

A417 Missing Link PEI Report Non-Technical Summary





FORD FUEL OILS



Introduction

Highways England proposes to improve the A417 Missing Link by providing a two-lane dual carriageway between Brockworth bypass and Cowley roundabout in Gloucestershire (the proposed scheme). The proposed scheme is a highways Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008. This means that an application will need to be made for permission to construct the scheme. This permission is called a Development Consent Order (DCO).

Before a planning application for a DCO is submitted, the local community and other stakeholders must be formally consulted on the proposals, including:

- a description of the proposed scheme
- the likely significant environmental effects based on the preliminary environmental information available at the time
- measures to avoid or reduce such effects
- the alternatives if any considered

This is to support consultees in developing an informed view of the likely significant environmental effects of the proposed scheme.

As well as undertaking this consultation, we are continuing to collect and assess information about environmental effects to inform decision making, a process known as environmental assessment.

While the environmental assessment is ongoing, we have prepared a Preliminary Environmental Information (PEI) Report to provide sufficient information to help consultees to develop an informed view of the project in light of its likely environmental effects. The PEI Report has been developed for the purposes of this consultation and presents currently available information from the ongoing environmental assessment. This document provides a summary of the PEI Report.

The information contained within the PEI Report is preliminary and this along with feedback received from the consultation will help to shape and develop the findings for the Environmental Statement (ES). The ES will be submitted as part of the DCO application.

Why is the scheme needed?

The Government identified the A417 Missing Link in its first Road Investment Strategy (RIS1) 2015-2020, which sets out a five year investment programme for improvements to the strategic road network (SRN). RIS1 acknowledged that any solution for the Missing Link needs to take into account both the environmental sensitivity of the site and the importance of the route to the local economy.

Delivery of the scheme will be subject to confirmation of funding within the second Road Investment Strategy (RIS2), which will cover the period between 2020 and 2025 and is due to be published towards the end of 2019.

The A417/A419 provides an important route between Gloucester, Cheltenham and Swindon that helps connect the West Midlands and the north to the south of England via the M5 and M4 motorways. While most of the route is dual carriageway, there is one section that isn't. Known as the Missing Link, this three-mile stretch of single carriageway between the Brockworth bypass and Cowley roundabout severely restricts the flow of traffic.

Traffic congestion can be frequent and unpredictable, leading to motorists, including HGV drivers, to divert onto smaller local roads to avoid long delays. This causes difficulties for neighbouring communities as these local roads were not built to accommodate such a high level of traffic.

The sensitive nature of the Cotswold escarpment, the shape of the landscape and the area being part of the Cotswolds Area of Outstanding Natural Beauty (AONB) present particular environmental and engineering constraints on the proposed scheme.

There are also specific planning and regulatory requirements that apply to development within the AONB, including that we need to demonstrate a compelling reason for the improvement scheme, and show that the scheme demonstrates that any benefits outweigh the costs very significantly.

Over the years, there have been numerous attempts to find a solution, but for various reasons, including affordability and changes in investment priorities, these have never become a reality.

However, in recent years, the case for improvement has become far more compelling – to improve safety, support the economy, ease congestion and reduce pollution. On this stretch of road alone, there were 49 personal injury collisions between 2013 and April 2018, 10 of which were fatal.

The project

Description of the Proposed Scheme

The proposed scheme would provide 3.6 miles (5.8 km) of new dual carriageway connecting the existing A417 Brockworth bypass with the existing A417 dual carriageway south of Cowley.

It consists of the following key features:

- a green bridge near Crickley Hill
- a new junction at Shab Hill, which would provide access to Birdlip via the B4070, and to the A436 for Oxford and Cheltenham
- a new junction arrangement at Cowley, which would make use of an existing underbridge to provide access for vehicles in all directions
- the existing A417 between the Air Balloon roundabout and the Cowley roundabout would be largely repurposed. Some lengths of this existing road would be converted into a route for walkers, cyclists and horse riders. Other sections would be retained to maintain local access for residents

These features are illustrated on the overall scheme consultation plan presented on the following page.

The scheme's vision: a landscape-led highways scheme

As part of this improvement, Highways England want to create a landscape-led highways scheme that will deliver a safe and resilient free-flowing road while conserving and enhancing the special character of the Cotswolds AONB; reconnecting landscape and ecology; bringing about landscape, wildlife and heritage benefits, including enhanced residents' and visitors' enjoyment of the area; improving quality of life for local communities; and contributing to the health of the economy and local businesses.

Design Principles

The overarching design principles have been developed as part of engagement exercises undertaken with key stakeholders and include:

- Any solution involving a new road must ensure that the scheme is designed to meet the character of the landscape, not the other way around.
- Any scheme should bring about substantial benefits for the Cotswolds landscape and environment as well as people's enjoyment of the area.
- Any scheme must have substantially more benefits than negative impacts for the Cotswolds AONB.

The three design principles are underpinned by objectives and will be considered and applied throughout the design of the proposed scheme.



LEGEND

- Indicative Scheme Boundary
- Potential walking, cycling and horse riding (WCH) paths
- Existing WCH paths
- Proposed native woodland / scrub
- Proposed tree avenue
- Proposed hedgerow
- Proposed limestone grassland
- Proposed dry stone wall
- Rock face with planting
- Watercourse diversion
- Drainage basin
- Existing contours
- Proposed embankment
- Proposed cutting

**A417 MISSING LINK
OVERALL SCHEME
CONSULTATION PLAN**

Alternatives

A range of route options for the A417 Missing Link were investigated, assessing them against the scheme's vision and objectives, as well as a range of engineering, economic and financial criteria. The need for a safe, resilient road that reconnects the landscape and contributes to local communities is imperative for this scheme.

As a result of this assessment, two route options were proposed at consultation in February and March 2018: Option 12 and Option 30. The consultation showed widespread public support for improving the A417 Missing Link, and particularly for Option 30, which 72% of respondents to the consultation favoured.

Since Option 30 was announced as the preferred route, work has been undertaken to refine the scheme so that further feedback on the detailed proposals can be obtained, before submitting the DCO application.

For more information on our route options consultation and the preferred route announcement, please visit our scheme webpage by following this link:

<https://highwaysengland.co.uk/projects/a417-missing-link/>

Scheme development

The scheme has been refined so that further feedback can be obtained on the detailed proposals before submitting the DCO planning application.

We've carried out an assessment of the alternative routes for the A436 link road which were presented at the preferred route announcement in March 2019. Since then, we've engaged with stakeholders such as local councils, environmental bodies, and other organisations as part of our ongoing engagement and assessment process.

As a result of this assessment and engagement, we propose Alternative 2 as the preferred link to the A436. This proposed link runs parallel to the new A417, linking the existing A436 by way of a new, smaller roundabout to the north of the Air Balloon roundabout. Our preferred solution would reduce impact on the landscape by ensuring that as much as possible of the surrounding land is left as we found it. The preferred link would be single carriageway, with verges on each side.

A junction would provide access to Birdlip Radio Station, as well as Shab Hill Barn and Farm.

Highways England's proposal is that Alternative 2 is chosen as the link road for the A436 based on the assessments and engagement on the three possible alternatives to date. However, we will have regard to all responses received through this consultation process, including any comments about alternatives to our proposal for the A436 link roads, before taking a final decision on which alternative is to be taken forward.

Our considerations for this decision are set out in the PEI Report.

What do we mean by 'landscape-led'?

Landscape-led means that landscape is a primary consideration in every design decision that we make. The proposals have been designed to meet the character of the surrounding area, rather than changing the landscape to fit our proposals.

An environmental masterplan is being developed to set out how any impact on the environment can be reduced and areas for wildlife, archaeology, watercourses and public accessibility can be enhanced. This will be submitted as part of our DCO planning application.

Overview of the scheme

To help understand the scheme and enable comments to be provided as part of this consultation, it has been split up into three sections.

- **Climbing the escarpment (online section)** – a section of road to the west of the existing Air Balloon roundabout which follows the existing A417 corridor.
- **Shab Hill to Cowley Junction (offline section)** – a section including two new junctions. A new junction at Shab Hill, with a link road to both Birdlip and to the A436, for journeys towards Oxford and Cheltenham. A new junction near Cowley, replacing the existing Cowley roundabout. Access to local villages will be maintained via existing underbridges from the A417.
- **Repurposed A417** – repurposing the existing A417 between the Air Balloon roundabout and Cowley roundabout. Some of the existing road would be converted into a route for walkers, cyclists and horse riders. Other sections would be kept to maintain local access for residents.

Potential environmental effects

The environmental impact assessment considers impacts during the construction and operation of the scheme. The construction phase assessment addresses both the temporary activities involved in building the scheme and the subsequent permanent presence of the scheme once constructed. The operational assessment considers the situation when the scheme is being used by traffic.

This section provides an overview of the preliminary findings relating to environmental impacts. The preliminary assessment is summarised in the table at the back of this non-technical summary.

During its construction, most of the proposed scheme's potential adverse impacts would be avoided or reduced by the implementation of industry standard practice and control measures, which would be contained within an Environmental Management Plan (EMP).

Further work continues to be undertaken as part of the EIA process to confirm the preliminary findings presented below. The final assessment of environmental impacts will be presented in the ES that will be submitted with the DCO application. The application will also include an outline EMP.



Air quality

Baseline

There are areas of poor air quality around the proposed scheme. There is one Air Quality Management Areas (AQMA) within 200m of the proposed scheme, located at the Air Balloon roundabout, known as the Birdlip AQMA.

There are a further 7 AQMA's within the wider road network outside of the construction footprint. A regional air quality assessment will be undertaken to assess the change in operational traffic emissions in these areas.

AQMAs are areas which the local authority has identified as requiring management to achieve desired air quality objectives and to protect health. Birdlip AQMA suffers from poor air quality as a result of traffic emissions from vehicles using the existing road. Air quality at the Crickley Hill and Barrow Wake Site of Special Scientific Interest (SSSI) is below the critical air quality levels defined for the SSSI.

Construction

During construction, potential air quality effects may arise from emissions of construction dust and particulate matter. These emissions could occur as a result of the proposed construction activities such as demolition and earthworks. The quantities of emissions would depend on the scale and intensity of the construction works. Best practice mitigation measures to reduce effects from construction dust would be used. These measures would typically include dust suppression techniques and road sweeping.

Preliminary construction assessment

- No likely significant effects are anticipated during construction.

Operation

During the operational phase, potential air quality effects may arise from emissions of pollutants from vehicles using the road network. The proposed scheme would change the flows on both existing roads and other roads in the wider surrounding area. This would result in changes to pollutant emissions from vehicle traffic on the affected roads and thus changes in pollutant concentrations at nearby sensitive locations.

There are no predicted exceedances of the air quality objectives in the opening year. Where increases in pollutant concentrations do occur as a result of the proposed scheme these are considered to be negligible. The proposed scheme improves air quality at a number of locations nearby in particular at the Air Balloon roundabout and the properties known as Air Balloon Cottages. The proposed scheme moves the road away from receptors in this area and improvements to traffic flow are predicted.

Ecological receptors are not predicted to experience any significant impacts as a result of the proposed scheme. Large improvements have been predicted to occur at Crickley Hill and Barrow Wake SSSI. Air quality is predicted to improve at these locations as the existing A417 is moved away from these receptor locations and the congestion on the A417 is improved.

Preliminary operation assessment

- No significant impacts to local air quality are predicted to occur as a result of the proposed scheme.
- Regional effects on air quality from the scheme will be reported in the ES.
- Air quality would likely be improved at properties in the Birdlip AQMA and at ecological receptors close to the proposed scheme.



Cultural heritage

Baseline

Cultural heritage includes archaeology, historic buildings/structures and historic landscapes. The existing A417 runs through a landscape of historical interest, with archaeological evidence present from prehistoric times to the Second World War. Within the study area of the proposed scheme, the landscape comprises historical assets including 10 scheduled monuments, 50 listed buildings, a registered park and garden, and two conservation areas.

Construction

During construction, there is potential for disturbance to unknown archaeological remains where the proposed scheme requires excavation below the existing ground surface. A detailed heritage desk-based assessment, and an archaeological geophysical survey are underway. This would be followed by targeted archaeological evaluation trenching. The surveys would inform mitigation, in the form of final scheme design choices and landscaping and would help establish pre-construction archaeological investigation strategies.

Construction activity, including movements of plant, temporary lighting and temporary compounds, would take place within the wider setting of listed buildings and other heritage assets within the study area. These works would be temporary and of limited duration.

Preliminary construction assessment

- Construction activities would adversely affect some heritage assets such as Crickley Hill during construction.

Operation

Impacts on the historic environment would take place during the operational phase of the proposed scheme; this would include traffic noise, and views of moving vehicles on the road from heritage receptors. There will be no physical impacts on below-ground archaeology during operation, as these will have occurred during the construction phase. Further assessment to fully understand the likely effects and to enable the development of detailed mitigation strategies is underway.

Preliminary operation assessment

- Further assessment work is ongoing. Operational effects will be fully considered in the ES.

Landscape and visual impacts

Baseline

The proposed scheme would be situated in the Cotswold AONB, a landscape which is highly valued for its scenic qualities and enjoyed by visitors and residents to landscape features including Crickley Hill Country Park, Barrow Wake, Leckhampton Hill and Coopers Hill. The landscape has a strong cultural heritage which is visually evident through Neolithic barrows, Iron age hill forts, historic medieval field patterns with ridge and furrow and later planned enclosures as well as historic parks and gardens.

Recreational viewpoints exist along the Cotswold Way National Trail and Gloucestershire Way, as well as other local public footpaths and cycle networks, Crickley Hill Country Park, Leckhampton Hill, Barrow Wake and The Peak. The proposed scheme has the potential to affect these viewpoints. Viewpoints which could also be affected include from communities around Shab Hill, Stockwell and Brimpsfield, from employment and commercial viewpoints representative of Cowley Manor and The Golden Heart Inn, along with views from the road

Construction

During construction, there would likely be significant effects on the landscape character within the study area and on the Cotswolds AONB. These effects would mostly be temporary in nature, associated with temporary construction compounds with lighting and fencing, temporary haul roads and the storage of materials. As the scheme is gradually built throughout the construction phase, permanent effects would increasingly become part of the landscape and views.

Preliminary construction assessment

- Likely temporary significant adverse effects on the landscape character within the study area and on some of the Special Qualities of the Cotswolds AONB.
- Likely temporary significant adverse effects and temporary significant beneficial effects on visual receptors including recreational users of the Cotswolds Way National Trail and visitors to the Cotswolds AONB and Crickley Hill Country Park.

Operation

The design of the proposed scheme will be developed to integrate the A417 into the existing surroundings, enhancing the local environment where possible. Landscape and visual effects are likely to occur as a result of changes to existing landscape features or characteristics, including changes to views.

The visual character of the area is likely to change as a result of the presence of the widened road, the green bridge, and changes to vegetation along the southern side of the A417.

Preliminary operation assessment

- A mix of likely permanent significant beneficial and permanent significant adverse effects on landscape character areas.
- A mix of likely permanent significant beneficial and permanent significant adverse effects on recreational user views.



Biodiversity

Baseline

There are numerous sites designated for ecological interest within the vicinity of the proposed scheme. These include Cotswold Beechwoods Special Area of Conservation (SAC) and several Sites of Special Scientific Interest (SSSI) including Crickley Hill and Barrow Wake SSSI. The surrounding area also includes a number of Local Wildlife Sites and other sites of biodiversity importance including Ullen Wood and Barber Wood.

There are also protected and priority species in close proximity to the proposed scheme.

There are also priority habitats including;

- Lowland calcareous grassland,
- Lowland meadow,
- Deciduous broadleaved woodland,
- Wood pasture.

Construction

The sites of ecological interest and other priority habitats throughout the proposed scheme have the potential to be affected by the proposed scheme either directly as a result of habitat severance and loss, or indirectly due to changes in air quality or hydrological changes resulting in degradation of habitat.

Ecological surveys are ongoing and will inform the ES. These surveys and the associated ongoing ecological impact assessment will help inform detailed mitigation measures and construction methodologies, which will safeguard the conservation status of populations through the construction phase.

Preliminary construction assessment

- Likely temporary significant adverse impacts on designated sites and protected species.
- Likely permanent significant adverse impacts on non-statutory designated sites.

Operation

Potential impacts on protected species during operation may include, but would not be limited to, disturbance from increased levels of noise or lighting, habitat degradation due to changes in air quality and incidental mortality through animal vehicle collisions. The ongoing ecological surveys and impact assessment will help identify mitigation and enhancement measures to reduce the magnitude of impacts through the design and associated ecological and landscape master plan.

Mitigation measures currently being incorporated into the proposed scheme design include a green bridge to provide connectivity for wildlife, wildlife friendly design of culverts and bridges to maintain connectivity and mammal fencing.

Locally appropriate habitats will be created along the route and designed to connect into existing habitats and wildlife corridors which will mitigate loss and fragmentation of habitat and enhance biodiversity within the local area. Through our mitigation and enhancement proposals, the proposed scheme is aiming to see an increase in habitat quality and diversity of flora and fauna compared to now. Habitat creation and plant species selection will be informed by ongoing surveys and appreciation of local biodiversity characteristics.

Preliminary operation assessment

- Likely significant beneficial impacts during operation on biodiversity due to habitat creation measures.



Geology and soils

Baseline

The Cotswold escarpment dominates the regional landscape. An extensive plateau exists above the escarpment, underlain by limestone, which was historically quarried across Crickley Hill and Leckhampton Hill. The proposed scheme passes through an area of relict landslide deposits around Brockworth bypass and Crickley Hill. Agricultural land includes areas classified as best and most versatile (BMV) land. A number of possible sources of contamination have been identified.

Construction

Excavations for the proposed scheme could result in the permanent removal of geological exposures and geomorphological features within the Crickley Hill and Barrow Wake SSSI. Due to the nature of this geology, there would be potential for rockfalls during construction from the escarpment into the existing carriageways or proposed works. Mitigation measures, such as limiting excavations through the SSSI area, creating new geological exposures within proposed cuttings, or enhancing existing geological exposures, would be incorporated in the design.

The proposed scheme could also impact the stability of existing former quarries if they contain open pit faces. Landslide prone deposits may also be encountered around Shab Hill. Further investigations will be undertaken to characterise the slope deposits and current slope condition. Monitoring of the existing slopes should be undertaken throughout design and construction.

Construction for the proposed scheme would lead to the temporary loss of agricultural land for construction compounds, haul roads and other works areas. However, given the temporary and short-term nature of the construction phase, and with appropriate mitigation, this is unlikely to result in long-term residual effects on agricultural land. An Agricultural Land Classification (ALC) survey and associated Agricultural Land and Soil Resources Report will be undertaken.

The proposed scheme also has the potential for adverse effects related to contaminated materials which may be present in the ground. Construction activity could result in the mobilisation of contaminants and the generation of contaminant transport pathways from site activities.

The findings from the ongoing and historical ground investigations will be used to inform options for appropriate mitigation. A management plan will be produced which will detail mitigation measures to limit or potentially completely remove these effects and ensure adverse effects are reduced as far as possible.

Preliminary construction assessment

- A mix of likely significant permanent adverse and significant beneficial effects on geological designated sites and the distinctive geomorphology of the Cotswold escarpment.
- Likely significant permanent adverse effects on best and most versatile agricultural land.

Operation

Operation of the proposed scheme would not include any activities that are likely to have an impact on geology and soils.

Preliminary operation assessment

- No significant effects are considered likely during the operation of the proposed scheme.



Materials assets and waste

Baseline

The use of materials and generation of waste is under consideration as part of the assessment. The baseline situation includes the availability of materials including primary minerals within the region and the capacity of waste management infrastructure. In the Gloucestershire region, the landbanks for crushed rock and sand and gravel are expected to meet projected demand for 17 years and 6 years, respectively. There is capacity in the waste management infrastructure in Gloucestershire and the UK should this be required for the proposed scheme.

Construction

During construction, the proposed scheme would require the import of materials to site which may have an impact on local sources of material, although this is anticipated to be small in the context of suppliers which regularly provide material for similar projects. The excavation works would result in a large surplus of material (approximately 750,000 cubic meters). Opportunities to use this material as part of the proposed scheme would be sought, including for engineering uses and essential landscaping. This would reduce the noise and air quality impacts associated with the transportation of large quantities of materials.

There would likely be some waste arising from the proposed scheme, however, where possible, waste would be prevented and designed out. Any waste generated would be managed in accordance with the waste hierarchy, with a preference to reduce and reuse prior to disposal.

Preliminary construction assessment

- There would be no significant effects relating to materials during construction.

Operation

Material use and waste generation is expected to be very small during operation of the proposed scheme, with no significant effects expected. Operational waste and materials have consequently been scoped out of the assessment.

Noise and vibration

Baseline

The existing A417 passes close to residential properties resulting in high existing noise levels along the A417. This is reflected in the designation of six 'Noise Important Areas' (areas identified by the government as being most exposed to noise) in the vicinity.

Construction

During the construction of the proposed scheme, temporary significant noise effects would occur at three residential locations, and three non-residential locations including certain Public Rights of Way (PRoW) in the AONB. Construction noise would be managed through the application of best practice measures including implementation of a traffic management plan, selection of quiet and low vibration equipment, locating equipment away from residential areas to minimise noise disturbance, the use of enclosures for stationary equipment, and the use of temporary screening hoarding/bunds. Construction vibration impacts are identified at two dwellings. Vibration effects from construction would be controlled with suitable mitigation.

Preliminary construction assessment

- Construction activities would result in likely significant temporary adverse noise effects for nearby residential properties and public footpaths in close proximity to the works.
- Significant adverse vibration effects are considered unlikely.

Operation

Once operational, changes in the noise environment would arise from changes in the road layout which alter the distance between road traffic and sensitive receptors such as residential properties and users of PRoW. Changes in noise levels would also be associated with changes in traffic flows, composition and speed on the local road network.

During operation, significant beneficial effects would mainly occur in areas where the existing A417 would be removed, such as near Birdlip. However, potential significant adverse noise effects are likely at some dwellings across the area of the proposed scheme. It is assessed that there would be more significant beneficial effects than adverse effects.

Noise reduction measures would be included where practicable within the proposed scheme such as the use of noise screening/earthworks and the use of lower noise surfacing.

At Crickley Hill Country Park, 'The Scrubbs' area and footpaths on the escarpment rising up to the Country Park, along with other local trails, there would be a reduction in road traffic noise levels. The greatest noise reduction would be at the lower part of the hill closer to the section of the A417 that would be removed south of the Air Balloon roundabout.

Significant beneficial effects have been assessed for PRoW in the AONB near to where the existing road would be removed. Also, some PRoW, including one section of the Gloucestershire Way, would be affected by significant adverse effects along the proposed new road alignment.

Preliminary operation assessment

- Likely significant permanent adverse effects at properties and some PRoW along the proposed route.
- Likely significant permanent beneficial effects at properties and PRoW along where the existing A417 is to be removed.

Population and human health

Baseline

The assessment of population and human health encompasses vehicle travellers, walkers, cyclists and horse riders, communities, land and property and human health.

There is an extensive network of PRoW and local routes in the vicinity of the proposed scheme which have the potential to be affected.

Construction

During construction the proposed scheme is likely to lead to both beneficial and adverse effects. Employment opportunities and spend within the economy during construction is likely to be beneficial, whilst potential direct effects on agricultural land and indirect effects on those within close proximity to construction works are likely to bring temporary negative effects. Two properties would be directly affected by the proposed scheme as these would be demolished. Mitigation measures during construction would include temporary diversions and signage to limit the impacts of any temporary closures of rights of way and agricultural accesses.

Preliminary construction assessment

- Likely significant permanent adverse effects on demolished properties.

Operation

Once operational, the proposed scheme is anticipated to bring beneficial effects in terms of overall accessibility and connectivity, both for the local community and for those visiting the area. The proposed scheme would bring potential journey time savings and reduced risk of accidents, bringing slight beneficial effects for road users and walkers, cyclists and horse riders. The proposed scheme includes a number of new crossing points which would provide better and safer links across the A417. No significant long-term negative effects are anticipated during operation of the proposed scheme.

Preliminary operation assessment

- Likely significant permanent beneficial effects on connectivity and amenity for users of the PRoW network.
- Likely significant permanent beneficial health effects in relation to air quality.



Road drainage and water environment

Baseline

The water environment comprises surface water features such as surface watercourses, groundwater resources in relation to water supplies and flood risk within the study area.

The land within the proposed scheme drains to the River Severn and its tributaries to the west, and to the River Churn, a tributary of the River Thames to the east and south-east. There are areas of surface water flood risk across the route of the proposed scheme. The value of the water environment results from the ground and surface water features themselves, and the biodiversity and landscape features they support.

The understanding of the baseline is being supplemented by ongoing groundwater and surface water surveys, including related to aquatic ecology populations. This will give greater certainty about the nature and scale of potential impacts and inform the design of mitigation and enhancement measures.

Construction

During construction, there would be potential adverse impacts on surface water and groundwater flows due to works including cuttings and trenches near to watercourses and the risk of accidental spillages. The proposed scheme would also require the realignment of Norman's Brook.

There are established construction practice guidelines to manage pollution risks during construction. Measures to mitigate any potential adverse effects on the water environment during construction would include pollution control measures such as emergency spill procedures/kit and the approach to managing storage areas and stockpiles. The appropriate sequencing of works would seek to minimise the impact on Norman's Brook. Full details of the ongoing ground investigations will enable mitigation of potential effects on groundwater during construction to be developed.

Preliminary construction assessment

- Likely significant permanent adverse effects on groundwater flows due to activity including cuttings, trenches, and underground structures.

Operation

The excavation of the deep cutting through Shab Hill and the top of Crickley Hill may act as a pathway that diverts surface water between catchments, thereby resulting in a change in flows. Drainage design would be developed to maintain existing catchments.

Without mitigation, operation of the road could lead to pollution impacts on surface water and groundwater from road run-off. Road drainage for the proposed scheme would be developed to protect the water environment from highway pollution and to prevent increases in flood risk. A sustainable drainage system would be developed that would discharge into a series of road drainage attenuation basins to provide treatment before allowing water to gradually soak into the ground or flow into a watercourse. This approach would control pollution from road run-off to higher standards than for the current road.

Preliminary operation assessment

- No likely significant effects are anticipated.

Climate

Baseline

The assessment of climate includes the effects of greenhouse gas (GHG) emissions associated with the proposed scheme. Consideration is also given to the resilience of the proposed scheme to cope with extreme weather events associated with UK climate projections predict an increase in annual temperatures and rainfall, with wetter winters and drier summers. Increases in the frequency of heatwaves, prolonged periods with no rainfall and days when precipitation is greater than 25mm are also predicted climate change.

The baseline for the assessment of climate change resilience is made up of the current climate observations in the local area and future projects changes to climate variables. UK climate projections predict an increase in annual temperatures and rainfall, with wetter winters and drier summers. Increases in the frequency of heatwaves, prolonged periods with no rainfall and days when precipitation is greater than 25mm are also predicted.

Construction

The proposed scheme would result in GHG emissions during construction. A quantitative assessment of these has not been undertaken for the PEI report. These will be reported in the ES when more detailed design information is available.

Mitigation measures would be implemented to reduce emissions during the construction of the proposed scheme, for example through specification of ultra-low sulphur diesel, management and minimisation of energy use, and wherever reasonably practicable sourcing recycled or secondary materials from the local area.

The proposed scheme would be designed to be resilient to impacts arising from predicted future more severe weather events and climatic conditions and designed in accordance with current planning, design and engineering practice and codes.

Preliminary construction assessment

- No likely significant effects with regard to greenhouse gas emissions.

- No likely significant effects with regard to the vulnerability of the scheme to climate change.

Operation

During operation of the proposed scheme emissions would be generated from road users. A detailed assessment of user carbon emissions has not been undertaken at this stage and would be quantified as part of the ES. Assets and infrastructure included as part of the proposed scheme would potentially be affected by climate change and mitigation measures are currently being explored. The impacts of the proposed scheme on relevant environmental resources and receptors in combination with climate change will be assessed and details will be presented in the ES.

Preliminary operation assessment

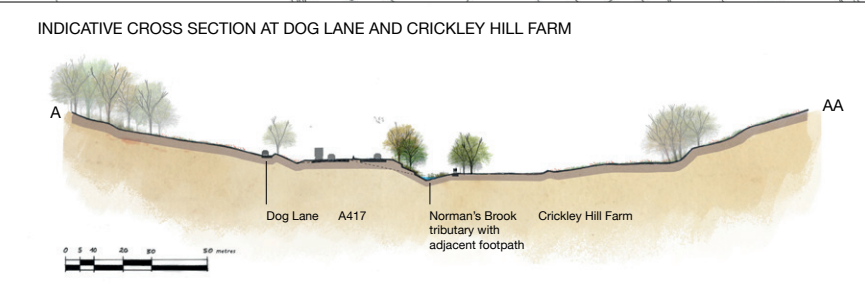
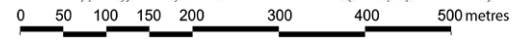
- No likely significant effects with regard to greenhouse gas emissions.
- No likely significant effects with regard to the vulnerability of the proposed scheme to climate change.

Cumulative effects

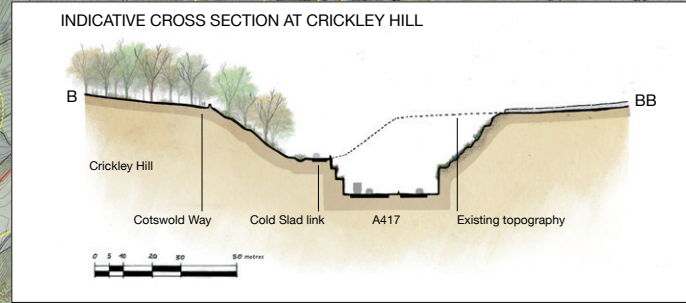
An assessment is being undertaken of cumulative effects arising from the following:

- proposed developments in the vicinity of the proposed scheme that are under construction or have been consented, combined with the effects of the proposed scheme; and
- combined effects from the proposed scheme on a single receptor from a number of individual environmental impacts, for example noise, dust and traffic.

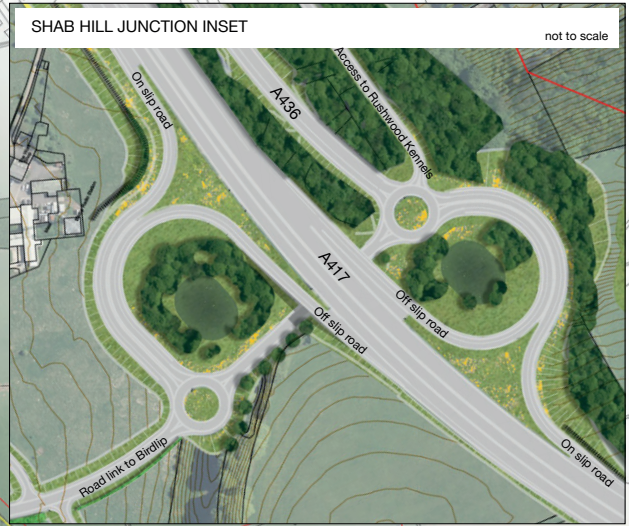
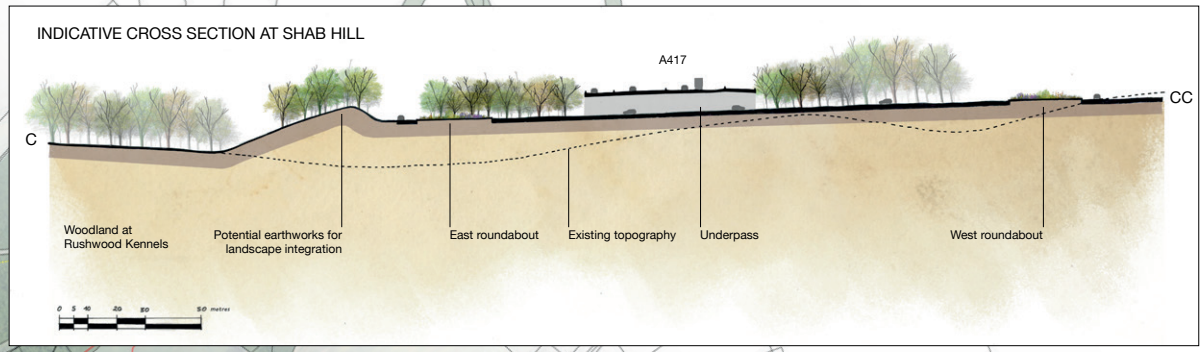
Data is being gathered regarding other proposed developments to facilitate the assessment of likely cumulative effects. The combined effects of different environmental impacts on a single receptor are determined when the environmental assessments for the separate environmental topics have been completed, and as such this data is also not currently available. The cumulative effects assessment will be reported in the ES.



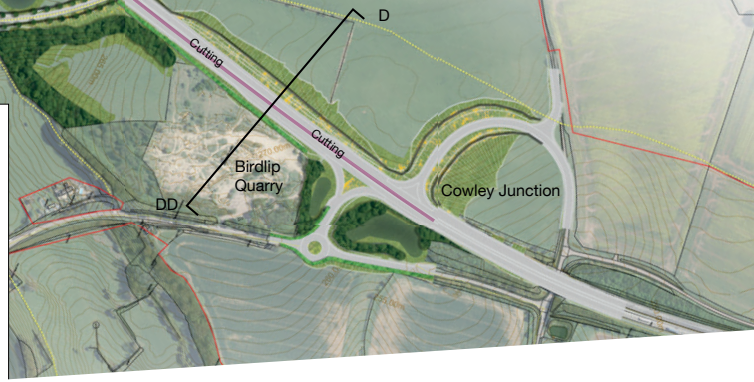
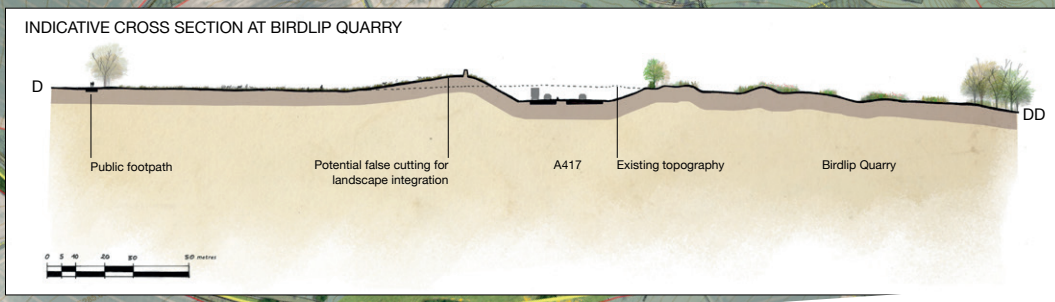
- LEGEND**
- Indicative Scheme Boundary
 - Potential walking, cycling and horse riding (WCH) paths
 - Existing WCH paths
 - Proposed native woodland / scrub
 - Proposed tree avenue
 - Proposed hedgerow
 - Proposed limestone grassland
 - Proposed dry stone wall
 - Rock face with planting
 - Watercourse diversion
 - Drainage basin
 - Existing contours
 - Proposed embankment
 - Proposed cutting



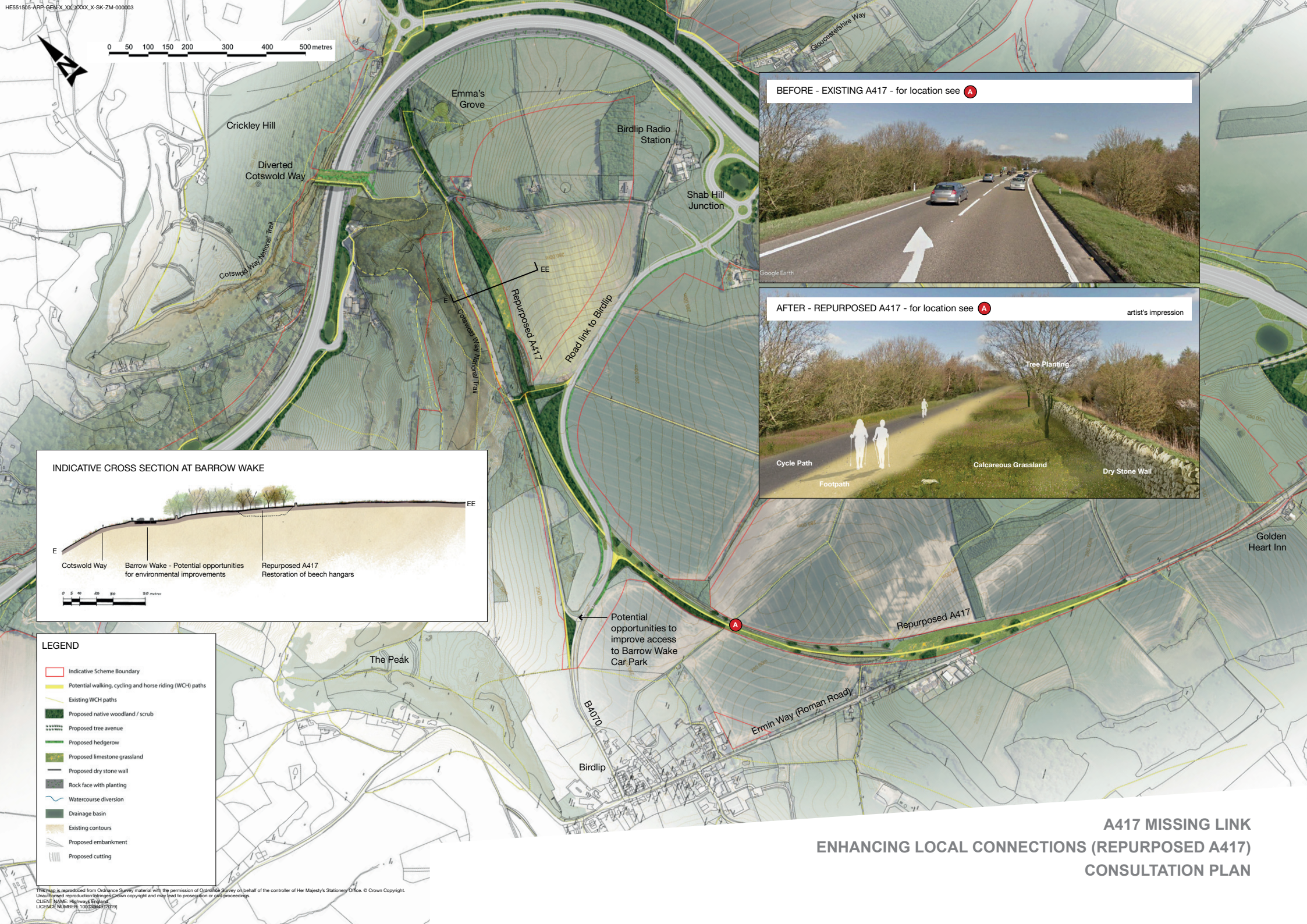
**A417 MISSING LINK
CLIMBING THE ESCARPMENT (ONLINE SECTION)
CONSULTATION PLAN**



- LEGEND**
- Indicative Scheme Boundary
 - Potential walking, cycling and horse riding (WCH) paths
 - Existing WCH paths
 - Proposed native woodland / scrub
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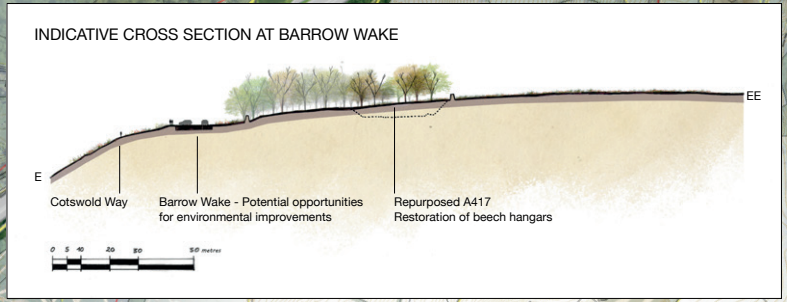
**A417 MISSING LINK
SHAB HILL TO COWLEY JUNCTION (OFFLINE SECTION)
CONSULTATION PLAN**



BEFORE - EXISTING A417 - for location see **A**



AFTER - REPURPOSED A417 - for location see **A** artist's impression



- LEGEND**
- Indicative Scheme Boundary
 - Potential walking, cycling and horse riding (WCH) paths
 - Existing WCH paths
 - Proposed native woodland / scrub
 - Proposed tree avenue
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Potential opportunities to improve access to Barrow Wake Car Park

A417 MISSING LINK
ENHANCING LOCAL CONNECTIONS (REPURPOSED A417)
CONSULTATION PLAN

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Preliminary assessment of likely significant environmental effects*

Topic	Construction stage	Operation stage
Air Quality	<ul style="list-style-type: none"> ■ No likely significant effects anticipated. 	<ul style="list-style-type: none"> ■ No likely significant effects anticipated.
Cultural Heritage	<ul style="list-style-type: none"> ■ Permanent adverse effects on the setting of 5 No. scheduled monuments, which include: barrows and Crickley Hill Camp. ■ Permanent adverse effects on Shab Hill Barn Grade II Listed Building ■ Adverse effect anticipated if below ground archaeology is directly impacted. 	<ul style="list-style-type: none"> ■ None assessed at PEI stage – see chapter 6.
Landscape and Visual	<ul style="list-style-type: none"> ■ Temporary adverse effects to the landscape character and on the Special Qualities of the Cotswolds AONB. ■ Temporary adverse effects likely for landscape character areas that are directly affected by the proposed development including, LCT 2 Escarpment, LCT 7 High Wold, LCT 8 High Wold Valley and LCT 18 Settled Unwooded Vale. ■ Temporary adverse effects experienced by residents of Little Witcombe and Great Witcombe, Shab Hill, Cowley, Stockwell, visitors to the Cotswolds AONB, and users of the public rights of way (PRoW) network. 	<ul style="list-style-type: none"> ■ Combination of adverse and beneficial permanent effects to the landscape character and on the Special Qualities of the Cotswolds AONB. ■ A mix of adverse and beneficial permanent significant effects likely for landscape character areas that are directly affected by the proposed development including, LCT 2 Escarpment, LCT 7 High Wold, LCT 8 High Wold Valley and LCT 18 Settled Unwooded Vale. ■ Temporary adverse effects experienced by residents of Little Witcombe and Great Witcombe, Shab Hill, Cowley, Stockwell, visitors to the Cotswolds AONB, and users of the public rights of way (PRoW) network.
Biodiversity	<ul style="list-style-type: none"> ■ Adverse effects likely on ancient woodland and veteran trees due to irreplaceable habitat. ■ Adverse effect possible on bats depending on outcome of ongoing surveys. 	<ul style="list-style-type: none"> ■ Beneficial effect on ecological connectivity. ■ Adverse effect likely due to irreplaceable habitat. ■ Adverse effect possible on bats depending on outcome of ongoing surveys.

Geology and Soils	<ul style="list-style-type: none"> ■ Permanent adverse or permanent beneficial effects on SSSI or geologically designated sites, including the distinctive geomorphology of the Cotswold escarpment, Crickley Hill and Barrow Wake SSSI, and the Churn Valley. ■ Adverse effect on best and most versatile agricultural land (subject to an Agricultural Land Classification survey.) 	<ul style="list-style-type: none"> ■ No likely significant effects anticipated.
Materials Assets and Waste	<ul style="list-style-type: none"> ■ No likely significant effects anticipated. 	<ul style="list-style-type: none"> ■ No likely significant effects anticipated.
Noise and Vibration	<ul style="list-style-type: none"> ■ Temporary adverse noise effects from construction activities for residential properties and particular footpath links in the AONB near new alignment. ■ Temporary adverse vibration effects at one location. 	<ul style="list-style-type: none"> ■ Beneficial noise effects at residential locations near section of removed A417, particularly at Birdlip and particular footpath links in the AONB near Crickley Hill. ■ Adverse noise effects for residential properties near new alignment and particular footpath links nearby in the AONB. ■ No operational vibration effects.
Population and Human Health	<ul style="list-style-type: none"> ■ Potential for significant adverse effects on one business and one residential property. 	<ul style="list-style-type: none"> ■ Likely significant beneficial effects on connectivity and amenity for users of the PRoW network. ■ Likely significant beneficial health effects in relation to air quality.
Road Drainage and the Water Environment	<ul style="list-style-type: none"> ■ Adverse effect on groundwater flows - Construction activities of cuttings, trenches, voids incl. dewatering, embankments, underground structures may affect groundwater flow - redistribution of flow paths and rate; new flow paths; affecting aquifer and surface water recharge. 	<ul style="list-style-type: none"> ■ No likely significant effects anticipated.
Climate Change	<ul style="list-style-type: none"> ■ No likely significant effects anticipated. 	<ul style="list-style-type: none"> ■ No likely significant effects anticipated.

*Note - After inclusion of the proposed mitigation measures

Consultation

Public consultation

Highways England wishes to obtain the views of the public on the draft proposals for the proposed scheme design, taking into account the potential environmental effects of the proposed scheme. These views can then be taken into account in finalising the design and refining the EIA and ES.

There will be a six-week consultation on the proposed scheme running from the 27 September to 8 November 2019 for members of the public to respond to the consultation.

Responses can relate to the preliminary environmental information set out in the report or to any other aspect of the proposed scheme. This will provide an opportunity for stakeholders to give views on our proposals. There are various ways to respond to the consultation

Online:

The feedback form can be completed on our consultation website at:
<https://highwaysengland.co.uk/projects/a417-missing-link/>

Freepost:

The feedback form, or any other feedback, can be posted to the freepost address below. If using this freepost address please write it exactly as shown on a single line, otherwise it may not be delivered.

FREEPOST A417 MISSING LINK (please note that the address must be written in capital letters and you do not need a stamp)

If you need a hard copy of the feedback form, let us know and we can provide one in the post.

Email:

You can email us your feedback via:
A417MissingLink@highwaysengland.co.uk

All consultation responses must be received by 23:59 on 8 November 2019. Responses received after this date may not be taken into consideration as part of the consultation.

If you have any questions you can also call us on 0300 123 5000.

After the consultation

After the consultation period, all responses will be considered in finalising the scheme design and the Environmental Statement. A Consultation Report will be prepared on the responses received and how they have been taken into account, including whether or not they led to changes to the proposed scheme. Highways England will include this report as part of the draft DCO application which is planned for submission in spring 2020. The Planning Inspectorate will decide whether the application meets the required standards to proceed to examination.

If you need help accessing this or any other Highways England information, please call **0300 123 5000** and we will help you.

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