponds are present within 500 m of the scheme which are suitable to support great crested newts. Surveys undertaken in 2014 revealed a medium population of great crested newts to be present. Smooth newts (*Lissotriton vulgaris*), palmate newts (*Lissotriton helveticus*), common frogs (*Rana temporaria*) and common toads (*Bufo bufo*) were also observed.

Invertebrates

4.6.29 HBRC returned one record of a White Clawed Crayfish (*Austropotamobius pallipes*) from 2005 situated within Newton Brook (at Newton Coppice). This species is listed under Annex 2 of the Habitats and Species Directive and is also a Species of Principal Importance and Local BAP Priority species.

4.6.30 HBRC also returned four records of Noble Chafer beetle (*Gnorimus nobilis*) situated approximately 1.5 km from the scheme and two records of Brown-banded Carder Bee (*Bombus (Thoracobombus) humilis*) situated approximately 1 km from the scheme. Both species are LBAP priority species and Species of Principal Importance. HBRC also returned one record of Club-Tailed Dragonfly (*Gomphus vulgatissimus*) situated approximately 1.8 km from the scheme, a LBAP priority species which is also listed on IUCN Red List as a Lower risk - Near Threatened species.

4.6.31 Invertebrate surveys are on-going. Invertebrate sampling of Newton Brook and Withy Brook has so far revealed a species assemblage typical of farmland drainage systems.

4.6.32 To date, a total of five species with current conservation status have been found during terrestrial sampling. The key features assessed as having significant conservation value for invertebrates are a group of veteran apple trees located adjacent to the south of the scheme which contain important wood-decay habitat for saproxylic invertebrates (including the Nationally Scarce large fruit tree bark beetle *Scolytus mali* and the very localised darkling beetle *Prionychus ater*); and veteran oak trees, in particular a hedgerow oak pollard located adjacent to the south of the scheme which also contains important wood-decay habitat, with an associated click beetle species *Procraerus tibialis* currently with British Red Data Book status and Brown Tree Ant *Lasius brunneus*, currently with Nationally Scarce status. Of more local interest for invertebrates to date are the woodlands described in this section, and the hedgerow habitats.

4.6.33 White-clawed crayfish surveys of Newton Brook and Withy Brook have been undertaken during September 2014. This involved daytime stone-turning and refugia searches, detailed habitat assessments and night-time torchlight surveys. No evidence of this species was recorded.

Flora

4.6.34 HBRC returned a record of a bluebell (*Hyacinthoides non-scripta*), and bluebells were also noted to be present within several of the woodlands described in this section. This species is a species of conservation concern in the Local BAP.

4.6.35 HBRC also returned records of mistletoe (*Viscum album*), a priority species on the LBAP, together with species listed in the LBAP as species of conservation concern such as cowslip (*Primula veris*), small-flowered buttercup (*Ranunculus parviflorus*), small-leaved lime (*Tilia cordata*), columbine (*Aquilegia vulgaris*) and grass vetchling (*Lathyrus nissolia*).

4.6.36 The dominant habitats are heavily managed arable and pasture farmland, separated by pockets of woodland and hedgerows. Some of the hedgerows and woodlands are species-rich and contain a diverse flora, with species of note to date including small-leaved lime and several ancient woodland indicator species within some of the woodland areas. The walkover survey identified some species-rich hedgerows. These will be categorised prior to the end of October 2014 in compliance with the Hedgerows Regulations to assess whether they are Important Hedgerows.

4.7 Water Environment

4.7.1 An assessment of potential impacts on the water environment was undertaken to inform the selection of the preferred option. The assessment identified existing environmental receptors that had the potential to be affected by the options and the potential significance of these effects. Environmental receptors comprised surface water features, groundwater features, flood plains and receptors at risk of flooding. Attributes of the water environment that were considered in this assessment included:

- Water supply
- Transport and dilution of waste products
- Biodiversity
- Aesthetics
- Cultural heritage
- Recreation
- Value to economy
- Conveyance of flow and material
- Conveyance of flood flows

4.7.2 The assessment identified that between the A49 in the east and the A465 in the west the route options pass over or near to Withy Brook and Newton Brook. These watercourses are classed as ‘ordinary watercourses’ under the jurisdiction of Herefordshire Council and ultimately discharge into the River Wye.

4.7.3 The assessment identified that the route options pass over or near to other minor watercourses and water features within the site boundary and wider study area. Whilst these features may be insignificant in terms of the majority of attributes listed above, they offer value in terms of transport and dilution of waste products and conveyance of flood flows.

4.7.4 The route options were identified to be located in the low risk Flood Zone 1 and do not pass through areas at risk from fluvial or tidal flooding. However, all route options were identified to pass through areas shown by the EA's online mapping to be at risk of surface water flooding.

4.7.5 Review of groundwater vulnerability maps indicated that the area is underlain by a Secondary A aquifer overlain by soils of an intermediate leaching potential. The area is not within a designated a Source Protection Zone. None of the route options are likely to have an adverse impact on groundwater abstractions in the area.

5 ROUTE OPTIONS

5.1 Options

5.1.1 Four route options were presented at the formal Public Consultation Exhibition held in Hereford between 30 June and 3 July 2014. These were Options SC2, SC2A, SC5 and SC7, representing the four shortlisted (southern) options identified within the SLR Route Corridor. These are illustrated in Figure 12 to Figure 15. The alternative four (northern side) options were discounted mainly on environmental grounds and the significant cost to mitigate this impact. The main constraint being the need to cross the ancient wood located to the north, known as Newton Coppice.

5.1.2 As part of the consultation process, various suggestions for amendments to the shortlisted options or alternative routes were made by third parties. These have been reviewed by the project team and are addressed within the later chapters of this report.

5.2 Southern Link Road Options

Option SC2

5.2.1 Option SC2 involves construction of a new section of road between the A49 Ross Road/Rotherwas Access Road Roundabout and a new roundabout constructed on the A465/B4349 Clehonger Road Junction. The road passes roughly through the centre of Grafton Wood and continues westwards over Grafton Lane and Withy Brook before crossing above the existing railway line. The route then immediately straightens up heading in a north-west direction to the A465 and to the south-west of Merry Hill/Beech Grove. It avoids Newton Coppice, passing to the south-west.

5.2.2 Option SC2 involves the construction of a new roundabout on the A465. As an addition to the new section of road connecting the A49 and the A465, SC2 would also include a new direct link from the A465 to the B4349 Clehonger Road, passing east of the property known as Pykeways.

5.2.3 With some adjustment to the horizontal and vertical alignments this is the most likely option to re-use all the material excavated. This is because the vertical alignment, in the main, follows the rolling profile of the countryside, except where it passes over the railway and under Haywood Lane.

Option SC2A

5.2.4 The alignment of Option SC2A is identical to SC2, except that the new road will pass underneath the railway line in a deep excavation, rather than over it. Although the vertical alignment on the east side follows the rolling profile of the countryside, it is forced deep in cutting in order to cross underneath the railway and Haywood Lane. This could give rise to groundwater and road drainage problems as well as generating a large amount of excess spoil, which cannot be reused on the scheme.

Option SC5

5.2.5 Option SC5 passes through the northern part of Grafton Wood and, in a generally north-westerly direction, crosses the densely wooded area between Grafton Lane and Withy Brook. It also crosses a site of archaeological importance before turning in a more westerly direction to cross underneath the railway line. The route continues through Merry Hill and under Haywood Lane. This alignment would require the demolition of the outbuildings to the south of Merryhill Farm. From this location the road turns in a slightly more northerly direction to overlap with the western alignment of Options SC2 and SC2A, avoiding Newton Coppice.

5.2.6 Option SC5 involves the construction of a new roundabout on the A465, but to avoid the property known as Pykeways, the new link to connect with the B4349 Clehonger Road is located further south-west. The arrangement of this new junction with the A465 would need to be determined during detailed design (ghost island turning, signalised junction etc.).

5.2.7 Although the vertical alignment of Option SC5 on the east side follows the rolling profile of the countryside, it is soon forced into deep cutting through Merry Hill and under Haywood Lane. This could give rise to groundwater and road drainage problems as well as generating a large amount of excess spoil which cannot be re-used on the scheme. The route crosses existing overhead power lines a number of times (including a 66kV) and is located partly within the main corridor of electricity cables running east to west.

Option SC7

5.2.8 Option SC7 passes through the northern tip of Grafton Wood but avoids the southern extent of the dense wooded area between Grafton Lane and Withy Brook. It also avoids the site of archaeological importance and runs to the south of Merryhill Lane before cutting through Merry Hill and under Haywood Lane. From this location the road heads in a westerly direction to overlap with the western alignment of Options SC2, SC2A and SC5, avoiding Newton Coppice.

5.2.9 Option SC7 involves the construction of a new roundabout on the A465. As an addition to the new section of road connecting the A49 and the A465, SC7 would also include a new direct link from the A465 to the B4349 Clehonger Road, passing east of the property known as Pykeways.

5.2.10 Although the vertical alignment on the east side largely follows the rolling profile of the countryside, it is soon forced into deep cutting through Merry Hill and under Haywood Lane. This could give rise to groundwater and road drainage problems as well as generating a large amount of excess spoil that cannot be re-used on the scheme.

5.2.11 The route crosses existing overhead power lines a number of times (including a 66kV) and is located largely within the main corridor of electricity cables running east to west. The route crosses Grafton Lane on a high embankment where existing services are present. This could be problematic in terms of providing a new (north to south) road crossing of the National Cycle Route.

5.2.12 Although the twisted alignment at the eastern end of the scheme helps to avoid environmental constraints, in so doing, it will introduce a speed limit restriction of 50mph instead of the standard national speed limit of 60mph.

6 ENGINEERING ASSESSMENT

6.1 Options

6.1.1 The four options under consideration are shown in Figures 12 to 15. The forecast traffic flow on the SLR is outlined below for both the Opening Year (2017) and Design Year (2032) are outlined below.

Year	Traffic Flow (AADT)
Opening Year	6,500
Design Year	11,004

Table 9: Design flow ranges

6.1.2 DMRB TA46/97 outlines the following opening year economic flow ranges:

Carriageway Standard	Opening year AADT	
	Minimum	Maximum
S2	Up to 13,000	
WS2	6,000	21,000
D2AP	11,000	39,000
D3AP	23,000	54,000

Table 10: Opening Year Economic Flow Ranges

6.1.3 Based on the design flow ranges, all routes adopt an S2 standard 7.3m (with two 1m hardstrips) single carriageway cross-section in accordance with TD27/05 'Cross Sections and Headrooms'.

Option SC2

6.1.4 Earthworks – with some adjustment to the horizontal and vertical alignments this is the most likely option to achieve as near as possible a cut/fill balance. The vertical alignment in the main follows the rolling profile of the countryside but with an embankment up to 7m high on the approaches to the railway and a 7.5m deep cutting under Haywood Lane. Preliminary bulk earthworks calculations suggest a net shortfall of 36,000m^3.

6.1.5 Design Standards – 60mph design speed with Departures from Standard are unlikely to be required. Opportunities for overtaking are also unlikely due to the topography (vertical curvature). The route has a relatively straight crossing of the existing country lanes and railway. The provision of new accesses for land areas being severed by the scheme and the provision of drainage runoff storage have yet to be determined.

6.1.6 Physical features – the route goes through Grafton Wood, which, although not listed on the Natural England Ancient woodland inventory, was identified as Candidate Ancient Woodland during the Ancient Woodland and Trees of Herefordshire Project.

6.1.7 Utilities – the route crosses existing overhead power lines a number of times (including a 66kV) but is located to the south of the main corridor of electricity cables

running east to west. The route crosses Grafton Lane almost at grade where existing services run north to south including a water main.

6.1.8 Rail structure – the route crosses over the existing railway line, which is Network Rail's preferred solution for reasons relating to asset ownership and future maintenance liability. Initial discussions with Network Rail have revealed that key issues that they will be looking for in relation to a new crossing over the railway are (i) ownership and liabilities for the new bridge; (ii) headroom clearances; (iii) lateral clearances; (iv) any effect on the siting of their current infrastructure e.g. signals; (v) the ability to accommodate likely future improvements to the railway e.g. four-tracking and electrification; (vi) vehicular containment of highway vehicles; (vii) impact resistance of parts of the structure from derailed trains; (viii) railway disruption both during construction and ongoing future maintenance of the new structure; and (ix) whether the new road provides them with opportunities to close any existing level crossings in the area.

6.1.9 Highway structures – A new bridge structure will be required to carry Haywood Lane over the new SLR thereby maintaining the north-south connectivity. The bridge is likely to take the form of a single span structure with prestressed concrete beams and an insitu reinforced concrete deck. To achieve the vertical clearance required there may be a need to raise the alignment of Haywood Lane locally. At the location where the SLR meets Grafton Lane (also the route of National Cycle Network Route No 46), the lane will be stopped up for motorised users, provision only being made for an at-grade crossing for non-motorised users. This will require local realignment of Grafton Lane to tie in with the alignment of the SLR.

Option SC2A

6.1.10 Earthworks – the vertical alignment on the east side follows the rolling profile of the countryside but is forced deep into cutting (on average 7-8m deep) to cross underneath both the railway and Haywood Lane. This could give rise to groundwater and road drainage problems. Preliminary bulk earthworks calculations suggest a net surplus of 50,000m3.

6.1.11 Design Standards – 60mph design speed with Departures from Standard are unlikely to be required. Opportunities for overtaking are also unlikely due to the topography (vertical curvature). The route has a relatively straight crossing of the existing country lanes and railway. The provision of new accesses for land areas being severed by the scheme and the provision of drainage runoff storage have yet to be determined.

6.1.12 Physical features – the route goes through Grafton Wood, which, although not listed on the Natural England Ancient woodland inventory, was identified as Candidate Ancient Woodland during the Ancient Woodland and Trees of Herefordshire Project.

6.1.13 Utilities – the route crosses existing overhead power lines a number of times (including a 66kV) but is located to the south of the main corridor of electricity cables running east to west. The route crosses Grafton Lane almost at grade where existing services run north to south including a water main.

6.1.14 Rail structure – the route crosses underneath the existing railway line, which is not Network Rail's preferred solution as they would be responsible for its future maintenance. Initial discussions with Network Rail have revealed that key issues which they will be looking for in relation to a new crossing over the railway are (i) ownership and liabilities for the new bridge; (ii) headroom clearances; (iii) lateral clearances; (iv) any effect on the siting of their current infrastructure e.g. signals; (v)

the ability to accommodate likely future improvements to the railway e.g. four-tracking and electrification; (vi) vehicular containment of highway vehicles; (vii) impact resistance of parts of the structure from derailed trains; (viii) railway disruption both during construction and ongoing future maintenance of the new structure; and (ix) whether the new road provides them with opportunities to close any existing level crossings in the area.

6.1.15 Highway structures – A new bridge structure will be required to carry Haywood Lane over the new SLR thereby maintaining the north-south connectivity. The bridge is likely to take the form of a single span structure with prestressed concrete beams and an insitu reinforced concrete deck. To achieve the vertical clearance required there may be a need to raise the alignment of Haywood Lane locally. At the location where the SLR meets Grafton Lane (also the route of National Cycle Network Route No 46), the lane will be stopped up for motorised users, provision only being made for an at-grade crossing for non-motorised users. This will require local realignment of Grafton Lane to tie in with the alignment of the SLR.

Option SC5

6.1.16 Earthworks – the vertical alignment on the east side follows the rolling profile of the countryside but is forced into cutting after Grafton Lane in order to cross under the railway. There is a significant 13m deep cutting through Merry Hill to enable the route to cross under Haywood Lane which could give rise to groundwater and road drainage problems. Preliminary bulk earthworks calculations suggest a net surplus of 150,000m3.

6.1.17 Design Standards – 60mph design speed with Departures from Standard are unlikely to be required. Opportunities for overtaking are also unlikely. The angled crossing of existing country lanes and the railway will increase cost. The provision of new accesses for land areas being severed by the scheme and the provision of drainage runoff storage have yet to be determined.

6.1.18 Physical features – the route goes through Grafton Wood, which, although not listed on the Natural England Ancient woodland inventory, was identified as Candidate Ancient Woodland during the Ancient Woodland and Trees of Herefordshire Project. It also passes through a wooded area between Grafton Lane and Withy Brook, a site of archaeological importance known as Grafton Enclosure and a barn yard situated south-west of the Merryhill Lane junction with Haywood Lane.

6.1.19 Utilities – the route crosses existing overhead power lines a number of times (including a 66kV) and is located partly within the main corridor of electricity cables running east to west. The route crosses Grafton Lane at grade where existing services run north to south including a water main. There is also conflict with a concentration of overhead and buried services in/around Haywood Lane including BT and a water main.

6.1.20 Rail structure – the route crosses underneath the existing railway line, which is not Network Rail's preferred solution as they would be responsible for its future maintenance. Initial discussions with Network Rail have revealed that key issues which they will be looking for in relation to a new crossing over the railway are (i) ownership and liabilities for the new bridge; (ii) headroom clearances; (iii) lateral clearances; (iv) any effect on the siting of their current infrastructure e.g. signals; (v) the ability to accommodate likely future improvements to the railway e.g. four-tracking and electrification; (vi) vehicular containment of highway vehicles; (vii) impact resistance of parts of the structure from derailed trains; (viii) railway disruption both

during construction and ongoing future maintenance of the new structure; and (ix) whether the new road provides them with opportunities to close any existing level crossings in the area.

6.1.21 Highway structures – A new bridge structure will be required to carry Haywood Lane over the new SLR thereby maintaining the north-south connectivity. The bridge is likely to take the form of a single span structure with prestressed concrete beams and an insitu reinforced concrete deck. To achieve the vertical clearance required there may be a need to raise the alignment of Haywood Lane locally. At the location where the SLR meets Grafton Lane (also the route of National Cycle Network Route No 46), the lane will be stopped up for motorised users, provision only being made for an at-grade crossing for non-motorised users. This will require local realignment of Grafton Lane to tie in with the alignment of the SLR.

Option SC7

6.1.22 Earthworks – the vertical alignment on the east side follows the rolling profile of the countryside but is forced into cutting after Grafton Lane in order to cross under the railway. There is a significant 13m deep cutting through Merry Hill to enable the route to cross under Haywood Lane which could give rise to groundwater and road drainage problems. Preliminary bulk earthworks calculations suggest a net surplus of 85,000m3.

6.1.23 Design Standards – 50mph design speed with Departures from Standard are unlikely to be required. There will be no opportunity for overtaking due to the twisted alignment. The angled crossing of existing country lanes and the railway will increase cost. The provision of new accesses for land areas being severed by the scheme and the provision of drainage runoff storage have yet to be determined.

6.1.24 Physical features – being of a twisted nature the route manages to avoid many physical constraints but does go through the northern tip of Grafton Wood, which, although not listed on the Natural England Ancient woodland inventory, was identified as Candidate Ancient Woodland during the Ancient Woodland and Trees of Herefordshire Project.

6.1.25 Utilities – the route crosses existing overhead power lines a number of times (including a 66kV) and is located largely within the main corridor of electricity cables running east to west. The route crosses Grafton Lane on a 3m high embankment where overhead BT and buried water services are present. There is also conflict with a concentration of overhead and buried services in/around Haywood Lane including BT and a water main.

6.1.26 Rail structure – the route crosses underneath the existing railway line, which is not Network Rail's preferred solution as they would be responsible for its future maintenance. Initial discussions with Network Rail have revealed that key issues which they will be looking for in relation to a new crossing over the railway are (i) ownership and liabilities for the new bridge; (ii) headroom clearances; (iii) lateral clearances; (iv) any effect on the siting of their current infrastructure e.g. signals; (v) the ability to accommodate likely future improvements to the railway e.g. four-tracking and electrification; (vi) vehicular containment of highway vehicles; (vii) impact resistance of parts of the structure from derailed trains; (viii) railway disruption both during construction and ongoing future maintenance of the new structure; and (ix) whether the new road provides them with opportunities to close any existing level crossings in the area.

6.1.27 Highway structures – A new bridge structure will be required to carry Haywood Lane over the new SLR thereby maintaining the north-south connectivity. The bridge is likely to take the form of a single span structure with prestressed concrete beams and an insitu reinforced concrete deck. To achieve the vertical clearance required there may be a need to raise the alignment of Haywood Lane locally. At the location where the SLR meets Grafton Lane (also the route of National Cycle Network Route No 46), the lane will be stopped up for motorised users, provision only being made for an at-grade crossing for non-motorised users. This will require local realignment of Grafton Lane to tie in with the alignment of the SLR in view of the SLR being on a 3m high embankment at this location.

6.2 Departures and Relaxations from Standards

6.2.1 Various constraints on the proposed route for a road may mean that it cannot be reasonably designed to full standards. Any desirable or necessary reductions in standards are dealt with as design Relaxations or design Departures. All Departures must have formal approval from the Technical Approval Authority (TAA).

6.2.2 Based on the preliminary design work carried out on the four route options, one-step Relaxations are anticipated in relation to Stopping Sight Distance (SSD). These are considered justifiable and therefore the designs would remain in accordance with Design Standards. At present, any further variation beyond defined limits resulting in Departures from Standard are not expected, but this could change during design development. Any Relaxations and/or Departures would be considered during the design process with the aim of being designed out wherever possible.

6.3 Footway and Cycle Routes

6.3.1 All of the route options bisect Grafton Lane, which forms part of the National Cycle Network, and mitigation options have been proposed in a separate Technical Note. In addition, the route options bisect a varying number of Public Rights of Way (PRoW), as shown in Table 11 below.

Option	No. PRoW Bisected
SC2	3
SC2A	3
SC5	4
SC7	2

Table 11: Public Rights of Way bisected by each option

6.3.2 The difference between the schemes is due to the varying options for the link road to the north of the A465. For example, SC7 does not extend north of the A465 and as such does not affect the PRoW in this location, whereas SC5 bisects both PRoW in this area.

6.4 Railway and Structures

6.4.1 All routes considered for the SLR would need to cross the main Cardiff to Hereford railway line. All options except SC2 cross underneath the railway line. In close proximity of routes SC2 and SC2A, there is infrastructure associated with the railway consisting of a mast and a generator building. These will be affected by the proposals

unless a local horizontal realignment can be achieved. No other engineering structures e.g. bridges are known to be affected by the proposals.

6.5 Drainage

6.5.1 The drainage proposals are likely to consist of a combination of carrier drains, filter drains, and grassed surface water channels or similar such as swales. Sustainable Urban Drainage Systems (SUDS) will be utilised where possible.

6.5.2 Where appropriate drainage would be provided at the top and bottom of embankments and, if necessary, drainage would also be provided within the cutting slopes. Attenuation ponds may be required to control the flow of highway drainage water entering a watercourse.

6.5.3 Affected minor watercourses would be diverted and/or culverted.

6.5.4 Appropriate measures to intercept any pollutants entering the highway drainage system will be agreed with the Environment Agency.

6.6 Lay-bys

6.6.1 The recommended spacing for lay-bys in both directions on a single carriageway road is between 2 and 5km. With the SLR being just over 3km long between the A49(T) and the A465 there is no requirement to provide a lay-by in accordance with design guidance.

6.7 Road Lighting

6.7.1 Road lighting is only proposed for the roundabouts. In view of the proximity of the new A465 roundabout to some properties a lower standard of lighting may be considered in conjunction with Herefordshire Council's policy for lighting which also includes phased dimming overnight, as appropriate.

6.8 Road Restraint Systems [e.g. Vehicle Containment Barriers]

6.8.1 Road restraint systems would be provided in accordance with Design Standards.

6.9 Statutory Undertakers

6.9.1 Diversionary works will be required. These are to be determined and agreed with the Statutory Undertakers.

6.10 Scheme Cost of Options

6.10.1 Table 12 shows the estimated scheme costs for the various options based on 2012 prices. For the purposes of this assessment we have made a contingency allowance of 44% on construction cost. If the contingency was not required, the scheme cost would be the lower of the two values over the page.

Option	Scheme Cost
SC2	£16.5M-£25M
SC2A	£19.5M-£29M
SC5	£24M-£35M
SC7	£21M-£31M

Table 12: Cost of Options

6.11 Value Engineering

6.11.1 Value Engineering principles such as optimising the alignment, structures and cut/fill balance will be considered during further development of the preferred option. This may include a Value Engineering workshop.

6.12 Engineering Assessment Conclusion

6.12.1 In conclusion, SC2 performs better than the other options with regards to engineering based on the following elements:

- Follows the ground profile (except where it has to go over the railway and under Haywood Lane)
- Most likely to achieve a balance of bulk earthworks
- Not in very deep cut and removes the potential for groundwater/drainage issues
- 60mph design speed throughout
- No Departures from Standard's expected for road geometry
- Affects the least amount of private properties
- Goes over the railway so aligns with Network Rail's expectation
- Crosses Grafton Lane at grade so aids a solution for the new NMU road crossing
- Located to south of the main corridor of electricity cables running east-west
- Least expensive of the four options

7 TRAFFIC, SAFETY AND ECONOMIC ASSESSMENT

7.1 Introduction

7.1.1 The methodologies used to assess the options take account of the Department for Transport and Highways Agency technical and guidance documents. The assessments use actual and predicted traffic volumes on the road network in the study area.

7.2 Scenarios

7.2.1 The 'Do Minimum' scenario within the Herefordshire Council SATURN model comprises of traffic and development growth that would occur regardless of whether or not one of the options is constructed. The 'Do Minimum' scenario also includes committed highway schemes in the area. The 'Do Something' scenario includes all of the above and the Southern Link Road.

7.3 Future Year Traffic Flows

7.3.1 Traffic flows have been predicted for 2017 (the Opening Year). The Opening Year is that when any Option constructed is expected to be completed and opened to traffic. The traffic flows have also been predicted for 2032 (the Design Year), which is 15 years post opening the SLR. With the Southern Link Road in place (Do Something Scenario), traffic flows are forecasted to change as shown in Table 13.

		AADT					
Link	Dir	2017 DM	2017 DS	% Change	2032 DM	2032 DS	% Change
A465 west of SLR	NE	3,606	3,221	-11%	4,255	4,439	4%
A465 west of SLR	SW	3,761	3,702	-2%	4,716	4,171	-12%
A465 Belmont Rd west of Tescos Roundabout	NE	5,318	5,406	2%	5,485	6,025	10%
A465 Belmont Rd west of Tescos Roundabout	SW	6,441	6,911	7%	7,682	7,932	3%
A465 Belmont Rd west of Belmont Roundabout	NE	8,466	8,562	1%	10,007	9,850	-2%
A465 Belmont Rd west of Belmont Roundabout	SW	9,885	9,563	-3%	12,264	11,302	-8%
Walnut Tree Avenue	EB	4,646	3,978	-14%	4,848	4,794	-1%
Walnut Tree Avenue	WB	4,078	3,401	-17%	4,603	4,145	-10%
A49 north of Walnut Tree Ave	NB	14,192	13,949	-2%	20,766	18,839	-9%
A49 north of Walnut Tree Ave	SB	12,164	12,167	0%	14,864	14,172	-5%
Holme Lacy Road east of A49	EB	7,767	7,566	-3%	9,729	8,911	-8%
Holme Lacy Road east of A49	WB	8,706	8,406	-3%	10,942	10,813	-1%
B3499 Rotherwas Access Road	NB	2,371	2,615	10%	4,887	4,383	-10%
B3499 Rotherwas Access Road	SB	2,201	2,279	4%	6,944	5,963	-14%

Table 13: Change in Traffic Flow

7.3.2 Figures 16 and 17 at the rear of this report illustrate the modelled traffic flows in the 2017 AM and PM peaks for both Do Minimum and Do Something scenarios.

7.3.3 Figures 18 and 19 at the rear of this report illustrate the modelled traffic flows in the 2032 AM and PM peaks for both Do Minimum and Do Something scenarios.

7.3.4 The results show that traffic reduces on the A465, and there is broadly no change in traffic flows on the A49 north of Walnut Tree Avenue, taking into account two-way flows.

7.4 Reliability Impacts

7.4.1 There is not expected to be a significant difference between the options in terms of reliability.

7.4.2 Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.

7.5 Accident Impacts

7.5.1 There is not expected to be a significant difference between the options in terms of accidents. Option SC7 has a 50mph design speed, which is lower than the other options and is likely to reduce the accident rate. However, this is likely to be offset by a relative increase in accidents due to the poor overtaking opportunities and sinuous alignment.

7.5.2 The Southern Link Road is designed to the latest design standards and is likely to be safer than the A465 and A49. A reduction in traffic along the A465 will result in a reduced accident rate along this section of road, although the increase in traffic along the A49 in some time periods may cause the accident rate to increase on this section of road.

7.6 Economy Impacts

7.6.1 There is not expected to be a significant difference between the Select Link Road options in terms of economy, with no significant differences in journey times, affordability, or accidents. However, the options do have different construction costs which would affect the overall cost benefit ratio for each option. Scheme costs are detailed in Section 6.10.

7.6.2 The scheme is anticipated to result in reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road, resulting in journey time savings for existing users. There is likely to be increased traffic along the A49 in some time periods, but the level of delay at the A49/A465 junction is proposed to remain at existing levels.

7.6.3 The Southern Link Road provides a direct connection to the Hereford Enterprise Zone (HEZ) from the A465. This will encourage development at the Enterprise Zone and improve the infrastructure serving the wider Rotherwas estate having subsequent benefits to the promotion of inward investment relating to both residential and employment development.

8 ENVIRONMENTAL ASSESSMENT

8.1 Air Quality

8.1.1 A high level assessment of the air quality impacts of scheme options was undertaken. Due to the scheme options not yet reaching detailed design stage, and in the absence of data, impacts were qualitatively assessed.

8.1.2 Assessment criteria included the change in proximity between the road centreline to sensitive receptors, which included residential premises as well as designated habitats. This criteria was assumed to represent the potential changes in exposure of sensitive receptors to vehicle emissions that the particular scheme option brought.

8.1.3 In order to distinguish between the potential impacts from each of the scheme options, the number of sensitive receptors within 200m either side of the scheme were recorded. These were totalled into residential properties within each 50m band, up to 200m from the centreline of the road.

Assumptions

8.1.4 It was assumed that all traffic flows along each of the scheme options would be identical in the number of vehicles and the fleet mix (% of HGVs and non-HGVs).

8.1.5 In addition for the purpose of the scheme options assessment, it was assumed that the air quality impact upon the centre of Hereford Town would be identical for all of the scheme options. Therefore impacts upon the Hereford Town AQMA were considered to be identical for each option and therefore not assessed at this stage.

Potential Effects

8.1.6 Air quality impacts from the operation of all scheme options will be as a result of the introduction of traffic into areas which were previously free from road traffic or had experienced very low traffic.

8.1.7 Table 14 shows the number of residential properties within 200m from each route option, split into bands. This only includes where the scheme introduces a new section of road, and does not include existing roads.

Distance from Road Centreline	Number of Properties			
	Option SC2	Option SC2A	Option SC5	Option SC7
0 – 50m	0	0	0	0
50m – 100m	4	4	7	4
100m – 200m	5	5	11	14
Total	**9**	**9**	**18**	**18**

Table 14: Residential properties within 200m of each route

8.1.8 There will also be potential secondary effects upon woodland habitats from air pollutants as a result of traffic flows across each of the scheme options. All scheme options would have identical secondary impacts upon Hayleasow Wood, Newton Coppice and Grafton Scheme. However, Options SC2 and SC2A would have some

secondary impacts upon Veddoes Coppice, which is to the east of the Hereford to Newport railway line.

8.2 Noise

8.2.1 For each of the route options identified, a qualitative assessment of potential noise and vibration impacts has been undertaken. Table 15 contains the number of properties within 600m of each route option. This information has been used to complete the AST for each route option.

Distance from Road Centreline	Number of Receptors by Route Option			
	Option SC2	Option SC2A	Option SC5	Option SC7
0 – 50m	0	0	0	0
50m – 100m	4	4	7	4
100m – 200m	5	5	11	14
200m – 300m	14	14	26	16
300m – 600m	82	82	68	71
Total	**105**	**105**	**112**	**105**

Table 15: Residential properties within 600m of each route

8.2.2 At this stage, it is not possible to undertake a more detailed assessment of potential noise and vibration impacts associated with each route option as validated traffic data is not available.

8.3 Greenhouse Gases

8.3.1 The four scheme Options SC2, SC2A, SC5 and SC7 were assessed for their potential greenhouse (CO_2eq) gas production in relation to the scheme length, change in vehicle speeds and changes to journey lengths as a consequence of the road traffic use of the proposed scheme options.

Scheme Options Assessment

8.3.2 The Department of Transport Emissions Factor Toolkit (EFT v6.01) was used to estimate the change in CO_2 emissions as a consequence of changes in vehicle speeds along the scheme option route. As a consequence the Total Carbon production (tonnes per year) was calculated for the 2013, current baseline 2013, opening year 2017 and the future year 2020, a range of speeds between 50 to 90 kph.

Assumptions

8.3.3 It was assumed that all scheme options were of a similar length and that traffic speeds would be similar between each scheme option. It was also assumed that traffic using all scheme options would be required to travel over slightly greater distances than the traffic currently using the local roads network. As a guide the percentage of HGVs predicted to use the scheme options was assumed to remain unchanged, at 5% for all assessment years.

Potential Effects

8.3.4 It is highly probable that local traffic speeds will increase as a result of the scheme development. In addition, the distance that vehicles will be required to travel is estimated to increase slightly as a result of the scheme development.

8.3.5 Figure 20 illustrates that increases in vehicle speeds between 60 to 90 kph increases CO_2 emissions. Therefore, it is possible that all scheme options will have a slight adverse impact on greenhouse gases due to vehicles travelling greater distances and at higher speeds.

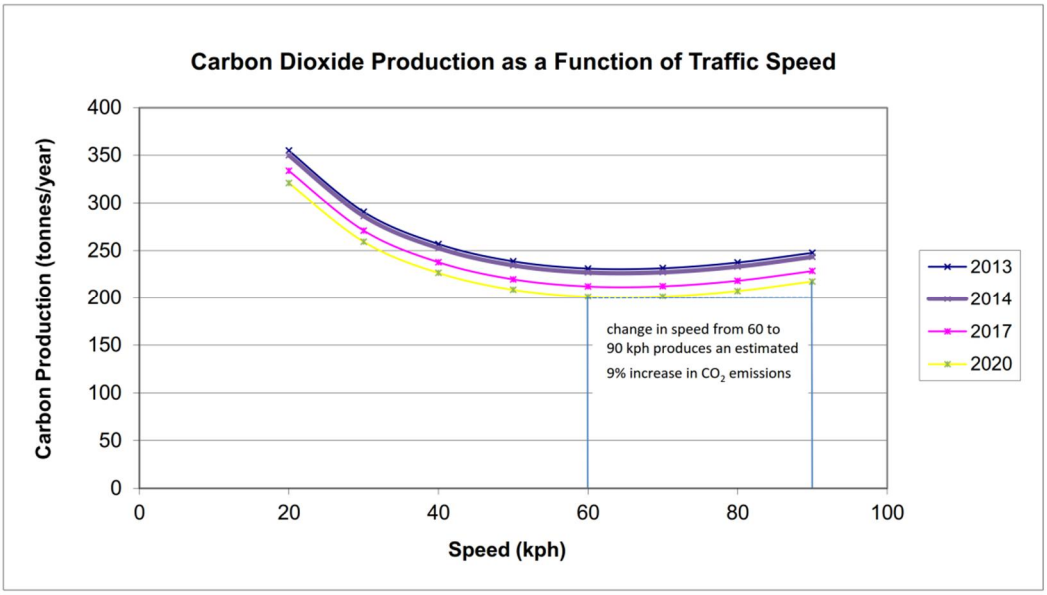


Figure 20: Carbon Dioxide Production as a Function of Traffic Speed (Emissions Factor Toolkit v6.01, Defra)

8.4 Landscape/Townscape

Options SC2 and SC2A

8.4.1 Route SC2 and SC2A pass through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although the routes are within the Herefordshire Lowlands character area, it is more typical of South Herefordshire and Over Severn. In terms of woodland, the routes cut through the centre of Grafton Wood (candidate ancient woodland and low density of trees). For the remainder of the route, Option SC2/SC2A is free of woodland and avoids Newton Brook.

8.4.2 The route passes Haywood Lodge Farm and associated properties with a resulting potential for adverse visual effects. One route passes under the railway (SC2) and one route passes over (SC2A). As a result, SC2A is likely to have more visual impact due to the increased earthworks and visibility of the highway and associated structures. A new roundabout on A465 and a short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is likely to be influenced by the additional sections of road, roundabout, embankments for the bridge over the railway in Option SC2A and the proximity to residential properties.

Option SC5

8.4.3 SC5 passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, it is more typical of South Herefordshire and Over Severn. In terms of woodland, it cuts through the centre of Grafton Wood (candidate ancient woodland and low density of trees) and a dense copse near Withy Brook. It runs close to residential properties along Grafton Lane and involves the loss of a large commercial premises accessed from Haywood Lane. It avoids Newton Brook and Hayleasow Wood. A new roundabout on A465 and an upgrade to the existing lane connecting to the B4349, introduces further built infrastructure and will adversely affect the character of the lane.

8.4.4 The landscape in this area would be classed as being of medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is likely to be influenced by the loss of woodland, the route going through a large Site of Archaeological Importance, the proximity of residential properties, the loss of commercial premises, and a new roundabout with loss of character due to the upgrade of the existing lane. Therefore, the magnitude of effect on the landscape resource is likely to be influenced by the loss of woodland, hedges and key local landscape characteristics.

Option SC7

8.4.5 SC7 passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, it is more typical of South Herefordshire and Over Severn. In terms of woodland, it cuts through the centre of Grafton Wood (candidate ancient woodland and low density of trees). It runs close to residential properties along Grafton Lane. It avoids Newton Brook and Hayleasow Wood. A new roundabout will be constructed on the A465 and a new section of road connecting with the B4349 will introduce further built infrastructure.

8.4.6 The landscape in this area would be classed as being of medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is likely to be influenced by the loss of woodland, the proximity of residential properties, and a new roundabout with additional section of road. Therefore, the magnitude of effect is likely to be influenced by the loss of some local landscape features.

8.5 Historic Environment

Options SC2 and SC2A

8.5.1 This option would have no effect on any Scheduled Monument or its setting resulting in no significant effect.

8.5.2 This option would encroach within 300m of but be largely screened from the Listed Building complex at Haywood Lodge, containing one Grade II* and three Grade II structures. It would encroach within 350m of but be largely screened from the Grade II Listed Buildings at Merryhill. It would encroach within 220m of but be largely screened from the agricultural structures at Clehonger Court, which are Grade II Listed Buildings. It would encroach within 150m of and be visible from the Grade II milestone on the A465.

8.5.3 The Listed Buildings in the study area are of high value. Although passing close to the listed milestone on the A465, the roadside is the appropriate setting for structure and, therefore, this option would have no significant effect. It would have a minor impact on the settings of the listed structures at Haywood Lodge, Merryhill and Clehonger Court, resulting in a slight to moderate effect.

8.5.4 This option would traverse four fields from which significant artefacts have been recovered. As they consist of findspots, the undesignated sites are of uncertain value, though the effect upon them could be major.

Option SC5

8.5.5 This option would have no effect on any Scheduled Monument or its setting resulting in no significant effect.

8.5.6 This option would encroach within 220m of but be largely screened from the Grade II Listed Buildings at Merryhill. It would encroach within 400m of but be largely screened from the Listed Building complex at Haywood Lodge, containing one Grade II* and three Grade II structures. It would encroach within 220m of but be largely screened from the agricultural structures at Clehonger Court, which are Grade II Listed Buildings. It would encroach within 150m of and be visible from the Grade II milestone on the A465.

8.5.7 The Listed Buildings in the study area are of high value. Although passing close to the listed milestone on the A465, the roadside is the appropriate setting for this structure and, therefore, this option would have no significant effect. It would have a minor impact on the settings of the listed structures at Clehonger Court, Merryhill and Haywood Lodge, resulting in a slight to moderate effect.

8.5.8 This option would traverse the Medieval site in Field 15 and two cropmark sites in Fields 10 and 34, as well as four fields from which significant artefacts have been recovered. As well as the findspots, which are of uncertain value, there are two cropmark sites, one of which is of medium value, and this option would have a major impact upon them, resulting in a moderate to large effect.

Option SC7

8.5.9 This option would have no effect on any Scheduled Monument or its setting. The Scheduled Ancient Monuments in the extended study area are of high value, but this option would have no effect upon them or their settings, resulting in no significant effect.

8.5.10 This option would encroach within 200m of but be largely screened from the Grade II Listed Buildings at Merryhill. It would encroach within 520m of but be largely screened from the Listed Building complex at Haywood Lodge, containing one Grade II* and three Grade II structures. It would encroach within 220m of but be largely screened from the agricultural structures at Clehonger Court, which are Grade II Listed Buildings. It would encroach within 150m of and be visible from the Grade II milestone on the A465.

8.5.11 The Listed Buildings in the study area are of high value. Although passing close to the listed milestone on the A465, the roadside is the appropriate setting for this structure and, therefore, this option would have no significant effect. It would have a minor impact on the settings of the listed structures at Merryhill, Clehonger Court and Haywood Lodge resulting in a slight to moderate effect.

8.5.12 This option would traverse and a cropmark site in Field 10, as well as four fields from which significant artefacts have been recovered. As well as the findspots, which are of uncertain value, there is a cropmark site, also of uncertain value, upon which this option would have a major effect.

8.6 Biodiversity

8.6.1 This options appraisal exercise has been produced following a similar methodology to that of the Appraisal Summary Tables included in Appendix A, with the information expanded where possible to incorporate updated survey information where this has become available.

Ecological receptors and their potential influence on the route options appraisal

8.6.2 Several of the potential ecological receptors identified in Section 4.6 have not been considered in this options appraisal process for the reasons outlined below.

Statutory and non-statutory designated sites

8.6.3 None of the four route options will directly affect any statutory or non-statutory designated sites. Impacts and mitigation measures are likely to be similar for all options and as such are not considered to affect the options appraisal.

Badgers

8.6.4 Minimal evidence of badger was recorded during the survey. Badgers are protected on the grounds of animal welfare rather than rarity / population decline and as such are not considered to affect the options appraisal. At this time there is no evidence to suggest badger-related road traffic collision risk will differ significantly between any of the options.

Dormice

8.6.5 The presence or absence of this species has not yet been determined however surveys are ongoing. There is insufficient information to date to fully consider this species in the options appraisal.

Otters

8.6.6 Otter has been identified using Withy Brook. All options cross this brook, therefore, impacts and mitigation are likely to be similar for all options.

Water voles

8.6.7 No evidence of this species was recorded, therefore it is not considered further in the options appraisal.

Bats

8.6.8 Surveys are on-going for this species group however to date it has been determined that the site is, in general, 'bat rich' with at least 10 species recorded to date. This includes two Annex 2 species (barbastelle and lesser horseshoe bat). These records are spread throughout the site, with no 'hotspots' identified for these species.

8.6.9 Foraging and commuting activity levels are considered to be relatively high, with continuous foraging activity recorded at several locations, on several occasions and for several different species. Bat activity has been recorded at all locations surveyed, with all options affecting areas where both higher and lower levels of activity have been recorded. As the four options follow the same broad corridor and will affect the same or very similar habitat features (such as woodlands and hedgerows), impacts and mitigation are likely to be similar for all options.

8.6.10 The level of roosting activity recorded to date is limited to two minor soprano pipistrelle roosts in two adjacent orchard trees. As these trees will not be directly affected by any of the route options, this data is not considered to affect the options appraisal. It is possible that roosts of greater conservation significance, which could influence the alignment, will be detected during the remaining surveys to be undertaken during September and October 2014, although this is relatively unlikely.

Birds

8.6.11 As the four options follow the same broad corridor and will affect the same or very similar habitat features (such as woodlands, arable fields and margins, and hedgerows), impacts and mitigation are likely to be similar for all options. Barn owls have been recorded flying and likely foraging and one likely roost has been recorded near to Haywood Lane. It is unlikely that any options will directly affect any barn owl roosts, should they be found during remaining surveys, and therefore this data is unlikely to affect the options appraisal.

Reptiles

8.6.12 Common reptile species have been recorded in low numbers within woodland glade and field margin habitats across the site. As the four options follow the same broad corridor and will affect the same or very similar habitat features, impacts and mitigation are likely to be similar for all options.

Amphibians

8.6.13 A medium population of great crested newts was recorded at several ponds within 500 m of the proposed options. None of the proposed options will directly affect any ponds, therefore impacts to great crested newts will be limited to terrestrial habitats.

8.6.14 Options SC2 and SC2A are the most proximate to the medium population recorded at Haywood Lodge, however it is considered that the scheme offers the potential for a net gain in the quality and quantity of suitable great crested newt habitats, therefore the residual effects of the options are likely to be similar. It is therefore not considered that this receptor affects the options appraisal.

Flora

8.6.15 Hedgerows Regulations data has not yet been analysed therefore there is insufficient information to date to consider this in the options appraisal.

<u>Consideration of the Four Options</u>

8.6.16 For the reasons detailed above a majority of the potential ecological receptors are not considered to influence the options appraisal at this stage. The main differences between the options are assessed below in terms of the habitats, which each option

will affect directly, and to some degree the invertebrate assemblages that these habitats support.

Options SC2 and SC2A

8.6.17 Options SC2 and SC2A pass through the centre of Grafton Wood, which has been identified as candidate ancient woodland by the updated ancient woodland inventory. This option would lead to habitat loss and fragmentation of the woodland.

8.6.18 Options SC2/SC2A would bisect species-rich hedgerows along and near to Grafton Lane, leading to habitat loss and fragmentation. Withy Brook would also be bisected. The option would pass close to, though would not directly affect, Hayleasow ancient woodland / plantation on ancient woodland, traditional orchard habitat, a further area of candidate ancient woodland, and a veteran oak tree.

8.6.19 There may be a slight preference for Option SC2A relative to SC2, as passing under the existing railway may allow an unmodified habitat corridor to be retained and enhanced along the railway line.

Option SC5

8.6.20 Option SC5 passes through Grafton Wood, slightly to the north of Options SC2/SC2A, with habitat loss and fragmentation impacts likely to be similar. Option SC5 would also lead to habitat loss and fragmentation within an area of candidate ancient woodland adjacent to Grafton Lane.

8.6.21 Akin to Options SC2/SC2A, Option SC5 would bisect species rich hedgerows along and near to Grafton Lane, leading to habitat loss and fragmentation. Withy Brook would also be bisected.

8.6.22 The option would pass close to, though would not directly affect, traditional orchard habitat and veteran oak trees. Option SC5 passes south of Hayleasow Wood ancient woodland, including a buffer zone of approximately 50 - 100 m.

Option SC7

8.6.23 Option SC7 passes through the northern edge of Grafton Wood; fragmentation impacts may therefore be less than Options SC5 and SC2/SC2A though habitat loss impacts would be similar.

8.6.24 Akin to the other options, Option SC7 would bisect species rich hedgerows along Grafton Lane, leading to habitat loss and fragmentation. This option would however bisect fewer hedgerows overall than the other options. Withy Brook would be bisected. Option SC7 would also bisect the very upper reaches of Newton Brook.

8.6.25 The option would pass close to, though would not directly affect, Hayleasow ancient woodland, traditional orchard habitat, and veteran oak trees.

Conclusions

8.6.26 There is likely to be little difference in impacts and mitigation measures between the four options for a majority of the ecological receptors, based on desk study and survey data gathered to date. This reflects the appraisal exercise undertaken in April 2014.

8.6.27 The chosen option should seek to minimise the impacts on the remaining pockets of woodland in a largely farmed landscape, therefore Option SC7 may be the preferred option as fragmentation impacts on Grafton wood are likely to be less, and this option avoids impacts to other areas of candidate ancient woodland. Option SC7 also bisects fewer hedgerows than the other options. Option SC7 could be improved by shifting the eastern end alignment slightly north to avoid Grafton Wood altogether, and by shifting the western end slightly south near Hayleasow Wood to increase the buffer distance here.

8.6.28 Any option selected will need to include suitable mitigation measures in relation to ecological impacts, with impacts predicted for all route corridor options remaining under consideration.

8.7 Water Environment

8.7.1 The most significant impacts to the water environment are likely to be associated with impacts to water quality and flood risk, specifically:

- Polluted surface water runoff during the construction phase consisting of high sediment load, chemicals, hydrocarbons and oils that may migrate or be discharged to surface water features or groundwater resources.
- Polluted surface water runoff during operation of the preferred route containing silts and hydrocarbons that may migrate or be discharged to surface water features or groundwater resources.
- Increased rates and volumes of surface water runoff during operation of the preferred route from an increase in impermeable area and/or changes to the existing drainage regime leading to a potential increase in flood risk.
- Flood risk to the route options as a result of construction within areas identified to be at flood risk and flood risk to people and property elsewhere as a result of the proposals.
- Impact to the hydromorphological and ecological quality of watercourses associated with works within or in close proximity to Withy Brook and Newton Brook.

8.7.2 With the information known at this stage, there is no significant difference between the route options.

8.8 Environmental Assessment Conclusion

8.8.1 A desktop review was undertaken of the Stage 2 Environment Assessment Report produced for the Belmont Transport Package by Amey in October 2013 to determine the baseline conditions in the study area.

8.8.2 In addition, the Biodiversity section was supplemented by a full desk study and survey data completed to date (September 2014) by Parsons Brinckerhoff.

8.8.3 The Environment Assessment undertaken reflects the assessment results from the Stage 2 Environment Assessment Report and the Appraisal Summary Tables produced in April 2014.

8.8.4 All of the four options will have adverse effects on the environment. On balance, Option SC7 performed the least worst of the four options while Option SC5 performed the worst.

9 SOCIAL ASSESSMENT

9.1 General

9.1.1 This section summarises our social appraisal of the four SLR route options against the following criteria:

- Physical activity
- Journey quality
- Security
- Access to services
- Affordability
- Severance

9.1.2 The appraisal is qualitative and proportionate to the characteristics of the scheme.

9.2 Physical Activity

9.2.1 Physical activity has an important role to play in preventing weight gain and obesity, and in improving mental health. Transport can affect physical activity levels by encouraging or discouraging walking and cycling.

9.2.2 Physical activity impacts can be important for schemes targeted at walking or cycling interventions. This is not the case with any of the SLR options assessed in isolation from the supporting sustainable transport improvements. All route variations will have an adverse impact on walking and cycling levels in the rural area, discouraging these activities by increasing severance on existing routes and loss of rural amenity through the introduction of traffic noise and proximity to traffic.

9.2.3 A numerical assessment of the number of pedestrians and cyclists affected is not possible based on the data available, and given the type of scheme being assessed not considered necessary. The four SLR options are assessed to have a moderate adverse impact on physical activity.

9.3 Journey Quality

9.3.1 Journey quality is a measure of the real and perceived physical and social environment experienced when travelling. The guidance breaks down the journey quality impacts into three groups:

- Traveller care – cleanliness, level of facilities, information and the general environment
- Traveller's views – pleasantness of the external surroundings
- Traveller stress – frustration, fear of accidents and route uncertainty

9.3.2 Both traveller views and traveller stress are of relevance to the appraisal of the SLR options. All four route options have been designed to divert traffic from existing built-up areas of the A465 and A49, to a new more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents for users.

9.3.3 There are, however, some counter-acting adverse impacts for A465 and A49 users that do not use the SLR. These relate to having to negotiate new SLR connecting junctions, and to the degraded views of earthworks associated with both those junctions and the SLR route itself.

9.3.4 On balance, all four SLR options are assessed to have a beneficial impact on journey quality. Differences between the schemes relate to the scale and works associated with:

- The new A465 roundabout arrangement - imposing additional stress to travellers on the A465 and connecting between the B4349 and A465, and
- The extent of earthworks and cuttings in taking the SLR route over/ under the railway and other structures– restricting views from the A465, A49 and SLR respectively.

9.3.5 SLR route Options SC2 and SC2A have been assessed as moderate beneficial in respect of journey quality. Options SC5 and SC7 have been assessed as minor beneficial.

9.4 Security

9.4.1 Security impacts relate to fear of and vulnerability to crime. These impacts can be important for public transport users, while there are no formal guidelines for road users. The only impact relevant to the SLR route options is considered to be reduced vulnerability to crime where users are less likely to be required to stop their vehicles or travel at slow speeds. This benefit can be attributed to users of the A465, A49 and SLR itself. The slight beneficial impact is the same for all four options.

9.5 Access to Services

9.5.1 Access to services relates to opportunities for people to travel and access the services they require or desire. Accessibility impacts are primarily concerned with households that do not have access to a car, and with interventions that influence opportunities to access services by public transport, walking and cycling. In the case of the SLR, all four options provide a potential new bus route between the A465 and A49, but not one that serves the key local destinations in Hereford City Centre. For this reason such a bus service is unlikely to materialise.

9.5.2 There may be some improved access to services for car users as a result of reduced journey times both into Hereford City Centre on the A465 and A49, and to key destinations located south of the city including HEZ. Consideration of accessibility, according to the guidance however is not concerned with car users. The assessment is therefore neutral for the four SLR options.

9.6 Affordability

9.6.1 Monetary costs can be a barrier to mobility for low-income groups, affecting their ability to access key destinations. Changes to the transport network involving changes in user charges can have a strong impact on people in low-income groups.

9.6.2 The SLR, when appraised in isolation of supporting sustainable transport options, is primarily concerned with re-routing to facilitate more efficient journeys. This has the impact of reducing congestion on the A465 and A49 to the north of the scheme, whilst increasing speeds and reducing distances for journeys between the A465 and A49.

Both will impact positively on the personal affordability of car drivers, saving on fuel costs. The impact has been assessed as slight beneficial for all four route options.

9.7 Severance

9.7.1 Severance is concerned with the physical separation of people from the facilities and services they use, or would use, within their community. Severance is important where infrastructure and/ or traffic using it presents a barrier to safe pedestrian movement. According to the guidance the appraisal of severance is concerned only with pedestrians, and not with the movement of cyclists, car users, or other user groups. Severance is classified according to hindrance of movement and the numbers of people affected.

9.7.2 When considering the SLR in isolation, all four options increase severance significantly, but for a very low number of residents located in rural communities. Scheme mitigation associated with Grafton Lane, other minor lanes and a number of PROWs, however, will have the effect of reducing/ minimising this severance. The severance experienced by a few, as a direct result of the SLR infrastructure, should be more than compensated by the reduction in severance resulting from reduced travel volumes through Belmont Road and the Holme Lacy Road area.

9.7.3 The net assessment of severance for the SLR is slightly beneficial, with no material difference in impact between the four route options.

9.8 Social Assessment Conclusion

9.8.1 There is not a great deal of difference between the scheme options in respect of the social impact appraisal criteria. The marginal differences between the four options are in relation to:

- The number and nature of PROWs and minor lanes affected.
- The complexity and scale of the junctions connecting the SLR with the A465 and B4349.
- The extent of earthworks and cuttings associated with the route.

9.8.2 In conclusion, route Options SC2 and SC2A demonstrate slightly more social benefits than Options SC5 and SC7. It should be stated, however, that the differences between all four options are slight.

10 SUMMARY OF APPRAISAL

10.1 Introduction

10.1.1 A brief summary of the results of the appraisal is given below.

10.1.2 An Appraisal Summary Table comparing the different SLR Options is at Appendix A. Option SC2 has the highest overall AST score of 1.5. Option SC5 and SC7 have the lowest scores of -2.5 and -1 respectively.

10.2 Route Option SC2

10.2.1 This option has many benefits to the economy, for instance reducing congestion and improving journey times, as well as enhanced accessibility to employment opportunities with the HEZ. However, there are negative impacts to the environment, including increasing road traffic noise and reducing air quality, with impacts upon woodlands, and the impact to the landscape and biodiversity. There are several social benefits, however, including improvements to journey quality, making the roads safer and reducing the number of collisions. It will also improve access to services.

10.3 Route Option SC2A

10.3.1 As with Option SC2, this option has many social and economic benefits to the economy, with a reduction in congestion, improvements to journey enjoyment, and an increase in accessibility to employment and services. However, there are some negative impacts to the environment, including increasing road traffic noise and reducing air quality, with impacts upon woodlands and to the landscape and biodiversity.

10.4 Route Option SC5

10.4.1 This option has many social benefits, as well as benefits to the economy. It will reduce congestion and improve journey times, as well as enhance accessibility to services and employment opportunities. There are some negative impacts to the environment, including increasing road traffic noise and reducing air quality. This option also has a significant impact to the landscape, as it would involve the loss of woodland, and cause severe damage to key characteristics.

10.5 Route Option SC7

10.5.1 This option has many benefits, for instance reducing congestion and improving journey reliability, as well as enhanced accessibility to services and employment. Furthermore, Option SC7 is considered the most ecologically preferable, with minimal impact on biodiversity and habitats. There are some negative impacts to the environment, however, including increasing road traffic noise and reducing air quality. As with the other options, there are social benefits, including making roads safer and reducing the number of collisions. Other options, however, will see greater benefits to journey quality by reducing driver stress.

10.6 Impact of Sustainable Transport Elements on Appraisal

10.6.1 As discussed in the SWTP – Package Assembly Report, the SLR options can be combined with a Sustainable Package of Measures, which could include such things as bus and cycle lanes, townscape improvements, and personalised travel planning programmes.

10.6.2 An Appraisal Summary Table comparing the different SLR Options combined with the Sustainable Transport Package is at Appendix B. The sustainable package has the same impact on each of the route options, and Option SC2 has the highest overall AST score of 5.5. Options SC5 and SC7 have the lowest scores of 2.5 and 4 respectively.

11 PUBLIC CONSULTATION

11.1 Public and Stakeholder Acceptability

11.1.1 Public and Stakeholder acceptability considers the likelihood that a proposal would be accepted by the public and stakeholders and is based on the results of the public consultation.

Public Consultation

11.1.2 Part of the study was to undertake a Public Consultation to obtain public opinion on the options developed as part of the SWTP. These options included improvements to encourage sustainable travel, as well as the four route options for the SLR discussed throughout this report (SC2, SC2A, SC5, and SC7).

11.1.3 The consultation period was advertised for the six-week period from the 1 July 2014 to 8 August 2014. A total of 199 people attended the Public Exhibition at the Three Counties Hotel, Hereford, between the 30 June and 3 July 2014. Additional exhibitions were held at Belmont Library on the 15 July 2014 and Hereford City Library on the 18 July 2014.

11.1.4 Brochures outlining the SWTP options (see Appendix A) were distributed to the public during the course of the consultation. To accompany these, questionnaires (Appendix C) were enclosed.

11.1.5 231 questionnaires were received in response to the consultation. In general, the responses to questions relating to the solutions for solving the transportation problems in the area demonstrated that the public felt that a SLR would be the best solution.

11.1.6 When selecting which option was preferred, out of the 404 responses to this question, the results were as follows:

- SC2 – 35%
- SC2A – 23%
- SC5 – 8%
- SC7 – 8%
- No Road – 26%

11.1.7 The responses from the questionnaires identified that route SC2 was the most preferred. This option was also supported by a 73-name petition, and ‘scored’ highly in the appraisal of the SLR options.

11.1.8 The alternative ‘No Road’ option to the SLR received the second highest number of positive responses.

11.1.9 Route SC2A was also received well. This route follows the same alignment as SC2, only differing by going under the railway line.

11.1.10 The two SLR options that have a northern alignment, SC5 and SC7, received the lowest amount of support from the public.

11.1.11 As well as the questionnaire responses, there have also been additional queries and letters, which have provided feedback from the public and other stakeholders. Some of these letters debated which road choice would affect residents the most, with more responses concluding that the alignments for SC2 and SC2A would affect fewer properties.

11.1.12 The responses from local residents also included requests to re-consider the proposed alignments in relation to their land and properties. Opinions were expressed that perhaps additional routes could be designed to achieve an option that would affect fewer residents.

Stakeholder Views

11.1.13 **Hereford City Council** has provided feedback on the proposals, and has commented that improving facilities for cyclists generally is highly desirable. It recognises that there may be some difficulties installing a cycle lane on the length of the Belmont Road, given the narrow width at points. If safe separation can be achieved without increasing congestion on an over-crowded road, then the Council would support such a plan. It has been acknowledged that local Councillors regard congestion in Belmont Road as a real concern, which they point out is echoed in the community consultation responses.

11.1.14 **The Highways Agency** has provided its views in writing. It acknowledges the commitment of £34.98 million towards the SWTP from the Marches Local Enterprise Partnership (LEP) single growth fund settlement. It notes that the SWTP provides a series of complementary transport measures, which is welcomed in principle. It supports the proposed improvements to walking and cycling on the A465, but would like to understand the traffic implications to the A49 if a bus priority measure were to be included. The Agency notes that the route alignment options appear to reflect the need to consider local topography. It supports the location of the junction with the A49 at the roundabout with the Rotherwas Access Road in principle, provided assessments of capacity are undertaken. The Agency requests that the design standards and alignment of the scheme are considered with reference to the Western Relief Road, should the Council's Submission Draft Core Strategy be approved.

11.1.15 **English Heritage** has provided its views in writing. The outlined that they were not directly consulted on the recent consultation of the four options. They acknowledge that there are a number of heritage assets, both designated and undesignated that may be affected by the proposed routes. They outline that a more detailed assessment of the harm to the significance of the heritage assets, including their settings will be required. They also recognise that as a statutory agency they will be engaged through any future planning application and EIA stage, although they want to highlight that the Council should ensure that all the appropriate evidence base and assessment has been undertaken in identifying the preferred route in the first instance.

11.1.16 **Jesse Norman MP** has provided a written response to the consultation in his capacity as Member of Parliament for Hereford and South Herefordshire. He welcomes the objectives of the SWTP, and is broadly in favour of the measures proposed to improve accessibility and reduce congestion in Hereford. He however, does have some caveats and concerns, including the need to have costings and detailed traffic modelling in order to appraise the effect of the Southern Link Road. He would like to see a detailed cost-benefit analysis before approval. He also recognises the need for sensitivity towards the environment and local residents, and urges that their concerns are listened to. He welcomes proposals to provide additional pedestrian crossings,

and would like to see existing cycle infrastructure made safer and more welcoming. He has concerns over the proposed bus lane, for instance how it would be monitored, and if it is indeed necessary given the cuts to bus services.

Conclusion

11.1.17 The consultation process concluded with a number of alternative alignments suggested by the public and third parties. These alignments have been assessed and those that were deemed viable have since been appraised to the same level of detail as the four options contained earlier in this report. The following chapter provides the assessment of the additional route options: SC8, SC8A, and SC9.

12 ADDITIONAL OPTION ASSESSMENT

12.1 Route Options

12.1.1 The additional routes that have been designed are SC8, SC8A, and SC9. These three route options are illustrated in Figure 21, and plans showing longitudinal sections for each route are shown in Figures 22 to 24, which can be found at the rear of this report.

Option SC8

12.1.2 Option SC8 passes through the northern part of Grafton Wood and, in a generally westerly direction, crosses to the south of the densely wooded area between Grafton Lane and Withy Brook. It crosses Grafton Lane at grade and avoids the site of archaeological importance. The route climbs over the railway line on embankment and then dips down in cutting underneath Haywood Lane, passing to the south of Beech Grove/Merry Hill. The alignment passes to the south of the outbuildings located to the south of Merryhill Farm. From this location, the road turns in a north-westerly direction avoiding Newton Coppice before tying into a new roundabout on the A465. A new link is provided from this roundabout to the B4349 Clehonger Road avoiding the property known as Pykeways. The excavation underneath Haywood Lane is the main source of fill to create the embankment to cross over the railway. With some adjustment to the horizontal and vertical alignments, this option may offer the potential to achieve an earthworks balance. However, this need for a deep excavation could give rise to groundwater and road drainage problems. The route crosses existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoids them within the middle section.

Option SC8A

12.1.3 The alignment of Option SC8A is identical to SC8 above except that the new road passes underneath the railway line in a deep excavation. The road remains in a deep cutting underneath Haywood Lane, which in itself could give rise to groundwater and road drainage problems. The lack of embankments along the route gives rise to a scheme which requires the disposal of a huge amount of excess spoil.

Option SC9

12.1.4 Option SC9 is largely based on the horizontal alignment of Option SC8. The difference lies within the central section where the route is aligned to cross the railway line in a near perpendicular angle, in order to simplify the bridge crossing. In so doing the route climbs over the railway on embankment and then turns westwards towards Haywood Lane to pass over the lane. This is the only option under consideration to cross over Haywood Lane. Between the railway and Haywood Lane the road passes through Beech Grove/Merry Hill, requiring the need for a small excavation over the top of the land feature. The route passes on an embankment just to the south of the outbuildings belonging to Merryhill Farm. A comparison of the earthworks generated from cuttings and the need for spoil to create embankments show a large shortage of material, which would require importation from an off-site source. Existing utilities are affected in the same way as those described above for SC8 above.

12.2 Engineering Assessment

12.2.1 As per Options SC2, SC2A, SC5 and SC& the additional options adopt an S2 standard 7.3m (with two 1m hardstrips) single carriageway cross-section in accordance with TD27/05 'Cross Sections and Headrooms'.

Option SC8

12.2.2 Earthworks – to cross over the railway line Option SC8 requires the construction of an embankment up to 8m high and to get underneath Haywood Lane, the cutting would be over 7m deep which could give rise to groundwater and road drainage problems. Preliminary bulk earthworks calculations suggest a net surplus of 16,000m3 which could be used in landscaping works. However, with some adjustment to the horizontal and vertical alignments this option may offer the potential to achieve an earthworks balance.

12.2.3 Design Standards – 60mph design speed with Departures from Standard unlikely to be required. Opportunities for overtaking are unlikely due to the topography (vertical curvature). Angled crossing of the existing railway will increase cost but the crossing of Haywood Lane is relatively straight. The provision of new accesses for land areas being severed by the scheme and the provision of drainage runoff storage have yet to be determined.

12.2.4 Physical features – the route skirts around the south-west corner of Newton Coppice (designated as Ancient Woodland) and through the northern section of Grafton Wood which, although not listed on the Natural England Ancient woodland inventory, was identified as Candidate Ancient Woodland during the Ancient Woodland and Trees of Herefordshire Project. The route also passes to the south of the wooded area between Grafton Lane and Withy Brook as well as to the south of the barn yard belonging to Merryhill Farm. The route passes to the south of Grafton Enclosure and Beech Grove (refer to commentary on Option SC9).

12.2.5 Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoid them within the central area. The route crosses Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer.

12.2.6 Rail structure – the route crosses over the existing railway line, which is Network Rail's preferred solution for reasons relating to asset ownership and future maintenance liability. Initial discussions with Network Rail have revealed that key issues which they will be looking for in relation to a new crossing over the railway are (i) ownership and liabilities for the new bridge; (ii) headroom clearances; (iii) lateral clearances; (iv) any effect on the siting of their current infrastructure e.g. signals; (v) the ability to accommodate likely future improvements to the railway e.g. four-tracking and electrification; (vi) vehicular containment of highway vehicles; (vii) impact resistance of parts of the structure from derailed trains; (viii) railway disruption both during construction and ongoing future maintenance of the new structure; and (ix) whether the new road provides them with opportunities to close any existing level crossings in the area.

12.2.7 Highway structures – a new bridge structure will be required to carry Haywood Lane over the new SLR thereby maintaining the north-south connectivity. The bridge is likely to take the form of a single span structure with prestressed concrete beams and an insitu reinforced concrete deck. To achieve the vertical clearance required there

may be a need to raise the alignment of Haywood Lane locally. At the location where the SLR meets Grafton Lane (also the route of National Cycle Network Route No 46), the lane will be stopped up for motorised users, provision only being made for an at-grade crossing for non-motorised users. This will require local realignment of Grafton Lane to tie in with the alignment of the SLR.

Option SC8A

12.2.8 Earthworks – to cross underneath the railway line and Haywood Lane, Option SC8A requires an extensive cutting up to 11m deep which could give rise to groundwater and road drainage problems. Preliminary bulk earthworks calculations suggest a net surplus of 167,000m3 which will require disposal off site.

12.2.9 Design Standards – 60mph design speed with Departures from Standard unlikely to be required. Opportunities for overtaking are unlikely due to the topography (vertical curvature). Angled crossing of the existing railway will increase cost but the crossing of Haywood Lane is relatively straight. The provision of new accesses for land areas being severed by the scheme and the provision of drainage runoff storage have yet to be determined.

12.2.10 Physical features – the route skirts around the south-west corner of Newton Coppice (designated as Ancient Woodland) and through the northern section of Grafton Wood which, although not listed on the Natural England Ancient woodland inventory, was identified as Candidate Ancient Woodland during the Ancient Woodland and Trees of Herefordshire Project. The route also passes to the south of the wooded area between Grafton Lane and Withy Brook as well as to the south of the barn yard belonging to Merryhill Farm. The route passes to the south of Grafton Enclosure and Beech Grove (refer to commentary on Option SC9).

12.2.11 Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoid them within the central area. The route crosses Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer.

12.2.12 Rail structure – the route crosses underneath the existing railway line, which is not Network Rail's preferred solution as they would be responsible for its future maintenance. Initial discussions with Network Rail have revealed that key issues which they will be looking for in relation to a new crossing over the railway are (i) ownership and liabilities for the new bridge; (ii) headroom clearances; (iii) lateral clearances; (iv) any effect on the siting of their current infrastructure e.g. signals; (v) the ability to accommodate likely future improvements to the railway e.g. four-tracking and electrification; (vi) vehicular containment of highway vehicles; (vii) impact resistance of parts of the structure from derailed trains; (viii) railway disruption both during construction and ongoing future maintenance of the new structure; and (ix) whether the new road provides them with opportunities to close any existing level crossings in the area.

12.2.13 Highway structures – a new bridge structure will be required to carry Haywood Lane over the new SLR thereby maintaining the north-south connectivity. The bridge is likely to take the form of a single span structure with prestressed concrete beams and an insitu reinforced concrete deck. To achieve the vertical clearance required there may be a need to raise the alignment of Haywood Lane locally. At the location where the SLR meets Grafton Lane (also the route of National Cycle Network Route No 46), the lane will be stopped up for motorised users, provision only being made for an at-

grade crossing for non-motorised users. This will require local realignment of Grafton Lane to tie in with the alignment of the SLR.

Option SC9

12.2.14 Earthworks – the route is predominantly on embankment both sides of Beech Grove/Merry Hill. To cross over the railway line Option SC9 requires the construction of an embankment up to 8.5m high and to get over Haywood Lane another embankment up to 8m high. The small cutting over Beech Grove is up to 4m deep. Preliminary bulk earthworks calculations suggest a net shortfall of 110,000m3 which would need to be brought in from an external source.

12.2.15 Design Standards –60mph design speed with Departures from Standard unlikely to be required. Opportunities for overtaking are also unlikely due to the topography (vertical curvature). Straighter crossing of railway will reduce the cost of the structure. The provision of new accesses for land areas being severed by the scheme and the provision of drainage runoff storage have yet to be determined.

12.2.16 Physical features – being of a twisted nature the route manages to avoid many physical constraints except the northern section of Grafton Wood which, although not listed on the Natural England Ancient woodland inventory, was identified as Candidate Ancient Woodland during the Ancient Woodland and Trees of Herefordshire Project. It passes close to the wooded area between Grafton Lane and Withy Brook and the barn yard belonging to Merryhill Farm. The route crosses the railway at a near perpendicular angle which should be beneficial in engineering and cost terms. The unique distinction between this route and others under consideration is that it goes through the middle of Beech Grove. To date it has not been confirmed whether the feature has archaeological relevance/significance or otherwise. Beech Grove does not appear as a specific record on the Herefordshire Historic Environment Record (HER) and is not listed as a Scheduled Ancient Monument. Grafton Enclosure (off Grafton Lane) on the other hand does appear on the HER and is believed to be a lost early medieval castle site. However, it is not affected by the alignment of Option SC9, the route passing well to the south of it.

12.2.17 Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoids them within the central area. The route crosses Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer.

12.2.18 Rail structure - the route crosses over the existing railway line, which is Network Rail's preferred solution for reasons relating to asset ownership and future maintenance liability. Initial discussions with Network Rail have revealed that key issues which they will be looking for in relation to a new crossing over the railway are (i) ownership and liabilities for the new bridge; (ii) headroom clearances; (iii) lateral clearances; (iv) any effect on the siting of their current infrastructure e.g. signals; (v) the ability to accommodate likely future improvements to the railway e.g. four-tracking and electrification; (vi) vehicular containment of highway vehicles; (vii) impact resistance of parts of the structure from derailed trains; (viii) railway disruption both during construction and ongoing future maintenance of the new structure; and (ix) whether the new road provides them with opportunities to close any existing level crossings in the area.

12.2.19 Highway structures – a new bridge structure will be required to carry the SLR over Haywood Lane. The bridge is likely to take the form of a single span structure with

prestressed concrete beams and an insitu reinforced concrete deck. The need to cross over Haywood Lane is likely to cause difficulty in tying the lane back to existing levels either side of it, particularly to the north at its junction with Merryhill Lane. At the location where the SLR meets Grafton Lane (also the route of National Cycle Network Route No 46), the lane will be stopped up for motorised users, provision only being made for an at-grade crossing for non-motorised users. This will require local realignment of Grafton Lane to tie in with the alignment of the SLR.

Departures and Relaxations from Standards

12.2.20 Various constraints on the proposed route for a road may mean that it cannot be reasonably designed to full standards. Any desirable or necessary reductions in standards are dealt with as design Relaxations or design Departures. All Departures must have formal approval from the Technical Approval Authority (TAA).

12.2.21 At present the number of Relaxations and Departures in the design is not known, although they are considered unlikely across all options. The aim would be to design out any Departures at detailed design stage.

Footway and Cycle Routes

12.2.22 All of the route options bisect Grafton Lane, which forms part of the National Cycle Network, and mitigation options have been proposed in a separate Technical Note. In addition, the route options bisect a varying number of Public Rights of Way (PRoW), as shown in Table 16 below.

Option	No. PRoW Bisected
SC8	3
SC8A	3
SC9	3

Table 16: Public Rights of Way bisected by each option

12.2.23 Each of the three additional options bisect the same PRoW.

Railway and Structures

12.2.24 All of the additional routes considered for the SLR would need to cross the main Cardiff to Hereford railway line. Options SC8 and SC9 cross over the railway line, while SC8A crosses underneath. No other engineering structures e.g. bridges are known to be affected by the proposals.

Drainage

12.2.25 The drainage proposals are likely to consist of a combination of carrier drains, filter drains, and grassed surface water channels or similar such as swales. Sustainable Urban Drainage Systems (SUDS) will be utilised where possible.

12.2.26 Where appropriate drainage would be provided at the top and bottom of embankments and, if necessary, drainage would also be provided within the cutting slopes. Attenuation ponds may be required to control the flow of highway drainage water entering a watercourse.

12.2.27 Affected minor watercourses would be diverted and/or culverted.

12.2.28 Appropriate measures to intercept any pollutants entering the highway drainage system will be agreed with the Environment Agency.

Lay-bys

12.2.29 The recommended spacing for lay-bys in both directions on a single carriageway road is between 2 and 5km. With the SLR being just over 3km long between the A49(T) and the A465 there is no requirement to provide a lay-by in accordance with design guidance.

Road Lighting

12.2.30 Road lighting is only proposed for the roundabouts. In view of the proximity of the new A465 roundabout to some properties a lower standard of lighting may be considered in conjunction with Herefordshire Council's policy for lighting which also includes phased dimming overnight, as appropriate.

Road Restraint Systems [e.g. Vehicle Containment Barriers]

12.2.31 Road restraint systems would be provided in accordance with Design Standards.

Statutory Undertakers

12.2.32 Diversionary works will be required. These are to be determined and agreed with the Statutory Undertakers.

Scheme Cost of Options

12.2.33 Table 17 shows the estimated scheme costs for the additional options based on 2012 prices. For the purposes of this assessment we have made a contingency allowance of 44% on construction cost. If the contingency was not required, the scheme cost would be the lower of the two values below.

Option	Scheme Cost
SC8	£17.9M-£26.5M
SC8A	£25.4M-£38.6M
SC9	£17.2M-£25.3M

Table 17: Cost of Additional Options

Value Engineering

12.2.34 Value Engineering principles such as optimising the alignment, structures and cut/fill balance will be considered during further development of the preferred option. This may include a Value Engineering workshop.

Engineering Assessment Conclusion

12.2.35 In conclusion, of the 3 additional alignment options considered, Option SC8 performs better than the other options in terms of engineering considerations. This is based on the following observations:

- The route is predominantly straight on plan only curving gradually north-west on the approach to the new A465 roundabout;

- The vertical alignment tends to follow the topography of the area and the need to create an embankment in order to cross over the railway is achieved from the cut area around Haywood Lane (adjacent). This should offer a sustainable earthworks solution, subject to the excavated material being acceptable for reuse as engineered fill;
- Of the three additional routes considered it is the most likely option to achieve a balance of bulk earthworks;
- 60mph design speed throughout;
- No Departures from Standard's expected for road geometry;
- The route offers a compromised alignment solution between the properties located in Merryhill and those around Haywood Lodge to the south. It is also located some 130m further north than Option SC2 from the property on Grafton Lane known as The Green;
- The route passes to the south of the knoll at Beech Grove/Merry Hill, the archaeological significance of which is not known to date;
- The route avoids the barns belonging to Merryhill Farm;
- The route goes over the railway so aligns with Network Rail's expectation. Furthermore it does not conflict with the existing communications mast and generator building located further south along the railway (which Option SC2 does);
- The central section of the route is located to south of the main corridor of overhead electricity cables running east-west;
- The route avoids Newton Coppice and the wooded area situated between Grafton Wood and Withy Brook.

12.3 Traffic, Safety and Economic Assessment

12.3.1 The methodologies used to assess the options take account of the Department for Transport and Highways Agency technical and guidance documents. The assessments use actual and predicted traffic volumes on the road network in the study area.

Future Year Traffic Flows

12.3.2 The traffic flows predicted for 2017 (the Opening Year) and 2032 (the Design Year) are those outlined in Table 13 in Section 7.4.

Reliability Comparison

12.3.3 There is not expected to be a significant difference between the options in terms of reliability.

12.3.4 Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.

Accident Comparison

12.3.5 There is not expected to be a significant difference between the additional options in terms of accidents. The options will be designed to the latest design standards and are likely to be safer than the A465 and A49 as per the Options SC2, SC2A, SC5 and SC7. A reduction in traffic along the A465 will result in a reduced accident rate along this section of road, although the increase in traffic along the A49 in some time periods may cause the accident rate to increase on this section of road.

Economy Comparison

12.3.6 There is not expected to be a significant difference between the options in terms of economy. Scheme costs for the additional options are detailed in Section 12.2.33.

12.3.7 The scheme is anticipated to result in reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road, resulting in journey time savings for existing users. There is likely to be increased traffic along the A49 in some time periods, but the level of delay at the A49/A465 junction is proposed to remain at existing levels.

12.4 Environmental Assessment

Air Quality

12.4.2 The methodology undertaken on the three additional options is consistent with the approach outlined in Chapter 8.

Potential Effects

12.4.3 Air quality impacts from the operation of the three additional options will be as a result of the introduction of traffic into areas which were previously free from road traffic or had experienced very low traffic.

12.4.4 Table 18 shows the number of residential properties within 200m from each route option, split into bands. This only includes where the scheme introduces a new section of road, and does not include existing roads.

Distance from Road Centreline	Number of Properties		
	Option SC8	Option SC8A	Option SC9
0 – 50m	0	0	0
50m – 100m	4	4	3
100m – 200m	5	5	4
Total	**9**	**9**	**7**

Table 18: Residential properties within 200m of each route

12.4.5 There will also be potential secondary effects upon woodland habitats from air pollutants as a result of traffic flows across each of the three additional options. All scheme options would have identical secondary impacts upon Hayleasow Wood, Newton Coppice and Grafton Scheme.

Noise

12.4.6 For each of the route options identified, a qualitative assessment of potential noise and vibration impacts has been undertaken. Table 19 contains the number of properties within 600m of each route option. This information has been used to complete the AST for each route option.

Distance from Road Centreline	Number of Receptors by Route Option		
	Option SC8	Option SC8A	Option SC9
0 – 50m	0	0	0
50m – 100m	4	4	3
100m – 200m	5	5	4
200m – 300m	13	13	13
300m – 600m	81	81	78
Total	**103**	**103**	**98**

Table 19: Residential properties within 600m of each route

12.4.7 At this stage, it is not possible to undertake a more detailed assessment of potential noise and vibration impacts associated with each route option as validated traffic data is not available.

Greenhouse Gases

The methodology adopted for the additional options is consistent with the approach outlined in Chapter 8. SC8, SC8A and SC9 were assessed for their potential greenhouse (CO_2eq) gas production in relation to the scheme length, change in vehicle speeds and changes to journey lengths as a consequence of the road traffic use of the proposed scheme options.

Potential Effects

12.4.8 It is highly probable that local traffic speeds will increase as a result of the scheme development. In addition the distances that vehicles will be required to travel is estimated to increase slightly as a result of the scheme development.

12.4.9 Figure 20 in Chapter 8 illustrates that increases in vehicle speeds between 60 to 90 kph increases CO_2 emissions. Therefore it is possible that all three of the additional options will have a slight adverse impact on greenhouse gases due to vehicles travelling greater distances and at higher speeds.

Landscape/Townscape

Option SC8

12.4.10 SC8 passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route runs in close proximity to Haywood Lodge Farm and associated properties, with potential for visual amenity effects. It avoids Newton Brook. The alignment of the eastern half of the route runs in a straight line and cuts across the grain of the landscape. The route therefore fails to take into account the undulating topography and irregular field pattern. SC8 will require extensive works to create embankments to take the route over the railway line resulting in a visible central section (as it passes over the railway line) and will have engineered slopes that will be disruptive to the character of the local topography.

12.4.11 The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource with the additional sections of road, roundabout and proximity to residential properties, is Moderate (loss of resource, at odds with the local pattern and landform, visually intrusive and will adversely impact on the landscape).

Option SC8A

12.4.12 SC8A passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route runs in close proximity to Haywood Lodge Farm and associated properties, with potential for visual amenity effects. It avoids Newton Brook. The alignment of the eastern half of the route runs in a straight line and cuts

across the grain of the landscape. The route therefore fails to take into account the undulating topography and irregular field pattern. SC8A will require extensive works to create a cutting to take the route under the railway and will involve engineered slopes that will be disruptive to the character of the local topography.

12.4.13 The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource with the additional sections of road, roundabout and proximity to residential properties, is Moderate (loss of resource, at odds with the local pattern and landform, visually intrusive and will adversely impact on the landscape).

Option SC9

12.4.14 SC9 passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route will be visible from Haywood Lodge Farm and associated properties, however it curves away in a NW direction after crossing the railway line. As it takes a NW direction it passes directly through a local landscape feature called Beech Grove. Similar to other more southerly routes, it avoids Newton Brook.

12.4.15 The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource would be Major (is at considerable variance with the landform, scale and pattern of the landscape, is visually intrusive and will adversely impact on the landscape).

Historic Environment

Options SC8 and SC8A

12.4.16 These options would have no effect on any Scheduled Monument or its setting. The Scheduled Monuments in the extended study area are of high value, but these options would have no effect upon them or their settings, resulting in no significant effect.

12.4.17 SC8 and SC8A would encroach within 370m of but be largely screened from the Listed Building complex at Haywood Lodge, containing one Grade II* and three Grade II structures. It would encroach within 320m of but be largely screened from the Grade II Listed Buildings at Merryhill. It would encroach within 220m of but be largely screened from the agricultural structures at Clehonger Court, which are Grade II Listed Buildings. It would encroach within 150m of and be visible from the Grade II milestone on the A465.

12.4.18 The Listed Buildings in the study area are of high value. Although passing close to the listed milestone on the A465, the roadside is the appropriate setting for structure and, therefore, these options would have no significant effect. It would have a minor impact on the settings of the listed structures at Haywood Lodge, Merryhill and Clehonger Court, resulting in a slight to moderate effect.

12.4.19 These options would traverse four fields from which significant artefacts have been recovered. As they consist of findspots, the undesignated sites are of uncertain value, though the effect upon them could be major.

Option SC9

12.4.20 This option would have no effect on any Scheduled Monument or its setting. The Scheduled Monuments in the extended study area are of high value, but this option would have no effect upon them or their settings, resulting in no significant effect.

12.4.21 This option would encroach within 420m of but be largely screened from the Listed Building complex at Haywood Lodge, containing one Grade II* and three Grade II structures. It would encroach within 250m of but be largely screened from the Grade II Listed Buildings at Merryhill. It would encroach within 220m of but be largely screened from the agricultural structures at Clehonger Court, which are Grade II Listed Buildings. It would encroach within 150m of and be visible from the Grade II milestone on the A465.

12.4.22 The Listed Buildings in the study area are of high value. Although passing close to the listed milestone on the A465, the roadside is the appropriate setting for structure and, therefore, this option would have no significant effect. It would have a moderate impact on the settings of the listed structures at Haywood Lodge and Merryhill and a minor impact Clehonger Court, resulting in a moderate effect.

12.4.23 This option would traverse five fields from which significant artefacts have been recovered. As they consist of findspots, the undesignated sites are of uncertain value, though the effect upon them could be major.

Biodiversity

12.4.24 This options appraisal exercise has been produced following a similar methodology to that of the Appraisal Summary Tables included in Appendix A, with the information expanded where possible to incorporate updated survey information where this has become available.

Statutory and non-statutory designated sites

12.4.25 None of the three additional options will directly affect any statutory or non-statutory designated sites. Impacts and mitigation measures are likely to be similar for all options and as such are not considered to affect the options appraisal.

Badgers

12.4.26 Minimal evidence of badger was recorded during the survey. Badgers are protected on the grounds of animal welfare rather than rarity / population decline and as such are not considered to affect the options appraisal. At this time there is no evidence to suggest badger-related road traffic collision risk will differ significantly between any of the options.

Dormice

12.4.27 The presence or absence of this species has not yet been determined however surveys are ongoing. There is insufficient information to date to fully consider this species in the options appraisal.

Otters

12.4.28 Otter has been identified using Withy Brook. All options cross this brook, therefore, impacts and mitigation are likely to be similar for all options.

Water voles

12.4.29 No evidence of this species was recorded, therefore it is not considered further in the options appraisal.

Bats

12.4.30 Surveys are on-going for this species group however to date it has been determined that the site is, in general, 'bat rich' with at least 10 species recorded to date. This includes two Annex 2 species (barbastelle and lesser horseshoe bat). These records are spread throughout the site, with no 'hotspots' identified for these species.

12.4.31 Foraging and commuting activity levels are considered to be relatively high, with continuous foraging activity recorded at several locations, on several occasions and for several different species. Bat activity has been recorded at all locations surveyed, with all options affecting areas where both higher and lower levels of activity have been recorded. As the three additional options follow the same broad corridor as the other options and will affect the same or very similar habitat features (such as woodlands and hedgerows), impacts and mitigation are likely to be similar for all options.

12.4.32 The level of roosting activity recorded to date is limited to two minor soprano pipistrelle roosts in two adjacent orchard trees. As these trees will not be directly affected by any of the route options, this data is not considered to affect the options appraisal. It is possible that roosts of greater conservation significance, which could influence the alignment, will be detected during the remaining surveys to be undertaken during October 2014, although this is relatively unlikely. It is possible that roosts may be present within trees that would be directly affected by SC9; insufficient surveys have been completed on these trees to determine presence or absence.

Birds

12.4.33 As the three additional options follow the same broad corridor as the other options and will affect the same or very similar habitat features (such as woodlands, arable fields and margins, and hedgerows), impacts and mitigation are likely to be similar for all options. Barn owls have been recorded flying and likely foraging and one likely roost has been recorded close to Haywood Lane. It is unlikely that any options will directly affect any barn owl roosts, should they be found during remaining surveys, and therefore this data is unlikely to affect the options appraisal.

Reptiles

12.4.34 Common reptile species have been recorded in low numbers within woodland glade and field margin habitats across the site. As the three additional options follow the same broad corridor as the other options and will affect the same or very similar habitat features, impacts and mitigation are likely to be similar for all options.

Amphibians

12.4.35 A medium population of great crested newts was recorded at several ponds within 500 m of the proposed options. None of the proposed options will directly affect any ponds, therefore impacts to great crested newts will be limited to terrestrial habitats.

Flora

12.4.36 Hedgerows Regulations data has not yet been analysed therefore there is insufficient information to date to consider this in the options appraisal.

Consideration of the three additional options

12.4.37 For the reasons detailed above a majority of the potential ecological receptors are not considered to influence the options appraisal at this stage. The main differences between the options are assessed below in terms of the habitats which each option will affect directly, and to some degree the invertebrate assemblages which these habitats support.

Options SC8 and SC8A

12.4.38 Options SC8/8A passes through the centre of Grafton Wood and is likely to lead to the greatest extent of habitat loss / disturbance within Grafton Wood relative to other route options under consideration, with comparable impacts to SC2/2A and SC9.

12.4.39 Akin to Options SC2/SC2A, Options SC8/8A would bisect species rich hedgerows along and near to Grafton Lane, leading to habitat loss and fragmentation. Withy Brook would also be bisected

12.4.40 There may be a slight preference to bridge over the railway, which would allow the railway corridor to act as an underpass under the road.

Options SC9

12.4.41 SC9 passes through the centre of Grafton Wood and is likely to lead to the greatest extent of habitat loss / disturbance within Grafton Wood relative to other route options under consideration, with comparable impacts to SC2/2A and SC8/8A.

12.4.42 Akin to Options SC2/SC2A, Option SC9 would bisect species rich hedgerows along and near to Grafton Lane, leading to habitat loss and fragmentation. Withy Brook would also be bisected

12.4.43 Option SC9 would pass over Haywood Lane via an overbridge, the only route option which does so. Haywood Lane could therefore provide an underpass for use by bats (providing this can be unlit), which may provide a more easily effective mitigation solution than having the proposed road passing under Haywood Lane. However, SC9 would directly affect several mature / veteran trees within hedgerows to the east of the railway (some of which have high bat roosting potential), which would not be affected by other route options.

Conclusion

12.4.44 There is likely to be little difference in impacts and mitigation measures between the three additional options for a majority of the ecological receptors, based on desk study and survey data gathered to date. This reflects the appraisal exercise undertaken in April 2014.

12.4.45 Any option selected will need to include suitable mitigation measures in relation to ecological impacts, with impacts predicted for all route corridor options remaining under consideration.

Water Environment

12.4.46 The most significant impacts to the water environment are likely to be associated with impacts to water quality and flood risk, specifically:

- Polluted surface water runoff during the construction phase consisting of high sediment load, chemicals, hydrocarbons and oils that may migrate or be discharged to surface water features or groundwater resources.
- Polluted surface water runoff during operation of the preferred route containing silts and hydrocarbons that may migrate or be discharged to surface water features or groundwater resources.
- Increased rates and volumes of surface water runoff during operation of the preferred route from an increase in impermeable area and/or changes to the existing drainage regime leading to a potential increase in flood risk.
- Flood risk to the route options as a result of construction within areas identified to be at flood risk and flood risk to people and property elsewhere as a result of the proposals.
- Impact to the hydromorphological and ecological quality of watercourses associated with works within or in close proximity to Withy Brook and Newton Brook.

12.4.47 With the information known at this stage, there is no significant difference between the route options.

Environmental Assessment Conclusion

12.4.48 A desk top review was undertaken of the Stage 2 Environment Assessment Report produced for the Belmont Transport Package by Amey in October 2013 to determine the baseline conditions in the study area.

12.4.49 In addition, the Biodiversity section was supplemented by a full desk study and survey data completed to date (September 2014) by Parsons Brinckerhoff.

12.4.50 The Environment Assessment undertaken reflects the assessment results from the Stage 2 Environment Assessment Report and the Appraisal Summary Tables produced in April 2014.

12.4.51 All of the options, including the three additional options, will have adverse effects on the environment. On balance Option SC7 performed the least worst of all the options whilst Options SC5 / SC9 performed the worst.

12.5 Social Assessment

Physical Activity

12.5.2 Physical activity has an important role to play in preventing weight gain and obesity, and in improving mental health. Transport can affect physical activity levels by encouraging or discouraging walking and cycling.

12.5.3 Physical activity impacts can be important for schemes targeted at walking or cycling interventions. This is not the case with any of the SLR options assessed in isolation from the supporting sustainable transport improvements. All seven route variations will have an adverse impact on walking and cycling levels, discouraging these activities by increasing severance on existing routes and loss of rural amenity through the introduction of traffic noise and proximity to traffic.

12.5.4 A numerical assessment of the number of pedestrians and cyclists affected is not possible based on the data available, and given the type of scheme being assessed, not considered necessary. The three additional options are assessed to have a moderately adverse impact on physical activity.

Journey Quality

12.5.5 Journey quality is a measure of the real and perceived physical and social environment experienced when travelling. The guidance breaks down the journey quality impacts into three groups:

- Traveller care – cleanliness, level of facilities, information and the general environment
- Traveller's views – pleasantness of the external surroundings
- Traveller stress – frustration, fear of accidents and route uncertainty

12.5.6 Both Traveller views and traveller stress are of relevance to the appraisal of the SLR options. The three additional options have been designed to divert traffic from existing built-up areas of the A465 and A49, to a new, more open, route with rural landscape vistas, greater route certainty, and reduced fear of accidents for users.

12.5.7 There are, however, some counter-acting adverse impacts for A465 and A49 users that do not use the SLR. These relate to having to negotiate new SLR connecting junctions, and to the degraded views of earthworks associated with both those junctions and the SLR route itself.

12.5.8 On balance, all three additional options are assessed to have a beneficial impact on journey quality. Differences between the schemes relate to the scale and works associated with:

- The new A465 roundabout arrangement - imposing additional stress to travellers on the A465 and connecting between the B4349 and A465, and
- The extent of earthworks and cuttings in taking the SLR route over/ under the railway and other structures, restricting views from the A465, A49 and SLR respectively.

12.5.9 All three additional routes, SC8, SC8A and SC9 have been assessed as moderate beneficial in respect of journey quality.

Security

12.5.10 Security impacts relate to fear of and vulnerability to crime. These impacts can be important for public transport users, while there are no formal guidelines for road users. The only impact relevant to the SLR route options is considered to be reduced vulnerability to crime where users are less likely to be required to stop their vehicles or travel at slow speeds. This benefit can be attributed to users of the A465, A49 and SLR itself. The slight beneficial impact is the same for all three additional options.

Access to Services

12.5.11 Access to services relates to opportunities for people to travel and access the services they require or desire. Accessibility impacts are primarily concerned with households that do not have access to a car, and with interventions that influence opportunities to access services by public transport, walking and cycling. In the case of the three additional options they provide a potential new bus route between the A465 and A49, but not one that serves the key local destinations in Hereford City Centre. For this reason such a bus service is unlikely to materialise.

12.5.12 There may be some improved access to services for car users as a result of reduced journey times both into Hereford City Centre on the A465 and A49, and to key destinations located south of the city including HEZ. Consideration of accessibility, according to the guidance however is not concerned with car users. The assessment is therefore neutral for the three additional options.

Affordability

12.5.13 Monetary costs can be a barrier to mobility for low-income groups, affecting their ability to access key destinations. Changes to the transport network involving changes in user charges can have a strong impact on people in low-income groups.

12.5.14 The SLR, appraised in isolation of supporting sustainable transport options, is primarily concerned with re-routing to facilitate more efficient journeys. This has the impact of reducing congestion on the A465 and A49 to the north of the scheme, whilst increasing speeds and reducing distances for journeys between the A465 and A49. Both will impact positively on the personal affordability of car drivers, saving on fuel costs. The impact has been assessed as slight beneficial for all three additional options.

Severance

12.5.15 Severance is concerned with the physical separation of people from the facilities and services they use, or would use, within their community. Severance is important where infrastructure and/ or traffic using it presents a barrier to safe pedestrian movement. According to the guidance, the appraisal of severance is concerned only with pedestrians, and not with the movement of cyclists, car users, or other user groups. Severance is classified according to hindrance of movement and also the numbers of people affected.

12.5.16 In the case of the three additional options, they increase severance significantly but for a very low number of residents located in rural communities. Scheme mitigation associated with Grafton Lane, other minor lanes and a number of PROWs, however,

will have the effect of reducing/ minimising this severance. The severance experienced by a few, as a direct result of the SLR infrastructure, should be more than compensated by the reduction in severance resulting from reduced travel volumes through Belmont Road and the Holme Lacy Road area.

12.5.17 The net assessment of severance for the three additional options is slight beneficial, as there is no material difference in impact between them.

Social Assessment Conclusion

12.5.18 There is little difference between the three additional options in respect of the social impact appraisal. In conclusion, SC8, SC8A and SC9 demonstrate similar social benefits to SC2 and slightly more benefit that Options SC5 and SC7. It should be stated, however, that the differences between all seven options are marginal.

13 OTHER FACTORS

13.1 General

13.1.1 There are other measures that need to be considered as part of the option appraisal as identified in Section 2.0. These factors include technical and operational feasibility, financial affordability and deliverability, and the likely risks associated with the option.

13.2 Technical and Operational Feasibility

13.2.1 Technical and operational feasibility considers for each option its implementation, buildability and influence on network resilience. Each of the seven options under consideration are seen to be technically feasible and if introduced will offer greater network resilience.

13.2.2 However, Options SC2 and SC8 are considered to offer a less challenging technical solution than the other five options because the routes cross over the railway line rather than underneath. Not only does this align with Network Rail's expectation, there may be less programming challenges in terms of possible closures and construction phasing than with the options that cross underneath. Options SC2 and SC8 also reduce the potential for groundwater/drainage issues associated with a very deep cut.

13.3 Financial Affordability and Deliverability

13.3.1 Financial affordability and deliverability acknowledges the estimated scheme costs, opportunities for phased construction and likelihood of third-party funding.

13.3.2 There are no funding issues associated with any particular route. It is worth noting however, that the SC2 rates of £4.6M/km is at least 8% less than the other options.

13.4 Risk

13.4.1 This requires an assessment of the potential risks associated with the implementation of the proposal.

13.4.2 The risks associated vary from option to option. Details of these risks can be found in the South Wye Transport Package Risk Register.

14 CONCLUSIONS AND RECOMMENDATIONS

14.1 Conclusions

14.1.1 PB has been commissioned by BBLP on behalf of HC to identify a package of measures that would address the transport problems within the South Wye area of Hereford. The SWTP has identified a number of possible improvements, covering different transportation modes, strategies and interventions.

14.1.2 One approach within the SWTP is to construct a new Southern Link Road, which would generate additional capacity with new infrastructure to the south of Hereford. The new road would improve existing connections between the A465, A49 and the Rotherwas Estate.

14.1.3 This Preferred Option Report describes the scheme development, and identifies that an appraisal of the route options determined that four of the initial eight options represented possible solutions to the transportation problems, with the other four routes discounted due to environmental considerations.

14.1.4 The four route options for the Southern Link Road initially assessed in this report were:

- SC2: the most southerly route, which crosses over the railway line and underneath Haywood Lane.
- SC2A: a variation on SC2 whereby the road crosses underneath the railway line.
- SC5: a route located further north of SC2/SC2A, which runs south of Merryhill Lane. The road crosses underneath the railway line and Haywood Lane.
- SC7: roughly similar to SC5, but more twisted in nature avoiding a number of existing environmental constraints but reducing the speed limit to 50mph.

14.1.5 This report outlined the consultation process, and concluded that as there were a number of alternative alignments suggested by the public and third parties, further assessment was necessary. Three additional routes that were deemed viable have been appraised to the same level of detail as the four options outlined above.

14.1.6 This report has assessed each of the final seven route options in terms of engineering considerations, economic outcomes, impact to the environment, and an assessment of the social implications of each route. The performances of these options within the appraisal have been mixed.

14.1.7 The engineering assessment concluded that SC2 and SC8 performed better than the other route options. Some of the reasons for this, as discussed in Chapter 6 and 11 of this report, include that Option SC2 and SC8 follows the ground profile (except where it has to go over the railway and under Haywood Lane), removes the potential for groundwater/drainage issues, they would have a 60mph design speed throughout, and it is goes over the railway so aligns with Network Rail's expectation.

14.1.8 In relation to the scheme costs, Option SC8A is the most expensive of the seven options whilst Option SC2 is the cheapest.

14.1.9 All seven options performed well under economy, by providing significant regeneration and wider economic impacts. There is not expected to be a significant difference between the options with regards to the economic benefits, as all seven are

anticipated to reduce congestion along the A465, and provide access to the Hereford Enterprise Zone.

14.1.10 All of the four options performed negatively against environment. Option SC7 performed the least worst of the four options as it is considered the most ecological preferable, with minimal impacts on biodiversity and habitats. Option SC5 performed the worst due to its significant impact upon the landscape.

14.1.11 All the options performed well in respect to the social impacts, with marginal differences between the seven options. Options SC2, SC2A, SC8, SC8A and SC9 demonstrate slightly more social benefits than Options SC5 and SC7.

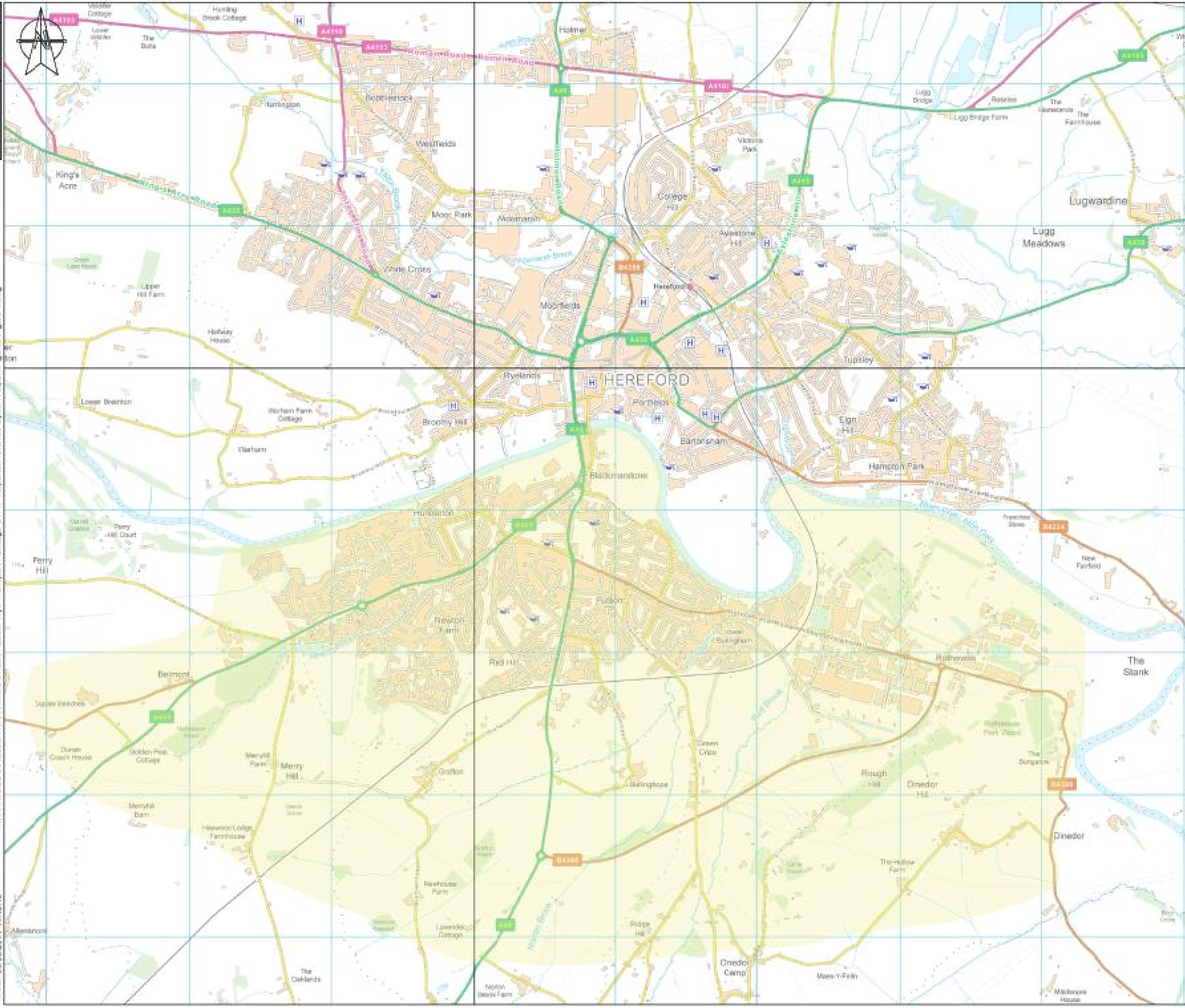
14.1.12 Overall, Option SC2 had the highest score for the appraisal although SC8 also scores highly within the appraisal. Both of these options perform the best of the seven options with regards to engineering.

14.2 Recommendations

14.2.1 The results of the appraisal have demonstrated that all of the options provide many benefits to the economy, reduce congestion, and improve journey times. All of the options cross greenfield land and have a negative impacts to the environment, including increasing traffic noise, reducing air quality, and impacts to the landscape.

14.2.2 The appraisal work has demonstrated that option SC2 is the best performing option within the technical appraisal. This option also received the highest level of support as a proportion of feedback received of the four that were taken to public consultation. Therefore, it is recommended that option SC2 is the preferred option for the SLR.

Figures



KEY:

- SOUTH WYE AREA

Rev	Date	Description	By	Chk	App

PARSONS BRINCKERHOFF
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Site/Project: SOUTH WYE TRANSPORT PACKAGE

Title: SWTP STUDY AREA

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Designed: IM		Approved: JC	
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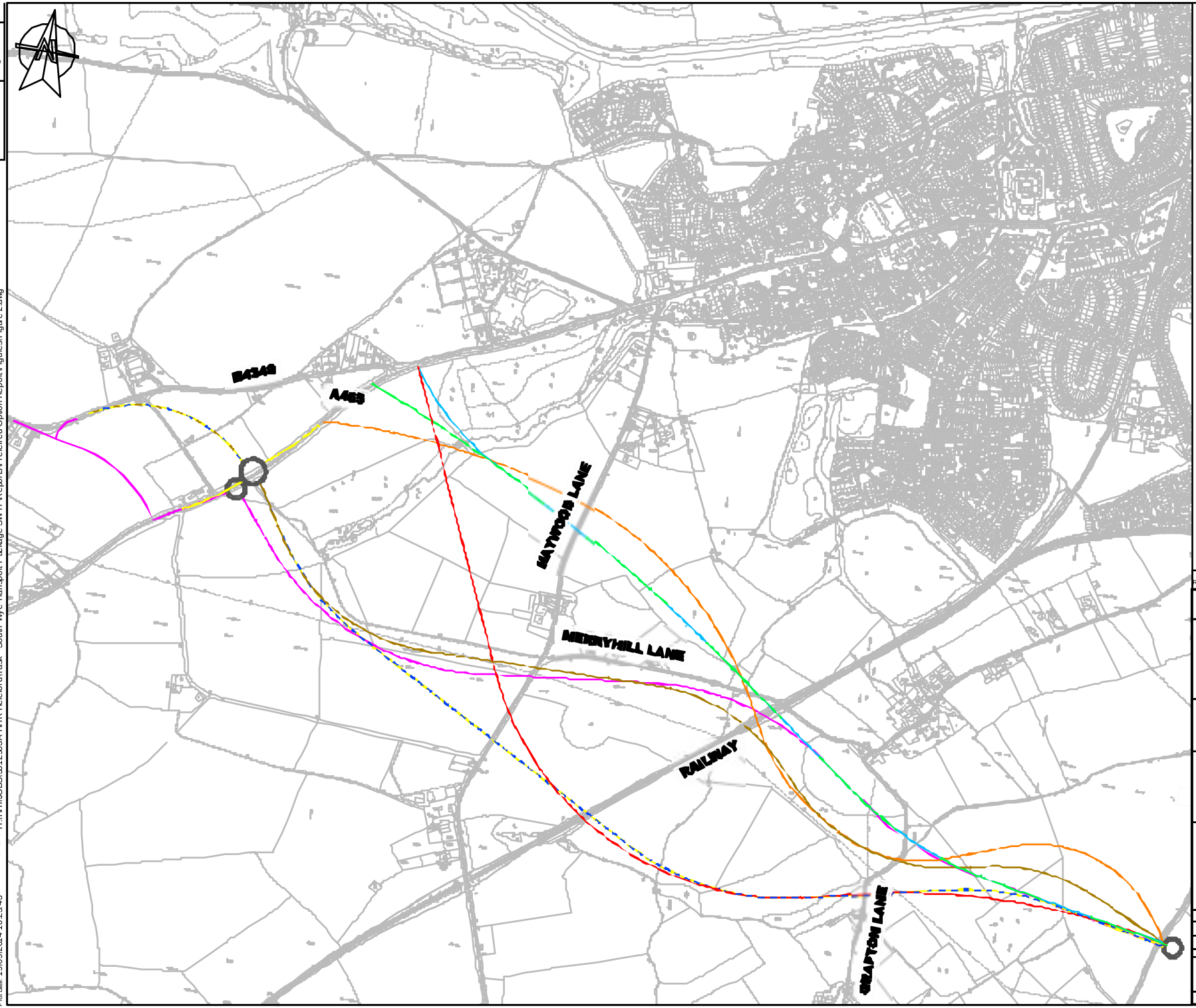
3512983A-HHR Figure 1



KEY:

- SC1
- SC2
- SC2A
- SC3
- SC4
- SC5
- SC6
- SC7

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Title:
ROUTE OPTIONS

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Project Number: 3512983A-HHR		Drawing Number: Figure 2	Revision

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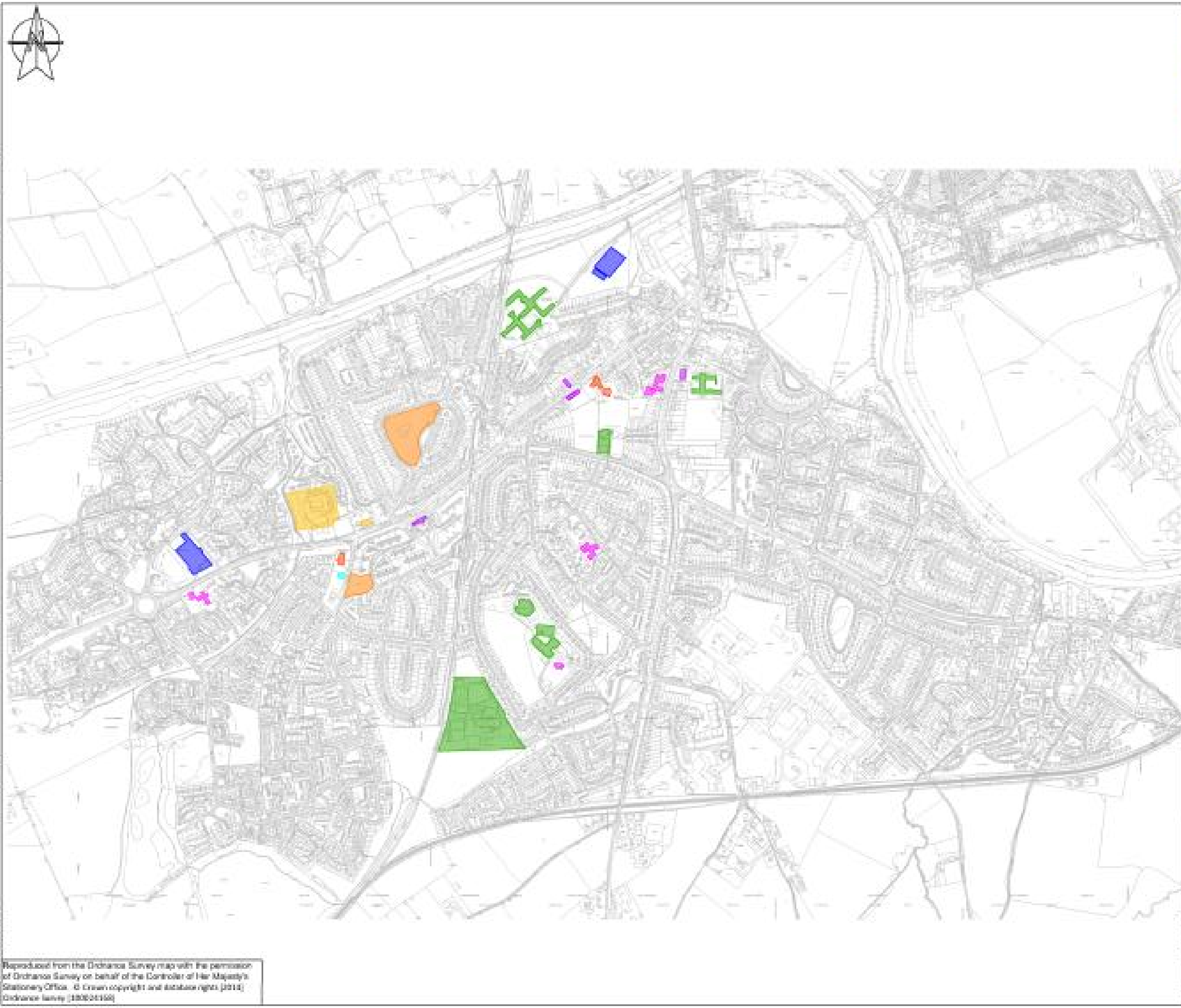

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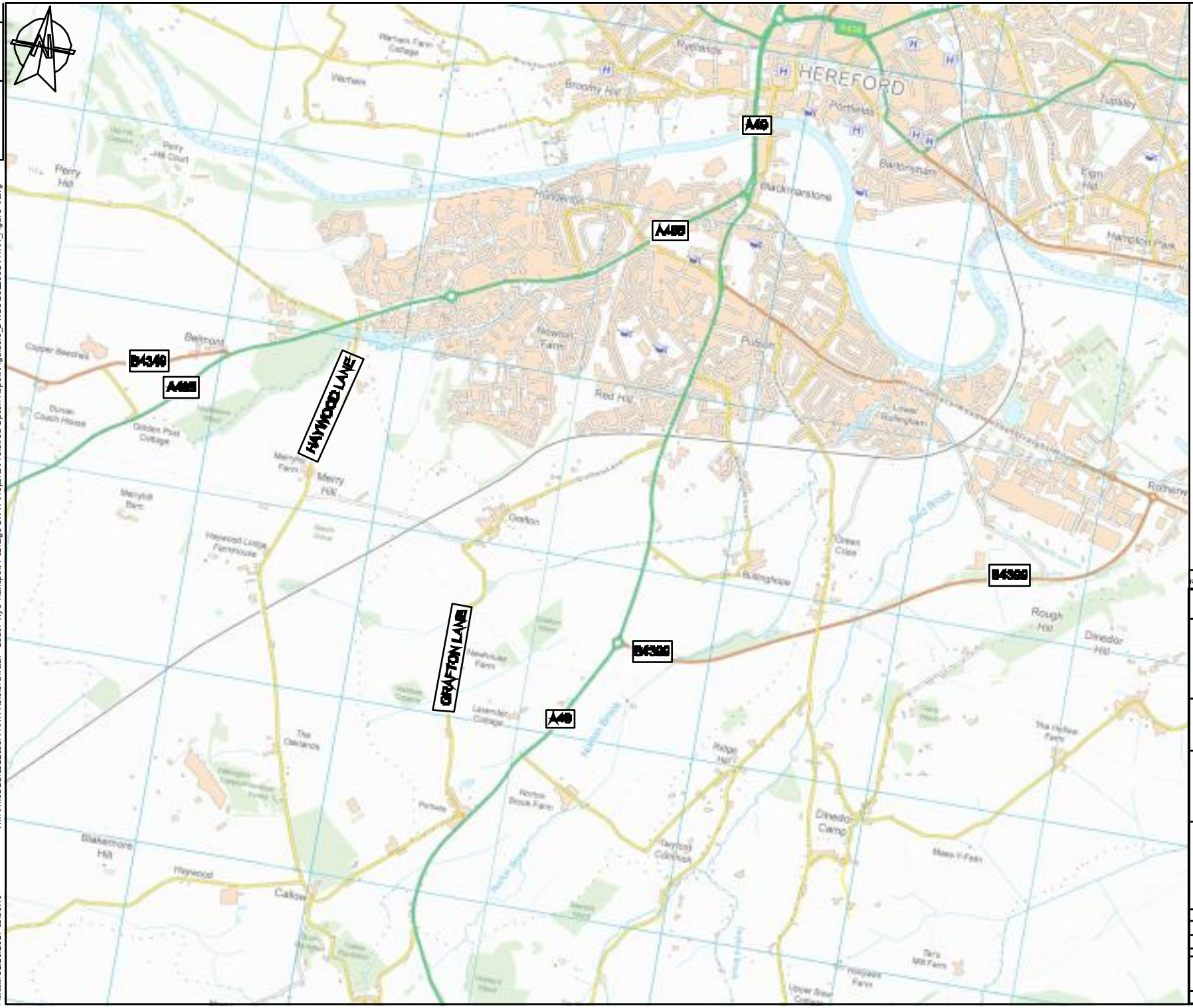
SOUTH WYE TRANSPORT PACKAGE

TRIP GENERATORS & ATTRACTORS

3512983A-HHR | FIGURE 3 | -



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SOUTH WYE TRANSPORT PACKAGE

Title:
EXISTING HIGHWAY NETWORK

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Project Number: 3512983A-HHR
Revision: -

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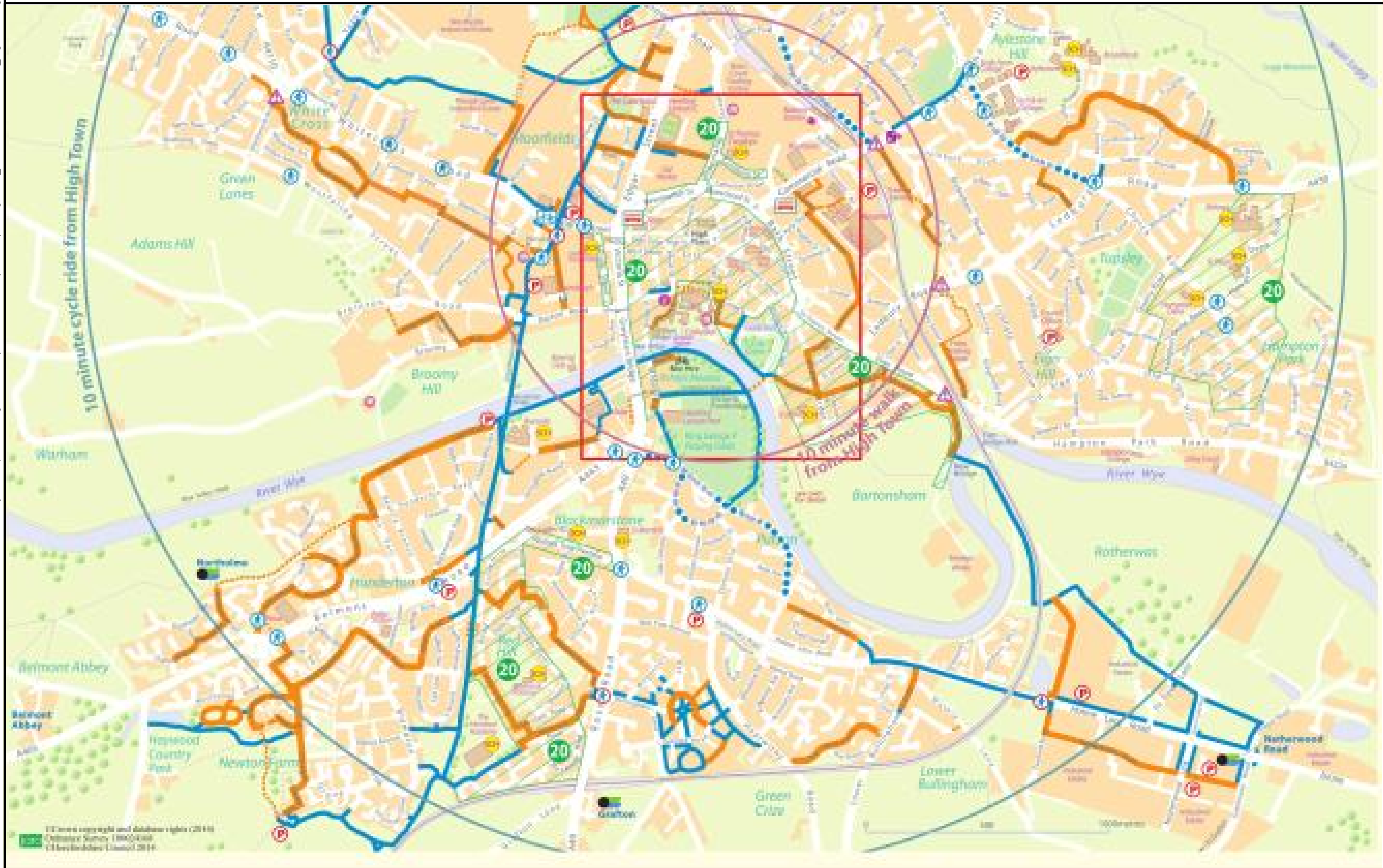

Key

- Traffic free and a mixture of special cycle tracks, riverside paths and other routes through parks
- Suggested routes on quiet suburban roads
- Indicates linking routes where cyclists are legally required to dismount
- Traffic calming
- 20 mph zone
- Junction/crossing
- Cycle parking
- Pedestrian crossing/Pedestrian & Cycle crossing
- Junction with advanced stop line for cyclists
- Safety camera sites
- Tourist Information Centre
- Bicycle shop
- Museum
- Bus Station
- Park & Share/Park & Cycle sites

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Site/Project: HEREFORDSHIRE SWTP SOUTHERN LINK ROAD

Title: WALKING AND CYCLING ROUTES

Drawn: IM		Checked: JC	
Designed: IM		Approved: JC	
Date: 09/09/2014	Scale: N.T.S	A3	Sheet:
Project Number: 3512983A-HHR		Drawing Number: Figure 5	Revision:

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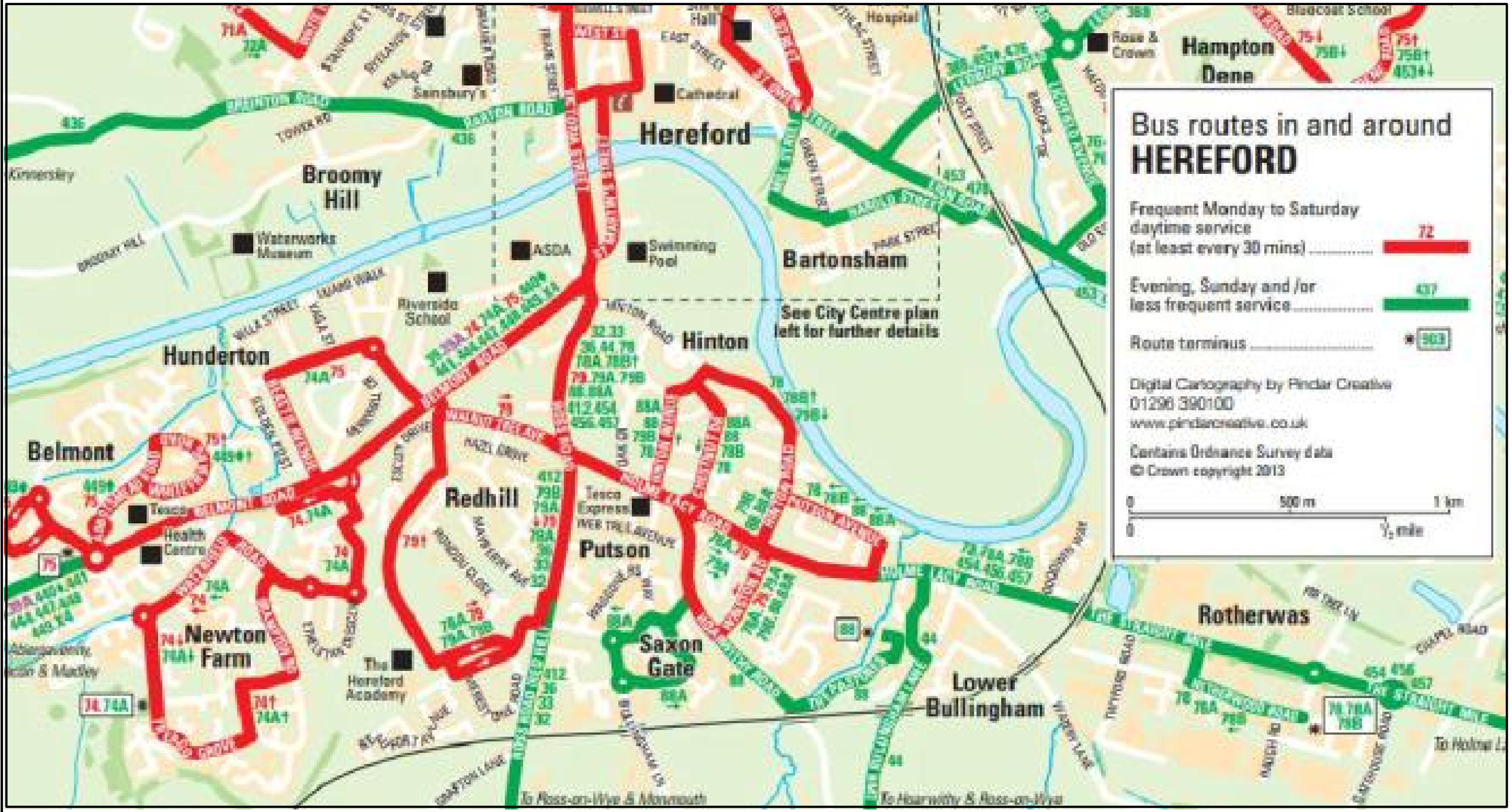

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Title: EXISTING PUBLIC TRANSPORT ROUTES IN SOUTH WYE AREA

Drawn	IM	Checked:	JC
Designed:	IM	Approved:	JC
Date: 09/09/2014	Scale: N.T.S.	A3	Sheet:
Project Number: 3512983A-HHR	Drawing Number: Figure 6	Revision:	

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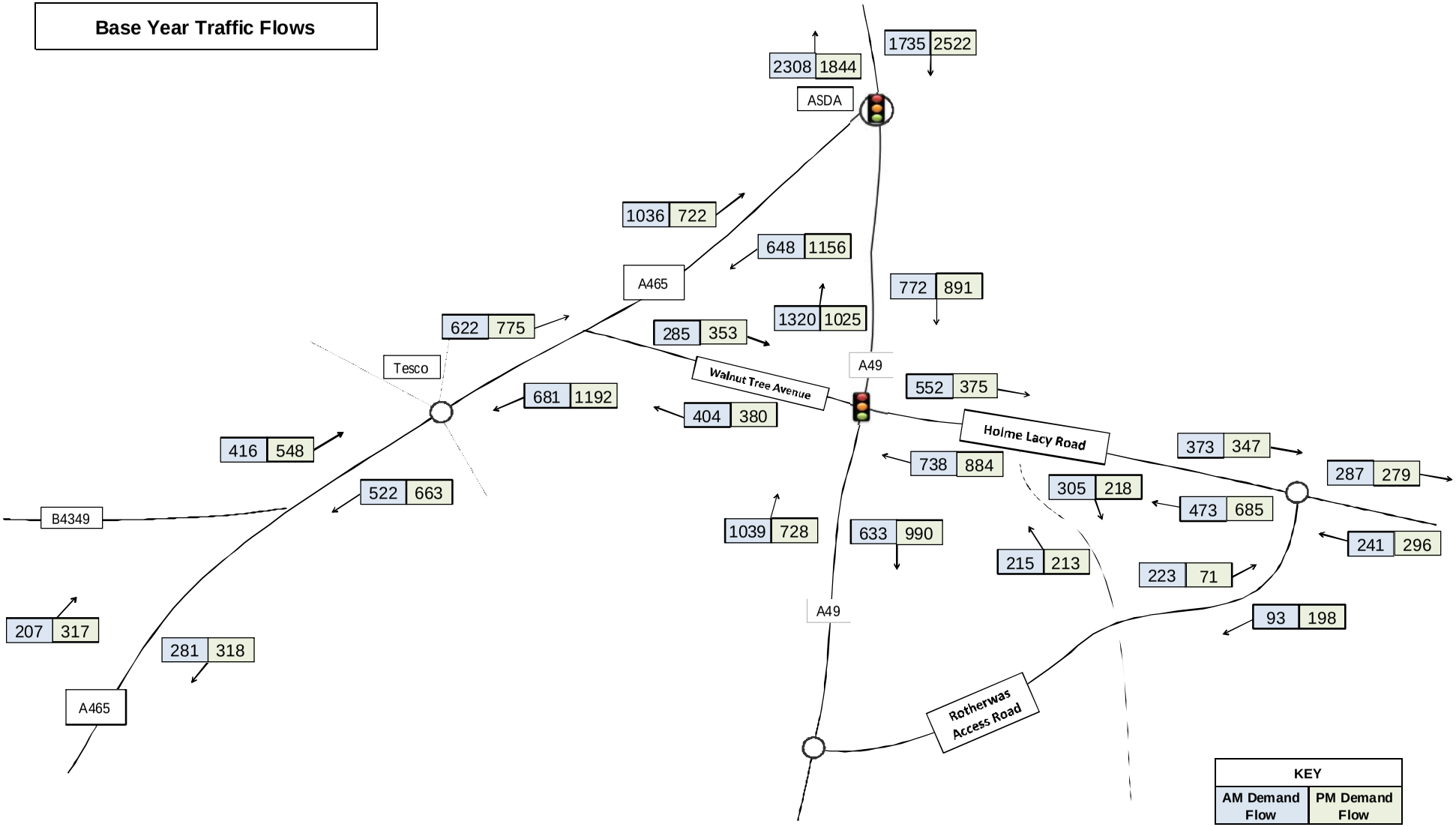
Plot Date: 31/10/2014 09:00:03

3512983A-HHR Figure 6

Base Year Traffic Flows



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South Wye Transport Package

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Base Year Traffic Flows

Figure 7

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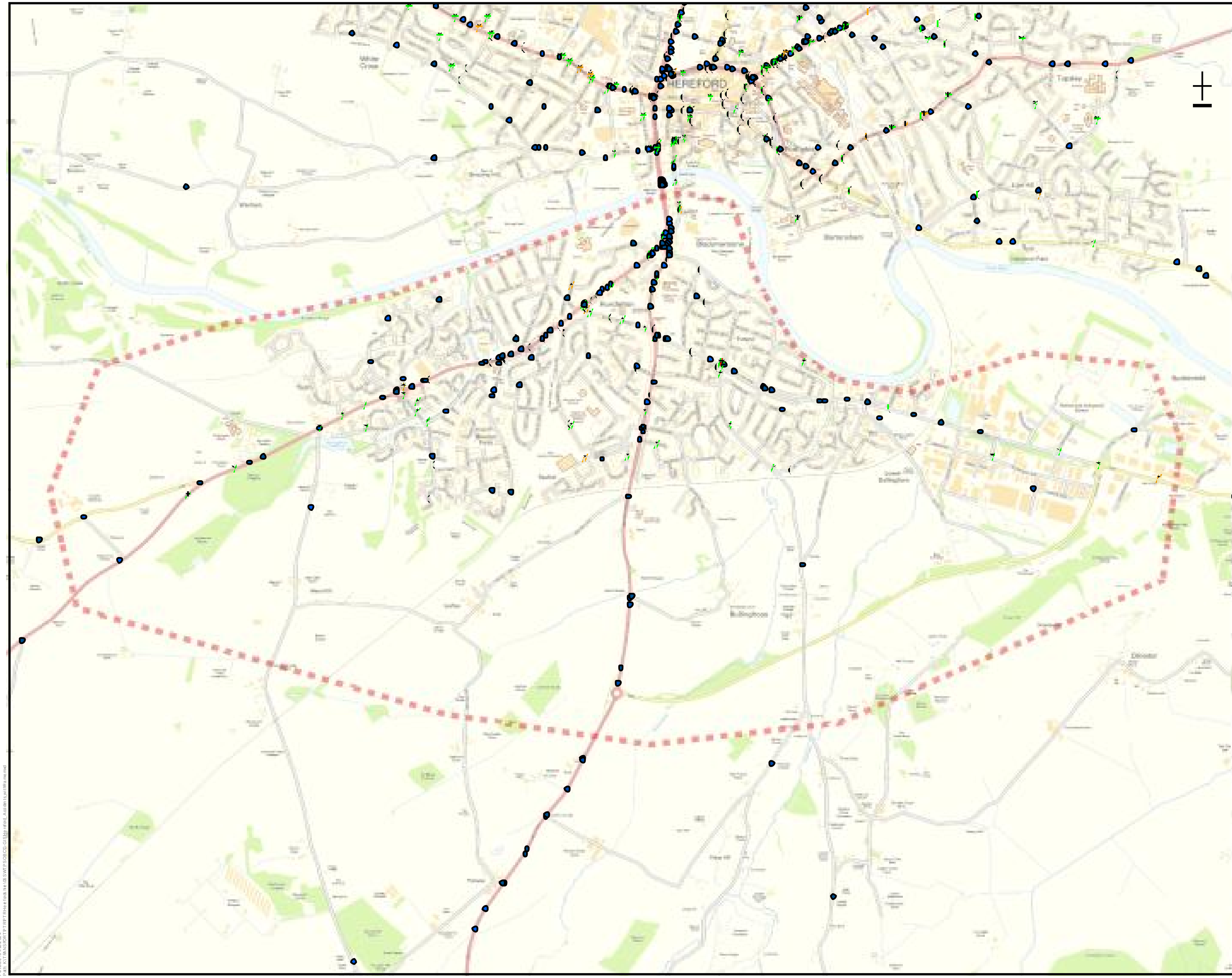

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Notes

Revision Details	By	Date	Suffix

Drawing Status: FINAL

Job Title: 3512983A-HHR South Wye Transport Package

Drawing Title: PLOT OF COLLISIONS IN STUDY AREA

Scale at A1: 1:20,000

Drawn	Approved
Chris Mason	Jason Collins

Stage 1 check	Stage 2 check	Originated	Date
			07/10/2014

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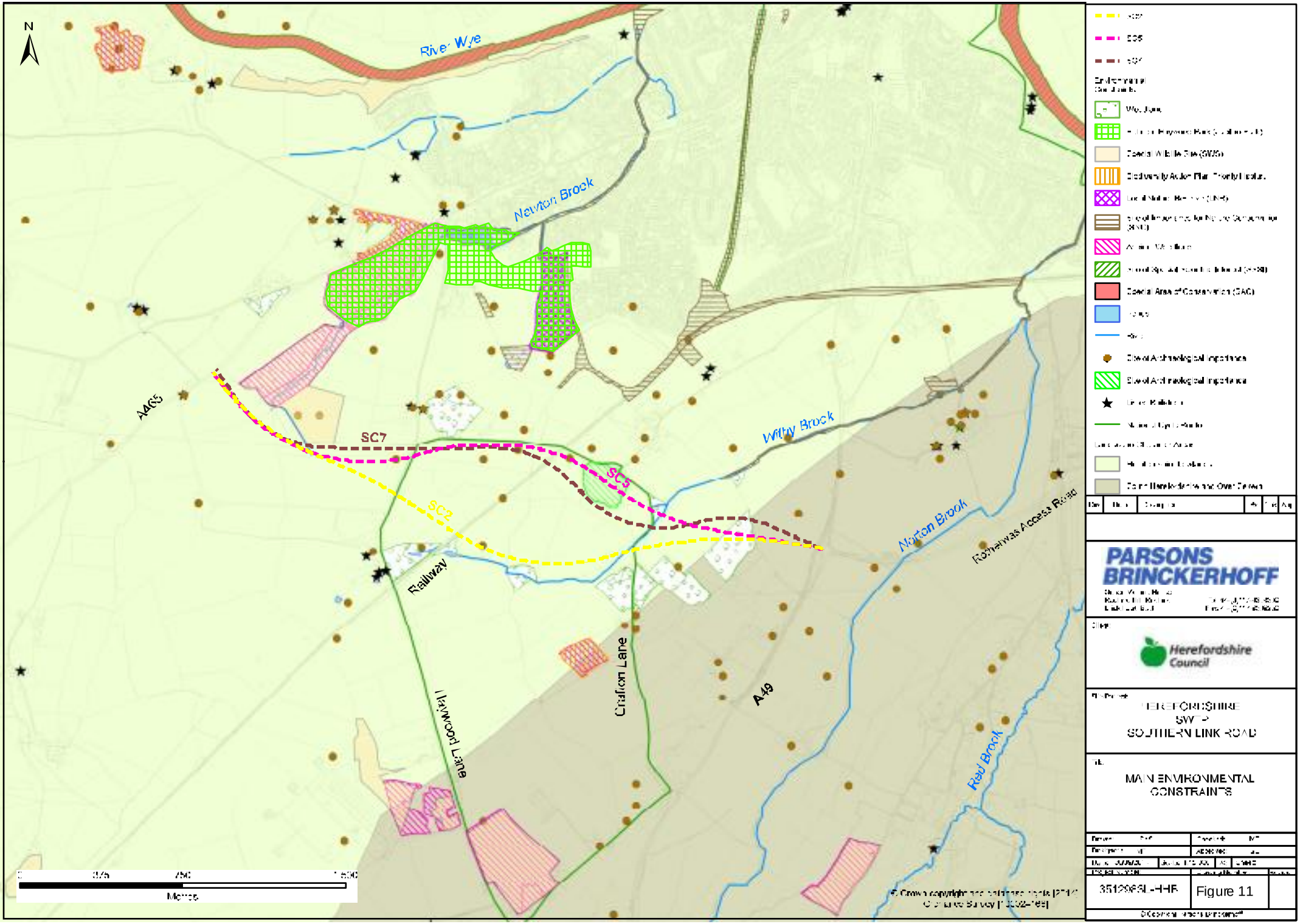
Drawing Number: Figure 8

Rev: A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River Wye
Newton Brook
A465
SC7
SC2
SC3
Withy Brook
Railway
Norton Brook
Rotherwas Access Road
Crafton Lane
Hawthorn Lane
A49
Red Brook
0
375
750
1,500
Metres
© Crown copyright and database rights [2012] Ordnance Survey [100032466]
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Herefordshire Council
HEREFORDSHIRE SWDP SOUTHERN LINK ROAD
MAIN ENVIRONMENTAL CONSTRAINTS
351296/SL-HHR
Figure 11

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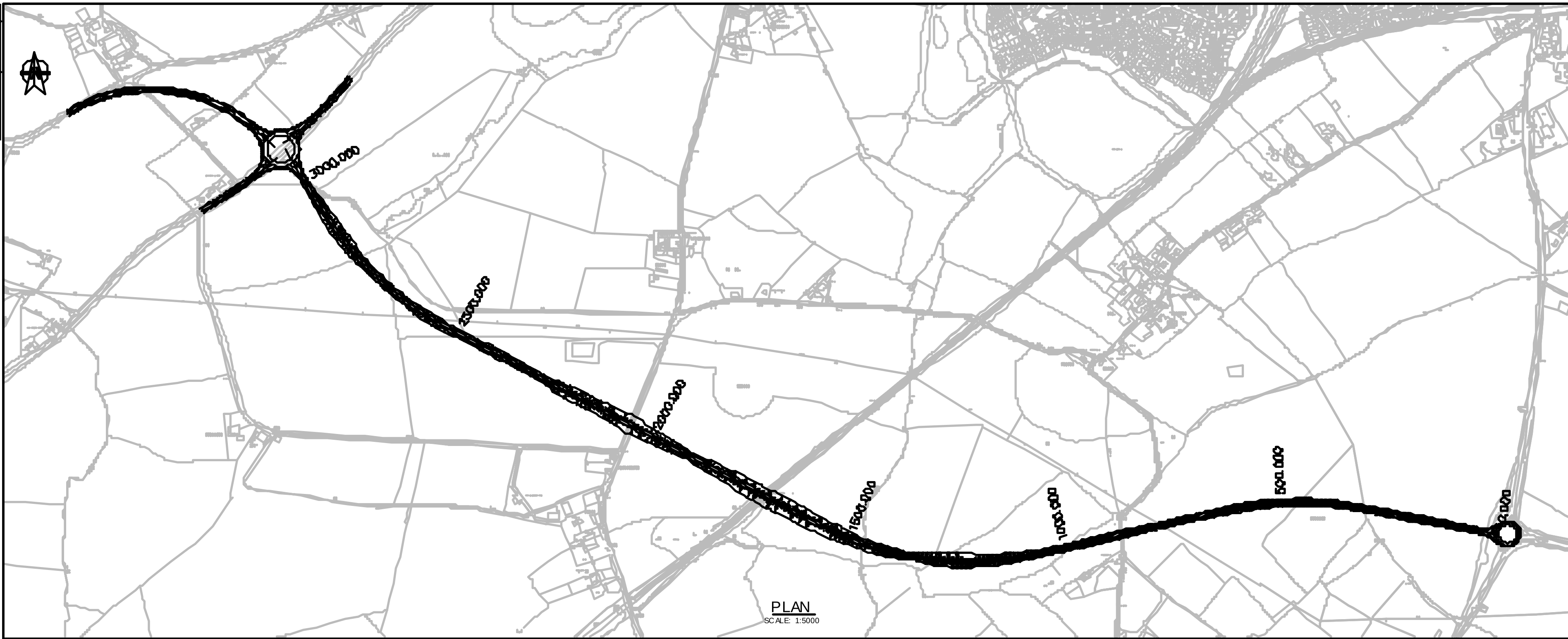

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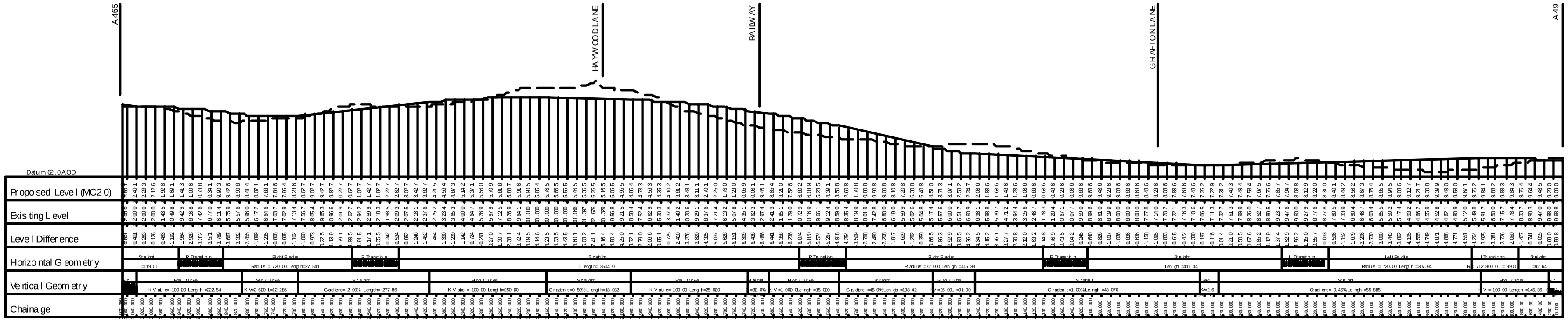

LONGITUDINAL SECTION
SCALE: 1:5000 H, 1:1000V

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OPTION SC2

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Date: 09/09/2014	Scale: AS SHOWN	A1	Sheet:
Project Number: 3512983A-HHR		Drawing Number: Figure 12	Revision: -

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Plot Date 31/10/2014 09:01:12
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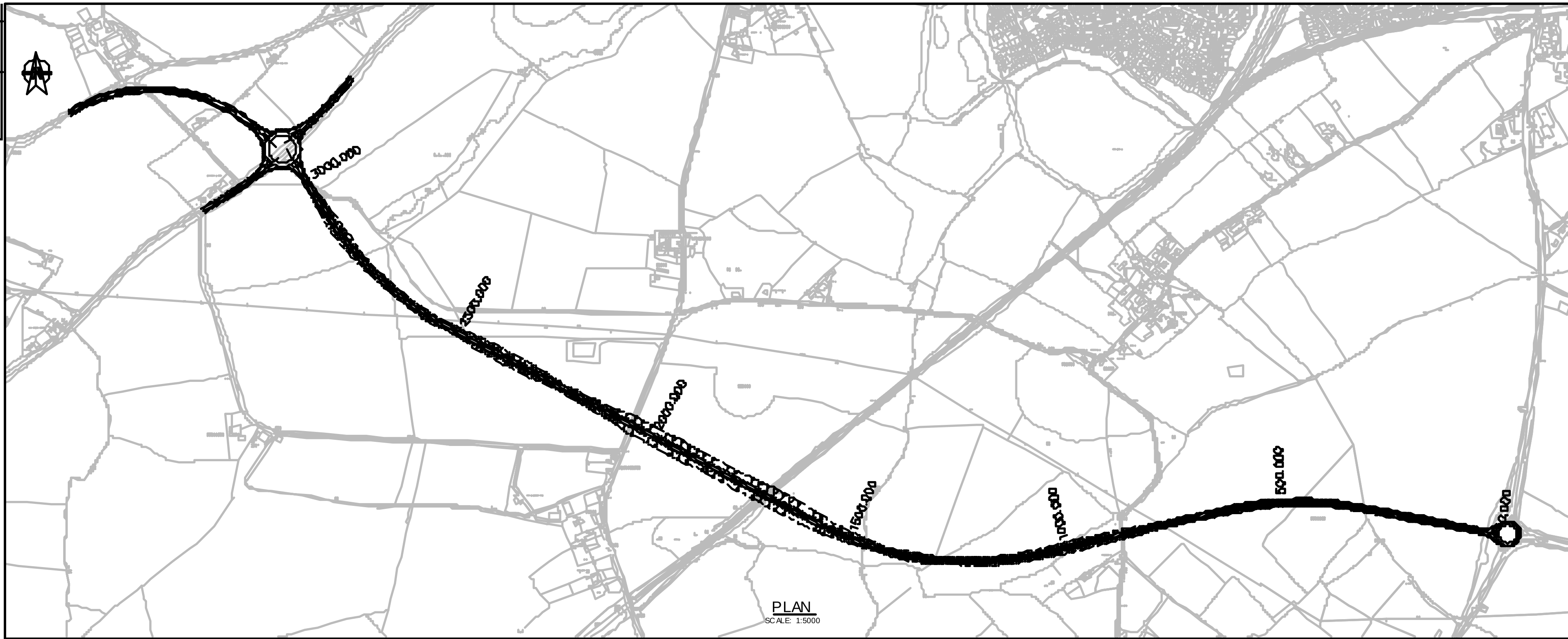

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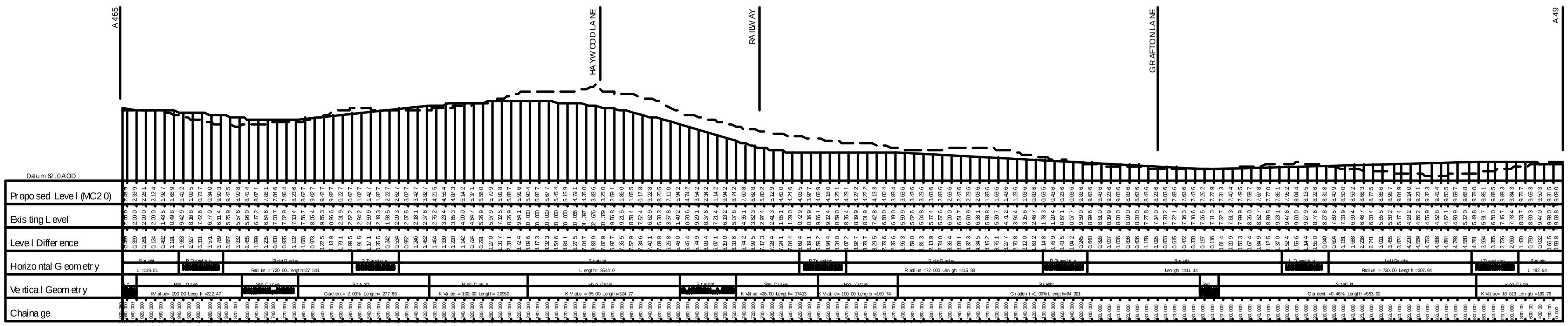

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OPTION SC2A

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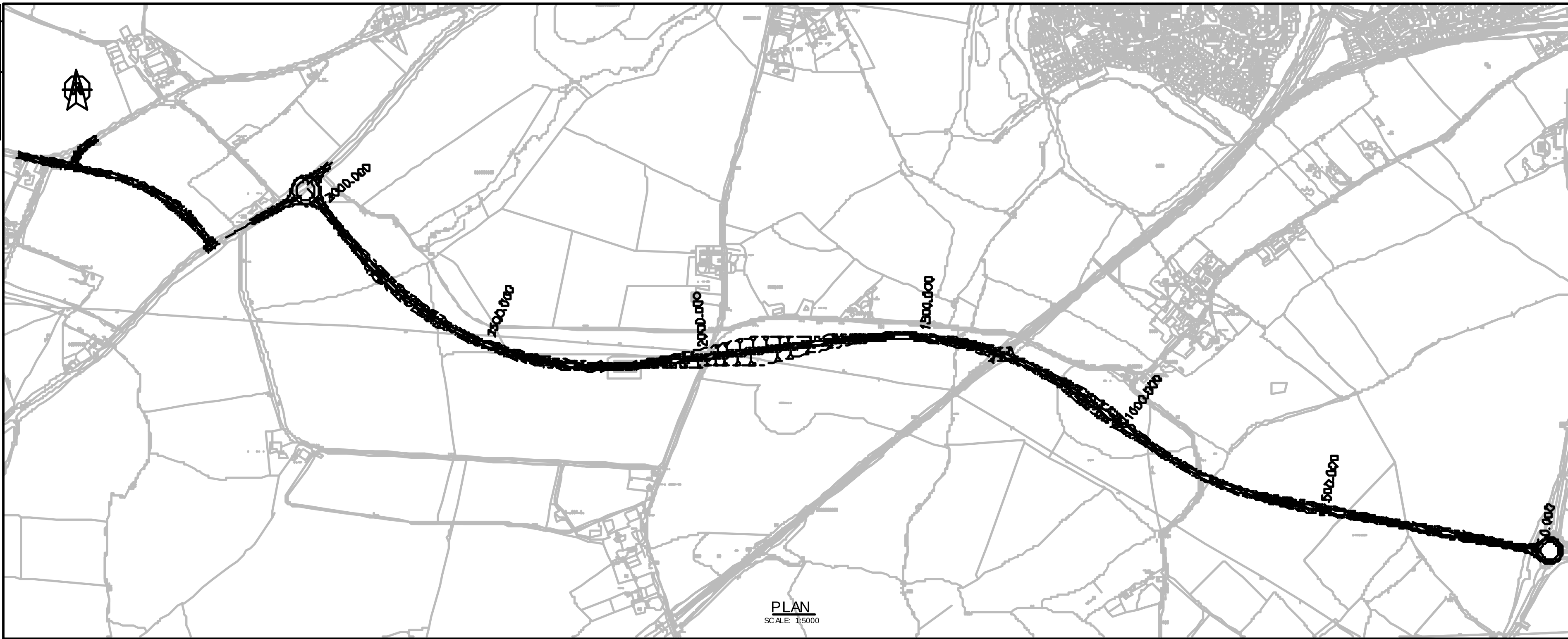

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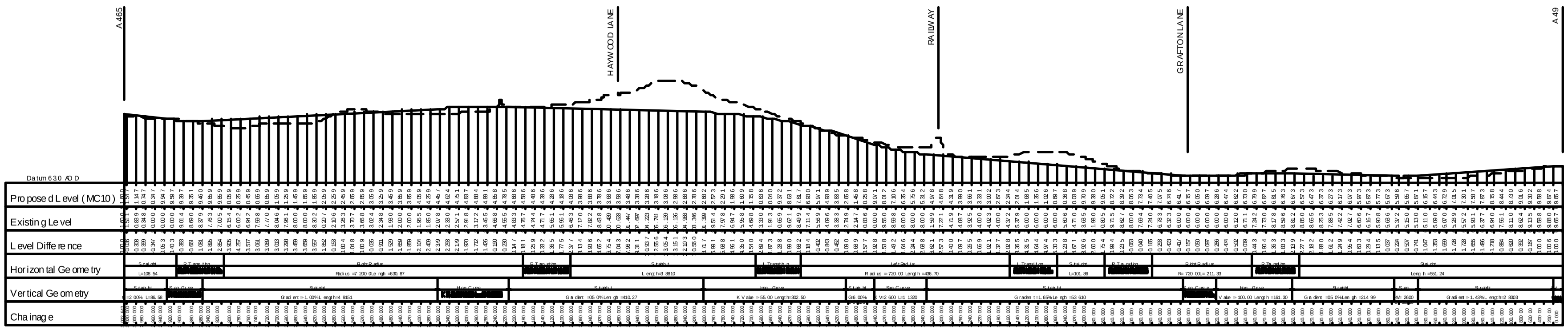

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PLAN AND
LONGITUDINAL SECTION
OPTION SC5

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3512983A-HHR Figure 14 -

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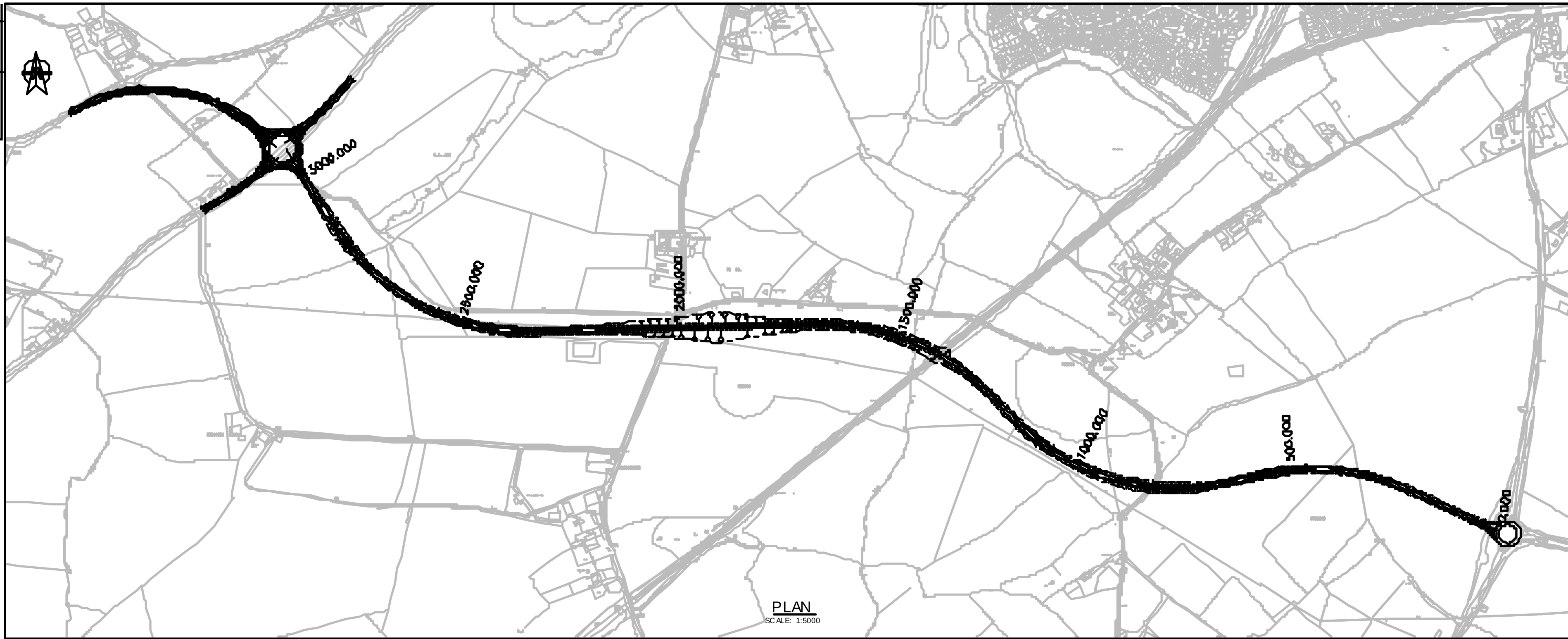

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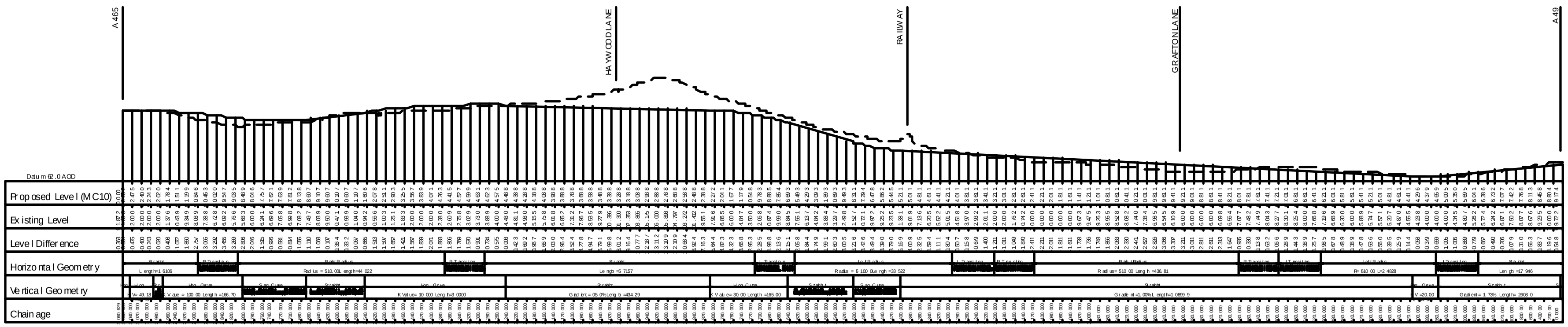

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OPTION SC7

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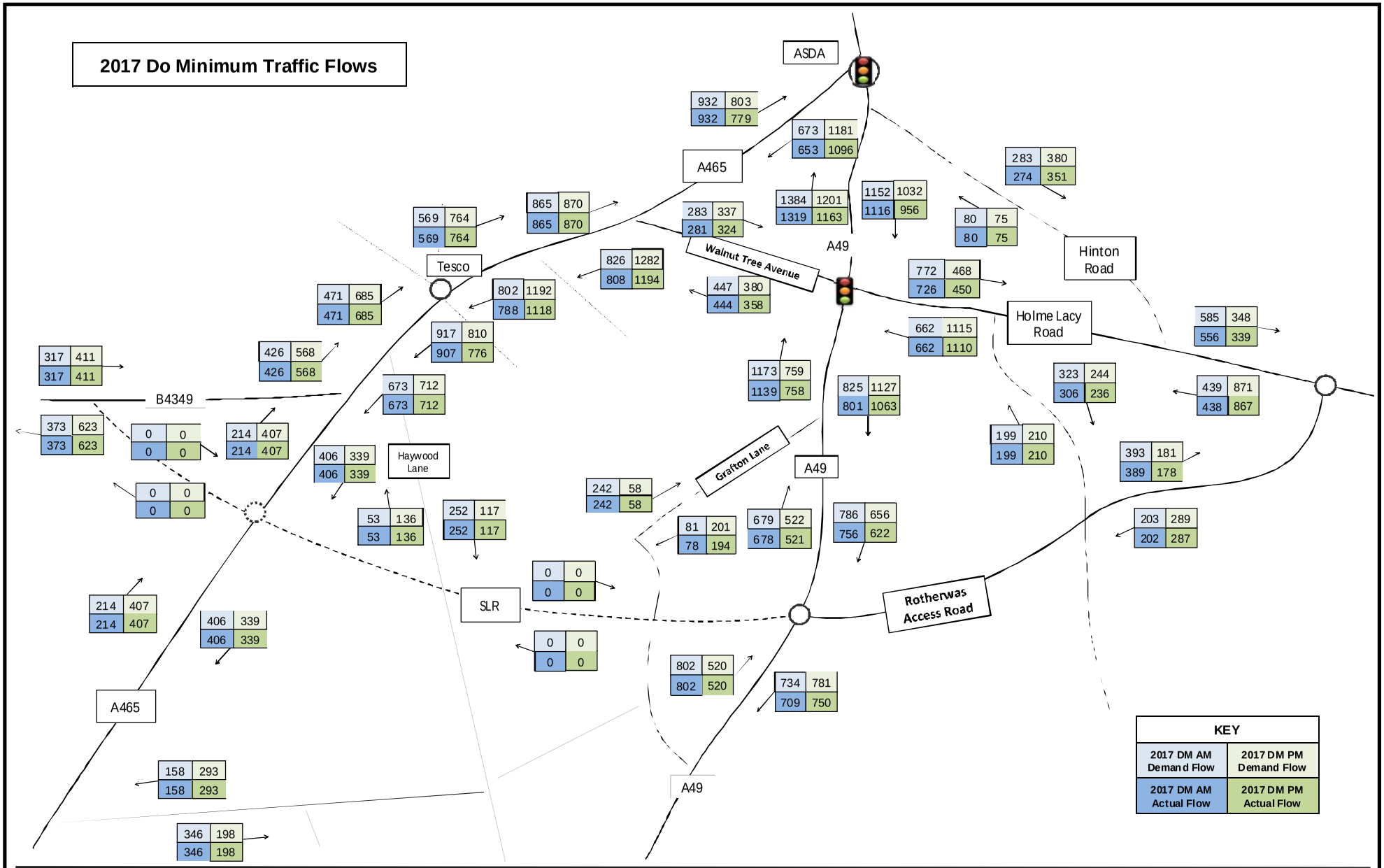
Plot Date: 31/10/2014 09:04:14

3512983A-HHR | Figure 15 | -

2017 Do Minimum Traffic Flows



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2017 DM AM Demand Flow	2017 DM PM Demand Flow
2017 DM AM Actual Flow	2017 DM PM Actual Flow

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PROJECT
South Wye Transport Package

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2017 Do Minimum Traffic Flows

Figure 16

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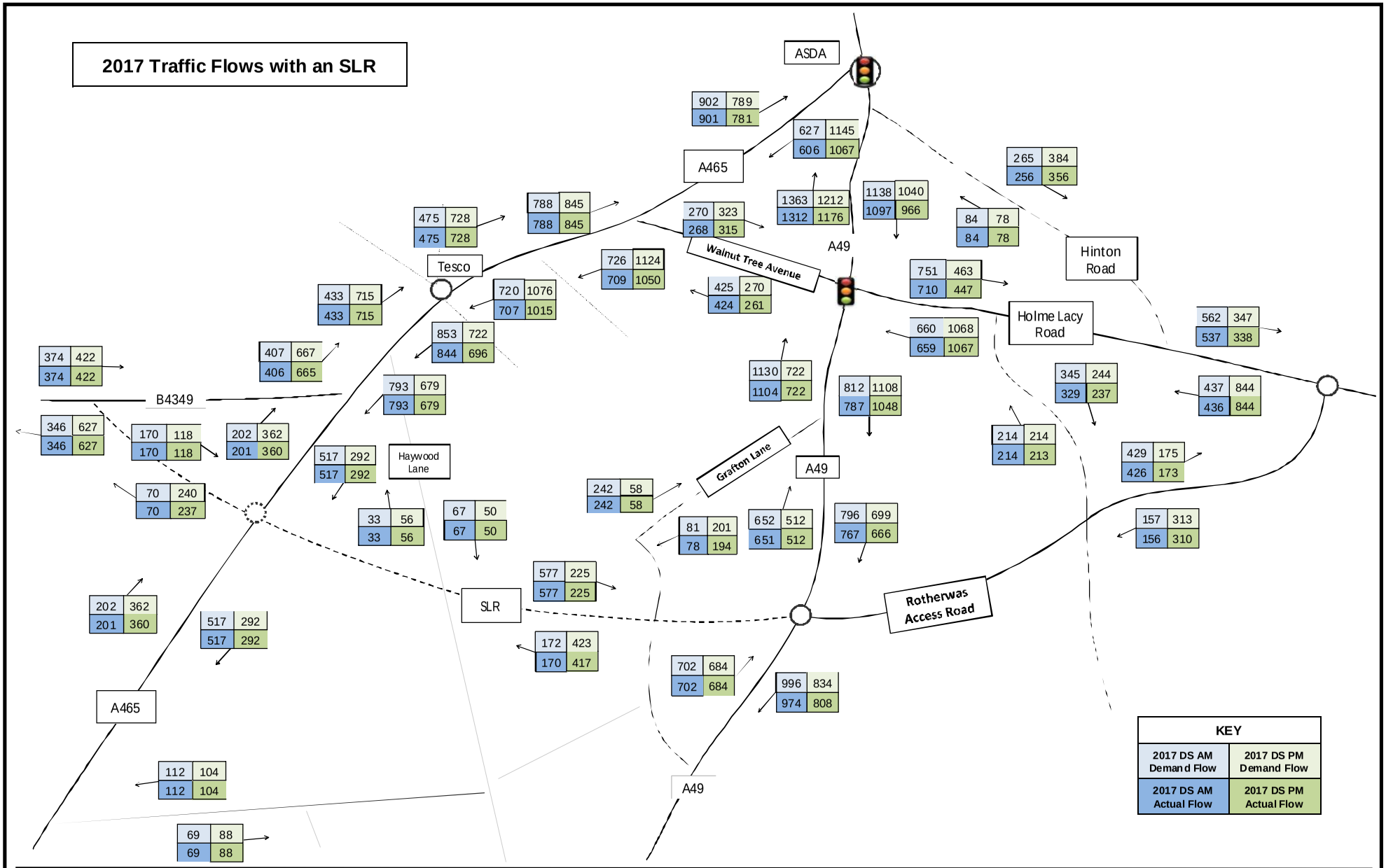
2017 Traffic Flows with an SLR



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DRAWING TITLE
2017 Traffic Flows with an SLR

Figure 17

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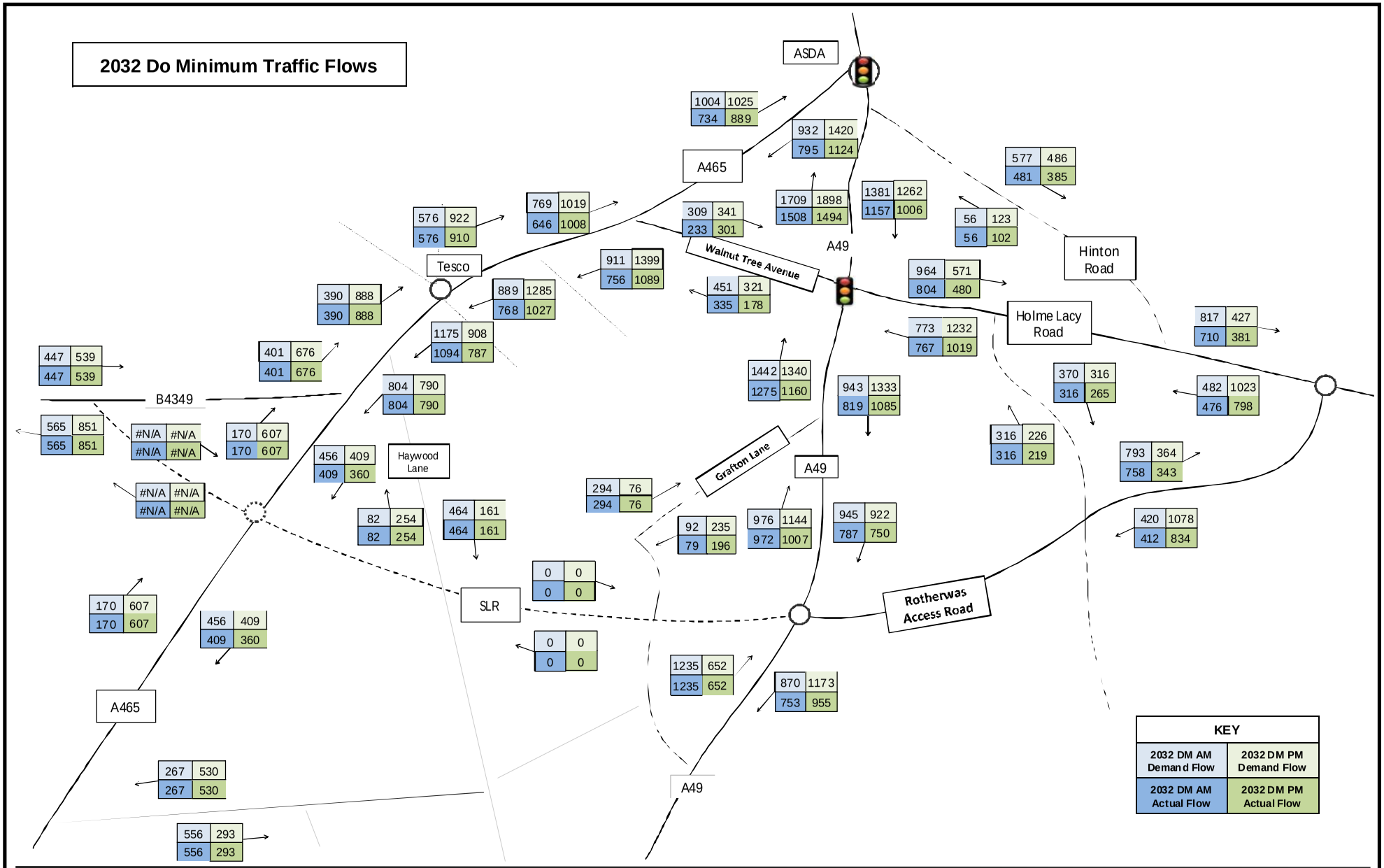
2032 Do Minimum Traffic Flows



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2032 Do Minimum Traffic Flows

Figure 18

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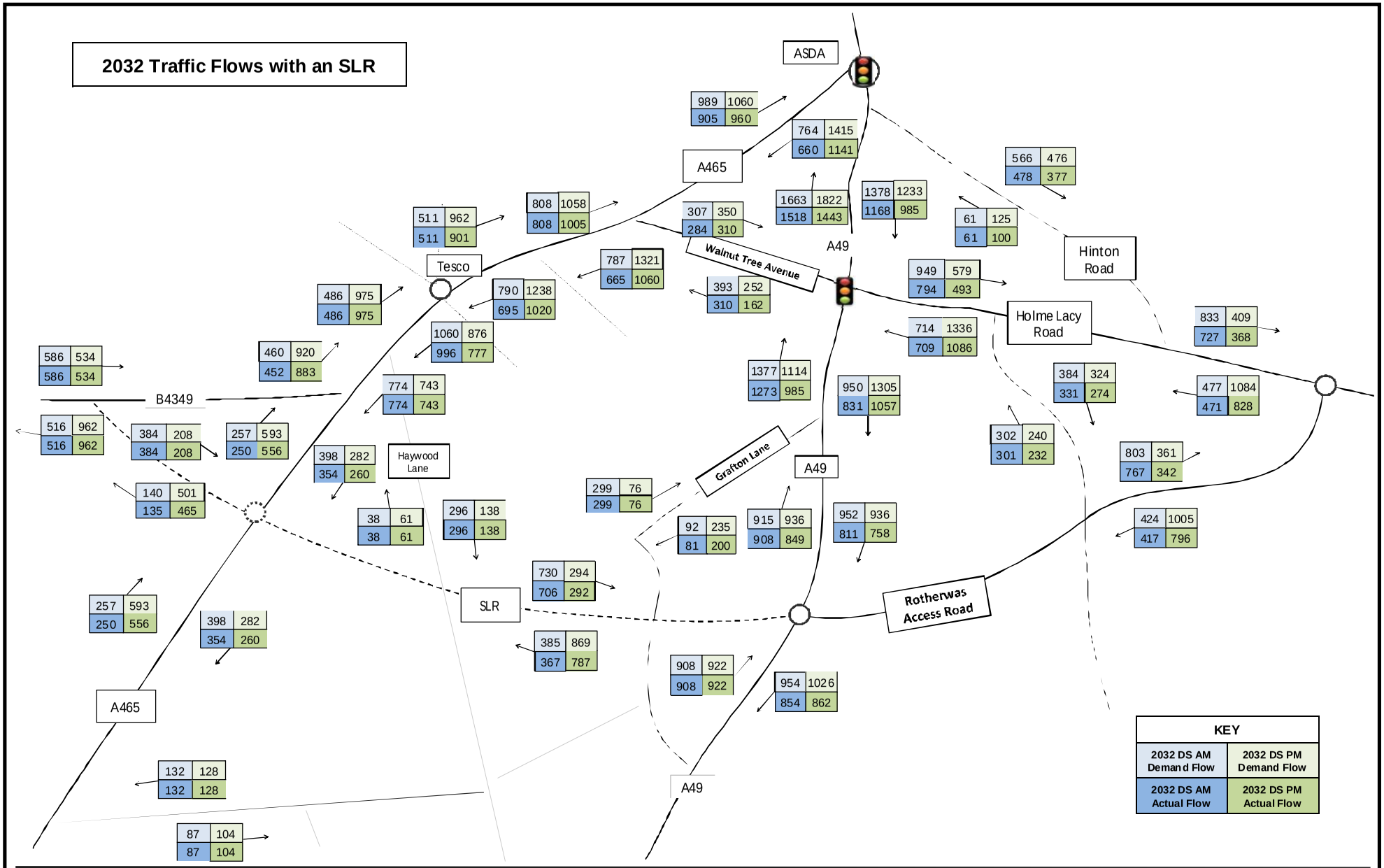
2032 Traffic Flows with an SLR



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South Wye Transport Package

DRAWING TITLE
2032 Traffic Flows with an SLR

Figure 19

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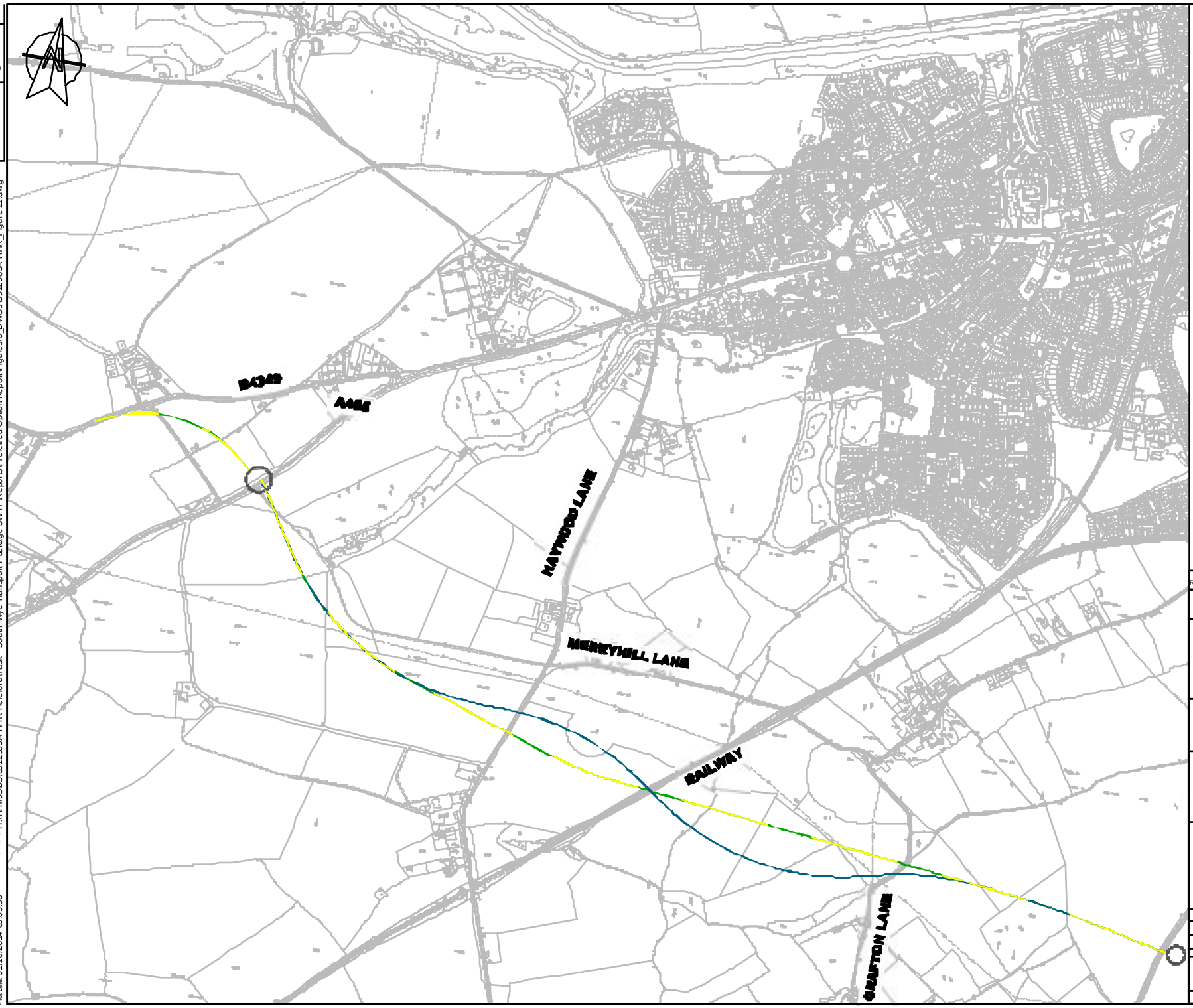

KEY:

- SC8
- SC8A
- SC9

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SOUTH WYE TRANSPORT PACKAGE

Title:
ADDITIONAL ROUTE OPTIONS

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Designed: IM		Approved: JC	
Date: 16/10/2014	Scale: 1:10,000	A3	Sheet:
Project Number: 3512983A-HHR		Drawing Number: Figure 21	Revision

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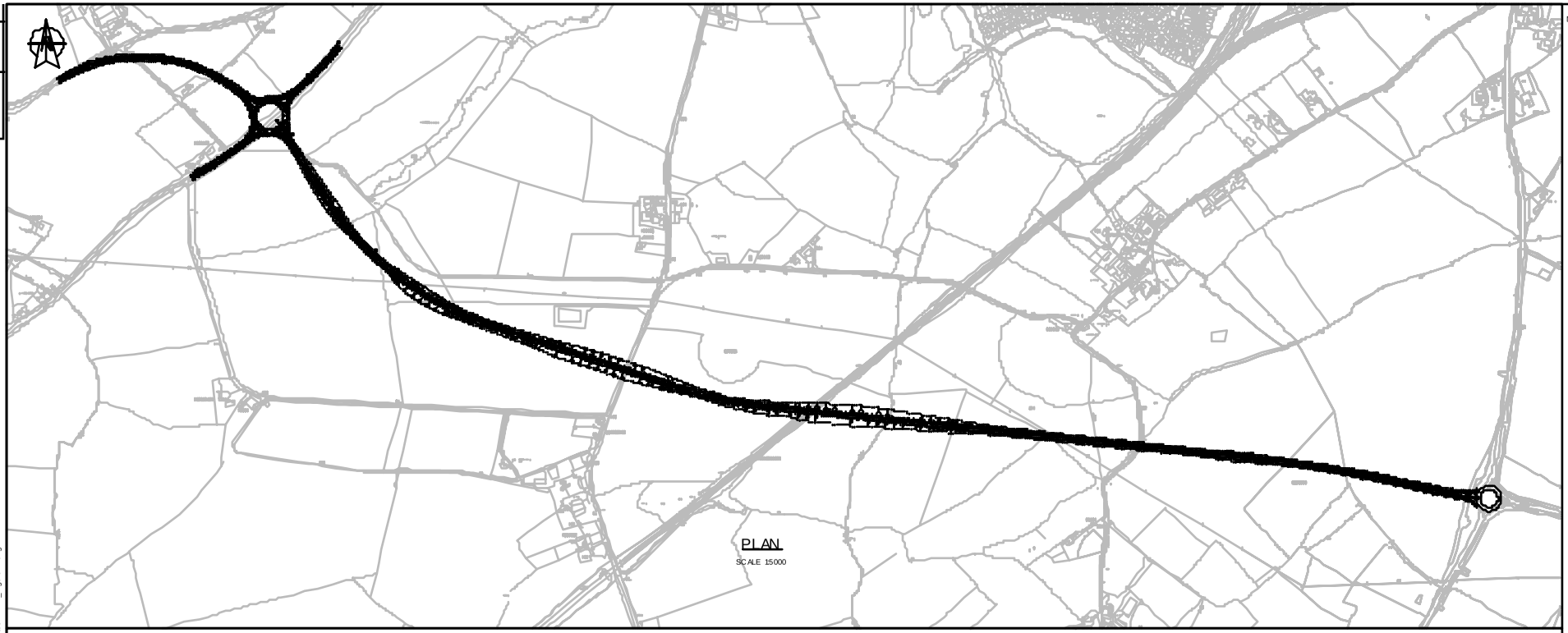
3512983A-HHR Figure 21



PLAN

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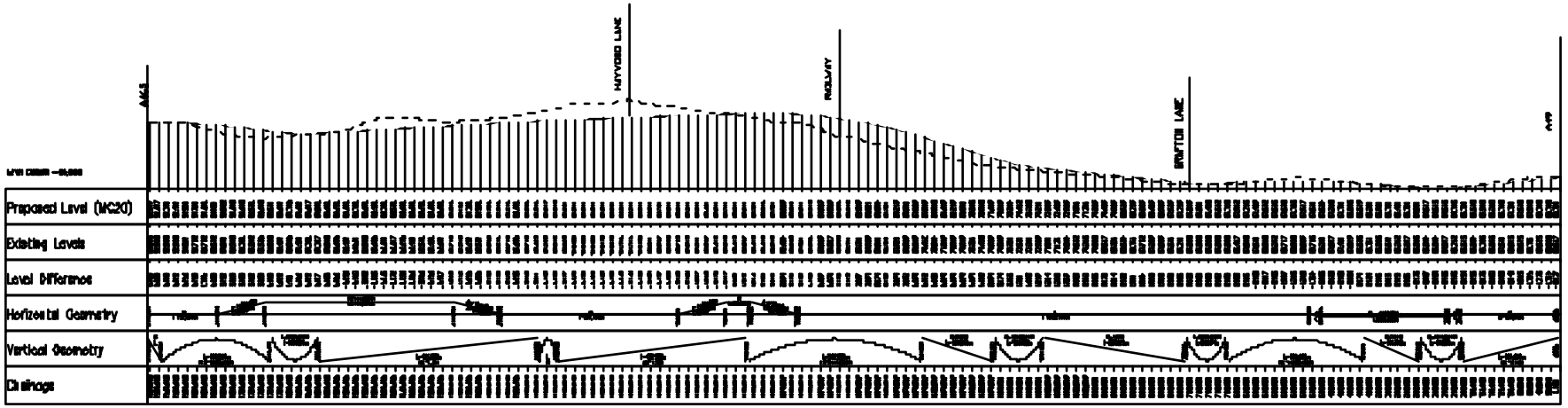

LONGITUDINAL SECTION

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Rev	Date	Description	By	Chk	App
A	09.01.14	Vertical alignment amended	AM	GJ	CJ

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OPTION SC8

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Date:	16/10/2014	Scale:	AS SHOWN AT A1
Size:	1 OF 1	Project Number:	
Drawing Number:		Revision:	

351 2983A-HHR

Figure 22

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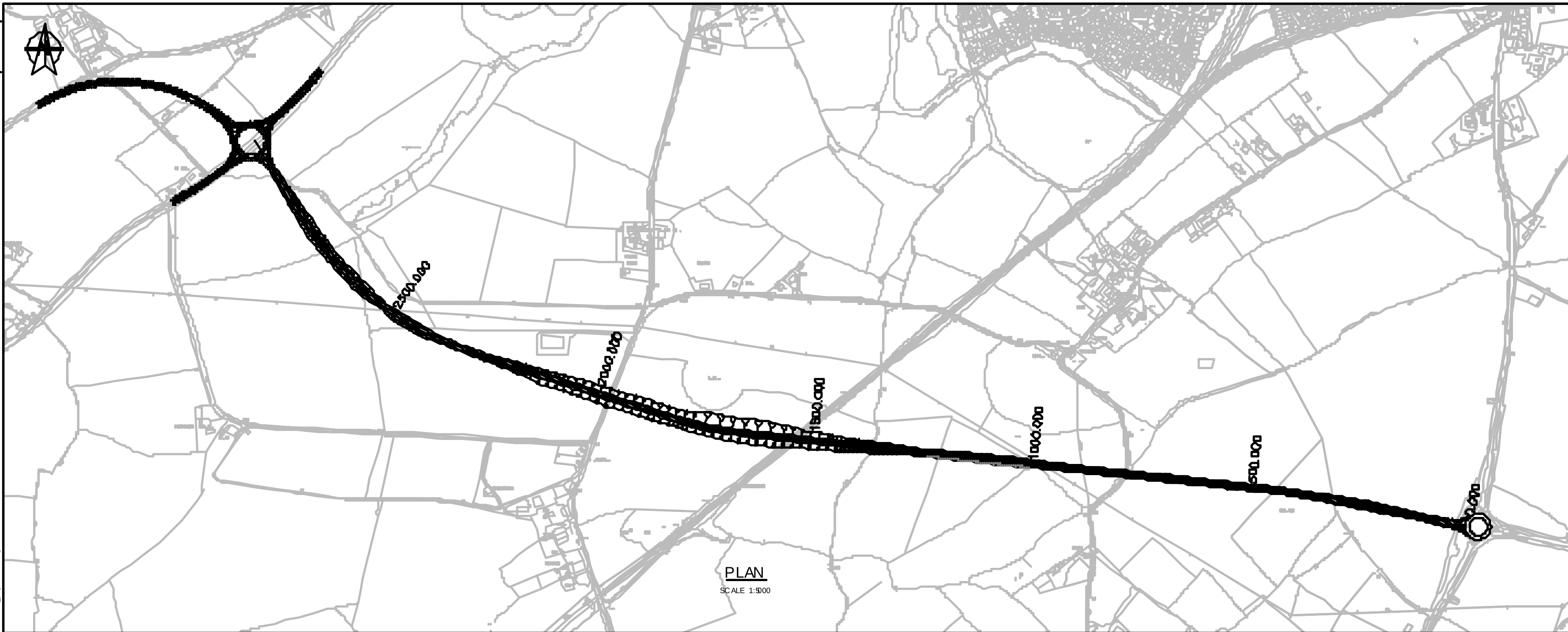

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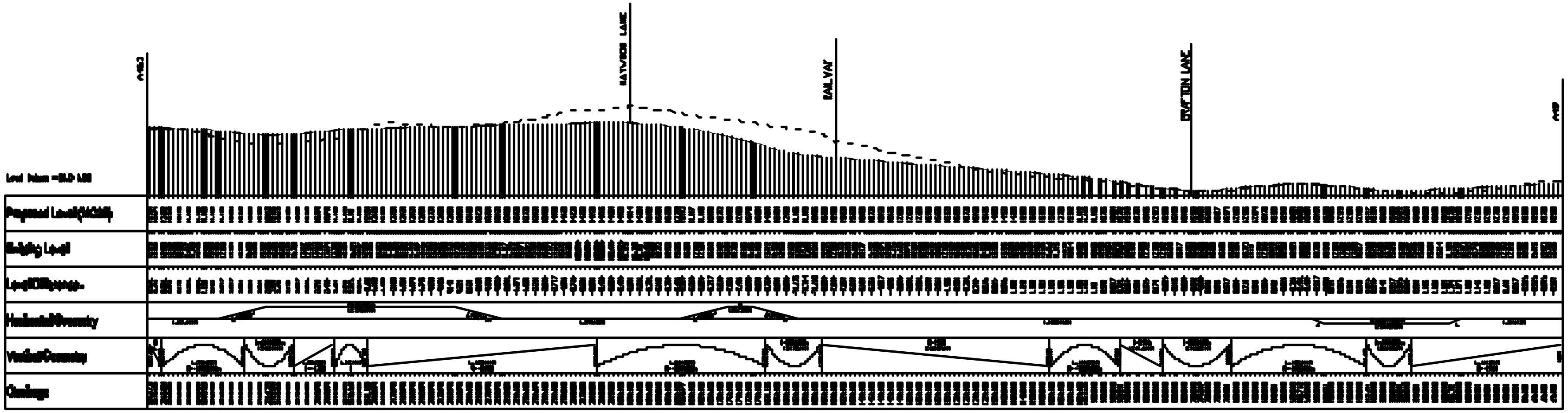

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OPTION SC8A

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Date: 16/10/2014	Scale: AS SHOWN A1	Sheet:	1 OF 1
Project Number: 3512983A-HHR		Drawing Number: Figure 23	Revision:

Login: Millward, Ianto
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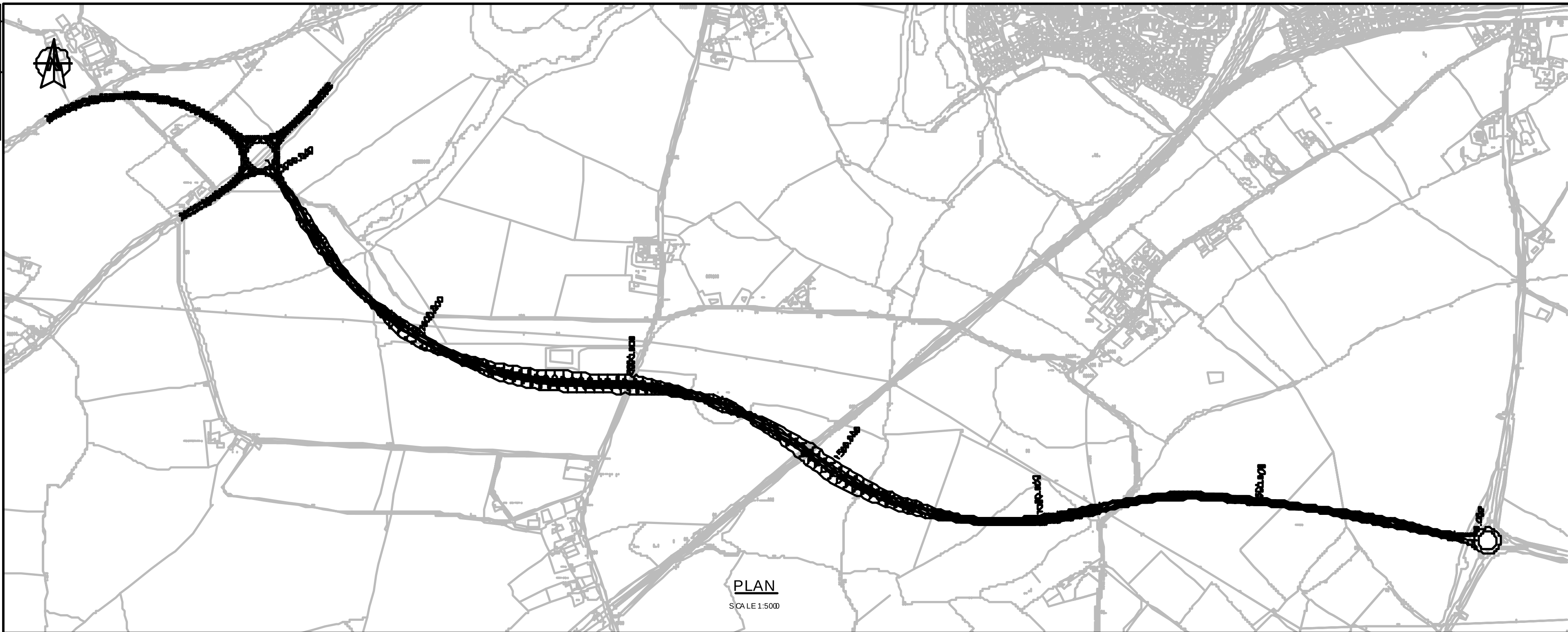

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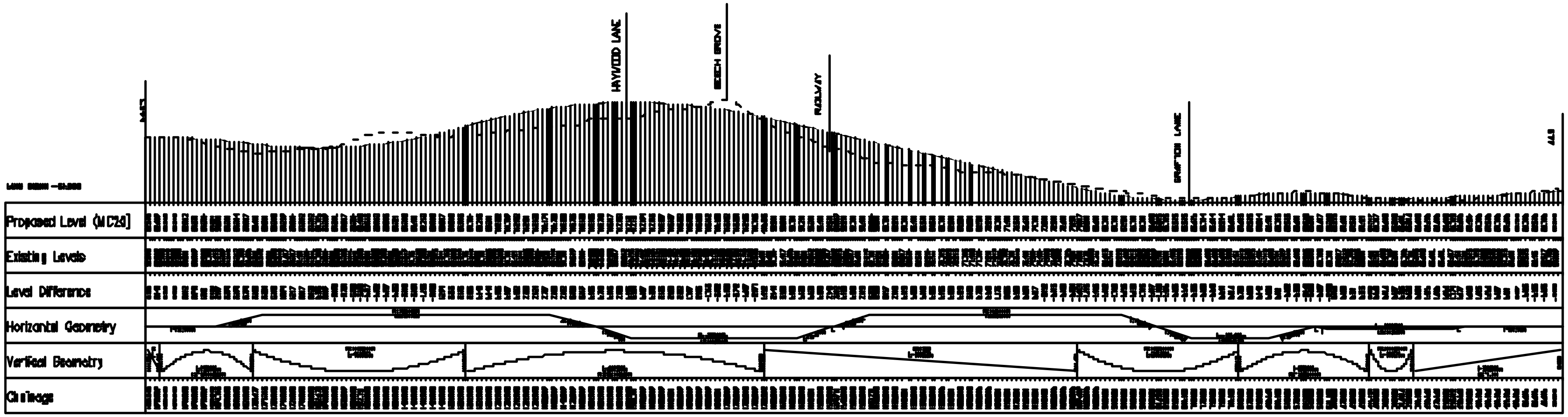

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A	09.10.14	Clehonger link earthworks added	AM	GJ	GI

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Title: PLAN AND LONGITUDINAL SECTION OPTION SC9

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Login: Millward, Ianto
Plot Date: 31/10/2014 09:09:57

Appendix A

Appraisal Summary Tables – SLR Options

Appraisal Summary Table Date Produced: 17/04/2014

Name of scheme:	South Wye Transport Package - **Option SC2**
Description of scheme:	Option SC2 passes through the centre of Grafton Wood and continues westwards over Grafton Lane and Withy Brook. Thereafter, it straightens up immediately heading in a north-west direction to the A465. SC2 involves the construction of a new roundabout on the A465/B4349 Clehonger Road Junction.

Impacts		Summary of Key Impacts	Qualitative Assessment
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Significant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts).	Major Adverse - - -
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently just below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedance of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present.	Moderate Adverse (local) Slight Adverse (regional) - -
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel.	Slight Adverse -
	Landscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood (not designated and low density of trees) but then is free of woodland for its entire length. This route brings the road closest to Haywood Lodge Farm and associated properties with a resulting increase in adverse visual effects. It avoids Newton Brook. A new roundabout on A465 and a short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is the least of all the routes, however with the additional sections of road, roundabout and proximity to residential properties, the magnitude is Moderate (loss of resource, but not affecting the integrity/ key characteristics of the rural scene.	Moderate Adverse - Has the least effect on woodland when compared to the other routes - -
	Townscape	N/A	
	Historic Environment	Direct impact (minor) on the significance of the setting of a Grade II* and three Grade II listed buildings at Haywood Lodge; direct impact (minor) on the significance of the setting of the Grade II Clehonger Court buildings; direct impact (minor) on the significance of the setting of a Grade II listed milestone; direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight to Moderate Adverse -

	Biodiversity	Route Option SC2 passes through the centre of Grafton Wood, which supports a mature tree canopy with some indicators of ancient woodland present. This Option is therefore likely to lead to the greatest extent of habitat loss/disturbance within Grafton Wood relative to other Route Corridor Options under consideration. All of the Route Corridor Options pass through extents of improved grassland and arable farmland, with fields separated by a network of hedgerows in varying condition. In terms of these habitats there is little to separate the different route corridor options or the species they are likely to support. The impacts of each Route Corridor Option on significant off-site receptors (for example receptors such as The River Wye SAC and bat roosts) are also likely to be broadly similar. East and west of the railway line, Route Corridor SC2 passes in close proximity (within 250 m) of a series of ponds. Initial surveys have confirmed the presence of great crested newts (a species receiving full protection under the conservation of Habitats and species Regulations 2010, as amended) in several of these ponds. Route corridor SC2 could destroy terrestrial habitat and fragment habitats either side of the proposed road used by great crested newts. With suitable scheme design and targeted mitigation it is likely these impacts could be mitigated, and the project may be able to deliver enhancements via the creation of new/enhanced aquatic and terrestrial habitat. Route corridor option SC2 passes south of Newton Coppice/Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland. Surveys conducted by Amey (Environmental Assessment Report, 2013) and Parsons Brinckerhoff (unpublished) have confirmed the ancient character of these woodland habitats. Route Corridor Option SC2 also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse upstream of Newton Coppice/Hayleasow Wood. Consultation responses from Natural England (letter dated November 2012) have identified that they consider a route option that passes through the ancient woodland areas as non-preferred. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a Route Corridor Option that passes through the ancient woodland.	Moderate Adverse - -
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse -
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse --
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this road. Connecting of B4349 to SC2 at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road.	Neutral
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers.	Slight Beneficial +
	Access to services	Scheme provides a new potential bus route (between the A465 and A49) but not one that better serves key local destinations in Hereford Town Centre.	Neutral
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465.	Slight Beneficial +
	Option and non-use values	No impacts identified.	Neutral

Public Accounts	Cost to Broad Transport Budget	Indicative cost of SC2 proposal is circa £16-£20M	Moderate Beneficial ++
	Indirect Tax Revenues	N/A	N/A
Other Issues	Technical and operational feasibility	Earthworks – with some adjustment to the horizontal and vertical alignments this is the most likely option to achieve as near as possible a cut/fill balance. Vertical alignment in the main follows the rolling profile of the countryside. Design Standards – 60mph design speed and Departures from Standard unlikely. Opportunity for overtaking unlikely due to topography (vertical curvature). Straighter crossing of existing country lanes and railway. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – route goes through Grafton Wood (not designated). Utilities – route crosses existing overhead power lines a number of times (including a 66kV) but is located to the south of the main corridor of electricity cables running east to west. Route crosses Grafton Lane almost at grade where there is a concentration of services running north to south including HP gas, a trunk water main and a sewer. Rail structure – route crosses over the existing railway line so reduced risk for Network Rail's operations.	

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Name of scheme:	South Wye Transport Package - **Option SC2A**
Description of scheme:	The SC2A option is identical to SC2, except that the new road section will pass under the railway line as opposed to passing over the top of it.

Impacts		Summary of Key Impacts	Qualitative Assessment
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Significant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts).	Major Adverse
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently just below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedance of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present.	Moderate Adverse (local) Slight Adverse (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel.	Slight Adverse
	Landscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood (not designated and low density of trees) but then is free of woodland for its entire length. This route brings the road closest to Haywood Lodge Farm and associated properties with a resulting increase in adverse visual effects. It avoids Newton Brook. A new roundabout on A465 and a short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is the least of all the routes, however with the additional sections of road, roundabout and proximity to residential properties, the magnitude is Moderate (loss of resource, but not affecting the integrity/ key characteristics of the rural scene.	Moderate Adverse - Has the least effect on woodland when compared to the other routes
	Townscape	N/A	
	Historic Environment	Direct impact (minor) on the significance of the setting of a Grade II* and three Grade II listed buildings at Haywood Lodge; direct impact (minor) on the significance of the setting of the Grade II Clehonger Court buildings; direct impact (minor) on the significance of the setting of a Grade II listed milestone; direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight to Moderate Adverse

	Biodiversity	Route Option SC2A passes through the centre of Grafton Wood, which supports a mature tree canopy with some indicators of ancient woodland present. This Option is therefore likely to lead to the greatest extent of habitat loss/disturbance within Grafton Wood relative to other Route Corridor Options under consideration. All of the Route Corridor Options pass through extents of improved grassland and arable farmland, with fields separated by a network of hedgerows in varying condition. In terms of these habitats there is little to separate the different route corridor options or the species they are likely to support. The impacts of each Route Corridor Option on significant off-site receptors (for example receptors such as The River Wye SAC and bat roosts) are also likely to be broadly similar. East and west of the railway line, Route Corridor SC2A passes in close proximity (within 250 m) of a series of ponds. Initial surveys have confirmed the presence of great crested newts (a species receiving full protection under the conservation of Habitats and species Regulations 2010, as amended) in several of these ponds. Route corridor SC2A could destroy terrestrial habitat and fragment habitats either side of the proposed road used by great crested newts. With suitable scheme design and targeted mitigation it is likely these impacts could be mitigated, and the project may be able to deliver enhancements via the creation of new/enhanced aquatic and terrestrial habitat. Route corridor option SC2A passes south of Newton Coppice/Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland. Surveys conducted by Amey (Environmental Assessment Report, 2013) and Parsons Brinckerhoff (unpublished) have confirmed the ancient character of these woodland habitats. Route Corridor Option SC2A also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse upstream of Newton Coppice/Hayleasow Wood. Consultation responses from Natural England (letter dated November 2012) have identified that they consider a route option that passes through the ancient woodland areas as non-preferred. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a Route Corridor Option that passes through the ancient woodland. There would be a slight preference for Route Corridor Option SC2A relative to SC2, as passing under the existing railway should allow an unmodified and unlit habitat corridor to be retained along the railway line.	Moderate Adverse - -
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse -
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse --
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this road. Connecting of B4349 to SC2A at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road.	Neutral
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers.	Slight Beneficial +
	Access to services	Scheme provides a new potential bus route (between the A465 and A49) but not one that better serves key local destinations in Hereford Town Centre.	Neutral
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +

	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465.	Slight Beneficial +
	Option and non-use values	No impacts identified.	Neutral
Public Accounts	Cost to Broad Transport Budget	Indicative cost of SC2A proposal is circa £21-£25M	Slight Beneficial +
	Indirect Tax Revenues	N/A	N/A
Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment on the east side follows the rolling profile of the countryside but is forced deep in cutting to cross under the railway and Haywood Lane. This could give rise to groundwater and road drainage problems. Large amount of excess spoil generated. Design Standards – 60mph design speed and Departures from Standard unlikely. Opportunity for overtaking unlikely due to topography (vertical curvature). Straighter crossing of existing country lanes and railway. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – route goes through Grafton Wood (not designated). Utilities – route crosses existing overhead power lines a number of times (including a 66kV) but is located to the south of the main corridor of electricity cables running east to west. Route crosses Grafton Lane almost at grade where there is a concentration of services running north to south including HP gas, a trunk water main and a sewer. Rail structure - route crosses underneath the existing railway line so increased risk for Network Rail's operations.	

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Name of scheme:	South Wye Transport Package - **Option SC5**
Description of scheme:	Route Option SC5 passes through the northern part of Grafton Wood and in a north-westerly direction, crosses the densely wooded area between Grafton Lane and Withy Brook and a site of archaeological importance before turning west to cross underneath the railway line. The route continues through Merry Hill and under Haywood Lane towards the A465.

	Impacts	Summary of Key Impacts	Qualitative Assessment
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Significant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts).	Major Adverse - - -
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently just below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedance of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present.	Moderate Adverse (local) Slight Adverse (regional) - -
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel.	Slight Adverse -
	Landscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood (not designated and low density of trees) and a dense copse near Withy Brook. It runs close to residential properties along Grafton Lane and involves the loss of a large commercial premises accessed from Haywood Lane. It avoids Newton Brook and Hayleasow Wood. A new roundabout on A465 and a separate short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is influenced by the loss of woodland, the route going through a large Site of Archaeological Importance, the proximity of residential properties, the loss of commercial premises, a new roundabout and additional sections of road. Therefore the magnitude of effect on the landscape resource would be Major (loss of resource and severe damage to key characteristics.	Major Adverse - - -
	Townscape	N/A	

	Historic Environment	Direct impact (minor) on the significance of the setting of Grade II listed Merryhill Stables; direct impact (minor) on the significance of the setting of Grade II listed Harwood Lodge; direct physical impact (moderate) on site of medieval fortifications (10467); direct physical impact (minor) on two cropmarks in fields 10 and 34; direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight to Moderate Adverse -
	Biodiversity	Route Corridor Option SC5 passes through Grafton Wood, slightly to the north of the most central alignments. It is therefore likely to lead to similar levels of Habitat Loss as Options SC1/2/3/4, but more than options SC6/7. Grafton Wood supports a mature tree canopy, with some indicator species for ancient woodland present. All of the Route Corridor Options pass through extents of improved grassland and arable farmland, with fields separated by a network of hedgerows in varying condition. In terms of these habitats and the species they are likely to support there is little to separate the different Route Corridor Options. The impacts of each Route Corridor Option on significant off-site receptors (for example The River Wye SAC, bat roosts etc) are also likely to be broadly similar. This Route Corridor Option is further away from ponds known to support great crested newts than options SC1/2. Impacts on great crested newts, a European Protected Species, are therefore likely to be reduced relative to the more southern options SC1/2. Route Corridor Option SC5 passes south of Newton Coppice/Hayleasow Wood including a buffer zone of approximately 50 - 100 m. Newton coppice/Hayleasow wood supports semi-natural ancient woodland and plantation on ancient woodland. Surveys conducted by Amey (Environmental Assessment Report, 2013) and Parsons Brinckerhoff (unpublished) have confirmed the ancient character of these woodland habitats. Route Corridor Option SC5 also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse relative to Routes passing through/adjacent to the woodland. Consultation responses from Natural England (letter dated November 2012) have identified that they consider a Route Corridor Option that passes through the ancient woodland areas as non-preferred. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a Route Corridor Option that passes through the ancient woodland.	Moderate Adverse - -
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse -
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking trips discouraged by severance of PROWs GF3, HA7, CH9 and CH10. Loss in rural amenity for recreational pedestrians on PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse - -
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New roundabout will degrade views slightly from A465. New A465 roundabout will add stress to travellers on this road. New link between B4349 and A465, in addition to the new A465 roundabout will increase stress for drivers connecting between the B4349 and SC5.	Slight Beneficial +
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road.	Neutral
	Security	road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers.	Slight Beneficial +
	Access to services	Scheme provides a new potential bus route (between the A465 and A49) but not one that better serves key local destinations in Hereford Town Centre.	Neutral
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +

	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465.	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Accounts	Cost to Broad Transport Budget	Indicative cost of proposal is circa £21-£25M	Slight Beneficial +
	Indirect Tax Revenues	N/A	N/A
Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment on the east side follows the rolling profile of the countryside but is forced into cutting after Grafton Lane in order to cross under the railway. 13m deep cutting through Merry Hill in order to cross under Haywood Lane which could give rise to groundwater and road drainage problems. Significant excess spoil generated. Design Standards – 60mph design speed and Departures from Standard unlikely. Opportunity for overtaking unlikely. Angled crossing of existing country lanes and railway will increase cost. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – route goes through Grafton Wood (not designated), a wooded area between Grafton Lane and Withy Brook, a site of archaeological importance and a barn yard situated south-west of the Merryhill Lane junction with Haywood Lane. Utilities – route crosses existing overhead power lines a number of times (including a 66kV) and is located partly within the main corridor of electricity cables running east to west. Route crosses Grafton Lane at grade where there is a concentration of services running north to south including HP gas, a trunk water main and a sewer. Conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure - route crosses underneath the existing railway line so increased risk for Network Rail's operations.	

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Name of scheme:	South Wye Transport Package - **Option SC7**
Description of scheme:	Route Option SC7 passes through the northern tip of Grafton Wood but avoids the southern extent of the dense wooded area between Grafton Lane and Withy Brook. It then runs to the south of Merryhill Lane before cutting through Merry Hill and under Haywood Lane. From this location the road heads in a westerly direction to the A465.

Impacts		Summary of Key Impacts	Qualitative Assessment
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Significant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts).	Major Adverse - - -
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently just below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedance of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present.	Moderate Adverse (local) Slight Adverse (regional) - -
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel.	Slight Adverse -
	Landscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood (not designated and low density of trees). It runs close to residential properties along Grafton Lane. It avoids Newton Brook and Hayleasow Wood. A new roundabout on A465 and a short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is influenced by the loss of woodland, the proximity of residential properties, a new roundabout with additional section of road. Therefore, the magnitude is Moderate (loss of resource, but not affecting the integrity/ key characteristics of the rural scene.	Moderate Adverse - -
	Townscape	N/A	
	Historic Environment	Direct impact (minor) on the significance of the setting of Grade II listed Merryhill Stables; direct impact (minor) on the significance of the setting of Grade II listed Harwood Lodge; direct physical impact (minor) on cropmark in field 10; direct physical impact (slight to moderate) on potential buried archaeological remains in five fields	Slight to Moderate Adverse -

	Biodiversity	Route Corridor Option SC7 passes through the northern edge of Grafton Wood. Grafton Wood supports a mature tree canopy, with some indicator species for ancient woodland present. Route Corridor Option SC7 has a marginally increased impact on Grafton Wood relative to SC6, but less than SC1 - SC5. All of the Route Corridor Options pass through extents of improved grassland and arable farmland, with fields separated by a network of hedgerows in varying condition. In terms of these habitats and the species they are likely to support there is little to separate the different Route Corridor Options. The impacts of each Corridor on significant off-site receptors (for example The River Wye SAC, bat roosts etc) are also likely to be broadly similar. This Route Corridor Option is further away from ponds known to support great crested newts than options SC1/2. Impacts on great crested newts, a European Protected species, are therefore likely to be reduced relative to the more southern options SC1/2. Route corridor option SC7 passes south of Newton Coppice/Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland, although it will be located close to the southern edge of the ancient woodland areas. Surveys conducted by Amey (Environmental Assessment Report, 2013) and Parsons Brinckerhoff (unpublished) have confirmed the ancient character of these woodland habitats. Route Corridor Option SC7 also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse relative to options passing through Newton Coppice/Hayleasow Wood. Consultation responses from Natural England (letter dated November 2012) have identified that they consider a Route Corridor Option that passes through the ancient woodland areas as non-preferred. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a Route Corridor Option that passes through the ancient woodland. Route Corridor Option SC7 passes under the railway, and would therefore allow greater retention/enhancement of the habitat corridor along the railway line than the options involving overbridges. Route Corridor SC7 is considered the most ecologically preferable Option at this time, due to the minimal direct impacts on Grafton Wood and Hayleasow Wood/Newton Coppice, the location relative to emerging locations of great crested newt populations, and the inclusion of an underpass beneath the railway line. This Route Corridor Option could be improved further by moving the eastern end end of the alignment north of Grafton Wood (as per SC6), and moving the western end south to provide a buffer to Hayleasow wood/Newton Coppice (as per SC5).	Moderate / Slight Adverse - - / -
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse -
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49?A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking trips discouraged by severance of PROWs GF3, HA14, HAF, CH9 and CH10. Loss in rural amenity for recreational pedestrians on PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse - -
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views from A465, particularly where it is raised to bridge over Hayleasow Wood. New A465 roundabout will add stress to travellers on this road. New link between B4349 and A465, in addition to the new A465 roundabout will increase stress for drivers connecting between the B4349 and SC6.	Slight Beneficial +
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road.	Neutral
	Security	road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers	Slight Beneficial +
	Access to services	Scheme provides a new potential bus route (between the A465 and A49) but not one that better serves key local destinations in Hereford Town Centre	Neutral

	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Accounts	Cost to Broad Transport Budget	Indicative cost of proposal is circa £21-£25M	Slight Beneficial +
	Indirect Tax Revenues	N/A	N/A
Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment on the east side follows the rolling profile of the countryside but is forced into cutting after Grafton Lane in order to cross under the railway. 13m deep cutting through Merry Hill in order to cross under Haywood Lane which could give rise to groundwater and road drainage problems. Large amount of excess spoil generated. Design Standards – 50mph design speed and Departures from Standard unlikely. No opportunity for overtaking due to the twisty alignment. Angled crossing of existing country lanes and railway will increase cost. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – being of a twisted nature the route manages to avoid many physical constraints but does go through the northern tip of Grafton Wood (not designated). Utilities – route crosses existing overhead power lines a number of times (including a 66kV) and is located largely within the main corridor of electricity cables running east to west. Route crosses Grafton Lane on a 3m high embankment where there is a concentration of services running north to south including HP gas, a trunk water main and a sewer. Conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure - route crosses underneath the existing railway line so increased risk for Network Rail's operations.	

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Name of scheme:	South Wye Transport Package - Option SC8
Description of scheme:	Option SC8 lies between the northern and southern options. The alignment is relatively straight over its entire length curving gradually north-west, west of the railway. It passes over the railway, underneath Haywood Lane and is at grade over Grafton Lane.

Impacts		Summary of key impacts	Assessment Qualitative
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Significant Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Signficant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts)	Major Adverse
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedence of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present	Moderate Adverse (local), Slight Adverse (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel	Slight Adverse
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route runs in close proximity to Haywood Lodge Farm and associated properties, with potential for visual amenity effects. It avoids Newton Brook. The alignment of the eastern half of the route runs in a straight line and cuts across the grain of the landscape. The route therefore fails to take into account the undulating topography and irregular field pattern. SC8 will require extensive works to create embankments to take the route over the railway line resulting in a visible central section (as it passes over the railway line) and will have engineered slopes that will be disruptive to the character of the local topography. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource with the additional sections of road, roundabout and proximity to residential properties, is Moderate (loss of resource, at odds with the local pattern and landform, visually intrusive and will adversely impact on the landscape).	Moderate Adverse
	Historic Environment	Direct impact (minor) on the the setting of a Grade II* and three Grade II listed buildings at Haywood Lodge. Direct impact (minor) on the significance of the setting of the Grade II Clehonger Court buildings; direct impact (minor) on the significance of the setting of a Grade II listed milestone. Direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight to Moderate Adverse

	Biodiversity	SC8 passes through the centre of Grafton Wood, which supports a mature tree canopy with some indicators of ancient woodland present. SC8 will likely to lead to the greatest extent of habitat loss / disturbance within Grafton Wood relative to other route options under consideration, with comparable impacts to SC2/2A and SC9. SC8 passes south of Newton Coppice / Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland, although it will be located close to the southern edge of the ancient woodland areas. Recent surveys have confirmed the ancient character of these woodland habitats. SC8 also passes upstream of open sections of Newton Brook, and has reduced potential for impacts on this watercourse relative to route options passing through Newton Coppice / Hayleasow Wood. Consultation with Natural England has indicated that they would not prefer a route option that passes through ancient woodland areas. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a Route Corridor Option that passes through the ancient woodland. SC8 is further away from ponds known to support great crested newts (GCN) than options SC2/2A. Impacts on GCNs, a European Pr+D25otected species, are therefore likely to be reduced relative to the more southern options SC2/2A. All of the route options pass through extents of improved grassland and arable farmland, with fields seperated by a network of hedgerows in varying condition. In terms of these habitats there is little to separate the different route corridor options or the species they are likely to support (other than GCN, see above). The impact of each route option on significant off-site receptors (e.g. River Wye SAC and bat roosts) are also likely to be broadly similar. SC8 would pass over the railway line, based on the current understanding of scheme-wide bat activity and design parameters (assuming the railway underpass would be unlit), SC8 would allow a wide underpass to be maintained under the new road alignment, subject to only infrequent train movements. Any overbridge would need to have wide vegetated margins in order to be as effective as an underpass.	Moderate adverse
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse - -
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this roadConnecting of B4349 to SC8 at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road.	Neutral
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers	Slight Beneficial +
	Access to services	Scheme provides a new potential bus route (between the A465 and A49) but not one that better serves key local destinations in Hereford Town Centre	Neutral
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Accounts	Cost to Broad Transport Budget	Indicative cost of SC8 proposal is circa £26.5M	
	Indirect Tax Revenues	N/A	

Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment of the option is similar at both the western and eastern ends of the route. The difference lies within the middle section either side of the railway line reflecting whether the route goes over or under it. To cross over the railway route Option SC8 requires the construction of an embankment up to 8m high. This could give rise to groundwater and road drainage problems. it may be possible to achieve a balanced earthworks scheme using alignment Option SC8. Design Standards – 60mph design speed and Departures from Standard unlikely. Although a much straighter route on plan, an opportunity for overtaking is unlikely due to topography (vertical curvature). Angled crossing of existing railway will increase cost but the crossing of Haywood Lane is relatively straight. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – the route skirts around the south-west corner of Newton Coppice (designated as Ancient Woodland), through the northern section of Grafton Wood (not designated), to the south of the wooded area between Grafton Lane and Withy Brook and to the south of the barn yard situated south-west of the Merryhill Lane junction with Haywood Lane. The route also passes to the south of Grafton Enclosure and Beech Grove (refer to commentary on Option SC9). Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoid them within the central area. Both routes cross Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure – route option SC8 (which crosses over the existing railway line) offers reduced risk for Network Rail's operations.

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Name of scheme:	South Wye Transport Package - Option SC8A
Description of scheme:	The SC8A option alignment is identical to SC8 except that it crosses underneath the railway line.

	Impacts	Summary of key impacts	Assessment Qualitative
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Significant Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Signficant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts)	Major Adverse
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedence of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present	Moderate Adverse - (local), Slight Adverse (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel	Slight Adverse
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route runs in close proximity to Haywood Lodge Farm and associated properties, with potential for visual amenity effects. It avoids Newton Brook. The alignment of the eastern half of the route runs in a straight line and cuts across the grain of the landscape. The route therefore fails to take into account the undulating topography and irregular field pattern. SC8A will require extensive works to create a cutting to take the route under the railwayand will involve engineered slopes that will be disruptive to the character of the local topography. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource with the additional sections of road, roundabout and proximity to residential properties, is Moderate (loss of resource, at odds with the local pattern and landform, visually intrusive and will adversely impact on the landscape).	Moderate Adverse
	Historic Environment	Direct impact (minor) on the significance of the setting of a Grade II* and three Grade II listed buildings at Haywood Lodge, Grade II Clehonger Court buildings and a Grade II listed milestone. Direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight to Moderate Adverse

	Biodiversity	SC8A passes through the centre of Grafton Wood, which supports a mature tree canopy with some indicators of ancient woodland present. SC8A will likely to lead to the greatest extent of habitat loss / disturbance within Grafton Wood relative to other route options under consideration, with comparable impacts to SC2/2A and SC9. SC8A passes south of Newton Coppice / Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland, although it will be located close to the southern edge of the ancient woodland areas. Recent surveys have confirmed the ancient character of these woodland habitats. SC8A also passes upstream of open sections of Newton Brook, and has reduced potential for impacts on this watercourse relative to route options passing through Newton Coppice / Hayleasow Wood. Consultation with Natural England has indicated that they woould not prefer a route option that passes through ancient woodland areas. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a Route Corridor Option that passes through the ancient woodland. SC8A is further away from ponds known to support great crested newts (GCN) than options SC2/2A. Impacts on GCNs, a European Protected species, are therefore likely to be reduced relative to the more southern options SC2/2A. All of the route options pass through extents of improved grassland and arable farmland, with fields seperated by a network of hedgerows in varying condition. In terms of these habitats there is little to separate the different route corridor options or the species they are likely to support (other than GCN, see above). The impact of each route option on significant off-site receptors (e.g. River Wye SAC and bat roosts) are also likely to be broadly similar. SC8A would pass under the railway line, based on the current understanding of scheme-wide bat activity and design parameters, SC8A would retain the rail corridor as a bridge, but with a 'drop-off' either side down to the road which is likely to lead to increased bat mortality / habitat fragmentation compared with SC8.	Moderate adverse
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse --
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this roadConnecting of B4349 to SC8A at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road.	Neutral
	Security	road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers	Slight Beneficial +
	Access to services	Scheme provides a new potential bus route (between the A465 and A49) but not one that better serves key local destinations in Hereford Town Centre	Neutral
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Account	Cost to Broad Transport Budget	Indicative cost of SC8A proposal is circa £38.6M	
	Indirect Tax Revenues	N/A	

Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment of the option is similar at both the western and eastern ends of the route. The difference lies within the middle section either side of the railway line reflecting whether the route goes over or under it. To cross over the railway route Option SC8A requires the construction of a cutting up to 11m deep. This could give rise to groundwater and road drainage problems. The extensive cutting on Option SC8A is likely to generate a significant amount of surplus spoil. Design Standards – 60mph design speed and Departures from Standard unlikely. Although a much straighter route on plan, an opportunity for overtaking is unlikely due to topography (vertical curvature). Angled crossing of existing railway will increase cost but the crossing of Haywood Lane is relatively straight. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – the route skirts around the south-west corner of Newton Coppice (designated as Ancient Woodland), through the northern section of Grafton Wood (not designated), to the south of the wooded area between Grafton Lane and Withy Brook and to the south of the barn yard situated south-west of the Merryhill Lane junction with Haywood Lane. The route also passes to the south of Grafton Enclosure and Beech Grove (refer to commentary on Option SC9). Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoid them within the central area. The route cross Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure – route option SC8A offers increased risk for Network Rail's operations.

Appraisal Summary Table Date Produced: 17/10/2014

Name of scheme:	South Wye Transport Package - Option SC9
Description of scheme:	This route is based on the alignment of Options SC8/SC8A except that it has a shorter, more direct crossing over the railway. It is the only option under consideration that crosses over Haywood Lane and through Beech Grove. Consequently the alignment is more twisted than Options SC8 and SC8A.

Impacts		Summary of key impacts	Assessment Qualitative
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Significant Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Signficant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts)	Major Adverse
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedence of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present	Moderate Adverse - (local), Slight Adverse (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel	Slight Adverse
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route will be visible from Haywood Lodge Farm and associated properties, however it curves away in a NW direction after crossing the railway line. As it takes a NW direction it passes directly through a local landscape feature called Beech Grove. Similar to other more southerly routes, it avoids Newton Brook. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource would be Major (is at considerable variance with the landform, scale and pattern of the landscape, is visually intrusive and will adversely impact on the landscape).	Major Adverse
	Historic Environment	Direct impact (moderate) on the significance of the setting of Grade II listed Merryhill Stables, Grade II* and three Grade II listed buildings at Haywood Lodge. Direct impact (minor) on the significance of the setting of the Grade II Clehonger Court buildings and a Grade II listed milestone. Direct physical impact (ranging from slight to substantial) on potential buried archaeological remains in five fields including the almost complete destruction of a feature of unknown date and function.	Moderate Adverse

	Biodiversity	SC9 passes through the centre of Grafton Wood, which supports a mature tree canopy with some indicators of ancient woodland present. SC9 is therefore likely to lead to the greatest extent of habitat loss / disturbance within Grafton Wood relative to other route options, with a level of immpactt comparable to SC2/2A and SC8/8A. SC9 passes south of Newton Coppice / Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland, although it will be located close to the southern edge of the ancient woodland areas. Recent surveys have confirmed the ancient character of these woodland habitats. SC9 also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse relative to route options passing through Newton Coppice / Hayleasow Wood. Consultation with Natural England has detemrined that they do not prefer route options that passes through the ancient woodland areas. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a route option that passes through the ancient woodland. SC9 is further away from ponds known to support great crested newts (GCNs) than SC2/2A. Impacts on GCNs, a European Protected species, are therefore likely to be reduced relative to the more southern options such as SC2/2A. All route options pass through areas of improved grassland and arable farmland, with fields seperated by a network of hedgerows in varying condition. There is little to separate the impacts of the different route options on these habitats or the species they are likely to support (other than GCN, see above). The impacts of each route option on significant off-site receptors (e.g. River Wye SAC and bat roosts) is also likely to be broadly similar. SC9 would pass over Haywood Lane via an overbridge, the only route option which does so. Haywood Lane could therefore provide an underpass for use by bats (providing this can be unlit), which may provide a more easily effective mitigation solution than having the proposed road passing under Haywood Lane. However, SC9 would directly affect several mature / veteran trees within hedgerows to the east of the railway (some of which have high bat roosting potential), which would not be affected by other route options.	Moderate Adverse
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse --
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this roadConnecting of B4349 to SC9 at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road.	Neutral
	Security	road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers	Slight Beneficial +
	Access to services	Scheme provides a new potential bus route (between the A465 and A49) but not one that better serves key local destinations in Hereford Town Centre	Neutral
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Account	Cost to Broad Transport Budget	Indicative cost of SC9 proposal is circa £25.3M	
	Indirect Tax Revenues	N/A	

Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment on the east side follows the rolling profile of the countryside but west of Grafton Lane it starts climbing on an 8.5m high embankment in order to pass over the railway line. The route cuts through Beech Grove in a cutting up to 4m deep before passing over Haywood Lane. It then continues on an 8m high embankment before eventually dipping down to the existing topography at the western end of the scheme. With very little cut the scheme would require significant importation of fill in order to create the two large embankments either side of Beech Grove. Furthermore, the need to cross over Haywood Lane is likely to cause difficulty in tying the lane back to existing levels either side of it, particularly to the north at its junction with Merryhill Lane. Design Standards – 60mph design speed and Departures from Standard unlikely. Opportunity for overtaking unlikely. Straighter crossing of railway will reduce the cost of the structure. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – being of a twisted nature the route manages to avoid many physical constraints except the northern section of Grafton Wood (not designated). It passes close to the wooded area between Grafton Lane and Withy Brook and the barn yard situated south-west of the Merryhill Lane junction with Haywood Lane. The route crosses the railway at a near perpendicular angle which should be beneficial in engineering and cost terms. The unique distinction between this route and others under consideration is that it goes through the middle of Beech Grove. To date it has not been confirmed whether the feature has archaeological relevance/significance or otherwise. Beech Grove does not appear as a specific record on the Herefordshire Historic Environment Record (HER) and is not listed as a Scheduled Ancient Monument. Grafton Enclosure (off Grafton Lane) on the other hand does appear on the HER and is believed to be a lost early medieval castle site. However, it is not affected by the alignment of Option SC9, the route passing well to the south of it. Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoids them within the central area. The route crosses Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure - route crosses over the existing railway line so reduced risk for Network Rail's operations.

Appendix B

Appraisal Summary Tables – SLR Options Including Sustainable Transport Package

Appraisal Summary Table Date Produced: 17/04/2014

Name of scheme:	South Wye Transport Package - **Option SC2 + Active Travel Improvements**
Description of scheme:	Option SC2 passes through the centre of Grafton Wood and continues westwards over Grafton Lane and Withy Brook. Thereafter, it straightens up immediately heading in a north-west direction to the A465. SC2 involves the construction of a new roundabout on the A465/B4349 Clehonger Road Junction.

Impacts		Summary of Key Impacts	Qualitative Assessment
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Significant increase in road traffic noise likely at properties close to the new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts).	Major Adverse - - -
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently just below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedance of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected, although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present.	Moderate Adverse - - (local) Slight Adverse - (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel.	Slight Adverse -
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood (not designated and low density of trees) but then is free of woodland for its entire length. This route brings the road closest to Haywood Lodge Farm and associated properties with a resulting increase in adverse visual effects. It avoids Newton Brook. A new roundabout on A465 and a short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is the least of all the routes, however with the additional sections of road, roundabout and proximity to residential properties, the magnitude is Moderate (loss of resource, but not affecting the integrity/ key characteristics of the rural scene). Kerb build outs, crossings and improved bus facilities on Belmont Road and Holme Lacy Road will lead to an improvement in the urban environment.	Moderate Adverse - -
	Historic Environment	Direct impact (minor) on the significance of the setting of a Grade II* and three Grade II listed buildings at Haywood Lodge; direct impact (minor) on the significance of the setting of the Grade II Clehonger Court buildings; direct impact (minor) on the significance of the setting of a Grade II listed milestone; direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight - to Moderate Adverse -

	Biodiversity	Route Option SC2 passes through the centre of Grafton Wood, which supports a mature tree canopy. This Option is therefore likely to lead to the greatest extent of habitat loss/disturbance within Grafton Wood relative to other Route Corridor Options under consideration. All of the Route Corridor Options pass through extents of improved grassland and arable farmland, with fields separated by a network of hedgerows in varying condition. In terms of these habitats there is little to separate the different route corridor options or the species they are likely to support. The impacts of each Route Corridor Option on significant off-site receptors (for example receptors such as The River Wye SAC and bat roosts) are also likely to be broadly similar. East and west of the railway line, Route Corridor SC2 passes in close proximity (within 250 m) of a series of ponds. Initial surveys have confirmed the presence of great crested newts (a species receiving full protection under the Conservation of Habitats and Species Regulations 2010, as amended) in several of these ponds. Route corridor SC2 could destroy terrestrial habitat and fragment habitats either side of the proposed road used by great crested newts. With suitable scheme design and targeted mitigation it is likely these impacts could be mitigated, and the project may be able to deliver enhancements via the creation of new/enhanced aquatic and terrestrial habitat. Route corridor option SC2 passes south of Newton Coppice/Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland. Surveys conducted by Amey (Environmental Assessment Report, 2013) and Parsons Brinckerhoff have confirmed the ancient character of these woodland habitats. SC2 also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse upstream of Newton Coppice/Hayleasow Wood.	Moderate Adverse - -
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse -
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link Road. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse - -
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents. New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this road. Connection of B4349 to SC2 at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduce accident rate along this section of road, although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road. Improved crossing facilities for vulnerable road users, improved cycle facilities, and reduction in dispersed accidents through 20mph limits. Increases in general cycle use have also been linked to overall increases in cycle safety.	Moderate Beneficial ++
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers. Increased walking and cycling in Belmont and along Holme Lacy Road will increase the number of people on-street, increasing security. CSOs will also be available to help improve perceived and actual security at problem locations.	Moderate Beneficial ++
	Access to services	Scheme provides improved bus services on the A465, decreasing bus journey times on this route by up to 20 minutes. Improved walking and cycling facilities will also improve access to services.	Moderate Beneficial ++
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +

	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465.	Slight Beneficial +
	Option and non-use values	No impacts identified.	Neutral
Public Account	Cost to Broad Transport Budget	Indicative cost of SC2 proposal is circa £16.5-£25M and is expected to make a return on its investment.	Moderate Beneficial ++
	Indirect Tax Revenues	N/A	N/A
Other Issues	Technical and operational feasibility	Earthworks – with some adjustment to the horizontal and vertical alignments this is the most likely option to achieve as near as possible a cut/fill balance. Vertical alignment in the main follows the rolling profile of the countryside. Design Standards – 60mph design speed and Departures from Standard unlikely. Opportunity for overtaking unlikely due to topography (vertical curvature). Straighter crossing of existing country lanes and railway. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – route goes through Grafton Wood (not designated). Utilities – route crosses existing overhead power lines a number of times (including a 66kV) but is located to the south of the main corridor of electricity cables running east to west. Route crosses Grafton Lane almost at grade where there is a concentration of services running north to south including HP gas, a trunk water main and a sewer. Rail structure – route crosses over the existing railway line so reduced risk for Network Rail's operations.	

Appraisal Summary Table Date Produced: 17/04/2014

Name of scheme:	South Wye Transport Package - **Option SC2A + Active Travel Improvements**
Description of scheme:	The SC2A option is identical to SC2, except that the new road section will pass under the railway line as opposed to passing over the top of it.

	Impacts	Summary of Key Impacts	Qualitative Assessment
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Significant increase in road traffic noise likely at properties close to the new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts).	Major Adverse ---
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently just below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedance of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected, although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present.	Moderate Adverse -- (local) Slight Adverse - (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel.	Slight Adverse -
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood (not designated and low density of trees) but then is free of woodland for its entire length. This route brings the road closest to Haywood Lodge Farm and associated properties with a resulting increase in adverse visual effects. It avoids Newton Brook. A new roundabout on A465 and a short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is the least of all the routes, however with the additional sections of road, roundabout and proximity to residential properties, the magnitude is Moderate (loss of resource, but not affecting the integrity/ key characteristics of the rural scene). Kerb build outs, crossings and improved bus facilities on Belmont Road and Holme Lacy Road will lead to an improvement in the urban environment.	Moderate Adverse --
	Historic Environment	Direct impact (minor) on the significance of the setting of a Grade II* and three Grade II listed buildings at Haywood Lodge; direct impact (minor) on the significance of the setting of the Grade II Clehonger Court buildings; direct impact (minor) on the significance of the setting of a Grade II listed milestone; direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight - to Moderate Adverse --

	Biodiversity	Route Option SC2A passes through the centre of Grafton Wood, which supports a mature tree canopy. This Option is therefore likely to lead to the greatest extent of habitat loss/disturbance within Grafton Wood relative to other Route Corridor Options under consideration. All of the Route Corridor Options pass through extents of improved grassland and arable farmland, with fields separated by a network of hedgerows in varying condition. In terms of these habitats there is little to separate the different route corridor options or the species they are likely to support. The impacts of each Route Corridor Option on significant off-site receptors (for example receptors such as The River Wye SAC and bat roosts) are also likely to be broadly similar. East and west of the railway line, Route Corridor SC2A passes in close proximity (within 250 m) of a series of ponds. Initial surveys have confirmed the presence of great crested newts (a species receiving full protection under the Conservation of Habitats and Species Regulations 2010, as amended) in several of these ponds. Route corridor SC2A could destroy terrestrial habitat and fragment habitats either side of the proposed road used by great crested newts. With suitable scheme design and targeted mitigation it is likely these impacts could be mitigated, and the project may be able to deliver enhancements via the creation of new/enhanced aquatic and terrestrial habitat. Route corridor option SC2A passes south of Newton Coppice/Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland. Surveys conducted by Amey (Environmental Assessment Report, 2013) and Parsons Brinckerhoff have confirmed the ancient character of these woodland habitats. SC2A also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse upstream of Newton Coppice/Hayleasow Wood. The route passes under the railway, and would therefore allow greater retention/enhancement of the habitat corridor along the railway line than the options involving overbridges.	Moderate adverse - -
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse -
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link Road. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse --
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents. New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this road. Connection of B4349 to SC2A at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduce accident rate along this section of road, although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road. Improved crossing facilities for vulnerable road users, improved cycle facilities, and reduction in dispersed accidents through 20mph limits. Increases in general cycle use have also been linked to overall increases in cycle safety.	Moderate Beneficial ++
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers. Increased walking and cycling in Belmont and along Holme Lacy Road will increase the number of people on-street, increasing security. CSOs will also be available to help improve perceived and actual security at problem locations.	Moderate Beneficial ++
	Access to services	Scheme provides improved bus services on the A465, decreasing bus journey times on this route by up to 20 minutes. Improved walking and cycling facilities will also improve access to services.	Moderate Beneficial ++
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +

	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465.	Slight Beneficial +
	Option and non-use values	No impacts identified.	Neutral
Public Accounts	Cost to Broad Transport Budget	Indicative cost of SC2A proposal is circa £19.5-£29M and is expected to make a return on its investment.	Slight Beneficial +
	Indirect Tax Revenues	N/A	N/A
Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment on the east side follows the rolling profile of the countryside but is forced deep in cutting to cross under the railway and Haywood Lane. This could give rise to groundwater and road drainage problems. Large amount of excess spoil generated. Design Standards – 60mph design speed and Departures from Standard unlikely. Opportunity for overtaking unlikely due to topography (vertical curvature). Straighter crossing of existing country lanes and railway. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – route goes through Grafton Wood (not designated). Utilities – route crosses existing overhead power lines a number of times (including a 66kV) but is located to the south of the main corridor of electricity cables running east to west. Route crosses Grafton Lane almost at grade where there is a concentration of services running north to south including HP gas, a trunk water main and a sewer. Rail structure - route crosses underneath the existing railway line so increased risk for Network Rail's operations.	

Appraisal Summary Table Date Produced: 17/04/2014

Name of scheme:	South Wye Transport Package - **Option SC5 + Active Travel Improvements**
Description of scheme:	Route Option SC5 passes through the northern part of Grafton Wood and in a north-westerly direction, crosses the densely wooded area between Grafton Lane and Withy Brook and a site of archaeological importance before turning west to cross underneath the railway line. The route continues through Merry Hill and under Haywood Lane towards the A465.

Impacts		Summary of Key Impacts	Qualitative Assessment
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link Road. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Significant increase in road traffic noise likely at properties close to the new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts).	Major Adverse ---
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently just below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedance of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present.	Moderate Adverse - (local) Slight Adverse - (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel.	Slight Adverse -
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood (not designated and low density of trees) and a dense copse near Withy Brook. It runs close to residential properties along Grafton Lane and involves the loss of a large commercial premises accessed from Haywood Lane. It avoids Newton Brook and Hayleasow Wood. A new roundabout on A465 and a separate short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is influenced by the loss of woodland, the route going through a large Site of Archaeological Importance, the proximity of residential properties, the loss of commercial premises, a new roundabout and additional sections of road. Therefore the magnitude of effect on the landscape resource would be Major (loss of resource and severe damage to key characteristics. Kerb build outs, crossings and improved bus facilities on Belmont Road and Holme Lacy Road will lead to an improvement in the urban environment.	Major Adverse ---
	Historic Environment	Direct impact (minor) on the significance of the setting of Grade II listed Merryhill Stables; direct impact (minor) on the significance of the setting of Grade II listed Haywood Lodge; direct physical impact (moderate) on site of medieval fortifications (10467); direct physical impact (minor) on two cropmarks in fields 10 and 34; direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight - to Moderate -- Adverse

	Biodiversity	Route Corridor Option SC5 passes through Grafton Wood, slightly to the north of the most central alignments. It is therefore likely to lead to similar levels of Habitat Loss as Options SC2/2A, but more than option SC7. Grafton Wood supports a mature tree canopy. All of the Route Corridor Options pass through extents of improved grassland and arable farmland, with fields separated by a network of hedgerows in varying condition. In terms of these habitats and the species they are likely to support there is little to separate the different Route Corridor Options. The impacts of each Route Corridor Option on significant off-site receptors (for example The River Wye SAC, bat roosts etc.) are also likely to be broadly similar. This Route Corridor Option is further away from ponds known to support great crested newts than options SC2. Impacts on great crested newts, a European Protected Species, are therefore likely to be reduced relative to the more southern options. Route Corridor Option SC5 passes south of Newton Coppice/Hayleasow Wood including a buffer zone of approximately 50 - 100 m. Newton coppice/Hayleasow wood supports semi-natural ancient woodland and plantation on ancient woodland. Surveys conducted by Amey (Environmental Assessment Report, 2013) and Parsons Brinckerhoff have confirmed the ancient character of these woodland habitats. Route Corridor Option SC5 also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse relative to Routes passing through/adjacent to the woodland.	Moderate adverse - -
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse -
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link Road. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking trips discouraged by severance of PROWs GF3, HA7, CH9 and CH10. Loss in rural amenity for recreational pedestrians on PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse -
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents. New roundabout will degrade views slightly from A465 New A465 roundabout will add stress to travellers on this road. New link between B4349 and A465, in addition to the new A465 roundabout will increase stress for drivers connecting between the B4349 and SC5.	Slight Beneficial +
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road. improved crossing facilities for vulnerable road users, improved cycle facilities, and reduction in dispersed accidents through 20mph limits. Increases in general cycle use have also been linked to overall increases in cycle safety.	Moderate Beneficial ++
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers. Increased walking and cycling in Belmont and along Holme Lacy Road will increase the number of people on-street, increasing security. CSOs will also be available to help improve perceived and actual security at problem locations.	Moderate Beneficial ++
	Access to services	Scheme provides improved bus services on the A465, decreasing bus journey times on this route by up to 20 minutes. Improved walking and cycling facilities will also improve access to services.	Moderate Beneficial ++
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465.	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Accounts	Cost to Broad Transport Budget	Indicative cost of SC5 proposal is circa £24-£35M and is expected to make a slight return on its investment.	Neutral
	Indirect Tax Revenues	N/A	N/A

Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment on the east side follows the rolling profile of the countryside but is forced into cutting after Grafton Lane in order to cross under the railway. 13m deep cutting through Merry Hill in order to cross under Haywood Lane which could give rise to groundwater and road drainage problems. Significant excess spoil generated. Design Standards – 60mph design speed and Departures from Standard unlikely. Opportunity for overtaking unlikely. Angled crossing of existing country lanes and railway will increase cost. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – route goes through Grafton Wood (not designated), a wooded area between Grafton Lane and Withy Brook, a site of archaeological importance and a barn yard situated south-west of the Merryhill Lane junction with Haywood Lane. Utilities – route crosses existing overhead power lines a number of times (including a 66kV) and is located partly within the main corridor of electricity cables running east to west. Route crosses Grafton Lane at grade where there is a concentration of services running north to south including HP gas, a trunk water main and a sewer. Conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure - route crosses underneath the existing railway line so increased risk for Network Rail's operations.

Appraisal Summary Table Date Produced: 17/04/2014

Name of scheme:	South Wye Transport Package - **Option SC7 + Active Travel Improvements**
Description of scheme:	Route Option SC7 passes through the northern tip of Grafton Wood but avoids the southern extent of the dense wooded area between Grafton Lane and Withy Brook. It then runs to the south of Merryhill Lane before cutting through Merry Hill and under Haywood Lane. From this location the road heads in a westerly direction to the A465.

	Impacts	Summary of Key Impacts	Qualitative Assessment
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link Road. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford and as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Significant increase in road traffic noise likely at properties close to the new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts)	Major Adverse ---
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently just below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedance of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected, although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present.	Moderate Adverse -- (local) Slight Adverse - (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel.	Slight Adverse -
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood (not designated and low density of trees). It runs close to residential properties along Grafton Lane. It avoids Newton Brook and Hayleasow Wood. A new roundabout on A465 and a short section of road connecting to B4349, introduces further built infrastructure. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource is influenced by the loss of woodland, the proximity of residential properties, a new roundabout with additional section of road. Therefore, the magnitude is Moderate (loss of resource, but not affecting the integrity/ key characteristics of the rural scene. Kerb build outs, crossings and improved bus facilities on Belmont Road and Holme Lacy Road will lead to an improvement in the urban environment.	Moderate Adverse --
	Historic Environment	Direct impact (minor) on the significance of the setting of Grade II listed Merryhill Stables; direct impact (minor) on the significance of the setting of Grade II listed Haywood Lodge; direct physical impact (minor) on cropmark in field 10; direct physical impact (slight to moderate) on potential buried archaeological remains in five fields.	Slight - to Moderate Adverse --

	Biodiversity	Route Corridor Option SC7 passes through the northern edge of Grafton Wood. Grafton Wood supports a mature tree canopy. SC7 has less impact on Grafton Wood relative to SC2/2A and SC5. All of the Route Corridor Options pass through extents of improved grassland and arable farmland, with fields separated by a network of hedgerows in varying condition. In terms of these habitats and the species they are likely to support there is little to separate the different Route Corridor Options. The impacts of each Corridor on significant off-site receptors (for example The River Wye SAC, bat roosts etc.) are also likely to be broadly similar. This Route Corridor Option is further away from ponds known to support great crested newts than options SC2/2A. Impacts on great crested newts, a European Protected species, are therefore likely to be reduced relative to the more southern options SC2/2A. Route corridor option SC7 passes south of Newton Coppice/Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland, although it will be located close to the southern edge of the ancient woodland areas. Surveys conducted by Amey (Environmental Assessment Report, 2013) and Parsons Brinckerhoff (unpublished) have confirmed the ancient character of these woodland habitats. Route Corridor Option SC7 also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse relative to options passing through Newton Coppice/Hayleasow Wood. Route Corridor Option SC7 passes under the railway, and would therefore allow greater retention/enhancement of the habitat corridor along the railway line than the options involving overbridges.	Moderate / slight adverse - - / -
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse -
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link Road. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking trips discouraged by severance of PROWs GF3, HA14, HAF, CH9 and CH10. Loss in rural amenity for recreational pedestrians on PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse --
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents. New road with associated earthworks will degrade views from A465, particularly where it is raised to bridge over Hayleasow Wood. New A465 roundabout will add stress to travellers on this road. New link between B4349 and A465, in addition to the new A465 roundabout will increase stress for drivers connecting between the B4349.	Minor Beneficial +
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduce accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road. Improved crossing facilities for vulnerable road users, improved cycle facilities, and reduction in dispersed accidents through 20mph limits. Increases in general cycle use have also been linked to overall increases in cycle safety.	Moderate Beneficial ++
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers. Increased walking and cycling in Belmont and along Holme Lacy Road will increase the number of people on-street, increasing security. CSOs will also be available to help improve perceived and actual security at problem locations.	Moderate Beneficial ++
	Access to services	Scheme provides improved bus services on the A465, decreasing bus journey times on this route by up to 20 minutes. Improved walking and cycling facilities will also improve access to services.	Moderate Beneficial ++
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465.	Slight Beneficial +
	Option and non-use values	No impacts identified.	Neutral
Public Account	Cost to Broad Transport Budget	Indicative cost of SC7 proposal is circa £21-£31M and is expected to make a slight return on its investment.	Neutral
	Indirect Tax Revenues	N/A	N/A

Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment on the east side follows the rolling profile of the countryside but is forced into cutting after Grafton Lane in order to cross under the railway. 13m deep cutting through Merry Hill in order to cross under Haywood Lane which could give rise to groundwater and road drainage problems. Large amount of excess spoil generated. Design Standards – 50mph design speed and Departures from Standard unlikely. No opportunity for overtaking due to the twisty alignment. Angled crossing of existing country lanes and railway will increase cost. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – being of a twisted nature the route manages to avoid many physical constraints but does go through the northern tip of Grafton Wood (not designated). Utilities – route crosses existing overhead power lines a number of times (including a 66kV) and is located largely within the main corridor of electricity cables running east to west. Route crosses Grafton Lane on a 3m high embankment where there is a concentration of services running north to south including HP gas, a trunk water main and a sewer. Conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure - route crosses underneath the existing railway line so increased risk for Network Rail's operations.

Appraisal Summary Table Date Produced: 17/10/2014

Name of scheme:	South Wye Transport Package - Option SC8
Description of scheme:	Option SC8 lies between the northern and southern options. The alignment is relatively straight over its entire length curving gradually north-west, west of the railway. It passes over the railway, underneath Haywood Lane and is at grade over Grafton Lane.

	Impacts	Summary of key impacts	Assessment Qualitative
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Signficant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts)	Major Adverse
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedence of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present	Moderate Adverse - (local), Slight Adverse (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel	Slight Adverse
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route runs in close proximity to Haywood Lodge Farm and associated properties, with potential for visual amenity effects. It avoids Newton Brook. The alignment of the eastern half of the route runs in a straight line and cuts across the grain of the landscape. The route therefore fails to take into account the undulating topography and irregular field pattern. SC8 will require extensive works to create embankments to take the route over the railway line resulting in a visible central section (as it passes over the railway line) and will have engineered slopes that will be disruptive to the character of the local topography. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource with the additional sections of road, roundabout and proximity to residential properties, is Moderate (loss of resource, at odds with the local pattern and landform, visually intrusive and will adversely impact on the landscape).	Moderate Adverse
	Historic Environment	Direct impact (minor) on the the setting of a Grade II* and three Grade II listed buildings at Haywood Lodge. Direct impact (minor) on the significance of the setting of the Grade II Clehonger Court buildings; direct impact (minor) on the significance of the setting of a Grade II listed milestone. Direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight to Moderate Adverse

	Biodiversity	SC8 passes through the centre of Grafton Wood, which supports a mature tree canopy with some indicators of ancient woodland present. SC8 will likely to lead to the greatest extent of habitat loss / disturbance within Grafton Wood relative to other route options under consideration, with comparable impacts to SC2/2A and SC9. SC8 passes south of Newton Coppice / Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland, although it will be located close to the southern edge of the ancient woodland areas. Recent surveys have confirmed the ancient character of these woodland habitats. SC8 also passes upstream of open sections of Newton Brook, and has reduced potential for impacts on this watercourse relative to route options passing through Newton Coppice / Hayleasow Wood. Consultation with Natural England has indicated that they would not prefer a route option that passes through ancient woodland areas. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a Route Corridor Option that passes through the ancient woodland. SC8 is further away from ponds known to support great crested newts (GCN) than options SC2/2A. Impacts on GCNs, a European Pr+D25otected species, are therefore likely to be reduced relative to the more southern options SC2/2A. All of the route options pass through extents of improved grassland and arable farmland, with fields seperated by a network of hedgerows in varying condition. In terms of these habitats there is little to separate the different route corridor options or the species they are likely to support (other than GCN, see above). The impact of each route option on significant off-site receptors (e.g. River Wye SAC and bat roosts) are also likely to be broadly similar. SC8 would pass over the railway line, based on the current understanding of scheme-wide bat activity and design parameters (assuming the railway underpass would be unlit), SC8 would allow a wide underpass to be maintained under the new road alignment, subject to only infrequent train movements. Any overbridge would need to have wide vegetated margins in order to be as effective as an underpass.	Moderate adverse
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse - -
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this roadConnecting of B4349 to SC8 at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road. Improved crossing facilities for vulnerable road users, improved cycle facilities, and reduction in dispersed accidents through 20mph limits. Increases in general cycle use have also been linked to overall increases in cycle safety.	Moderate Beneficial ++
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers. Increased walking and cycling in Belmont and along Holme Lacy Road will increase the number of people on-street, increasing security. CSOs will also be available to help improve perceived and actual security at problem locations.	Moderate Beneficial ++
	Access to services	Scheme provides improved bus services on the A465, decreasing bus journey times on this route by up to 20 minutes. Improved walking and cycling facilities will also improve access to services.	Moderate Beneficial ++
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Account	Cost to Broad Transport Budget	Indicative cost of SC8 proposal is circa £26.5M	
	Indirect Tax Revenues	N/A	

Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment of the option is similar at both the western and eastern ends of the route. The difference lies within the middle section either side of the railway line reflecting whether the route goes over or under it. To cross over the railway route Option SC8 requires the construction of an embankment up to 8m high. This could give rise to groundwater and road drainage problems. it may be possible to achieve a balanced earthworks scheme using alignment Option SC8. Design Standards – 60mph design speed and Departures from Standard unlikely. Although a much straighter route on plan, an opportunity for overtaking is unlikely due to topography (vertical curvature). Angled crossing of existing railway will increase cost but the crossing of Haywood Lane is relatively straight. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – the route skirts around the south-west corner of Newton Coppice (designated as Ancient Woodland), through the northern section of Grafton Wood (not designated), to the south of the wooded area between Grafton Lane and Withy Brook and to the south of the barn yard situated south-west of the Merryhill Lane junction with Haywood Lane. The route also passes to the south of Grafton Enclosure and Beech Grove (refer to commentary on Option SC9). Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoid them within the central area. Both routes cross Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure – route option SC8 (which crosses over the existing railway line) offers reduced risk for Network Rail's operations.

Appraisal Summary Table Date Produced: 17/10/2014

Name of scheme:	South Wye Transport Package - Option SC8A
Description of scheme:	The SC8A option alignment is identical to SC8 except that it crosses underneath the railway line.

	Impacts	Summary of key impacts	Assessment Qualitative
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Signficant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts)	Major Adverse
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedence of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present	Moderate Adverse - (local), Slight Adverse (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel	Slight Adverse
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route runs in close proximity to Haywood Lodge Farm and associated properties, with potential for visual amenity effects. It avoids Newton Brook. The alignment of the eastern half of the route runs in a straight line and cuts across the grain of the landscape. The route therefore fails to take into account the undulating topography and irregular field pattern. SC8A will require extensive works to create a cutting to take the route under the railwayand will involve engineered slopes that will be disruptive to the character of the local topography. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource with the additional sections of road, roundabout and proximity to residential properties, is Moderate (loss of resource, at odds with the local pattern and landform, visually intrusive and will adversely impact on the landscape).	Moderate Adverse
	Historic Environment	Direct impact (minor) on the significance of the setting of a Grade II* and three Grade II listed buildings at Haywood Lodge, Grade II Clehonger Court buildings and a Grade II listed milestone. Direct physical impact (slight to moderate) on potential buried archaeological remains in four fields.	Slight to Moderate Adverse

	Biodiversity	SC8A passes through the centre of Grafton Wood, which supports a mature tree canopy with some indicators of ancient woodland present. SC8A will likely to lead to the greatest extent of habitat loss / disturbance within Grafton Wood relative to other route options under consideration, with comparable impacts to SC2/2A and SC9. SC8A passes south of Newton Coppice / Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland, although it will be located close to the southern edge of the ancient woodland areas. Recent surveys have confirmed the ancient character of these woodland habitats. SC8A also passes upstream of open sections of Newton Brook, and has reduced potential for impacts on this watercourse relative to route options passing through Newton Coppice / Hayleasow Wood. Consultation with Natural England has indicated that they woould not prefer a route option that passes through ancient woodland areas. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a Route Corridor Option that passes through the ancient woodland. SC8A is further away from ponds known to support great crested newts (GCN) than options SC2/2A. Impacts on GCNs, a European Protected species, are therefore likely to be reduced relative to the more southern options SC2/2A. All of the route options pass through extents of improved grassland and arable farmland, with fields seperated by a network of hedgerows in varying condition. In terms of these habitats there is little to separate the different route corridor options or the species they are likely to support (other than GCN, see above). The impact of each route option on significant off-site receptors (e.g. River Wye SAC and bat roosts) are also likely to be broadly similar. SC8A would pass under the railway line, based on the current understanding of scheme-wide bat activity and design parameters, SC8A would retain the rail corridor as a bridge, but with a 'drop-off' either side down to the road which is likely to lead to increased bat mortality / habitat fragmentation compared with SC8.	Moderate adverse
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse --
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this roadConnecting of B4349 to SC8 at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road. Improved crossing facilities for vulnerable road users, improved cycle facilities, and reduction in dispersed accidents through 20mph limits. Increases in general cycle use have also been linked to overall increases in cycle safety.	Moderate Beneficial ++
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers. Increased walking and cycling in Belmont and along Holme Lacy Road will increase the number of people on-street, increasing security. CSOs will also be available to help improve perceived and actual security at problem locations.	Moderate Beneficial ++
	Access to services	Scheme provides improved bus services on the A465, decreasing bus journey times on this route by up to 20 minutes. Improved walking and cycling facilities will also improve access to services.	Moderate Beneficial ++
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Account	Cost to Broad Transport Budget	Indicative cost of SC8A proposal is circa £38.6M	
	Indirect Tax Revenues	N/A	

Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment of the option is similar at both the western and eastern ends of the route. The difference lies within the middle section either side of the railway line reflecting whether the route goes over or under it. To cross over the railway route Option SC8A requires the construction of a cutting up to 11m deep. This could give rise to groundwater and road drainage problems. The extensive cutting on Option SC8A is likely to generate a significant amount of surplus spoil. Design Standards – 60mph design speed and Departures from Standard unlikely. Although a much straighter route on plan, an opportunity for overtaking is unlikely due to topography (vertical curvature). Angled crossing of existing railway will increase cost but the crossing of Haywood Lane is relatively straight. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – the route skirts around the south-west corner of Newton Coppice (designated as Ancient Woodland), through the northern section of Grafton Wood (not designated), to the south of the wooded area between Grafton Lane and Withy Brook and to the south of the barn yard situated south-west of the Merryhill Lane junction with Haywood Lane. The route also passes to the south of Grafton Enclosure and Beech Grove (refer to commentary on Option SC9). Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoid them within the central area. The route cross Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure – route option SC8A offers increased risk for Network Rail's operations.

Appraisal Summary Table Date Produced: 17/10/2014

Name of scheme:	South Wye Transport Package - Option SC9
Description of scheme:	This route is based on the alignment of Options SC8/SC8A except that it has a shorter, more direct crossing over the railway. It is the only option under consideration that crosses over Haywood Lane and through Beech Grove. Consequently the alignment is more twisted than Options SC8 and SC8A.

Impacts		Summary of key impacts	Assessment Qualitative
Economy	Business users & transport providers	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those business users who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Business users	Reduced congestion along the A465 provides greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Regeneration	Southern Link Road provides direct connection to the Hereford Enterprise Zone (HEZ) from the A465. Improves the supply of employment land by allowing the planning conditions that presently limit development at the HEZ to be extinguished, therefore removing substantial barriers to inward investment relating to both residential and employment development. Regeneration benefits within Belmont enhanced due to greater accessibility to employment opportunities within the HEZ.	Major Beneficial +++
	Wider Impacts	Potential for greater agglomeration benefits across Hereford as a result of greater connections to the HEZ. Scheme will support the adopted economic growth of the Marches Sub-region.	Moderate Beneficial ++
Environmental	Noise	Signficant increase in road traffic noise likely at properties close to new road. Possible decreases in noise at properties adjacent to A465 and A49 (DEFRA Noise Action Planning Important Area on A465 between Tesco and Asda Roundabouts)	Major Adverse
	Air Quality	Air quality along both Belmont Road and Ross Road is relatively poor but, at property facades, is currently below the air quality objective. Traffic is expected to decrease on Belmont Road and increase on Ross Road. This will result in an improvement of air quality on Belmont Road and a deterioration on Ross Road. The deterioration in air quality could potentially lead to exceedence of the air quality objective. The option is not expected to affect the Hereford AQMA itself, since traffic flows across the river are not expected to be affected although some changes at the A465/A49 junction may result in highly localised air quality impacts. Regional air quality is likely to show a slight adverse impact for all options, due to the greater distance travelled by vehicles diverting onto the bypass and the greater speed of travel. Any impacts on congestion relief on roads into Hereford cannot be assessed at present	Moderate Adverse - (local), Slight Adverse (regional)
	Greenhouse gases	The option will have a slight adverse impact on greenhouse gas emissions due to the greater distance travelled by vehicles diverting onto the Southern Link Road and the greater speed of travel	Slight Adverse
	Landscape/Townscape	Route passes through fertile, undulating farmland with extensive arable fields, with low hedges and occasional woodland. Although most of the route is within the Herefordshire Lowlands character area, more typical of South Herefordshire. In terms of woodland, it cuts through the centre of Grafton Wood, which is not designated and has a low density of trees. This route will be visible from Haywood Lodge Farm and associated properties, however it curves away in a NW direction after crossing the railway line. As it takes a NW direction it passes directly through a local landscape feature called Beech Grove. Similar to other more southerly routes, it avoids Newton Brook. The landscape in this area would be classed as being of Medium sensitivity (good quality example of Herefordshire rural landscape). The magnitude of effect on the landscape resource would be Major (is at considerable variance with the landform, scale and pattern of the landscape, is visually intrusive and will adversely impact on the landscape).	Major Adverse
	Historic Environment	Direct impact (moderate) on the significance of the setting of Grade II listed Merryhill Stables, Grade II* and three Grade II listed buildings at Haywood Lodge. Direct impact (minor) on the significance of the setting of the Grade II Clehonger Court buildings and a Grade II listed milestone. Direct physical impact (ranging from slight to substantial) on potential buried archaeological remains in five fields including the almost complete destruction of a feature of unknown date and function.	Moderate Adverse

	Biodiversity	SC9 passes through the centre of Grafton Wood, which supports a mature tree canopy with some indicators of ancient woodland present. SC9 is therefore likely to lead to the greatest extent of habitat loss / disturbance within Grafton Wood relative to other route options, with a level of immpactt comparable to SC2/2A and SC8/8A. SC9 passes south of Newton Coppice / Hayleasow Wood which includes semi-natural ancient woodland and plantation on ancient woodland, although it will be located close to the southern edge of the ancient woodland areas. Recent surveys have confirmed the ancient character of these woodland habitats. SC9 also passes upstream of currently open sections of Newton Brook, and hence has reduced potential for impacts on this watercourse relative to route options passing through Newton Coppice / Hayleasow Wood. Consultation with Natural England has detemrined that they do not prefer route options that passes through the ancient woodland areas. The National Planning Policy Framework identifies ancient woodland as an irreplaceable habitat, and it is unlikely to be possible to fully mitigate a route option that passes through the ancient woodland. SC9 is further away from ponds known to support great crested newts (GCNs) than SC2/2A. Impacts on GCNs, a European Protected species, are therefore likely to be reduced relative to the more southern options such as SC2/2A. All route options pass through areas of improved grassland and arable farmland, with fields seperated by a network of hedgerows in varying condition. There is little to separate the impacts of the different route options on these habitats or the species they are likely to support (other than GCN, see above). The impacts of each route option on significant off-site receptors (e.g. River Wye SAC and bat roosts) is also likely to be broadly similar. SC9 would pass over Haywood Lane via an overbridge, the only route option which does so. Haywood Lane could therefore provide an underpass for use by bats (providing this can be unlit), which may provide a more easily effective mitigation solution than having the proposed road passing under Haywood Lane. However, SC9 would directly affect several mature / veteran trees within hedgerows to the east of the railway (some of which have high bat roosting potential), which would not be affected by other route options.	Moderate Adverse
	Water Environment	Assuming surface water management design and construction measures are implemented, the proposed alignment is likely to have low significance impacts on transport and dilution of waste products and biodiversity in Withy Brook and Newton Brook.	Slight Adverse
Social	Commuting and Other users	Reduced congestion along the A465 Belmont Road due to diversion of traffic onto the Southern Link Road and modal shift therefore journey time savings for existing users of the A465. Longer journeys for those who divert to the Southern Link. Increased traffic along the A49 but level of delay at the A49/A465 junction proposed to remain at existing levels.	Slight Beneficial +
	Reliability impact on Commuting and Other users	Reduced congestion along the A465 provide greater journey time reliability for users of the A465. Journey times along the A49 are expected to remain at existing levels.	Slight Beneficial +
	Physical activity	Walking and cycling trips discouraged by severance of PROWs GF3 and HA7. Loss in rural amenity for recreational pedestrians using existing PROWs due to introduction of increased traffic noise and proximity to traffic.	Moderate Adverse --
	Journey quality	Road users benefiting from improved views and reduced traveller stress resulting from more open route with rural landscape vistas, greater route certainty, and reduced fear of accidents (compared to existing urban routes through Hereford town centre). New road with associated earthworks will degrade views slightly from A49 and Haywood Lane. New A465 roundabout will add stress to travellers on this roadConnecting of B4349 to SC8 at A465 will reduce driver stress compared to existing junction arrangement.	Moderate Beneficial ++
	Accidents	Southern Link Road designed to latest design standards. Reduction in traffic along A465 will reduction accident rate along this section of road although the resultant increase in traffic along the A49 may cause the accident rate to increase on this section of road. Improved crossing facilities for vulnerable road users, improved cycle facilities, and reduction in dispersed accidents through 20mph limits. Increases in general cycle use have also been linked to overall increases in cycle safety.	Moderate Beneficial ++
	Security	Road users slightly less vulnerable to crime as this option reduces need to stop vehicles or reduce speeds compared to existing routes. No impact on security of PT passengers. Increased walking and cycling in Belmont and along Holme Lacy Road will increase the number of people on-street, increasing security. CSOs will also be available to help improve perceived and actual security at problem locations.	Moderate Beneficial ++
	Access to services	Scheme provides improved bus services on the A465, decreasing bus journey times on this route by up to 20 minutes. Improved walking and cycling facilities will also improve access to services.	Moderate Beneficial ++
	Affordability	Rerouting will impact on journey speeds and congestion on both A465 and A49 (north of the scheme), impacting positively on personal affordability of car users.	Slight Beneficial +
	Severance	Scheme option increases severance significantly for very low number hamlets but reduces severance slightly (by reducing traffic flows) through Belmont and Redhill residential areas in vicinity of A49 and A465	Slight Beneficial +
	Option and non-use values	No impacts identified	Neutral
Public Account	Cost to Broad Transport Budget	Indicative cost of SC9 proposal is circa £25.3M	
	Indirect Tax Revenues	N/A	

Other Issues	Technical and operational feasibility	Earthworks – Vertical alignment on the east side follows the rolling profile of the countryside but west of Grafton Lane it starts climbing on an 8.5m high embankment in order to pass over the railway line. The route cuts through Beech Grove in a cutting up to 4m deep before passing over Haywood Lane. It then continues on an 8m high embankment before eventually dipping down to the existing topography at the western end of the scheme. With very little cut the scheme would require significant importation of fill in order to create the two large embankments either side of Beech Grove. Furthermore, the need to cross over Haywood Lane is likely to cause difficulty in tying the lane back to existing levels either side of it, particularly to the north at its junction with Merryhill Lane. Design Standards – 60mph design speed and Departures from Standard unlikely. Opportunity for overtaking unlikely. Straighter crossing of railway will reduce the cost of the structure. Side access issues yet to be looked at as well as any drainage runoff storage provision. Physical features – being of a twisted nature the route manages to avoid many physical constraints except the northern section of Grafton Wood (not designated). It passes close to the wooded area between Grafton Lane and Withy Brook and the barn yard situated south-west of the Merryhill Lane junction with Haywood Lane. The route crosses the railway at a near perpendicular angle which should be beneficial in engineering and cost terms. The unique distinction between this route and others under consideration is that it goes through the middle of Beech Grove. To date it has not been confirmed whether the feature has archaeological relevance/significance or otherwise. Beech Grove does not appear as a specific record on the Herefordshire Historic Environment Record (HER) and is not listed as a Scheduled Ancient Monument. Grafton Enclosure (off Grafton Lane) on the other hand does appear on the HER and is believed to be a lost early medieval castle site. However, it is not affected by the alignment of Option SC9, the route passing well to the south of it. Utilities – the route clashes with existing overhead power lines located at the eastern and western ends of the scheme (including a 66kV) but generally avoids them within the central area. The route crosses Grafton Lane at grade (or thereabouts) where BT and water services are present. There is conflict with a concentration of overhead and buried services in/around Haywood Lane including BT, a water main and a sewer. Rail structure - route crosses over the existing railway line so reduced risk for Network Rail's operations.