Bexhill to Hastings Link Road (BHLR)

One Year After Report

March 2018
# Issue and Revision Record

<table>
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<th>Date</th>
<th>Originator</th>
<th>Checker</th>
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<td>A BENNETT</td>
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Glossary

The table below presents some of the key abbreviations used in this report.

Table 1: Glossary of abbreviation

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Elaboration</th>
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<tbody>
<tr>
<td>%HDV</td>
<td>Percentage Heavy Duty Vehicles</td>
</tr>
<tr>
<td>AADT</td>
<td>Annual Average Daily Traffic</td>
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<tr>
<td>AFR</td>
<td>Accident Frequency Rate</td>
</tr>
<tr>
<td>AONB</td>
<td>Area of Outstanding Beauty</td>
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<tr>
<td>AQMA</td>
<td>Air Quality Management Area</td>
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<tr>
<td>BAFB</td>
<td>Best and Final Funding</td>
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<tr>
<td>BAFFFB</td>
<td>Best and Final Funding</td>
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<tr>
<td>BAP</td>
<td>Biodiversity Action Plan</td>
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<td>BHLR</td>
<td>Bexhill to Hastings Link Road</td>
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<tr>
<td>BOD</td>
<td>Biochemical oxygen demand</td>
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<tr>
<td>CaCO$_3$</td>
<td>Calcium carbonate</td>
</tr>
<tr>
<td>CCS</td>
<td>Considerate Constructors Scheme</td>
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<tr>
<td>CHIP</td>
<td>Complimentary Highway Improvement Plan</td>
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<tr>
<td>CPO</td>
<td>Compulsory Purchase Order</td>
</tr>
<tr>
<td>CRTN</td>
<td>Calculation of Road Traffic Noise</td>
</tr>
<tr>
<td>CVCP</td>
<td>Combe Valley Countryside Park</td>
</tr>
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<td>DfT</td>
<td>Department for Transport</td>
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<tr>
<td>DMRB</td>
<td>Design Manual for Roads and Bridges</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>ES</td>
<td>Environmental Statement</td>
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<tr>
<td>ESCC</td>
<td>East Sussex County Council</td>
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<tr>
<td>EQS</td>
<td>Environmental Quality Standards</td>
</tr>
<tr>
<td>ETE</td>
<td>Economy, Transport and Environment</td>
</tr>
<tr>
<td>FFB</td>
<td>Final Funding Bid</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
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<tr>
<td>GVA</td>
<td>Gross Value Added</td>
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<tr>
<td>HBC</td>
<td>Hastings Borough Council</td>
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<tr>
<td>HDV</td>
<td>Heavy-duty Vehicles</td>
</tr>
<tr>
<td>HGV</td>
<td>Heavy-goods Vehicles</td>
</tr>
<tr>
<td>JSA</td>
<td>Job Seeker's Allowance</td>
</tr>
<tr>
<td>KPIs</td>
<td>Key Performance Indicators</td>
</tr>
<tr>
<td>LNR</td>
<td>Local Natural Reserve</td>
</tr>
<tr>
<td>M&amp;EP</td>
<td>Monitoring and Evaluation Plan</td>
</tr>
<tr>
<td>MSBC</td>
<td>Major Scheme Business Case</td>
</tr>
<tr>
<td>NEC3</td>
<td>New Engineering Contract 3</td>
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<tr>
<td>NMU</td>
<td>Non-motorised user</td>
</tr>
<tr>
<td>NO</td>
<td>Nitrogen Oxide</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Elaboration</td>
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<td>--------------</td>
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<tr>
<td>NO₂</td>
<td>Nitrogen Dioxide</td>
</tr>
<tr>
<td>NOₓ</td>
<td>Oxides of nitrogen: a mixture of NO and NO₂</td>
</tr>
<tr>
<td>NPV</td>
<td>Net Present Value</td>
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<tr>
<td>NVC</td>
<td>National Vegetation Classification</td>
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<td>NVQ</td>
<td>National Vocational Qualification</td>
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<tr>
<td>OYA</td>
<td>One Year After</td>
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<tr>
<td>PM₁₀</td>
<td>Particulate Matter</td>
</tr>
<tr>
<td>ProW</td>
<td>Public Rights of Way</td>
</tr>
<tr>
<td>PVB</td>
<td>Present Value of Benefits</td>
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<tr>
<td>PVC</td>
<td>Present Value of Costs</td>
</tr>
<tr>
<td>RE</td>
<td>River Ecosystem</td>
</tr>
<tr>
<td>SNCI</td>
<td>Site of Nature Conservation Importance</td>
</tr>
<tr>
<td>SoCoMMS</td>
<td>South Coast Corridor Multi-Modal Study</td>
</tr>
<tr>
<td>SoE</td>
<td>Statement of Evidence</td>
</tr>
<tr>
<td>SSSI</td>
<td>Site of Special Scientific Interest</td>
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<tr>
<td>tCO₂</td>
<td>Total carbon dioxide</td>
</tr>
<tr>
<td>WebTAG</td>
<td>Transport Analysis Guidance</td>
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<td>WFD</td>
<td>Water Framework Directive</td>
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Executive summary

Introduction

The Bexhill to Hastings Link Road (BHLR) One Year After (OYA) report is the second formal report of the monitoring and evaluation plan for this scheme. The purpose of this OYA report is to build upon the BHLR Baseline Report by analysing and reporting the outcomes and impacts of the BHLR on its surrounding area one year after it opened.

Post-construction evaluations are carried out for all major road transport schemes which require a ‘fuller evaluation’ to take place\(^1\). The aim of undertaking a fuller evaluation is to generate evidence on the efficiency of the delivery, the causal effect of the scheme and whether it had any unintended adverse or positive effects. Combining this data with other bespoke evaluation data collected will demonstrate the causal pathway between the scheme and the observed outcomes and impacts.

The scheme

The BHLR connects the local authorities of Rother and Hastings in the county of East Sussex, located in the South East of England. It is a single carriageway road stretching 5.6km from north east Bexhill to the western approaches of Hastings, between the A259 in Bexhill and the B2092 Queensway in Hastings. The road links the outskirts of Bexhill and Hastings, providing access to areas that have been identified for regeneration in north east Bexhill, in addition to easing congestion and improving air quality on the A259.

\(^1\) Department for Transport (2012) ‘Monitoring and Evaluation Framework for Local Authority Major Schemes’ p.6
This report

Throughout this OYA report, the BHLR is assessed and evaluated in terms of its impact on the Bexhill and Hastings areas, including the wider economic affects concerning the regeneration and development of this underperforming area of the South East.

The indicators detailed in this report (the indicators) will give a broad view of how the BHLR has impacted upon local economic development, affected the local environment, and altered acute congestion problems and the associated negative consequences of community severance and road accidents. These indicators remain the same throughout the monitoring and evaluation process (up to 15 years after the opening of the scheme) to allow for consistent reporting. The indicators are listed below, grouped by theme:

**Table 1: Indicators**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>1. Emissions of particulates ($PM_{10}$ and $NO_2$) along the A259 Bexhill Road</td>
</tr>
<tr>
<td></td>
<td>2. Change in carbon dioxide emissions attributable to the BHLR</td>
</tr>
<tr>
<td></td>
<td>3. Level of adverse noise impacts of the BHLR within the Combe Haven Valley</td>
</tr>
</tbody>
</table>
Theme | Indicator
---|---
4. | Integration levels of the BHLR within the wider landscape
5. | Monitoring that there is no net loss of biodiversity as a result of the BHLR and that the two for one compensation strategy for Nature Conservation is achieved
6. | Ensure that the BHLR is complementary to the future implementation of the proposed Combe Valley Countryside Park
7. | To preserve and where possible enhance ecological value of marginal aquatic habitat for waterbodies that are affected by the Scheme (i.e. those that are bridged or culverted)

Safety | 8. Reduction in the number of accidents on the local road network giving associated economic benefits
9. | Reduction in the accident rate on the A259 between the junction with London Road/the BHLR at Belle Hill, Bexhill and the junction with the Ridge in Hastings

Economy | 10. To enable the strategic housing and commercial developments proposed in north east Bexhill to be realised
11. | Contribute to regeneration by increased employment opportunities
12. | Percentage of construction supply chain expenditure spent within businesses in the South East

Accessibility | 13. To reduce journey times for all road users
14. | To reduce community severance in the A259 corridor and in local villages used as ‘rat runs’ to avoid the A259
16. | To improve reliability of bus services on the local road network

Integration | 15. To improve conditions for pedestrians, cyclists and equestrians on the local road network in general and to facilitate creation of dedicated cycle ways between the two towns

Source: Mott MacDonald

The findings of this study for each indicator are outlined in the sections below.

**Environment**

I1: Emissions of particulates (PM$_{10}$ and NO$_{2}$) along the A259 Bexhill Road

Operation phase air quality effects have the potential to occur as a result of the new road due to changes in traffic flows, and therefore vehicle emissions. The scheme not only introduces a new road (and therefore a new emission source) into the Combe Valley, but also affects traffic flow characteristics over the surrounding road network. Part IV of the Environment Act 1995 requires that every local authority shall periodically carry out a review of air quality within its area, including likely future air quality. As part of this review, the relevant authority has assessed whether air quality standards and objectives are being achieved.

A review of Hastings Borough Council monitored concentrations of PM$_{10}$ and NO$_{2}$ along the A259 has been undertaken to determine the effects of the BHLR on air quality. It is likely that the BHLR is a contributing factor to the reduction in NO$_{2}$ and PM$_{10}$ concentrations along the A259, however to what extent cannot be quantified from review of the monitoring data alone. A reduction in Annual Average Daily Traffic (AADT) between 2015 and 2016 is noted, however further analysis of future monitoring data would be required to fully remove the potential that meteorological impacts or other local factors are not also partially accountable. One of the key objectives of the BHLR has been achieved ahead of schedule with the Hastings AQMA revocation in April 2017 due to improved air quality within the surrounding area.

I2: Change in carbon dioxide emissions attributable to the BHLR

This indicator provides details of the greenhouse gas monitoring assessment of the BHLR. Traffic counts were undertaken on the A271, the A259, the Queensway, Crowhurst Road, and Catsfield Road during 2017.
This assessment shows that the project has resulted in a disbenefit of 430 tCO₂ in terms of GHGs. This is 262 tCO₂ less than predicted by the baseline. This is due to fewer vehicle kms travelled by HDV in the observed data than in the Modelled ‘Do-Something’ scenario.

I3: Level of adverse noise impacts of the BHLR within the Combe Valley

One objective of the scheme is to minimise the effect of noise upon homes, and minimise the real and psychological effects of noise upon countryside (including High Weald AONB), Sites of Special Scientific Interest (SSSIs) and recreational use of the countryside and Combe Valley Country Park. The effects of the scheme upon the noise environment within the Combe Valley were subsequently assessed as part of the Environmental Impact Assessment (EIA) for the scheme, and revisited for the 2009 Public Inquiry. The aim of this indicator is to analyse whether or not the future noise environment within the Combe Valley is better, worse or the same as the predicted effects for the approved Scheme.

Comparison of the LA10,18hr 2017 - 1-year post- Construction monitoring data with the LA10,18hr 2006 measured baseline in the Environmental Statement (ES) show an increase in the noise level in the majority of the Combe Valley (west and central part of the BHLR), while a decrease in the noise level is localised to the north and east part of the BHLR.

Comparison of the LA10,18hr 2017 1-year post- Construction monitoring data with the LA10,18hr prediction for 2010 within the 2007 ES and with the LA10,18hr prediction for 2013 within the 2009 Compulsory Purchase Order (CPO) area show that the measured noise level to the south of the BHLR are lower than predicted, while to the north of the road the measured noise levels are in line with the prediction. The measured noise level to the west of the BHLR indicates that the value is lower than the prediction, but to the south-west the opposite is true (higher than the prediction).

I4: Integration levels of the BHLR within the wider landscape

One of the key aims of the BHLR’s design has been to develop a scheme that retains and, where possible, enhances the integrity of the areas of distinctive landscape and townscape character. The scheme also aims to minimise and, if possible, avoid adverse landscape effects upon the High Weald AONB (which is situated to the north of the BHLR), as well as minimise visual effects upon properties and countryside (BHLR Design and Access Statement, ESCC, 2007). These design objectives have been used to inform the landscape proposals which are an integral part of the scheme design and are designed to avoid, reduce, or remedy potential adverse effects.

The following techniques have been adopted:

- Optimising the route alignment to make full use of existing vegetation and landform to screen the route and achieve a good fit into the topography.
- The provision of earth mounding to screen the route from view and blend it into the local landform.
- The provision of planting to screen the route from view and blend it into the local surroundings.

The integration levels of the scheme within the wider landscape are as predicted during the original assessment and photomontage production in 2009. The engineering and earthworks aspect of the design appearance is as predicted. Further assessment in the future (at Year 5 and Year 15 after opening) will determine whether soft landscaping proposals have been effective, as vegetation matures over time to help screen the scheme and further soften its presence within the landscape.
I5: Monitoring that there is no net loss of biodiversity as a result of the BHLR and that the two for one compensation strategy for Nature Conservation is achieved

The route of the BHLR passes across a valley system with nationally and county important wildlife features, including ancient woodland, flood-plain meadows and fens, flower-rich pasture, streams and ponds. A wide range of habitats are present throughout the route corridor. At the western end of the scheme the route passes through a short urban section (Bexhill Connection) with habitats including areas of scrub, private gardens and grassland, some of which are part of an abandoned railway, designated as a Site of Nature Conservation Importance (SNCI). The route of the BHLR provides habitats for protected species which have also been assessed as part of the One Year After Report.

It is too early to see evidence of the active management of the floodplain grassland and fen and species rich grassland present on the scheme, however, re-seeding has been undertaken and areas have been flooded to provide wetland compensation. Mesotrophic grassland scrub and secondary woodland have evidence of top soil stripping and grassland planting however, some areas still contain stone and rubble which would benefit from tilling and reseeding to increase biodiversity value. Woodland management has been undertaken and evidence is displayed in the Offsite Woodland Management Plan completed in April 2017. This provides details on management activities including coppicing, thinning and planting. Management of woodland successfully met original objectives of replanting broadleaved woodland trees at a ratio of 2:1 in part of the scheme area. Extensive hedgerow planting was observed with damaged areas to be replaced annually during the five-year aftercare period. Objectives relating to ditches and streams have been largely met with biodiversity value retained. The majority of ponds met original objectives and biodiversity value should increase in line with pond maturity. Protected species present within the scheme area have been monitored and have shown bat roost status to be unchanged from 2012 results. The current height and location of fencing appears to prevent bat and vehicle collisions and the use of bat boxes requires continual monitoring due to current lack of use. Several badger casualties were observed during the 2016 monitoring period, indicating some lapses in the effectiveness of badger mitigation such as delayed repairs to the roadside badger fence. Periodic checks are required to ensure the fence is kept to required specification. Great Crested Newt presence was confirmed within only one of the ten ponds surveyed with seven adults recorded, which suggests successful mitigation for that pond. Dormice survey results from 2016 suggest populations have decreased however continual monitoring is required before conclusions can be made. No barn owl casualties were recorded during the surveys or data search and no further action is required.

Much of the area requires a National Vegetation Classification (NVC) survey to ascertain if the desired communities and biodiversity value has been maintained.

I6: Ensure that the BHLR is complementary to the future implementation of the proposed Combe Valley Countryside Park

This indicator assesses visitor numbers to the Combe Valley Countryside Park (formerly Pebsham Countryside Park) in order to determine the effect of the BHLR on pedestrian, equestrian and cyclist usage of the park. The Combe Valley Countryside Park covers approximately 2.3 square miles of countryside between Bexhill and Hastings. Although most of the land is privately owned and farmed, there are numerous footpaths, Public Rights of Way and bridleways for walkers, cyclists and horse-riders to use, allowing access to the countryside. The park contains the Combe Haven SSSI, and the Filsham Reedbed Local Nature Reserve (LNR) which is managed by the Sussex Wildlife Trust.
The non-motorised users (NMU) 2017 survey results compared to 2006 surveys suggest that the implementation of the BHLR has had a positive effect on visitor numbers to the Combe Valley Countryside Park through the provision of improved access and increase in the quantity and quality of NMU facilities.

**I7: To preserve and where possible enhance ecological value of marginal aquatic habitat for waterbodies that are affected by the Scheme (i.e. those that are bridged or culverted)**

The BHLR scheme crosses a total of five watercourses between Bexhill and Hastings. These are:

1. Egerton Stream – uses part of the disused railway corridor in Bexhill as a flood storage area. This is to be culverted.
2. Combe Haven – a statutory watercourse – to be crossed by a free span structure.
3. Watermill Stream – a classified watercourse – to be crossed by a free span structure.
4. Powdermill Stream – a classified watercourse – to be crossed by a free span structure.
5. Decoy Pond Stream – a classified watercourse – to be crossed by a free span structure.

The post-construction water quality samples taken during 2017 indicate that the water quality of the surrounding waterbodies has not been adversely affected by the construction of the scheme, given that both copper and zinc concentrations are below the corresponding Environmental Quality Standards (EQS) values identified. Overall, the quality of the waterbodies in question appears to have improved over the ten-year period since the baseline water quality samples were obtained.

There is potential for some of the copper concentrations in sampling locations with softer water (>50mg/l CaCO3) to be above the relevant EQS of 1μg/l, but this is unlikely given the general trends in copper concentrations. However, further analyses of results using methods with lower detection limits would be required to confirm this.

The results from the 2017 samples (and generally the findings from this report) are consistent with the ecological assessment of the Powdermill Stream, Watermill Stream and Combe Haven waterbodies as part of the Water Framework Directive (WFD); for which copper and zinc concentrations have reported to be at ‘high’ status during the most recent assessments conducted.

Overall, the results suggest that the Scheme’s current mitigations to reduce the impact of routine run off are sufficient. Therefore, no further action is required or recommended.

**Safety**

**I8: Reduction in the number of accidents on the local road network giving associated economic benefits**

The accident numbers on local roads within Bexhill and Hastings have been declining both before and after the opening of the BHLR. The total number of accidents on local roads between 2009 and 2012 was 1,306, giving an average yearly figure of 435 accidents. However, accident numbers in 2012 alone were only 310. The assessment work undertaken for BHLR predicted a saving of 4.68 in accident numbers in the first year after opening across the local road network compared to the average of the 2009-2012 data. The post scheme opening data shows that there was an observed saving of 144 accidents compared to the three-year period average, or a saving of 19 accidents when compared to the 2012 data alone.
Data collected in a single year after scheme opening provides an initial indication of the impact of the scheme. Data will continue to be collected and analysed again five years after scheme opening to give a more robust assessment of the impact of the scheme.

I9: Reduction in the accident rate on the A259 between the junction with London Road/the BHLR at Belle Hill, Bexhill and the junction with the Ridge in Hastings

As with the data for East Sussex as a whole, there has been a reduction in accidents along both subsets of the A259 between the three-year average prior to BHLR opening and the year after opening. There has been a slight increase in accidents between the specific years of 2012 and 2016.

The assessment work undertaken for BHLR predicted a saving of 8.1 in accident numbers in the first year after opening along the A259 between Belle Hill and the Ridge compared to the 2009-2012 data. The data collected for this report shows that there was an observed saving of 12 accidents.

The assessment work undertaken for BHLR predicted a saving of 6.9 in accident numbers in the first year after opening along the A259 between Waller’s Haven and Butcher’s Lane compared to the 2009-2012 data. The data collected for this report shows that there was an observed saving of 15 accidents.

Data collected in a single year after scheme opening provides an initial indication of the impact of the scheme. Data will continue to be collected and analysed again five years after scheme opening to give a more robust assessment of the impact of the scheme.

Economics

I10: To enable the strategic housing and commercial developments proposed in north east Bexhill to be realised

At this very early stage in the 25-year benefits plan, many of the ambitions for housing and commercial development are yet to be realised. However, as anticipated, progress can be seen in several of the sites, with some developments completed and others showing works have begun and are in progress.

The development of the West of scheme site (referred to as site BX3 in the planning documentation) was identified in the 2006 Rother Local Plan and allocated for major business development, together with housing and open space. Although development of this site is yet to come forward, plans have progressed as the land for this BX3 site has all now been acquired in anticipation of development.

In the development land East of the scheme (referred to as site BX2 in the planning documentation), there has been significant progress in the first year and plans for continued development are in place. On part of BX2, construction has begun in the Bexhill Enterprise Park, also known as Bexhill Innovation Park, and some sites have already been completed and opened. The first property to be completed at Bexhill Enterprise Park was Glovers House, a high-quality, 25,235 sq ft set of offices with three floors. Construction began in November 2014 and the site was fully let on completion in December 2015 to Park Holidays UK. Rother District Council (RDC) has also granted planning permission for two 3-storey office buildings with associated plant, pedestrian and vehicle circulation at Bexhill Enterprise Park.

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1 Rother District Council (2006) ‘Rother District Local Plan’
2 Rother District Council (2017) ‘Application RR/2017/963/P’
I11: Contribute to regeneration by increased employment opportunities

The BHLR aims to contribute toward long-term planning, regeneration and economic development policy and help more residents into work, lowering the unemployment rate.

A survey was carried out with the business (Park Holidays UK) currently located on the newly developed land and found the following information:

- In its former site, Park Holidays UK employed approximately 60 staff. Since the relocation to the current site, this has increased to 110.
- The relocation has also seen significant modal shifts in travel to work patterns. Previously, the remote location of the former offices necessitated car use, but access to public transport and a more accessible location at the current site has encouraged several employees to change to using more sustainable transport methods.
- While the primary justification for Park Holidays UK’s relocation to Glovers House off the BHLR was to enable the expansion of the business in employing more people, the access provided by the BHLR was considered a significant benefit by the consultee.
- As approximately 90% of the employees of Park Holidays UK are residents of East Sussex, the economic benefits of the growth in employment at this business enabled in part by the BHLR have largely been retained within East Sussex.

The BHLR has enabled land to be developed that has so far supported a local business to expand and employ more people, without the need to move out of East Sussex.

I12: Percentage of construction supply chain expenditure spent within businesses in the South East

To date, the BHLR has incurred supply chain costs associated with its construction of approximately £12.8m in labour and £79.1m in suppliers. This has been spent on goods and services across the UK (and some internationally), with 15% of labour expenditure and 50% of supplier expenditure in the South East of England. Together, 45% of all expenditure on labour and suppliers has been spent in the South East of England. Approximately 3% of the total labour expenditure and 8% of expenditure on suppliers were concentrated locally in East Sussex. This data shows that the scheme is on track with a significant share of construction supply chain expenditure being spent locally in the South East.

Accessibility

I13: To reduce journey times for all road users

A comparison has been undertaken between the journey times from Bexhill to Hastings before the implementation of the scheme (May 2011) and one year after the scheme’s opening. The route compared runs from the A259/Combe Valley Way junction in Bexhill along the A259 to the A259/Harley Shute Road in Hastings and is the same but in reverse for the opposite direction.

The comparison shows a decrease in journey times with the inclusion of the scheme in all time periods and both directions, and the journey time savings of up to nearly two minutes are significant considering the short route length.

I14: To reduce community severance in the A259 corridor and in local villages used as ‘rat runs’ to avoid the A259

On the A271, there is an increase in traffic from 2012 to 2015. This is to be expected given background traffic growth and given the fact that this is before the implementation of the
scheme. There is a significant decrease in traffic between the 2015 and 2016 data, showing that the scheme has attracted more people to use the main route rather than rat running. There is a further decrease in the 1 year after 2017 data.

The data for Crowhurst Road shows more fluctuations with traffic flows reducing between 2012 and 2015, rising during 2016 and reducing again in 2017.

**I16: To improve reliability of bus services on the local road network**

Specific surveys of bus service reliability have not been undertaken. The Hastings Quality Bus Partnership used to set targets for Bexhill-Hastings journey times and record whether they met those targets, but we have been unable to source any survey data collected by the QBP.

However, route 99 travels along a very similar path to the journey time reported for Indicator 13, therefore the reductions in journey time would have positive impacts on the reliability of the bus service too.

**Integration**

**I15: To improve conditions for pedestrians, cyclists and equestrians on the local road network in general and to facilitate creation of dedicated cycle ways between the two towns**

The number of vehicles travelling on the A259 between Bexhill and Hastings on a weekday between 0700 and 1900 has reduced by over 20% since the opening of the scheme. Traffic counts at Glyne Gap roundabout show a similar number of cyclists before and after scheme opening, forming a similar proportion of the total observed traffic. There has been a slight reduction in cyclists on the parallel off-road cycle route after the scheme has opened.

As part of the scheme, a Greenway has been provided alongside Combe Valley Way providing access for walkers, cyclists and horse riders between Bexhill and Hastings. It links up with public bridleways and footpaths in the area, including the 1066 Country Walk Bexhill Link.

A new walking and cycling route linking the Greenway into Hastings is being progressed. Discussion with local cycle groups and Hastings Borough Council has taken place and key stakeholders will be consulted further during the design development process. Detailed design will progress during late 2018/19 with implementation scheduled for early 2019.

**Process Evaluation**

The Process Evaluation seeks to understand what has been delivered and how efficient the delivery process has been. The findings of the Process Evaluation contribute to the broader objectives of evaluation and will support the theory of change approach adopted for the evaluation.

Findings from the consultation programme suggest that the scheme design had a significant environmental and landscaping focus, and was perhaps being over-designed in some areas. Value engineering as part of the funding review is suggested to have led to East Sussex County Council (ESCC) needing to take on greater risk and re-design to avoid cost and time delays.

Inflation costs of around £7 million were assessed to have been incurred post 2009. Lessons learned regarding the planning process and cost implications of using Regulation 3 have also been identified by stakeholders. There was disagreement among stakeholders as to the extent to which protestor action hindered delivery of the scheme. Some identified considerable pre-
start costs to respond to protestor action while others stressed that ultimately, they felt there was no long-term impact on delivery of the BHLR from protestor action.

The Process Evaluation developed a nuanced and detailed picture of the design and delivery of the BHLR. The Process Evaluation drew from key sources including stakeholder consultations, progress reports, previous independent performance reviews and scheme narrative summaries.

Based on the evidence reviewed and the stakeholder consultations undertaken, the following key conclusions can be drawn:

● Delays in scheme funding and CPO approval led to negative impacts on the BHLR programme delivery and costs including inflation related costs.
● The BHLR was well managed on the whole but was affected by a number of external factors such as: protestor action, archaeology, ecology, heavy rainfall and construction sector skills shortages. The extent to which each of these factors affected scheme delivery cannot be determined within the scope of this evaluation.
● There are examples of best practice within the scheme including a well-managed stakeholder engagement programme and excellent health & safety and site management.

Confidence in scheme benefits realisation is high which has been achieved through close partnership working.

**Wider economic benefits**

By examining key economic data for the area before and after the opening of the scheme, the following was established:

● Hastings has a higher proportion of its residents claiming Job Seekers Allowance (JSA) benefits than the national average, and Rother has the lowest rate of all comparator areas. Both districts saw the claimant rates continue to fall after the BHLR opened.
● Hastings has consistently seen much lower house prices than the national average, and Rother has the highest rate of all comparator areas. Both districts are seeing an upward trend in prices that continued to rise both throughout the construction period and after the BHLR opened to traffic.
● Hastings saw an increase in National Vocational Qualifications (NVQ) 1, 3 and 4 qualifications. This is in line with the other comparator areas, but at a smaller rate of increase. Rother saw a similar pattern of increase across the NVQ qualifications, with levels 3 and 4 increasing at a faster rate than the national average.

While these changes cannot be attributed to the opening of the BHLR, the scheme is likely to support economic growth across East Sussex, as discussed below.

**Construction impacts**

During construction, a total of approximately 39 permanent jobs were supported through the labour and supplier expenditure in construction of the BHLR in the South East. For the rest of the UK, this number rises significantly to 110 permanent jobs (it is important to remember, however, that this is for the purposes of comparison - there will be many more jobs than this, but lasting for only a short time during the construction period). These jobs translate into supporting approximately £2.0m GVA in the South East economy, with £0.3m concentrated locally in East Sussex.
Operational impacts

At this stage, many of the ambitions for housing and commercial development are yet to be realised. Upon completion, the development sites associated with the BHLR are anticipated to create the largest concentration of employment space anywhere in the area with the capacity to support 3,000 jobs. However, progress has been made at several sites, with some developments completed and others showing works have begun and continue to progress. There have been key economic benefits from the construction and operation of the road. These include Bexhill Enterprise Park, which has seen sites completed and opened within the first year of the road being in operation. The first property to be completed at Bexhill Enterprise Park was Gowers House, which was let on completion in December 2015 to Park Holidays UK. Park Holidays UK employs 110 staff at the site and expects to add 10 new positions in 2017. The company’s head-quarters are now located at Gowers House where it has room for future expansion.

Conclusion

The OYA report has established that many of the indicators used to demonstrate the effects of the BHLR scheme are as predicted or better than predicted (including I6, I7, I8, I9, I11 and I13). This shows that the BHLR scheme is meeting its objectives in these areas. Some indicators (such as I4 and I10) are more long-term and it was not expected that they would reach their full potential in the first year. A few indicators (such as I15) have not reached their forecasted level, but at this stage it is difficult to establish whether this is a long-term result or a temporary issue.

Further assessment to track the progress of all indicators is necessary to establish how the scheme meets and maintains the targets set in the Baseline report.

The Process Evaluation examined the details of what has been delivered and how efficient the delivery process has been. Consultations with stakeholders suggested that, generally, on site communications across the teams was strong and that the scheme design had a significant environmental and landscaping focus, and was perhaps being over-designed in some areas. The evaluation found that the BHLR includes good examples of management of external factors such as protestors or archaeology and ecology over the lifetime of scheme delivery. Delays in scheme funding and CPO approval led to negative impacts on the BHLR programme delivery and costs including inflation related costs.

At this early stage in the 25 year benefits plan, many of the ambitions for housing and commercial development are yet to be realised. Upon completion, the development sites associated with the BHLR are anticipated to create a large concentration of employment space, with the capacity to support 3,000 jobs. The findings of the economic indicators demonstrate that there have already been some key economic benefits from the construction and operation of the road (such as 39 permanent jobs created in the South East, and one development site brought forward thereby allowing a local firm to grow).
1 Introduction

1.1 Purpose of this report

The Bexhill to Hastings Link Road (BHLR) One Year After (OYA) Report is the second formal report of the Monitoring and Evaluation Plan (M&EP) for this scheme.

The schedule for this M&EP was agreed with the Department for Transport (DfT) and East Sussex County Council (ESCC) prior to its publication in December 2013. The schedule was subsequently revised by agreement. The requirement for BHLR to be subject to a fuller evaluation was made by DfT and the M&EP has been structured to reflect this requirement.

In 2014, the first formal report, the BHLR Baseline report was published. This OYA report will be followed by a subsequent Five Years After Report and a Fifteen Years After Report scheduled to be published in 2021 and 2031 respectively.

The purpose of this OYA Report is to build upon the BHLR Baseline Report by analysing and reporting the outcomes and impacts of the BHLR on its surrounding area one year after it opened.

1.2 Overview of this report

Post-construction evaluations are carried out for all major road transport schemes, especially those which require a ‘fuller evaluation’ to take place. The aim of undertaking a fuller evaluation is to generate evidence on the efficiency of the delivery, the causal effect of the scheme and whether it had any unintended adverse or positive effects. Triangulating this data with other bespoke evaluation data collected will demonstrate the causal pathway between the scheme and the observed outcomes and impacts.

Throughout this OYA Report the BHLR is assessed and evaluated in terms of its impact on the Bexhill and Hastings areas, including the wider economic affects concerning the regeneration and development of this underperforming area of the South East. Following this introduction to the BHLR OYA Report the remainder of the evaluation is divided into the following sections:

- Section 3: The scheme
- Section 4: Logic Maps
- Section 5: Environment
- Section 6: Safety
- Section 7: Economic indicators
- Section 8: Accessibility
- Section 9: Integration
- Section 10: Wider economic impacts
- Section 11: Process evaluation
- Section 12: Conclusions and evaluation summary table
2 The scheme

2.1 Background to the scheme

The need to regenerate the economy of the Bexhill and Hastings area has been recognised for over forty years. The need for regeneration is reinforced through the UK Government’s Indices of Multiple Deprivation which rank Hastings as one of the most deprived areas in England and the most deprived community in the South East region.

Lack of effective transport infrastructure, particularly the poor connectivity between Bexhill and Hastings and with other parts of the South East, alongside high and consistent levels of traffic congestion are recognised as major factors in the structural economic problems facing the area. Consequently, proposals to address these problems have been central to regeneration plans for the area.

The BHLR is considered by ESCC to be an essential element of the infrastructure required to sustain economic growth in Bexhill and Hastings as well as the surrounding areas. The BHLR consists of a single carriageway road stretching 5.6km from north east Bexhill to the western approaches of Hastings, between the A259 in Bexhill and the B2092 Queensway in Hastings.

The road links the outskirts of Bexhill and Hastings, providing access to areas that have been identified for regeneration in north east Bexhill, in addition to easing congestion and improving air quality on the A259. The scheme was opened on 17th December 2015 and although the road has since been named Combe Valley Way this report will refer to the scheme as the BHLR, as this was the scheme title throughout the design and delivery of the link road.

2.2 History

The South Coast Corridor Multi-Modal Study (SoCoMMS) could be seen as the beginning of the scheme’s timeline. SoCoMMSs was commissioned by Government in 2001 to develop a 30-year transportation strategy for the coastal corridor between Southampton and Ramsgate. The decision to advance with the scheme was agreed by ESCC in September 2003. Following preparation of the business case document, DfT confirmed to ESCC in December 2004 that the BHLR had been provisionally accepted into its programme and that DfT would part fund the road.4

The planning application for the BHLR was submitted in April 2007 and was approved by ESCC in December 2008. The Secretary of State decided not to call the application in and, subject to various conditions, planning permission for the road was granted in July 2009.5

The programme entry Major Scheme Business Case (MSBC) was submitted in May 2009 and programme entry was awarded by letter from the DfT in October 2009.6

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Following the Government’s Comprehensive Spending Review in October 2010, the scheme was placed in the DfT’s Development Pool. The BHLR was in one group of an initial 22 schemes (subsequently increased to 45 schemes) across the country competing against each other for a share of the available major transport scheme funding.\(^7\)

Through the summer of 2011 the DfT advised the pooled schemes on how the Best and Final Funding Bid (BAFB) process would operate as a final submission for funding. Following discussions within the local authority in June 2011 the ESCC Cabinet approved the submission of a bid for DfT funding for the BHLR within the range of £55-60 million. The BAFB for funding was submitted on 9 September 2011. In December 2011 DfT made announcements on all but a small number of Development Pool schemes, one of those being the BHLR. However, DfT advised that further work on the scheme be carried out over the following three months with Ministers expected to make a decision shortly thereafter. This work included wider economic assessments of the benefits of the road beyond those recorded by WebTAG.

Following public hearing meetings in the winter of 2012 between DfT and a local reference group, the Government’s Budget Announcement stated the DfT would approve a maximum funding contribution of £56 million towards the BHLR. This was followed by a letter from DfT to ESCC in March 2012 confirming funding approval and re-confirming programme entry.\(^9\)

Delays in receiving funding approval threatened the planned construction programme, so the ESCC Cabinet took the decision in April 2012 to proceed with preparatory works in advance of final funding approval. Advance ecological and archaeological work started on site in summer 2012.\(^10\)

**Figure 1: BHLR under construction, September 2013**

![BHLR under construction, September 2013](Source: Mott MacDonald)

In 2015 the road was officially opened to road traffic.\(^11\) A summary of the key dates of the development of the BHLR scheme are given in the table below:

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Table 2: Key dates in the history of BHLR

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Planning Application for BHLR submitted</td>
</tr>
<tr>
<td>2008</td>
<td>Planning Application approved by ESCC</td>
</tr>
<tr>
<td>2009</td>
<td>Major Scheme Business Case submitted</td>
</tr>
<tr>
<td>2009</td>
<td>Public Inquiry</td>
</tr>
<tr>
<td>2010</td>
<td>Comprehensive Spending Review, BHLR entered competitive development pool with 45 other schemes</td>
</tr>
<tr>
<td>2013</td>
<td>Funding approved by DfT</td>
</tr>
<tr>
<td>2013</td>
<td>Monitoring and Evaluation Plan published</td>
</tr>
<tr>
<td>2014</td>
<td>Baseline Report published</td>
</tr>
<tr>
<td>2015</td>
<td>BHLR opened</td>
</tr>
<tr>
<td>2016</td>
<td>Process Evaluation published</td>
</tr>
<tr>
<td>2016</td>
<td>One Year After Report started</td>
</tr>
<tr>
<td>2018</td>
<td>One Year After Report published</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald: Bexhill to Hastings Link Road Process Evaluation

2.3 Scheme description

The BHLR connects the local authorities of Rother and Hastings in the county of East Sussex. Both areas are comparable in terms of population size as the 2011 Census recorded the usual resident population of Rother as 90,588 while the population of Hastings was 90,258.

Figure 2: Location of the BHLR in relation to the U.K.

Source: Mott MacDonald
The coastal towns of Bexhill and Hastings are the largest urban centres in this area located approximately 100km south of London and 26km east of Eastbourne. These towns are well-known tourist destinations due to their close proximity to the coast as well as their historical significance.

The BHLR is a single carriageway road stretching 5.6km from north east Bexhill to the western approaches of Hastings, between the A259 in Bexhill and the B2092 Queensway in Hastings. The road links the outskirts of Bexhill and Hastings, providing access to areas that have been identified for regeneration in north east Bexhill, in addition to easing congestion and improving air quality on the A259.

Figure 3: Route of BHLR and surrounding area

The first 1.5km section of the road follows the route of the abandoned Crowhurst, Sidley & Bexhill Branch Railway passing through the built up area of Bexhill. This section of road is a single two lane urban carriageway standard.

The remaining length of the road continues through open countryside passing around the northern side of the Combe Haven Site of SSSI and the southern edge of the Marline Valley Woods SSSI. This section is designed to a wide single two lane rural carriageway standard. A climbing lane is provided towards the eastern end of the new road from where it crosses the Hastings to London railway line to join the B2092 Queensway just north of its existing junction with Crowhurst Road.
2.4 Scheme objectives

The BHLR scheme objectives were laid out in the 2007 Environmental Statement and reiterated in the 2013 BHLR M&EP. These agreed scheme objectives included:\(^\text{12}\):

- Reducing the emission of particulates (PM\textsubscript{10}) along the A259 Bexhill Road, with the aim of reducing concentrations to within the UK air quality objectives and removing the need for the currently designated Air Quality Management Area (AQMA).
- Minimising the impact of the BHLR on the environmentally sensitive area in the Combe Valley and ensuring that the number of persons adversely affected by the BHLR is kept as low as possible.
- Ensuring that the BHLR is complementary to the future implementation of the proposed Pebsham Countryside Park, later to be called the Combe Valley Countryside Park.
- Reducing the number of accidents on the local road network in general and on the A259 in particular.
- Contributing towards regional and sub-regional policies for the regeneration of Hastings and Bexhill by improving overall accessibility to employment, increasing employment opportunities, education, health and other opportunities within the local area and thereby contributing to improvements in social inclusion.
- Enabling the strategic housing and commercial developments proposed in North East Bexhill which are dependent on construction of the BHLR for planning approval to be realised.
- Reducing journey times for all road users and improving the reliability of bus services on the local road network.
- Maximising and preserving the benefit from reductions in traffic volume and congestion on the A259 corridor between Bexhill and Hastings for buses by introducing bus priority measures.
- Reducing community severance in the A259 corridor and in local villages used as ‘rat runs’ to avoid the A259.
- Improving conditions for pedestrians, cyclists and equestrians on the local road network in general and facilitating the creation of dedicated cycle ways between the two towns.
- Ensuring that the BHLR is complementary to future transportation development in the area.

2.5 Monitoring and evaluation plan

Having approved the construction of the BHLR, the DfT chose to provide a grant of £56.85 million towards the overall cost of the scheme. This required that a M&EP be drafted and subsequently implemented. The M&EP was structured to follow DfT guidance although ESCC increased the evaluation period of BHLR from five years after opening to fifteen years. The findings and conclusions of the M&EP will be reported through four separate reports:

- A Baseline report.
- One Year After report (this report)
- Five Years After report.
- Fifteen Years After report.

A Theory of Change Evaluation Approach was adopted with five logic maps produced to analyse the causal effects of the BHLR project. Nineteen separate indicators have been designed to establish a broad yet in-depth understanding of the outcomes and impacts from the

BHLR project. These indicators are divided into environmental, economic, congestion and process evaluation. When combined they give a full picture of the impacts of the BHLR.

2.6 Contract arrangement

The BHLR is a major project overseen by ESCC’s Economy, Transport and Environment (ETE) Department. Mott MacDonald is the Council’s employer’s agent.

Hochtief-Vinci is a joint venture of the two separate companies that won the contract under Early Contractor Involvement for the design and construction of the scheme. Jacobs is a sub-contractor of Hochtief-Vinci for design and site support. ESCC entered into a contract with Hochtief-Vinci based on NEC3 option C on 5 June 2009.

2.7 Governance

The ESCC Project Board is accountable for the success of the project. It supports and assists the Project Sponsor to collectively monitor and control the project’s overall progress, act as a quality assurance mechanism for its deliverables, and an escalation (and resolution) route for any risks and issues. The members of the Project Board have appropriate authority to make decisions and are able to authorise the use of resources to resolve matters escalated to them.

The scheme’s Project Sponsor has delegated powers to ‘sign off’ on behalf of the Project Board for all financial and project approvals. The Project Manager has responsibility for day-to-day control of the project and has the authority to make decisions in line with policies agreed by the Project Board and for spending within approved budgets.

Where unforeseen issues or costs arise, the Project Manager discusses it in the first instance with the Project Sponsor, who will either approve appropriate action or refer to the Project Board for views and/or approval. Project Board approval can be given at a regular, scheduled meeting; at a specially convened meeting; or by email. Decisions requiring authorisation by ESCC are referred to the Cabinet or Lead Member for ETE as appropriate.

Additional scrutiny is provided at meetings between representatives from the Project Board and the ESCC Director of Corporate Resources.

2.8 Evaluation approach

The purpose of evaluation is to understand causal links between an intervention and wider change in an area including changes to socio-economic characteristics and human travel behaviour. This makes Theory of Change methods ideal as the causal link between interventions and observed change can be assessed.

Evaluation of the BHLR will therefore follow a Theory of Change approach recognising causal links for change and reflecting the timescale for delivering the identified range of outputs and outcomes. The evaluation will largely be based on data that is already collated by various parties though qualitative material from key stakeholders will be collected specifically for the evaluation.

2.9 Policy context

The construction of the BHLR is seen as a major part of the solution to the lack of effective transport infrastructure within the Bexhill and Hastings area which also negatively impacts the connectivity with the wider South East region. As well as improving the connectivity of these two areas it is anticipated that the existence of the BHLR would also alleviate the following transport issues:
• traffic congestion;
• poor bus reliability;
• high accident levels;
• community severance;
• poor provision for pedestrians and cyclists; and,
• poor air quality.

However, there is also an aspiration that the BHLR will have a much wider impact on the Bexhill and Hastings areas. These positive impacts could include improving the economic performance of one of the most deprived areas in the South East as well as bringing about improvements in the environmental impact of road transport in this part of the region.

Previous research into the potential impacts of the BHLR has led to the collation of a long list of expected outcomes that relate to economic regeneration, traffic congestion and associated air quality benefits as well as environmental enhancements for the Bexhill and Hastings areas. This list is summarised below:\textsuperscript{13}:

**Environmental enhancements**

• ‘Greenway’ to segregate cyclists, walkers and horse riders from motor traffic.
• New wildlife habitats will be provided under the supervision of ecologists.
• 19 hectares of woodland and extensive hedgerow planting will provide cover to hide the road and minimise views and sounds of traffic.
• All wood from felled trees will be recycled. Larger pieces will go to sawmills, the rest will be made into chippings for biomass fuel and the roots will be used as filter beds in ponds and reservoirs.

**Economic regeneration**

• Creating 2,900 jobs providing a substantial boost to the local labour market.
• Constructing 2,650 new homes.
• A new 50,000 m$^2$ business park at North East Bexhill.

**Reduced traffic congestion by reducing traffic along a series of key routes**

• A259 Glyne Gap between Bexhill and Hastings.
• Hastings seafront.
• Harley Shute Road.
• A2036 to the East of Bexhill.
• Rural roads to the North of Bexhill and Hastings.
• Crowhurst and Battle through routes.

Through these potential and expected outcomes, it is possible for ESCC to justify the construction of the BHLR as part of the solution to the wider economic problems in the Bexhill and Hastings area.

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\textsuperscript{13} East Sussex County Council, “Bexhill-Hastings Link Road: Baseline Report”, pg. 15-16.
2.10 Baseline report

The baseline report sets out the baseline conditions in Bexhill and Hastings prior to construction commencing on the BHLR. The baseline position is the comparison point for future monitoring and evaluation effort for the scheme.

A pre-construction baseline was chosen as, although impacts of construction will be sought to be minimised, a scheme of this size will affect the surrounding area which could provide a false baseline for future comparisons if data were taken immediately prior scheme opening.

The baseline report focuses on the outcome metric indicators developed for the M&EP. The outcome metrics address scheme impacts on the environmental, road safety, economic and congestion position prior to construction.
3 Logic maps

3.1 Introduction to logic mapping

A logic map can be constructed to reflect a programme's theory of how it is going to produce change within a specified target system. This is termed a Theory Approach Logic Model.

In essence, logic maps are a tool for charting the causal effects between inputs, outputs, outcomes and the relationship these have back to stated objectives, and the initial rationale for intervention.

Theory Approach Logic Models are often used in government organisations in the absence of a direct link between investment and financial benefit, they make a case for how the elements of the programme fit together to produce downstream outcomes and impacts.

Figure 4: Illustrative logic map for an evaluation process

Source: National Audit Office

3.2 Initial BHLR logic maps

For the BHLR, five logic maps were produced for the M&EP published in December 2013. These logic maps demonstrate how the BHLR was expected to impact upon various aspects of the wider economy and environment.

Following the BHLR’s completion there was a need to revisit these logic maps to consider whether changes to the maps were necessary. For example, with the benefit of hindsight, would there be additional outcomes to include which were not foreseen prior to the road’s construction.
3.2.1 The BHLR overview of overall scheme

Bexhill and Hastings both suffer from poor connectivity, between each other and also the wider South East region. The A259 is a key link between the two settlements but suffers from serious congestion that creates issues of pollution, noise, severances, accidents and journey time delay that combine to deter investment in the area.

Transport infrastructure and connectivity were identified as factors in poor economic performance in these towns. Thus, the BHLR was seen as not only improving connectivity, but also unlocking land for development and supporting economic regeneration.

Figure 5: BHLR Overview

![BHLR Overview Diagram]

Source: M&EP, Mott MacDonald, 2013

3.2.2 The BHLR and development sites

The BHLR unlocked land for employment and housing development to the North East of Bexhill. These sites have stimulated development activity and provided space for economic regeneration.
3.2.3 The BHLR and congestion

Along the A259 corridor and routes joining it, congestion was seen to be creating the following problems:

- Air pollution.
- Journey time reliability.
- Community severance.
- Accidents.
- Inhibiting investment in the area.

The BHLR sought to relieve pressure on the A259 by creating an alternative link between the two towns bringing efficiency savings for local businesses and improving trading links. The Greenway provides an additional shared use pedestrian/cycleway between Bexhill and Hastings, both increasing travel choice and potentially reducing car use.
3.2.4 The BHLR and the environment

Constructing the BHLR caused the loss of 38.6 ha of land categorised as ‘best and most versatile agricultural land’. Efforts have been made to minimise environmental damage and significant work has been undertaken to screen the road and reduce visual impact.

Further work on habitat creation and improvement as well as the Greenway are intended to improve the relationship between the BHLR and its environment. The BHLR also provides access to Combe Valley Countryside Park (CVCP).
3.2.5 The BHLR construction supply chain and the economy

The BHLR delivered supply chain opportunities through its construction period and also through the construction of the development sites, new employment premises and new dwelling units.
Figure 9: BHLR economy

Source: M&EP, Mott MacDonald, 2013
4 Environment

This chapter presents the indicators which relate to the environment surrounding the scheme, including air quality, noise level, integration into the wider landscape, water quality and biodiversity.

4.1 Key points

Key findings from this chapter are presented below.

- It is likely that the BHLR is a contributing factor to the reduction in NO2 and PM10 concentrations along the A259.
- The level of Greenhouse Gases attributed to BHLR was 430 tCO2 in 2017, lower than the 2011 prediction of 692 tCO2.
- The measured noise level to the south of the BHLR are lower than predicted, while to the north of the road the measured noise levels are in line with the prediction.
- The integration levels of the scheme within the wider landscape are as predicted during the original assessment and photomontage production in 2009.
- The water quality of the surrounding waterbodies has not been adversely affected by the construction of the scheme. The current mitigation to reduce the impacts of routine run off from the scheme on the receiving waterbodies is sufficient, and therefore no further action is required or recommended.

4.2 Introduction

This section documents the evaluation of the seven environmental indicators:

- Indicator 1: Emissions of particulates (PM10 and NO2) along the A259 Bexhill Road;
- Indicator 2: Change in carbon dioxide emissions attributable to the BHLR;
- Indicator 3: Level of adverse noise impacts of the BHLR within the Combe Valley;
- Indicator 4: Integration levels of the BHLR within the wider landscape;
- Indicator 5: Monitoring potential net biodiversity losses and achievement of compensation strategy for Nature Conservation;
- Indicator 6: Ensure that the BHLR is complementary to the future implementation of the proposed Combe Valley Countryside Park; and,
- Indicator 7: To preserve and where possible enhance ecological value of marginal aquatic habitat for waterbodies that are bridged or culverted by the scheme.

The evaluation has been undertaken in comparison to the 2007 Environmental Assessment (Environmental Statement (ES)) prepared in support of the planning application for the Bexhill to Hastings Link Road (BHLR) and submitted to East Sussex County Council (ESCC).

4.3 I1: Emissions of particulates (PM10 and NO2) along the A259 Bexhill Road

4.3.1 Introduction

This indicator assesses the effects of the BHLR on air quality through a comparison of monitored concentrations of Particulate Matter (PM10) and Nitrogen Dioxide (NO2). The key aim...
of the BHLR was to reduce PM$_{10}$ along the A259 Bexhill Road with the overall aim of removing the need for the currently designated Air Quality Management Area (AQMA) No.1 (Hastings AQMA). The Hastings AQMA was designated for exceedances to the PM$_{10}$ 24-hour mean objective and has since been revoked, as of April 2017.

4.3.1 Methodology

A review of the 2007 ES and supporting documents (including Addendum (2008) and Statement of Evidence (SoE; 2009)) has been undertaken to obtain the modelled results. A review of the 2016 Hastings Borough Council Air Quality Annual Status Report has been undertaken to obtain the monitoring results.

4.3.2 Baseline

4.3.2.1 Particulate matter (PM$_{10}$)

Particulate matter is a complex mixture of organic and inorganic substances present in the atmosphere. Sources are numerous and include power stations, other industrial processes, road transport, domestic coal burning and trans-boundary pollution. Secondary particulates, in the form of aerosols, attrition of natural materials and, in coastal areas, the constituents of sea spray, are significant contributors to the overall atmospheric loading of particulates. In urban areas, road traffic is generally the greatest source of fine particulate matter, although localised effects are also associated with construction and demolition activity.

4.3.2.2 Oxides of Nitrogen

Oxides of nitrogen is a term used to describe a mixture of nitrogen oxides NO and NO$_2$, referred to collectively as NOx. These are primarily formed from atmospheric and fuel nitrogen as a result of high temperature combustion. The main sources in the UK are road traffic and power generation.

4.3.2.3 ES and supporting documents review

The WebTAG and DMRB assessments presented in the ES predicted that there would be a reduction in NO$_2$ and PM$_{10}$ concentrations in the Do-Something (‘with the BHLR scheme’) scenarios, particularly along the A259 and within the Hastings AQMA. The predicted improvement in air quality was due to a reduction in traffic flows in this area as vehicles were predicted to re-route from the A259 onto the BHLR. The magnitude of impact within the Hastings AQMA was predicted to be moderate beneficial and has been demonstrated by the removal of the AQMA in April 2017.

Increases of pollutant concentrations were predicted in areas close to the BHLR, however no exceedances of the relevant air quality objectives were predicted at any location.

The SoE reached the same conclusions as the ES and was based on updated modelling.

4.3.2.4 Local authority monitoring

Hastings Borough Council undertake air quality monitoring throughout the borough using one automatic air quality monitor and 14 passive diffusion tube sites. Of these monitoring locations, the automatic monitor and one of the diffusion tubes are located at roadside locations, adjacent to the A259 within the Hastings AQMA. A further five diffusion tubes are located at roadside locations on the A259 but outside of the extents of the Hastings AQMA. An AQMA revocation report was submitted on behalf of Hastings Borough Council in 2017, which concluded that monitored NO$_2$ and PM$_{10}$ concentrations have been below the air quality objectives for over
three years. Key local activities, including the implementation of the BHLR have been sighted as contributing to an improvement in air quality in the area, resulting in the Hastings AQMA being revoked in April 2017\textsuperscript{14}. Monitoring results from these locations are presented in Table 3 and Table 4, the locations of the monitoring sites are shown in Figure 10 below.

Table 3: Hastings Borough Council PM\textsubscript{10} monitoring data 2013 - 2016

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Site ID</th>
<th>In AQMA?</th>
<th>National Grid Reference</th>
<th>Annual Mean PM\textsubscript{10} Concentration µg/m\textsuperscript{3}</th>
<th>Short Term PM\textsubscript{10} - days above 50 µg/m\textsuperscript{3}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hastings Bulverhythe</td>
<td>HT1</td>
<td>Yes</td>
<td>577633 108726</td>
<td>20.6 21.6 23.3 19.3 0 0 3 3</td>
<td></td>
</tr>
</tbody>
</table>

Source: Hastings Borough Council\textsuperscript{15} and Sussex Air\textsuperscript{16}

Note: The data capture was above 86% at this location

Table 4: Hastings Borough Council NO\textsubscript{2} monitoring data 2013 - 2016

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Site ID</th>
<th>In AQMA?</th>
<th>National Grid Reference</th>
<th>Annual Mean NO\textsubscript{2} Concentration µg/m\textsuperscript{3}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hastings Bulverhythe</td>
<td>HT1</td>
<td>Yes</td>
<td>577633 108726</td>
<td>28 22 18.8 18.4</td>
</tr>
<tr>
<td>Bexhill Road Boat</td>
<td>6</td>
<td>Yes</td>
<td>576770 108101</td>
<td>37.4 40.4 31.9 22.7</td>
</tr>
<tr>
<td>81 Bexhill Road</td>
<td>7</td>
<td>No</td>
<td>578500 108771</td>
<td>42.9 54.9 37.1 35.4</td>
</tr>
<tr>
<td>45 Bexhill Road</td>
<td>8</td>
<td>No</td>
<td>578637 108798</td>
<td>39.5 44.6 30.6 26.2</td>
</tr>
<tr>
<td>71 Bexhill Road</td>
<td>9</td>
<td>No</td>
<td>578532 108776</td>
<td>29.7 33.1 25.6 34.2</td>
</tr>
<tr>
<td>138 Bexhill Road</td>
<td>10</td>
<td>No</td>
<td>578290 108819</td>
<td>40.1 44.5 33.2 25.3</td>
</tr>
<tr>
<td>Railway Bridge Bexhill Road</td>
<td>11</td>
<td>No</td>
<td>578946 108746</td>
<td>29.3 32.2 25.9 18.7</td>
</tr>
</tbody>
</table>

Source: Hastings Borough Council\textsuperscript{17} and Sussex Air\textsuperscript{18}

Note: All years of data are bias adjusted. Bias adjustment factor of 0.94 used for the 2016 data. The data capture was above 92% at all locations.


\textsuperscript{15}Hastings Borough Council, 2016 Air Quality Annual Status Report (ASR), October 2016

\textsuperscript{16}Sussex Air. Available online at: www.sussex-air.net/, [accessed 2017]
4.3.3 Evaluation

4.3.3.1 Monitoring data analysis

The BHLR opened in December 2015 and therefore 2016 monitoring data is representative of pollutant concentrations with the BHLR in place.

As indicated in Table 3 and Figure 11: Monitored Annual Mean PM10 Concentrations on the A259 2013 - 2016 , monitored concentrations of annual mean PM10 reduced in 2016 compared to previous years.
Figure 11: Monitored Annual Mean PM$_{10}$ Concentrations on the A259 2013 - 2016

![A259 PM$_{10}$ Annual Mean Concentrations, 2013-2016](image)

Figure 12: Monitored Annual Mean NO$_2$ Concentrations on the A259 2013 - 2016 shows the trends of monitored annual mean NO$_2$ concentrations on the A259 from 2013 to 2016.

Figure 12: Monitored Annual Mean NO$_2$ Concentrations on the A259 2013 - 2016

![A259 NO$_2$ Annual Mean Concentrations, 2013-2016](image)

As indicated in Table 4: Hastings Borough Council NO$_2$ monitoring data 2013 - 2016 and highlighted further within Figure 12: Monitored Annual Mean NO$_2$ Concentrations on the A259 2013 - 2016, a general increase in concentrations is noted between 2013 and 2014, decreasing again in 2015. In 2016, some diffusion tubes continued to show a decrease in concentrations relative to previous years, while others increased in concentration relative to 2015. There is no obvious correlation between location that would explain this variation. A review of diffusion tube monitoring concentrations away from the A259 reflects this same...
variation. The peak in diffusion tube monitoring concentrations in 2014 may also be related to construction traffic during this time, and should not be considered to be a key indicator of pre-BHLR scheme levels.

Of the monitoring which does reflect a reduction in NO2 and PM10 concentrations in 2016, it is likely that the BHLR may be a contributing factor, however it cannot be quantified from review of the monitoring data alone.

4.3.3.2 Additional evidence

The AQMA revocation report submitted in 2017 discussed the impact of the BHLR on air quality within the Hastings AQMA. The report concluded that it was difficult to quantify the effects on PM10 and NO2 concentrations, however traffic counts were undertaken on Bexhill Road which indicated:

- A total reduction in Annual Average Daily Traffic (AADT) of 22% between 2015 and 2016 on the A259; and,
- A total reduction in HGV of 18% between 2015 and 2016 on the A259.

This reduction in vehicles should reduce the vehicle exhaust emissions of both PM10 and NO2 and the amount of resuspended dust due to vehicle movements within the AQMA, however further monitoring data is required to confirm this conclusion.

4.3.3.3 Discussion around the counterfactual

A review of the baseline, monitored and modelled data has been undertaken to discuss the likely state of PM10 and NO2 concentrations in the absence of the BHLR.

Based on the Hastings Borough Council monitoring data, it is considered unlikely that concentrations of PM10 or NO2 would have exceeded the relevant air quality objectives within the Hastings AQMA in the absence of the BHLR as monitored concentrations have been well below the objectives both before and after the BHLR was in place.

As indicated in Table 4: Hastings Borough Council NO2 monitoring data 2013 – 2016, it is considered possible that exceedances of the annual mean NO2 objective could have been monitored in the absence of the BHLR outside the AQMA at diffusion tubes 7 and 9. This is due to monitored results at these sites indicating concentrations close to the NO2 objective in recent years. Traffic movements are also predicted to be approximately 22% higher on the A259 without the BHLR, as discussed in Section 4.3.3.2.

A review of modelling data also predicted an overall reduction in NO2 and PM10 concentrations as a result of the BHLR, particularly along Bexhill Road, however some increases in concentrations were predicted at locations close to the BHLR. It is therefore likely that NO2 and PM10 concentrations would be higher along Bexhill Road and be higher overall in the absence of the BHLR.

4.3.4 Summary

A review of Hastings Borough Council monitored concentrations of PM10 and NO2 along the A259 has been undertaken to determine the effects of the BHLR on air quality.

It is likely that the BHLR is a contributing factor to the reduction in NO2 and PM10 concentrations, however to what extent cannot be quantified from review of the monitoring data alone. A reduction in AADT between 2015 and 2016 is noted however further analysis of future...
monitoring data will be required to fully remove the potential that meteorological impacts or other local factors are accountable for the lower concentrations monitored in 2015.

Additional data is required to confirm the impacts of the BHLR on air quality and this will be investigated further in the Five Year After Report. It is noted however that one of the key objectives of the BHLR has been achieved ahead of schedule with the Hastings AQMA revocation in April 2017 due to improved air quality within the surrounding area.

4.4 I2: Change in carbon dioxide emissions attributable to the BHLR

4.4.1 Introduction
This Section provides details of the greenhouse gas monitoring assessment of the BHLR. The monitoring and assessment was undertaken in line with the Monitoring and Evaluation Plan (2013) which aims for this indicator to “determine the carbon benefits/disbenefits of the scheme”. Details of the methods used and the results of the assessment can be found below.

4.4.2 Methodology
Traffic counts were undertaken on the A271, the A259, the Queensway, Crowhurst Road, and Catsfield Road during 2017. To determine the benefits/disbenefits of the BHLR (the scheme), this traffic count data, that represents a ‘Do-Something’ case with the scheme, needed to be compared to a ‘Do-Minimum’ scenario without the scheme. To do this the modelled ‘Do-Minimum’ scenario produced for the updated scheme business case in 2011 was compared to the observed traffic count data that represents the ‘Do-Something’ case. Additionally a comparison between the benefits/disbenefits of the scheme based on the ‘Do-Something’ and ‘Do-Minimum’ 2011 modelled data, and the benefits/disbenefits of the scheme based on the modelled ‘Do-Minimum’ scenario and the traffic count ‘do-something’ scenario.

To achieve this, the modelled data was cut down to only cover the same roads as the traffic counts, to ensure a like for like comparison. The AADT data was used for the assessment as it covered a full 24hr period. However, off peak data was not available, and speed and percentage Heavy Duty Vehicles (%HDV) data was not available on an AADT basis. As such, speed and %HDV data from the inter-peak period was used with the AADT flows. AM Peak, PM Peak and average data available from the Department for Transport (DfT) was used as a sensitivity test. The traffic count data did not include speed data, and only had %HDV data for six out of the 18 roads where counts were undertaken. As such the inter-peak data from the modelled ‘Do-Something’ scenario was used. The modelled data was based on 2015 and 2028 data. A linear regression was therefore used to produce the data on a 2017 basis. A sensitivity test was also undertaken on the traffic count data in-line with the modelled data.

This provided a full set of raw traffic data that could be used in the comparison. Emissions were then calculated using version 1.8 of the WebTAG data tables. These were then aggregated to produce total emissions for the modelled ‘do-minimum’ Scenario, for the modelled ‘do-something’ scenario, and the observed ‘do-something’ scenario. The observed ‘do-something’ scenario was based on 2017 data, and the modelled data was based on 2015 and 2028 data. As such linear regression was used to put the modelled data on a 2017 basis. The ‘do-minimum’ results were then subtracted from the ‘do-something’ results to determine the benefits/disbenefits of the scheme.

4.4.3 Baseline
The baseline for this assessment is based on the modelled data for the 2011 business case. The baseline itself is the difference between the modelled ‘Do-something’ and modelled ‘Do-
minimum’ emissions. This is the change in carbon emissions in 2017 due to the scheme for the roads that have 2017 observed data. This data is presented in Table 5: Baseline data (2017) below:

Table 5: Baseline data (2017)
Source: Mott MacDonald

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Value</th>
<th>Units</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modelled ‘Do-minimum’</td>
<td>9,015</td>
<td>tCO₂</td>
<td>+/-15%</td>
</tr>
<tr>
<td>Observed ‘Do-Something’</td>
<td>9,707</td>
<td>tCO₂</td>
<td>+/-15%</td>
</tr>
<tr>
<td>Observed ‘Do-Something’ minus Modelled ‘Do-minimum’</td>
<td>692</td>
<td>tCO₂</td>
<td>+/-15%</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

4.4.4 Evaluation

The results of the assessment, and the uncertainty based on the sensitivity analysis are presented in Table 6: Result (2017) below:

Table 6: Result (2017)
Source: Mott MacDonald

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Value</th>
<th>Units</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modelled ‘Do-minimum’</td>
<td>9,015</td>
<td>tCO₂</td>
<td>+/-15%</td>
</tr>
<tr>
<td>Observed ‘Do-Something’</td>
<td>9,445</td>
<td>tCO₂</td>
<td>+/-15%</td>
</tr>
<tr>
<td>Observed ‘Do-Something’ minus Modelled ‘Do-minimum’</td>
<td>430</td>
<td>tCO₂</td>
<td>+/-15%</td>
</tr>
</tbody>
</table>

The assessment shows that the project has resulted in a disbenefit of approximately 430 tCO₂ in terms of GHGs. This is 262 tCO₂ less than predicted by the baseline. This is due to fewer vehicle kms travelled by HDV in the observed data, than in the Modelled ‘Do-Something’ scenario.

4.4.4.1 Discussion around the counterfactual

The results show that without the scheme, emissions of GHGs would have been 430 tCO₂ lower. The scope of the assessment was limited to where traffic counts were undertaken (see 5.4.2). In terms of road length, the scheme represented 12% of the assessment. However, the increase in emissions due to the scheme was estimated to be 5%. It is therefore likely that some of the additional emissions due to the scheme were due to additional journeys, whilst some from journeys that would have taken place on other roads included in the assessment, instead took place using the scheme. It is also likely that if the scope of the assessment was broader, more journeys that used other roads in the Do-Minimum Scenario, would use the scheme in the Do-Something Scenario. This would have led to a smaller increase in emissions due to the Scheme than reported.

The assessment therefore shows that the scheme has resulted in slightly more emissions than without the scheme, although fewer emissions than predicted in the 2011 modelling. However, it is likely that this increase reported would have been less if the scope of the assessment was broader.
4.4.5 Summary
The results of the assessment show that the scheme resulted in a disbenefit in terms of GHGs due to an increase in emissions of 430 tCO$_2$. This is compared to a disbenefit of 692 tCO$_2$ predicted by the modelling in 2011.

4.5 I3: Level of adverse noise impacts of the BHLR within the Combe Valley

4.5.1 Introduction
This indicator assesses the level of adverse noise impacts of the BHLR within the Combe Valley through a comparison of:

- Measured baseline noise levels obtained for the BHLR ES;
- Opening year noise levels that were predicted and presented within the ES; and,
- Measured one year after post-scheme implementation noise levels.

Figure 13 shows the area of the section of the route that skirts the Combe Valley with the measurement positions used for the 1-year post-construction noise measurement survey. Where it was not possible to undertake the measurement at the same position used for the 2007 ES, representative alternative positions have been selected for 1-year post-construction noise measurements. Details of each measurement position are shown in Figures A3.1 to Figure A3.5 in Appendix A.

Figure 13: Map indicating 1-year post-construction noise measurement positions

A supplementary measurement position was included at Byne’s Farm close to LT5. This was in response to a resident’s concern regarding shielding of LT5. The additional measurement position is shown in Figure A5.4 indicated LT5BF.
4.5.2 Methodology

The noise measurements have been conducted using either:

- The measurement method described in Section III of the Calculation of Road Traffic Noise (CRTN) (DoT and Welsh Office, 1988); or,
- The shortened measurement procedure described in CRTN.

This is consistent with the baseline survey previously conducted and reported in the 2007 ES.

The CRTN shortened measurement procedure allows the $L_{A10,18hr}$ level to be determined by measuring the $L_{A10,1hr}$ level over three consecutive hours between 10:00 and 17:00 on a single weekday. The $L_{A10,18hr}$ value is then obtained by taking the arithmetic average of the $L_{A10,1hr}$ values and subtracting 1dB.

Except where otherwise stated, all measurements were taken under free field conditions with a microphone fitted with a windshield suitable for outdoor use. The sound level meters were supported using a tripod with the microphone at a height of 1.5m above local ground level. Where the measurement was a façade measurement the microphone was 1m from the façade.

The weather conditions during the survey were dry with temperatures in the range of 6°C to 11°C. Wind speeds were measured at <5m/s. Road surfaces were dry throughout the measurement days. Cloud cover during the measurement periods ranged from <10% to overcast with frequent sunny spells. The conditions were considered suitable for noise measurements.

4.5.3 Baseline

Table 7 describes the measurement positions within the Combe Valley section of the route. The existence/availability of previous noise measurement data is also indicated. The following convention is used in applying position IDs:

- ST: Short-term measurement position;
- LT: Long-term measurement position; and,
- SML: Seasonal monitoring location.

In the case that it was not possible to undertake the survey at the same baseline noise measurement location of the 2007 ES, a suitable representative alternative was selected. Table 7 provides a summary of the measurement positions.

Table 7: ES noise measurement positions in the Combe Valley with previous surveys and 1-year post-construction noise monitoring

<table>
<thead>
<tr>
<th>Position ID (as per ES)</th>
<th>Address</th>
<th>May/June 2006</th>
<th>July 2010</th>
<th>October 2010</th>
<th>January 2011</th>
<th>March 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST23</td>
<td>Glovers Lane, Bexhill</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST24</td>
<td>Crowhurst Lane, Bexhill</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>ST25</td>
<td>Buckholt Cattery, Buckholt Lane, Bexhill</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>ST26</td>
<td>Buckholt Farm, Buckholt Lane, Bexhill</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>SML2</td>
<td>Acton Farm, Buckholt Lane, Bexhill</td>
<td>x</td>
<td></td>
<td></td>
<td>x - SML2a. Relocated circa 260m south/west and circa 65m west of Acton Farm.</td>
<td></td>
</tr>
<tr>
<td>LT5</td>
<td>Hillcroft Farm House, Crowhurst</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>
4.5.4 Evaluation

A summary of the baseline noise measurements, the predictions (both in the 2007 ES and in the 2009 CPO) and the 1-year post-construction noise measurements, is provided for each position in Table A3.1 to Table A3.11 in Appendix B.

The results of the unattended noise measurement at position LT5 are presented graphically in Figure 14 and Figure 15, and at LT28a in Figure 16.

The closest position to ST23 Glovers Lane for predicted noise with the 2007 ES is position no. 79. However, this was screened by the old farm house (Figure 14) that had been demolished at the time of the 2017 - 1-year post-construction noise monitoring. Therefore, it is considered that position no. 78 was a more representative location of the current status of the area and its predicted level has been used for comparison with the 2017 $L_{A10,1hr}$.

Due to inaccessibility at the time of the survey to the 2007 ES baseline position SML2, this was relocated to a suitable alternative and representative location, circa 260m south/west of SML2 and circa 65m west of Acton Farm (SML2a, Figure A3.2).

The 1-year post-construction noise monitoring data has been compared both with the 2007 ES predicted noise levels at positions no. 84 and no. 374. Position no. 84 (approximately 240 south/west to ST26), has been kept for continuity between the 2007 ES and the 2009 Compulsory Purchase Order (CPO) Public Inquiry SoE; while position no. 374, despite present only in the 2009 CPO, has been used as a more representative location (Figure A3.3).

In discussion with East Sussex County Council, due to the security of the noise monitoring equipment, the 2006 long-term measurement position LT6 has been converted to a short-term measurement position.

Due to safety reasons and pending land access permission at the time of the survey, the 2007 ES baseline position ST30 was relocated for the 2017 - 1-year post-construction noise monitoring to a suitable alternative and representative location, on a public footpath approximately 60m to the south/east of Hollyhocks Cottage (ST30a, Figure A3.5).

Figure 14 shows that at Position LT5 on one occasion during Thursday 16/03/2017 the value of the $L_{Aeq,1hr}$ exceeded the value of the $L_{A10,1hr}$. This is not a typical trend of road traffic noise and is an indication that, for example, the measurement interval has been affected by a loud noise event of a relatively short duration. However, this event occurred once with no repetition, therefore no data has been discarded and the $L_{A10,1hr}$ for all the three days of measurement.
have been compared with baseline and predicted noise level. The resident of Hillcroft Farm did not report any observed unusual noise events during the period of the noise survey.

Figure 14: Position LT5 results - plot of long-term unattended noise measurement data

Source: Mott MacDonald
Figure 15: LT5 results - plot of long-term unattended noise measurement data

Source: Mott MacDonald
Figure 16: LT28a results - plot of long-term unattended noise measurement data

Source: Mott MacDonald
The 2007 ES baseline position (ST28) was relocated for the 2017 – 1-year post-construction noise monitoring to a suitable alternative and representative location, in the front garden of The Briar (approximately 110m north/west of ST28). Additionally, this position was converted to a long-term measurement position (LT28a, Figure A3.5). Both within the 2007 ES and the 2009 CPO, predicted noise levels have been calculated for The Briar.

The plot shows that on one occasion on Wednesday 15/03/2017, Saturday 25/03/2017, on a couple of occasions on Tuesday 23/03/2017 and on multiple occasions on Thursday 16/03/2017, the value of the $L_{Aeq,1hr}$ exceeded the value of the $L_{A10,1hr}$. This is not a typical trend of road traffic noise and is an indication that, for example, the measurement interval has been affected by a loud noise event of relatively short duration. The resident of The Briar did not report any observed unusual noise events during the survey. The data of Wednesday 15/03/2017 are not considered valid for comparison with the baseline and the predicted noise level and have been discarded.

4.5.4.1 Discussion around the counterfactual

The 2007 ES presented the results of predictions of road traffic noise levels to compare impacts at key receptors under the Do Minimum and Do Something scenarios which was then anticipated to have an opening year of 2010 and design year of 2025. Revised predictions were produced in 2009 to inform the CPO Inquiry with an opening year of 2013 and design year of 2028. The latter provides the most recent, published comparison of noise levels, due to road traffic noise impacts alone, at key receptors and in noise contour format with and without the operation of the BHLR scheme.

The post-operational noise surveys undertaken in March 2017 were intended to inform a comparison of the predicted and measured Do Something road traffic noise impacts. It is not possible to conduct a similar study to provide a comparison of measured noise levels with predicted Do Minimum road traffic noise impacts.

However, the results of the post-operational noise surveys showed that for the majority of measurement positions there was reasonably close agreement between the measured and predicted road traffic noise levels (either 2007 ES or 2009 CPO) under the Do Something scenario (+ 3 dB). Therefore, reference to the comparison of predicted road traffic noise impacts prepared for the 2009 CPO Inquiry is expected to provide the most recent indication of differences between road traffic noise levels with and without the scheme in operation.

4.5.5 Summary

A summary of the comparisons is provided per each position in Table 8.

Table 8: Summary comparison of measured and predicted noise levels

<table>
<thead>
<tr>
<th>Survey ID</th>
<th>Predicted ID</th>
<th>2017 survey</th>
<th>2006 baseline*</th>
<th>Delta</th>
<th>2007 ES prediction</th>
<th>Delta</th>
<th>2009 CPO prediction</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-term measurements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST23</td>
<td>78</td>
<td>49.5</td>
<td>40</td>
<td>+9.5</td>
<td>56.3</td>
<td>-6.8</td>
<td>56.5</td>
<td>-7.0</td>
</tr>
<tr>
<td>ST24</td>
<td>76</td>
<td>49.9</td>
<td>48</td>
<td>+1.9</td>
<td>45.1</td>
<td>+4.8</td>
<td>44.8</td>
<td>+5.1</td>
</tr>
<tr>
<td>ST25</td>
<td>80</td>
<td>51.8</td>
<td>48</td>
<td>+3.8</td>
<td>56.7</td>
<td>-4.9</td>
<td>56.9</td>
<td>-5.1</td>
</tr>
<tr>
<td>SML2a</td>
<td>81</td>
<td>51.2</td>
<td>45</td>
<td>+6.2</td>
<td>53.1</td>
<td>-1.9</td>
<td>55.1</td>
<td>-3.9</td>
</tr>
<tr>
<td>ST26</td>
<td>374</td>
<td>47.1</td>
<td>45</td>
<td>+2.1</td>
<td>n/a</td>
<td>n/a</td>
<td>42.2</td>
<td>+4.9</td>
</tr>
<tr>
<td>ST6a</td>
<td>84</td>
<td>47.1</td>
<td>45</td>
<td>+2.1</td>
<td>47.0</td>
<td>+0.1</td>
<td>45.5</td>
<td>+1.6</td>
</tr>
</tbody>
</table>

Table 8 continued...
Survey ID | Predicted ID | 2017 survey | 2006 baseline | Delta | 2007 ES prediction | Delta | 2009 CPO prediction | Delta
---|---|---|---|---|---|---|---|---
ST29 | 91 | 54.9 | 62 | -7.1 | 55.7 | -0.8 | 57.1 | -2.2
ST30a | 92 | 55.1 | 61 | -5.9 | 63.9 | -8.8 | 65.0 | -9.9

**Long-term measurements**

| ST29 | 91 | 54.9 | 62 | -7.1 | 55.7 | -0.8 | 57.1 | -2.2
| ST30a | 92 | 55.1 | 61 | -5.9 | 63.9 | -8.8 | 65.0 | -9.9

* when two measurement data available, the most recent has been used (May/July 2006). + increase, - decrease.

Source: Mott MacDonald

Comparison of the L\(_{A10,18hr}\) 2017 - 1-year post monitoring data with the L\(_{A10,18hr}\) 2006 measured baseline in the ES show an increase in the noise level in the majority of the Combe Valley (west to and central part of the BHLR), while a decrease in the noise level is localised to the north and east part of the BHLR.

Comparison of the L\(_{A10,18hr}\) 2017 – 1-year post-construction noise monitoring data with the L\(_{A10,18hr}\) prediction for 2010 within the 2007 ES and with the L\(_{A10,18hr}\) prediction for 2013 within the 2009 CPO show that the measured noise level to the south of the BHLR are lower than predicted, particularly for position ST23 and ST30a; while to the north of the road the measured noise levels are in line with the prediction including ST6 that is adjacent to the BHLR. The measured noise level to the west of the BHLR indicate that the value is lower than the prediction while to the south-west (ST24) the opposite is true (higher than the prediction).

4.6 I4: Integration levels of the BHLR within the wider landscape

4.6.1 Introduction

This indicator assesses the integration of the BHLR within the wider landscape in relation to:
● potential landscape and visual impacts arising from the scheme identified during the scheme assessment, and outlined in the ES; and,
● mitigation measures outlined in the ES to reduce potential adverse landscape, townscape and visual effects.

In order to assess the integration of the scheme within the wider landscape, photographs were retaken from photomontage locations identified in the original ES and reproduced in 2009 as part of the Landscape Statement of Evidence (SoE) for the 2009 CPO Public Inquiry. For a full understanding of the landscape context and methodology for undertaking the original Landscape and Visual Impact Assessment, refer to the ES and SoE.

4.6.2 Methodology

To ensure consistency with the ES and 2009 SoE, the methodology followed was the same as that applied in the original Landscape and Visual Impact Assessment. This was in order to aid the comparison between the photomontages produced as part of the SoE in 2009 and the actual view at Year 1 of Operation.

Photographs were taken by a Chartered Landscape Architect in October 2016, and represent summer conditions prior to leaf fall. Photographs were taken from key viewpoints as identified in Appendix C. Viewpoints included the locations of: Belle Hill Junction, Ninfield Bridge, Actons Farm Footpath, Powdermill Valley, view from 1066 Country Walk (Combe Valley) and view to Chapel Wood from Crowhurst Road.

It should be noted that the photograph capturing the view to Chapel Wood could not be taken from the exact location on Crowhurst Road as previously taken, due to frequent and fast-moving traffic which presented a potential risk to safety.

4.6.3 Baseline

The visual baseline for each of the six viewpoints has been presented in Table 9 below and visually in Appendix D. It provides a description of the view prior to the construction of the scheme and one year after opening.

<table>
<thead>
<tr>
<th>Viewpoint/Photomontage location</th>
<th>Existing view description</th>
<th>Year 1 view description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belle Hill Junction looking North</td>
<td>The view from this location is dominated by the Belle Hill junction and associated infrastructure including traffic lights, multiple signs and pedestrian crossing points. Business properties can be seen either side of the junction, and Victorian terraced properties on the southernmost section of Combe Valley Road as it heads north.</td>
<td>The essence of the view portrayed in the Year 1 photomontage produced in 2009 is evident in Year 1 of operation. Slight differences with fencing alignment can be observed, but essentially the presentation is representative of what can be seen. The route has brought an enlargement to the northern arm of the junction, backed by acoustic fencing and specimen trees, as planned. The scheme has integrated well with the townscape in this location, where the local road network and associated infrastructure dominate.</td>
</tr>
<tr>
<td>Ninfield Bridge A269 looking south</td>
<td>Looking south from Ninfield bridge an enclosed short distance view is afforded down to a motorcycle training centre situated under the bridge. Either side, mature trees surround the site, enclosing it from the wider landscape.</td>
<td>The change in view depicted in the 2009 Year 1 photomontage is essentially representative of the scheme within the highway boundary. A new low level wall can be seen in the right hand side of the view which was not depicted in the original photomontage. Likewise, outside the highway boundary, the background of the view varies from</td>
</tr>
<tr>
<td>Viewpoint/Photomontage Location</td>
<td>Existing View Description</td>
<td>Year 1 View Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Powdermill Valley looking south from Footpath 16.</td>
<td>This broad open view looks out upon an agricultural scene, with arable fields dominating the fore and middle ground through this flat valley and gently rising land to the west. Groups of mature trees and single, in field trees can be seen. The background of the view is characterised by large woodland swathes forming the horizon of this rural view.</td>
<td>The photomontage produced for Year 1 in 2009 is a good representation of the current Year 1 view. Key elements are accurately portrayed with the only notable difference being a reduction in the use of acoustic fencing in the operational view compared with that proposed in the photomontage. However given its distance from the receptor, this is a minor discrepancy.</td>
</tr>
<tr>
<td>Actons Farm from Footpath 34.</td>
<td>A broad far reaching view captures the open valley landscape with rising land to the west and north forming the backdrop of the view. Scrub and intermittent vegetation runs across grazing land in the middle ground of the view with larger woodland landcover in the distance. Arable land also makes up the western half do the view in the middle ground. A powerline is just visible above the treeline providing an additional vertical element on the skyline.</td>
<td>The photomontage produced in 2009, has captured the complexities of the change in baseline well. The photomontage reflects the view in Year 1, and actually aided positioning on site given the notable change in the baseline view. There are a small number of discrepancies, for example the track shown in the foreground of the view in Year one has been retained unlike the photomontage which assumed it would be returned to grassland. The bridge crossing the route in the far distance appears more prominent than as presented in the photomontage, however on balance the view is as anticipated. The lake in the middle ground of the view also appears slightly more prominent than depicted in the Year 1 photomontage. In essence, the predicted view for Year 1 of operation is representative of the current scene.</td>
</tr>
<tr>
<td>Powdermill Valley looking north from Footpath 16.</td>
<td>This view is dominated by marshy grassland in the foreground and middle ground of the view. In the immediate foreground, a small timber bridge can be seen crossing one of the many drainage channels that traverse this landscape. Individual trees and groups of shrubs punctuate the grassland whilst the more distant elements of the view are characterised by mature woodland on the valley slopes. A powerline and associated towers can be seen traversing the view from east to west.</td>
<td>The view captured within the Year 1 photomontage appears an accurate representation of the view at Year 1. The road can be seen traversing the view from east to west, with much of the route in false cutting at this point, screening views of passing traffic. Short runs of acoustic barrier on bridge crossings offer screening of cars, although high sided vehicles can be seen. The foreground of the view has a greater sense of intervening vegetation than previously shown in the photomontage, developing since the original photographs in 2009. Whilst the change in topography is clear, the route itself appears well integrated within the wider landscape.</td>
</tr>
<tr>
<td>Chapel Wood</td>
<td>The view from the road is restricted to a degree by an intervening hedgebank which prevents short distance views to the field beyond in the most part. The top of farm buildings are visible over the hedge, before a more distant view to undulating ground and woodland beyond. Long distance views are afforded over this undulating ground profile to the area of Hollington in Hastings beyond.</td>
<td>Due to heavy traffic and lack of safe stopping location, the survey team were unable to replicate a photograph at Year 1 from this exact location. Views captured from the hedgebank side of the road included areas of new planting with shrub shelters and the Greensand Way, fenced by a post and rail fence, rising up the hillside. The new road and passing traffic could just be seen above the top</td>
</tr>
</tbody>
</table>
Table 9 above provides details of view in Year 1, and evaluates how well that change in view was represented in the Year 1 photomontages produced in 2009.

In summary, it appeared that the photomontages had captured an accurate representation of the future of the site, with all views being in line with those presented within the photomontages.

The evaluation of mitigation planting was limited in Year 1 due to the recent planting (post-opening) and immaturity of the plant stock, leading to only tree and shrub shelters being visible rather than the plants themselves. Future monitoring will allow further review as to the success of mitigation planting.

4.6.4.1 Discussion around the counterfactual

Given the extent of change within the landscape associated with the introduction of the scheme, it is not considered possible to assess the counterfactual for Integration levels of the BHLR within the wider landscape. With certain environmental assets it is possible to make a quantitative assessment based on numerical readings or factors, however given the qualitative nature of landscape as an asset, this is not considered to be the case. As such the evaluation has focused upon the change in baseline compared to the predicted effects.

4.6.5 Summary

In conclusion, the integration levels of the scheme within the wider landscape are as predicted during the original assessment and photomontage production in 2009. The engineering and earthworks aspect of the design appear as predicted. Further assessment in the future (at Year 5 and Year 15 after opening) will determine whether soft landscaping proposals have been effective, as vegetation matures over time to help screen the scheme and further soften its presence within the landscape.

4.7 I5: Monitoring that there is no net loss of biodiversity as a result of the BHLR and that the two for one compensation strategy for Nature Conservation is achieved

4.7.1 Introduction

This indicator assesses the effects of the scheme on surrounding habitats through a comparison of the original Phase 1 Habitat survey and Mitigation Strategy plans presented in the Environmental Statement (ES), with actual habitat and mitigation (re-instatement of habitat, enhancement and newly created habitat) implemented one year on from the scheme opening.

4.7.1.1 Background information

Surveys specifically related to the scheme began in 2003 with a Phase 1 survey of route options. Following this, further surveys followed and are summarised in Table 10 below.
The study area for the surveys includes a 500m corridor either side of the centre-line of the scheme route, as shown in the ES (Appendix 5.7A and 5.7B). This 500m zone of influence was selected in accordance with the guidance given in the Design Manual for Roads and Bridges (DMRB).

**Table 10: Ecological Survey and Report History**

<table>
<thead>
<tr>
<th>Survey</th>
<th>Date</th>
<th>Survey Description</th>
</tr>
</thead>
</table>
| Species Surveys of Route corridor and Pebsham Countryside Park | July-September 2004 | - Floodplain grassland and fen;  
- Species-rich neutral grassland;  
- Mesotrophic grassland, scrub and scrub woodland;  
- Ditches;  
- Hedgerows;  
- Bats;  
- Dormice;  
- Water voles; and,  
- Indicator wetland invertebrates.  
Species surveys were preliminary and intended to define the scope of more detailed surveys. |
| Species Surveys of Route corridor and the Pebsham Countryside Park. | 2005 | - Vegetation of the immediate route corridor;  
- Dormice;  
- Water Voles;  
- Water Shrews;  
- Bats;  
- Badgers;  
- Wintering and breeding birds;  
- Reptiles;  
- Great Crested Newts;  
- Dragonflies and damselflies; and,  
- Indicator wetland invertebrates |
| Route corridor and the Pebsham Countryside Park. | 2006 | More detailed surveys were undertaken in 2006 in order to address specific issues identified in the previous surveys and to bring the data up to the level appropriate for an Environmental Impact Assessment of the proposed scheme:  
- Vegetation within the land take for the road;  
- Bats;  
- Badgers;  
- Breeding birds;  
- Great Crested Newts;  
- Indicator wetland and terrestrial invertebrates;  
- Fish; and,  
- Crayfish. |
| Environmental Statement (ES) Route corridor and the Pebsham Countryside Park. | 2007 | The 2004-6 reports were collated as single subject reports in Appendices 12-C to 12-I of the ES. Each feature mentioned in the reports are shown on Figs 12.1A and 12.1B in Volume 3 and has been given a reference number, which is shown in the text, as follows:  
- F - Floodplain grassland and fen (Appendix 12-C.2)  
- G - Species-rich neutral grassland (Appendix 12-C.4) and  
- G - Mesotrophic grassland, scrub and scrub woodland (Appendix 11-3D)  
- W - Woodland (Appendix 12-C.5)  
- H - Hedgerows (Appendix 12-C.6), important hedgerows under the Hedgerow Regulations are numbered OA.  
- D1-69 ditches and streams (Appendix 12-C.3)  
Mitigation strategy formulated and presented in Appendix 12-J. |
| Extended Phase 1 Habitat assessment Marline Valley Woods SSSI. | 2008 | Natural England (NE) formally commented that the proposed mitigation was inadequate to compensate for the loss of connectivity at the southern tip of Marline Valley Woods Site of Special Scientific Interest (SSSI). The extended phase 1 examined the potential for creating suitable compensation woodland. |
Survey | Date | Survey Description
---|---|---
Protected Species Monitoring Reports – Jacobs 2016. | 2016 | Monitoring Reports include:
- Bats
- Badger and Barn Owls
- Great Crested Newts
- Dormice

Source: Mott MacDonald

4.7.1.2 Scope of works

The objective of this assessment is to undertake the following:
- Review existing information from previous Mott MacDonald reports on ecological receptors and mitigation strategies.
- Audit the mitigation strategy one year on from the scheme opening.
- Provide further recommendations to supplement the Nature Conservation Strategy.

4.7.2 Methodology

Suitably qualified and experienced ecologists visited the survey area on 5th and 6th December 2016. A copy of the Nature Conservation Strategy Plans, as presented in the Ecology Statement of Evidence (SOE), were used to complete an audit of the survey area regarding the mitigation strategy implemented (Appendix 5.7C of the 2009 SoE). No detailed National Vegetation Classification (NVC) for grassland and woodland were undertaken, the audit is based on observations only. Protected species monitoring reports created by Jacobs December 2016, for Badgers, Bats, Barn owls, Great Crested Newts and Dormice were also reviewed.

Mitigation strategies were assessed and target notes taken on how well the objectives have been achieved, whilst conducting a site walk over. Additional notes were also taken on areas of interest.

Where public rights of way were available, the surveyors utilised these to access the survey area, along with the greenway and access gates where permitted by East Sussex County Council.

4.7.3 Constraints

No detailed NVC for grassland, wetland and woodland areas were undertaken as part of the audit conducted in 2016 due to seasonal constraints. The audit was based on observations only, meaning in many cases, habitat management could not be adequately commented on. Certain management activities such as rotational coppicing and vegetation thinning require 5+ years of growth before management can commence as the audit was undertaken in Year 1 it was not possible to audit certain management activities as they had not yet occurred. Recently seeded grassland areas and marginal aquatic planted had also not maturated to a level where these features could be accurately observed.

4.7.4 Baseline

The ES outlines that the road, earthworks, greenway and associated grading-out for landscape mitigation would result in the loss of the following habitats:
- Floodplain grassland and fen;
- Species-rich neutral grassland;
● Mesotrophic grassland scrub and secondary woodland;
● Managed woodland
● Ditches and streams;
● Ponds
● Hedgerows including hedgerows with wet ditches.

The first five of these habitats have significant biodiversity. Improved grassland has limited biodiversity but is valuable in particular contexts, e.g. as foraging for badgers or as roosting sites for wintering waterfowl. Arable land is a Biodiversity Action Plan (BAP) priority habitat in Sussex but the areas present on the site are not significant. The habitat losses and the areas that would be used to mitigate or compensate for these losses are discussed.

A small area of ancient woodland, amounting to just 0.01% of the area of the SSSI, would have been directly affected which is contiguous with the Marline Valley Woods SSSI.

In addition, the scheme would:
● Create a barrier between habitats, possibly isolating smaller areas of habitat to the extent that they would be unable to support viable populations of some species of biodiversity significance;
● Sever habitat links, particularly the network of hedges, copses and ditches shown on and specific links for badgers, bats and common dormice; and,
● Create noise and visual disturbance arising from vehicles and users of the greenway.

The planned approach, as presented in the ES 2007, to mitigate these impacts is summarised in the following section. Actual mitigation observed during the 2016 site visit is then discussed and compared with original mitigation plans.

4.7.4.1 Habitat mitigation

The following sections provide more detail on the habitat mitigation strategy originally present before scheme commencement and the original mitigation plans laid out in the ES in 2007. An audit of mitigation measures implemented, as observed in 2016, is also presented.

4.7.4.2 Floodplain grassland and fen

Floodplain grassland and fen within the whole of the Combe Valley was identified during the Phase 1 survey in 2003 and were surveyed in detail in 2004, plotting NVC communities. The communities present were:
● M24 Purple Moor-grass Molinia caerulea - Meadow Thistle Cirsium dissectum fen-meadow;
● MG1 False Oat-grass Arrhenatherum elatius grassland;
● MG6 Rye-grass Lolium perenne Crested Dog’s-tail Cynosurus cristatus grassland;
● MG7 Rye-grass leys and related grasslands;
● MG9 Yorkshire Fog Holcus lanatus – Soft Rush Juncus effusus rush pasture;
● MG10 Yorkshire Fog – Tufted Hair-grass Deschampsia cespitosa grassland;
● MG13 Creeping Bent Agrostis stolonifera - Marsh Foxtail Alopecurus geniculatus grassland;
● S4 Common Reed Phragmites australis swamps and reedbed;
● S5 Reed Sweet-grass Glycera maxima swamp;
● S6 Greater Pond-sedge Carex riparia swamp;
● S14 Branched Bur-reed Sparganium erectum swamp; and,
● S28 Reed Canary-grass *Phalaris arundinacea* tall-herb fen.
Fields F29, F9, F16, F17, shown in figure 12.1B of the ES 2007, would be directly affected by the scheme. A detailed description of the habitat and mitigation plans are presented in Table A5.1 in Appendix H, along with a direct comparison of mitigation measures observed and audited in 2016.

4.7.4.3 Species-rich neutral grassland

The principal areas of species-rich neutral grassland are present in G6 and G13. A detailed description of the habitat and mitigation plans are presented in Table A5.2 in Appendix H, along with a direct comparison of mitigation measures audited in 2016.

4.7.4.4 Mesotrophic grassland, scrub and secondary woodland

Approximately 3 ha of scrub would be lost in the urban area, 1.6ha of scrub and scrub woodland on the disused railway embankments and 2ha of a mosaic of habitats adjacent to the railway and within G20 adjacent to Queensway. The total lost would be approximately 6.6ha. Within the urban area, biodiversity is limited by aspect and nutrient-rich ground conditions. The railway vegetation is more varied and G20 had a good habitat mosaic. Approximately 10.4ha of woodland and shaws are required for landscape mitigation. Since these would have to be in narrow, long strips there will be abundant ‘soft’ edges to replace the much smaller area of this habitat that would be lost. In addition, there was the opportunity to create approximately 22ha of scrub and rough grass at the locations shown on the Environmental Design drawings in Figures 3A.38 to 3A.44. Some of these sites have a southerly or south-easterly aspect and can be managed for invertebrates.

A detailed description of the habitat and mitigation plans are presented in Table A5.3 in Appendix H, along with a direct comparison of mitigation measures audited in 2016.

4.7.4.5 Managed woodland

Most of the woodland within the study area is ancient and semi-natural. Even the small copses, many of which appear to have been formed around marl pits, have ancient woodland ground flora as well as frequent field maple. The latter often form a ring around the edges of the copses and small woodlands and may have been planted. Within the larger copses and small woods there are large pits probably resulting from extraction of iron ore. In a few cases, there is a sharp distinction between the secondary vegetation of the pits and the ancient woodland ground flora of the undisturbed areas, although generally ancient woodland plants appear to have re-established on the disturbed areas.

The woods were typical of the High Weald in consisting of the NVC communities consisting of W8 Ash - Field Maple-Dog’s Mercury woodland in the more base-rich areas and the W10 Pedunculate Oak-Bracken-Bramble community on the more acidic and drier areas. The principal sub-communities are:

- W8a Primrose *Primula vulgaris* – Ground Ivy sub-community;
- W8d Ivy sub-community;
- W10b Wood Anemone sub-community; and
- W10c Yorkshire Fog sub-community.

The woodland that would either be directly affected by the scheme or would be very close to it were; W8, W37, W34, W23 and W25, W26, W55 and W27 Marline Wood South edge. A
detailed description of the habitat and mitigation plans are presented in Table A5.4 in Appendix H, along with a direct comparison of mitigation measures audited in 2016.

4.7.4.6 Hedgerows

The study area and the Weald in general had a high frequency of unmanaged hedgerows and shaws with frequent standards and a moderately wide range of shrubs, although this is not as great as on calcareous soils. The principal standards are Pedunculate Oak and Ash but Field Maple is locally frequent as a standard and as a shrub. Some of the hedges had spread to form a wide scrub edge, and while these can have significant biodiversity, they often consist of uniform Blackthorn. Some have ancient woodland indicator plants, principally Bluebell and Wood Melick. At the edge of the floodplain the unmanaged hedgerows have wet ditches.

Managed hedges were often cut to below 1.5m and were generally species-poor, often with only Hawthorn and Blackthorn. These were mainly within arable areas. The verges between the hedge and the pasture or arable crop were narrow and consist of weed species such as Stinging Nettle and Cleavers within MG1. Occasionally there were banks with a finer sward comprising mainly Red Fescue and Common Bent.

The main characteristics of hedgerows that would be severed by the scheme are listed in Table A5.5 in Appendix H, along with a direct comparison of mitigation measures audited in 2016.

4.7.4.7 Ditches and streams

Most ditches were dominated by Common Reed *Phragmites australis*, Reed Sweet-grass, Reed Canary-grass, or Branched Bur-reed *Sparganium erectum*.

The average number of species per 20m length for almost all ditches was low and well below favourable condition.

The following NVC communities were present:

- A2 Common Duckweed *Lemna minor* community;
- A3 Greater Duckweed *Spirodela polyrhiza*-Frog-bit *Hydrocharis morsus-ranae* community;
- A4 Frog-bit - Water-soldier *Stratiotes aloides* community;
- A5 Hornwort *Ceratophyllum demersum* community;
- A7 Yellow Water-lily *Nuphar lutea* community;
- A9 Floating Pondweed *Potamogeton natans* community;
- A15 Nuttall's Waterweed *Elodea nuttallii* community; and
- S17 Cyperus Sedge *Carex pseudocyperus* swamp. Together with the S4, S5, S6, S12, S14, S22, S26 and S28 communities present in the Floodplain Grassland and Fen.

The watercourses that would be directly affected by the scheme or would be very close to it were: D2, D4, Watermill Stream, D19, D29, D40, D36, D35, D37 Powdermill Stream, D33 and Decoy Pond Stream. The habitat and planned mitigation is explained in greater detail in Table A5.6 in Appendix H, along with a direct comparison of mitigation measures audited in 2016.

4.7.4.8 Ponds

A detailed description of the habitat and mitigation plans for ponds are presented in Table A5.7 in Appendix H, along with a direct comparison of mitigation measures audited in 2016.
4.7.5 **Habitat mitigation summary and evaluation**

4.7.5.1 **Floodplain grassland and fen**

The original management objective for the central floodplain grassland areas W29 and connecting wetland fields was to achieve a mosaic of S26 Greater Pond-sedge (Carex riparia) swamp, MG10 Yorkshire Fog Soft-Rush Pasture and MG9 Yorkshire Fog-Tufted Hair-grass (Deschampsia cespitosa) grassland. The rationale behind this was to replace habitat lost through the removal of habitat present on F29 and F9.

When audited in 2016, no active evidence was present in F29 of any new planting of mixed wetland grassland with rush and sedge. Although adjacent and interconnected floodplain grassland does show some recent evidence of a top soil strip and grassland re-seeding. This is broadly in line with the original management objectives. A NVC survey would be needed to ascertain if the desired communities and biodiversity value of this important habitat has been maintained and enhanced through the mitigation strategy.

Although not mentioned in original mitigation plans, F16 and F17 have been flooded to provide wetland compensation and is managed as wetland (standing water area with wetland grassland margins). The area is of high value for waterfowl and overwintering birds, and is in line with original management objectives.

4.7.5.2 **Species-rich neutral grassland**

*G6 and G13*

The original management objective was to create tall species-rich neutral grassland approximating to the NVC MG5 Common Knapweed - Crested Dog’s-tail community. The rationale for this was that G6 and G13 that was to be lost due to the scheme, had fairly low frequency of grasses and a high frequency of mid to late season flowering plants which support a good range of invertebrates.

When audited in 2016, no direct evidence was present of new planting or active management to create a species rich neutral grassland. The management objective has not currently been achieved. Our recommendation would be to NVC this area to see if the objective has been achieved once weed control and other management measures have been undertaken.

4.7.5.3 **Mesotrophic grassland scrub and secondary woodland**

*G10 and G20*

The original management objective was to create mosaics of species-rich grassland, mixed scrub and scrub woodland with varied structure. The grassland will correspond roughly with the NVC communities MG5 and MG1. Within the scrub and scrub woodland, native trees and shrubs that are found in the locality will be used, but it was not intended that any particular NVC community should be targeted. The rationale for this was because tree and shrub planting is necessary to screen the road and to maintain links for bats, dormice and other species. Mosaics of the types proposed would achieve these benefits and provide a net biodiversity gain over the arable and improved grassland habitats that they were to replace.

When audited in 2016, G10 Greenway and adjacent road grassland areas had evidence of top soil strip and grassland planting, however this is currently of low biodiversity value and does not represent the original MG6 or MG5 grassland. There was some evidence of MG1 communities.
However, grassland adjacent to the greenway and road still containes a lot of stone and rubble which is likely to increase the capacity of the area to be dominated by tall ruderal of lower biodiversity value. These areas would benefit from being tilled and re-seeded with grassland. Active management to reduce weed cover and a scheduled cutting region within these areas would increase the biodiversity value of grassland areas. Some grassland areas have been fenced to reduce the impact of grazing and trampling until these habitats have established.

4.7.5.4 Managed woodland

The overall original management objective was to return woodlands to active management based on standard conservation methods. The rationale for this was that the woodlands were managed by coppicing and other traditional practices and this has been one of the main reasons for their high biodiversity. Active management was also promoted to ensure broadleaved woodlands that were directly impacted such as Marline Wood (W27), the discussed Railway, Bexhill and Crowhurst woodland blocks could still retain their structure and functionality through management intervention and creation of new woodland edges and glades.

Woods such as Chapel Wood (W23), Little Bog (W19), Decoy Pond (W19) and W17 were largely impacted by edge effects and it was proposed that active management would increase the biodiversity of the woodland. The Offsite Woodland Management Plan produced by Jacobs in April 2017 provides details of landscaping completed one year after project completion.

Additionally, another primary objective was to ensure that any loss of Marline Wood south edge, was to be replaced on a 2:1 basis, calculated at approximately 6.6ha. Planting in Marline Wood was largely achieved. A mix of broadleaved woodland trees have been planted. However, thining and replacement planting needs to be undertaken within the next five years and the success of this planting programme monitored. Mitigation for woodland loss for the direct residual loss of 0.9ha of woodland was achieved. The programme of 12.5ha of planting has also been largely achieved. However, trees were mostly young whips and therefore the success of the overall planting and management can only be fully measured once trees have matured and active management measures achieved.

Woodland blocks; W8, W23, W25, W26, W27, W32, W37 and W55 that were directly affected by broad leaved woodland loss or indirectly through edge effects are described below.

One of the original management objectives included maintaining the wet flush which runs through the wood. During the 2016 audit some evidence was found of wet flush, which feeds adjacent wetland areas and a pond. Connecting hedgerows were observed to link woodland into the wider network of hedgerows adjacent to the greenway once matured.

The Offsite Woodland Management Plan produced by Jacobs in April 2017 provides details of management activities. The report includes evidence of copice rotation and edge thining as well as plans for repeated coppicing to occur after 5+ years.

W23, W24, W25 and W55 decoy pond wood

W23 was not directly observed. However the liner railway woodlands W24, W25 and W26 are benifitting from areas of broadleaved woodland planting to replace woodland lost trees along this corridor. Some areas of woodland scrub have been maintained although other forms of mangment were not observed. Ongoing active management will benefit this woodland corridor and ensure its biodiversity function is maintained.
W34 and W3

The 2016 audit revealed that the character of the open woodland (W34) has been retained, despite the severance of the scheme and the alignment of the Greenway. The woodland is connected into the wider habitat by adjacent newly planted hedgerows.

The woodland shaw (W37) has been retained although severed from southern woodland shaws, broadleaved woodland blocks and hedgerows. The newly planted east west greenway habitats re-connect these areas into the wider landscape. Newly planted hedgerows will need to be actively managed to ensure east west habitat connectivity and biodiversity value is maintained and enhanced.

W27 Marline Wood South edge

The audit conducted in 2016 revealed that compensation planting had been undertaken and was largely inline with the original management objective, comprising a mix of broadleaved woodland trees. A report presented to ESCC Planning confirms that the 2:1 planting has been completed.

4.7.5.5 Hedgerows

The original management objectives were to provide hedgerows with varied vertical, horizontal structure and species composition typical of the locality which sustain the original habitat network and spatially re-connect severed hedgerows through the creation of 867m² of linked hedgerows connecting the newly created 12.5ha of linear woodland and scrub with existing habitats. The rationale for this was to ensure the continuity of feeding and movement corridors for bats and dormice. The loss of hedgerows for the scheme was considered large adverse with a loss of over 4000m².

During the audit 2016, extensive hedgerow planting was observed, however planting was damaged in some areas and will be replaced annually during the five year aftercare period as specified. Other areas did not tie in to adjacent hedgerows and other habitat features and would benefit from some additional gap planting to strengthen connectivity.

4.7.5.6 Ditches and streams

The original management objectives included ensuring that new ditches and existing ditches brought into active management have a structure and water levels that will support a wide range of the species characteristic of the valley. The rationale for this was because many of the existing ditches were species poor because of narrow steep profiles and low water levels. The audit in 2016 revealed that ditches had been retained and excavated to match original plans of shallow edge and gently sloping sides. Overall objectives have been largely achieved in terms of water level management. Newly created riparian floodplain grassland, sedge and rush pasture needs to mature before a biodiversity gain can be achieved.

Marginal and aquatic macrophytes in the existing ditches appear to have retained biodiversity value. Water monitoring studies will ensure water quality in existing ditches is maintained.

4.7.5.7 Ponds

Original management objectives were to create ponds that would be excavated with a range of depths and of different sizes, with a saucer-shaped profile. Ponds were categorised into three types; existing ponds that were to be maintained and enhanced for biodiversity, attenuation ponds of little biodiversity value and flood relief ponds which were to be planted with a range of
riparian plants, including both marginal and aquatic macrophytes. The majority of ponds meet the original objectives, although number and shape of ponds varied due to local topographical and construction issues. As ponds start to mature, the biodiversity value of the riparian, marginal and aquatic planting should increase.

4.7.6 Protected species

4.7.6.1 Bats

To facilitate construction of the scheme, habitats used by commuting and foraging bats were severed, mature trees were felled, and a brick barn supporting a bat roost at Adams Farm was demolished (under Natural England licence EPSM2012-5266 and 2014-541-EPS-MIT).

A bat monitoring survey programme is being undertaken by Hochtief Taylor Woodrow Joint Venture (HTWJV). Monitoring surveys have been undertaken pre-construction (2008-2012), during construction (2013-2015) and will continue into the operational phase (2016-2020) in order to assess the impacts of the new road on bats, as per the requirements of the scheme’s Landscape and Ecology Management Plan (LEMP) (Jacobs, 2015).

Table A5.8 in Appendix H provides a summary of Bat mitigation, features observed during the 2016 audit and 2016 monitoring results.

Bat Mitigation Evaluation

The roost status of all buildings surveyed in 2016, apart from Upper Wilting, remain unchanged from the 2012 results. Continual monitoring is required to record any possible future changes.

Based on the information from the crossing point survey, the current location and height of the fencing appears to be helping keep the majority of bats’ flight level above road height where collision with a vehicle is likely to occur.

The bat box monitoring has revealed that they are currently not in use. However, the bat boxes were installed in summer 2016 and checked in August hence suitability for bats should increase in future years as they will have had time to ‘weather in’ and be found by bats. Continual monitoring is required to determine this.

4.7.6.2 Badgers

A total of 97 setts (of varying status) were recorded within the scheme’s survey area (which extended several hundred metres from the Compulsory Purchase Order (CPO) boundary) in 2012. The scheme resulted in the permanent loss of setts and foraging habitat across the site, but a comprehensive habitat creation and landscaping plan has provided a net gain in foraging area and suitable sett development habitat.

Due to the presence of badgers Meles meles within the local landscape, mitigation to reduce the likelihood of road casualties was incorporated into the design of the scheme. As per the requirements of the scheme’s Landscape and Ecological Management Plan (LEMP), monitoring surveys (including a desk study) of the entire length of the BHLR were undertaken during 2016 to search for dead badger which were likely to have died as a result of being hit by a motor vehicle using the new road. Monitoring surveys to check the status of the badger underpasses were also undertaken to ensure that these were fit for purpose and to record evidence of their use by badgers.

Table A5.9 in Appendix H, provides a summary of Badger mitigation, features observed during the 2016 audit and 2016 monitoring results.
Badger mitigation evaluation
As several badger road casualties were found during the 2016 monitoring, this would suggest some failures/gaps in the fencing. Periodic checks and repairs of the fence will ensure the fence is kept to required specification, to keep casualties to a minimum.

Periodic checks and repairs of the fence will ensure the fence is kept to required specification, to keep casualties to a minimum.

4.7.6.3 Great Crested Newts
Three suites of surveys carried out between 2005 and 2012 identified eight ponds which supported a ‘small’ population of great crested newts (GCN), although Pond 13 is the only pond to have shown a consistent GCN presence across all surveyed years.

Under a GCN European Protected Species Mitigation licence (2015-13924-EPS-MIT) for the scheme, one breeding pond was lost (Pond 16) and another damaged (Pond 17) as part of the construction works.

Table A5.10 in Appendix H, provides a summary of GCN mitigation, features observed during the 2016 audit and 2016 monitoring results.

Great Crested Newt mitigation evaluation
The presence of GCN within the ponds surveyed and/or an HIS score of 0.69 or above achieved within five years of the construction of the road would represent successful achievement of the mitigation and enhancement strategy (Jacobs, 2016).

As ponds start to mature, the biodiversity value of the riparian, marginal and aquatic planting should increase.

However if 2017 surveys of the monitored ponds (Ponds 5, 13, 15, 17 (E9), 20, 29 (E10), E8, E12 and E13), HSI score drops below the score recorded in 2016, remedial action should be considered in accordance with the LEMP.

4.7.6.4 Dormice
Monitoring surveys have been undertaken before, during and after construction in order to assess the impacts of the scheme on dormice and to ascertain the effectiveness of the scheme’s dormouse mitigation, as per the requirements of the scheme’s Landscape and Ecological Management Plan (LEMP) (Jacobs, 2016) and European Protected Species Mitigation Licence.

Table A5.11 in Appendix H, provides a summary of dormice mitigation, features observed during the 2016 audit and 2016 monitoring results.

Dormice mitigation evaluation
The 2016 survey results suggest changes in the dormouse distribution and population since 2012 as the population appears to have decreased. However, the lack of positive results in some hedgerows and woodlands does not confirm the absence of dormice within these habitats.

Continual monitoring is required before any conclusions regarding the cause for any population change can be made and the potential impact that construction of the scheme has had on dormice.
Extensive hedgerow planting was observed; however planting was damaged in some areas and is in need of replacement. Dormice bridges are not currently tying in to adjacent hedgerows and other habitat features and would benefit from some additional gap planting to strengthen connectivity.

4.7.6.5 Barn owls

Barn owls were found to be present at several points along the scheme during pre-construction surveys. As the scheme was considered to pose a risk to low flying animals, mitigation measures were put in place to reduce the risk to barn owl.

As per the requirements of the scheme's Landscape and Ecological Management Plan (LEMP), monitoring surveys (including a desk study) of the entire length of the BHLR were undertaken during 2016 to search for dead barn owl which were likely to have died as a result of being hit by a motor vehicle using the new road. Table A5.12 in Appendix H, provides a summary of Barn Owl mitigation, features observed during the 2016 audit and 2016 monitoring results Barn Owl Mitigation Evaluation

Barn owl mitigation evaluation

No barn owl road casualties were recorded during the surveys or data search and no further action is required with respect to this species.

4.7.6.6 Discussion around the counterfactual

As the 2016 mitigation audit was to assess mitigation measures of the BHLR by observation only, it is difficult to make a direct comparison of habitat and protected species, against the original baseline quantitative data collected in 2006.

However, based on observation alone, overall the majority of mitigation met the original objectives. As additional planting across all habitats matures, the biodiversity value and habitat connectivity across the scheme should increase.

Compensation woodland planting on a 2:1 basis, means that overall the scheme has produced a positive habitat gain. The value of this new habitat should improve as new planting matures.

Jacobs' 2016 monitoring has revealed no adverse effects on Barn Owl, Badger, Bat, Dormice or GCN populations in relation to the scheme. Habitat gain has now provided additional habitat opportunities for species and as additional planting matures, this can only have further positive impacts on species that utilise these environments. This should become more apparent through a continued monitoring programme.

4.7.7 Summary

Overall, it was observed that the majority of habitat and protected species mitigation has met the original objectives. Continual planting maintenance, habitat management and monitoring should ensure continual positive impacts of the scheme on ecological assets.
4.8  I6: Ensure that the BHLR is complementary to the future implementation of the proposed Combe Valley Countryside Park

4.8.1  Introduction

This indicator assesses visitor numbers to the Combe Valley Countryside Park (formerly Pebsham Countryside Park) in order to determine the effect of the BHLR on pedestrian, equestrian and cyclist usage of the park.

The Combe Valley Countryside Park covers an area of approximately 1480 acres within Rother District and Hastings Borough. The park contains Combe Valley SSSI, Filsham Reedbeds Local Nature Reserve and a number of Sites of Nature Conservation Interest. In addition, the park includes a network of Public Rights of Way (PRoWs) and cycle paths. The Hastings Borough Council Local Development Framework Core Strategy 2008 contained an objective to work with Rother District Council and East Sussex County Council to develop the Combe Valley Countryside Park by 2016. The implementation of the BHLR and subsequent NMU provisions would contribute to achieving this objective. The vision of the Combe Valley Countryside Park is ‘To create and manage a high quality sustainable, attractive, accessible and multi-functional countryside areas to serve the recreational, economic and health and well-being needs of residents and visitors’.

4.8.2  Methodology

As outlined in the ES, non-motorised user (NMU) counts of visitors to the Combe Valley Countryside Park were conducted in the spring of 2006. Surveys were carried out at 11 locations on PRoWs (Appendix I) between 07:00-20:00 on Easter Bank Holiday Monday, a Sunday in April and a Wednesday in late April. The exact survey methodology undertaken in the ES in regards to the survey length at each location is unknown however it is presumed that each location was surveyed for 13 hours between 07:00-20:00. In order to compare the results of the surveys completed in the ES, visitor count surveys were undertaken in the spring of 2017 between 07:00-20:00 at the same 11 locations and on the representative days as outlined in the ES. The NMU counts were carried out at 50-minute intervals at each of the 11 locations. The results of the 2006 and 2017 NMU counts are presented in Tables 11 and 12 below. Due to the difference in time spent at the survey locations between the 2006 and 2017 surveys, the 2017 survey results have been proportionately amended to be comparable with the 2006 survey results. The 2006 survey also involved interviews with NMUs (Appendix J). Whilst the 2017 survey did not involve interviews, some of the findings of the interviews have been used to aid the evaluation.

4.8.3  Baseline

The visitor surveys undertaken in 2006 (Table 11) found the Bank Holiday Monday to be the most popular day for visitors with almost double those on the Sunday and Wednesday. The interviews found that the area was popular with pedestrians with 60% of users of the PRoWs being walkers or dog-walkers, with 5% equestrians and 4% cyclists. The survey identified the area of use by equestrians with 30 riders identified over the three days. The area was identified

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17 Combe Valley Countryside Park [http://combevalleycountrysidepark.com/]
as in need of improved facilities for all users, particularly for cyclists and equestrians. The BHLR was identified as causing minimal severance to existing rights of way with the provision of well designed footbridges and underpasses. The ES concludes that the scheme would have a slight beneficial impact on pedestrians, cyclists and recreational users in the scheme opening year.

Table 11 Total number of NMUs surveyed at each location from the 2006 NMU Survey

<table>
<thead>
<tr>
<th>Survey Location/ Date</th>
<th>17/04/2006 (Bank Holiday Monday)</th>
<th>23/04/2006 (Sunday)</th>
<th>26/04/2006 (Wednesday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>44</td>
<td>38</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>41</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>26</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>174</td>
<td>57</td>
<td>45</td>
</tr>
<tr>
<td>5</td>
<td>130</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td>6</td>
<td>111</td>
<td>42</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td>139</td>
<td>94</td>
<td>41</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td>23</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>10</td>
<td>34</td>
<td>44</td>
<td>60</td>
</tr>
<tr>
<td>11</td>
<td>171</td>
<td>96</td>
<td>159</td>
</tr>
<tr>
<td>Total</td>
<td>899</td>
<td>463</td>
<td>497</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

4.8.4 Evaluation

Visitor Numbers

The results of the 2017 survey which have been amended in proportion to the 2006 survey results, are presented in Table 12. The actual results and method of proportioning the results are presented in Appendix K. Table 12 suggests that Sunday was the most popular day for visitors in comparison to the 2006 findings which showed the Bank Holiday Monday to have been the most popular day. Conversely, the Bank Holiday Monday was the least visited day from the 2017 surveys though had a greater number of visitors compared to the 2006 bank holiday Monday. This could be a result of the increasing popularity of using bank holiday weekends for overnight trips for which in 2006, overnight trips on the Easter bank holiday were taken by 13% of adults surveyed for Visit Britain\(^1\) compared to 20% surveyed for Easter 2017\(^2\). The number of visitors to the Combe Valley Countryside Park on the Sunday and Wednesday in 2017 were over double those on the same days in 2006. This could be a result of the provision of new ProWs as a result of the BHLR. A 2.5-mile Greenway extending from the outskirts of Bexhill to the edge of Hastings was introduced alongside the BHLR in July 2016 for pedestrians, cyclists and equestrians (Figure 17)\(^3\). The Greenway allows direct access to the Combe Valley Countryside Park from numerous areas. Survey locations 2,3,5 and 8 (as presented in Appendix I) are directly on or adjacent to the Greenway. From Table 12, these survey locations recorded some of the highest numbers of NMUs, particularly in locations 3 and 5 and in comparison to

\(^1\) Visit Britain (2007) Short term domestic tracker 23\(^{rd}\) – 25\(^{th}\) March 2007


\(^3\) East Sussex County Council (2016) New Link Road paths offer ‘green’ access to countryside
2006 survey results. This suggests that implementation of the Greenway, and subsequently the BHLR, has complimented visitor numbers to the Combe Valley Countryside Park.

Table 12 Proportionate numbers of NMUs surveyed at each location from the 2017 NMU Survey

<table>
<thead>
<tr>
<th>Survey Location/Date</th>
<th>Proportionate NMU visitor numbers 17/04/2017 (Bank Holiday Monday)</th>
<th>Proportionate NMU visitor numbers 23/04/2017 (Sunday)</th>
<th>Proportionate NMU visitor numbers 26/04/2017 (Wednesday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26</td>
<td>52</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>78</td>
<td>104</td>
</tr>
<tr>
<td>3</td>
<td>88</td>
<td>177</td>
<td>199</td>
</tr>
<tr>
<td>4</td>
<td>143</td>
<td>104</td>
<td>23</td>
</tr>
<tr>
<td>5</td>
<td>221</td>
<td>273</td>
<td>403</td>
</tr>
<tr>
<td>6</td>
<td>169</td>
<td>71</td>
<td>32</td>
</tr>
<tr>
<td>7</td>
<td>143</td>
<td>91</td>
<td>39</td>
</tr>
<tr>
<td>8</td>
<td>91</td>
<td>91</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>13</td>
<td>221</td>
<td>18</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>31</td>
<td>130</td>
</tr>
<tr>
<td>11</td>
<td>26</td>
<td>130</td>
<td>78</td>
</tr>
<tr>
<td>Total</td>
<td>961</td>
<td>1319</td>
<td>1053</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

Figure 17 Bexhill to Hastings greenway

![Map of Bexhill to Hastings greenway]
Source: East Sussex County Council (2016)

**Types of Visitors**

The NMUs recorded in both the 2006 and 2017 surveys included walkers, runners, dog walkers, cyclists and equestrians. The 2006 surveys were able to ascertain the purpose of NMU visits to the Combe Valley through interviews (Figure 18) whereas the 2017 surveys were limited to a visual assessment (Figure 19). Nevertheless, Figures 18 and 19 allow comparison between the types of user of the Combe Valley Countryside Park.

**Figure 18 The purpose of NMU visits to the Combe Valley from the 2006 survey**

![Purpose of visit](chart18)

**Figure 19 The types of NMU visiting the Combe Valley from the 2017 survey**

![Type of Non-Motorised User](chart19)

The proportion of walkers recorded within the Combe Valley was 42% in 2006 compared to 53% in 2017. Leisure walking has been increasing in popularity since the early 2000s due to its recognised health and relaxation benefits. Green spaces near homes have been found to be an increasingly important aspect of modern life with half of outdoor recreation visits taken within a
town or city in 2015 compared to 40% of visits in 2010\textsuperscript{24}. These trends in walking and increased proportion of walkers within the Combe Valley as reflected in the 2017 survey results suggest that the provision of NMU routes and increased access to the Combe Valley as a result of the BHLR has been complimentary to use of the park.

In addition to an increase in walkers, the proportion of cyclists and runners has also increased from the 2006 survey. The Greenway provides alternative routes for walkers and cyclists from equestrians (Figure 17) which could encourage an increased use of the park due to increased safety away from horses, and less disruption for runners and cyclists who would have to slow down for equestrians.

The proportion of dog walkers has decreased from 41% in 2006 to 29% in 2017. This could potentially be a result of the increase in cyclists and runners using the park or a reflection on facilities such as dog waste bins in the park. The latter however was not considered in either the 2006 or 2017 NMU assessments. The ES (Chapter 15A) notes that the majority of dog walkers exercised close to their homes for which is could be inferred that the proportion of dog owners in the area has decreased or dog owners are locating elsewhere to walk their dogs.

The proportion of equestrians has also decreased from 5% in 2006 to 2% in 2017 despite the provision of the segregated equestrian and pedestrian and cycle path on the Greenway. This could be a result of the differences in the 2006 and 2017 survey methodology in that interviews were able to ascertain the purpose of NMU visits whereas the 2017 survey was speculative and limited to those physically horse-riding as opposed to those who may be travelling through the park to go horse-riding. As outlined in the ES, there are a large number of stables, liveries and horse owners within the immediate vicinity of the BHLR in addition to a Riding Centre for the disables near Pebsham Farm therefore it is likely that there would have been more equestrian users of the park.

4.8.4.1 Discussion around the counterfactual

Comparing the difference in visitor numbers between the 2006 and 2017 surveys, in the absence of the BHLR it would suggest that visitor numbers would be lower than those surveyed following the implementation of the BHLR. This could be a result of the BHLR providing an increase in connectivity between the Combe Valley Countryside Park and surrounding residential areas through the provision of the Greenway. However, the objective within the Hastings Borough Council Local Development Framework Core Strategy 2008 to develop the Combe Valley Countryside Park by 2016 may have resulted in improvements to access and NMU facilities of the Combe Valley in the absence of the BHLR.

4.8.5 Summary

The NMU survey results undertaken in 2017 in comparison to 2006 surveys suggest that the implementation of the BHLR has had a positive effect on visitor numbers of the Combe Valley Countryside Park through the provision of improved access and increase in the quantity and quality of NMU facilities.

\textsuperscript{24} Natural England (2015) Survey shows more people are heading for the outdoors in England

4.9 I7: To preserve and where possible enhance ecological value of marginal aquatic habitat for waterbodies that are affected by the Scheme (i.e. those that are bridged or culverted)

4.9.1 Introduction

This indicator assesses the water quality of receiving watercourses within the catchment areas of the BHLR through analysis of water quality within these waterbodies and comparison between water quality data presented within the ES.

4.9.2 Methodology

In order to compare the water quality within the waterbodies within the catchment areas of the BHLR with the water quality data presented in the 2007 ES, water quality sampling was carried out in winter and summer of 2017. Thirteen locations were sampled in 2017 and were selected to match those that were sampled for the 2007 ES (Appendix L), although it should be noted that during the 2017 February sampling period, sampling locations 2, 6, 8, and 11 could not be accessed due to flooding. During the 2017 June sampling period, locations 2 and 3 could not be sampled as the watercourses were dry. Therefore, there is no 2017 data available for location 2, and limited seasonal data for the other locations listed.

A full description of the methodology for the 2017 water quality sampling is provided within Appendix M.

A qualitative comparison of the 2017 sample results and the results presented in the 2007 ES is given in Section 4.9.6 below. This was carried out with reference to Environmental Quality Standards (EQS) provided by the Environment Agency’s online Chemical Standards database. Professional judgement was used to analyse water quality results pre- and post-construction, to identify whether the scheme has had any significant impacts on water quality, which would cause a breach of the EQS for any of the receiving watercourses.

4.9.3 Baseline

The study area for the scheme covers the catchments of both the Egerton Stream and Combe Haven. The scheme follows the alignment of the Egerton Stream, running approximately north from Bexhill-on-Sea then north-east across the Combe Haven catchment towards Hastings.

4.9.3.1 Egerton stream baseline conditions

The Egerton Stream rises to the north-west of Bexhill, flowing south-east through Bexhill alongside gardens, residential properties, community and recreational facilities before discharging into the English Channel via an outfall on the foreshore. The stream has been extensively modified, with a large proportion of the watercourse contained within culverts, and several drainage outfalls discharging into the watercourse.

The Egerton Stream lies within a predominantly urban catchment, which suffers from typical urban pressures including discharges from surface waters and untreated sewage. The Egerton Stream is classed as a ‘Main River’, and lies within the ‘Combe Haven’ Water Framework Directive (WFD) operational catchment. However, the Egerton Stream itself is not a designated WFD waterbody.

As noted in the 2007 ES, the Environment Agency does not routinely monitor the Egerton Stream, due to the size and nature of the watercourse. As such, there was no water quality data available from the Environment Agency to inform the baseline conditions in the 2007 ES. As an alternative, a single ‘snapshot’ water quality sample was taken in June 2004; but this sampling had limited success due to insufficiently reliable data. Therefore, no further water quality samples were taken in 2017 as there was no baseline to which they could be reliably compared.

4.9.3.2 Combe Haven baseline conditions

The Combe Haven lies to the north-east of Bexhill, and to the west of Hastings. The catchment is predominantly rural, covering an area of over 51.5 km². The Combe Haven is complex in that it comprises ten sub-catchments, including six Main River tributaries; Watermill Stream, Powdermill Stream, Decoy Pond Stream, Spring Ditch, Pebsham Stream, and Hollington Stream, as well as several drainage ditches. The Combe Haven drains from west to east, picking up the six tributaries on route before discharging into the English Channel on the coast between Bexhill and Hastings.

The Combe Haven lies within the Combe Haven WFD operational catchment, which consists of three designated WFD waterbodies, Powdermill Stream, Watermill Stream and the Combe Haven. Although the Combe Haven operational catchment is predominantly rural, two of these waterbodies (Powdermill Stream and Combe Haven) are classified as heavily modified waterbodies due to extensive modifications along their reaches. For example, the Combe Haven flows through a series of small flap gates which prevent tidal water flowing upstream, and there are concrete pipes linking the floodplains in the upper catchment.

There is also an extensive ditch system that drains into the Combe Haven and its tributaries. Most of these ditches lie within the Combe Haven Valley SSSI and the Filsham Reedbed Nature Reserve. The surrounding landscape of the Combe Haven Valley (and downstream SSSI) was previously identified in the 2007 ES as being particularly sensitive to changes in water quality and hydrology; therefore, it was stipulated by the Environment Agency that no degradation in water quality (as a result of either scheme construction or operation) would be acceptable.

4.9.3.3 Baseline (pre-construction) water quality

The 2007 ES used a combination of water quality monitoring data available from the Environment Agency (River Ecosystem classifications\(^{26}\), and the formerly used General Quality Assessment scheme\(^{27}\)), and water quality data from field sampling to determine the baseline conditions of the Combe Haven and surrounding watercourses.

The baseline data obtained from the Environment Agency is summarised in Table 13. This baseline data shows that main rivers feeding the upper catchment of the Combe Haven were of ‘good quality’ with high chemical and biological GQA scores, and good River Ecosystem (RE) targets. The Combe Haven scored less well, with a chemical GQA score of E (‘poor’) and an RE target of RE4 (‘water of fairly good quality’). It was observed that downstream of where the

\(^{26}\) The River Ecosystem (RE) classification scheme was based on The Surface Water (River Ecosystem) Classification Regulations 1994, which classified rivers on a five point scale on the basis of the waters ability to support fish life. There were five classes ranging from ‘water of very good quality’ (RE1) to ‘water of poor quality’ (RE5).

\(^{27}\) At the time that the 2007 ES was written, water quality samples were routinely collected by the Environment Agency, with results used to establish a ‘General Quality Assessment’ (GQA) class. The GQA scheme was used to assess the chemical and biological quality of surface waters. GQA results were expressed on a six-point scale, from A (very good) to F (bad) quality. The GQA class system formerly used by the Environment Agency has since been superseded by a new monitoring and assessment programme under the Water Environment (Water Framework Directive) Regulations 2017, which are used to monitor chemical and ecological quality of waterbodies in England and Wales.
Decoy Pond Stream discharges into the Combe Haven, water quality appeared to deteriorate; attributed to inputs from ditches draining from the south-east of the catchment.

**Table 13 Water Quality Classifications for main watercourses, based on Environment Agency Data (sourced from 2007 ES)**

<table>
<thead>
<tr>
<th>Watercourse</th>
<th>RE Target</th>
<th>Chemical GQA Grade</th>
<th>Biological GQA Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egerton Stream</td>
<td>No data available</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Combe Haven</td>
<td>RE4 (marginal because of dissolved oxygen levels)</td>
<td>E (as a result of poor dissolved oxygen)</td>
<td>B (2003)</td>
</tr>
<tr>
<td>Spring Ditch</td>
<td>No data available</td>
<td>No data available</td>
<td></td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

In addition to the Environment Agency data, a set of ‘snapshot’ water quality samples were obtained from field sampling throughout the system, which was undertaken in June 2004 (as outlined in section 4.9.2). The watercourses sampled include Watermill Stream, Powdermill Stream, Spring Ditch, Decoy Pond Stream, the Combe Haven, as well as several ditches which drain into the Combe Haven. A range of water quality parameters were assessed from these field samples including: dissolved oxygen, biochemical oxygen demand (BOD), ammonium, pH, water hardness (CaCO₃), copper, zinc, iron, chloride, fats/oils/grease and suspended solids.

A complete set of the baseline water quality data obtained from the ‘snapshot’ field sampling is provided in Table 14 below.
<table>
<thead>
<tr>
<th>Site</th>
<th>Description RE class</th>
<th>Dissolved oxygen (% saturation)</th>
<th>BOD (ATU) (mg/l)</th>
<th>Ammonium (mg/l)</th>
<th>pH</th>
<th>Hardness (mg/l)</th>
<th>Copper (μg/l)</th>
<th>Zinc (μg/l)</th>
<th>Iron (μg/l)</th>
<th>Chloride (mg/l)</th>
<th>Fats, oils and grease (mg/l)</th>
<th>Suspended solids (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Watermill Stream</td>
<td>RE1</td>
<td>45.0</td>
<td>2.1</td>
<td>0.03</td>
<td>7.3</td>
<td>80</td>
<td>4.7</td>
<td>81</td>
<td>1200</td>
<td>35</td>
<td>&lt;10</td>
</tr>
<tr>
<td>2</td>
<td>Ditch A (adjacent to and right of Watermill Stream)</td>
<td>RE2</td>
<td>50.4</td>
<td>2.2</td>
<td>0.07</td>
<td>7.0</td>
<td>70</td>
<td>&lt;1</td>
<td>21</td>
<td>1300</td>
<td>34</td>
<td>&lt;10</td>
</tr>
<tr>
<td>3</td>
<td>Ditch B (adjacent to and left of Watermill Stream)</td>
<td>RE3/RE4</td>
<td>8.9</td>
<td>2.8</td>
<td>0.02</td>
<td>6.6</td>
<td>84</td>
<td>&lt;1</td>
<td>7.4</td>
<td>820</td>
<td>38</td>
<td>&lt;10</td>
</tr>
<tr>
<td>4</td>
<td>Powdermill Stream</td>
<td>RE2/RE3</td>
<td>43.7</td>
<td>1.5</td>
<td>0.06</td>
<td>6.9</td>
<td>67</td>
<td>&lt;1</td>
<td>5.7</td>
<td>1100</td>
<td>30</td>
<td>&lt;10</td>
</tr>
<tr>
<td>5</td>
<td>Ditch C (adjacent to and north of Combe Haven / Watermill Streams)</td>
<td>RE3/RE4</td>
<td>9</td>
<td>3.5</td>
<td>0.22</td>
<td>6.3</td>
<td>75</td>
<td>1.5</td>
<td>19</td>
<td>1900</td>
<td>33</td>
<td>&lt;10</td>
</tr>
<tr>
<td>6</td>
<td>Ditch D (parallel to and south of Combe Haven / Watermill Streams)</td>
<td>RE2/RE3</td>
<td>43.4</td>
<td>1.2</td>
<td>0.11</td>
<td>7</td>
<td>63</td>
<td>&lt;1</td>
<td>7.9</td>
<td>1500</td>
<td>30</td>
<td>&lt;10</td>
</tr>
<tr>
<td>7</td>
<td>Combe Haven</td>
<td>RE2</td>
<td>46.9</td>
<td>&lt;1</td>
<td>0.08</td>
<td>6.9</td>
<td>59</td>
<td>1.2</td>
<td>36</td>
<td>1800</td>
<td>27</td>
<td>&lt;10</td>
</tr>
<tr>
<td>8</td>
<td>Ditch E (RE2/RE3)</td>
<td>36.8</td>
<td>1.8</td>
<td>0.2</td>
<td>6.9</td>
<td>53</td>
<td>&lt;1</td>
<td>38</td>
<td>1400</td>
<td>29</td>
<td>&lt;10</td>
<td>78</td>
</tr>
<tr>
<td>9</td>
<td>Decoy Pond Stream</td>
<td>RE2</td>
<td>62.9</td>
<td>&lt;1</td>
<td>0.07</td>
<td>7</td>
<td>81</td>
<td>1.0</td>
<td>11</td>
<td>1400</td>
<td>36</td>
<td>&lt;10</td>
</tr>
<tr>
<td>10</td>
<td>Spring Ditch</td>
<td>RE2/RE3</td>
<td>43.4</td>
<td>&lt;1</td>
<td>0.07</td>
<td>6.9</td>
<td>105</td>
<td>&lt;1</td>
<td>22</td>
<td>900</td>
<td>33</td>
<td>&lt;10</td>
</tr>
<tr>
<td>11</td>
<td>Ditch F (adjacent to and south of Combe Haven)</td>
<td>RE2/RE3</td>
<td>36.9</td>
<td>&lt;1</td>
<td>0.11</td>
<td>6.8</td>
<td>59</td>
<td>1.3</td>
<td>38</td>
<td>2300</td>
<td>28</td>
<td>&lt;10</td>
</tr>
<tr>
<td>12</td>
<td>Ditch G (within Filsham Rebed Local Nature Reserve)</td>
<td>RE2</td>
<td>51.3</td>
<td>2.3</td>
<td>0.11</td>
<td>6.9</td>
<td>135</td>
<td>&lt;1</td>
<td>31</td>
<td>2700</td>
<td>50</td>
<td>&lt;10</td>
</tr>
<tr>
<td>13</td>
<td>Ditch H (within Filsham Rebed Local Nature Reserve)</td>
<td>RE3</td>
<td>30.6</td>
<td>2.7</td>
<td>0.14</td>
<td>6.8</td>
<td>182</td>
<td>&lt;1</td>
<td>43</td>
<td>1300</td>
<td>63</td>
<td>&lt;10</td>
</tr>
<tr>
<td>n/a</td>
<td>Egerton Stream</td>
<td>No data</td>
<td>No data</td>
<td>1.1</td>
<td>0.37</td>
<td>7.49</td>
<td>116</td>
<td>4.4</td>
<td>55</td>
<td>2078</td>
<td>No data</td>
<td>&lt;10</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald
4.9.4 Water quality assessment

Routine surface water run-off from roads has the potential to be contaminated with a range of contaminants including: particulate solids, hydrocarbons, heavy metals, oxides, organic toxic matter, de-icing agents and pesticides/herbicides. A range of heavy metals may be present in contaminated run off, particularly copper and zinc, but also cadmium, iron, lead and chromium.

Dissolved copper and total zinc (soluble pollutants found in routine run off) are typically used as representative of a list of heavy metal pollutants in routine run off from highways schemes; as they are indicative of acute pollution impacts in surface waters.

Concentrations of these elements can be compared with published Environmental Quality Standards (EQS) to assess the potential for long-term impacts on ecology. If average annual concentrations are below the EQS then no further action is required with respect to long term risks to the environment; whereas if average annual concentrations are above the EQS then significant mitigation would be required to reduce long term impacts on the environment.

The Water Quality Assessment within the 2007 ES (Chapter 9) predicted that for each of the receiving watercourses, residual concentrations of dissolved copper and total zinc would be below the relevant EQSs with or without mitigation; although substantial mitigation against potential pollution was incorporated as part of the scheme's drainage design regardless.

The following assessment will analyse water quality results pre- and post-construction, to identify whether the scheme has had any significant impacts on water quality, which would cause a breach of the EQS for any of the receiving watercourses.

The EQSs defined in the 2007 ES related to the former RE and GQA classifications that were used to define the watercourses (see footnote above). These were; 0.112mg/l for copper and 0.5mg/l or 2mg/l for zinc, depending on hardness of water.

The RE and GQA classifications have since been replaced by the Water Framework Directive, and therefore new EQS are used for the protection of surface water quality. These are as follows:

Copper (dependent on water hardness)\[28\]
- 1 µg/l for 0-50mg CaCO₃;
- 6 µg/l for 50-100mg CaCO₃;
- 10 µg/l for 100-250mg CaCO₃; and,
- 28 µg/l for >250mg CaCO₃.

Zinc (dependent on water hardness)\[29\]
- 8 µg/l for 0-50mg CaCO₃;
- 50 µg/l for 50-100mg CaCO₃;
- 75 µg/l for 100-250mg CaCO₃; and,
- 125 µg/l for >250mg CaCO₃.

4.9.5 Results from water quality sampling (2017)

The results from the water quality samples taken in summer and winter of 2017 are provided in Table 15.

The data from June 2004 has also been included in Table 15 for reference. When comparing this baseline data to the new EQS for copper and zinc (identified in Section 2), it is clear that the copper and zinc concentrations were well below the corresponding EQS at all locations sampled (apart from zinc concentrations at Location 1, which are likely to be an anomalous value).

To note, during the 2017 February sampling period, sampling locations 2, 6, 8, and 11 could not be accessed due to flooding. During the 2017 June sampling period, locations 2 and 3 could not be sampled as the watercourses were dry. Therefore, there is no 2017 data available for location 2, and limited seasonal data for the other locations listed.

Table 15 Water quality sampling results (samples obtained during field sampling conducted in February and June 2017 - results from June 2004 samples have been included for reference).

<table>
<thead>
<tr>
<th>Sampling Location</th>
<th>Copper (mg Cu/l)</th>
<th>Zinc (μg Zn/l)</th>
<th>Total hardness (mg CaCO₃/l)</th>
<th>Copper (mg Cu/l)</th>
<th>Zinc (μg Zn/l)</th>
<th>Total hardness (mg CaCO₃/l)</th>
<th>Copper (mg Cu/l)</th>
<th>Zinc (μg Zn/l)</th>
<th>Total hardness (mg CaCO₃/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;0.004</td>
<td>8.2</td>
<td>43.9</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>47.9</td>
<td>0.0047</td>
<td>81</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>&lt;0.001</td>
<td>21</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>46.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>&lt;0.001</td>
<td>7.4</td>
<td>84</td>
</tr>
<tr>
<td>4</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>29.1</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>42</td>
<td>&lt;0.001</td>
<td>5.7</td>
<td>67</td>
</tr>
<tr>
<td>5</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>65.8</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>127.7</td>
<td>0.0015</td>
<td>19</td>
<td>75</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>45.2</td>
<td>&lt;0.001</td>
<td>7.9</td>
<td>63</td>
</tr>
<tr>
<td>7</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>39.7</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>50.1</td>
<td>0.0012</td>
<td>36</td>
<td>59</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>56.1</td>
<td>&lt;0.001</td>
<td>38</td>
<td>53</td>
</tr>
<tr>
<td>9</td>
<td>0.015</td>
<td>&lt;7.0</td>
<td>60.9</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>60</td>
<td>0.001</td>
<td>11</td>
<td>81</td>
</tr>
<tr>
<td>10</td>
<td>&lt;0.004</td>
<td>7.5</td>
<td>37.6</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>71.9</td>
<td>&lt;0.001</td>
<td>22</td>
<td>105</td>
</tr>
<tr>
<td>11</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>54.2</td>
<td>0.0013</td>
<td>38</td>
<td>59</td>
</tr>
<tr>
<td>12</td>
<td>&lt;0.004</td>
<td>8.3</td>
<td>71.7</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>89.4</td>
<td>&lt;0.001</td>
<td>31</td>
<td>135</td>
</tr>
<tr>
<td>13</td>
<td>&lt;0.004</td>
<td>11.4</td>
<td>61.2</td>
<td>&lt;0.004</td>
<td>&lt;7.0</td>
<td>69.5</td>
<td>&lt;0.001</td>
<td>43</td>
<td>182</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

*red values denote potentially anomalous values, and < symbol is used to denote values which are below the limit of detection for the element.

4.9.6 Analysis and evaluation


Copper concentrations

The sampling results indicate that there were no significant increases in copper concentrations between the pre-construction baseline and post-construction.

Water hardness at all locations sampled was between 0-50mg/l (CaCO₃) or 50-100mg/l (CaCO₃), meaning the EQS for copper concentrations is either 0.001mg/ or 0.006mg/l respectively. All but one of the locations sampled had copper concentrations of <0.004mg/l, which falls under the EQS limit for locations with water hardness >50mg/l (CaCO₃). The 2017
winter (February) result for Location 9 (Decoy Pond Stream) appears to be anomalous, at 0.015mg/l, which is higher than the EQS. However, by June 2017 this value was <0.004mg/l, therefore the February result is considered to be anomalous and not representative of the normal conditions for the stream.

Unfortunately, 0.004mg/l marked the detection limit for copper concentrations for the methods used to analyse the samples in 2017, which means that it is not possible to know if the copper concentrations were <0.001mg/l at locations where the water was softer (<50mg/l CaCO₃). However, it is very likely, given the low levels of copper concentrations in water with >50mg/l (CaCO₃) that these samples are compliant with the relevant EQS.

**Zinc concentrations**

Generally, the sampling results show a significant decrease in zinc concentrations between the pre-construction baseline and post-construction, particularly at certain locations (Locations 1, 5, 7, 8, 10, 11, 12 and 13). These marked improvements in zinc concentrations between 2004 and 2017 are mostly likely indicative of major improvements to water treatment from routine runoff (through SUDS) and to other inputs such as sewage discharges, which have had an effect the water quality in the surrounding area over and above the effect that additional routine runoff from the scheme has had.

Again, as the water hardness at all locations sampled was between 0-50mg/l (CaCO₃) or 50-100mg/l (CaCO₃) - apart from for Location 5 during June 2017, which is likely to be an anomalous value - the EQS for zinc concentrations are 8μg/l or 50μg/l respectively.

Zinc concentrations taken during the summer sampling period (June 2017) at all locations sampled were below the corresponding EQS. All but one of the results from the winter sampling period (February 2017) were below the relevant EQS; concentrations at Location 1 (Watermill Stream) were slightly higher than the EQS at 8.2μg/l. Given how close this value is to the EQS it is not considered to be a water quality issue, particularly given that the zinc concentration had decreased to <7.08μg/l by June 2017. If the summer and winter values are averaged, the mean zinc concentration falls below the EQS.

**Water hardness (CaCO₃)**

Water hardness is a measurement of the dissolved calcium in the water ranging from low (<50mg/l) to high (>250mg/l). The post-construction data shows a general decrease in water hardness at all locations between pre and post construction, which indicates a background change in the levels of dissolved calcium. Changes to water hardness are significant because heavy metals are more toxic in softer waters – however as neither the copper or zinc concentrations are significantly higher post construction, this is not considered to be a factor affecting the water quality in this context.

**4.9.6.2 Discussion around the counterfactual**

In terms of water quality, the post-construction water quality samples taken during 2017 indicate that the surrounding waterbodies have not been adversely affected by the construction of the scheme, given that both copper and zinc concentrations are below the corresponding EQS values identified. Overall, the quality of the waterbodies in question appears to have improved over the ten-year period since the baseline water quality samples were obtained, although this improvement cannot be attributed to the scheme.

In terms of hydromorphology, as described in Section 9.6.1 of the 2007 ES, the scheme crosses four main rivers (Combe Haven, Watermill Stream, Powdernill Stream, and Decoy Pond Stream) and four minor drainage ditches in the Combe Haven Valley. The scheme also restored
the historic channel of Powdermill Stream for flood flows and separated normal and flood flows in Egerton Stream. There are therefore changes to the hydromorphology of watercourses and catchments in the area around the BHLR, which are changes caused by the scheme. However, the design of the scheme alignment and the drainage design have ensured that flows have not been impeded and flood risk has not increased as a result of the scheme. In accordance with Environment Agency requirements, all new bridges were designed to be clear span offset from the top of the banks by at least 2m both sides.

It can therefore be concluded that without the scheme, the water quality within the catchments surrounding the BHLR would be similar to their current condition. The hydromorphology would be different without the scheme, as the construction of the BHLR did lead to changes within the catchment, but these changes are not considered to be detrimental due to mitigation measures incorporated within the scheme design.

4.9.7 Summary

The post-construction water quality samples taken during 2017 indicate that the water quality of the surrounding waterbodies has not been adversely affected by the construction of the scheme, given that both copper and zinc concentrations are below the corresponding EQS values identified. Overall, the quality of the waterbodies in question appears to have improved over the ten-year period since the baseline water quality samples were obtained.

There is potential for some of the copper concentrations in sampling locations with softer water (>50mg/l CaCO₃) to be above the relevant EQS of 1μg/l, but this is unlikely given the general trends in copper concentrations. However, further analyses of results using methods with lower detection limits would be required to confirm this.

The results from the 2017 samples (and generally the findings from this report) are consistent with the ecological assessment of the Powdermill Stream, Watermill Stream and Combe Haven waterbodies as part of the WFD; for which copper and zinc concentrations have reported to be at 'high' status during the most recent assessments conducted 30,31.

Overall, the results from this report suggests that the current mitigation to reduce the impacts of routine run off from the scheme on the receiving waterbodies is sufficient, and therefore no further action is required or recommended.

This chapter presents the two indicators that assess the impact of BHLR on the number of accidents, both on the local road network and on the A259.

5.1 Key points
Key findings from this chapter are presented below.

- East Sussex as a whole has seen a reduction in accidents between the three year average prior to BHLR opening and the year after opening.
- The assessment work undertaken for BHLR predicted a saving of 8.1 in accident numbers in the first year after opening along the A259 between Belle Hill and the Ridge compared to the 2009-2012 data. The data shows that there was an observed saving of 12 accidents.
- The assessment work undertaken for BHLR predicted a saving of 6.9 in accident numbers in the first year after opening along the A259 between Waller’s Haven and Butcher’s Lane compared to the 2009-2012 data. The data shows that there was an observed saving of 15 accidents.

5.2 i8: Reduction in the number of accidents on the local road network giving associated economic benefits
The accident data has been analysed over two study areas:

- Area A) Local road network in Bexhill and Hastings, and
- Area B) East Sussex as a whole.

For analysis of the number of accidents on the local road network, a map of the total area of interest that covered all roads, including the area of the BHLR was cropped:

Figure 20: Total area of interest

Source: BHLR Baseline Report Figure 4.7
5.2.1 Study area A – Local road network in Bexhill and Hastings

Data from SSRP for accidents occurring in East Sussex before the opening of the road and in the year since opening is detailed in the table below.

Table 16: Total number of accidents throughout local road network

<table>
<thead>
<tr>
<th>Area</th>
<th>Date</th>
<th>Total number of accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total area of interest; all local road network</td>
<td>36 months inclusive 2009-2012</td>
<td>1306</td>
</tr>
<tr>
<td>Total area of interest; all local road network</td>
<td>2012</td>
<td>310</td>
</tr>
<tr>
<td>Total area of interest; all local road network</td>
<td>2016</td>
<td>291</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

The accident numbers on local roads within Bexhill and Hastings have been declining both before and after the opening of the BHLR. The assessment work undertaken for BHLR predicted a saving of 4.68 in accident numbers in the first year after opening across the local road network compared to the 2009-2012 data. The data above shows that there was an observed saving of 144 accidents, although it can also be seen from the table above that there is a significant difference between accident numbers observed in 2012 compared to the average for the three-year period between 2009 and 2012.

Data from 2016 shows that there were 5 fatalities, 92 serious casualties and 442 minor casualties amongst the 291 accidents in 2016.

The results from Table 16 above are illustrated in GIS grid maps in the following figures.

Figure 21: Accidents in total area of interest, 36 months inclusive 2009-2012

Source: BHLR Baseline Report Figure 4.8
Figure 22: Accidents in total area of interest, 2012

Source: BHLR Baseline Report Figure 4.9
Figures 21 and 22 above compare the data from 36 months prior to construction and the 12 months prior to construction. This presents the benchmark against which the data from 12 months after construction contained within Figure 23 can be compared.

For the period of 36 months between 2009 and 2012, there were eight km square areas where more than 39 road accidents occurred. Two of these were in central Bexhill along the A259, three along the A21 north of Hastings, and another three along the A259 in central Hastings.

In 2012, there were three km square areas where more than 14 accidents occurred, with one remaining on the A21 near Hollington and two remaining on the A259 in central Hastings area.

In 2016 there were again three km squares where more than 14 accidents occurred, two remaining in central Hastings and the final one in central Bexhill.

5.2.2 Study area B – East Sussex

Data from SSRP for total number of road accidents occurring in Study Area B, East Sussex as a whole, is presented in the table below.
Table 17: Total number of accidents throughout East Sussex

<table>
<thead>
<tr>
<th>Area</th>
<th>Date</th>
<th>Total Number of Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Sussex</td>
<td>36 months inclusive</td>
<td>5,309</td>
</tr>
<tr>
<td></td>
<td>2009-2012</td>
<td></td>
</tr>
<tr>
<td>East Sussex</td>
<td>2012</td>
<td>1,276</td>
</tr>
<tr>
<td>East Sussex</td>
<td>2016</td>
<td>1,376</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

East Sussex as a whole has seen a reduction in accidents between the three year average prior to BHLR opening and the year after opening. There has been a slight increase in accidents between the specific years of 2012 and 2016.

5.3 19: Reduction in the accident rate on the A259 between the junction with London Road/the BHLR at Belle Hill, Bexhill and the junction with the Ridge in Hastings

The M&E plan split this indicator into two study areas: Area A (the shorter stretch of A259 between the junction with London Road/the BHLR at Belle Hill Bexhill and the junction with the Ridge in Hastings), and Area B (the longer stretch of the A259 from Waller’s Haven to Butcher’s Lane).

The figure below illustrates where the shorter stretch of A259 between the junction at Belle Hill Bexhill and the junction with the Ridge in Hastings (between the red lines) sits within the wider stretch of A259.

Figure 24: Shorter stretch of A259 between the junction at Belle Hill Bexhill and the junction with the Ridge in Hastings

Source: BHLR Baseline Report Figure 4.10
Data from SSRP for accidents occurring at these study areas between 2009 and 2012, and during 2016 is detailed in the table below.

**Table 18: Total number of accidents along A259 Study Area A and Study Area B**

<table>
<thead>
<tr>
<th>Area</th>
<th>Date</th>
<th>Total Number of Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Area A A259 between the junction with London Road/the BHLR at Belle Hill Bexhill and the junction with the Ridge in Hastings</td>
<td>36 months inclusive 2009-2012</td>
<td>246</td>
</tr>
<tr>
<td>Study Area B longer stretch of the A259 from Waller’s Haven to Butcher’s Lane</td>
<td>36 months inclusive 2009-2012</td>
<td>344</td>
</tr>
<tr>
<td>Study Area A A259 between the junction with London Road/the BHLR at Belle Hill Bexhill and the junction with the Ridge in Hastings</td>
<td>2012</td>
<td>58</td>
</tr>
<tr>
<td>Study Area B longer stretch of the A259 from Waller’s Haven to Butcher’s Lane</td>
<td>2012</td>
<td>81</td>
</tr>
<tr>
<td>Study Area A A259 between the junction with London Road/the BHLR at Belle Hill Bexhill and the junction with the Ridge in Hastings</td>
<td>2016</td>
<td>70</td>
</tr>
<tr>
<td>Study Area B longer stretch of the A259 from Waller’s Haven to Butcher’s Lane</td>
<td>2016</td>
<td>99</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

As with the data for East Sussex as a whole, there has been a reduction in accidents along both subsets of the A259 between the three-year average prior to BHLR opening and the year after opening. Similarly, there has been a slight increase in accidents between the specific years of 2012 and 2016.

The assessment work undertaken for BHLR predicted a saving of 8.1 in accident numbers in the first year after opening along the A259 between Belle Hill and the Ridge compared to the 2009-2012 data. The data above shows that there was an observed saving of 12 accidents.

The assessment work undertaken for BHLR predicted a saving of 6.9 in accident numbers in the first year after opening along the A259 between Waller’s Haven and Butcher’s Lane compared to the 2009-2012 data. The data above shows that there was an observed saving of 15 accidents.

As with the data for the local road network as a whole, there is a significant difference between accident numbers observed in 2012 compared to the average for the three-year period between 2009 and 2012.

For Study Area A A259 between the junction with London Road/the BHLR at Belle Hill Bexhill and the junction with the Ridge in Hastings, there was one fatality, 14 serious casualties and 82 slight casualties across the 70 accidents.

For Study Area B longer stretch of the A259 from Waller’s Haven to Butcher’s Lane there was 1 fatality, 25 serious casualties and 117 slight casualties across the 99 accidents.

The results from the table above have been illustrated in GIS grid maps below.
Figure 25: Accidents on longer stretch of the A259 from Waller’s Haven to Butcher’s Lane, 2009-2012 inclusive

Source: BHLR Baseline Report Figure 4.11
Figure 26: Accidents on longer stretch of the A259 from Waller’s Haven to Butcher’s Lane, 2012

Source: BHLR Baseline Report Figure 4.12
Figures 25 and 26 above compare the data from 36 months prior to construction and the 12 months prior to construction. This presents the benchmark against which the data from 12 months after construction contained within Figure 27 can be compared.

In the 36 months inclusive 2009-2012 there were two one km square areas that recorded more than 27 accidents; these occurred on the A259 in central Bexhill (37 accidents) and in central Hastings (34 accidents). It should be noted that 246 of the 344 accidents (72%) that occurred along the A259 in this 36 month period took place along the shorter stretch of A259 between the junction with London Road/the BHLR at Belle Hill Bexhill and the junction with the Ridge in Hastings.

In 2012 there was one km square area that reported more than nine accidents; this occurred on the A259 between St Leonards and Hastings. Only one km square area reported between 7 and 9 accidents. It should be noted that 58 of the 81 accidents (72%) that occurred along the A259 in this 12 month period took place along the shorter stretch of A259 between the junction with London Road/the BHLR at Belle Hill.

In 2016 there were two km squares which reported more than nine accidents, both of which were in the centre of Hastings, and one other square with between 7 and 9 accidents in St Leonards. A similar percentage (71%) of accidents that occurred along the A259 in 2016 took
place along the shorter stretch of A259 between the junction with London Road/the BHLR at Belle Hill.
6 Economic indicators

This chapter presents the indicators which relate to supporting economic growth in the area surrounding BHLR, through improving access to housing and employment development land.

6.1 Key points

Key findings from this chapter are presented below.

- At this stage, many of the ambitions for housing and commercial development are yet to be realised. However, progress has been made at several sites, with some developments completed and others showing works have begun and continue to progress.
- Upon completion, the development sites associated with the BHLR are anticipated to create the largest concentration of employment space anywhere in the area with the capacity to support 3,000 jobs.
- One business (Park Holidays UK) relocated in December 2015 to land opened up by BHLR. In its former site, Park Holidays UK employed approximately 60 staff. Since the relocation to the current site, this has increased to 110.
- To date, the BHLR has incurred supply chain costs associated with construction of approximately £12.8m in labour and £79.1m in suppliers. The scheme is on track with a significant share of construction supply chain expenditure being spent locally in the South East.

6.2 To enable the strategic housing and commercial developments proposed in north east Bexhill to be realised

6.2.1 Anticipated strategic developments

The BHLR scheme was anticipated to unlock a series of development sites across the area, covering areas of Bexhill and the wider Rother District Council area. The anticipated sites were set out in the BHLR Regeneration Report (2009) and each was assessed for the degree to which the development of each site depended on the BHLR being delivered. Figure 28 below shows a high-level view of the development sites identified to be enabled by the BHLR scheme at North East Bexhill.
The 2009 BHLR Regeneration Report identified 16 sites, several of which were connected to other sites and each rated to have a different degree of dependency on the BHLR being delivered. The degree to which each site depended on the BHLR scheme was considered in terms of the take up of land by tenants and by occupancy rate on the site by year, rather than by the actual development of each site.

Table 19: Development sites

<table>
<thead>
<tr>
<th>Site</th>
<th>Dependency</th>
<th>Floorspace (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East Bexhill - Development West of scheme (BX3)</td>
<td>Total</td>
<td>28,000</td>
</tr>
<tr>
<td>North East Bexhill - Development East of scheme (BX2)</td>
<td>Total</td>
<td>23,500</td>
</tr>
<tr>
<td>Northwest of Queensway - north</td>
<td>Partial</td>
<td>10,000</td>
</tr>
<tr>
<td>Northwest of Queensway - south</td>
<td>Partial</td>
<td>9,400</td>
</tr>
<tr>
<td>Ivyhouse Lane, north of The Ridge</td>
<td>None</td>
<td>22,250</td>
</tr>
<tr>
<td>Baldslow</td>
<td>None</td>
<td>11,148</td>
</tr>
<tr>
<td>University Centre Phase 1</td>
<td>None</td>
<td>3,500</td>
</tr>
<tr>
<td>Lacuna Place - B1</td>
<td>Partial</td>
<td>8,100</td>
</tr>
<tr>
<td>Lacuna Place - Retail</td>
<td>Partial</td>
<td>1,100</td>
</tr>
<tr>
<td>Priory Quarter - B1</td>
<td>Partial</td>
<td>26,900</td>
</tr>
<tr>
<td>Priory Quarter – University Centre Phase II</td>
<td>None</td>
<td>14,500</td>
</tr>
<tr>
<td>Priory Quarter – retail</td>
<td>Partial</td>
<td>4,500</td>
</tr>
<tr>
<td>Priory Quarter – leisure</td>
<td>Partial</td>
<td>1,700</td>
</tr>
<tr>
<td>Site</td>
<td>Dependency</td>
<td>Floorspace (m²)</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Pelham - B1</td>
<td>Partial</td>
<td>3,800</td>
</tr>
<tr>
<td>Pelham - retail</td>
<td>Partial</td>
<td>2,300</td>
</tr>
<tr>
<td>Pelham - leisure</td>
<td>Partial</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>171,698</strong></td>
</tr>
</tbody>
</table>

Source: BHLR Regeneration Report, 2009

This level of dependency is broken down into anticipated build out and occupancy rates by site, the total of this shows that an anticipated 30% of sites is entirely dependent on the BHLR with an additional 40% of development land partially dependent on the scheme. This is shown in the below table.

**Table 20: Development floorspace by dependency on BHLR**

<table>
<thead>
<tr>
<th>Dependency</th>
<th>Floorspace (m²)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Totally dependent</td>
<td>51,500</td>
<td>30%</td>
</tr>
<tr>
<td>Partially dependent</td>
<td>68,800</td>
<td>40%</td>
</tr>
<tr>
<td>Not dependent</td>
<td>51,398</td>
<td>30%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>171,698</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: BHLR Regeneration Report, 2009

Only two of the development sites were identified as being fully dependent on the delivery of the BHLR, as such our review focusses on these two key sites:

- North East Bexhill - Development West of scheme (BX3); and
- North East Bexhill - Development East of scheme (BX2).

**Figure 29: Aerial photograph highlighting key development sites**

Source: [https://www.rother.gov.uk/media/pdf/a/2/north_east_bexhill.pdf](https://www.rother.gov.uk/media/pdf/a/2/north_east_bexhill.pdf)
In the 2009 BHLR Regeneration Report, Policy BX2 states that the area to the east of the Link Road should provide:

- at least 980 dwellings;
- some 22,000 sq.m of business floorspace; and,
- a neighbourhood centre.

To the west of the Link Road, Policy BX3 provides for:

- some 26,000 sq.m of business floorspace;
- at least 130 dwellings; and,
- structural open spaces, landscape and woodland belts.

6.2.2 Progress of developments

Upon completion, the development sites associated with the BHLR are anticipated to create the largest concentration of employment space anywhere in the area with the capacity to support 3,000 jobs. These jobs are anticipated to be generated by local firms in the new development sites and new companies moving to the area.

6.2.2.1 North East Bexhill - development west of scheme (BX3)

The BX3 site was identified in the 2006 Rother Local Plan and allocated for major business development, together with housing and open space within a generous landscape setting, although development of this site is yet to come forward. Plans have progressed as the land for this BX3 site has all now been acquired in anticipation of development.

Consultations with Rother DC stated that construction had begun on the new access road to connect the BHLR with Ninfield Road north of Sidley, which will provide access to the employment sites in the BX3 site. It is anticipated by Rother DC that this land west of scheme will be developed following the opening of the new access road. From consultation with Sea Change Sussex, we understand that the access road is currently under construction. Sea Change Sussex owns these sites and is anticipated by the council to bring forward planning applications in the coming months.

6.2.2.2 North East Bexhill - development east of scheme (BX2)

At the BX2 site, there has been significant progress in the first year (2016) and there are plans for continued development in place.

Connectivity to the area is in place as the majority of the planned internal roads and bus routes have been completed. This area has been allocated for a mix of housing, business, and related uses. To date, roads have opened up all the land designated for housing development and 50% of the employment land. The infrastructure supplying all public utilities to the BX2 site is in place (e.g. electricity and water supplies).

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30 https://www.seachangesussex.co.uk/our-programme/bexhill-hastings-link-road/
31 https://www.seachangesussex.co.uk/our-programme/bexhill-hastings-link-road/
34 Consultation with Sea Change Sussex.
On part of BX2, construction has begun on the **Bexhill Enterprise Park**, also known as **Bexhill Innovation Park**, and some sites have already been completed and opened.

“The Bexhill Enterprise Park offers sites which can accommodate from 2,000 up to 244,000 sq ft of office premises (net internal area). The total capacity of the park, including the Glovers House development, is 269,000 sq ft (25,000 sqm)”\(^{38}\).

The first property to be completed at Bexhill Enterprise Park was Glovers House, “a high-quality, 25,235 sq ft set of offices” with three floors. Construction began in November 2014 and the site was fully let on completion in December 2015 to Park Holidays UK\(^{39}\). Glovers House is described as “a contemporary, low-energy, light-filled building with ample parking”\(^{40}\).

Park Holidays UK employs 110 staff at the site and expects to add 10 new positions in 2017\(^{41}\). The company’s head-quarters are located at Glovers House where it will have a seven-day-a-week call center and room for future expansion.

Sea Change Sussex notes that plans to build offices similar to those in Glovers House are underway for other sites in the Bexhill Enterprise Park, from approximately 600 sq ft up to 25,000 sq ft\(^{42}\).
Sea Change Sussex has recently been granted planning permission by Rother District Council to develop a site area of 1.12ha at Plots 4 and 5 in the figure above (Bexhill Innovation Park, Bexhill TN39 5AW). Approval has been granted for 4,750sqm of office space in two 3-storey office buildings with associated parking (220 spaces plus 10 accessible), cycle storage, and landscaping. The approved plan is shown below.
To encourage businesses to move to and expand at these sites in the current uncertain economic climate following the referendum decision for the UK to leave the EU, the developers have designed innovative flexible leases with just three-month notice periods which can be served by occupiers at any time\textsuperscript{44}. This is designed to give business greater flexibility given uncertain market conditions, which in turn is intended to promote the site to businesses.

Through consultations with Rother DC, it was established that the entirety of this BX2 site has been granted planning permission. This is a mixed-use site which Rother DC’s Developer Interest Progress Report reports to have had permissions granted to Bovis Homes Ltd for 108 dwellings in May 2015. In addition to this, outline conditional permission was granted in March 2016, also to Bovis Homes Ltd for\textsuperscript{45}:

- 1,050 dwellings (30% of which will be affordable);
- up to 7,000m\textsuperscript{2} of employment space (Class B1);
- a children’s nursery and up to a two-form entry primary school.
- up to 2,100sqm (Gross Internal Area) of associated and supporting uses within Use Classes A1-A5 and D1, including commercial premises, multi-use community building, sports pavilion/changing rooms and ancillary car-parking and service areas;
- three primary vehicular accesses from the Gateway Road;

\textsuperscript{44} https://www.seachangesussex.co.uk/innovative-flexible-leases-for-sussex-offices-to-address-brexit-economy/

\textsuperscript{45} Rother DC, Annual Monitoring Report, Annex 12 Developer Interest, March 2016 and http://planweb01.rother.gov.uk/OcellaWeb/planningDetails?reference=RR/2015/1760/P&from=planningSearch
● public open space and amenity greenspace with sustainable drainage systems; and
● associated infrastructure including utility services on approximately 57 hectares of land, with all matters reserved.

Consultations with Rother DC found that while the development of residential land on this site has not yet begun, the council is confident that development will commence in 2017/18.

6.3 I11: Contribute to regeneration by increased employment opportunities

A survey will be carried out with all subsequent businesses which relocate or are founded at land enabled by the BHLR. As only one business is currently located on the developed land, the survey focuses solely on this business at this stage of the evaluation. This found the following information:

● The business is Park Holidays UK, a company that owns and rents out spaces at its 26 holiday parks across the UK. The company also deals in the sales of static caravans.
● Park Holidays UK was founded in Hastings and has remained based in this area.
● This location will be home to Park Holidays UK’s Headquarters where they will manage all bookings for all of its holiday park sites across the UK.
● While the customer base is UK wide, the majority of customers are from the South East of England
● Approximately 90% of the employees of Park Holidays UK are residents of East Sussex.

The relocation of the business:

● The business was previously located at its Coghurst Hall site to the North East of Hastings, where a part of the holiday park site was used as the headquarters of the business and the location from which staff handling holiday bookings were based.
● The former site at Coghurst Hall was considered too small to support the planned growth in the number of employees at the business and was difficult to access due to the single, narrow country lane that necessitated car use.
● Park Holidays UK relocated to Glovers House, just off the BHLR in December 2015.
● The primary reason given for this relocation was to enable the business to increase the number of people it employs. The previous site was said to be too small to accommodate this growth without expensive expansions made to the building which were considered more costly than relocating.
● Another key benefit of the move to Glovers House highlighted in the consultations was the gain in better access to the road network and to public transport. The previous site was approximately three miles from the nearest bus stop and walking or cycling down the narrow country lanes was considered impractical and unsafe. All of the employees at the previous site drove to work, compared to approximately 90% of employees at the current site who do so. In addition, the new site is located near to a bus stop and several people cycle to work at the Glovers House site.

The impact of the relocation:

● In its former site, Park Holidays UK employed approximately 60 staff. Since the relocation to the current site, this has increased to 110.
● Of these 110 staff, approximately 80% (90 staff) work full-time while the remaining staff (approximately 20) are employed on a part-time basis. These part-time jobs are the equivalent to approximately eight full-time equivalent jobs.
• The relocation has also seen significant modal shifts in travel to work patterns, where previously the remote location of the former offices necessitated car use, access to public transport and a more accessible location at the current site has encouraged several employees to change to using more sustainable transport methods. While all 60 people employed at the former site drove to work, approximately 10% of employees at the current site (approximately 11 people) either walk, cycle or take the bus to work.

• While the primary justification for Park Holidays UK’s relocation to Glovers House off the BHLR was to enable the expansion of the business in employing more people, the access provided by the BHLR was considered a significant benefit by the consultee.

• As approximately 90% of the employees of Park Holidays UK are residents of East Sussex, the economic benefits of the growth in employment at this business enabled in part by the BHLR have largely been retained within East Sussex.

The BHLR has enabled land to be developed that has so far supported a local business to expand and employ more people, without the need to move out of East Sussex.

6.4 I12: Percentage of construction supply chain expenditure spent within businesses in the South East

To date, the BHLR has incurred supply chain costs associated with construction of approximately £12.8m in labour and £79.1m in suppliers. This has been spent on goods and services across the UK (and some internationally), with 15% of labour expenditure and 50% of supplier expenditure in the South East of England. Together, 45% of all expenditure on labour and suppliers has been spent in the South East of England. Approximately 3% of the total labour expenditure and 8% of expenditure on suppliers were concentrated locally in East Sussex. This data shows that the scheme is on track with a significant share of construction supply chain expenditure being spent locally in the South East. This data is presented in the maps below.

This expenditure has been incurred over the course of the scheme to date (i.e. between 2012 and present (2017)).

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46 Client information collected in the Application for Payment log.
47 Client information collected in the Application for Payment log.
Figure 11: Distribution of labour expenditure by region

Source: Client data, Mott MacDonald analysis
Figure 37: Distribution of supplier expenditure by region

Taking the average annual salary figure in the South East of England construction sector for the latest year available, 2016 (£35,680), we estimate that direct expenditure on labour supported an equivalent of approximately 55 direct job-years in the South East.

Adding to this the expenditure on suppliers, we estimate that a further c.270 direct job-years are supported in the South East. This is based on the assumption that 25% of supplier expenditure is spent on employment costs.

Regeneration projects often generate short term construction work and, later on, ‘permanent’ jobs, though permanent jobs may nowadays be of relatively short duration. It is usual, therefore, to express construction employment in job-years, but permanent jobs simply as a number of jobs. In assessing projects a standard of comparison is needed to say how, for instance, Project A that creates 100 job-years in construction and 50 permanent jobs compares with Project B that creates 20 job-years in construction and 70 permanent jobs. There is an established convention that, absent project-specific information to the contrary, one permanent job is on reasonable assumptions about ten times that of one construction job year.

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Footnotes:

48 Annual Survey of Hours and Earnings, 2016, Office for National Statistics. Relates to full time average mean annual wages for the construction industry in the South East. We use 2016 salary data which is likely to be higher than preceding years, hence our estimates are conservative.

49 The size of the construction workforce at any time will depend on the duration and profiling of the works. As an example, if this is spread evenly over the five years over which the data is from, this would average to 68 full-time equivalents in each year, but might be profiled to peak at considerably more than 68. Due to the different construction phases, it is likely that the level and type of employment and skills would fluctuate over the development period.

50 The convention is soundly based in economics. Allowing for the probable duration of ‘permanent’ jobs and given that they arise later in time and with less certainty than construction job-years, the discounted value of output from one permanent job is on reasonable assumptions about ten times that of one construction job year.
job has the same regeneration value as ten construction job-years. On this convention, Project A is better than Project B.

The works during the full construction phase of the BHLR supported construction industry and supplier jobs in the South East equivalent to about 33 direct permanent jobs.

Construction activity feeds through to numerous other related business activities such as building materials, steel, architectural services, legal services and insurance, and some of these linkages result in job creation in the local economy, and also generates some local consumer spending. In the absence of detailed input-output modelling, the composite multiplier (which captures both indirect and induced impacts) has conservatively been assumed to be 1.2. This means that every ten job-years in construction will result in a further two job-years, locally, in supplier industries. This multiplier of 1.2 is based on national guidance for estimating the likely scale of the composite multiplier at the sub-regional level. As with the primary activity of construction, the profiling of these supplier job-years will depend on the profiling of the construction activity itself.

Applying this multiplier, we estimate that approximately 6 indirect and induced jobs were supported through the labour and supplier expenditure in construction of the BHLR in the South East.

Together, we estimate that a total of approximately 39 permanent jobs were supported through the labour and supplier expenditure in construction of the BHLR in the South East. If we include the rest of the UK this number rises significantly to 110 permanent jobs.

It is important to remember, however, that this is for the purposes of comparison: the reality is that there will be many more jobs than this, but lasting for only a short time during the construction period.

Taking average Gross Value Added (GVA) per worker in South East of £51,480, we estimate that these jobs translate into supporting approximately £2.0m GVA in the South East economy, with £0.3m GVA concentrated locally in East Sussex.

This data shows that the BHLR scheme is on track to deliver a significant share of construction supply chain expenditure in the South East, with almost 40 permanent jobs from a total of 110, and £2.0m in GVA per annum from a total of £5.6m, supported in the South East since works have begun. In other words, the wider economic benefits from the scheme to date have been concentrated locally in the South East, with over 35% of total jobs and GVA supported being in the South East and over 15% in East Sussex.

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51 Additionality Guide, Homes and Communities Agency, 2014
52 Regional GVA accounts and workforce jobs, ONS, 2015
7  Accessibility

This chapter presents the indicators which relate to journey times for all road users, including private vehicles and public transport, and the reduction of community severance.

7.1  Key points

Key findings from this chapter are presented below.

- The scheme has resulted in a decrease in journey times in all time periods and both directions (up to two minutes).
- There was a significant decrease in traffic on the A259 between 2015 and 2016, indicating that BHLR is helping alleviate congestion on this route.

7.2  I13: To reduce journey times for all road users

A comparison has been undertaken between the journey times of the journey from Bexhill to Hastings before the implementation of the scheme (May 2011) and one year after the scheme’s opening. The route compared runs from the A259/Combe Valley Way junction in Bexhill along the A259 to the A259/Harley Shute Road in Hastings and is the same but in reverse for the opposite direction.

The comparison shows a decrease in journey times with the inclusion of the scheme in all time periods and both directions and the journey time savings of up to nearly two minutes are significant considering the short route length.

<table>
<thead>
<tr>
<th>Journey</th>
<th>AM</th>
<th>IP</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bexhill-Hastings (EB) Before (May 2011)</td>
<td>0:10:21</td>
<td>0:08:05</td>
<td>0:09:11</td>
</tr>
<tr>
<td>Bexhill-Hastings (EB) 1 Year After (June 2017)</td>
<td>0:07:28</td>
<td>0:07:03</td>
<td>0:07:34</td>
</tr>
<tr>
<td>Hastings-Bexhill (WB) Before (May 2011)</td>
<td>0:08:20</td>
<td>0:07:36</td>
<td>0:09:11</td>
</tr>
<tr>
<td>Hastings-Bexhill (WB) 1 Year After (June 2017)</td>
<td>0:07:40</td>
<td>0:07:27</td>
<td>0:07:56</td>
</tr>
</tbody>
</table>

Journey time savings of 5 minutes between A259/Coombe Valley Way in Bexhill and A259/A21 in Hastings were predicted by the traffic modelling current at the Public Inquiry into the scheme. Journey time savings of 1.5 minutes eastbound and less than 1 minute westbound between A259/Combe Valley Way junction in Bexhill along the A259 to the A259/Harley Shute Road in Hastings were predicted by the updated traffic model used for the Best and Final Funding Bid. The observed data shows that for this stretch of the A259, the journey time savings achieved are higher than predicted.

7.3  I14: To reduce community severance in the A259 corridor and in local villages used as ‘rat runs’ to avoid the A259

Traffic counts have been carried out at two locations shown in Figure 38 below in order to assess the amount of ‘rat running’ taking place in these locations.

On the A271, there is an increase in traffic from 2012 to 2015. This is to be expected given background traffic growth and given the fact that this is before the implementation of the scheme. There is a significant decrease in traffic between the 2015 and 2016 data, showing that
the scheme has attracted more people to use the main route rather than rat running. There is a further decrease in the 1 year after 2017 data.

The data for Crowhurst Road shows more fluctuations with traffic flows reducing between 2012 and 2015, rising during 2016 and reducing again in 2017.

**Table 22: 12 hour (0700-1900) Traffic Count at A271 North Trade Road, Battle**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Eastbound (vehs)</th>
<th>Westbound (vehs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before (2012, Baseline report May/Sept average)</td>
<td>4348</td>
<td>4450</td>
</tr>
<tr>
<td>2015 (June)</td>
<td>4623</td>
<td>4973</td>
</tr>
<tr>
<td>2016 (June)</td>
<td>4308</td>
<td>4624</td>
</tr>
<tr>
<td>1 year after (June 2017)</td>
<td>4289</td>
<td>4487</td>
</tr>
</tbody>
</table>

Source: ESCC

**Table 23: 12 hour (0700-1900) Traffic Count at Crowhurst Road**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Northbound (vehs)</th>
<th>Southbound (vehs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before (2012, Baseline report May/Sept average)</td>
<td>1333</td>
<td>1194</td>
</tr>
<tr>
<td>2015 (June)</td>
<td>624</td>
<td>525</td>
</tr>
<tr>
<td>2016 (June)</td>
<td>951</td>
<td>749</td>
</tr>
<tr>
<td>1 year after (2017)</td>
<td>748</td>
<td>618</td>
</tr>
</tbody>
</table>

Source: ESCC
Figure 38: Traffic count locations

Source: Mott MacDonald
7.4 I16: To improve reliability of bus services on the local road network

Specific surveys of bus service reliability have not been undertaken. The Hastings Quality Bus partnership used to set targets for Bexhill-Hastings journey times and record whether they met those targets, but we have been unable to source any survey data collected by the QBP.

However, the bus route 99 travels along a very similar path to the journey time reported for I13 (Section 7.2), therefore the reductions in journey time would have positive impacts on the reliability of the bus service too.
8 Integration

This chapter presents the indicator which relates to the improvement of conditions to non-motorised road users.

8.1 Key points

Key findings from this chapter are presented below.

- The number of vehicles travelling on the A259 between Bexhill and Hastings has reduced by over 20% since the scheme opened.
- The data shows a similar number of cyclists before and after scheme opening, forming a similar proportion of the total observed traffic.
- There has been a slight reduction in cyclists on the parallel off-road cycle route after the scheme has opened.

8.2 I15: To improve conditions for pedestrians, cyclists and equestrians on the local road network in general and to facilitate creation of dedicated cycle ways between the two towns

Table 24 contains traffic vehicle flow data taken on the A259 at Glyne Gap between Bexhill and Hastings observed before (September 2011) and after (June 2017) the implementation of the scheme. This shows a 21% decrease in the Eastbound direction and a 23% decrease in the Westbound direction. In both the before and after data, the number of vehicles travelling on the A259 between Bexhill and Hastings is similar in each direction. The reduction in vehicular flow along the A259 will improve the environment for pedestrians and cyclists.

Table 24: Traffic Flow comparison on A259

<table>
<thead>
<tr>
<th></th>
<th>Average weekday 12 hour flows (all vehicles)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eastbound</td>
</tr>
<tr>
<td>Before (Sept 2011)</td>
<td>14,253</td>
</tr>
<tr>
<td>After (June 2017)</td>
<td>11,276</td>
</tr>
<tr>
<td>% Flow Decrease</td>
<td>21%</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

Analysis of turning count data observed at the Glyne Gap roundabout is displayed in Table 25 for 24th May 2011 and 16th June 2017. The data shows a similar number of cyclists before and after scheme opening, forming a similar proportion of the total observed traffic.

Table 25: A259 Glyne Gap Cycle traffic comparison (0700-1900)

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of cyclists</td>
<td>% of total traffic</td>
</tr>
<tr>
<td>Eastbound</td>
<td>34</td>
<td>0.27%</td>
</tr>
<tr>
<td>Westbound</td>
<td>46</td>
<td>0.35%</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald
Analysis has also been undertaken of cyclist numbers on the parallel off-road cycle route at Galley Hill as shown in the table below. This shows a slight reduction in cyclists after the scheme has opened.

Table 26: Galley Hill cycle data

<table>
<thead>
<tr>
<th></th>
<th>5-day Average</th>
<th>7-day Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastbound</td>
<td>100</td>
<td>89</td>
</tr>
<tr>
<td>Westbound</td>
<td>79</td>
<td>71</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

As part of the scheme, a Greenway has been provided alongside Combe Valley Way providing access for walkers, cyclists and horse riders between Bexhill and Hastings. It links up with public bridleways and footpaths in the area, including the 1066 Country Walk Bexhill Link, with two sections where horse riders take an alternative route to walkers and cyclists. Observations of users of the Greenway at Acton Farm were undertaken between 0800 and 0850 on a Wednesday, Sunday and Bank Holiday in April 2017. A total of 8 pedestrians and 1 cyclist were observed across the survey periods.

Figure 39 shows the locations of the three surveys discussed above.

A new walking and cycling route linking the Greenway into Hastings is being progressed. The design for the western section of the cycle route (between the Greenway and Silverhill) is being developed to preliminary design during 2017. The route was identified as part of East Sussex County Council’s / Hasting Borough Council’s (HBC) ‘Hastings Walking and Cycling Strategy’ that was published in January 2014. Discussion with local cycle groups and HBC has taken place and key stakeholders will be consulted further during the design development process. Detailed design will progress during late 2018/19 with implementation scheduled for early 2019.
Figure 39: Cycle survey locations

Source: Mott MacDonald
9 Economic appraisal

This chapter situates the BHLR scheme within the local economic context, presenting economic data before and after the scheme. We also present the wider economic impacts of the construction and operation of the scheme.

9.1 Key points

This chapter seeks to understand the causal links between the scheme and improvements in access to and creation of employment opportunities, the facilitation of local development and BCR of the scheme. This type of evaluation has been conducted in accordance with the principles in HM Treasury’s Green Book which sets out general principles for the assessment of investment and other projects to be applied across government particularly where economic impacts are sought. DfT’s WebTAG includes guidance on transport modelling and appraisal, including guidance on assessing the benefits that transport can have in regeneration. This is important context for BHLR which has based its rationale for intervention on the need to regenerate the area and create new employment opportunities.

Key findings from this chapter are presented below.

- Hastings has a higher proportion of its residents claiming JSA benefits than the national average, and Rother has the lowest rate. Both districts saw the claimant’s rates continue to fall after the BHLR opened.
- Hastings has consistently seen much lower house prices than the national average, while Rother has a higher rate. Both districts are seeing an upward trend in prices that has continued before, during and after the BHLR opened.
- Hastings saw an increase in NVQ 1,3 and 4 qualifications. This is in line with the other comparator areas, but at a smaller rate of increase. Rother saw a similar pattern of increase across the NVQ qualifications, with levels 3 and 4 increasing at a faster rate than the national average.
- An update of the scheme BCR using the actual scheme costs and observed traffic flow and journey times shows that the scheme BCR has reduced slightly to 1.39, compared to the BCR of 1.53 at Full Approval in 2013.
- The findings of the economic indicators (Chapter 6) demonstrate that there have been key economic benefits from the construction and operation of the road (such as 39 permanent jobs created in the South East, one development site brought forward).

9.2 Economic context

The data dashboards below display the key economic data for Hastings and Rother, comparing them to East Sussex and England. It is important to understand the socio-economic context in which the scheme opened and how the opening of BHLR may have assisted local and regional socio-economic aspirations.

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54 DfT’s WebTAG available at: http://www.dft.gov.uk/webtag
Figure 40: Employment and unemployment rates in Hastings, Rother, East Sussex and England (average) 2007-2016

Employment

- Hastings
- Rother
- East Sussex
- England

Unemployment

- Hastings
- Rother
- East Sussex
- England

Source: Mott MacDonald, using ONS data.
9.2.1 Employment 16-64

- After the BHLR opened in December 2015 both the districts of Hastings and Rother had a lower proportion of its working age population (16-64 years old) employed than the national average for England. For Hastings, there were 35,800 people employed between 16 and 65 years old equating to 63% of its population whilst Rother had a total of 36,700 people employed in this age range equating to 71% of its population. East Sussex also had a lower proportion of people of working age employed than the national average for England with approximately 72.5%.

- When comparing the employment rates of working age populations in the year before and after the BHLR opened both Hastings and Rother fell by five percentage points. East Sussex also fell by approximately 1 percentage point after the opening of the BHLR.

- Between 2009/10 and 2015/16 Hastings has seen a lower proportion of its population between 16 and 65 years old employed than the national average for England. Rother had a lower proportion of its population between 16 and 65 years old employed than the national average for England between 20010/11 to 2013/14 before increasing above the national average in 2014/15 and then dropping below it again in 2015/16.

9.2.2 Unemployment 16-64

- After the BHLR opened in December 2015 the Hastings District had a far higher proportion of its working age population (16-64 years old) unemployed than the national average for England at approximately 9.5%. In contrast, the Rother District had a lower proportion of its working age population unemployed than the national average for England with approximately 2.5%. East Sussex was also slightly lower than the national average for England.

- From 2012/13 until the opening of the BHLR both Hastings and Rother Districts had followed the national trend of seeing unemployment fall but since the opening of the road unemployment levels have increased in these areas.

- Both Hastings and Rother Districts saw an increase in unemployment after the BHLR was opened with Hastings’ unemployment rising by approximately 3.5 percentage points and Rother’s unemployment rising by approximately 0.5 percentage points.
Figure 41: Proportion of JSA and benefits claimants over the total resident population and Average House Prices in Hasting, Rover, East Sussex and England over the 2008-2017

Source: Mott MacDonald, using ONS data
9.2.3 JSA claimants

- In 2017 Hastings District had the highest proportion of its population claiming JSA benefits (approximately 1.8%) than any of the other comparator areas. In contrast Rother District had the lowest proportion of its population claiming JSA benefits than any of the other comparator areas at approximately 0.8%. East Sussex had a slightly higher proportion than Rother District with 1% of its population claiming JSA benefits.
- Since 2013 there has been a decrease in the number of people claiming JSA benefits in both Hastings and Rother Districts and this decline continued after the opening of the BHLR in December 2015.

9.2.4 Benefit claimants

- In 2016 both Hastings and Rother Districts had higher proportions of their respective populations claiming benefits than the national average for England. Approximately 19% of Hastings’ population claimed benefits in 2016 with approximately 11% of Rother’s population doing the same. East Sussex registered the same proportion as Rother District.
- Since 2011 there has been a gradual decrease in the number of people claiming benefits in both Hastings and Rother Districts mirroring the decline for the England. This decline continued after the opening of the BHLR in December 2015.

9.2.5 Average house prices

- In 2016 Hastings District had the lowest average house price of all the comparator areas with £185,798 including the national average house price for England which was £42,748 higher. In contrast Rother District had the highest average house price of all the comparator areas with £265,903 which was £37,357 higher than the national average house price for England.
- Since 2011 there has been an increase in the average house price across all the comparator areas including after the opening of the BHLR in December 2015.
Figure 42: Qualification level attainment percentage change of the resident population in Hastings, Rother, East Sussex and England between 2012 and 2016

Qualifications- aged 16-64

Percentage Change from 2012 to 2016

<table>
<thead>
<tr>
<th></th>
<th>Hastings</th>
<th>Rother</th>
<th>East Sussex</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>14,600</td>
<td>24,500</td>
<td>25,800</td>
<td>28,500</td>
</tr>
<tr>
<td>% with NVQ4+</td>
<td>13%</td>
<td>2%</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>% with NVQ3+</td>
<td>17,300</td>
<td>20,400</td>
<td>26,500</td>
<td>27,700</td>
</tr>
<tr>
<td>% with NVQ2+</td>
<td>27%</td>
<td>36%</td>
<td>36%</td>
<td>8%</td>
</tr>
<tr>
<td>% with NVQ1+</td>
<td>90,600</td>
<td>153,100</td>
<td>218,200</td>
<td>179,900</td>
</tr>
<tr>
<td>% with other qualifications</td>
<td>108,800</td>
<td>166,800</td>
<td>228,300</td>
<td>19,541,600</td>
</tr>
<tr>
<td>% with no qualifications</td>
<td>15%</td>
<td>8%</td>
<td>5%</td>
<td>9%</td>
</tr>
<tr>
<td>2016</td>
<td>16,000</td>
<td>26,200</td>
<td>28,300</td>
<td>28,400</td>
</tr>
<tr>
<td>% with NVQ4+</td>
<td>16%</td>
<td>7%</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>% with NVQ3+</td>
<td>17,300</td>
<td>20,400</td>
<td>26,500</td>
<td>27,700</td>
</tr>
<tr>
<td>% with NVQ2+</td>
<td>27%</td>
<td>36%</td>
<td>36%</td>
<td>8%</td>
</tr>
<tr>
<td>% with NVQ1+</td>
<td>90,600</td>
<td>153,100</td>
<td>218,200</td>
<td>179,900</td>
</tr>
<tr>
<td>% with other qualifications</td>
<td>108,800</td>
<td>166,800</td>
<td>228,300</td>
<td>19,541,600</td>
</tr>
<tr>
<td>% with no qualifications</td>
<td>15%</td>
<td>8%</td>
<td>5%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald, using APS data.

9.2.6 Qualifications – aged 16-64

- In 2016 Hastings District had over 45% of all residents being educated to NVQ3 level or higher. Approximately 6,700 people (12%) in Hastings District had no recognised qualifications of any kind. Rother District exceeded Hastings District by having 56% of its
residents being educated to NVQ3 level or higher. Rother District also had proportionally less people than Hastings District with no recognised qualifications in 2016 with 3.6%.

- Rother District was comparable with both East Sussex and England in terms of the proportions of residents with education levels of NVQ3 or higher but Hastings District fell below both of these comparators.

### 9.2.7 Summary table

**Table 27: Economic context summary table**

<table>
<thead>
<tr>
<th>Study area performance indicator</th>
<th>Study area performance indicator status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>Under performing</td>
<td>Since 2009/10, Hastings has seen a lower proportion of residents employed than the national average. For Rother, its employment rate was gradually improving until 2015/16. Both districts saw a reduction in employment after the BHLR was opened.</td>
</tr>
<tr>
<td>Unemployment</td>
<td>Mixed performance</td>
<td>Both Hastings’ and Rother’s unemployment rates have fluctuated either side of the national average. In 2015/16, Hastings was underperforming as it was higher, and Rother was over performing as it was lower. Both districts saw an increase in unemployment after the BHLR was opened.</td>
</tr>
<tr>
<td>JSA claimants</td>
<td>Mixed performance</td>
<td>Hastings has a higher proportion of its residents claiming JSA benefits than the national average, and Rother has the lowest rate of all comparator areas. Both districts saw the claimant’s rates continue to fall after the BHLR opened.</td>
</tr>
<tr>
<td>Benefit Claimants</td>
<td>Under performing</td>
<td>Hastings and Rother both have a higher proportion of their residents claiming benefits than any other comparator area. However, Hastings’ rate is much more significant. Both saw a slight reduction after the BHLR opened.</td>
</tr>
<tr>
<td>Average House Prices</td>
<td>Good performance</td>
<td>Hastings has consistently seen much lower house prices than the national average, and Rother has the highest rate of all comparator areas. Both districts are seeing an upward trend in prices that continues after the BHLR opened.</td>
</tr>
<tr>
<td>Qualifications – aged 16-64</td>
<td>Mixed performance</td>
<td>Hastings saw an increase in NVQ 1,3 and 4 qualifications, with decreases in ‘Other quals’. This is in line with the other comparator areas, but at a smaller increase rate. Rother saw a similar pattern of increase across the NVQ qualifications, with levels 3 and 4 increasing at a faster rate than the national average.</td>
</tr>
</tbody>
</table>

**Source:** Mott MacDonald

### 9.3 WebTAG

WebTAG (Web-based Transport Analysis Guidance) is DfT’s transport appraisal guidance and toolkit. It consists of software tools and guidance on transport modelling and appraisal methods that are applicable for all types of transport interventions. These facilitate the appraisal and development of transport interventions, enabling analysts to build evidence to support business case development, to inform investment funding decisions.

At BAFFB the BCR assessment was submitted to the DfT. The assessment of the following types of benefits were included in the assessment and compared against the scheme costs:

- travel time, distance and vehicle operating cost benefits, calculated using TUBA;
- accident benefits;
- noise benefits;
- construction delay benefits;
- reliability benefits; and;
• wider impact benefits.

The DfT subsequently made a number of adjustments and published a revised assessment dated 9th March 2012. Table 28 shows the ESCC assessment and the DfT adjustments, which reduced the BCR from 2.6 to 1.5 primarily due to the inclusion of Landscape disbenefits.

Table 28: BAFFB BCR with DfT adjustments (2002 prices discounted to 2002)

<table>
<thead>
<tr>
<th></th>
<th>PVB</th>
<th>PVC</th>
<th>BCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESCC assessment (Oct 2011)</td>
<td>140.1</td>
<td>50.5</td>
<td>2.6</td>
</tr>
<tr>
<td>Adjust for Treatment of National Rail revenues (to take account of increased costs to the public sector when the franchise is re-let)</td>
<td>6.5</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>Operating and renewal costs, advance purchase of land, increase in Optimism Bias to 15%</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove developer funded link road</td>
<td>22.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment for large journey time changes from zone 160</td>
<td>-13.4</td>
<td>-4.0</td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td>4.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wider Impacts</td>
<td>7.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td>-77.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final values including DfT adjustments</td>
<td>90.5</td>
<td>60.2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

At Full Approval, the results of the economic assessment were updated. Outputs from the traffic model were the same as the BAFFB but costs were updated in accordance with the latest profile (June 2013). The adjustments that DfT made to the BAFFB results were updated to 2010 prices discounted to 2010 and included in the assessment, where appropriate, in order to be consistent with the BAFFB assessment. Table 29 below shows the updated BCR at Full Approval.

Table 29: Full Approval (June 2013) BCR with DfT adjustments (2010 prices discounted to 2010)

<table>
<thead>
<tr>
<th></th>
<th>PVB</th>
<th>PVC</th>
<th>BCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESCC assessment Jun 2013</td>
<td>223.8</td>
<td>87.1</td>
<td>2.6</td>
</tr>
<tr>
<td>Adjust for Treatment of National Rail revenues (to take account of increased costs to the public sector when the franchise is re-let)</td>
<td>10.6</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>Remove developer funded link road</td>
<td>37.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment for large journey time changes from zone 160</td>
<td>-22.4</td>
<td>-6.7</td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td>8.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wider Impacts</td>
<td>10.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td>-129.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final values including DfT Adjustments</td>
<td>139.3</td>
<td>91.0</td>
<td>1.53</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

Comparisons of observed traffic flows and journey times since the opening of Combe Valley Way against the predictions of the traffic model have been undertaken to assess how accurate the predictions of travel time, distance and vehicle operating costs benefits were. These comparisons together with the actual scheme costs have been used to provide an assessment of the outturn BCR for the scheme.

A comparison has been undertaken of the observed flows and journey times between Bexhill and Hastings against those predicted by the BAFFB traffic model. The following tables show how the modelled flows for the predicted scheme opening year of 2015 compare with observed flows from June 2017 across a screenline of roads between Bexhill and Hastings.
In the AM peak, total modelled flows in both directions across the screenline are within 3% of observed. In the interpeak period, the total modelled westbound screenline flows are within 1% of observed and within 8% of observed in the eastbound direction. In the PM peak, the total modelled westbound screenline flows are within 1% of observed and in the eastbound direction the model predicts slightly less traffic travelling between Bexhill and Hastings than observed.

In general, the traffic model predicted a slightly greater transfer of traffic off A259 and onto Coombe Valley Way than has actually occurred so far.

A comparison of modelled and observed journey times along the A259 between Belle Hill and Breeds Place before scheme opening (2011) and after scheme opening has also been
undertaken to ascertain how different the modelled and observed time savings along this route are. The table below shows that in the AM peak time savings in the eastbound direction were underestimated with the westbound time savings overestimated by a similar amount. Eastbound time savings in the interpeak were accurately predicted but overestimated in the westbound direction. In the PM peak, modelled journey time savings were underestimated in the eastbound direction and overestimated in the westbound direction. Total journey time savings across each time period and direction were generally underpredicted by the model.

Table 33: A259 Belle Hill to Breeds Place journey time savings

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Direction</th>
<th>Modelled time saving (mm:ss)</th>
<th>Observed time saving (mm:ss)</th>
<th>Observed – modelled (mm:ss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak (0730-0930)</td>
<td>EB</td>
<td>00:58</td>
<td>03:05</td>
<td>02:07</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>03:00</td>
<td>00:34</td>
<td>- 02:26</td>
</tr>
<tr>
<td>Interpeak (1000-1600)</td>
<td>EB</td>
<td>01:09</td>
<td>01:11</td>
<td>00:02</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>00:59</td>
<td>00:08</td>
<td>-00:51</td>
</tr>
<tr>
<td>PM Peak (1600-1800)</td>
<td>EB</td>
<td>01:05</td>
<td>01:37</td>
<td>00:32</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>00:29</td>
<td>01:58</td>
<td>01:29</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>07:40</strong></td>
<td><strong>08:33</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

Observed journey time data was not available along Combe Valley Way as the TrafficMaster data provided to ESCC from DfT was only available for the road network as of September 2015, before the opening of Combe Valley Way. Instead a comparison of modelled journey times was made against Google travel times. The modelled travel times were all within 10% of the observed travel time except for the AM peak westbound where modelled travel times were some 27% higher than predicted.

Table 34: A259 Belle Hill to Queensway via Coombe Valley Way journey times

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Direction</th>
<th>Modelled travel time (mm:ss)</th>
<th>Observed travel time (mm:ss)</th>
<th>Observed – modelled (mm:ss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak (0730-0930)</td>
<td>EB</td>
<td>05:15</td>
<td>05:00</td>
<td>-00:15</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>06:28</td>
<td>05:06</td>
<td>-01:22</td>
</tr>
<tr>
<td>Interpeak (1000-1600)</td>
<td>EB</td>
<td>04:52</td>
<td>05:00</td>
<td>00:08</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>05:21</td>
<td>05:00</td>
<td>-00:21</td>
</tr>
<tr>
<td>PM Peak (1600-1800)</td>
<td>EB</td>
<td>05:06</td>
<td>04:45</td>
<td>-00:21</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>05:58</td>
<td>05:30</td>
<td>00:28</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

By combining the journey time savings along the A259 through Glyne Gap with the traffic flows at this location, a comparison of modelled and observed vehicle hour savings can be made. Combining the vehicle hours saved across all time periods it can be seen that the traffic model has generally underestimated the savings achieved with the completion of Coombe Valley Way by around 5%.

Table 35: A259 vehicle hours savings

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Direction</th>
<th>Observed veh-hr savings</th>
<th>Modelled veh-hr savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak</td>
<td>EB</td>
<td>12,873</td>
<td>3,325</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>2,606</td>
<td>9,273</td>
</tr>
<tr>
<td>Interpeak</td>
<td>EB</td>
<td>27,674</td>
<td>28,644</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>4,616</td>
<td>23,363</td>
</tr>
<tr>
<td>Time Period</td>
<td>Direction</td>
<td>Observed veh-hr savings</td>
<td>Modelled veh-hr savings</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>--------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>PM Peak</td>
<td>EB</td>
<td>14,969</td>
<td>7,133</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>16,170</td>
<td>2,961</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>78,907</td>
<td>74,698</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

As the predicted time savings are less than observed, we have therefore concluded that the original model predictions of economic benefits resulting from the time savings are a good proxy for those actually achieved and therefore that the Present Value of Benefits for the scheme from TUBA can be retained in an update of the scheme BCR.

The Present Value Cost for the scheme has been updated using the actual scheme cost spending and using the latest version of TUBA, version 1.9.9.

The previous assumptions of costs and spend profile for the schemes complementary measures and North East Bexhill Gateway Road have been retained.

The table below therefore summarises the revised scheme BCR assessment taking account of the increased scheme costs and new version of TUBA. The DfT adjustments have been retained at the values used in the Full Approval assessment. The adjusted BCR has reduced slightly to 1.39.

Table 36: Updated Full Approval BCR with DfT adjustments (2010 prices discounted to 2010)

<table>
<thead>
<tr>
<th>Source: Mott MacDonald</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>ESCC assessment</td>
</tr>
<tr>
<td>Adjust for Treatment of National Rail revenues (to take account of increased costs to the public sector when the franchise is re-let)</td>
</tr>
<tr>
<td>Remove developer funded link road</td>
</tr>
<tr>
<td>Adjustment for large journey time changes from zone 160</td>
</tr>
<tr>
<td>Reliability</td>
</tr>
<tr>
<td>Wider Impacts</td>
</tr>
<tr>
<td>Landscape</td>
</tr>
<tr>
<td>Final values including DfT Adjustments</td>
</tr>
</tbody>
</table>

9.4 Wider economic benefits

Part of the rationale for the BHLR scheme was linked to supporting economic growth in East Sussex, particularly in Hastings and Rother. Potential wider economic benefits include agglomeration impacts; output change in imperfectly competitive markets; labour supply impacts; and a move to more productive jobs. At this OYA stage, many of these ambitions – often linked to housing and commercial development - are yet to be realised and as such, the full wider economic benefits of the scheme have not yet come forward.

However, the findings of the economic indicators (Chapter 6) demonstrate that there have been key economic benefits from the construction and operation of the road. These are summarised below:

- A total of approximately 39 permanent jobs were supported through the labour and supplier expenditure in construction of the BHLR in the South East. For the rest of the UK, this number rises significantly to 110 permanent jobs (it is important to remember, however, that
this is for the purposes of comparison - there will be many more jobs than this, but lasting for only a short time during the construction period).

- These jobs translate into supporting approximately £2.0m GVA in the South East economy, with £0.3m GVA concentrated locally in East Sussex.

- One of the two development sites dependent on the BHLR scheme - Bexhill Enterprise Park – has seen sites completed and opened within the first year of the road being in operation. The first property to be completed at Bexhill Enterprise Park was Glovers House, which was let on completion in December 2015 to Park Holidays UK. Park Holidays UK employs 110 staff at the site. The company’s headquarters are now located at Glovers House where it has room for future expansion.

- It is important to keep in mind at this stage that these benefits may not be additional jobs and GVA generated by the project itself, but may be displaced from other sectors and activities in the local area or nationally.
10 Process evaluation

The Process Evaluation, carried out in 2016, seeks to understand what has been delivered and how efficient the delivery process has been. The findings of the Process Evaluation contribute to the broader objectives of evaluation and will support the theory of change approach adopted for the evaluation.

The Process Evaluation draws on the evidence assembled through the confidential interview sessions and questions posed to stakeholders identified in consultation with ESCC. The Process Evaluation method is essentially qualitative in nature, but also presents information on the scheme’s progress and a commentary on the processes and procedures used by scheme managers to make decisions, monitor progress and be accountable to stakeholders, including funders. In doing so, the aim of the evaluation is to highlight good practice which can be disseminated to guide future project delivery.

The approach is based on DfT guidance for Process Evaluations, and is tailored to the specifics of the BHLR scheme. Agreed elements of the Process Evaluation include:

- Discussion with key stakeholders involved in delivering the scheme and involved in the area’s economic regeneration.
- A review of the funding profile and delivery with the scheme’s management team.
- A review of decision-making processes and decision-making based on confidential interview feedback.
- Consideration of contextual factors influencing the scheme’s delivery timescale and cost.
- A review of the scheme’s risk management strategy and mitigation measures.
- Commentary on the scheme’s management structures and any changes during the construction period.
- Updating of logic maps as required.

Consultations and report drafting was undertaken alongside completion of the road to ensure that knowledge held by individuals was, so far as possible, captured before key delivery staff move on to their next opportunities.

10.1 Key points

Key findings from this chapter are presented below.

- Consultations with stakeholders suggested that, generally, on site communications across the teams was strong.
- Findings from the consultation programme suggest that the scheme design had a significant environmental and landscaping focus, and was perhaps being over-designed in some areas.
- The BHLR includes good examples of management of external factors such as protestor action, archaeology and ecology over the lifetime of scheme delivery.
- Delays in scheme funding and CPO approval led to negative impacts on the BHLR programme delivery and costs including inflation related costs.
10.2 Scheme design and approval

10.2.1 Organograms

The original management structures established for the delivery of the BHLR are shown in the organogram displayed in Figure 43 below.

The organogram in Figure 43 shows the relationship between the ESCC Project Board, the Joint Venture Board and the ECI Joint Board at the beginning of the scheme as well as those roles identified as responsible for delivering each of the components of the BHLR scheme. However, in Figure 44 there is another organogram displaying a revised management structure that better reflects the relationships and formal governance processes for the delivery of BHLR.
Figure 43: BHLR Project Management Structure

Source: ESCC
Figure 44: Revised BHLR Delivery Organogram

Source: Original BHLR project Management structure adapted by Mott MacDonald
The revised organogram shown in Figure 44 has been adapted to reflect the following findings from the Process Evaluation:

- The distinctions within the project between the ESCC project management and supervisory team and the contractor delivery team.
- Increased prominence of the ESCC management and supervisory team as central to delivery of the link road.
- The importance, both day-to-day and at a strategic level, of the working relationship between the project managers of the ESCC supervisory team and the Joint Venture contractors.
- The reporting and governance arrangements of the respective project managers up to their respective project boards.

Consultations with stakeholders suggested that, generally, on site communications across the teams was strong. As such the organogram highlights key linkages between individual roles on the supervisory and contractor delivery teams that were essential for delivering under the design and build arrangements. However, the clearer distinctions between the teams in the re-drafted organogram helps to better illustrate the respective governance and responsibilities of the project team that delivered the road.

10.2.2 Logic maps

From reviewing the original BHLR logic models, shown in section 4 of this OYA Report no significant changes were identified as being required in the representation of how inputs/outputs for the scheme combine to deliver the targeted outcomes for the scheme. The participation components of the logic models have been shown to be particularly important as strong collaboration with partner organisations during scheme delivery has been suggested to have been essential for ensuring that scheme benefits can be delivered.

10.2.3 Proposed costs

The DfT agreed to provide funding to the value of £56.850 million, with the balance being funded by ESCC. The cost estimate for the BHLR as per the Final Funding Bid (FFB) submission and at Approval to Construct shows how estimates increased prior to commencement of the scheme. The largest increases in cost were the contractor’s fees (£5.8 million increase), risk assessment (£6.6 million increase), and assessed risks from protestor action (£2.5 million increase). Balancing these cost rises slightly was a reduced allowance for construction inflation and a lower allocation for site supervision.
Table 36: BHLR funding profile at FFB and Approval to Construct (£m)

<table>
<thead>
<tr>
<th>Cost Heading</th>
<th>Proposed scheme cost as at FFB</th>
<th>Approval to construct July 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor’s Total of the Prices</td>
<td>59.451</td>
<td>65.232</td>
</tr>
<tr>
<td>Statutory Undertakers Works</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Site Supervision</td>
<td>2.655</td>
<td>2.553</td>
</tr>
<tr>
<td>Fees Payable by Client</td>
<td>0.410</td>
<td>0.438</td>
</tr>
<tr>
<td>Land and Compensation</td>
<td>12.470</td>
<td>12.401</td>
</tr>
<tr>
<td>Base Operating Costs</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td><strong>Base Cost</strong></td>
<td><strong>74.986</strong></td>
<td><strong>80.624</strong></td>
</tr>
<tr>
<td>Allowance for Construction inflation (4.7%pa Dec09-June11, 2.7%pa June 11 onwards, 2009 base)</td>
<td>8.117</td>
<td>7.006</td>
</tr>
<tr>
<td>Allowance for General Inflation (2.5%pa 2012 base)</td>
<td>0.069</td>
<td>0.022</td>
</tr>
<tr>
<td>Allowance for Land and Property Inflation (2%pa 2012 Base)</td>
<td>0.203</td>
<td>0.020</td>
</tr>
<tr>
<td><strong>Sub-total Inflation</strong></td>
<td><strong>8.389</strong></td>
<td><strong>7.048</strong></td>
</tr>
<tr>
<td>Allowance for Quantified Risk Assessment (3)</td>
<td>3.204</td>
<td>9.788</td>
</tr>
<tr>
<td><strong>Scheme Cost Estimate (1+2+3)</strong></td>
<td><strong>86.579</strong></td>
<td><strong>97.461</strong></td>
</tr>
<tr>
<td>Eligible Preparatory Costs</td>
<td>4.590</td>
<td>4.563</td>
</tr>
<tr>
<td><strong>Total Scheme Costs exc. Protestor Action Risk</strong></td>
<td><strong>91.169</strong></td>
<td><strong>102.024</strong></td>
</tr>
<tr>
<td>Part 1 Claims</td>
<td>1.061</td>
<td>1.061</td>
</tr>
<tr>
<td>Ineligible Preparatory Costs</td>
<td>7.180</td>
<td>7.180</td>
</tr>
<tr>
<td><strong>Total Cost to ESCC exc. Protestor Action</strong></td>
<td><strong>99.410</strong></td>
<td><strong>110.265</strong></td>
</tr>
<tr>
<td>Protestor Action Risk</td>
<td>0.700</td>
<td>3.195</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td><strong>100.110</strong></td>
<td><strong>113.460</strong></td>
</tr>
</tbody>
</table>

Source: Figures provided by ESCC

10.2.4 Findings from Process Evaluation consultations

In the sub-sections below the findings from the Process Evaluation consultations carried out are presented having been divided into six common topics.

10.2.4.1 Scheme concept

Some consultees suggested that the original scheme was detailed and well developed but contained a lot of items that were too expensive for the funding situation BHLR had found itself in.

The scheme is seen by some as being landscape led, with some of the project team building the road suggesting that the ecology was given more weight and emphasis than necessary. This emphasis has, ultimately, impacted on the scheme in terms of cost and timescales. The importance given to ecology is a key reason that engagement with organisations such as Natural England has been essential to scheme delivery.

Some consultees saw as an overbalancing of environmental concerns as one explanatory factor behind the view that the scheme was overdesigned. Examples given included:

- Footbridges and paths wider than necessary.
• The risk of settlement had been completely designed out, though the risk could have been minimised, rather than eliminated, at a much lower cost.
• The emphasis on ecology meant that the focus was perhaps not on protection of biodiversity and individual species of flora and fauna but on individual creatures.

10.2.4.2 Impact of the CSR and funding rules
Initially ESCC had been assured the road would be funded but following the General Election the funding rules for road applications changed significantly. ESCC now had:
• To compete for funding in open competition.
• To accept any funding which came out of DfT would now be significantly reduced – with only 50% of the funding now available to successful bidders.
• Any overspend would be at ESCC risk, and not a shared risk as previously.
Thus, ESCC found itself in the position of having to become less risk averse in order to pursue its aim of securing funds for the BHLR. Therefore, the initial plans for the scheme needed to be redesigned, taking on additional risk.
The impact on the scheme was therefore suggested to be two-fold:
• There became an on-going requirement to value engineer and redesign the road to keep costs down.
• Risk and contingency as well as value engineering would become crucial factors in the delivery phase of the scheme.

10.2.4.3 Local planning and the BHLR
The BHLR was a Regulation 3 application. One implication of this was that there was no judicial review of the planning application, only of the CPO orders. This was contentious as the BHLR would normally be too large for this approach. Thus, ESCC needed to:
• Find resources to fund independent studies and reviews of the application - the scale of the project meant this became expensive.
• Find the additional resources to respond to a very effective and well-informed protest campaign, from both local groups and national lobby groups.
• Ensure planning decisions took an appropriate weighting to the wider regeneration benefits of the road scheme.
• Find a practical method of constructing information barriers within the authority to prevent lobbying or influence.
• Ensure that, given there was no appeal process under Regulation 3 applications, the planning process was as rigorous as possible.
The key point is that the local planning authority has to withstand the pressures of having their employer being a client/applicant putting a strain on the planning system resulting from this approach as the planning authority has to be and be seen as being independent. The client, correspondingly, has to be responsible and responsive.
The following learning points were suggested from this experience by consultees:
• They need to take account of the experience of the planning authority in handling larger schemes before opting to send a scheme down the Regulation 3 route.
• Such schemes could include funding to support the planning authority in this role for such schemes.
At a more local level, the experience seems to suggest these schemes require greater attention at the pre-application process including support and advice from planning officers in preparing schemes.

There could be a better balance with supporting between comprehensiveness and conciseness. The submitted Environmental Statement for example was over 1,000 pages long. This was suggested to be not digestible for public scrutiny and reassurance.

10.2.4.4 Funding and initial progress

The scheme faced significant challenge because the Inquiry led to the funding envelope and actual construction becoming misaligned. The consequences of this identified by consultees included:

- A loss of knowledge from the design phase once construction actually started.
- There has been insufficient funding or time to complete the design programme – even when contractors were working on site the design phase had not been completed. A number of consultees pointed to the impact this had on the delivery partnership.
- Need for supplemental agreements to ensure early stage works could be undertaken to ensure the scheme was not delayed by missing the upcoming earthworks season.
- Reliance on statutory bodies (such as Natural England) to show flexibility in responding positively to necessary design changes.
- A need to balance preparedness with premature action in advance of the Inquiry decision when preparing and designing complementary schemes such as employment and housing land development.

10.2.4.5 Procurement

Comments regarding management of the procurement process were broadly positive though several missed opportunities were flagged by stakeholders including:

- Opportunity to utilise the Highways Agency’s bulk buying power for framework rates was not taken advantage of.
- The 50-50 pain and gain share between contractor and client in this project is suggested to be more generous than some construction project contracts as often the share would be 80-20 in the contracting authority’s favour.

10.2.4.6 Responding to protestors

The early presence of protestors on site was suggested to have created significant disruptions to the BHLR scheme. Stakeholders identified two distinct groups:

- Local ramblers and conservation groups concerned about the negative impacts of the scheme.
- Environmental protestors, with a stronger focus on ‘direct action’.

Protestors from each of these groups led to considerable pre-start costs – security in the latter case and then also in responding to queries and objections, including the costs of legal action, from more local campaigners.

It is important to note that some consultees identified the management of protestors as a key early stage success of the BHLR, particularly once private security contractors were engaged. These contractors were viewed by stakeholders to have managed protestors effectively.
Furthermore, some consultees noted that, from their perspective, in practice protestors had limited to no impact on the long term delivery timeline for the scheme.

10.2.5 Summary
Findings from the consultation programme suggest that the scheme design had a significant environmental and landscaping focus, and was perhaps over-designed in some areas. Value engineering as part of the funding review is suggested to have led to ESCC needing to take on greater risk and re-design to avoid cost and time delays. Inflation costs of around £7 million were assessed to have been incurred post 2009. Lessons learned regarding the planning process and cost implications of using Regulation 3 have also been identified by stakeholders. There was disagreement among stakeholders as to the extent to which protestor action hindered delivery of the scheme. Some identified considerable pre-start costs to respond to protestor action while others stressed that ultimately, they felt there was no long-term impact on delivery of the BHLR from protestor action.

10.3 Scheme delivery process
The way in which the scheme was delivered is reviewed in this section. Evidence reviewed includes the findings from the Considerate Constructors Scheme (CCS) monitoring review, project monitoring and reporting documents and findings from the evaluation’s consultation programme.

10.3.1 Considerate Constructors Scheme monitoring review
On the 21st January 2015 the CCS completed its second site visit to the BHLR. The Monitor assessed compliance in the areas of Appearance, Community, Environment, Safety and Workforce, assessing each category on a scale of 1 (Gross Failure) to 10 (Innovative). In the Executive Summary of the Monitor’s report it was noted:

“The site has continued to operate to outstanding levels of performance and improvements are clearly identifiable in section 5 [Value their Workforce]. Standards of appearance and image are still to an excellent standard despite the adverse conditions. Programme has been affected by the severe weather and with such a high proportion of the work carried out in very environmentally sensitive areas including existing flooded and inhabited woodlands. Additional monitoring has been included to confirm standards are being kept.”

“Well done and keep up the good work.”
10.3.2 Review of project monitoring and reporting

The review of delivery is based upon the reporting made over the lifetime of the scheme including its funding application and detailed reporting across the lifetime of the road’s construction as undertaken by the scheme’s management. Key reporting processes include:

- Local authority/CET Risk Register.
- DfT Monitoring Returns and accompanying Progress Reports.
- Progress meeting monitoring reports.
- Project Contract Risk Register.
- Miscellaneous reports (including summaries of the above information sources).

The monthly ESCC progress meeting monitoring reports on the following topics through management presentations and accompanying documentation:

- Health, Safety and Environmental issues.
- Design progress & emerging key issues.
- Construction progress against agreed programme.
- Detailed analysis at key sites.
- “Next steps” construction review.
- Planning issues & compliance.
- Value engineering activities at key locations.
- Land acquisition.
- Progress with Complimentary Highway Improvement Plan (CHIP).
- Review of key project risks.
- Budget analysis.
- Stakeholder management issues.

In the following sub-sections key areas identified within the reporting process are reviewed.

10.3.2.1 Contractual KPIs

The monthly progress meetings reported on the eight delivery performance indicators presented in Table 37. These reflect the progress-based reporting undertaken by the Project Manager to the BHLR Project Board. September 2014 reflects when the Process Evaluation process commenced and December 2015 is the latest concluded reporting period during the evaluation. To build understanding of the KPIs the BHLR Project Manager was invited to comment on the KPIs and their comments are included in the final column of Table 37 below.

<table>
<thead>
<tr>
<th>Table 37: KPIs for the Hotchief Joint Venture Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Level Performance KPIs</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>RIDDOR (Reporting of injuries) free</td>
</tr>
<tr>
<td>Manhours to date</td>
</tr>
<tr>
<td>Zero Level for 1 or 2 Environmental Incidents</td>
</tr>
<tr>
<td>Apprentices/Trainee engineers on site</td>
</tr>
<tr>
<td>Locally employed staff</td>
</tr>
<tr>
<td>Win Considerate Constructors Award</td>
</tr>
<tr>
<td>Occupational Health Nurse to visit each month to give health advice and have occupational training for safety critical workers</td>
</tr>
<tr>
<td>Achieve £1M saving through Value Engineering</td>
</tr>
</tbody>
</table>
### High Level Performance KPIs

<table>
<thead>
<tr>
<th>Lifetime performance target</th>
<th>Achievement as per September, 2014</th>
<th>Achievement as per December, 2015</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Engagement with Community and Stakeholders</td>
<td>2 days per month</td>
<td>51</td>
<td>63</td>
</tr>
</tbody>
</table>

The stakeholder manager was very proactive in identifying opportunities for engagement with the Community. These opportunities were then sifted in order to identify which ones were a good match for the skills of the workforce volunteers.

Source: As reported by the BHLR project monitoring reports

#### 10.3.2.2 Health and safety

Throughout the project, health and safety performance was reported at monthly progress meetings to the project board. The Accident Frequency Rate (AFR) was tracked and reported on a monthly as well as on 12 month rolling basis.

In December 2015 the AFR was 0.35 on a 12 month rolling basis from a total man hours of 561,066. This compares to an AFR for the final Highways England Annual Report and Accounts 2014-15 of 0.36 and 0.34 in the previous year.

As shown in Figure 46, the top causes for close call cards over the lifetime of the scheme were Environment, Housekeeping and PPE.

**Figure 46: Close call cards by cause**

![Figure 46: Close call cards by cause](chart.png)

Where areas were identified as needing improvement they were actioned and discussed at subsequent monthly progress meetings. Figure 47 shows some of the key areas for improvement identified in the September 2014 report.
Figure 47: Example of reporting on areas for improvement – BHLR Areas for Improvement August 2014

The BHLR’s January 2015 review of compliance to the CCS Code of Practice included reviewing health and safety procedures. On their site visits the CCS Monitor noted a large number of safety procedures in force on site including:

- Visitors sign in and out, are escorted at all times and issued with Green hardhats for easy identification.
- Extensive first aid cover with frontline team contact details and photographs on notice boards. Satellite areas have full details and information of the first aid teams. Local Accident & Emergency details are fully detailed and operatives informed. All trades have a requirement to have qualified first aiders on site.
- Protection of the public is paramount and working areas are suitably fenced and protected together with security and travelling security patrols employed. Public rights of way are suitably guarded with designated routes. Netting and assistance highlighted with special painted signs to assist partially sighted local residents. Any changes to the footpaths and residents are informed in writing. Public walking routes are checked twice daily and any issues or incidents are logged and monitored.
- Both operative and site visitors are inducted. Regular Toolbox talks reinforce the safety culture and are supplemented with regular training.
- Site has introduced a monthly stand down where operatives attend a meeting with topical subjects covered by a variety of invited guest speakers recently covering safety, occupational health, environment and quality.
- Operatives demonstrating best practice receive a safety breakfast.
- White board meetings daily with project team to discuss any interface issues, control of deliveries and forward planning.
- Subcontractors required to hold their own monthly safety meetings and are scored as part of the monitoring and proactive reporting and initiatives policy.
- Two defibrillators have been purchased and 13 direct employees have been trained to use. Additional staff including subcontractors are receiving training.
- Operatives issued with a keyring which contains emergency information and ICE stickers issued on completion.
- Access and egress from work areas are manned by security guards/banks man. Roads crossed by construction vehicles are fully controlled with traffic lights where appropriate. Top five at risk boards are strategically placed in prominent areas including highlighting specific risks, activities etc. for that day/week.
- Management team regularly reinforces the ethos that the site is a team and everybody has a part to play in providing a safe environment.
- Random drug and alcohol testing at induction with additional testing carried out.
- Supply chain including S/Cs and suppliers have been required to complete a form indicating registration with FORS and which vehicles in their fleets are meeting latest standards.
- A designated team headed by part of the management set up and on-call rota out of hours.
- As part of highlighting and raising safety improvements and performance, the team actively reviewed the Highways Agency “Raising the Bar” and has identified already achieving very high compliance. Additional safety courses have been introduced and recently 12 operatives and staff completed and attained Triple S certification.
- Increased number of cyclists using footpaths has been identified and additional warning and dismount signs have been displayed.
- Safety leadership talks are used to score and track AFRs and other safety performance data currently providing positive feedback and acknowledging successes.
- In addition to operatives, the entire workforce is required to display ICE stickers and complete paperwork. Compounds have full-time gateman with additional security and mobile guards operating at night with swipe card check points. Additional checks are carried out to work areas to which public have access during adverse weather conditions. HiPer Alerts created to share incidents and lessons across all projects.

Overall, site safety was scored 9 out of 10 which was ranked as an exceptional result by the CCS Monitor.

### 10.3.2.3 Delivery quality

Incidences of non-conformance (NCR) and the cause attributed to them were reported to the ESCC Project Manager on a monthly basis.
Review of the NCR data developed on the ESCC scheme suggests that the top three identified causes of an NCR report on the project were:

- Contractor’s Workmanship.
- Planning/Design.
- Contractor’s Supervision.

10.3.3 Findings from Process Evaluation consultations - key delivery factors

Consultation evidence presented in Section 10.2.4 of this report suggests how the planning and conception phase necessarily reduced contingencies to meet competitive funding requirements. This narrative meant the success of the scheme depended upon there being no significant additional costs generated when delivering the road scheme.

However, most stakeholders reflected on a combination of factors set out below that transpired to impact on scheme delivery (Sections 10.3.3.1 – 10.3.3.5). Though not all consultees cited all these factors, the majority pointed to at least one of these as making a contribution to challenges in delivering the scheme.

Though the factors were commonly raised, there is less agreement on the relative importance between the factors. There is also disagreement among the stakeholders on the overall impact these factors have had on delivering the scheme. The key individual factors are summarised below.

10.3.3.1 Archaeology

It was known at the planning phase that the area was an important Neolithic site, and costs were included for modest excavation. However, the significant opportunity and challenges of
managing a major archaeological effort has become a challenge which has shaped the construction phase of BHLR.

Several stakeholders noted that:
- The additional costs of archaeology could not have been fully anticipated.
- This has been a key area in which the lack of headroom on costs has been crucial.
- Stakeholders have remained committed to fully excavating the site, in spite of resultant additional direct costs.

While archaeological excavation was seen to have disrupted delivery from an engineering perspective, some stakeholders were keen to praise project management of the scheme for showing flexibility to allow the archaeological work to continue on site while construction was ongoing.

Several stakeholders also stressed the importance of the opportunity the BHLR has presented to excavate and learn more about Neolithic history with significant flint scatter and other finds. The archaeological finds have now been identified as being of international significance.

10.3.3.2 Ecology
Though the ecology had already been given consideration at design phase, costs of ensuring the scheme took due consideration of local ecology increased beyond expectations, despite the constructive response of Natural England to mitigation. Some of the impacts that have had cost implications for the scheme include:
- The need to move badger sets sensitively and without distress. Post approval, there was found to be no fewer than 19 badger sets along the proposed site, including a key set where a temporary road diversion needed to be built.
- Delays in moving established colonies of bats due to the mating season.
- The presence of rare great crested newts which needed to be relocated and re-established in the new ponds alongside the road scheme.
- Between 15 and 20 artificial ponds required by the scheme had to be redesigned in order to mitigate their archaeological impact - requiring negotiation with key partners.

On the management of ecology during the delivery phase:
- Some stakeholders stressed how the scheme had done well to adapt to environmental considerations to minimise negative impacts of the road as they emerged. This was not just at initial design stage but throughout the value engineering and delivery process. One stakeholder concluded that the scheme’s approach to environmental mitigation had been ‘world class’.
- Stakeholders noted there has clearly been positive partnership working to preserve and enhance local flora and fauna.

10.3.3.3 Weather and ground conditions
With the road being built across a flood plain, the ground conditions were always expected to pose a challenge in constructing the BHLR. However, the extent of flooding was observed by stakeholders to be significantly greater than anticipated both in winter and summer months. Weather and wet ground were viewed to have combined to significantly hamper construction of the road. For example:
- Extra ground improvement works were required to alleviate problems with soft ground.
- Existing railway cuttings, a key piece of design, proved to be inadequate to be used as intended due to a large landslip occurring early in the contract – again adding to delays and costs.
There is agreement that the weather has worked against the scheme, but there is less of a consensus as to the extent to which weather-based and ground-based factors could have been circumnavigated.

10.3.3.4 Protestors
Direct protestor action, combined with casual vandalism, led to continued costs resulting from security and policing. In addition, ESCC faced non-monetised costs in meeting the concerns of more local protestors – these included legal costs in responding to protestor tactics such as High Court legal challenges. The protests took place mostly before the award of funding and one stakeholder noted the delay in awarding funding may have extended the period when protestors were on site.

There was praise for the way the Police had handled the more vociferous protestors. Local action groups remain, but were viewed as less of an obstacle as when the scheme’s construction commenced. There have been several initiatives which have had a positive impact on these local action groups, and these are set out in subsequent sections.

10.3.3.5 Skills shortages
A number of consultees chose to discuss the delivery of the scheme within the wider context of a national shortage of highway engineering skills. It was noted that few new major roads had been built in recent years leading to a depletion of the skills pool.

The scheme location and remoteness to London was noted by some stakeholders as an issue for personnel recruitment, exacerbated by a construction boom in London. Thus, the project was suggested to, at times, have struggled to recruit and retain construction staff with suitable experience and qualifications.

10.4 Benefits realisation
The majority of consultees were confident that the benefits identified at Public Inquiry will be delivered by the scheme across the elements. Some stakeholders expressed optimism that benefits may exceed expectations though it was noted that delays in final delivery of the scheme would likewise delay some benefits also.

Consultees responsible for delivering the economic benefits of the BHLR were particularly confident that the scheme could unlock greater levels of development than originally forecast with key employment sites unlocked since scheme approval such as the sites in North Bexhill.

Several consultees were keen to note the importance of working closely with local development partners such as Sea Change Sussex to ensure design and delivery of the BHLR supported economic development to the greatest extent possible. Continued engagement throughout the construction programme was suggested to be important to ensure development could be progressed alongside road construction and broadly this was seen to have happened.

Contractor targets for 12 apprentices / trainee engineers on site were met, though the 60% target for locally employed labour was not achieved as only 52.6% of the workforce qualified were locally employed. The locally employed labour force changed over the course of the contract based on the nature of works undertaken.

Stagecoach PLC commenced its new bus service on 17th December 2015, which is the same day that the Link Road opened to traffic. The new service includes the Link Road as part of its route which comprises the following:
● A half-hourly service, numbered 21, running between Bexhill (Devonshire Road) and Hollington Tesco via the BHLR and onwards to Silverhill, St Leonards Warrior Square, Hastings town centre and Ore (Malvern Way).
● Runs Mondays to Saturdays (except public holidays) between approximately 7am and 6.30pm. The Impact and Economic Evaluations will examine in greater depth the extent to which anticipated benefits have been achieved, one, five and fifteen years after road opening.

10.5 Lessons learned and good practice

In this section, we present some of the lessons and examples of good practice identified during the Process Evaluation that could be considered for future design and delivery of highways schemes.

10.5.1 Scheme design and transferable lessons

● Timing of funding and scheme designation impacts on the distribution of costs and risks between DfT and the bodies accountable for scheme delivery.
● Due to inflation, delays to scheme approval can directly affect the cost of delivering a scheme.
● The balance between value engineering, funding contingency levels and risk management is an iterative process that changes as project delivery progresses.
● Protestor action can impact on scheme costs and should be considered further on future schemes. Costs can include security responding to queries and objections, including the costs of legal action. Costs associated by protestor action are estimated to be £2.7million for the BHLR.
● The 50:50 pain and gain share between contractor and client in this project is suggested to be more generous than some construction project contracts as often the share would be 80-20 in the contracting authority’s favour.

10.5.2 Scheme delivery

● Continuity between scheme design and delivery is important and there was some identified loss of knowledge between the stages for the BHLR.
● National and local skills shortages exist in highways engineering which can impact on recruitment and retention of project management and on-site delivery team members.
● As identified by the CCS Monitor, the BHLR includes many examples of good practice for site management that could be reviewed by future infrastructure construction project managers to ensure high standards in appearance, community, environment, safety and workforce management are maintained on site.
● The BHLR includes good examples of management of external factors such as protestor action, archaeology and ecology over the lifetime of scheme delivery. Management requires flexibility to emerging issues, though costs may rise. How the DfT can support management of such factors will be a key learning outcome from delivery of this scheme.
● Partnership working between scheme delivery team and wider stakeholders including regulatory bodies is essential to ensure anticipated benefits can be delivered.
● Commercial understanding of the implications of the NEC contract was viewed as low for some stakeholders with training courses and advice viewed as valuable to address this.
● Examples of best practice for future schemes in BHLR public engagement including site tours for the public and links developed with local schools as a positive process. Alongside
praise, some lessons learned for public liaison were suggested including a stakeholder and decisions log, more advanced notice for residents of road closures and the need for a more pro-active rather than reactive approach to managing communications.

10.5.3 Outputs and outcomes

- Close partnership working with wider stakeholders, statutory and non-statutory is important for delivery of anticipated benefits.
- At the point of drafting of the Process Evaluation, regeneration benefits from the BHLR were anticipated to exceed those forecast at scheme inception.
- Timing of some benefits realisation anticipated to be delayed by scheme programme slippage.

10.6 Summary

The Process Evaluation developed a nuanced and detailed picture of the design and delivery of the BHLR. The Process Evaluation drew from key sources including stakeholder consultations, monthly progress reports, previous independent performance reviews and scheme narrative summaries.

Based on the evidence reviewed and the stakeholder consultations undertaken, the following key conclusions can be drawn:

- Delays in scheme funding and CPO approval led to negative impacts on the BHLR programme delivery and costs including inflation related costs.
- The BHLR was well managed on the whole but affected by a number of external factors such as: protestor action, archaeology, ecology, heavy rainfall and construction sector skills shortages. The extent to which each of these factors affected scheme delivery cannot be determined within the scope of this evaluation.
- There are examples of best practice within the scheme including a well-managed stakeholder engagement programme and excellent health and safety and site management.
- Confidence in scheme benefits realisation is high which has been achieved through close partnership working.
11 Conclusions and evaluation summary

To conclude this report, this section summarises how the scheme is meeting its objectives and assesses the scheme’s impacts against those forecasted.

11.1 Evaluation summary table

The table below presents the results of this report against the forecasts which were outlined in the BHLR Baseline report.

Table 38: Comparison of indicators - forecast and actual results

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Y1 Forecast</th>
<th>Y1 Actual</th>
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</thead>
<tbody>
<tr>
<td>I1</td>
<td>Annual mean NO\textsubscript{2} and PM\textsubscript{10} concentrations are predicted to be below the air quality objectives at all locations within the study area for Year 1 after opening. Improvements in air quality primarily occur in urban areas where total concentrations are high, particularly along the eastern section of the A259, including the Hastings AQMA.</td>
<td>Since the opening of the BHLR in December 2015 there have been noticeable reductions in concentrations of annual mean PM\textsubscript{10} from approximately 23 µg/m\textsuperscript{3} in 2015 to under 20 µg/m\textsuperscript{3} in 2016. There have also been recorded reduction in NO\textsubscript{2} concentrations since the opening of the BHLR. A reduction in AADT between 2015 and 2016 is also noted with a total reduction in AADT of 22% between 2015 and 2016 on the A259 as well as a total reduction in HGV of 18% between 2015 and 2016 on the A259. However further analysis of future monitoring data would be required to fully remove the potential that meteorological impacts or other local factors are accountable for the lower concentrations monitored in 2015.</td>
</tr>
<tr>
<td>I2</td>
<td>The assessment carried out in 2011 predicted a disbenefit of 692 tCO\textsubscript{2}.</td>
<td>The results of this assessment show that the scheme resulted in a benefit in terms of GHGs due to emissions of 430 tCO\textsubscript{2}.</td>
</tr>
<tr>
<td>I3</td>
<td>Year 1 after opening (2013) predictions/ contour Plots suggest that noise increases would be greater than 5dB within the Combe Valley, with the introduction of a new noise source.</td>
<td>Comparison of the L\textsubscript{A10,18hr} 2017 - 1-year post monitoring data with the L\textsubscript{A10,18hr} 2006 measured baseline in the ES show an increase in the noise level in the majority of the Combe Haven Valley (west to and central part of the BHLR), while a decrease in the noise level is localised to the north and east part of the BHLR. Comparison of the L\textsubscript{A10,18hr} 2017 - Year 1 post-construction noise monitoring data with the L\textsubscript{A10,18hr} prediction for 2010 within the 2007 ES and with the L\textsubscript{A10,18hr} prediction for 2013 within the 2009 CPO show that the measured noise level to the south of the BHLR are lower than predicted, particularly for position ST23 and ST30a; while to the north of the road the measured noise levels are in line with the prediction including ST6 that is adjacent to the BHLR. The measured noise level to the west of the BHLR indicate that the value is lower than the prediction while to the south-west (ST24) is the opposite (higher than the prediction).</td>
</tr>
<tr>
<td>I4</td>
<td>Impacts would be minimised through extensive screen mounding, but the photomontages illustrate that some aspects of the scheme would still be visible within the Combe Haven valley. Within the rural section there are very few properties close to the scheme and it is considered that visual impacts would also be reduced from the Day of Opening by the extensive screen mounding. Views from the many Footpaths which cross the area would on the whole be Moderate Adverse in Year 1.</td>
<td>On the A271, there is an increase in traffic from 2012 to 2015. There is a significant decrease in traffic between the 2015 and 2016 data, showing that the scheme has attracted more people to use the main route rather than rat running. There is a further decrease in the 1 year after 2017 data. The data for Crowhurst Road shows more fluctuations with traffic flows reducing between 2012 and 2015, rising during 2016 and reducing again in 2017.</td>
</tr>
<tr>
<td>Indicator</td>
<td>Y1 Forecast</td>
<td>Y1 Actual</td>
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<tr>
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<tr>
<td>I5 Areas for replacement habitats would have been created, and planted. Habitats will not yet be fully functioning but some benefits may be seen. It will not yet be clear whether the No Net Loss strategy has been successful.</td>
<td>When floodplain grassland and fen areas were audited in 2016, no active evidence was present in F29 of any new planting of mixed wetland grassland with rush and sedge. Although adjacent and interconnected floodplain grassland does show some recent evidence of a top soil strip and grassland re-seeding. This is broadly in line with the original management objectives. When species-rich neutral grassland was audited in 2016, no direct evidence was present of new planting or active management to create a species rich neutral grassland. The management objective has not currently been achieved. When mesotrophic grassland scrub and secondary woodland areas were audited in 2016, G10 Greenway and adjacent road grassland areas had evidence of top soil strip and grassland planting, however this is currently of low biodiversity value and does not represent the original MG6 or MG5 grassland. There was some evidence of MG1 communities. However, grassland adjacent to the greenway and road still contains a lot of stone and rubble which is likely to increase the capacity of the area to be dominated by tall ruderals of lower biodiversity value. There was no evidence of active woodland management within the woodland edge. There was also no evidence of coppice rotation or edge thinning which is likely to occur after 5+ years. In relation to W23, W24, W25 and W55 Decoy Pond Wood W23 was not directly observed. However the liner railway woodlands W24, W25 and W26 are benefitting from areas of broadleaved woodland planting to replace woodland lost trees along this corridor. The 2016 audit revealed that the character of the open woodland (W34) has been retained, despite the severance of the scheme and the alignment of the Greenway. The woodland is connected into the wider habitat by adjacent newly planted hedgerows. The woodland shaw (W37) has been retained although severed from southern woodland shaws, broadleaved woodland blocks and hedgerows. The newly planted east west greenway habitats re-connect these areas into the wider landscape. In relation to W27 Marline Wood South edge the audit conducted in 2016 revealed that compensation planting had been undertaken and was largely inline with the original management objective, comprising a mix of broadleaved woodland trees. During the audit 2016, extensive hedgerow planting was observed, however planting was damaged in some areas and needs replacing. Other areas did not tie in to adjacent hedgerows and other habitat features and would benefit from some additional gap planting to strengthen connectivity. The audit in 2016 revealed that ditches had been retained and excavated to match original plans of shallow edge and gently sloping sides. Overall objectives have been largely achieved in terms of water level management. The audit of ponds in 2016 showed that the majority of ponds meet the original objectives, although number and shape of ponds varied due to local topographical and construction issues. As ponds mature, the biodiversity value of the riparian, marginal and aquatic planting should increase.</td>
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<td></td>
<td>The Greenway would be established on opening of the scheme. This network of footpaths and cycleways for non-motorised users would provide a real benefit for pedestrians, cyclists and recreational users, and would enable greater access to the countryside, particularly for those with mobility constraints. An increase in NMU activity</td>
<td>The NMU survey results undertaken in 2017 in comparison to 2006 surveys suggest that the implementation of the BHLR has had a positive effect on visitor numbers of the Combe Valley Countryside Park through the provision of improved access and increase in the quantity and quality of NMU facilities. In 2006 the proportion of walkers within the Combe Valley was 42% compared with 53% in 2017.</td>
</tr>
</tbody>
</table>
### Indicator | Y1 Forecast | Y1 Actual
--- | --- | ---
I7 | With the mitigation included within the scheme design, it is not expected that there would be any adverse effects upon water quality from highways runoff or pollution events. However, construction stage activities may result in an initial degradation in water quality and subsequent marginal aquatic ecology as a result of siltation and construction discharges if not adequately managed and contained during the construction stage. With appropriate mitigation measures in place during construction, the RE Classification for Water Quality is anticipated to be the same in Year 1 after opening as the pre-construction assessment. Aquatic habitats would not have re-established following construction, and would not be fully functioning at this stage. | The post-construction water quality samples taken during 2017 indicate that the water quality of the surrounding waterbodies has not been adversely affected by the construction of the scheme, given that both copper and zinc concentrations are below the corresponding EQS values identified. Overall, the quality of the waterbodies in question appears to have improved over the ten-year period since the baseline water quality samples were obtained. The results from the 2017 samples are consistent with the ecological assessment of the Powdermill Stream, Watermill Stream and Combe Haven waterbodies as part of the WFD; for which copper and zinc concentrations have reported to be at 'high' status during the most recent assessments conducted. Overall, the results from this report suggests that the current mitigation to reduce the impacts of routine run off from the scheme on the receiving waterbodies is sufficient, and therefore no further action is required or recommended. |
I8 | Forecast accident savings for local road network: 4.6 | Actual accident saving of 144 accidents compared to the 2009-2012 three year period average, or a saving of 19 accidents when compared to the 2012 data alone. |
I9 | Forecast accident saving for A259 between Belle Hill and The Ridge: 8.1 | Actual accident saving for A259 between Belle Hill and The Ridge: 12 | Actual accident saving for A259 between Waller’s Haven to Butcher Lane: 6.9 | Actual accident saving for A259 between Waller’s Haven to Butcher Lane: 15 |
I10 | Business space completed: 0 m² |
Housing units constructed: 0 | At this early stage, many of the ambitions for housing and commercial development are yet to be realized. However, progress can be seen in several the sites, with some developments completed and others showing works have begun and continue to progress. |
Business space completed: 2,344 m² |
Housing units constructed: 0 |
I11 | Direct Jobs: 39 |
Indirect Jobs: 0 | Approximately 39 permanent jobs were supported through the labour and supplier expenditure in construction of the BHLR in the South East. A survey was carried out on the one business that had relocated to the newly developed land. It found that since the relocation the number of staff has increased from 60 to 110 and 90% of them are residents of East Sussex. |
I12 | Not included in the Baseline report | To date, the BHLR has incurred supply chain costs associated with construction of approximately £12.8m in labour and £79.1m in suppliers. This has been spent on goods and services across the UK (and some internationally), with 15% of labour expenditure and 50% of supplier expenditure on the South East of England65. Together, 45% of all expenditure on labour and suppliers has been spent in the South East of England. Approximately 3% of the total labour expenditure and 8% of expenditure on suppliers were concentrated locally in East Sussex. |
I13 | Journey times from A259 Belle Hill/A269 London Rd, Bexhill through to | A comparison of journey times pre and post opening of the BHLR shows a decrease in journey times with the inclusion of "Client information collected in the Application for Payment log."
<table>
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<tr>
<th>Indicator</th>
<th>Y1 Forecast</th>
<th>Y1 Actual</th>
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<tbody>
<tr>
<td>A259/A2101 London Rd to reduce by 5 minutes in each direction compared to the baseline position by end of Year One.</td>
<td>the scheme in all time periods and both directions and the journey time savings of up to nearly two minutes are significant considering the short route length between A259 Belle Hill/Combe Valley Way and A259/Harley Shute Road. This is less than the 5 minute prediction from the Public Inquiry traffic model made before the opening of the BHLR for a longer stretch of the A259. However, the observed journey time savings are higher than predicted by the BAFFB traffic model for the same, shorter stretch of A259.</td>
<td></td>
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<tr>
<td>Therefore, all change should be observed in the One Year after report.</td>
<td></td>
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<tr>
<td>Yr1 forecasts taken from Public Enquiry traffic model predictions</td>
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</tbody>
</table>

I14 Predicted AADT traffic reductions:  
- 23%  
Crowhurst Road: -19%  

At both locations, there is an increase in traffic from 2011 to 2015. This is to be expected given traffic growth and given the fact that these are both before the implementation of the scheme. There is a significant decrease in traffic between the 2015 and 2016 data, showing that the scheme has attracted more people to use the main routes rather than rat running. There is a further decrease in the 1 year after 2017 data in each location.

I15 Predicted traffic reductions for A259 of Yr 1: -39%  
Traffic analysis shows a 21% decrease in the Eastbound direction and a 23% decrease in the Westbound direction in traffic reduction for the A259. This is a smaller reduction than that anticipated before the opening of the BHLR.  
Data gathered also shows a similar number of cyclists before and after scheme opening, forming a similar proportion of the total observed traffic. Analysis has also been undertaken of cyclist numbers on the parallel off-road cycle route at Galley Hill. The data shows a slight reduction in cyclists after the scheme has opened.

Source: Mott MacDonald

11.2 Concluding remarks

The OYA report has established that many of the indicators used to demonstrate the effects of the BHLR scheme are delivering as predicted or better than predicted (including I6, I7, I8, I9, I11 and I13). This shows that the BHLR scheme is meeting its objectives in these areas. Some indicators (such as I4 and I10) are more long-term and it was not expected that they would reach their full potential in the first year. A few indicators (such as I15) have not reached their forecasted level, but at this stage it is difficult to establish whether this is a long-term result or a temporary issue. Further assessment to track the progress of all indicators is necessary to establish how the scheme meets and maintains the targets set in the Baseline report.

The Process Evaluation developed a nuanced and detailed picture of the design and delivery of the BHLR. Using information from a variety of sources (including stakeholder consultations, Project Board reports and independent performance reviews), the following three findings emerged:

- Delays in scheme funding and CPO approval led to negative impacts on the BHLR programme delivery and costs including inflation related costs.
- The BHLR was well managed on the whole but affected by a number of external factors such as: protestor action, archaeology, ecology, heavy rainfall and construction sector skills shortages. The extent to which each of these factors affected scheme delivery cannot be determined within the scope of this evaluation.
- There are examples of best practice within the scheme including a well-managed stakeholder engagement programme and excellent health and safety and site management.

By examining key economic data for the area before and after the opening of the scheme, the following was established:
● Hastings has a higher proportion of its residents claiming JSA benefits than the national average, and Rother has the lowest rate of all comparator areas. Both districts saw the claimant rates continue to fall after the BHLR opened.
● Hastings has consistently seen much lower house prices than the national average, and Rother has the highest rate of all comparator areas. Both districts are seeing an upward trend in prices that continues after the BHLR opened.
● Hastings saw an increase in NVQ 1,3 and 4 qualifications. This is in line with the other comparator areas, but at a smaller increase rate. Rother saw a similar pattern of increase across the NVQ qualifications, with levels 3 and 4 increasing at a faster rate than the national average.

While these changes cannot solely be attributed to the opening of the BHLR, the scheme is supporting economic growth across East Sussex. During construction, a total of approximately 39 permanent jobs were supported through the labour and supplier expenditure in construction of the BHLR in the South East. For the rest of the UK, this number rises significantly to 110 permanent jobs (it is important to remember, however, that this is for the purposes of comparison - there will be many more jobs than this, but lasting for only a short time during the construction period). These jobs translate into supporting approximately £2.0m GVA in the South East economy, with £0.3m GVA concentrated locally in East Sussex.

At this very early stage in the 25 year benefits plan, many of the ambitions for housing and commercial development are yet to be realised. Upon completion, the development sites associated with the BHLR are anticipated to create the largest concentration of employment space anywhere in the area with the capacity to support 3,000 jobs. However, progress has been made at several sites, with some developments completed and others showing works have begun and continue to progress. There have been key economic benefits from the construction and operation of the road. These include Bexhill Enterprise Park – has seen sites completed and opened within the first year of the road being in operation. The first property to be completed at Bexhill Enterprise Park was Glovers House, which was let on completion in December 2015 to Park Holidays UK. Park Holidays UK used to employ 60 staff at its old headquarters but now employs 110 staff following relocation and expects to add 10 new positions in 2017. The company’s head-quarters are now located at Glovers House where it has room for future expansion.
Appendices

A. List of appendices 138
A. List of appendices

Please see supporting documents for the following appendices:

- Appendix A Noise Measurements Positions;
- Appendix B Post-Construction Noise Measurements;
- Appendix C Landscape Viewpoint Locations;
- Appendix D Photomontages Pre-Scheme, Year 1 predicted and Year 1 actual;
- Appendix E Phase 1 Study Area;
- Appendix F Nature Conservation Strategy;
- Appendix G Biodiversity Mitigation Strategy;
- Appendix H Biodiversity Audit Tables;
- Appendix I NMU Survey Locations;
- Appendix J 2006 NMU Survey Interview Questions;
- Appendix K 2017 NMU Survey results; and
- Appendix L Water Quality Monitoring Locations.